SEISMIC REVIEW OF THE
MAINE YANKEE NUCLEAR POWER PLANT
VOLUME II

APPENDIX A

SUMMARY OF COMBUSTION ENGINEERING EQUIPMENT SEISMIC DESIGN CRITERIA AS DETAILED IN C-E REQUISITION SPECIFICATIONS

Synopsis of Seismic Requirements of the
Acquisition Specifications of the Safe Shutdown Equipment
Purchased by Combustion Engineering

Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations[1]	
L.P.Safety Injection Pump	4467-220-402	Low Pressure Safety Injection Pump	Combustion Engineering	4.2.1.3	The pumps shall be designed to accept the maximum hypothetical seismic acceleration in combination with normal operating loads. The magnitudes of seismic accelerations as given in data sheet No. 1 are: 0.22 g horizontal and 0.15 g vertical for hypothetical seismic accelerations.
PLCEDM	4467-485-301	Part-Length Control Element Drive Mechanism	Combustion Engineering	4.2.1.1.3	Design earthquake forces are defined as 0.67 g horizontal and 0.45 g vertical acceleration applied simultaneously at the center of gravity of the PLCEDM. Maximum earthquake loads are defined as 1.00 g horizontal and 0.67 vertical acceleration of gravity of the PLCEDM. For both the design and the maximum hypothetical earthquake forces. The horizontal component is applied in the least resistart direction.
PLCEDM	4467-485-301	"	"	4.2.1.1.5	Supplementing the requirements of Section III fo the ASME Boiler and Pressure Vessel Code, which specifies stress limits for all design normal operating loading conditions, the PLCEDM shall be designed such that the calculated primary bending stresses, P_m, and the calculated primary bending stresses, P_B, do not exceed the following limits:

$$P_m < S_D$$

$$P_B < 1.5\left[1 - \left(\frac{P_m}{S_D}\right)^{4}\right] S_D, \quad \text{for rectangular sections}$$

$$P_B < \frac{1}{\pi} \cdot S_D \cos\left(\frac{\pi}{2} \cdot \frac{P_m}{S_D}\right), \quad \text{for annular sections}$$

The design stress value, S_D, appearing in the above expressions shall be as follows for the loading combinations indicated:

(1) Maximum or Maximum Hypothetical Earthquake as identified herein are equivalent to a Safe Shutdown Earthquake.
Design Earthquake as identified herein is equivalent to a Operation Basis Earthquake.

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Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations		
				Loading Combinations	Design Stress Value	
				1. Design Loading + Design Earthquake	Section III, ASME Code	
				2. Normal Operating Loading + Maximum Earthquake	$S_D = S_y$ for ferrite steels	
				3. Normal Operating Loading + Pipe Rupture + Maximum Earthquake	$S_D = S_y + 1/3\ (S_u - S_y)$	
				where: S_m = Tabulated Allowable Stress Limit at Temperature, Section III, ASME Code S_y = Tabulated Minimum Yield Strength at Temperature, Section III, ASME Code S_u = Minimum Tensile Strength of Material at Temperature		
CEDM	4467-486-300	Control Element Drive Mechanism	Combustion Engineering	4.2.14.3	Design earthquake forces are defined as 1.07 g horizontal and 0.104 g vertical acceleration applied simultaneously at the center of gravity of the CEDM. Maximum hypothetical earthquake forces are define as 2.14 g horizontal and 0.21 g vertical acceleration applied simultaneously at the center of gravity of the CEDM. For both the design and the maximum hypothetical earthquake forces, The horizontal component is applied in the least resistant direction. a. For normal loads plus design earthquake forces membrane stresses shall be limited to the applicable material specification allowable stresses at operating temperature. The sum of the primary local membrane plus primary bending stresses shall be limited to 1.5 times the allowable stress limit at temperature. b. For normal loads plus maximum hypothetical earthquake forces, membrane stresses shall be limited to S_D defined below. The parimary bending stress shall be limited to $1.5\ (1 - [P_m/S_D]^2)\ S_D$	

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Equipment	Spec. No.	Specification Title	Spec. By		Seismic Design Requirements & Loading Combinations
					d. For normal loads plus pipe rupture loads plus maximum hypothetical earthquake forces, membrane stresses shall be limited to $1.5\ (1 - [P_m/S_L]^2)\ S_L$
					e. where: P_m = Calculated primary membrane stress
					S_L = S_y + 1/3 (S_u - S_y) where: S_y is the minimum tensile strength as given by the ASME Boiler and Pressure Vessel Code, Section III at temperature.
					S_D = Design stress = 1.2 S_m = Allowable stress limit at temperature as given by the ASME Boiler and Pressure Vessel Code Section III.
Reactor Vessel	4467-23-1	A Reactor Vessel Assembly	Combination Engineering	4.2.4.2	Design Earthquake (Note 1) A. Design Seismic Load per 4.2.6. B. CRDM Scram forces 5000 lbs. per CEDM location.
				4.2.4.3	Maximum Earthquake (Note 1) A. Maximum Seismic Load per 4.2.6. B. CRDM Scram forces 5500 lbs. per CEDM location.
					Note 1: The seismic, CRDM, and Pipe rupture support reactions will not contribute to friction forces on the supports.
Reactor Vessel Assembly	4467-23-1	A Reactor Vessel Assembly	Combustion Engineering	4.2.5	Supplementing the requirements of Section III of the ASME Boiler and Pressure Vessel Code, which specifies stress limits for all design and normal operating loading conditions, the reactor vessel assembly shall be designed such that the calculated primary membrane stresses, P_m, and the calculated primary bending stresses, P_B, do not exceed the following limits:

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Equipment	Spec. No.	Specification Title	Spec. By

Seismic Design Requirements & Loading Combinations

$P_m \leq S_D$

$P_B \leq 1.5 \left[1 - \left(\frac{P_m}{S_D}\right)^2 \right] S_D$, for rectangular sections

$P_B \leq \frac{4}{\pi} \cdot S_D \cos\left(\frac{\pi}{2} \cdot \frac{P_m}{S_D}\right)$, for annular sections

The design stress value, S_D, appearing in the above expressions, shall be as follows for the loading combinations indicated.

Loading Combination	Design Stress Value	Criteria for design of Supports
1. Design Loading + Design Earthquake	Section III ASME Code	Section III, ASME Code
2. Normal Operating Loadings + Maximum Earthquake	$S_D = S_y$ for ferritic steels $S_D + 1.2S_m$ for austenitic steels	Stresses within Yield
3. Normal Operating Loading + Pipe Rupture + Maximum Earthquake	$S_D = S_y + 1/3(S_u - S_y)$	Deflections limited to maintain supported equipment within specified stress limits

Where: S_m = Tabulated Allowable Stress Limit at Temperature, Section III, ASME Code.
S_y = Tabulated Minimum Yield Strength at Temperature, Section III, ASME Code.
S_u = Minimum Tensile Strength of Material of Temperature.

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
Purchased by Combustion Engineering

Equipment	Spec. No.	Specification Title	Spec. By		Seismic Design Requirements & Loading Combinations
					Notes: 1. The expression for the limit on P_B for annular sections is based on a minimum "shape factor". This limit may be modified to incorporate the shape factor of the particular section being analyzed. 2. In evaluating the effects of local loads on the vessel, as a result of loading combinations 2 and 3, the Primary Local Membrane Stress, P_L, shall replace P_m in the expressions for stress limits. 3. The stress criteria for loading combination 3 need not be applied to the piping run within which a pipe break is considered to have occurred.
				4.2.6	The design seismic loadings on the reactor vessel applied simultaneously through its supports are 0.25 g in the horizontal direction and 0.25 g in the vertical direction. The maximum seismic loadings on the reactor vessel applied simultaneously through its supports are 0.5 g in the horizontal direction and 0.5 g in the vertical direction.
Fasteners	4467-23-2	Lockweld Specification for Fasteners	Combustion Engineering	4.3.12	The steam generator assembly shall be designed to withstand design seismic loading equivalent to 0.25 g in both the horizontal direction and the vertical direction, applied simultaneously through the steam generator supports. In addition, the assembly shall be capable of withstanding maximum seismic loading equivalent to 0.5 g in both the horizontal and vertical directions applied simultaneously through the steam generator supports.
				4.3.13	The steam generator assembly shall be designed to withstand the combined loadings and meet the stress criteria specified below:

Synopsis of Seismic Requirements of the
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Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations	
				Loading	Stress Criteria
				(A) MOL + PIT + E	Reference 3.1.1
				(B) MOL + MIT + E	Minimum yield stress at operating temperature
				*(C) MOL + MIT + E'	*Minimum yield stress at operating temperature may be exceeded if the calculated plastic deformation does not propagate failure or malfunction of critical elements.

MOL = Maximum normal operating loads, including dead weight, design pressure, design temperature plus piping and support reactions.

PIT = Maximum loads associated with normal plant transients such as start-up, shutdown and load swings.

MIT = Maximum loads associated with the most severe plant transients during emergency conditions such as reactor trip, loss of flow, loss of load, loss of secondary pressure and pipe rupture.

E = Design seismic load applied through the supports (Paragraph 4.3.12) plus design seismic load transmitted by the piping.

E' = Maximum seismic load applied through the supports (Paragraph 4.3.12) plus maximum seismic load transmitted by the piping.

* If a detailed stress analysis of this loading indicates yielding in any area, the Purchaser shall determine the acceptability of such yielding. Under this loading condition there shall be no functional failure that will prevent a safe shutdown during or after the earthquake. This loading condition shall not be a basis for the Code design of the vessel.

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Requisition Specifications of the Safe Shutdown Equipment
Purchased by Combustion Engineering

Equipment	Spec. No.	Specification Title	Spec. By		Seismic Design Requirements & Loading Combinations
Boric Acid Filter	4467-487-202	Boric Acid Filter	Combustion Engineering		From the General Engineering Specification Sheet: 30. Stress Analysis Requirements: Sizing, Seismic Loads 31. Design Seismic Loading, 0.15 g horizontal
Coolant Pumps	4467-23-3	Reactor Coolant Pumps	Combustion Engineering	4.3.8	The design seismic loadings on the pump assembly applied simultaneously through its supports are 0.75 g in the horizontal direction and 0.75 g in the vertical direction. The maximum seismic loadings on the pump assembly applied simultaneously through its supports are 1.0 g in the horizontal direction and 1.0 g in the vertical direction. Supplementing the requirements of Section III of the ASME Boiler and Pressure Vessel Code which specifies stress limits for all design and normal operating conditions, the reactor coolant pump case assembly shall be designed such that the calculated primary membrane stresses, P_m, and the calculated primary bending stresses, P_B do not exceed the following limits: $P_m \leq S_D$ $P_B \leq 1.5 \left[1 - \left(\frac{P_m}{S_D}\right)^2 \right] S_D$, for rectangular sections $P_B \leq \frac{4}{\pi} \cdot S_D \cos\left(\frac{\pi}{2} \cdot \frac{P_m}{S_D}\right)$, for annular sections The design stress value, S_D, appearing in the above expressions, shall be as follows for the loading combinations indicated.

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Requisition Specifications of the Safe Shutdown Equipment
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Equipment	Spec. No.	Specification Title	Spec. By

Seismic Design Requirements & Loading Combinations

Loading Combination	Design Stress Value	Criteria for Design of Supports
1. Design Loadings + Design Earthquake	Section III, ASME B & PV Code	Section III, ASME B & PV Code
2. Normal Operating Loadings + Maximum Earthquake	$S_D = S_y$ for ferritic steels $S_D + 1.2S_m$ for austenitic steels	Stresses within Yield
3. Normal Operating Loading + Pipe Rupture + Maximum Earthquake	$S_D = S_y + 1/3(S_u - S_y)$	Deflections limited to maintain supported equipment within specified stress limits

Where: S_m = Tabulated Allowable Stress Limit at Temperature, Section III, ASME Boiler and Pressure Vessel Code.
S_y = Tabulated Minimum Yield Strength at Temperature, Section III, ASME Boiler and Pressure Vessel Code.
S_u = Minimum Tensile Strength of Material of Temperature.

Notes: 1. The expression for the limit on P_B for annular sections is based on a minimum "shape factor". This limit may be modified to incorporate the shape factor of the particular section being analyzed.

2. In evaluating the effects of local loads on the vessel, as a result of loading combinations 2 and 3, the Primary Local Membrane Stress, P_L, shall replace P_m in the expressions for stress limits.

3. The stress criteria for Loading Combination No. 3 need not be applied to the piping run within which a pipe break is considered to have occurred.

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Equipment	Spec. No.	Specification Title	Spec. By		Seismic Design Requirements & Loading Combinations
Pressurizer Assembly	4467-23-4	A Pressurizer Assembly	Combustion Engineering	4.3.10	The pressurizer assembly shall be designed to withstand design seismic loading equivalent to 0.25 g in the horizontal direction and 0.25 g in the vertical direction, applied simultaneously through the pressurizer supports. In addition, the assembly shall be capable of withstanding maximum seismic loading equivalent to 0.5 g in the horizontal direction and 0.5 g in the vertical direction applied simultaneously through the pressurizer supports.
				4.3.11	Supplementing the requirements of Section III of the ASME Boiler and Pressure Vessel Code which specifies stress limits for all design and normal operating loading conditions, the pressurizer assembly shall be designed such that the calculated primary membrane stresses, P_m and the calculated primary bending stresses, P_B do not exceed the following limits: $P_m \leq S_D$ $P_B \leq 1.5\left[1 - \left(\frac{P_m}{S_D}\right)^2\right] S_D$, for rectangular sections $P_B \leq \frac{4}{\pi} \cdot S_D \cos\left(\frac{\pi}{2} \cdot \frac{P_m}{S_D}\right)$, for annular sections The design stress value, S_D, appearing in the above expressions, shall be as follows for the loading combinations indicated:

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
Purchased by Combustion Engineering

Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations		
				Loading Combination	Design Stress Value	Criteria for Design of Supports
				1. Design Loadings + Design Earthquake	Section III, ASME B & PV Code	Section III, ASME B & PV Code
				2. Normal Operating Loadings + Maximum Earthquake	$S_D = S_y$ for ferritic steels $S_D + 1.2S_m$ for austenitic steels	Stresses within Yield
				3. Normal Operating Loading + Pipe Rupture + Maximum Earthquake	$S_D = S_y + 1/3(S_u - S_y)$	Deflections limited to maintain supported equipment within specified stress limits

Where: S_m = Tabulated Allowable Stress Limit at Temperature, Section III, ASME Boiler and Pressure Vessel Code.
S_y = Tabulated Minimum Yield Strength at Temperature, Section III, ASME Boiler and Pressure Vessel Code.
S_u = Minimum Tensile Strength of Material of Temperature.

Notes: 1. The expression for the limit on P_B for annular sections is based on a minimum "shape factor". This limit may be modified to incorporate the shape factor of the particular section being analyzed.

2. In evaluating the effects of local loads on the vessel, as a result of loading combinations 2 and 3, the Primary Local Membrane Stress, P_L, shall replace P_m in the expressions for stress limits.

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Requisition Specifications of the Safe Shutdown Equipment
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Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations
Filters	4467-487-201	Filters-Radioactive Service	Combustion Engineering	From the Pre-Demineralizer Purification Filter Project Data Sheet: 30. Stress Analysis Requirements: Sizing, Seismic, etc. 31. Design Seismic Loading, 0.15 g horizontal From the Post-Demineralizer Purification Filter Project Data Sheet: 31. Design Seismic Loading, 0.15 g horizontal From the Seal Water Supply Filter Project Data Sheet: 31. Design Seismic Loading, 0.15 g horizontal From the Seal Water Return Filter Project Data Sheet: 31. Design Seismic Loading, 0.15 g horizontal
Heat Exchanger	447-487-301	Residual Heat Exchanger	Combustion Engineering	From the Construction and Performance Design Data: 27. Seismic Loadings: Design: .110 g Horizontal, .073 g Vertical Max. Hypothetical: .220 g Horizontal, .147 g Vertical 28. Excitation Frequency, cps: None Excitation Amplitude, psi: None

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
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Equipment	Spec. No.	Specification Title	Spec. By		Seismic Design Requirements & Loading Combinations
Heat Exchanger	447-487-302	Regenerating Heat Exchanger	Combustion Engineering		From the Construction and Performance Design Data: 27. Design Seismic Load: 0.11 g Horizontal 28. Excitation Frequency, 3 to 36 cps Excitation Amplitude. ± 300 psi (This pressure fluctuation applies to the shell side only)
Heat Exchanger	447-487-303	Letdown Heat Exchanger	Combustion Engineering		From the Construction and Performance Design Data: 27. Design Seismic Load: 0.11 g Horizontal 28. Excitation Frequency & Amplitude: None
Heat Exchanger	447-487-304	Miscellaneous Heat Exchanager	Combustion Engineering	4.1 4.1.3	Design Data The vessel supports, attachment welds and anchor bolts shall be designed to withstand simultaneous static loads applied to the center of gravity as follows: a) horizontal - 2.0 times the weight of the vessel full of water applied in whichever direction will cause the worst stress condition. b) vertical downward - 2.7 times the weight of the vessel full of water. c) vertical upward - 0.7 times the weight of the vessel full of water. The allowable stress criteria of Reference 3.3.3 shall apply except the increase in allowable stresses due to seismic or wind loads per Paragraph 1.5.6, Part 5 is not permitted.
				4.1.4	The heat exchanger shall be designed such that its natural frequency including its support is equal to or greater than 20 cps.

Synopsis of Seismic Requirements of the
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Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations
Drain Cooler Heat Exchanger	447-487-304	A. Drain Cooler Heat Exchanger	Combustion Engineering	From the Construction and Performance Design Data: 27. Design Seismic Load: .15 g Horizontal Hypothetical Seismic Load: .22 g Horizontal 28. Excitation Frequency & Amplitude: None
Seal Water Heat Exchanger	447-487-304	B. Seal Water Heat Exchanger	Combustion Engineering	From the Construction and Performance Design Data: 27. Design Seismic Load: .15 g Horizontal Hypothetical Seismic Load: .22 g Horizontal 28. Excitation Frequency & Amplitude: None
Seal Water Heater	447-487-304	Seal Water Heater	Combustion Engineering	From the Construction and Performance Design Data: 27. Seismic Loading: 0.11 g Horizontal 28. Excitation Frequency, 3 to 36 cps Excitation Amplitude, ± 300 psi (This pressure fluctuation applies to the tube side only.)
Boric Acid Pump	4467-487-404	Boric Acid Transfer Pump	Combustion Engineering	From Project Data Sheet 8. Seismic Acceleration Horizontal 0.97 g Vertical 0.65 g
Auxiliary Charging Pump	4467-487-403	Auxiliary Charging Pump	Combustion Engineering	From Project Data Sheet 10. Maximum Hypothetical Seismic Acceleration Horizontal 0.75 g Vertical 0.50 g

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
Purchased by Combustion Engineering

Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations
Centrifugal Charging Pump	4467-487-449	Centrifugal Charging Pump	Combustion Engineering	From Project Data Sheet 14. Hypothetical Seismic Acceleration — Horizontal 0.22 g, Vertical 0.15 g
Centrifugal Charging Pump	4467-487-449	Centrifugal Charging Pump	Combustion Engineering	From Project Data Sheet 14. Hypothetical Seismic Acceleration — Horizontal 0.22 g, Vertical 0.15 g
Pressurizer Quench Tank	4467-487-602	Pressurizer Quench Tank	Combustion Engineering	From Tank Data Sheet 9. Seismic Design Coefficient — Horizontal 0.35 g
Tanks	4467-487-603 -1	Miscellaneous Tanks Requiring a Code Stamp Safety Injection Tank	Combustion Engineering	From Tank Data Sheet 11. Seismic Coefficients Design: Horizontal 0.22 g, Vertical 0.18 g Hypothetical: 0.44 g, 0.35 g
Volume Control Tank	4467-487-603 -2	Volume Control Tank	Combustion Engineering	From Tank Data Sheet 11. Seismic Coefficients Design: Horizontal 0.22 g, Vertical 0.18 g Hypothetical: 0.44 g, 0.35 g

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
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Equipment	Spec. No.	Specification Title	Spec. By		Seismic Design Requirements & Loading Combinations
Demineralizers	4467-487-651	Demineralizers: Purification Deborating Fuel Pool Borated Waste	Combustion Engineering		From Tank Data Sheet 10. Seismic Design Coefficient Horizontal 0.22 g
Reactor Regulatory System	4467-488-301	Reactor Regulating System	Combustion Engineering	4.2.1	Environmental Conditions In addition to the environmental conditions described in Reference 3.1.1, Section 4.3, the structure mounting, component support details and wiring shall be designed so that the maximum stresses, including simultaneous seismic accelerations of 0.1 g and 0.07 g in the horizontal and vertical directions respectively shall not dislodge or cause relative movement between components such as to impair the functional integrity of circuits or equipment.
Feedwater Regulating System	4467-488-305	Feedwater Regulating System	Combustion Engineering	4.2 4.2.1	Design Data Environmental Conditions In addition to the environmental conditions described in Reference 3.1.1., Section 4.3, the structure, mounting, component support details and wiring shall be designed so that the maximum stresses, including simultaneous seismic accelerations of .22 g and .15 g in the horizontal and vertical directions respectively shall not dislodge or cause relative movement between components such as to impair the functional integrity of circuits or equipment.
Axial Power Distribution Trip Calculator	4467-ICE-306	Axial Power Distribution Trip Calculator	Combustion Engineering	4.2.2	The equipment furnished under this specification shall be designed to withstand in operation a horizontal acceleration of 0.22 g and a vertical acceleration of 0.15 g acting simultaneously without loss of function.

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
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Equipment	Spec. No.	Specification Title	Spec. By		Seismic Design Requirements & Loading Combinations
Reactor Regulating System Cabinet Assembly	4467-488-312	Reactor Regulating System Cabinet Assembly	Combustion Engineering	4.2.1.1	The equipment furnished under this specification shall be designed to withstand in operation a horizontal acceleration of 0.22 g and a vertical acceleration of 0.15 g acting simultaneously.
	4467-488-705	Control System for Magnet Jack CEDM's	Combustion Engineering	4.6	Seismic Acceleration The control components when mounted within the cabinet assembly must be capable of withstanding, without loss of function, simultaneous ground seismic acceleration of 0.1 g and 0.07 g in the horizontal and vertical directions respectively. The enclosure structure, mounting, component supports details, and wiring, shall be designed so that they do not dislodge or cause relative movement between components sufficient to impair the functional integrity of the circuits of equipment.
Motor - Generator	4467-ICE-706	Motor - Generator Sets of Control Element Drive Mechanism	Combustion Engineering	4.4.1	The equipment shall be designed to withstand a horizontal acceleration of 0.22 g and a vertical acceleration of 0.15 g acting simultaneously without loss of function.
Reactor Protective System	00000-ICE-501	Reactor Protective System	Combustion Engineering	4.3 4.3.1	Seismic Requirements All equipment required by this specification shall be classified as seismic Class I and shall be designed in accordance with the seismic response spectrums as described in the individual project specification. Vertical and horizontal response spectrum shall be based on a critical damping of 1 percent. The supplier shall submit test data, prototype or actual, and/or calculations which substantiate the following: a. The equipment will be designed to withstand all simultaneous horizontal and vertical accelerations, resulting from the operating basis earthquake seismic condition without loss of function.

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Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations
Bistable & Auxiliary Trip Units	00000-ICE-503	Bistable & Auxiliary Trip Units	Combustion Engineering	Reactor Protective System Seismic: The relay module shall be designed such that seismic accelerations shall not cause loss of function either during or following a seismic disturbance. The values tabulated below are based on a maximum horizontal ground acceleration of 0.08 g and represent the response in the vertical and horizontal directions that a single degree of freedom mass with a 0.01 damping factor would experience at its natural frequency. Class I Frequency Range (Hz) / Simultaneous Accelerations: Vertical (g) / Horizontal (g) 0 - 40: 0.4 / 2.1 except 1 - 2: 0.4 / 5.1 40 - 100: 0.1 / 0.6 The Supplier is required to determine the resonance point(s) and damping factor of the module over the range of 0 to 100 Hz. If a damping factor is not known, and if the Supplier chooses not to determine an experimental value, a damping factor of 0.01 is to be used. The module should then be subjected to vertical and horizontal forces, such that the measured response is equivalent to the acceleration(s) listed for the resonance point(s).

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Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations	
C.P.P. Control Center	00000-ICE-707	Coil Power Programer Control Center	Combustion Engineering	4.4	Seismic Requirements The solid state control centers shall be capable of withstanding a horizontal acceleration of 0.22 g and a vertical acceleration of 0.15 g occurring simultaneously in conjunction with other loads for which the equipment is designed without exceeding allowable stresses of causing an equipment or component malfunction. The above accelerations are those of the support floor.
Switchgear	4467-ICE-708	Reactor Trip Circuit Breaker Switchgear	Combustion Engineering	4.10.1	The switchgear furnished under this specification shall be designed to withstand in operation a horizontal acceleration of 0.22 g and a vertical acceleration of 0.15 g acting simultaneously.

APPENDIX B

SUMMARY OF STONE & WEBSTER EQUIPMENT SEISMIC DESIGN CRITERIA AS DETAILED IN S&W REQUISITION SPECIFICATIONS

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
Purchased by Stone & Webster Engineering

Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations
P & S Component Cooling Pumps	MYS-505	Primary and Secondary Component Cooling Pump	Stone & Webster Co.	Seismic Requirements The ability to withstand the effect of earthquake is a requirement prescribed by regulatory bodies having jurisdiction over this nuclear project. The equipment furnished under this specification shall be checked for conformity to two different seismic requirements. 1. The equipment shall be designed within allowable working stresses for all normal loads, plus an earthquake load corresponding to a horizontally applied average acceleration of 0.11 g and a vertical acceleration of 0.07 g both acting simultaneously. 2. The equipment shall also be designed to withstand, without loss of structural integrity or function, all normal loads plus an earthquake load corresponding to a horizontally applied average acceleration of 0.22 g and a vertical acceleration of 0.15 g, both acting simultaneously.
P & S Component Cooling Heat Exchanger	MYS-613 MY-25	Primary and Secondary Component Cooling Heat Exchanger Equipment	Stone & Webster Co.	The ability to withstand the effect of earthquake is a requirement prescribed by regulatory bodies having jurisdiction over this nuclear project. The equipment furnished under this specification shall be checked for conformity to two different seismic requirements. 1. The equipment shall be designed within allowable working stresses for all normal loads, plus an earthquake load corresponding to a horizontally applied average acceleration of 0.11 g and a vertical acceleration of 0.07 g, both acting simultaneously. 2. The equipment shall also be designed to withstand, without loss of structural integrity or function, all normal loads plus an earthquake load corresponding to a horizontally applied average acceleration of 0.22 g and a vertical acceleration of 0.15 g, both acting simultaneously.

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
Purchased by Stone & Webster Engineering

Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations
Service Water Pump	MYS-523	Service Water Pump Equipment	Stone & Webster Co.	The ability to withstand the effect of earthquake is a requirement prescribed by regulatory bodies having jurisdiction over this nuclear project. The equipment furnished under this specification shall be checked for conformity to two different seismic requirements. 1. The equipment shall be designed within allowable working stresses for all normal loads, plus an earthquake load corresponding to a horizontally applied average acceleration of 0.11 g and a vertical acceleration of 0.07 g, both acting simultaneously. 2. The equipment shall also be designed to withstand, without loss of structural integrity or function, all normal loads plus an earthquake load corresponding to a horizontally applied average acceleration of 0.22 g and a vertical acceleration of 0.15 g, both acting simultaneously.
E.D. Engine Driven AC Generators	MYS-525	Emergency Diesel Engine Driven AC Generators	Stone & Webster Co.	Earthquake Requirements The ability to withstand earthquake when in operation is a requirement prescribed by regulatory bodies having jurisdiction over this nuclear power station. The emergency generator sets shall be designed to withstand in operation a horizontal acceleration of 0.22 g and a vertical acceleration of 0.15 g acting simultaneously. The seller shall guarantee the structural integrity of the equipment (including separately mounted accessories) and its controls to start and operate through and earthquake of this intensity.
Containment Spray Pumps	MYS-601	Containment Spray Pumps	Stone & Webster Co.	Earthquake Requirements and Piping Thrusts The design of each pumping unit (including suction casing) shall insure that all combinations of operating loads and forces plus earthquake forces do not exceed the stress values defined below for each of the two incidents to be considered:

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
Purchased by Stone & Webster Engineering

Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations
				1. The Design Earthquake incident is based on a horizontal average acceleration of 0.11 g and a vertical average acceleration of 0.07 g acting simultaneously. The total resultant stress due to all loads, thrusts and forces shall be within the limits of the allowable working stress values of the affected materals. 2. The Hypothetical Earthquake incident is based on a horizontal average acceleration of 0.22 g and a vertical average acceleration of 0.15 g acting simultaneously. The equipment design shall provide for withstanding the total resultant stress due to all loads, thrusts, and forces without loss of structural integrity or function. The complete pumping unit shall remain intact and operable through the incident.
Fuel Pool Cooling Heat Exchanger	MYF-771	Fuel Pool Cooling Heat Exchanger	Stone & Webster Co.	1. The heat exchangers shall be designed within allowable working stresses for all normal loads, plus an earthquake load corresponding to a horizontally applied average acceleration of 0.11 g and a vertical acceleration of 0.07 g, both acting simultaneously. 2. The exchanger shall also be designed to withsand, without loss of structural integrity or function, all normal loads plus an earthquake load corresponding to a horizontally applied average acceleration of 0.22 g and a vertical acceleration of 0.15 g, both acting simultaneously.
Fuel Pool Cooling and Purification Pumps	MYS-860	Fuel Pool Cooling and Purification Pumps	Stone & Webster Co.	The Fuel Pool Cooling Pumps and Motors, P17A and B, shall be designed for two seismic load conditions as follows: 1. The pumps and motors shall be designed within allowable working stresses for all normal loads, plus an earthquake load corresponding to a horizontally applied average acceleration of 0.11 g and a vertical acceleration of 0.07 g, both acting simultaneously. 2. The equipment shall also be designed to withstand, without loss of structural integrity or function, all normal loads plus an earthquake load corresponding to a horizontally applied average acceleration of 0.22 g and a vertical acceleration of 0.15 g, both acting simultaneously.

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
Purchased by Stone & Webster Engineering

Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations
Fuel Oil Storage Tanks	MYS-1482	Fuel Oil Storage Tanks	Stone & Webster Co.	Earthquake Requirements The ability to withstand the effect of earthquake is a requirement prescribed by regulatory bodies having jurisdiction over this nuclear project. The equipment furnished under this specification shall be checked for conformity to two different seismic requirements. 1. The equipment shall be designed with allowable working stresses for normal loads, plus an earthquake load corresponding to a horizontally applied average acceleration of .15 g and a vertical acceleration of .10 g both acting simultaneously. 2. The equipment shall also be designed to withstand, without loss of structural integrity or function, all normal loads plus an earthquake load corresponding to a horizontally applied average acceleration of .22 g and a vertical acceleration of .17 g, both acting simultaneously.
Control Boards	MYS-1546	Control Boards	Stone & Webster Co.	Seismic Requirements The ability of certain specified equipment to withstand the effects of earthquake is a requirement specified by regulatory bodies having jurisdiction over this nuclear project. The equipment furnished under this specification shall be designed to withstand in operation a horizontal acceleration of 0.22 g and a vertical acceleration of 0.15 g acting simultaneously. The Seller shall guarantee the structural integrity of this equipment to operate through an earthquake of this intensity.
Axial Flow Fans	MYS-1651	Axial Flow Fans	Stone & Webster Co.	Earthquake Resistance The ability to withstand the effect of earthquake is a requirement prescribed by regulatory bodies having jurisdiction over this nuclear project. Items 3, 5 and 8 furnished under this specification shall be checked for conformity to two different seismic requirements.

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
Purchased by Stone & Webster Engineering

Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations
3	FN-32		SM-74-P-3	Prot. Cable Tray and Switchgear Room Exhaust
5	FN-20A, B		SM-74-P-4	Emergency Diesel Generator Rooms Exhaust
8	FN-11A, B		SM-74-P-5	Control Room Filter Booster Fans

1. Item 5 shall be capable to withstand all allowable working stresses for normal loads, plus an earthquake load corresponding to a horizontally applied average acceleration of 0.05 g and a vertical of 0.033 g, both acting simultaneously.
2. Item 5 shall also be capable to withstand, without loss of structural integrity or function, all normal loads plus an earthquake load corresponding to a horizontally applied average acceleration of 0.1 g and a vertical of 0.067 g, both acting simultaneously.
3. Items 3 and 8 shall be capable to withstand all allowable working stresses for normal loads, plus an earthquake load corresponding to a horizontally applied average acceleration of 0.110 g and a vertical of 0.073 g, both acting simultaneously.
4. Items 3 and 8 shall also be capable to withstand, without loss of structural integrity or function, all normal loads plus an earthquake load corresponding to a horizontally applied average acceleration of 0.220 g and a vertical of 0.143 g, both acting simultaneously.

These earthquake requirements extend to the fans and their drivers. A notarized statement based on experience or judgment is acceptable as satisfying this requirement.

Where the Items are:

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
Purchased by Stone & Webster Engineering

Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations
Boric Acid Tank Mixing Agitator	MYS-1781	Boris Acid Tank Mixing Agitator	Stone & Webster Co.	Seismic Requirements The ability to withstand the effect of earthquake is a requirement prescribed by regulatory bodies having jurisdiction over this nuclear project. The equipment furnished under this specification shall be checked for conformity to two different seismic requirements. 1. The equipment shall be designed within allowable working stresses for all normal loads, plus an earthquake load corresponding to a horizontal applied average acceleration of 0.11 g and a vertical of 0.07 g, both acting simultaneously. 2. The equipment shall also be designed to withstand, without loss of structural integrity or function, all normal loads plus an earthquake load corresponding to a horizontally applied average acceleration of 0.22 g and a vertical of 0.15 g, both acting simultaneously.
Reactor Containment Air Cooling Coils	MYS-1706	Reactor Containment Air Cooling Coils	Stone & Webster Co.	Earthquake Requirements The ability to withstand the effect of earthquake is a requirement prescribed by regulatory bodies having jurisdiction over this nuclear project. The equipment furnished under this specification shall be checked for conformity to two different seismic requirements. 1. The equipment shall be capable to withstand all allowable working stresses for normal loads, plus an earthquake load corresponding to a horizontally applied average acceleration of 0.05 g and a vertical of .033 g both acting simultaneously. 2. The equipment shall also be capable to withstand, without loss of structural integrity or function, all normal loads plus an earthquake load corresponding to a horizontally applied average acceleration of .10 g and a vertical acceleration of .067 g, both acting simultaneously. These earthquake requirements extend to the air recirculation system cooling coils, E-54-1 to E-54-6, Item 1. A notarized statement based on experience or judgment is acceptable as satisfying the requirements of this section.

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
Purchased by Stone & Webster Engineering

Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations
Static High Reliability Power System	MYS-1784	Static High Reliability Power System	Stone & Webster Co.	Seismic Requirements The ability of certain specified equipment to withstand the effect of earthquake is a requirement specified by regulatory bodies having jurisdiction over this nuclear project. The High Reliability Power System furnished under this specification shall be designed to withstand in operation a horizontal acceleration of 0.22 g and a vertical acceleration of 0.15 g acting simultaneously. The Seller shall guarantee the structural integrity of this equipment and its controls to operate through an earthquake of this intensity. Supporting data, to substantiate that this requirement is being met, will be required subsequent to receipt of the purchase order.
Centrifugal Fans	MYS-1908	Centrifugal Fans	Stone & Webster Co.	Earthquake Resistance The ability to withstand the effect of earthquake is a requirement prescribed by the regulatory bodies having jurisdiction over this nuclear project. Items 1, 2, 6, 11, 12, 13, and 14 furnished under this specification shall be checked for conformity to two different seismic requirements. 1. The equipment shall be capable to withstand all allowable working stresses for normal loads, plus an earthquake load corresponding to horizontally and vertically applied average acceleration listed in the table below, both acting simultaneously.

Item	Horizontal Acceleration, g	Vertical Acceleration, g
1 and 2	0.050	0.033
6	0.110	0.073
11 and 12	0.050	0.033
13 and 14	0.050	0.033

2 The equipment shall also be capable to withstand, without loss of structural integrity or function, all normal loads plus an earthquake load corresponding to horizontally and vertically applied average acceleration listed in the table below, both acting simultaneously.

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
Purchased by Stone & Webster Engineering

Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations

Item	Horizontal Acceleration, g	Vertical Acceleration, g
1 and 2	0.10	0.067
6	0.22	0.146
11 and 12	0.10	0.067
13 and 14	0.10	0.067

Where the Items are:

Item	Page No.	Mark No.	Service
1	1	FN-1A	Ventilation & Purge Fan
2	1	FN-1B	Ventilation & Purge Fan
6	2	FN-31	Protected Swgr & Cable Tray Supply
11	4	FN-44A	Spray Pump Area Exhaust
12	4	FN-44B	Spray Pump Area Exhaust
13	5	FN-17-1,3,5	Reactor Containment Air Recirculation Fans
14	5	FN-17-2,4,6	Reactor Containment Air Recirculation Fans

Station Batteries	MYS-2144	Station Batteries	Stone & Webster Co.	Seismic Requirements The ability of certain specified equipment to withstand the effect of earthquake is a requirement specified by regulatory bodies having jurisdiction over this nuclear project. The Control Storage Batteries and Racks furnished under this specification shall be designed to withstand in operation a horizontal acceleration of 0.22 g and a vertical acceleration of 0.15 g acting simultaneously. The Seller shall guarantee the structural integrity of this equipment and its controls to operate through an earthquake of this intensity.

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
Purchased by Stone & Webster Engineering

Equipment	Spec. No	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations
DC Distribution Cabinets	MYS-2168	DC Distribution Cabinets	Stone & Webster Co.	Seismic Requirements The ability of certain specified equipment to withstand the effect of earthquake is a requirement specified by regulatory bodies having jurisdiction over this nuclear project. The Direct Current Distribution Cabinets and Component Mountings, furnished under this specification shall be designed to withstand in operation a horizontal acceleration of 0.22 g and a vertical acceleration of 0.15 g acting simultaneously. The Seller shall guarantee the structural integrity of this equipment and its controls to operate through an earthquake of this intensity.
Heat Exchangers	MYS-2426A	Miscellaneous Heat Exchangers	Stone & Webster Co.	Earthquake Design Requirements Those exchangers herein designated as Safety Related Equipment shall be designed for two seismic load conditions as follows: 1. The exchangers shall be designed within allowable working stresses for all normal loads, plus an earthquake load corresponding to a horizontal applied average acceleration of 0.11 g and a vertical of 0.07 g, both acting simultaneously. 2. The exchanger shall also be designed to withstand, without loss of structural integrity or function, all normal loads, plus an earthquake load corresponding to a horizontally applied average acceleration of 0.22 g and a vertical of 0.15 g, both acting simultaneously.
Motors for Containment Recirculating Fans	MYS-2854	Motors for Containment Recirculating Fans	Stone & Webster Co.	Seismic Requirements The ability of certain specified equipment to withstand the effect of earthquake is a requirement specified by regulatory bodies having jurisdiction over this nuclear project. Motor Drivers for Primary Plant Components shall be designed to withstand in operation a horizontal acceleration of 0.22 g and a vertical acceleration of 0.15 g acting simultaneously. The Seller shall guarantee the structural integrity of these motors and their accessories to operate through an earthquake of this intensity.

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
Purchased by Stone & Webster Engineering

Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations
Ventilation Air Filter Assemblies	MYS-3570	Ventilation Air Filter Assemblies	Stone & Webster Co.	Earthquake Requirements The ability to withstand the effect of earthquake is a requirement prescribed by the regulatory bodies having jurisdiction over this nuclear project. Items 2, 3, 6, and 10 furnished under this specification shall be checked for conformity to two different seismic requirements. 1. The equipment shall be designed with allowable working stresses for normal loads, plus an earthquake load corresponding to horizontally and vertically applied average acceleration listed in the table below, both acting simultaneously. Item / Horizontal Acceleration, g / Vertical Acceleration, g 2 and 3 / 0.05 / 0.033 6 and 10 / 0.110 / 0.073 2. The equipment shall also be designed to withstand, without loss of structural integrity or function, all normal loads plus an earthquake load corresponding to horizontally and vertically applied average acceleration listed in the table below, both acting simultaneously. Item / Horizontal Acceleration, g / Vertical Acceleration, g 2 and 3 / 0.10 / 0.067 6 and 10 / 0.22 / 0.146

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
Purchased by Stone & Webster Engineering

Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations
Service Water Pumps	MYS-5440	Service Water Pumps	Stone & Webster Co.	Seismic Requirements The ability to withstand the effect of earthquake is a requirement prescribed by regulatory bodies having jurisdiction over this nuclear project. The Seller shall submit calculations to substantiate that his equipment meets the loading requirements described below and shall include calculations for natural frequency data. The equipment furnished under this specification shall be checked for conformity to two different seismic conditions. 1. The equipment shall be designed within allowable working stresses for all normal loads, plus an earthquake load corresponding to a horizontally applied average acceleration of .15 g and a vertical of .33 g both acting simultaneously. 2. The equipment shall also be designed to withstand, without loss of structural integrity or function, all normal loads plus an earthquake load corresponding to a horizontally applied average acceleration of .75 g and a vertical of 0.50 g, both acting simultaneously. The material stress levels permitted under the above loading conditions shall not exceed the allowable working stress under any applicable case requirements and in no case shall the yield stresses exceed 90 percent, under combined loading conditions.

Synopsis of Seismic Requirements of the
Requisition Specifications of the Safe Shutdown Equipment
Purchased by Stone & Webster Engineering

Equipment	Spec. No.	Specification Title	Spec. By	Seismic Design Requirements & Loading Combinations

Instructions to Seller For Static Analysis

1. Formulate a program for qualifying the equipment in accordance with the conditions specified in the earthquake requirements. A summary of the effort to be undertaken shall be submitted to the Engineers as specified.
2. The Engineers will confirm whether the program for qualifying the equipment is acceptable within two weeks of receipt of the summary.
3. The values cited in paragraphs 1 and 2 are to be used, the base natural frequency of the equipment must be determined.
4. The Seller is required to multiply the appropriate masses of the equipment components by the acceleration values in three orthogonal directions, so as to load the equipment in these directions. One direction of horizontal earthquake shall be considered concurrently with the vertical direction earthquake.
5. The structural load-carrying members, whether internal components or external components such as hold-down bolts, must be checked to ensure adequacy of design under seismic loading.
6. The equipment is to be analyzed on a worst case basis with regard to operating conditions. A check of critical area deflections must be made to ascertain that detrimental damage will not occur.
7. A final analysis report must be compiled by the Seller and submitted to the Engineers for approval. Upon receipt of approval, the Seller will submit a Certificate of Compliance. The Certificate of Compliance must be stamped and signed by a Registered Professional Engineer with the statement that he has seen and reviewed the adequacy of the method for establishing that the seismic design requirements have been met. A summary of the calculation method must be included in the compliance statement. The summary need be only a short paragraph but should include code references and equations. The Certificate must also be signed by a knowledgeable officer of the Seller's company.

APPENDIX C

PLANT WALK-THROUGH EQUIPMENT SURVEY FORMS

ATTACHMENT I
COMPONENT LIST

S&A

LIST OF COMPONENTS AT MAINE YANKEE NUCLEAR POWER STATION
REVIEWED DURING THE WALK-THROUGH

Component

Pumps:

Auxiliary Feed, P-25A & C
Auxiliary Feed, P-25B
Charging, P-14A, B
SCCW, P-10A, B
Service Water, P29A, B, C, D
PCCW, P-9A, B
Core Spray
Diesel Oil Transfer

Heat Exchangers:

Regen, E-67
RHR, E-3B
SCCW, E 5A, B
PCCW, E 4A, B
Letdown

Tanks:

Spray Chemical Addition
DWST, TK-4
Fuel Oil Day, TK-62A
Fuel Oil Day, TK-62B
Air Start-Up
Boric Acid Storage

Electrical Equipment:

Motor Control Center- 7B1, 8B, 8B1
Batteries (Racks) 1, 2, 3, 4
Diesel Generators DG-1A & 1B
Main Control Board
Battery Charger
Diesel Generator Local Panel
Inverters

Misc. Instrumentation:

Cable Trays

S&A

ATTACHMENT II
COMPONENT WORK PACKAGES

S&A

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. P-25

Item Description: Aux Feed Pumps

Location: _____

1) General Description, Photograph, or Sketch of Supports:

See attached sketch

2) Check List

A) Base Plate: _____

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number 10

b) Spacing See Sketch

c) Size 5/8" ϕ Embedded

d) Edge Distance O.K.

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: ✓

b) Expansion Anchor Bolts: _____

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: _____

C) Description of Additional Attachments (bracing, gussetts, etc.) None

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO. P-25

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 8.15.1)

a) Cracks:

b) Fusion:

c) Craters:

d) Profiles:

e) Fillet Size:

2) Bolts

a) Fit: O.K.

b) Relative Size (Bolt to hole): O.K.

c) Material:

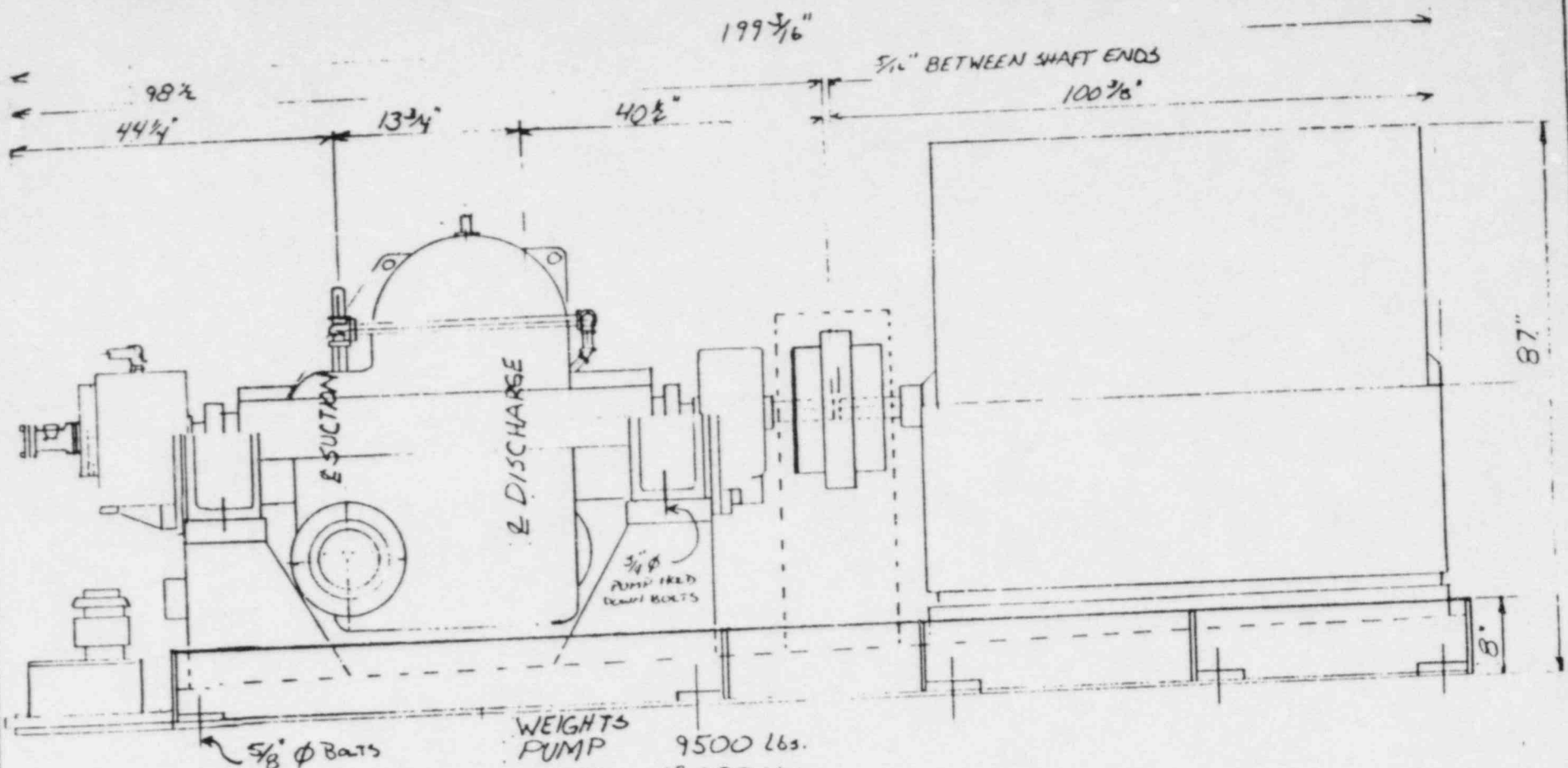
E) General Equipment Dims: SEE SKETCH

F) Estimated Weight: SEE SKETCH

Estimated Location of C.G.: Geometric ℄ of Pump & Motor

G) Is component supported or restrained by block wall? ___ Yes ___ No ✓

H) General Comments



WEIGHTS	
PUMP	9500 Lbs.
MOTOR	19,000 Lbs.
*BASE	6200 Lbs.
TOTAL	34,700 Lbs.

* INCLUDES OIL RESERVOIR, AUX. PUMP, COOLER

MOTOR DRIVEN AUX. FEEDWATER PUMP

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. P-14

Item Description: CHARGING PUMP

Location: _____

1) General Description, Photograph, or Sketch of Supports:

SEE ATTACHED SKETCH

2) Check List

A) Base Plate: _____

1) Base Plate Dims: 20'-0" x 9'-0"

2) Bolt Holes:

a) Number 8

b) Spacing O.K.

c) Size 5/8" ϕ

d) Edge Distance O.K.

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: ✓

b) Expansion Anchor Bolts: _____

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: _____

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 6.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit: O.K.

b) Relative Size (Bolt to hole): O-K-

c) Material:_____

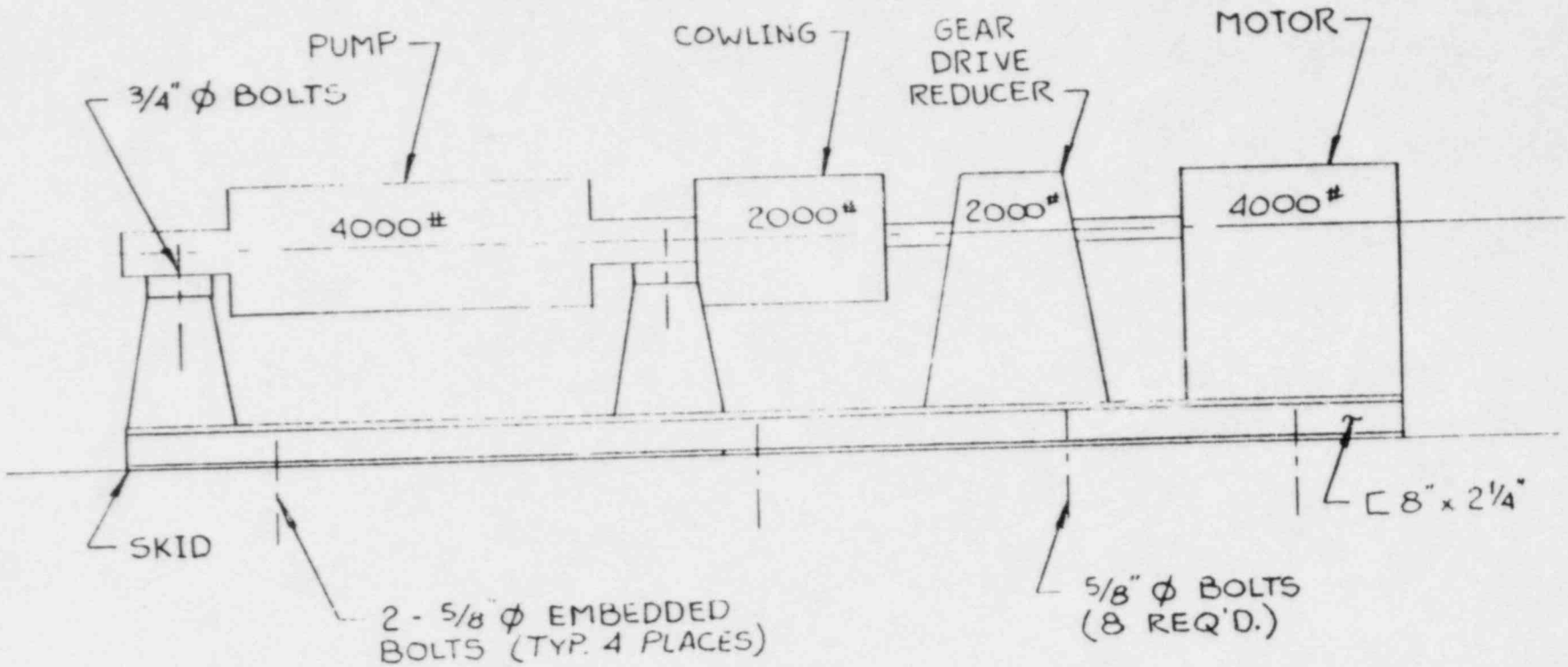
E) General Equipment Dims: SEE SKETCH

F) Estimated Weight: SEE SKETCH

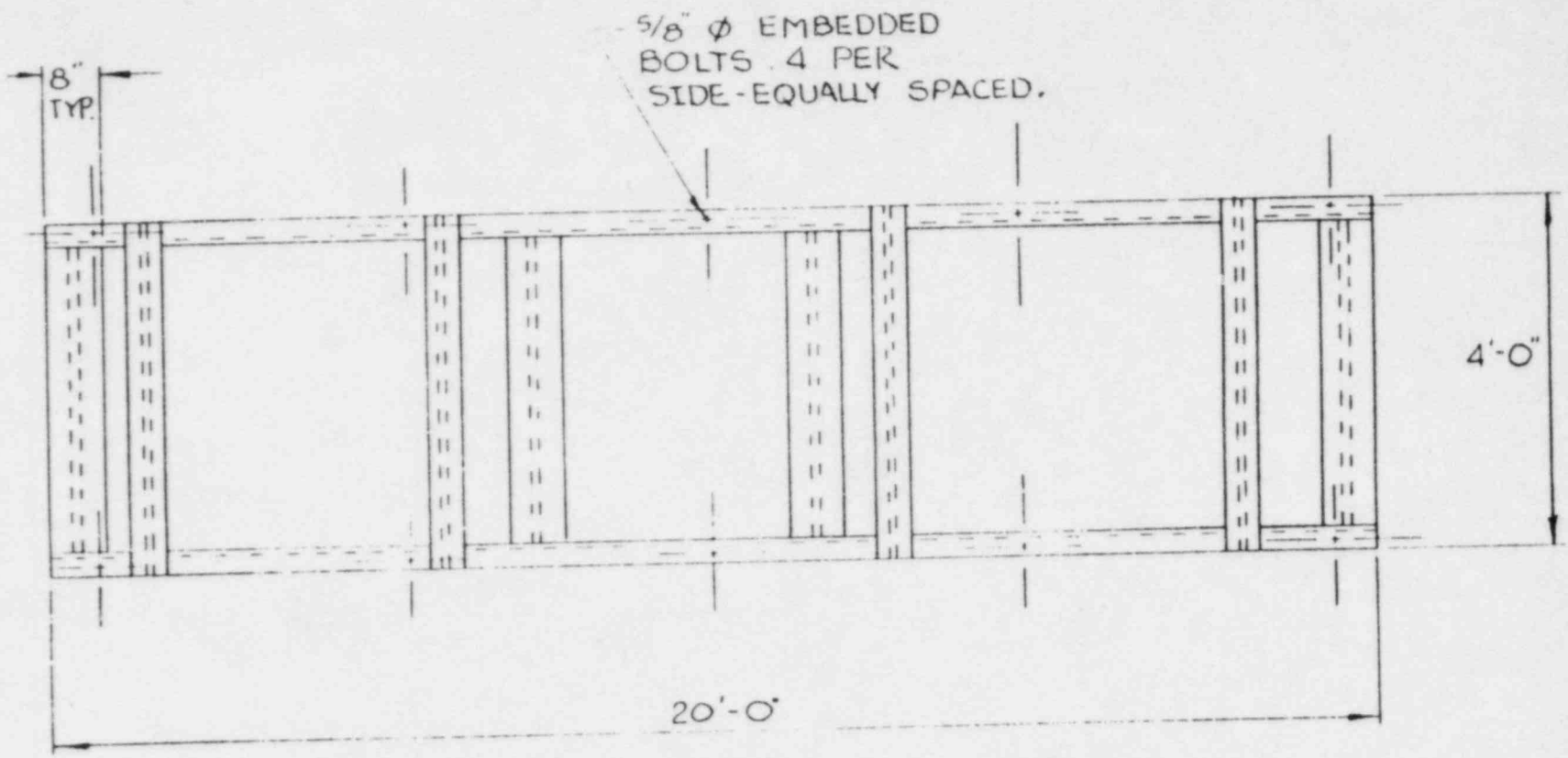
Estimated Location of C.G.: Geometric ℄

G) Is component supported or restrained by block wall?___Yes____No ✓

H) General Comments_____



MAIN CHARGING PUMP



PLAN VIEW OF BASE
CHARGING PUMP

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 6.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit: O.K.

b) Relative Size (Bolt to hole): O.K.

c) Material:_____

E) General Equipment Dims: SEE SKETCH

F) Estimated Weight: 6000 #

Estimated Location of C.G.: GEOMETRIC ℄

G) Is compoonent supported or restrained by block wall?___Yes____No ✓

H) General Comments_____

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. P-10

Item Description: SECONDARY COMPONENT COOLING

Location: _____

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: _____

1) Base Plate Dims: 8'-0" x 3'-0"

2) Bolt Holes:

a) Number 6

b) Spacing SEE SKETCH

c) Size 1" ϕ

d) Edge Distance O.K.

B) Specify means of attachment of equipment to structure:

1) Bolted: ✓

a) Poured in Place Bolts: _____

b) Expansion Anchor Bolts: _____

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: _____

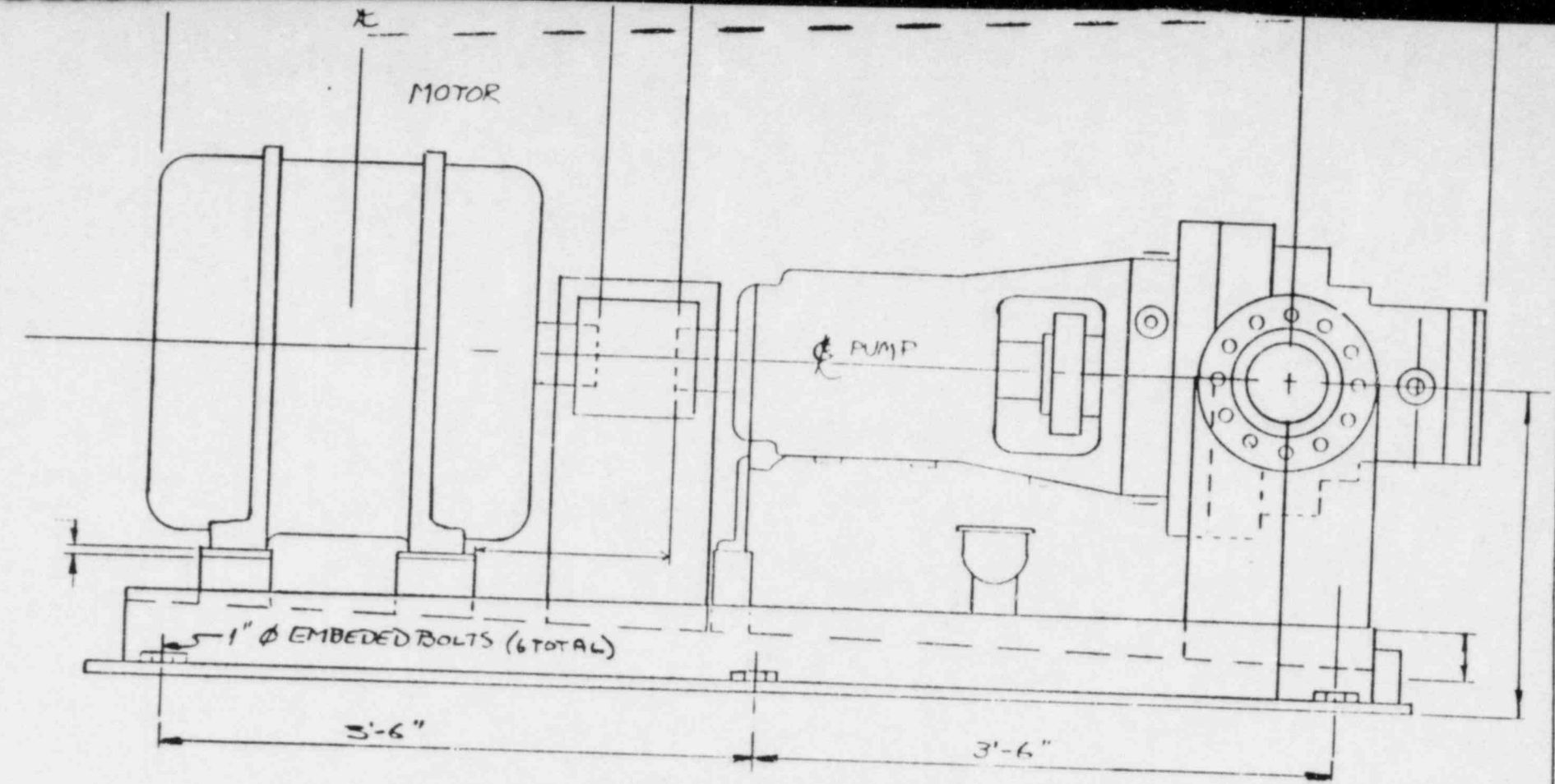
C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____



PRIMARY & SECONDARY COMPONENT
COOLING PUMP

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO._____

Item Description: CORE SPRAY PUMP

Location:_____

1) General Description, Photograph, or Sketch of Supports:

Vertical, Can type - SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims:_____

2) Bolt Holes:

a) Number _____

b) Spacing SEE SKETCH

c) Size_____

d) Edge Distance O.K.

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: ✓

b) Expansion Anchor Bolts:_____

c) Welded Bolts:_____

2) Welded:

a) Plug Welded to Structure:_____

b) Tack Welded to Structure:_____

c) Fillet Welded to Structure:_____

3) Other:_____

C) Description of Additional Attachments (bracing, gussetts, etc.)_____

1) Number: SEE SKETCH

2) Location:_____

3) Dimension:_____

4) Size:_____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 6.15.1)_____

a) Cracks: None

b) Fusion: O.K.

c) Craters: None

d) Profiles: O.K.

e) Fillet Size:_____

2) Bolts

a) Fit: O K.

b) Relative Size (Bolt to hole): O-K.

c) Material:_____

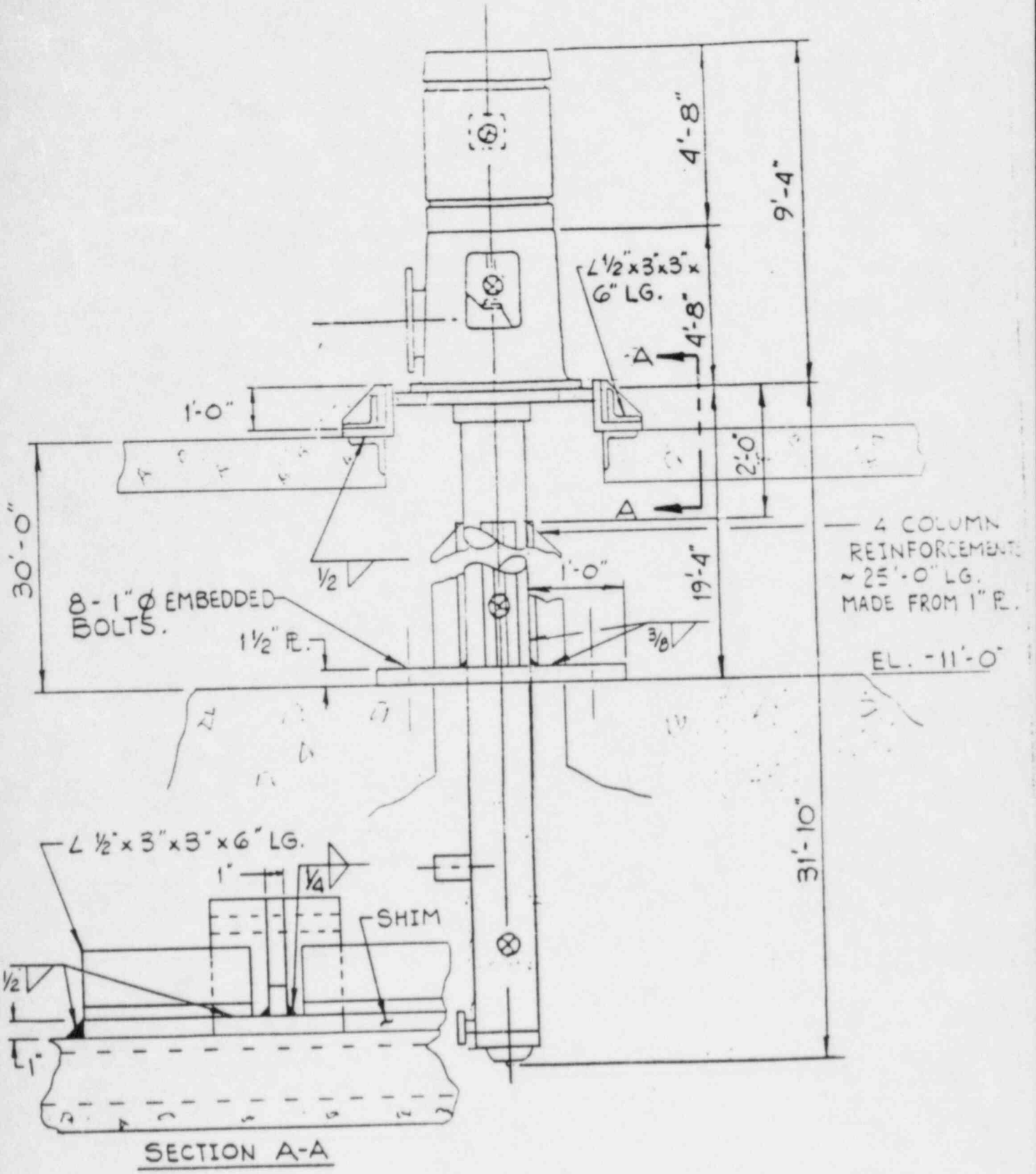
E) General Equipment Dims: SEE SKETCH

F) Estimated Weight:_____

Estimated Location of C.G.:_____

G) Is component supported or restrained by block wall?___Yes___No ✓

H) General Comments_____



SECTION A-A

SPRAY PUMP

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. _____

Item Description: ESW PUMP

Location: PUMP HOUSE

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number _____

b) Spacing _____

c) Size _____

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: ✓

b) Expansion Anchor Bolts: _____

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: _____

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 6.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit: O.K.

b) Relative Size (Bolt to hole): O.K.

c) Material:_____

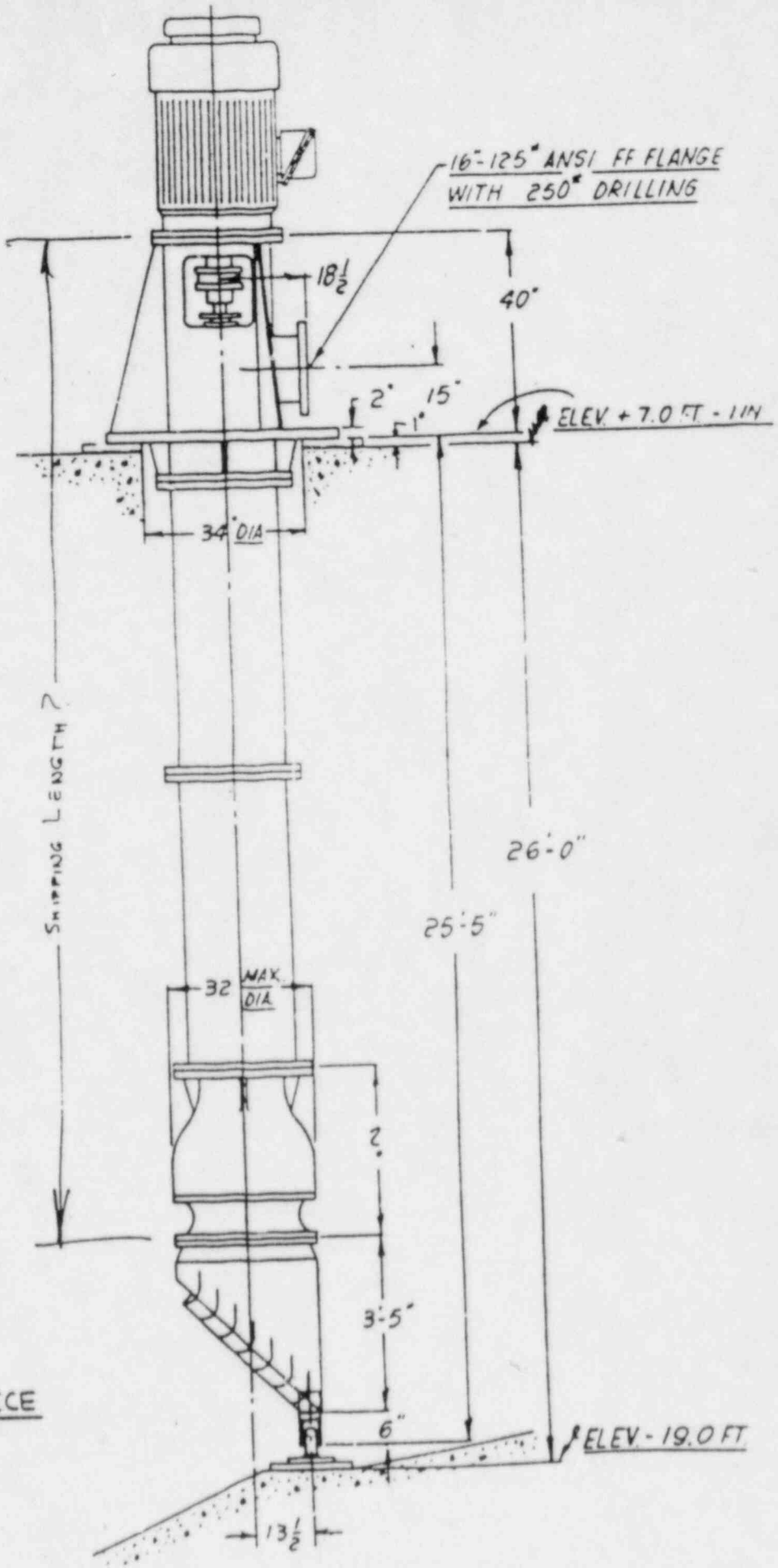
E) General Equipment Dims: SEE SKETCH

F) Estimated Weight: SEE SKETCH

Estimated Location of C.G.:_____

G) Is component supported or restrained by block wall?___Yes___No___

H) General Comments_____



EMERGENCY SERVICE
WATER PUMP

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. _____

Item Description: DIESEL OIL TRANSFER PUMP

Location: _____

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims: TO MATCH TANKS 6" FLG.

2) Bolt Holes:

a) Number SEE SKETCH

b) Spacing "

c) Size _____

d) Edge Distance O.K.

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: _____

b) Expansion Anchor Bolts: _____

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: _____

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 8.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit: O.K.

b) Relative Size (Bolt to hole): O.K.

c) Material:_____

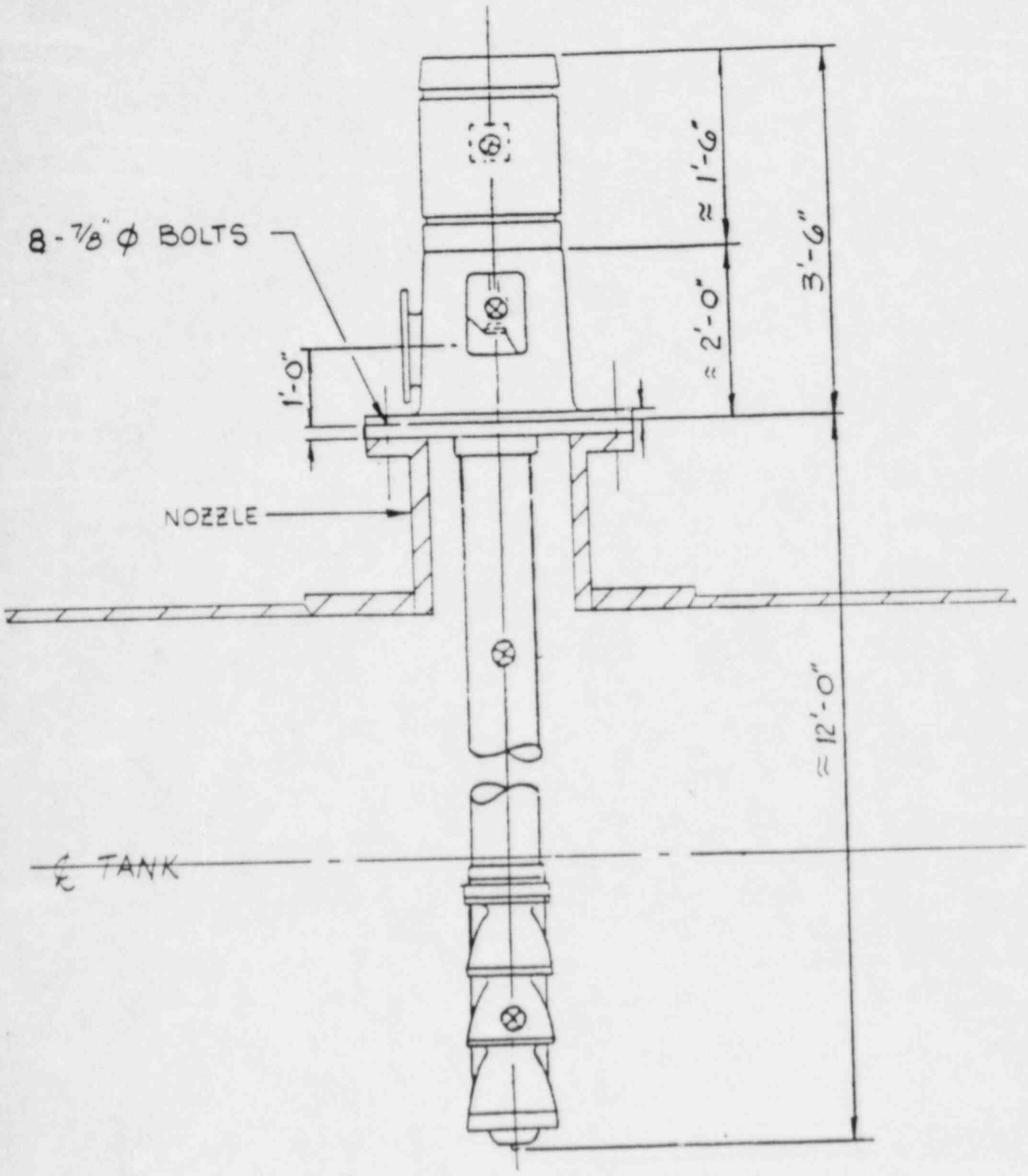
E) General Equipment Dims: SEE SKETCH

F) Estimated Weight: 800 #

Estimated Location of C.G.:_____

G) Is component supported or restrained by block wall?___Yes___No___

H) General Comments Pump Head of Tank Flg. appear to be F.F. Cast Iron



DIESEL OIL TRANSFER PUMP

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. E-4&5

Item Description: SCCW & PCCW HX's

Location:

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims:

2) Bolt Holes:

a) Number 4 per saddle

b) Spacing SEE SKETCH

c) Size

d) Edge Distance

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: ✓

b) Expansion Anchor Bolts:

c) Welded Bolts:

2) Welded:

a) Plug Welded to Structure:

b) Tack Welded to Structure:

c) Fillet Welded to Structure:

3) Other:

C) Description of Additional Attachments (bracing, gussetts, etc.)

1) Number:

2) Location:

3) Dimension:

4) Size:

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 8.15.1)_____

a) Cracks: NONE

b) Fusion: O.K.

c) Craters: NONE

d) Profiles: O.K.

e) Fillet Size:_____

2) Bolts

a) Fit: O.K.

b) Relative Size (Bolt to hole): O.K.

c) Material:_____

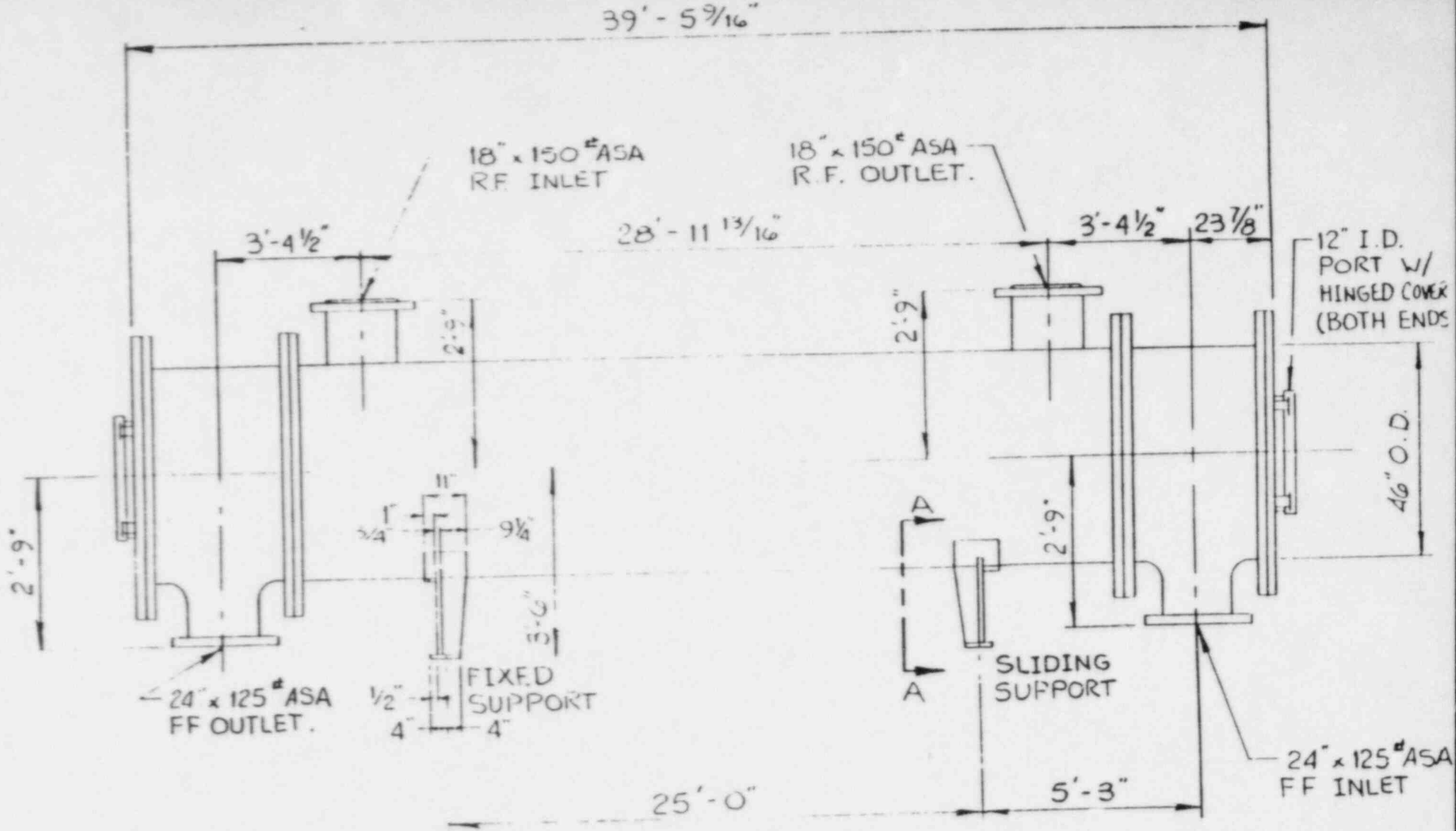
E) General Equipment Dims:_____

F) Estimated Weight:_____

Estimated Location of C.G.: Geometric ℄

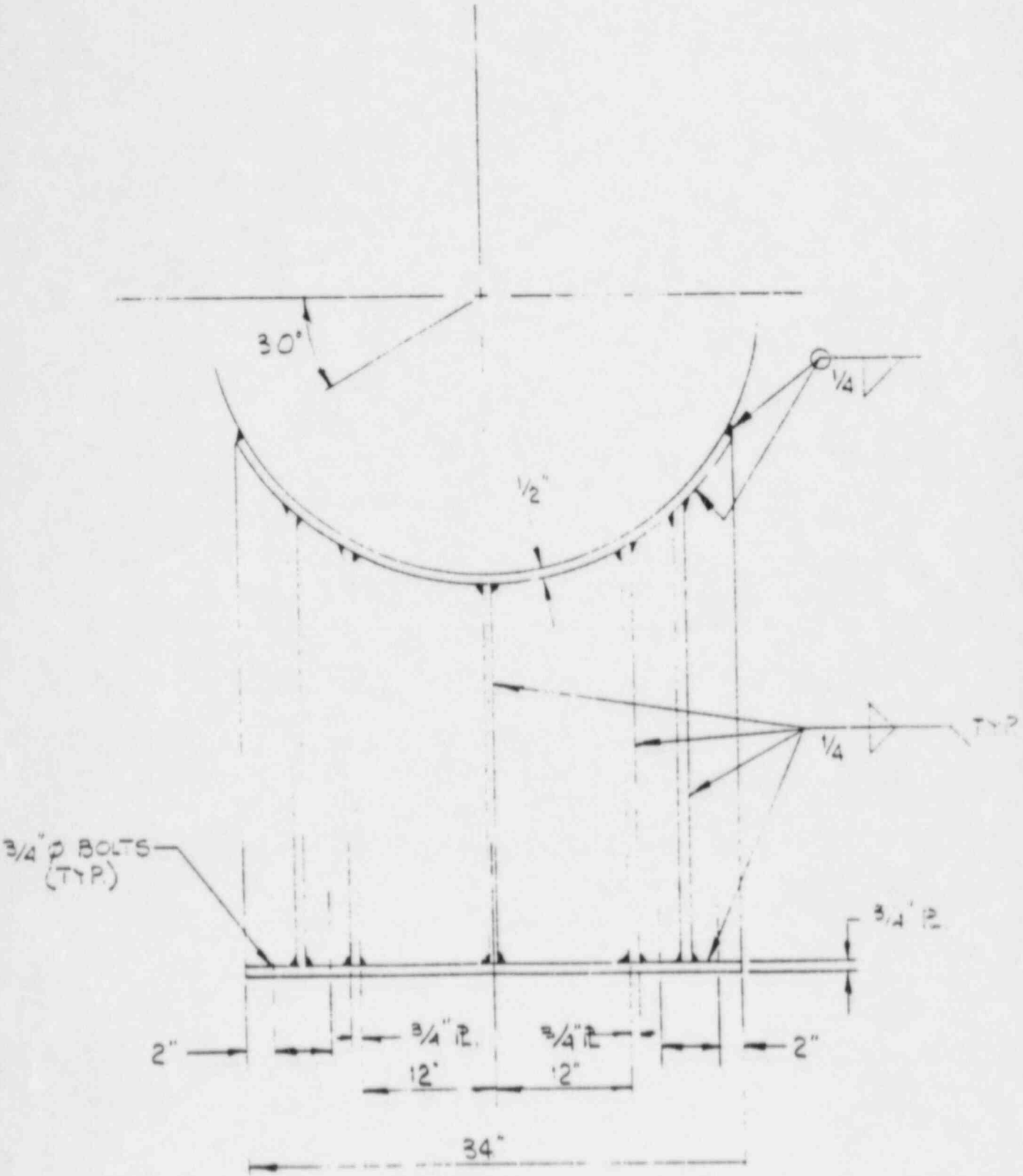
G) Is component supported or restrained by block wall?___Yes___No ✓

H) General Comments Channel piping at opposite end of fixed saddle appears to be anchored. This has resulted in the saddles being bent.



COMPONENT COOLING HEAT EXCHANGER

(Pg 1 of 2)



VIEW A-A

COMPONENT COOLING HEAT EXCHANGER

(Sh. 2 of 2)

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. E-3B

Item Description: RHR Heat Exchanger

Location: _____

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: _____

1) Base Plate Dims: SEE SKETCH

2) Bolt Holes:

a) Number SEE SKETCH

b) Spacing _____

c) Size _____

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: _____

b) Expansion Anchor Bolts: _____

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: Bolted through metal support.

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 6.15.1)_____

a) Cracks: NONE

b) Fusion: O.K.

c) Craters: NONE

d) Profiles: O.K.

e) Fillet Size:_____

2) Bolts

a) Fit: O.K.

b) Relative Size (Bolt to hole): O.K.

c) Material:_____

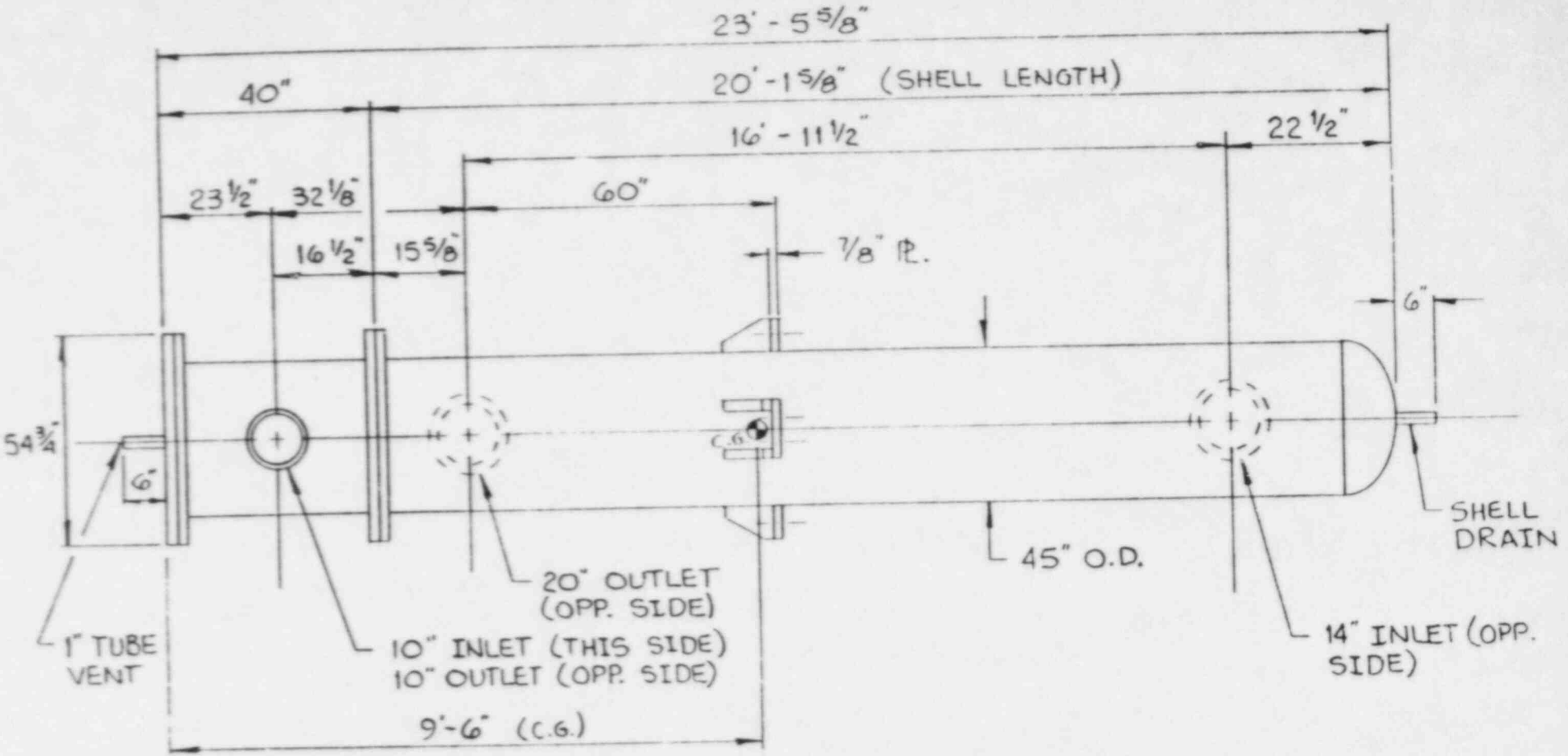
E) General Equipment Dims:_____

F) Estimated Weight:_____

Estimated Location of C.G.: Geometric ℄

G) Is component supported or restrained by block wall?___Yes____No ✓

H) General Comments_____



R.H.R. HEAT EXCHANGER

WEIGHTS:

BUNDLE - 25000 lbs.
FULL H_2O - 50,970 lbs.
EMPTY - 38,090 lbs.

VOLUME OF H_2O: SHELL SIDE - 885 GAL'S.
TUBE SIDE - 660 GAL'S.

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. _____

Item Description: LETDOWN HX

Location: _____

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number SEE SKETCH

b) Spacing _____

c) Size _____

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: _____

b) Expansion Anchor Bolts: _____

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: Bolted through metal Supt's.

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 8.15.1)_____

a) Cracks: None

b) Fusion: O.K

c) Craters: None

d) Profiles: O.K.

e) Fillet Size:_____

2) Bolts

a) Fit: O.K.

b) Relative Size (Bolt to hole): O.K.

c) Material:_____

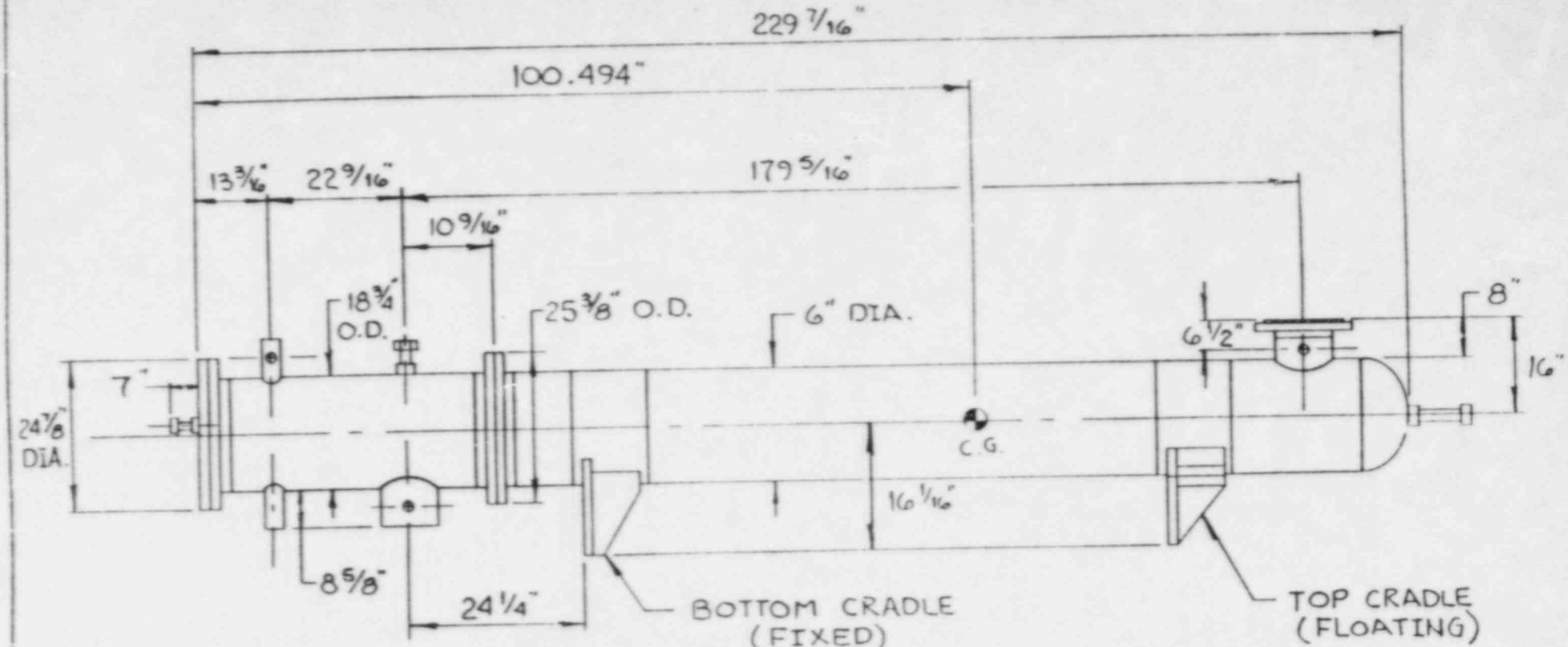
E) General Equipment Dims:_____

F) Estimated Weight:_____

Estimated Location of C.G.: Geometric C

G) Is component supported or restrained by block wall?___Yes___No ✓

H) General Comments_____



LETDOWN HEAT EXCHANGER

CONTENTS:

TUBE SIDE - 6.141 CU. FT.
BORIC ACID SOLUTION.
SHELL SIDE - 17.647 CU. FT.
INHIBITED WATER.

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. _____

Item Description: REGENERATIVE HX

Location: _____

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number SEE SKETH

b) Spacing _____

c) Size _____

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: _____

b) Expansion Anchor Bolts: _____

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: Bolted through steel supt.

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 8.15.1)_____

a) Cracks: None

b) Fusion: O.K.

c) Craters: None

d) Profiles: O.K.

e) Fillet Size:_____

2) Bolts

a) Fit: O K.

b) Relative Size (Bolt to hole): O. K.

c) Material:_____

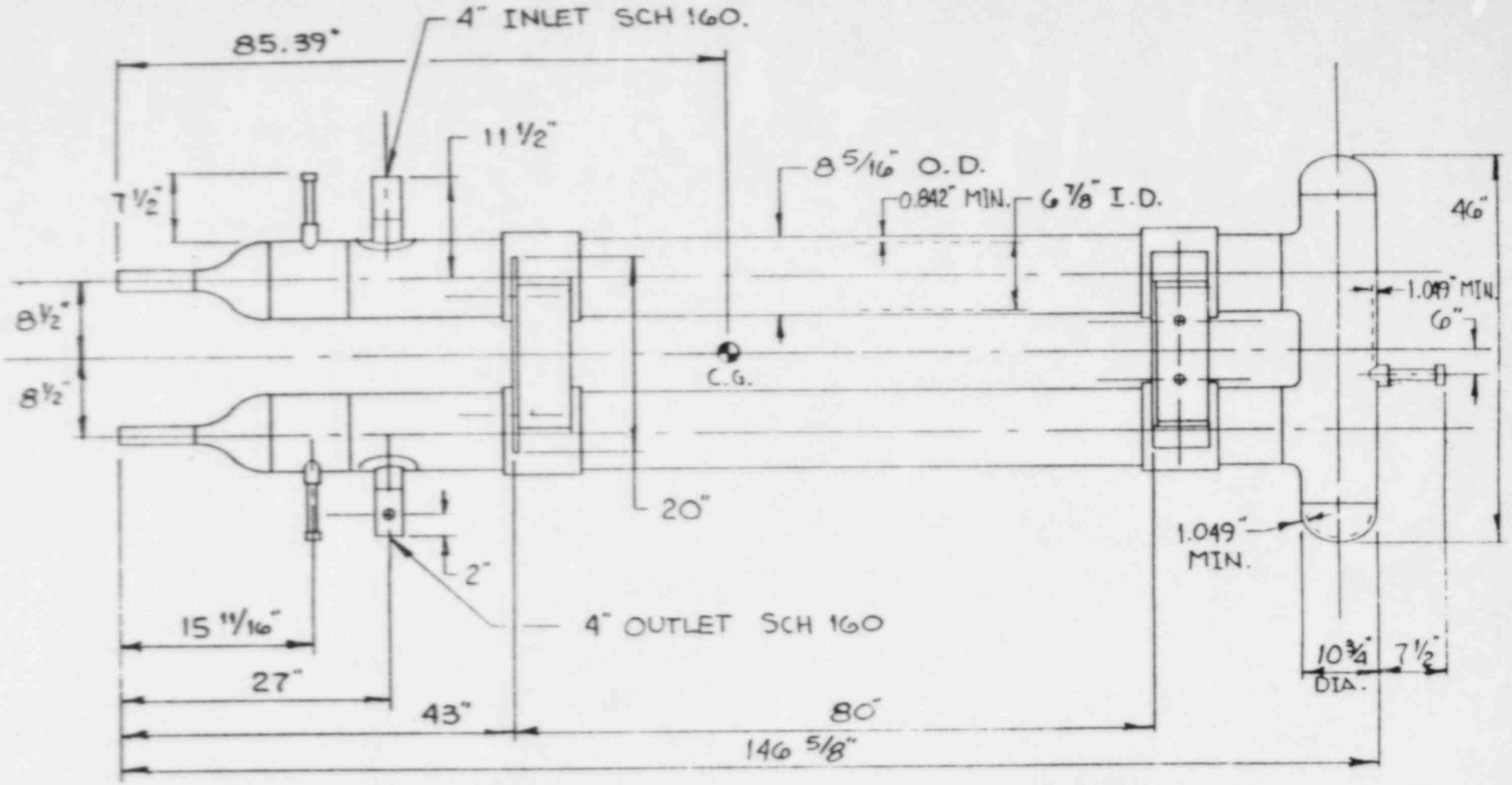
E) General Equipment Dims: SEE SKETCH

F) Estimated Weight:_____

Estimated Location of C.G.: Geometric ℄

G) Is component supported or restrained by block wall?___Yes___No ✓

H) General Comments_____



REGENERATIVE HEAT EXCHANGER

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. _____

Item Description: AIR START-UP TANKS

Location: DIESEL GEN. ROOM.

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number SEE SKETCH

b) Spacing _____

c) Size _____

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: ✓ structure to Floor

b) Expansion Anchor Bolts: ✓ structure to wall

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: Bolted through steel structure

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 6.15.1)_____

a) Cracks: NONE

b) Fusion: O.K.

c) Craters: NONE

d) Profiles: O.K.

e) Fillet Size: 1/4"

2) Bolts

a) Fit: O.K.

b) Relative Size (Bolt to hole): O.K.

c) Material:_____

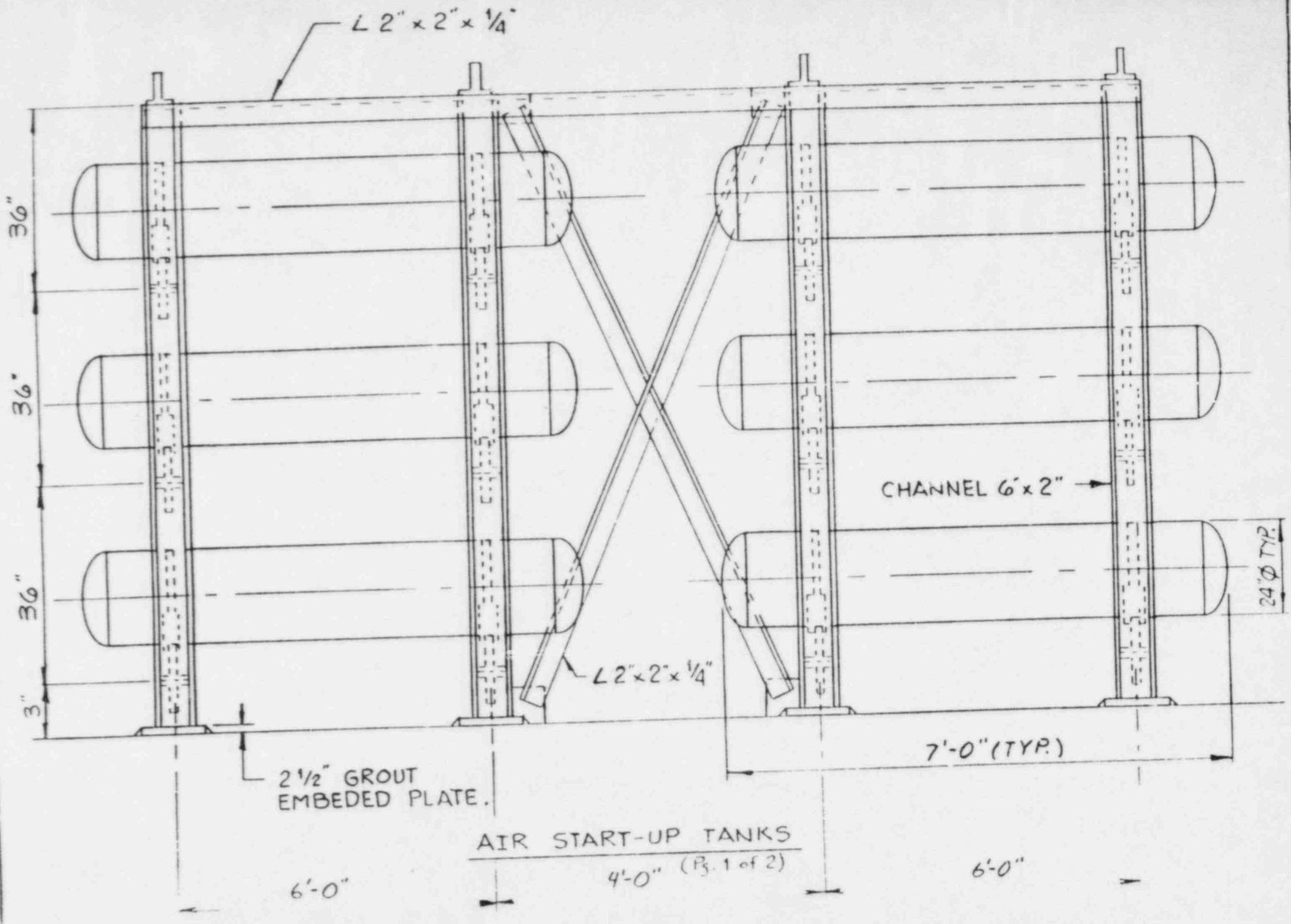
E) General Equipment Dims:_____

F) Estimated Weight: 500#/TANK

Estimated Location of C.G.: @ Geometric ℄ of TK.

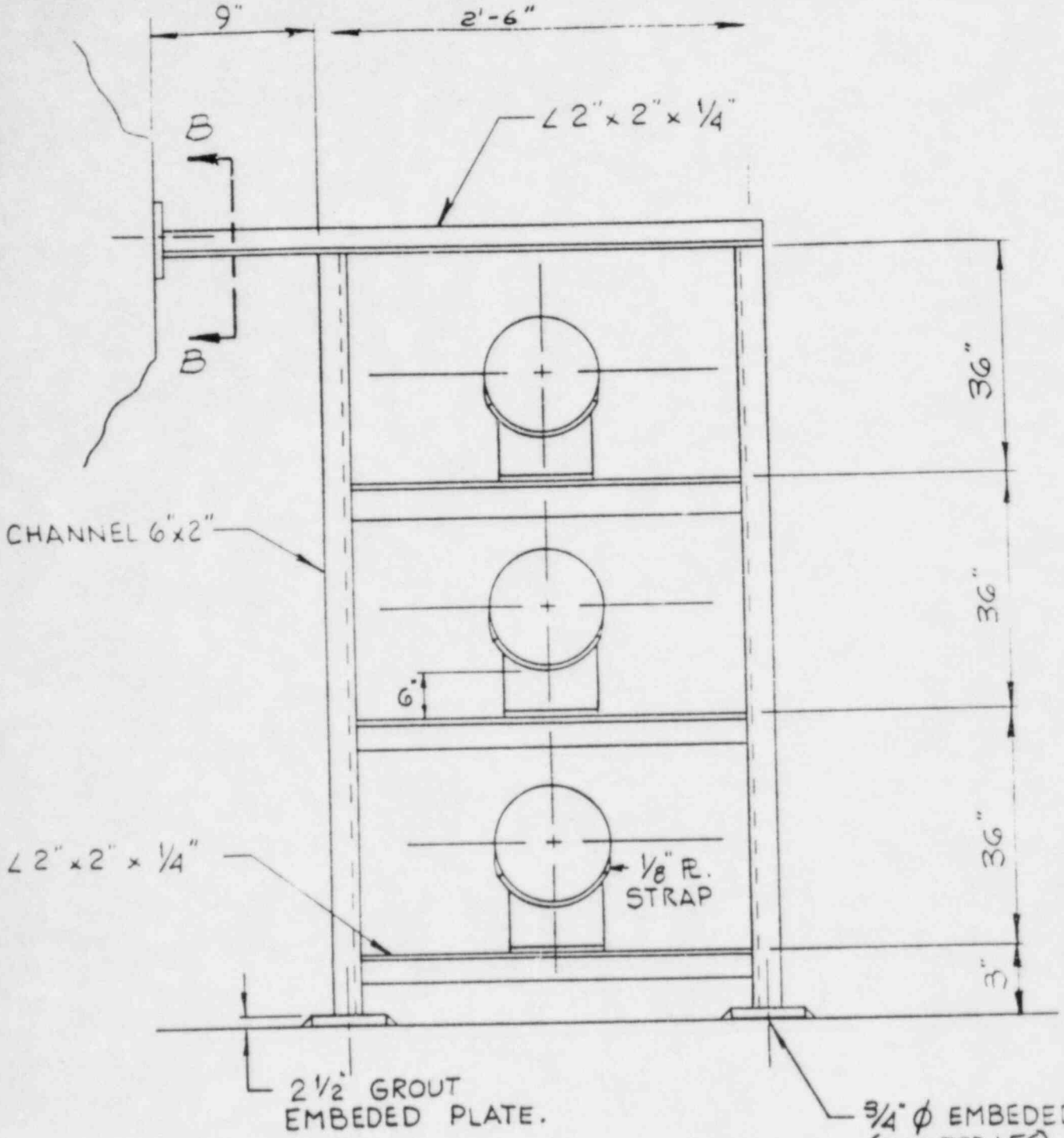
G) Is component supported or restrained by block wall? ___ Yes ___ No ✓

H) General Comments Neither the saddles nor the straps are welded to the tank. Friction only, holds tanks axially.

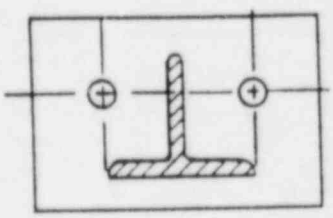


AIR START-UP TANKS

(Pg. 1 of 2)



VIEW A-A



SECTION B-B
4 REQ'D.

AIR START-UP TANKS
(Pg 2 of 2)

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. _____

Item Description: FUEL OIL DAY TANK

Location: DIESEL GENERATOR ROOM.

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number SEE SKETCH

b) Spacing _____

c) Size _____

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: ✓

b) Expansion Anchor Bolts: _____

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: _____

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 6.15.1)_____

a) Cracks: NONE

b) Fusion: O.K.

c) Craters: NONE

d) Profiles: O.K.

e) Fillet Size: 1/4"

2) Bolts

a) Fit: O.K.

b) Relative Size (Bolt to hole): O.K.

c) Material:_____

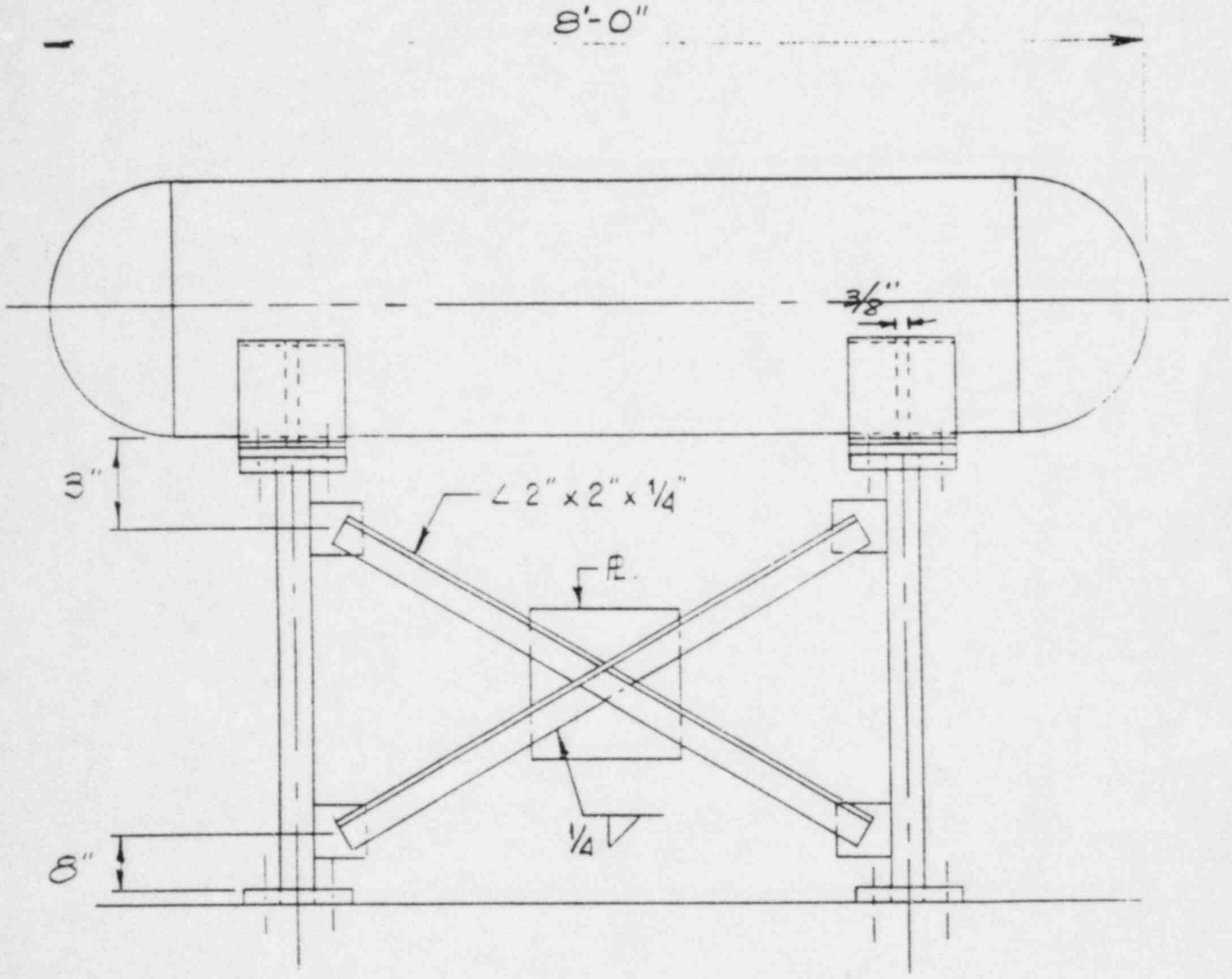
E) General Equipment Dims: SEE SKETCH

F) Estimated Weight: 6000# - FULL

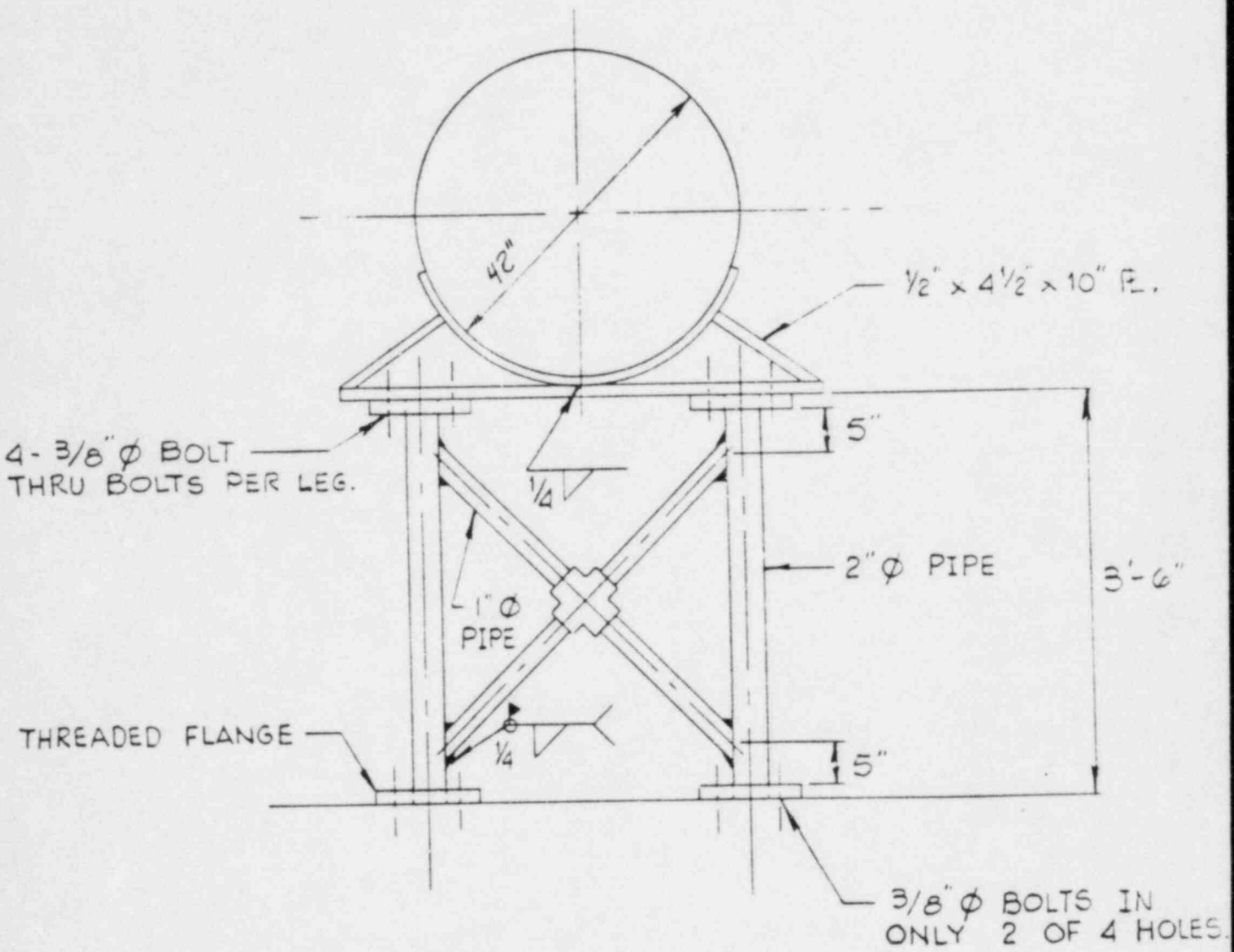
Estimated Location of C.G.: @ Geometric ℄ of TK

G) Is component supported or restrained by block wall?___Yes____No ✓

H) General Comments_____



FUEL OIL DAY TANK
(Pg. 1 of 2)



FUEL OIL DAY TANK

(Pg. 2 of 2)

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO._____

Item Description: SPRAY CHEMICAL ADDITION TANK

Location: YARD

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims:_____

2) Bolt Holes:

a) Number SEE SKETCH

b) Spacing_____

c) Size_____

d) Edge Distance_____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: ✓

b) Expansion Anchor Bolts:_____

c) Welded Bolts:_____

2) Welded:

a) Plug Welded to Structure:_____

b) Tack Welded to Structure:_____

c) Fillet Welded to Structure:_____

3) Other:_____

C) Description of Additional Attachments (bracing, gussetts, etc.)_____

1) Number:_____

2) Location:_____

3) Dimension:_____

4) Size:_____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 8.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit: O.K

b) Relative Size (Bolt to hole): O.K.

c) Material:_____

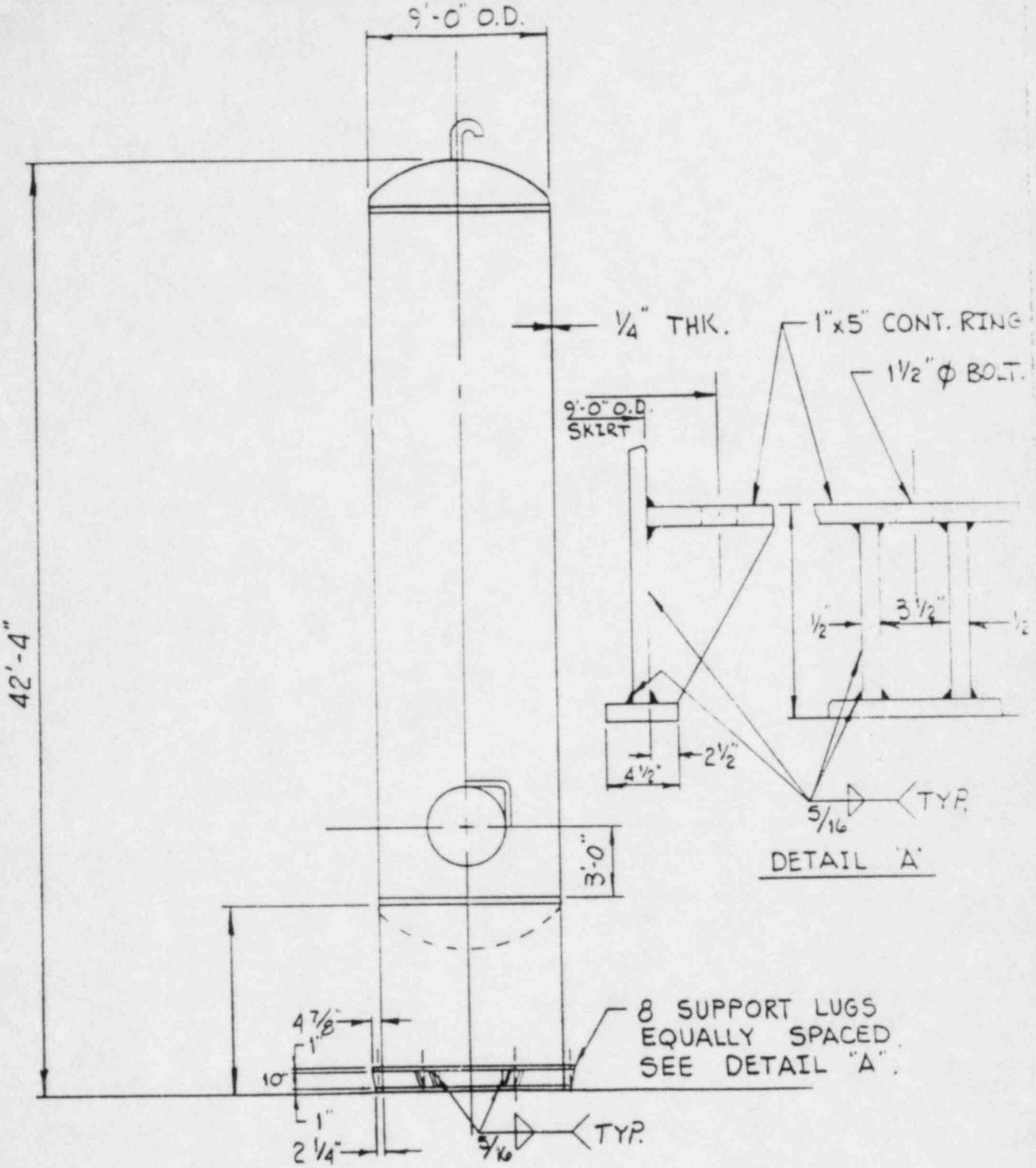
E) General Equipment Dims:_____

F) Estimated Weight: 218,000 # Full - 110,000 # empty

Estimated Location of C.G.: Geometric ℄

G) Is component supported or restrained by block wall?___Yes___No ✓

H) General Comments A-304 stainless



SPRAY CHEMICAL ADDITION TANK
TK-54

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. _____

Item Description: BORIC ACID STORAGE TANK

Location: _____

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: Tanks sits on 6 21WF44 which

1) Base Plate Dims: are bolted to floor.

2) Bolt Holes:

a) Number 8

b) Spacing 45°

c) Size 3/4" ϕ

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: _____

b) Expansion Anchor Bolts: ✓ Beams to floor (2/beam one side on

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: Bolted through-tank ring to beams

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 6.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit: O.K.

b) Relative Size (Bolt to hole): O.K.

c) Material:_____

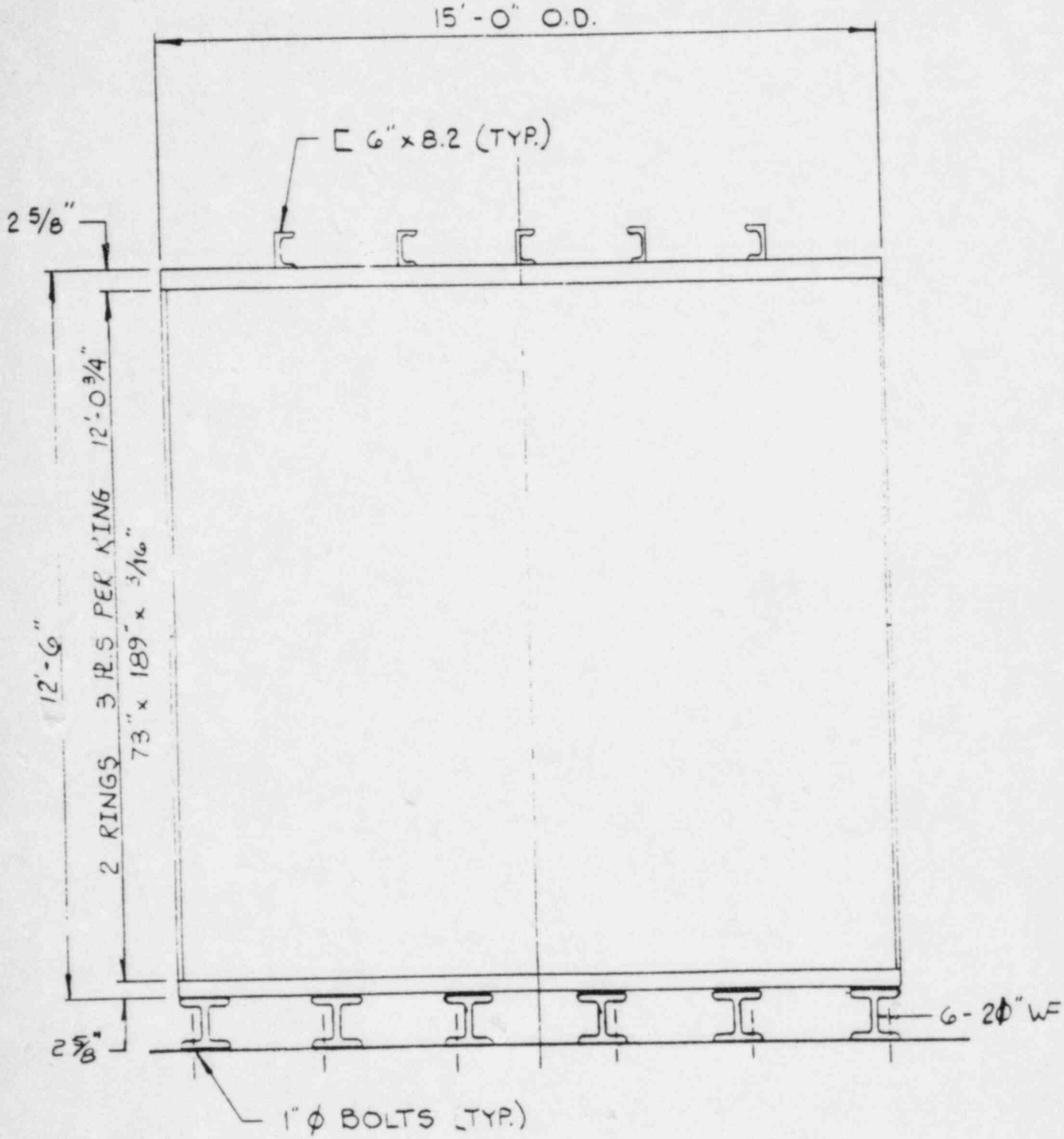
E) General Equipment Dims:_____

F) Estimated Weight:_____

Estimated Location of C.G.: Geometric ℄

G) Is component supported or restrained by block wall?___Yes____No ✓

H) General Comments A 304 stainless



BORIC ACID STORAGE TANK
TK-2

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. _____

Item Description: Demineralized Water Storage Tank

Location: Yard

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number SEE SKETCH

b) Spacing _____

c) Size _____

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: ✓

b) Expansion Anchor Bolts: _____

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: _____

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 6.15.1)_____

a) Cracks: NONE

b) Fusion: O.K

c) Craters: NONE

d) Profiles: O.K.

e) Fillet Size:_____

2) Bolts

a) Fit: O.K.

b) Relative Size (Bolt to hole): O.K.

c) Material:_____

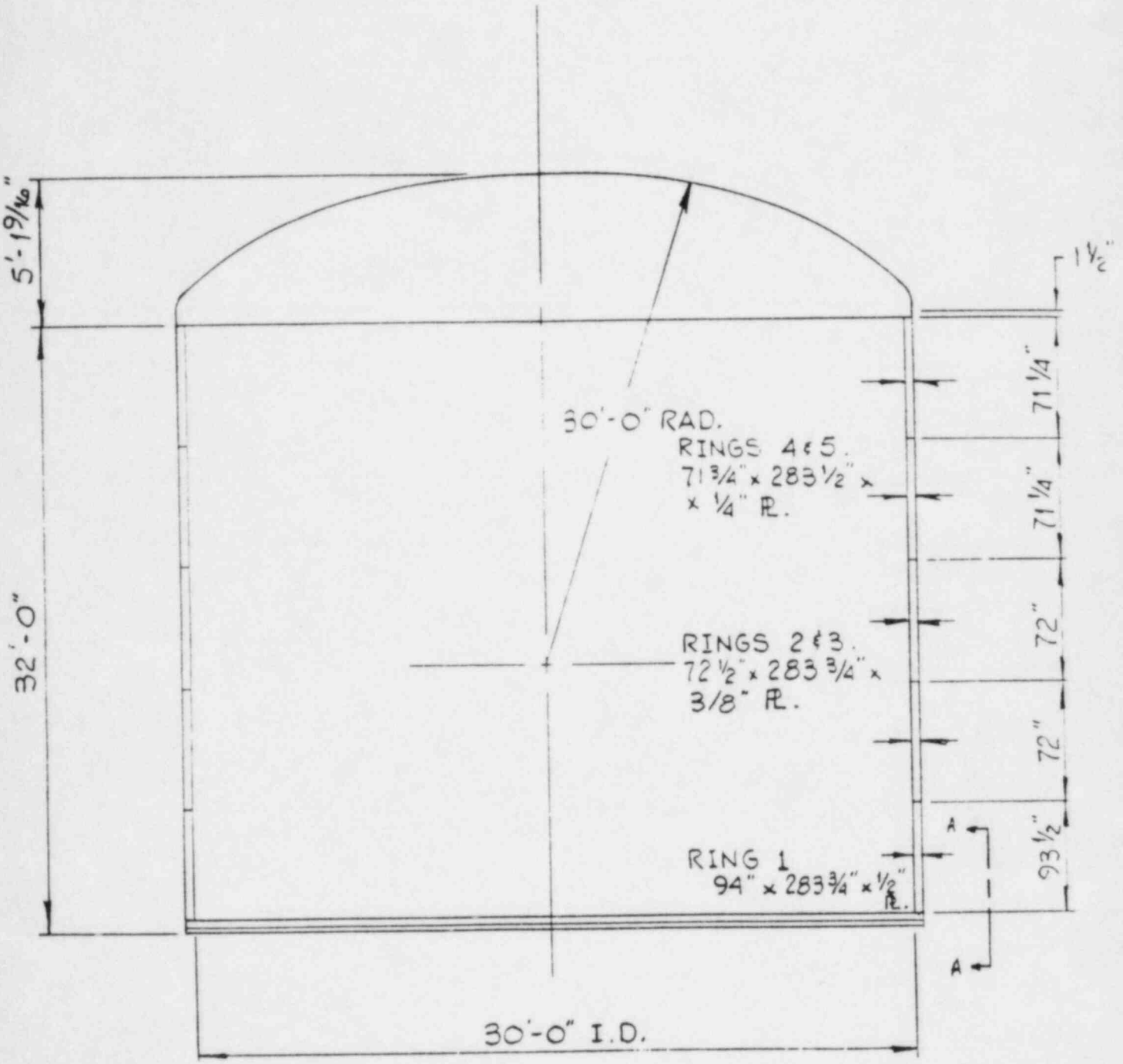
E) General Equipment Dims:_____

F) Estimated Weight: 25K (empty) - 1,500K (FULL)

Estimated Location of C.G.: Geometric ℄

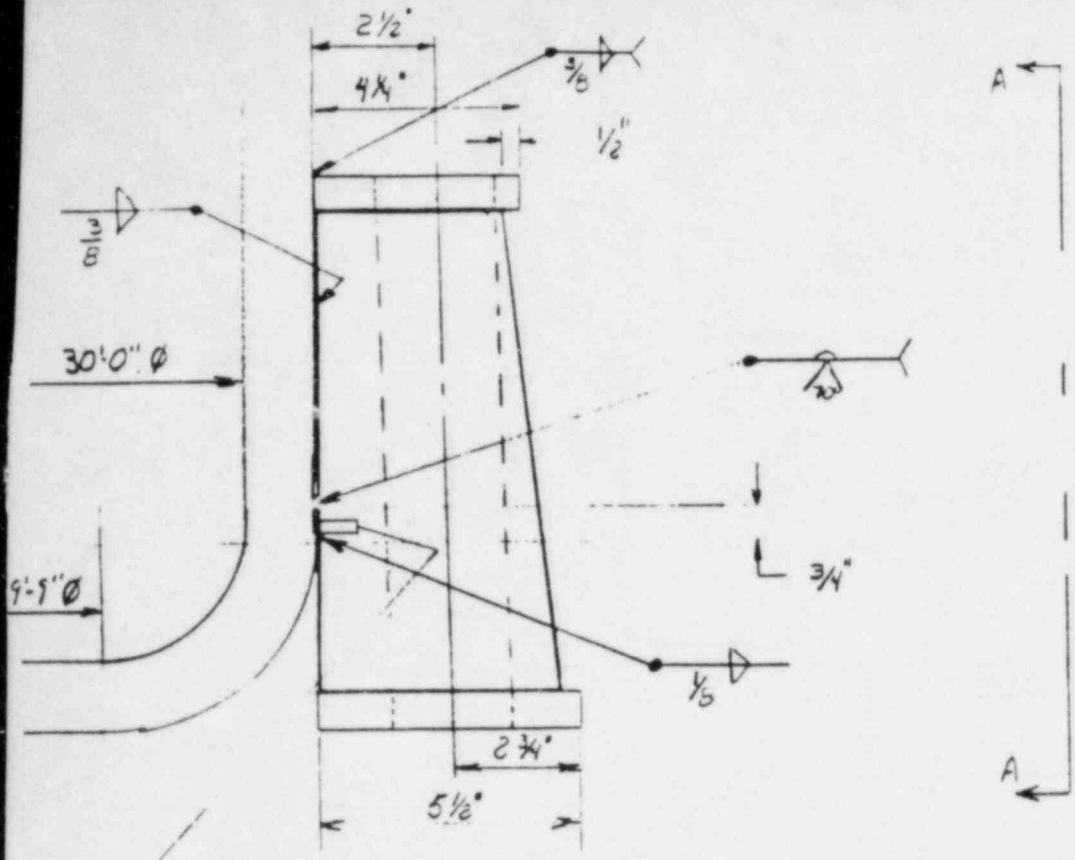
G) Is component supported or restrained by block wall?___Yes____No ✓

H) General Comments_____



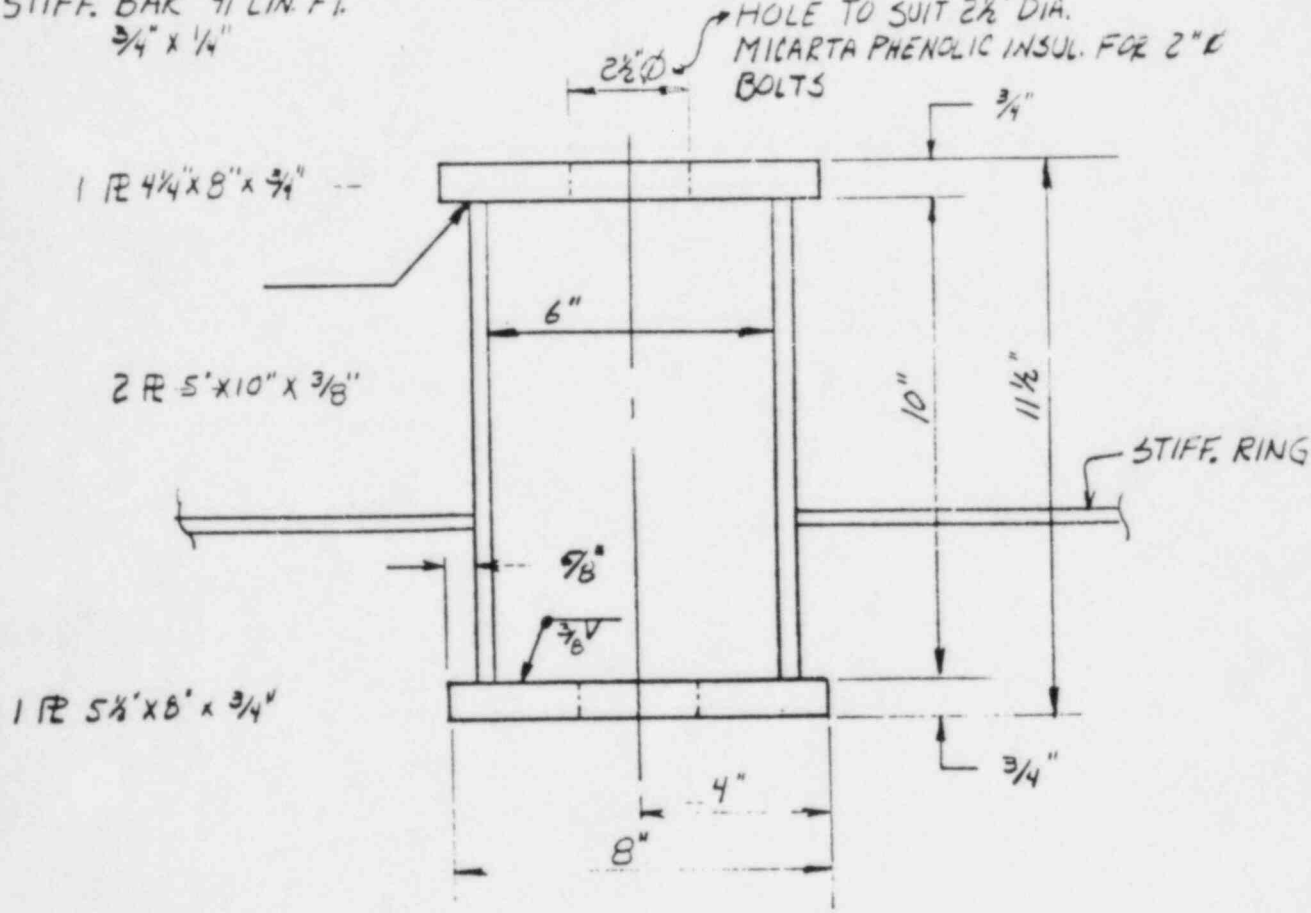
DEMINERALIZED WATER STORAGE TANK PG 1 OF 2

TK-21



ANCHOR BRACKETS
8 REQ'D

STIFF. BAR 91 LIN. FT.
¾" x ¼"



VIEW "A-A"

DEMINERALIZED WATER STORAGE TANK FIG 2 OF 2

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. _____

Item Description: Instrument Racks

Location: Containment

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number SEE SKETCH

b) Spacing _____

c) Size 1/2" ϕ

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: _____

b) Expansion Anchor Bolts: _____

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: _____

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 8.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit:_____

b) Relative Size (Bolt to hole):_____

c) Material:_____

E) General Equipment Dims:_____

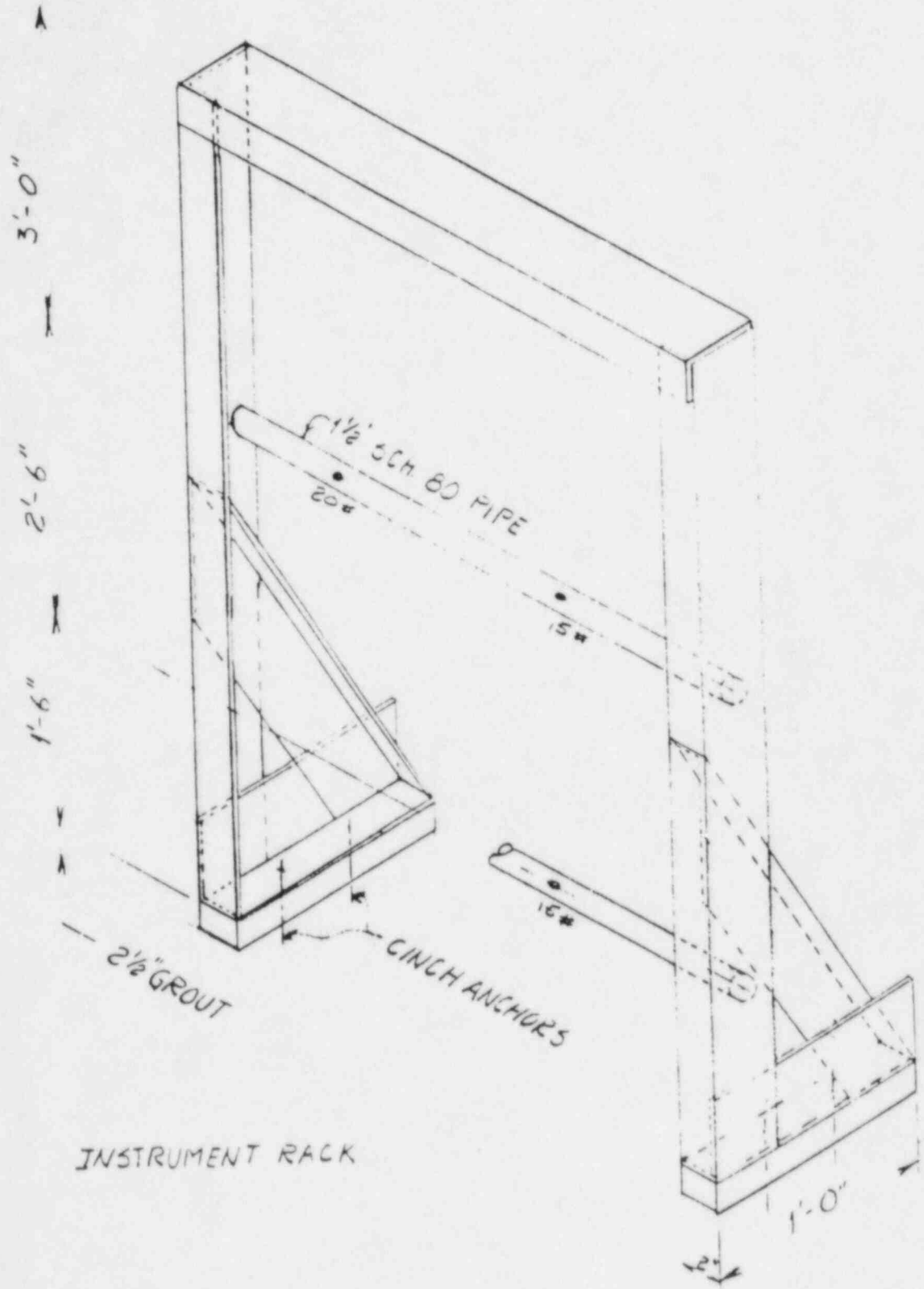
F) Estimated Weight: SEE SKETCH

Estimated Location of C.G.:_____

G) Is component supported or restrained by block wall?___Yes___No ✓

H) General Comments Grouting under RB may prevent expansion anchors from having sufficient embedment.

ALL ANGLES ARE
2 x 4 x 3/16"



INSTRUMENT RACK

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. _____

Item Description: MAIN CONTROL BOARD

Location: CONTROL ROOM

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: _____

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number _____

b) Spacing _____

c) Size _____

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: _____

b) Expansion Anchor Bolts: _____

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: ✓ 1" tack every ~10'-0"

c) Fillet Welded to Structure: _____

3) Other: _____

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 8.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit:_____

b) Relative Size (Bolt to hole):_____

_____

_____

c) Material:_____

E) General Equipment Dims:_____

_____

_____

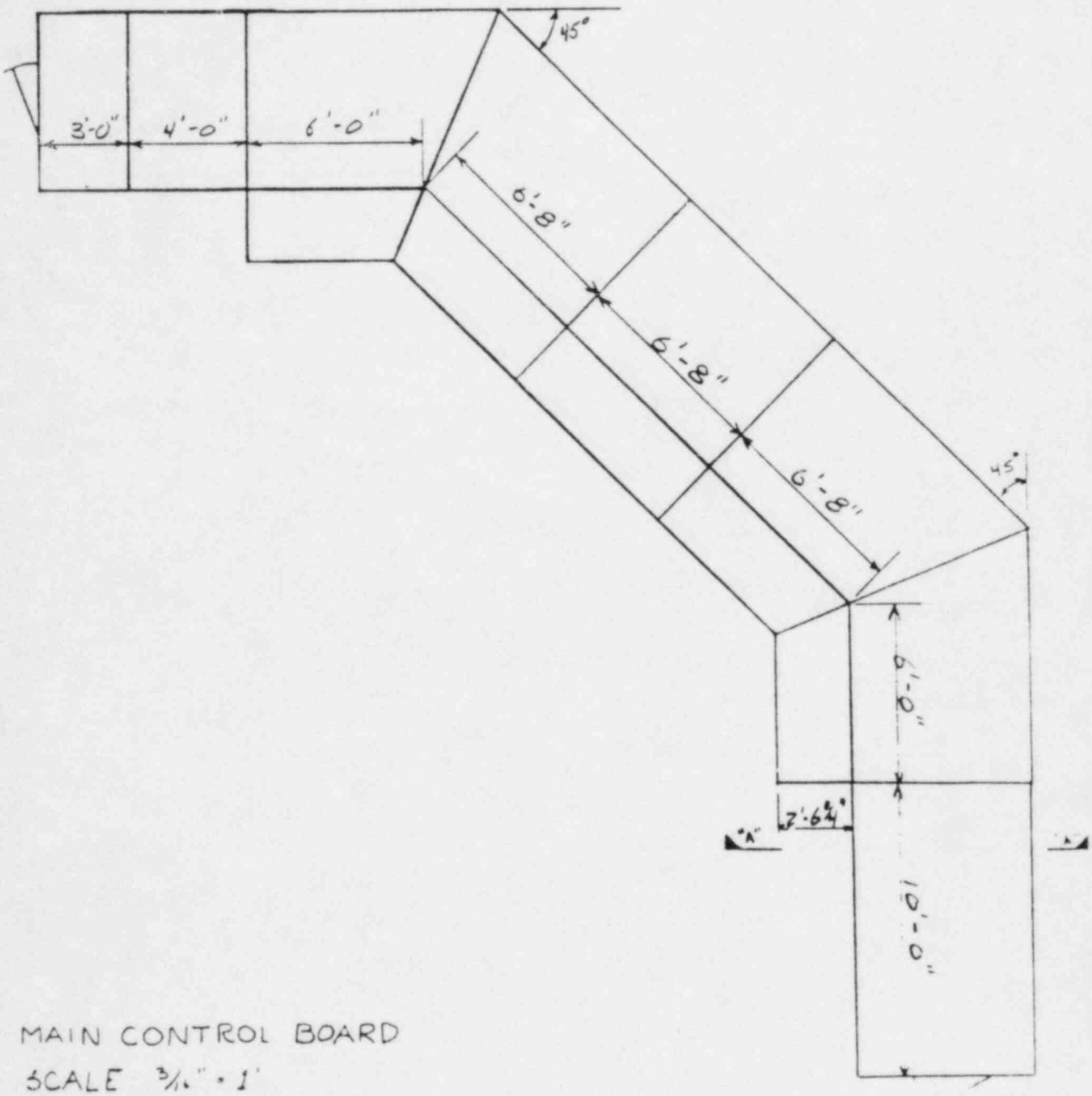
_____

F) Estimated Weight:_____

Estimated Location of C.G.: Geometric ℄

G) Is component supported or restrained by block wall?___Yes___No ✓

H) General Comments Cant. levered components contained within are quite flexible. Most will respond at a very low frequency. Many components are sitting on cantilevered trays with no attachment to panel to prevent their sliding. Many components are cantilevered off panel rails with only two or four 1/4" screws holding them (wt. up to 30#).



MAIN CONTROL BOARD

SCALE 3/4" = 1'

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO._____

Item Description: DIESEL GEN. LOCAL CONTROL PANEL

Location: DIESEL GEN. RM.

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims:_____

2) Bolt Holes:

a) Number _____

b) Spacing_____

c) Size_____

d) Edge Distance_____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts:_____

b) Expansion Anchor Bolts:_____

c) Welded Bolts:_____

2) Welded:

a) Plug Welded to Structure:_____

b) Tack Welded to Structure:_____

c) Fillet Welded to Structure: ✓

3) Other:_____

C) Description of Additional Attachments (bracing, gussetts, etc.)_____

1) Number:_____

2) Location:_____

3) Dimension:_____

4) Size:_____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 8.15.1)_____

a) Cracks: NONE

b) Fusion: O.K.

c) Craters: NONE

d) Profiles: O.K.

e) Fillet Size: 1/4"

2) Bolts

a) Fit: O.K.

b) Relative Size (Bolt to hole): O.K.

c) Material:_____

E) General Equipment Dims:_____

F) Estimated Weight: 500#

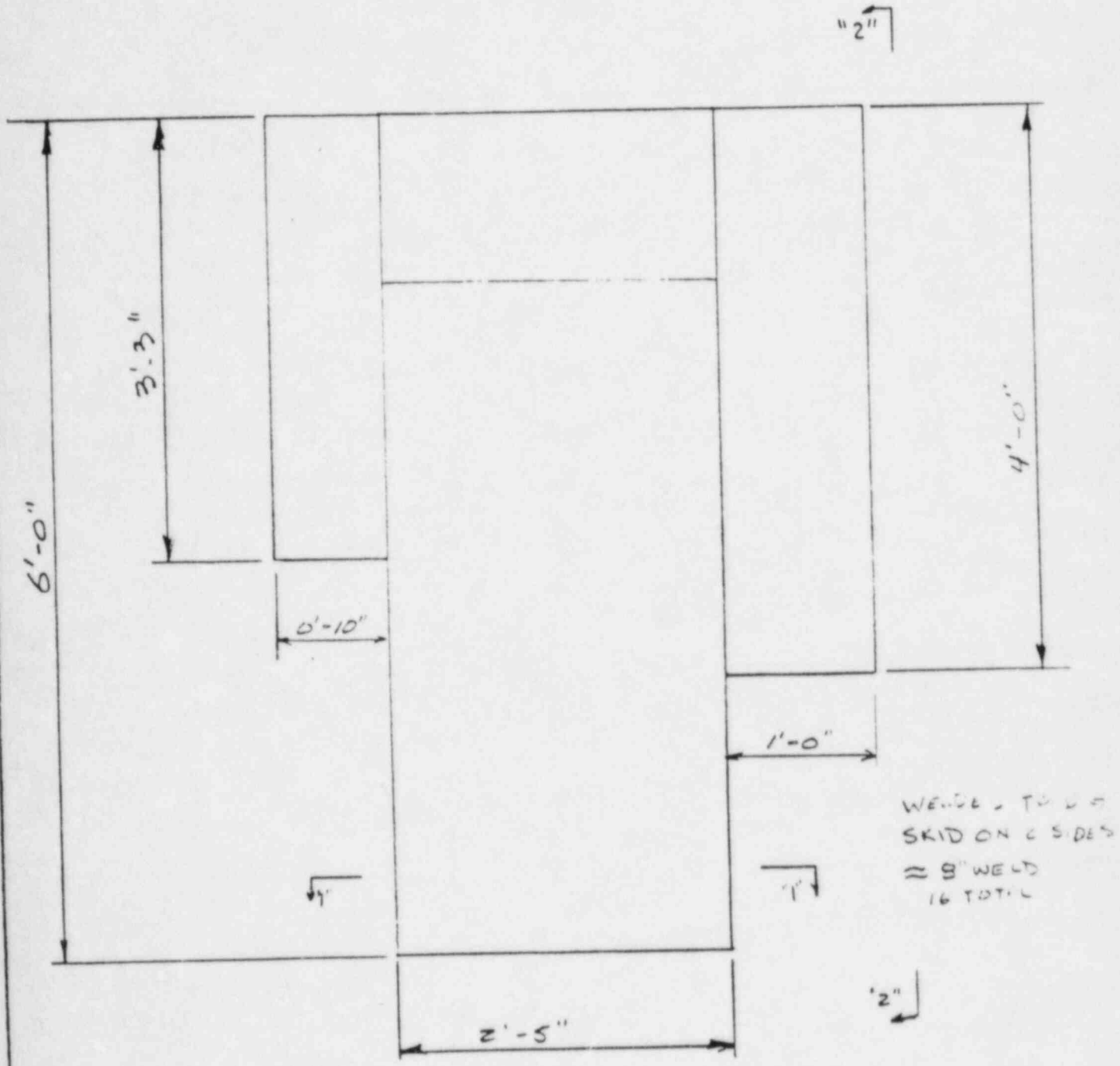
Estimated Location of C.G.: Geometric ℄

G) Is component supported or restrained by block wall?___Yes___No ✓

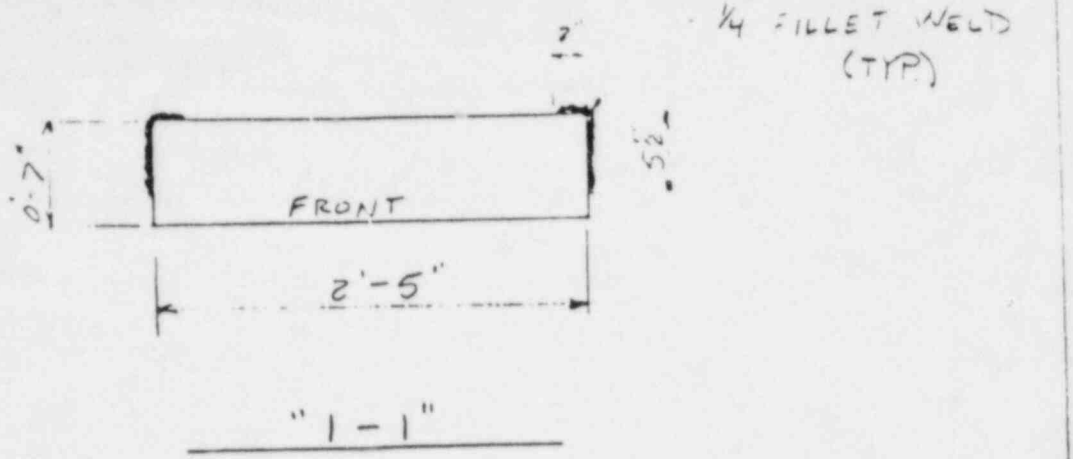
H) General Comments_____

WT. APPROX.

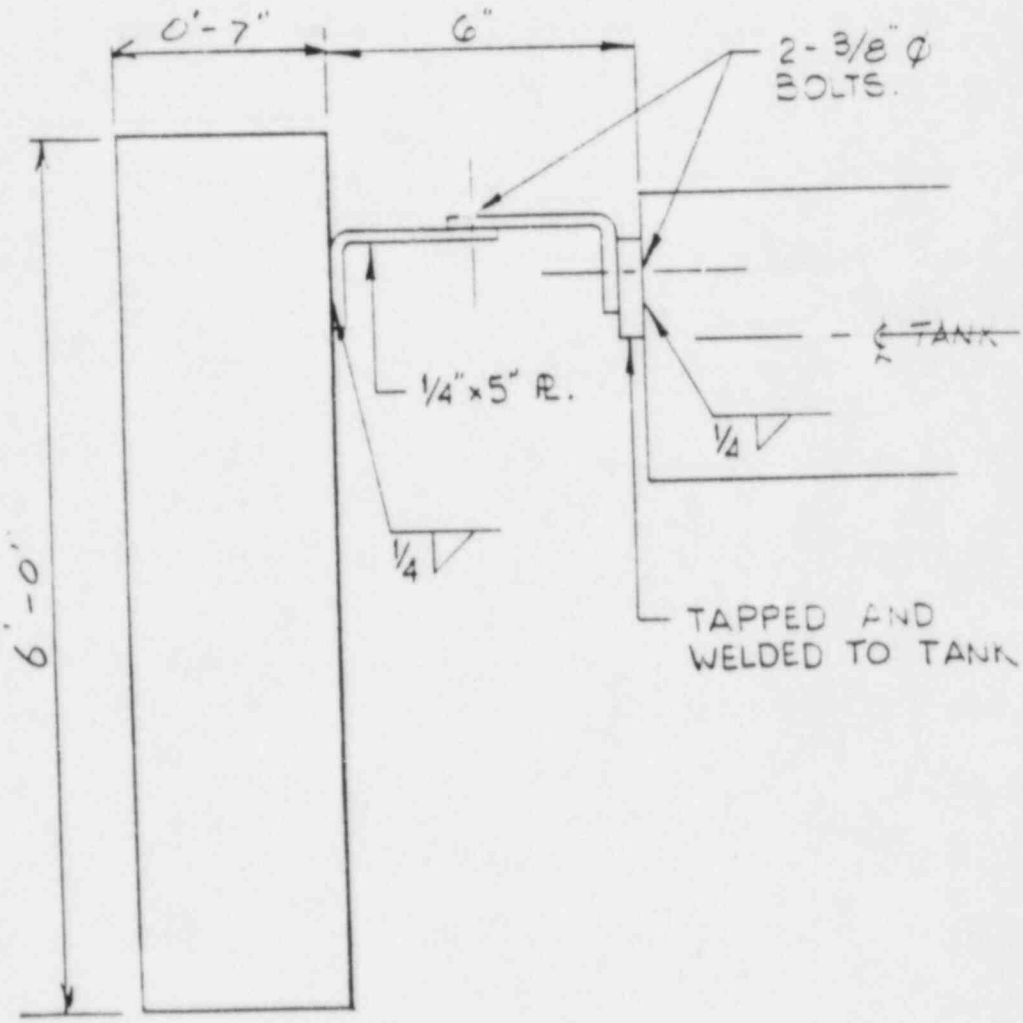
C.G. @ LANE 2



ELECTRICAL CONTROL PANEL



"1-1"



"2-2"

EMERGENCY DIESEL GENERATOR
LOCAL PANEL

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. _____

Item Description: MOTOR CONTROL CENTER

Location: _____

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number 4/Panel only 2 bolts/panel

b) Spacing _____

c) Size 3/8" ϕ

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: _____

b) Expansion Anchor Bolts: ✓

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: _____

C) Description of Additional Attachments (bracing gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 8.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit: O.K

b) Relative Size (Bolt to hole): O.K.

c) Material:_____

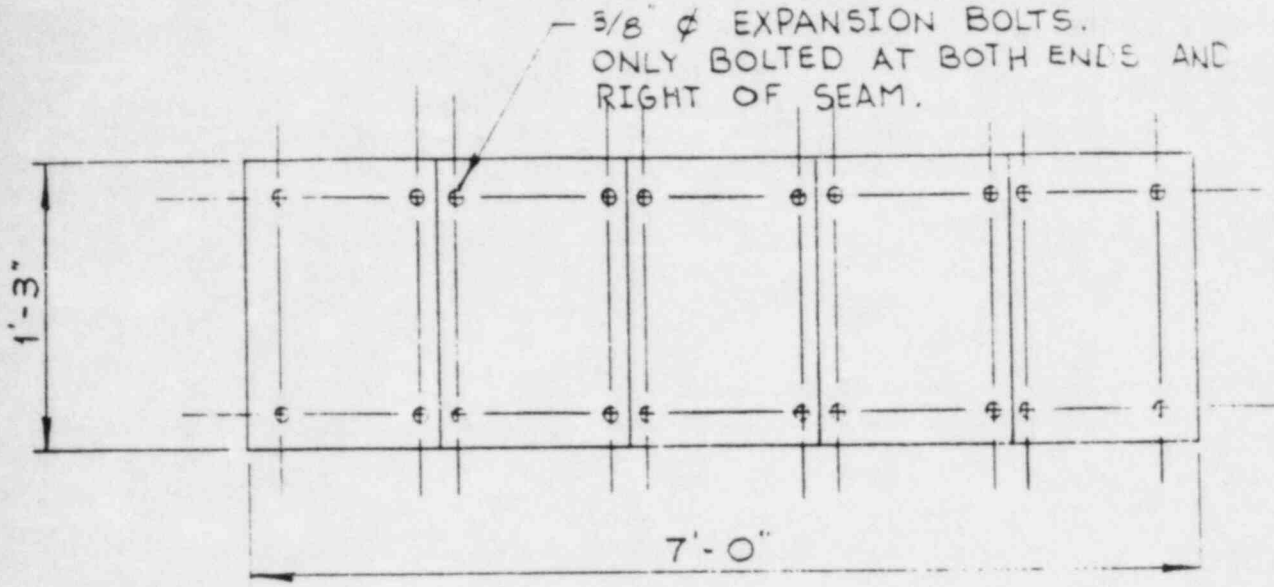
E) General Equipment Dims:_____

F) Estimated Weight: 5,400 #

Estimated Location of C.G.: Geometric ℄

G) Is component supported or restrained by block wall?___Yes____No ✓

H) General Comments_____



MOTOR CONTROL CENTER

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. _____

Item Description: Inverter

Location: _____

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number 4

b) Spacing _____

c) Size 3/4" ϕ

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: _____

b) Expansion Anchor Bolts: ✓

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: _____

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 8.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit: O.K.

b) Relative Size (Bolt to hole): O.K

c) Material:_____

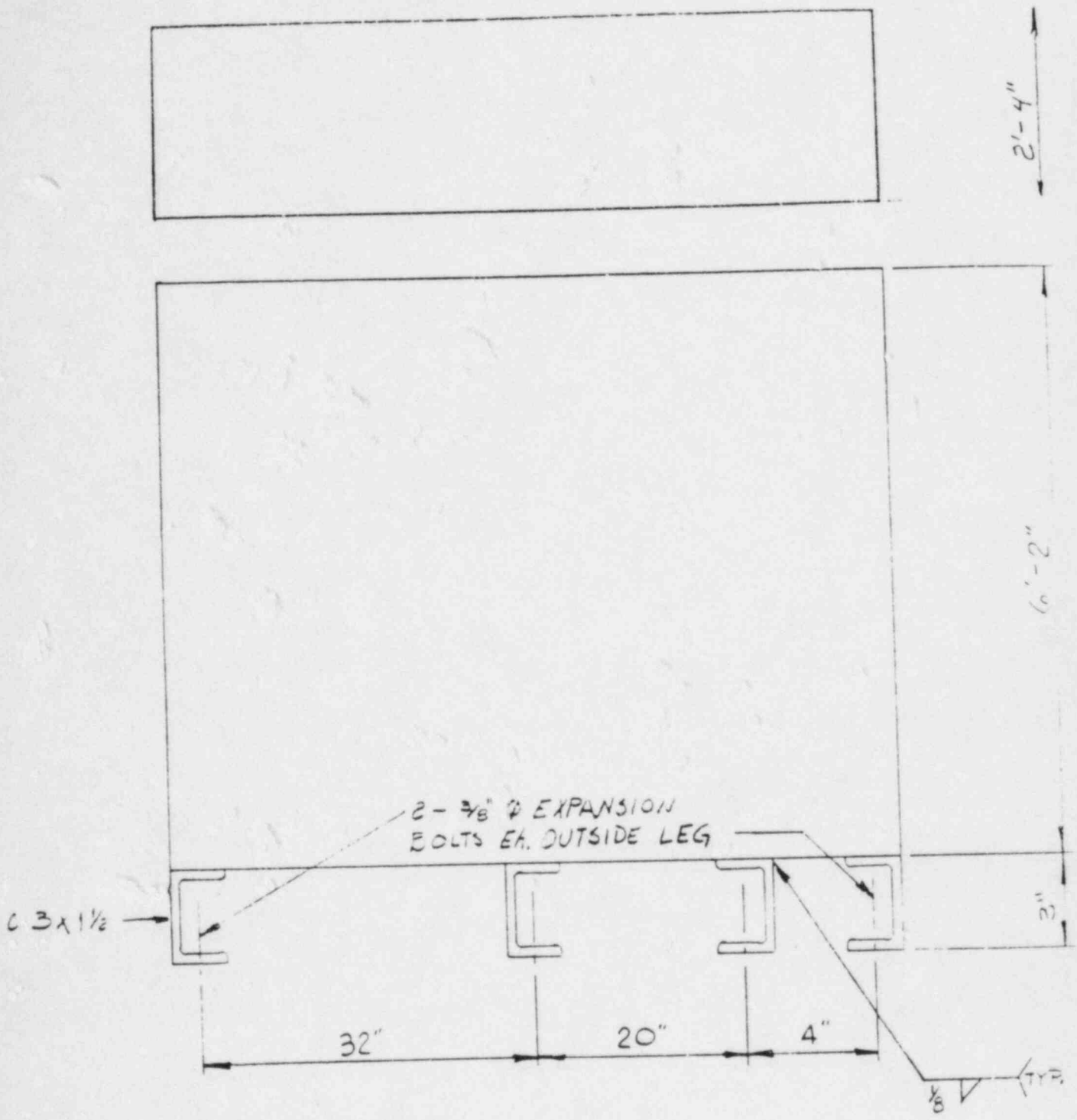
E) General Equipment Dims:_____

F) Estimated Weight: 700#

Estimated Location of C.G.: Geometric ℄

G) Is component supported or restrained by block wall?___Yes____No ✓

H) General Comments_____


2'-4"
6'-2"
2 - 3/8" ø EXPANSION
BOLTS EA. OUTSIDE LEG
C 3x1½
2"
32"
20"
4"
1/8
TYP.

INVERTER

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. _____

Item Description: Battery Charger

Location: Switchgear Room

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number SEE SKETCH

b) Spacing _____

c) Size _____

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: _____

b) Expansion Anchor Bolts: ✓

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: _____

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 6.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit: O.K

b) Relative Size (Bolt to hole): O.K

c) Material:_____

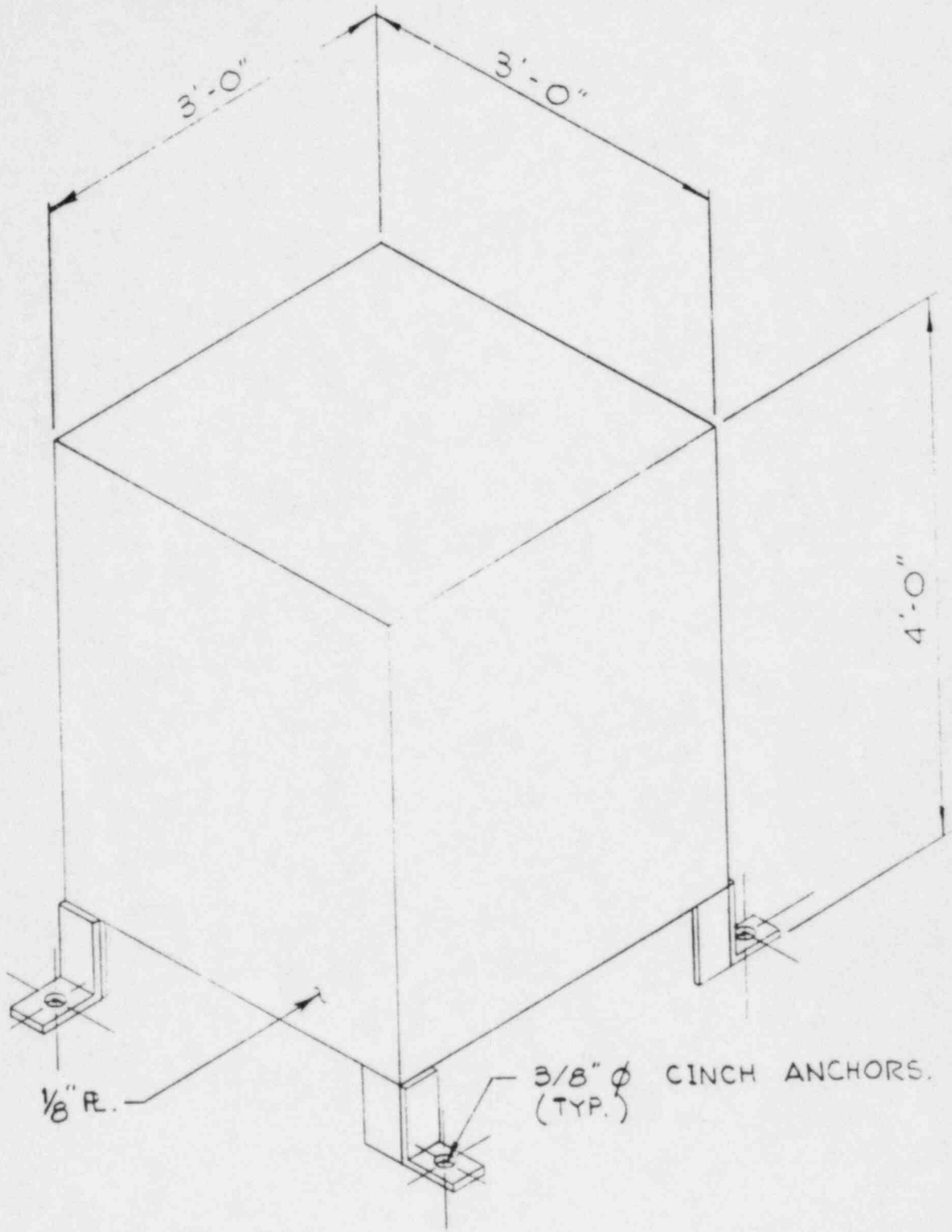
E) General Equipment Dims:_____

F) Estimated Weight: 500#

Estimated Location of C.G.: 2'-6" from F/Door

G) Is component supported or restrained by block wall?___Yes____No ✓

H) General Comments_____



BATTERY CHARGER
(EL. 46'-0")

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. _____

Item Description: BATTERY RACK

Location: _____

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number SEE SKETCH

b) Spacing _____

c) Size 3/8" ∅

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: _____

b) Expansion Anchor Bolts: ✓

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: _____

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 6.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit: O.K.

b) Relative Size (Bolt to hole): O.K.

c) Material:_____

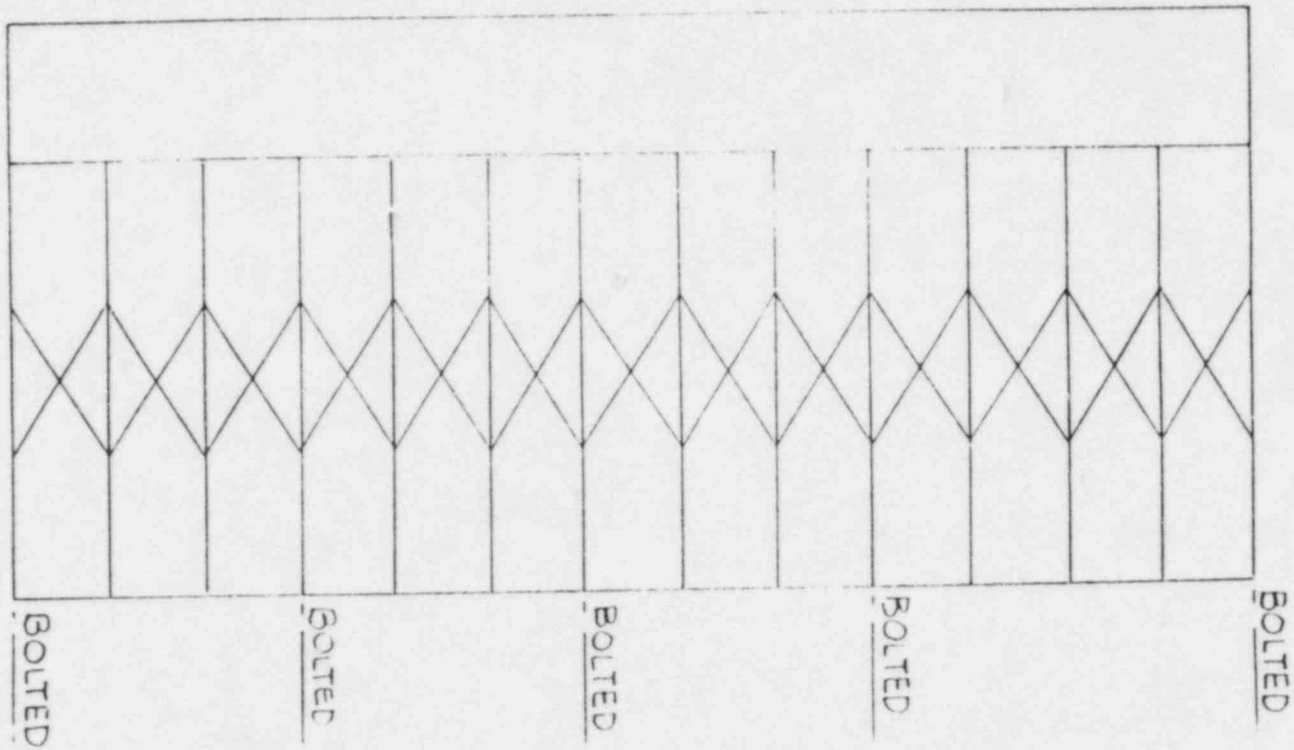
E) General Equipment Dims:_____

F) Estimated Weight: 2400 ±

Estimated Location of C.G.:_____

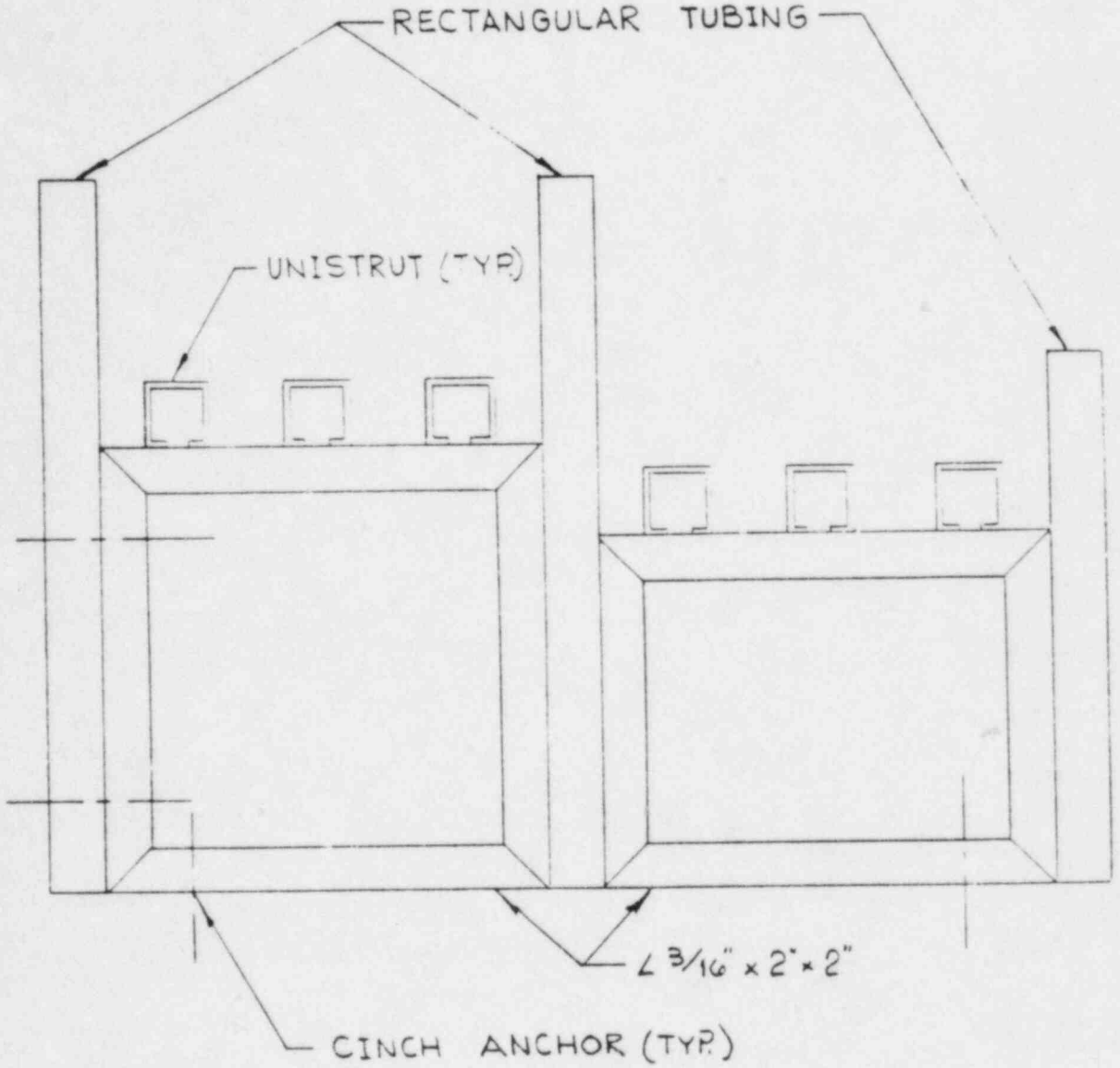
G) Is component supported or restrained by block wall?___Yes___No___

H) General Comments_____



ONLY 2 BOLTS PER BAY.

BATTERY RACK



ALL BOLTS 3/8" Ø

BATTERY RACK
(APPROX. EL. 36'-0")

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. _____

Item Description: EMERGENCY DIESEL GEN.

Location: DIESEL GEN. RM.

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number 14

b) Spacing SEE SKETCH

c) Size 1 1/4"

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: ✓

b) Expansion Anchor Bolts: _____

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: _____

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 6.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit:_____

b) Relative Size (Bolt to hole):_____

_____

_____

c) Material:_____

E) General Equipment Dims:_____

_____

_____

_____

F) Estimated Weight: 90K

Estimated Location of C.G.: Geometric ℄

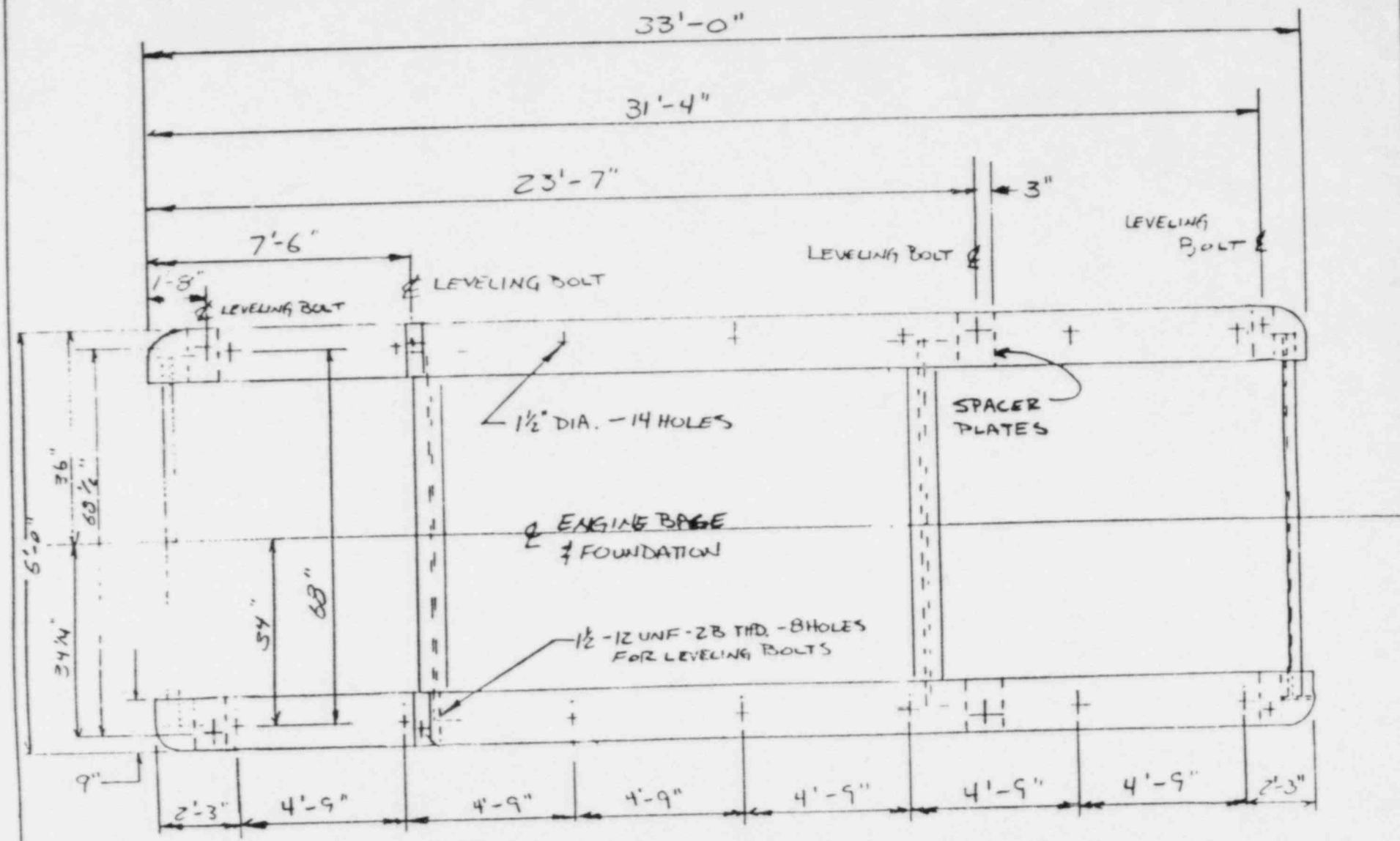
G) Is component supported or restrained by block wall?___Yes___No ✓

H) General Comments_____

_____

_____

SCALE: 1/2" = 1'-0" ↕
1/4" = 1'-0" ↔



DIESEL GENERATOR

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. _____

Item Description: Containment Fan Cooler

Location: Containment

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number SEE SKETCH

b) Spacing _____

c) Size _____

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: _____

b) Expansion Anchor Bolts: ✓

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: _____

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 8.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit: O.K.

b) Relative Size (Bolt to hole): O.K.

c) Material:_____

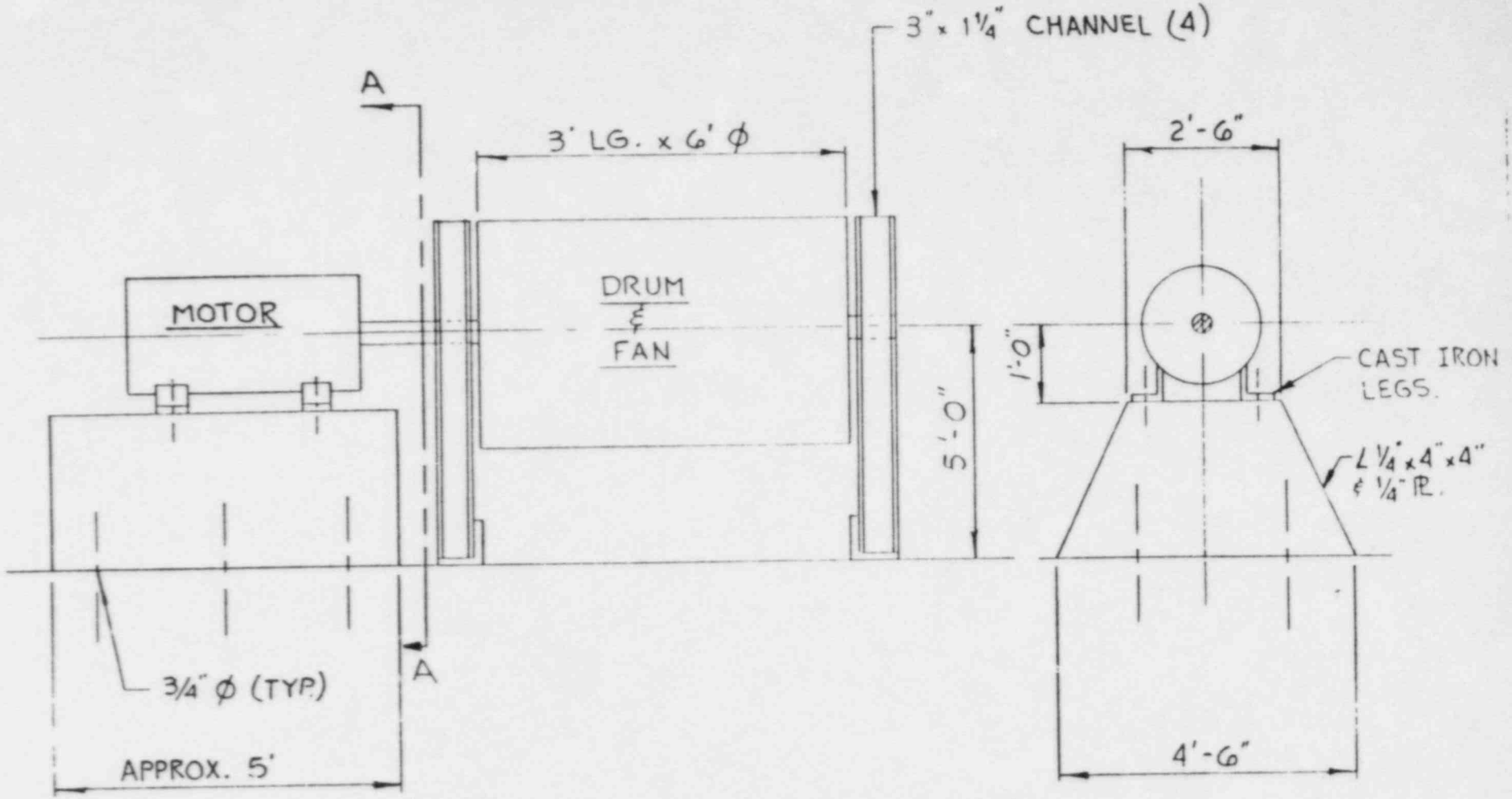
E) General Equipment Dims:_____

F) Estimated Weight: Motor - 500#, Drum & Fan - 300#

Estimated Location of C.G.: 5'-0" From Floor

G) Is component supported or restrained by block wall?___Yes____No ✓

H) General Comments_____



VIEW A-A

CONTAINMENT COOLING FAN & MOTOR

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO._____

Item Description: CABLE TRAYS

Location:_____

1) General Description, Photograph, or Sketch of Supports:

24"-30" wide cable trays - supported by rods threaded into star slug-ins

2) Check List

A) Base Plate:_____

1) Base Plate Dims:_____

2) Bolt Holes:

a) Number _____

b) Spacing_____

c) Size_____

d) Edge Distance_____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts:_____

b) Expansion Anchor Bolts: ✓ star slugs - not completely embedd.

c) Welded Bolts:_____

2) Welded:

a) Plug Welded to Structure:_____

b) Tack Welded to Structure:_____

c) Fillet Welded to Structure:_____

3) Other:_____

C) Description of Additional Attachments (bracing, gussetts, etc.)_____

1) Number: Guides - washers bolted thru to spring clamps

2) Location: every support

3) Dimension:_____

4) Size:_____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 8.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit:_____

b) Relative Size (Bolt to hole):_____

_____

_____

c) Material:_____

E) General Equipment Dims:_____

_____

_____

_____

F) Estimated Weight:_____

Estimated Location of C.G.:_____

G) Is component supported or restrained by block wall?____Yes_____No_____

H) General Comments_____

_____

_____

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. MCV-262

Item Description: LUBE OIL CHARGING - VALVE

Location: _____

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: _____

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number _____

b) Spacing _____

c) Size _____

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: _____

b) Expansion Anchor Bolts: _____

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: _____

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 8.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit:_____

b) Relative Size (Bolt to hole):_____

_____

_____

c) Material:_____

E) General Equipment Dims:_____

_____

_____

_____

F) Estimated Weight:_____

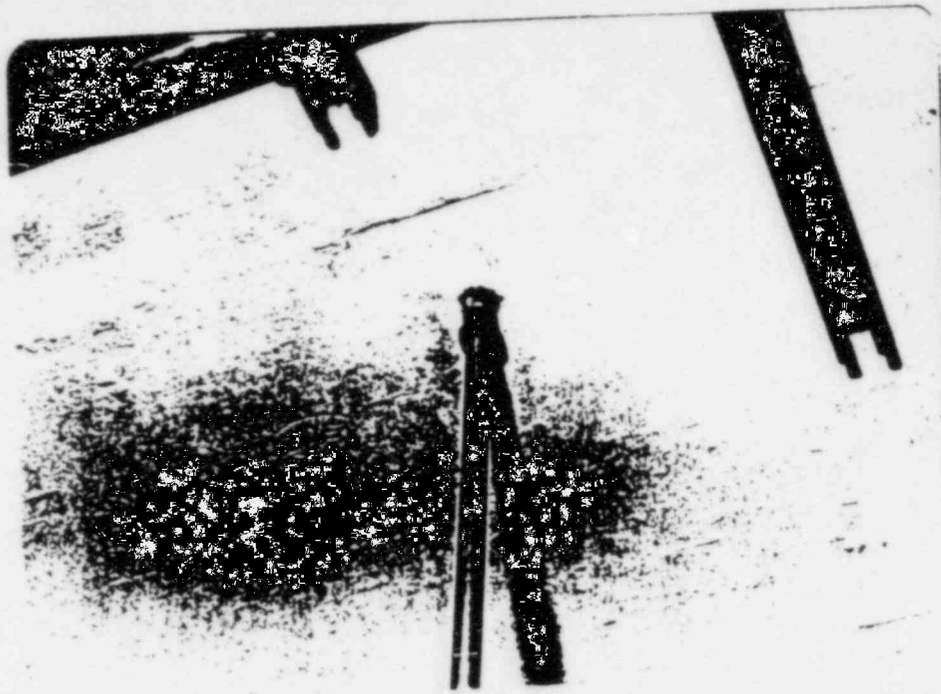
Estimated Location of C.G.:_____

G) Is component supported or restrained by block wall?____Yes_____No_____

H) General Comments_____

_____

_____



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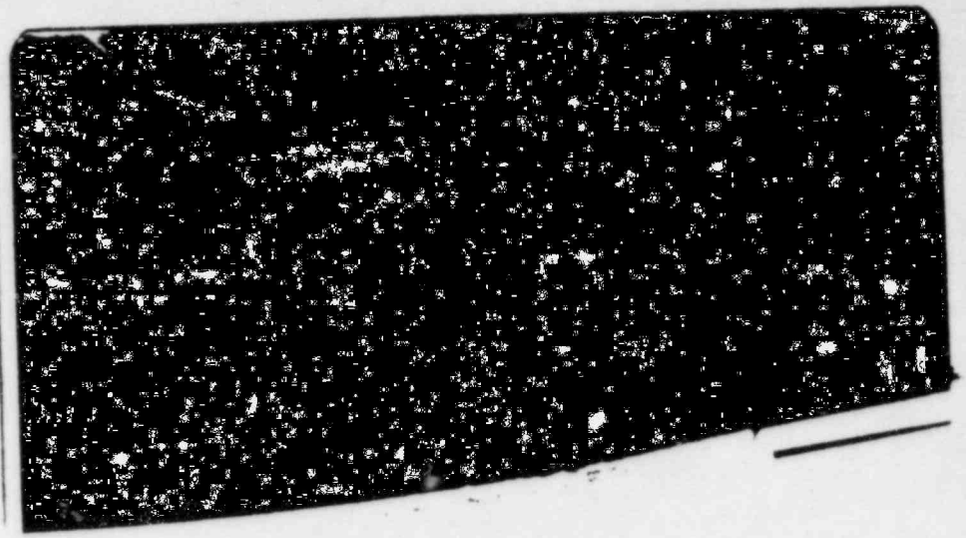

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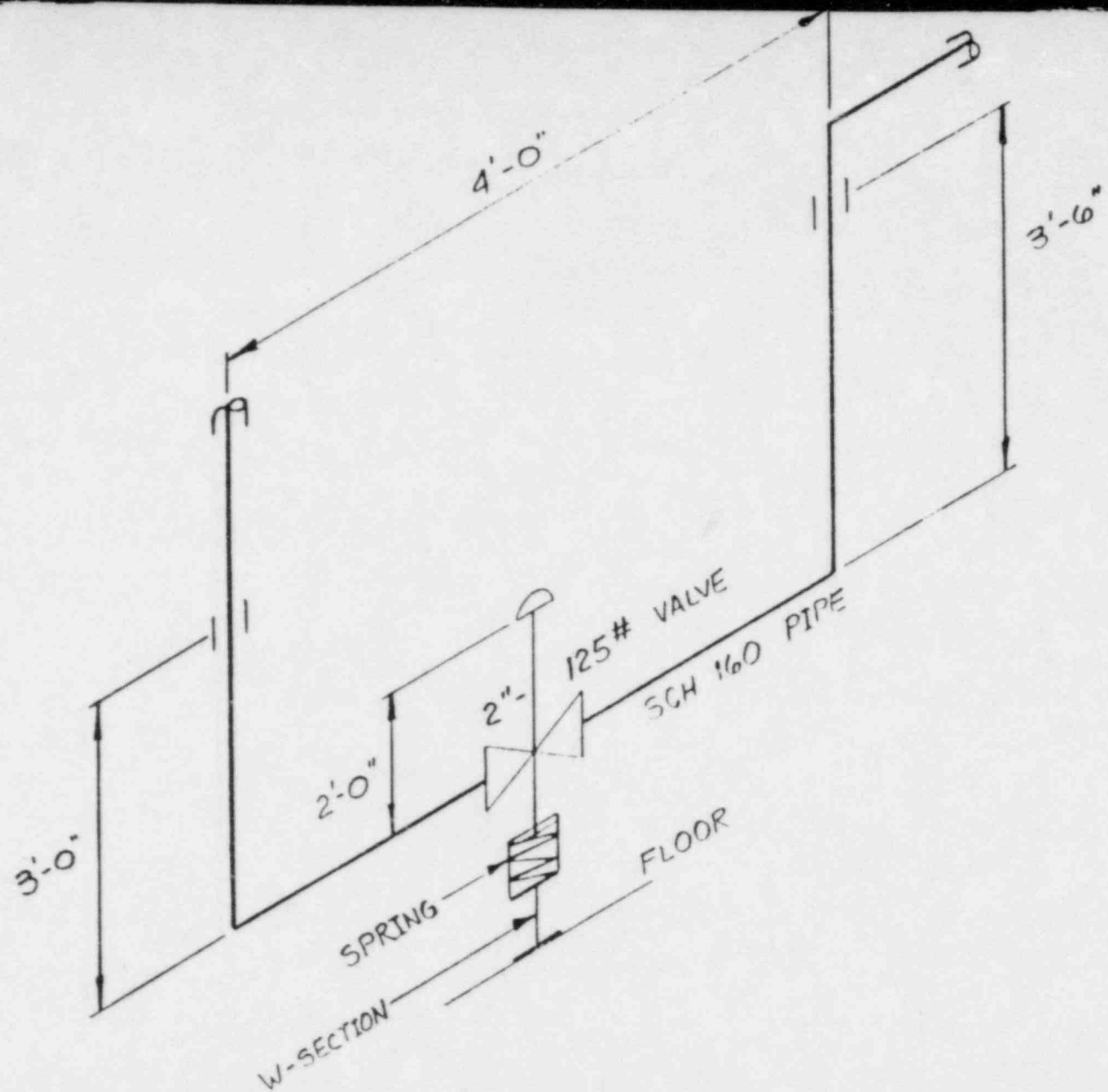


LUBE OIL CHARGING SYSTEM

MCV - 262

ATTACHMENT A

EQUIPMENT, DEVICE OR COMPONENT
SURVEY FORM

I.D. NO. AFW-A-301

Item Description: Valve - AUX. FEED SYSTEM

Location: _____

1) General Description, Photograph, or Sketch of Supports:

SEE SKETCH

2) Check List

A) Base Plate: SEE SKETCH

1) Base Plate Dims: _____

2) Bolt Holes:

a) Number _____

b) Spacing _____

c) Size _____

d) Edge Distance _____

B) Specify means of attachment of equipment to structure:

1) Bolted:

a) Poured in Place Bolts: _____

b) Expansion Anchor Bolts: _____

c) Welded Bolts: _____

2) Welded:

a) Plug Welded to Structure: _____

b) Tack Welded to Structure: _____

c) Fillet Welded to Structure: _____

3) Other: _____

C) Description of Additional Attachments (bracing, gussetts, etc.) _____

1) Number: _____

2) Location: _____

3) Dimension: _____

4) Size: _____

I.D. NO._____

D) General Condition - Visual Inspection:

1) Welds (AWS D1.1 para. 8.15.1)_____

a) Cracks:_____

b) Fusion:_____

c) Craters:_____

d) Profiles:_____

e) Fillet Size:_____

2) Bolts

a) Fit:_____

b) Relative Size (Bolt to hole):_____

_____

_____

c) Material:_____

E) General Equipment Dims:_____

_____

_____

_____

F) Estimated Weight: Oper. ≤ 70#

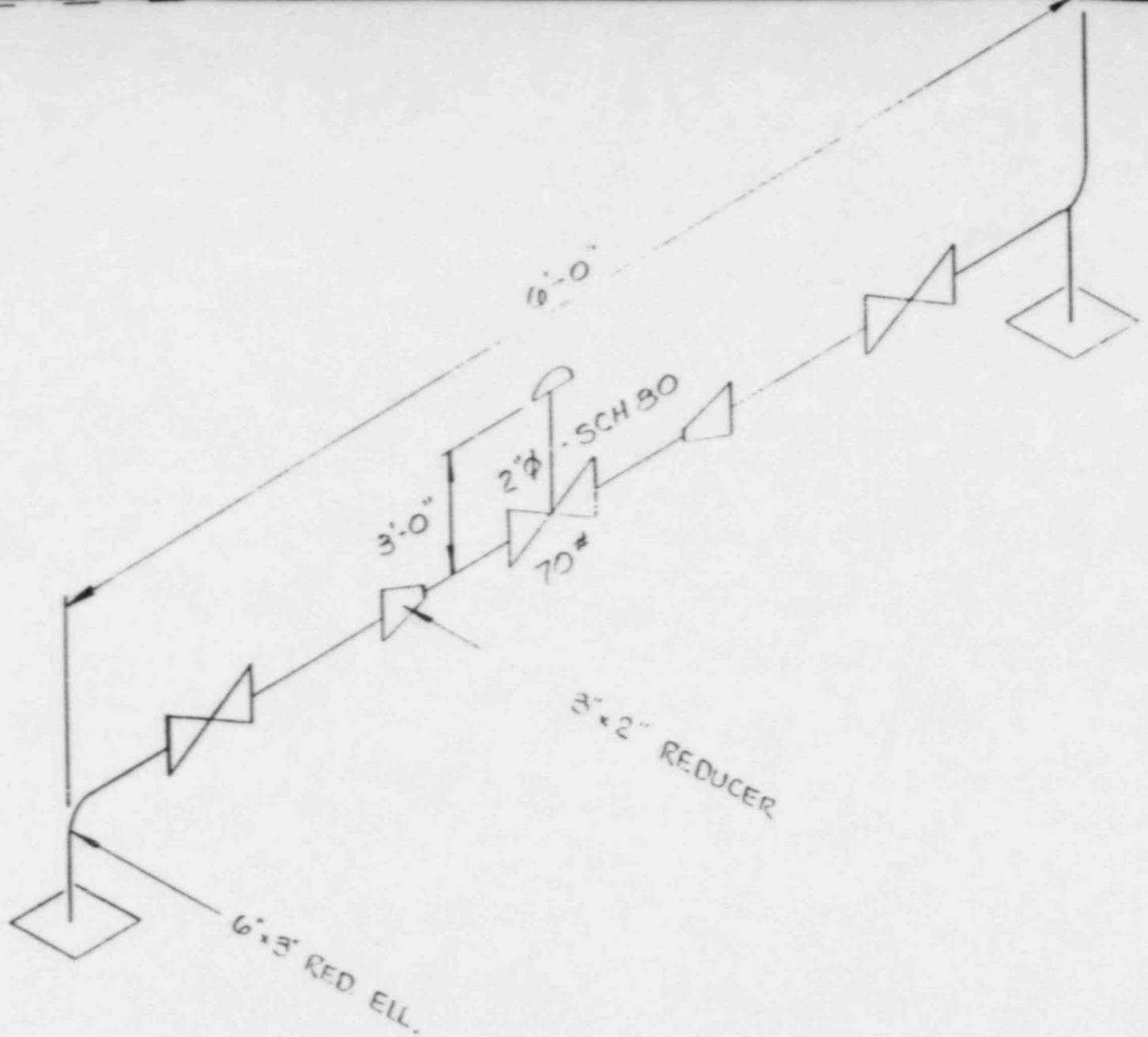
Estimated Location of C.G.:_____

G) Is component supported or restrained by block wall?___Yes____No ✓

H) General Comments_____

_____

_____



AUXILIARY FEED WATER SYSTEM
VALVE - AFW-A 301

ATTACHMENT III
PHOTOS

S&A

PHOTO INDEX

Photo No.	Description
1.	SCCW PUMP
2.	SCCW PUMP ANCHOR BOLT
3.	SCCW Heat Exchanger Saddle
4.	SCCW Heat Exchanger Saddle
5.	Diesel Oil Day Tank Support
6.	Diesel Oil Day Tank Support
7.	Regenerative Heat Exchanger
8.	Regenerative Heat Exchanger
9.	Diesel Generator Air Start-Up Tanks
10.	Diesel Generator Air Start-Up Tanks
11.	Diesel Generator Air Start-Up Tanks
12.	Chemical Spray Addition Tank
13.	Chemical Spray Addition Tank
14.	Safety Injection Tank
15.	Safety Injection Tank
16.	Main Control Board Internals
17.	Main Control Board Internals
18.	Main Control Board Internals
19.	Main Control Board Internals
20.	Main Control Board Internals
21.	Main Control Board Internals

S&A

22. Main Control Board Internals

23. Battery Racks

24. Battery Racks

25. Diesel Generator Local Control Panel

26. Instrument Rack

27. Instrument Rack

28. Instrument Rack

29. Wall Mounted Instrument

30. Cable Tray Rod Attachment

31. Cable Tray Rod Attachment

32. Cable Tray Rod Attachment

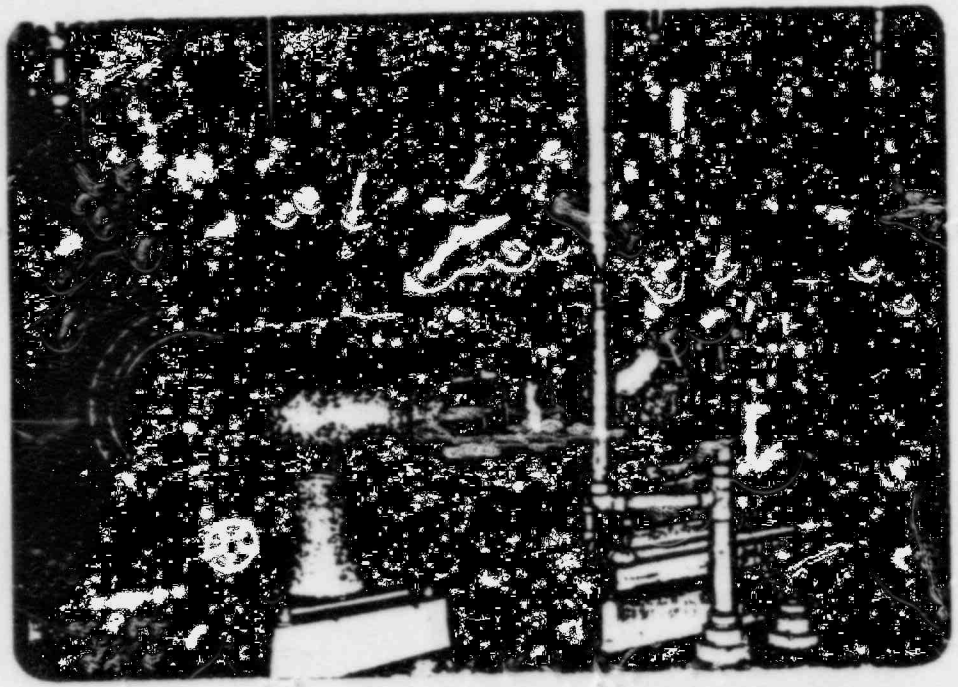
33. Cable Tray Rod Attachment

34. Auxiliary Feed Valve #AFW-A301

35. Auxiliary Feed Valve #AFW-A301

36. Auxilairy Feed Valve #AFW-A301

S&A



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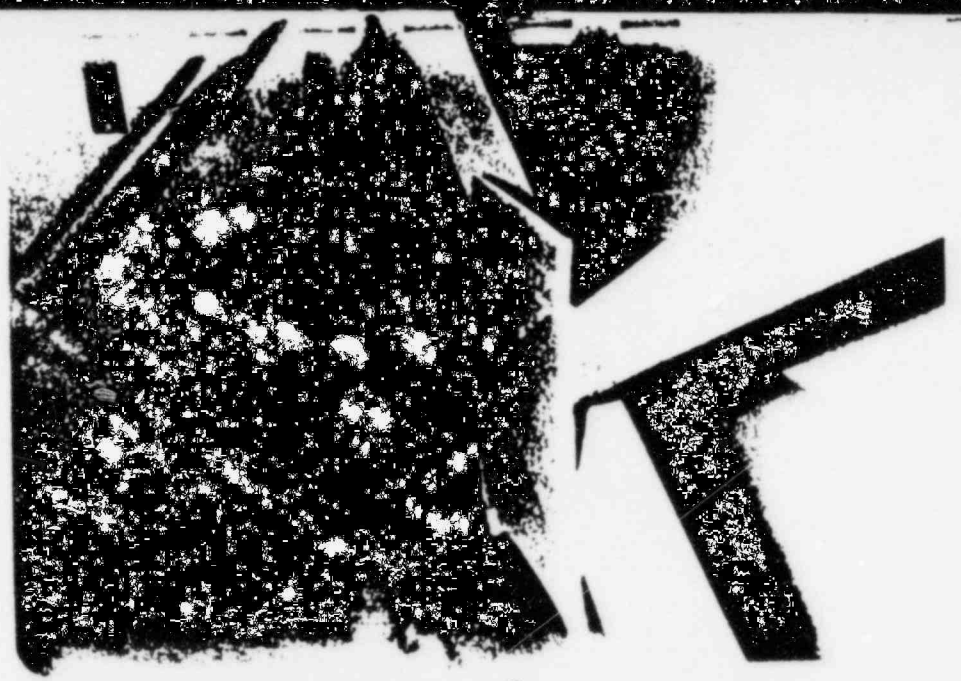

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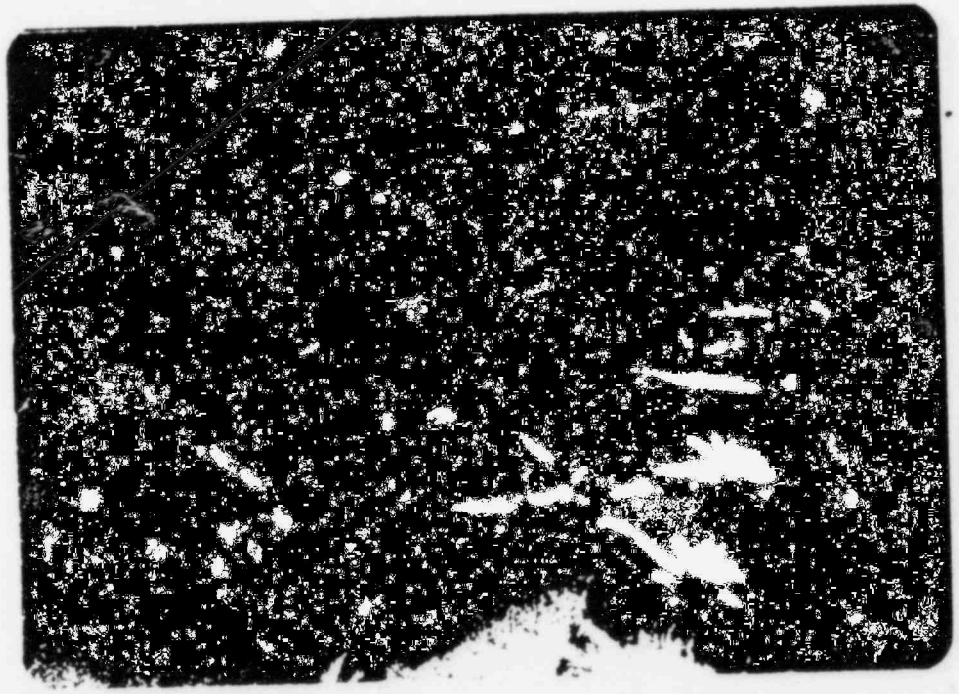

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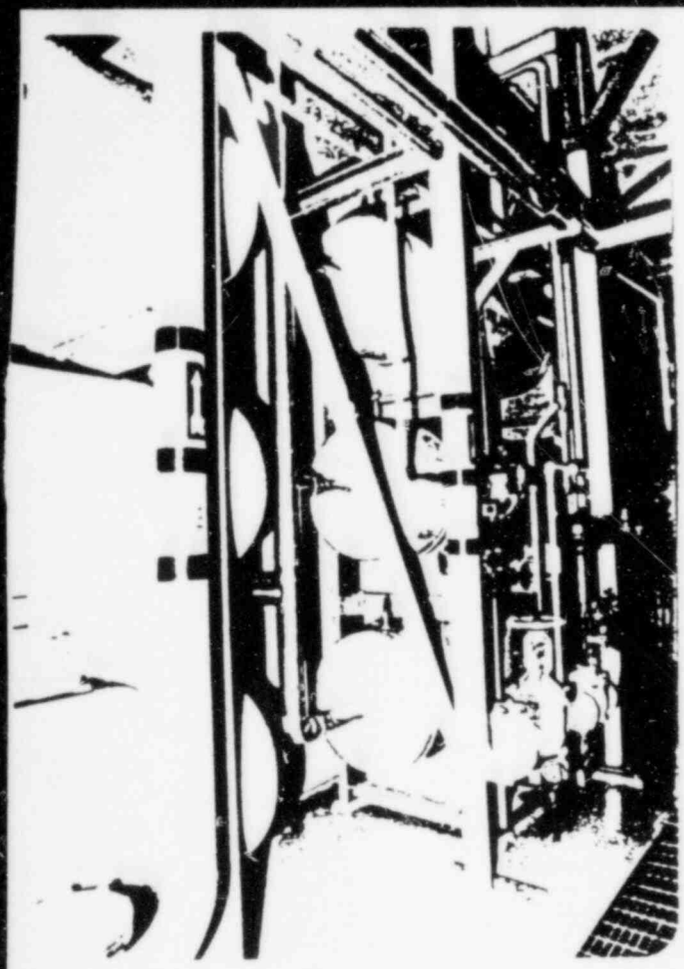

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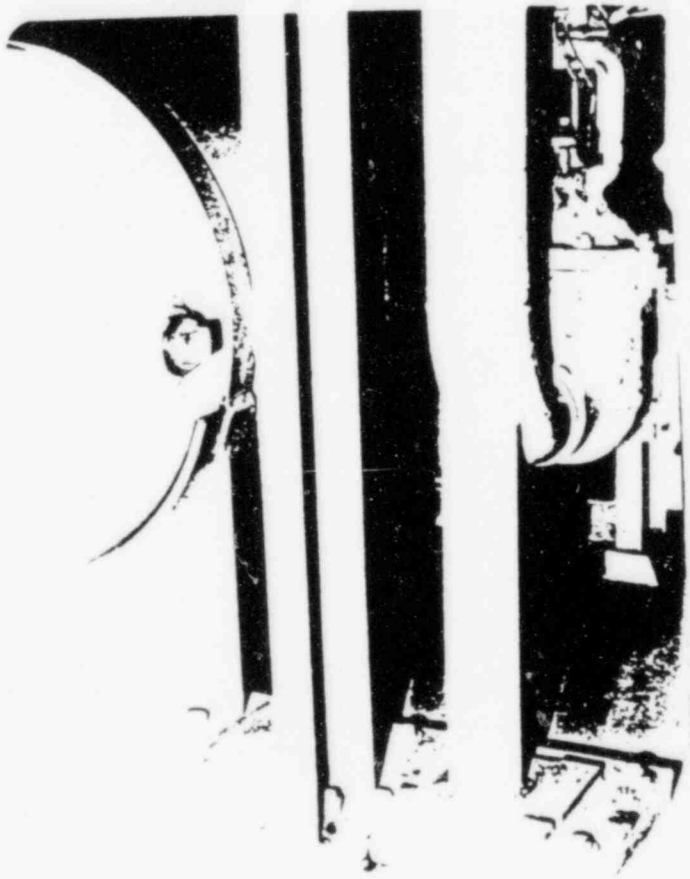

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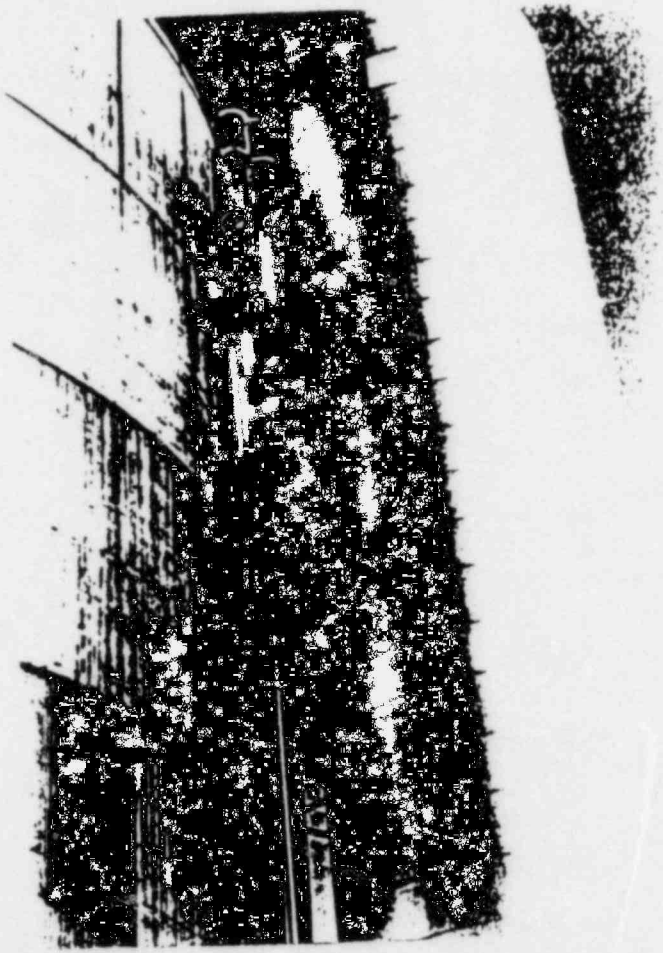

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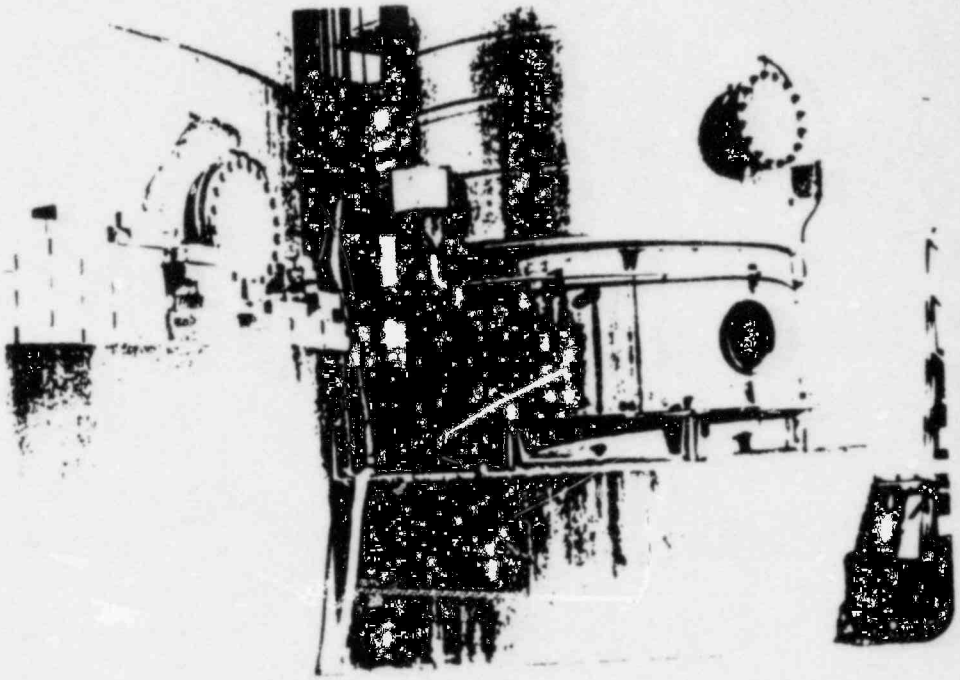

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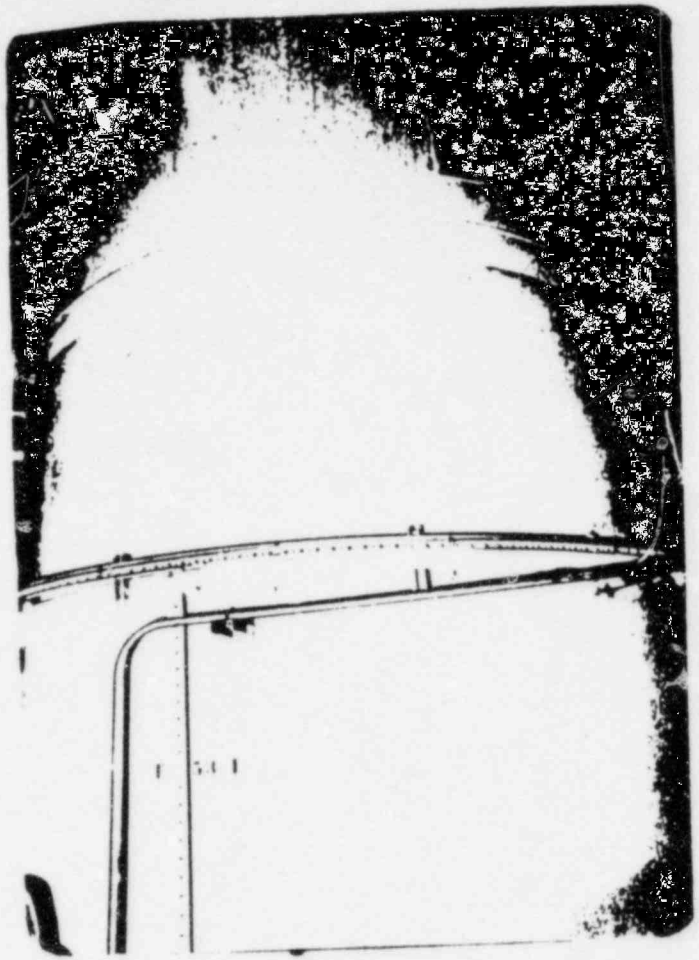

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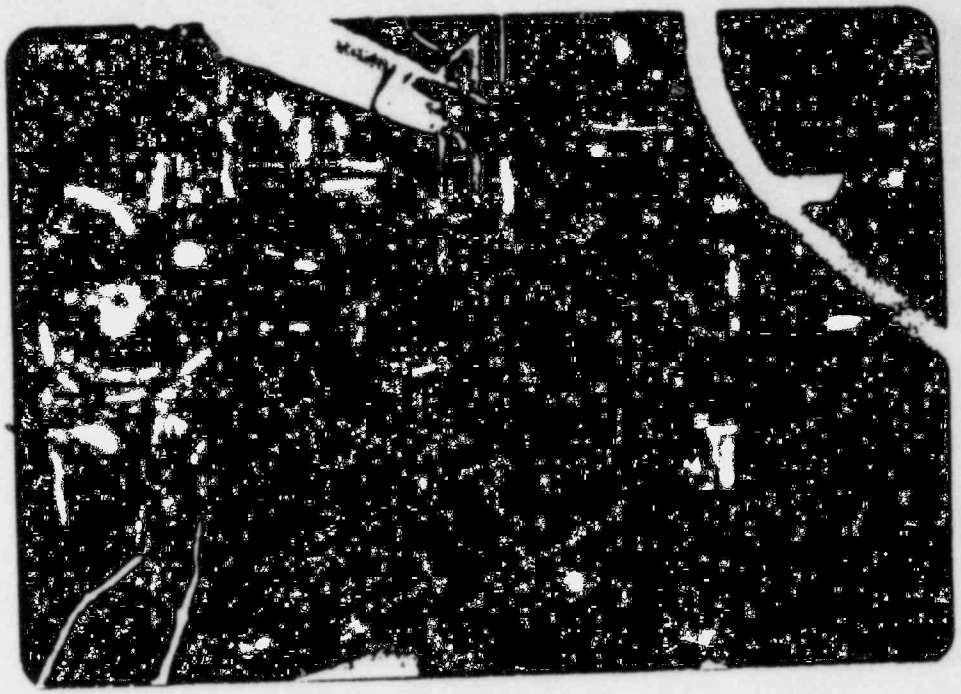

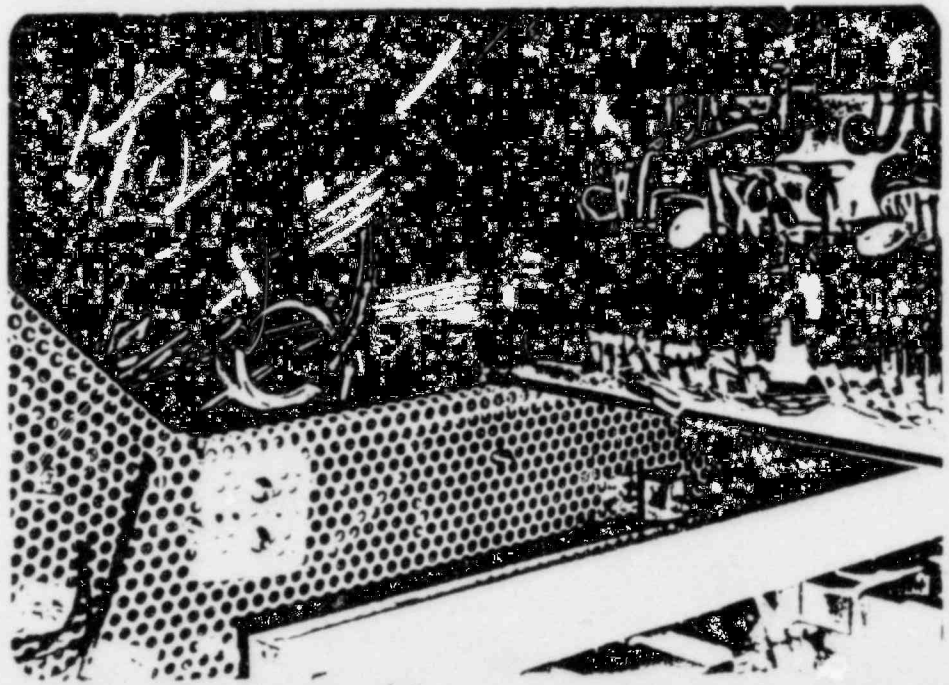

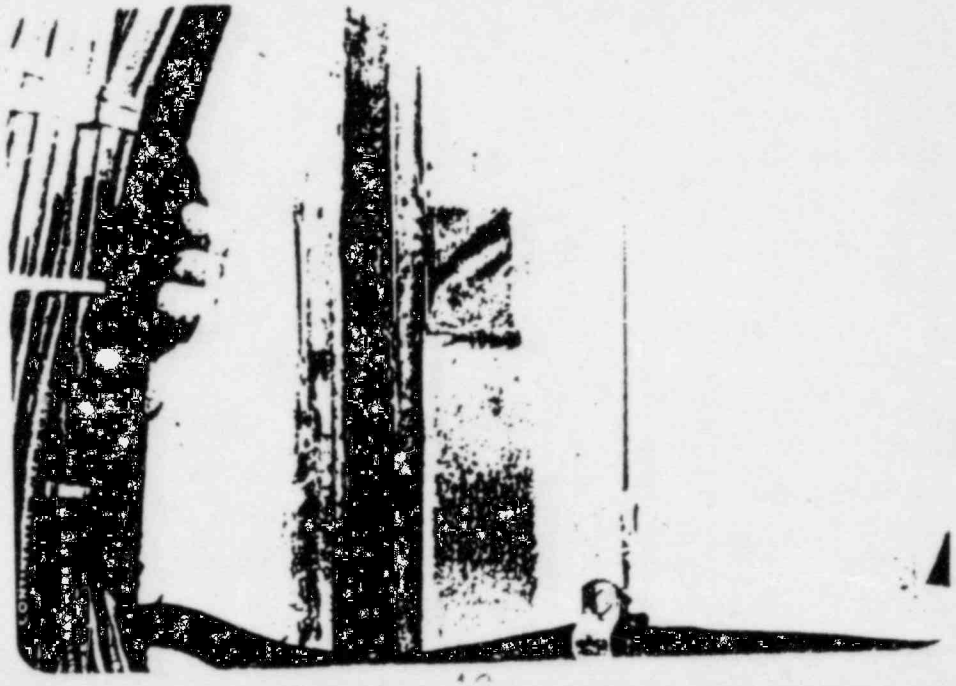

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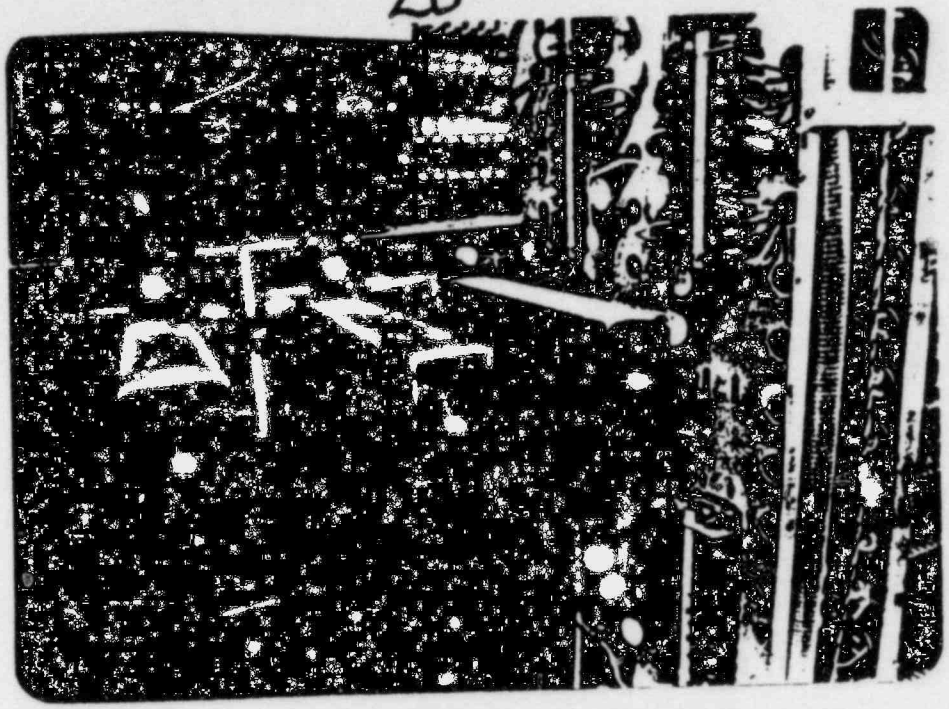

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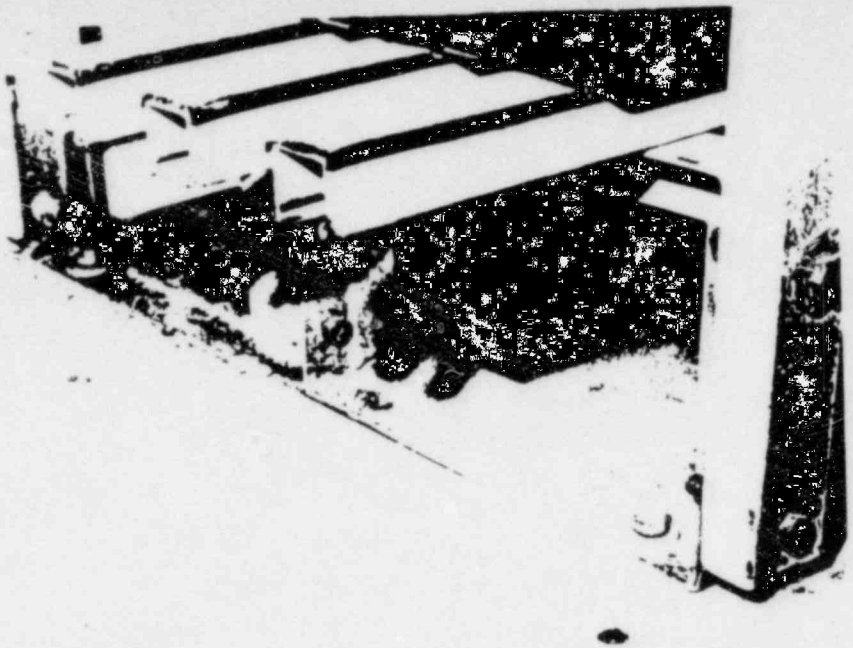

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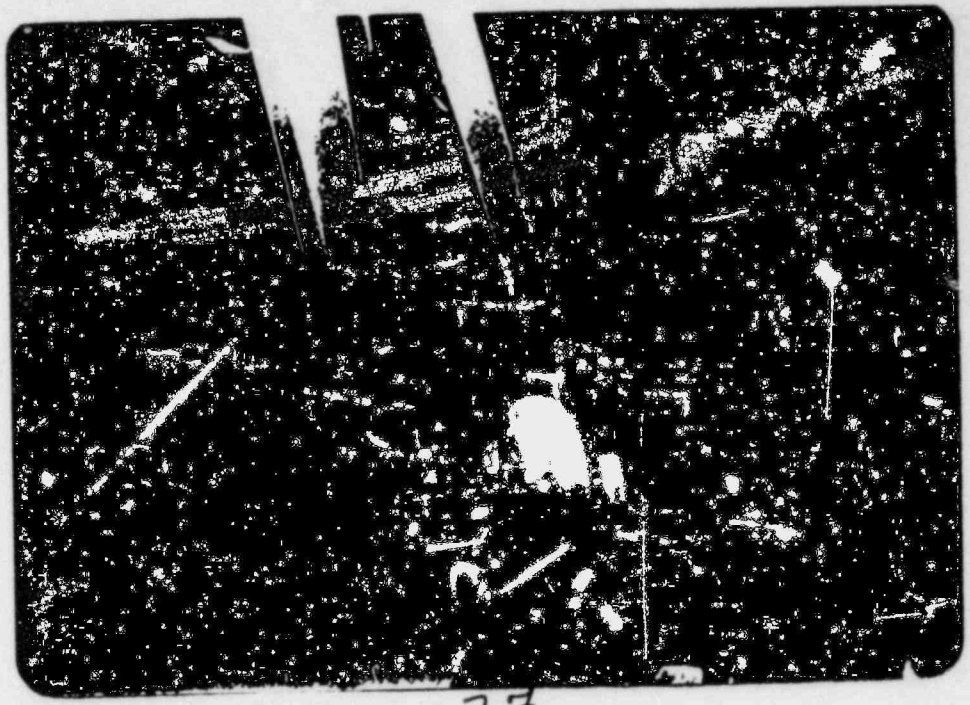

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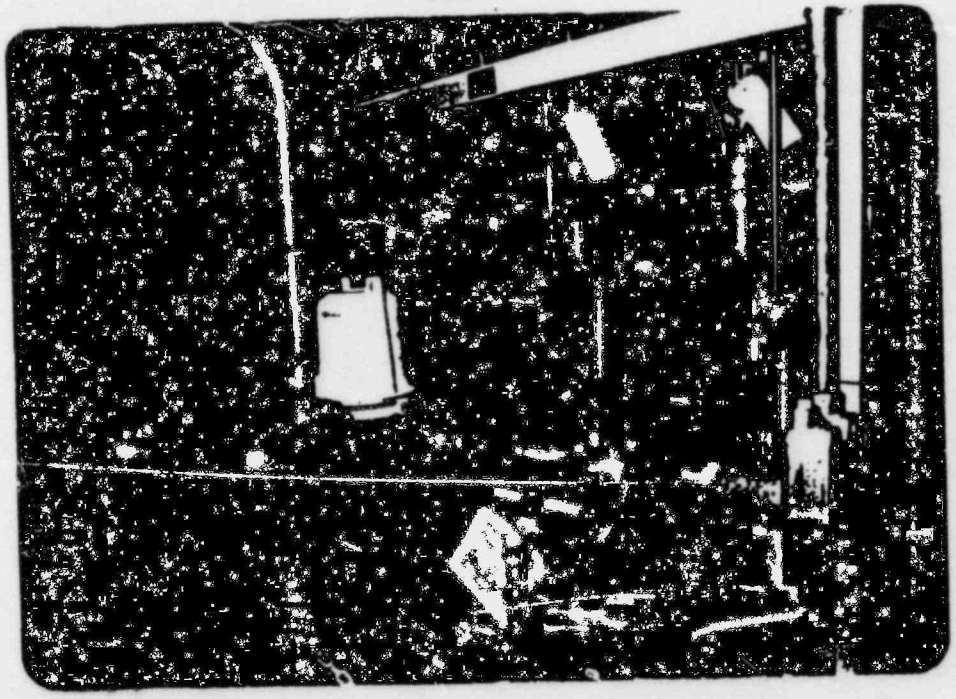

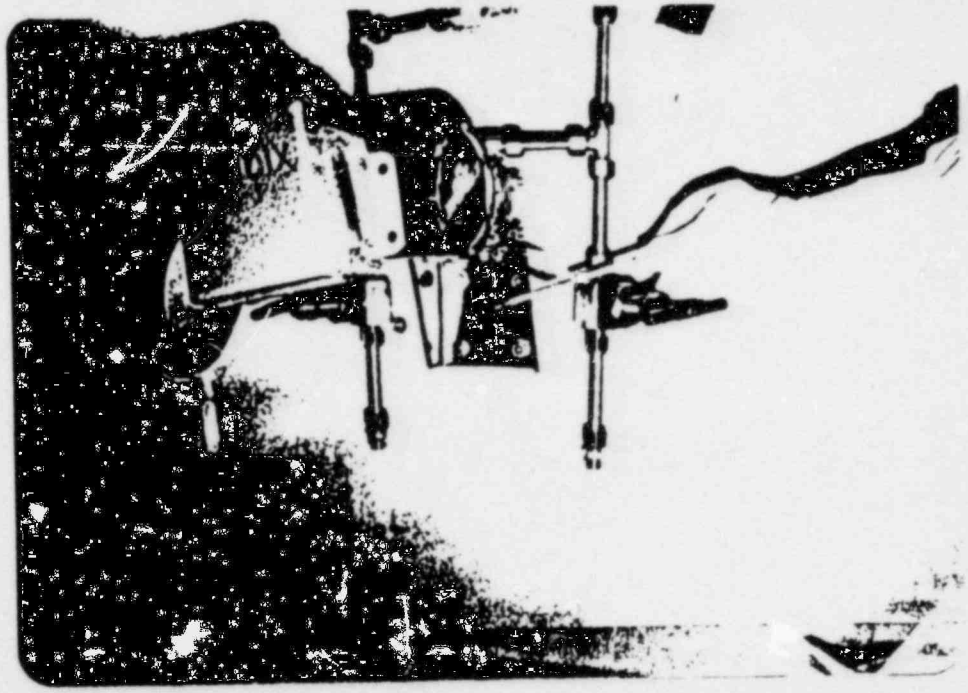

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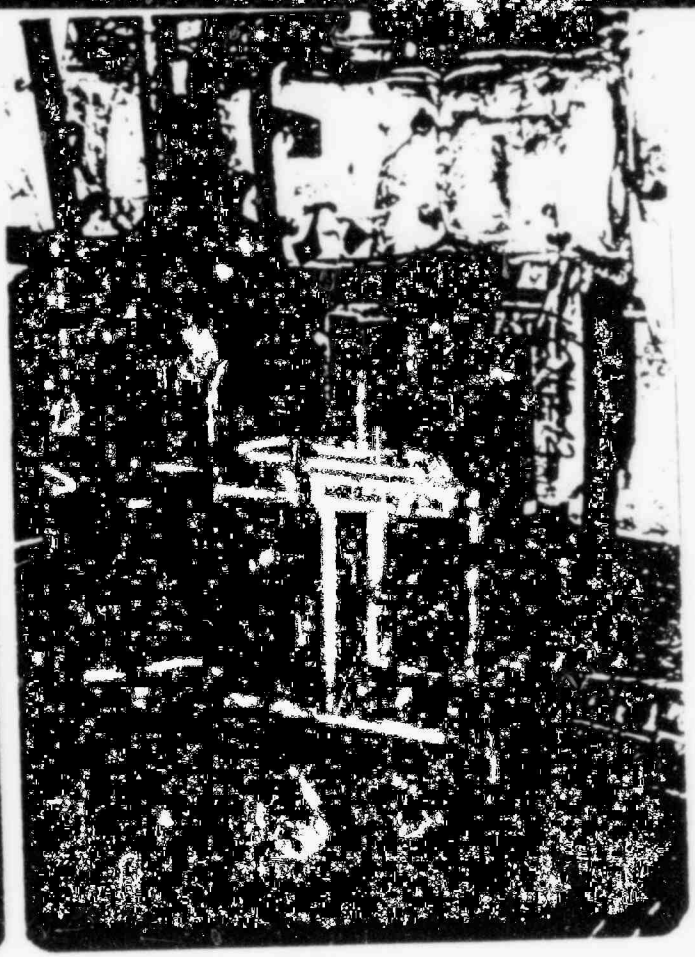

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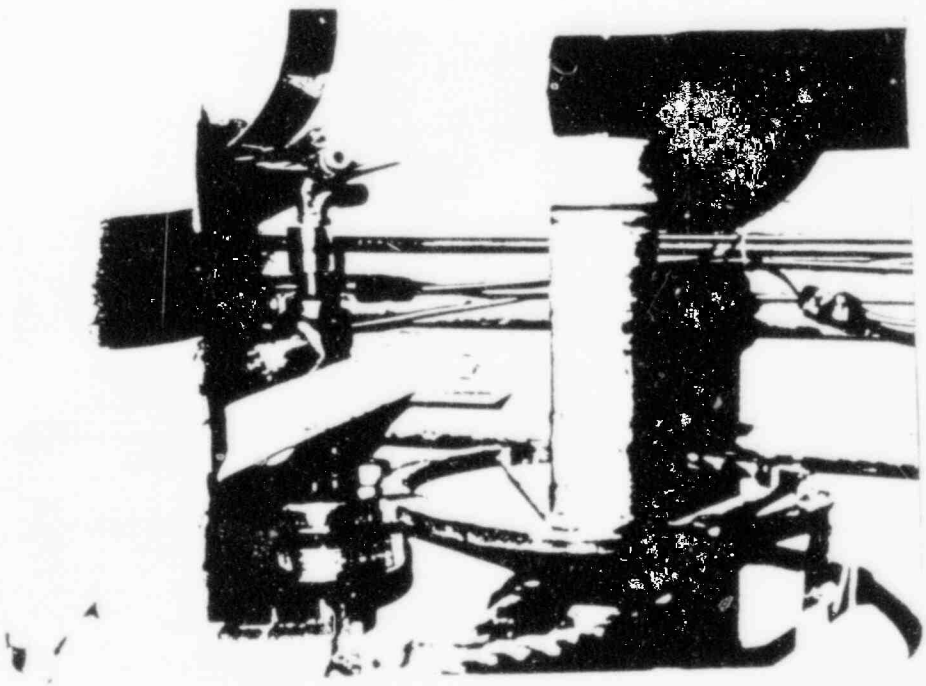

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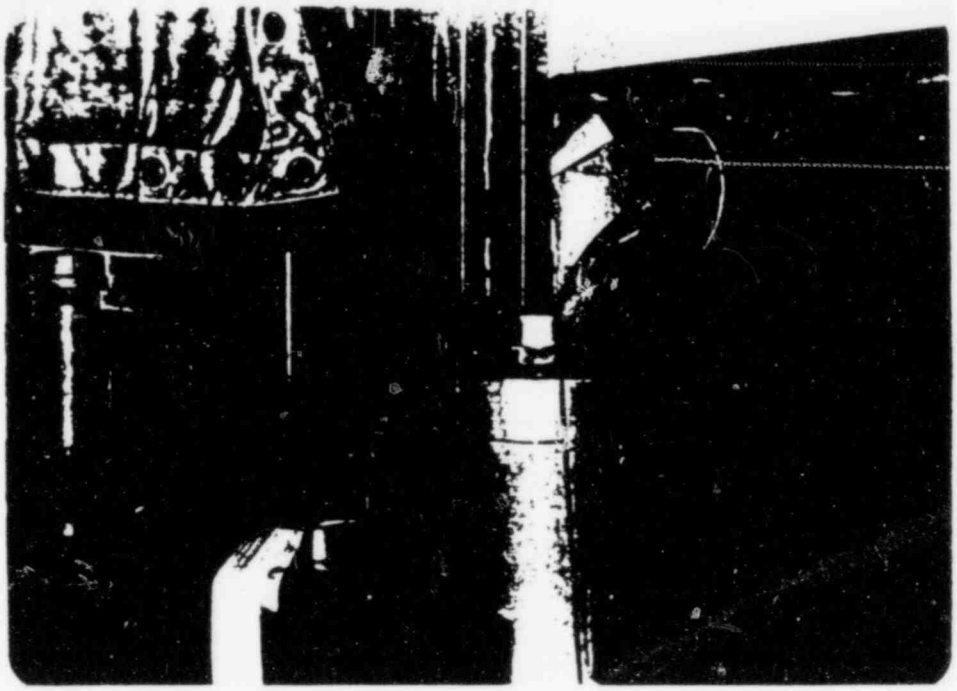

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