

NOTE
 EACH UNDERFLOW PUMP INCLUDES A BALL CHECK VALVE, AIR FILTER/REGULATOR, SOLENOID VALVE, PRESSURE VACUUM GAUGE, AND OTHERS.

PRESSURE PROFILES ACROSS THE SYSTEM
 SCRUBBER - 32.0" W.G.
 GAS DUCTS - 3.0" W.G.
 HEAT EXCHANGER - 15.0" W.G.
 FLUID BED - 50" W.G.
 REFRACTORY DOME - 20" W.G.

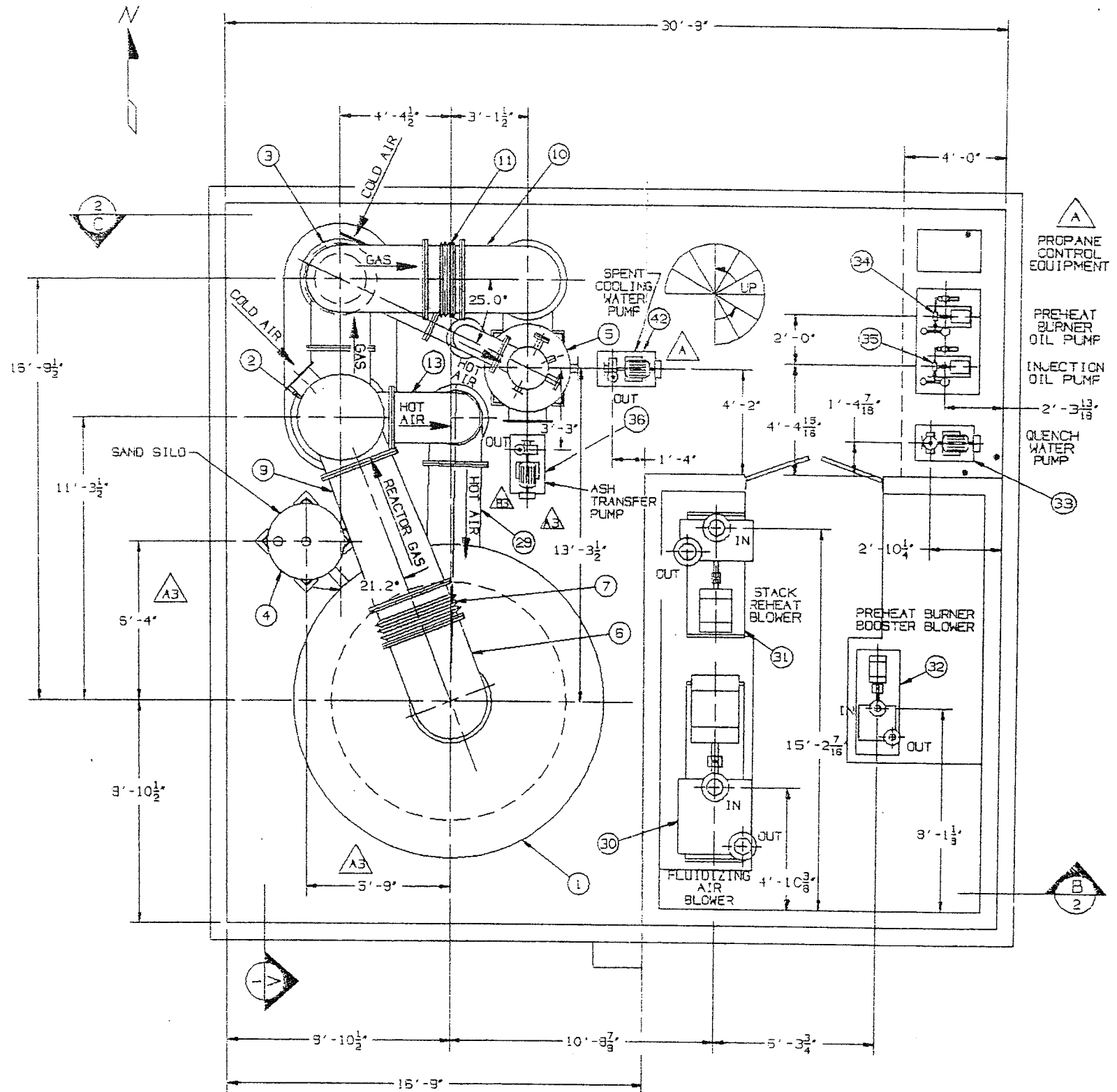
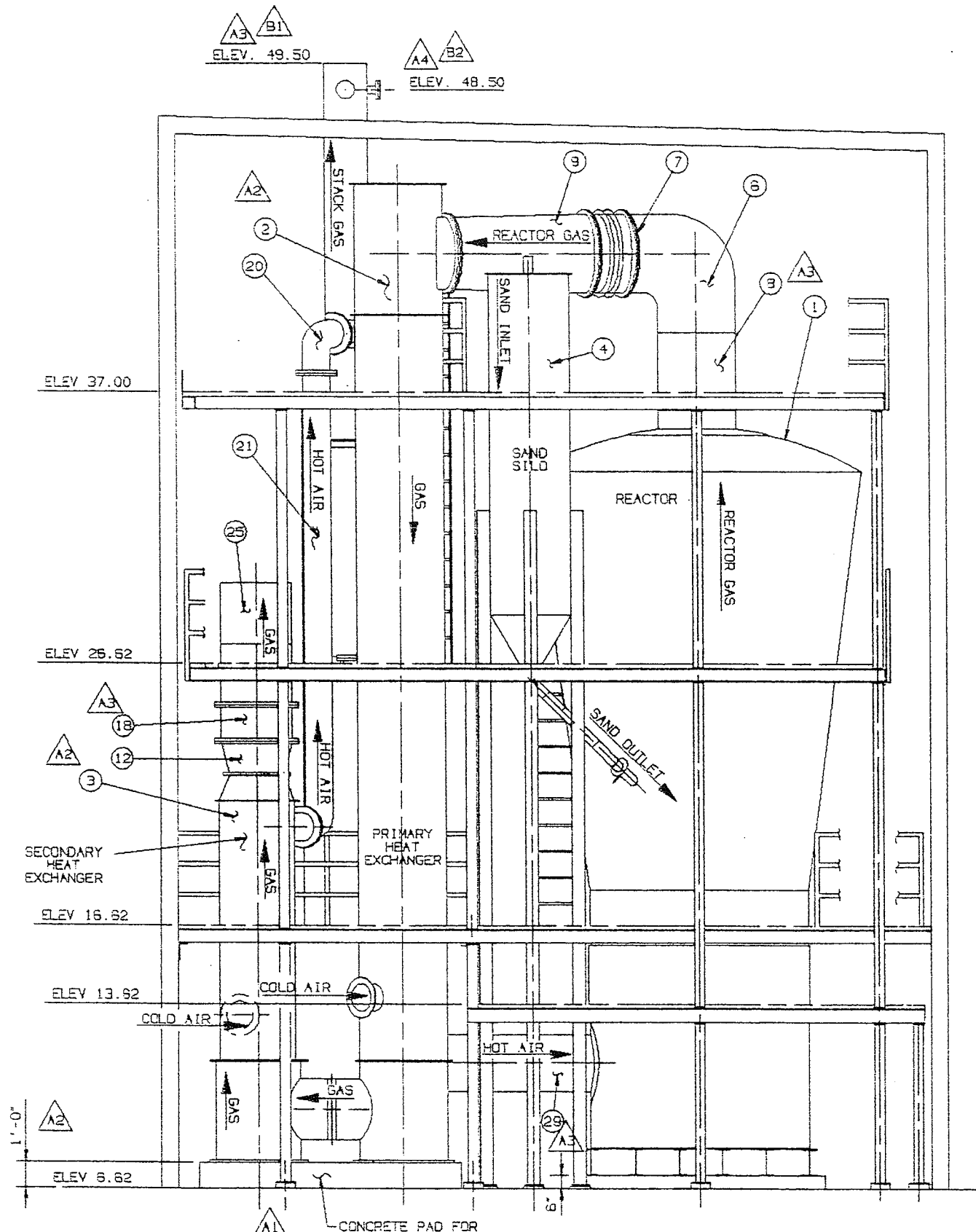
* STATED BATTERY LIMITS ARE 1 FOOT INSIDE BUILDING

▲ FOR EMERGENCY WATER
 ▲ ONE INSTALLED - THE OTHER SPARE UNINSTALLED

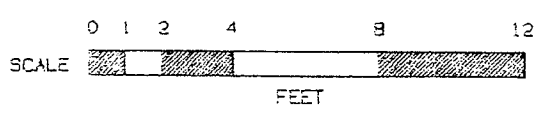
C	EMERGENCY WATER ADDED	CM	5-05-90						
B	ADDED EMERGENCY OVERFLOW LINE / REMOVED POLYMER BLENDER	CM	3-27-90						
A	ADDED POLYMER DRAIN AND FEED PUMP (NO. 2), ADDED SECONDARY SLUDGE PUMP ADDED MOTOR HP'S.	DMS	7-31-99						

REV	DESCRIPTION	BY	DATE	ANGULAR	11/2"
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JOY ENERGY SYSTEMS, INC.		BY	DATE	CHKD	DATE
A Joy Technologies Company		DWA, DMS	5-23-99		
MATERIAL:		SCALE:			
THIS DRAWING AND ANY REPRODUCTION IN WHOLE OR IN PART ARE THE PROPERTY OF JOY ENERGY SYSTEMS, INC. ANY DISSEMINATION WITHOUT WRITTEN CONSENT BY AN AUTHORIZED AGENT OF JOY ENERGY SYSTEMS, INC. IS PROHIBITED.		TOT. WT.			
DATE OF PRINT		NO. OF PAGES			
DRAWING NO.		REV.			



SECTION A
1



REVISION	DATE	ISSUED BY	REVISION	DATE	ISSUED BY
A A3	7-13-89				
B	10-10-89				
C	12-20-89				

REVISED HEIGHT OF HEAT EXCHANGERS PER LATEST VENDOR DRAWING. PRIMARY HEAT EXCHANGER HEIGHT 14'-3" WAS 17'-0". CONCRETE PAD FOR HEAT EXCHANGERS HEIGHT 1'-0" WAS 6'-2".

ADDED NOTE TO IDENTIFY CONCRETE PAD FOR HEAT EXCHANGERS. ELEV 49.50 TO TOP OF STACK. ADDED SPENT COOLING WATER PUMP ITEM NO. 42. ALSO ADDED PROPANE CONTROL EQUIPMENT.

JOY ENERGY SYSTEMS, INC.
A Joy Technologies Company

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DWG. NO.	5-15-89
SCALE	3/8" = 1'-0"
PATERIAL	SEE B.M.
DATE	
DESIGNED BY	
DRAWN BY	

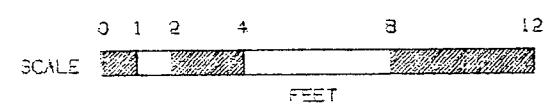
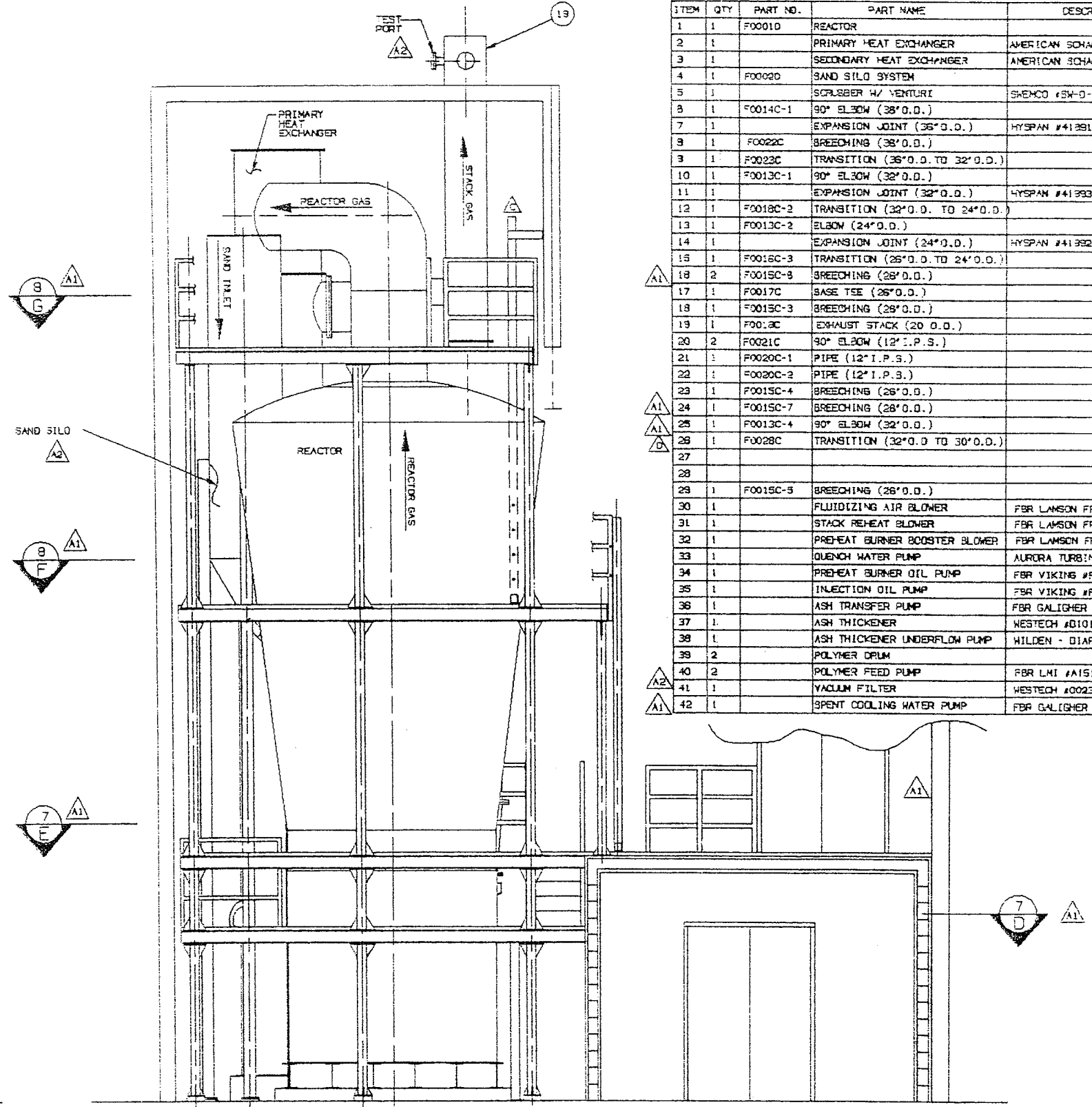
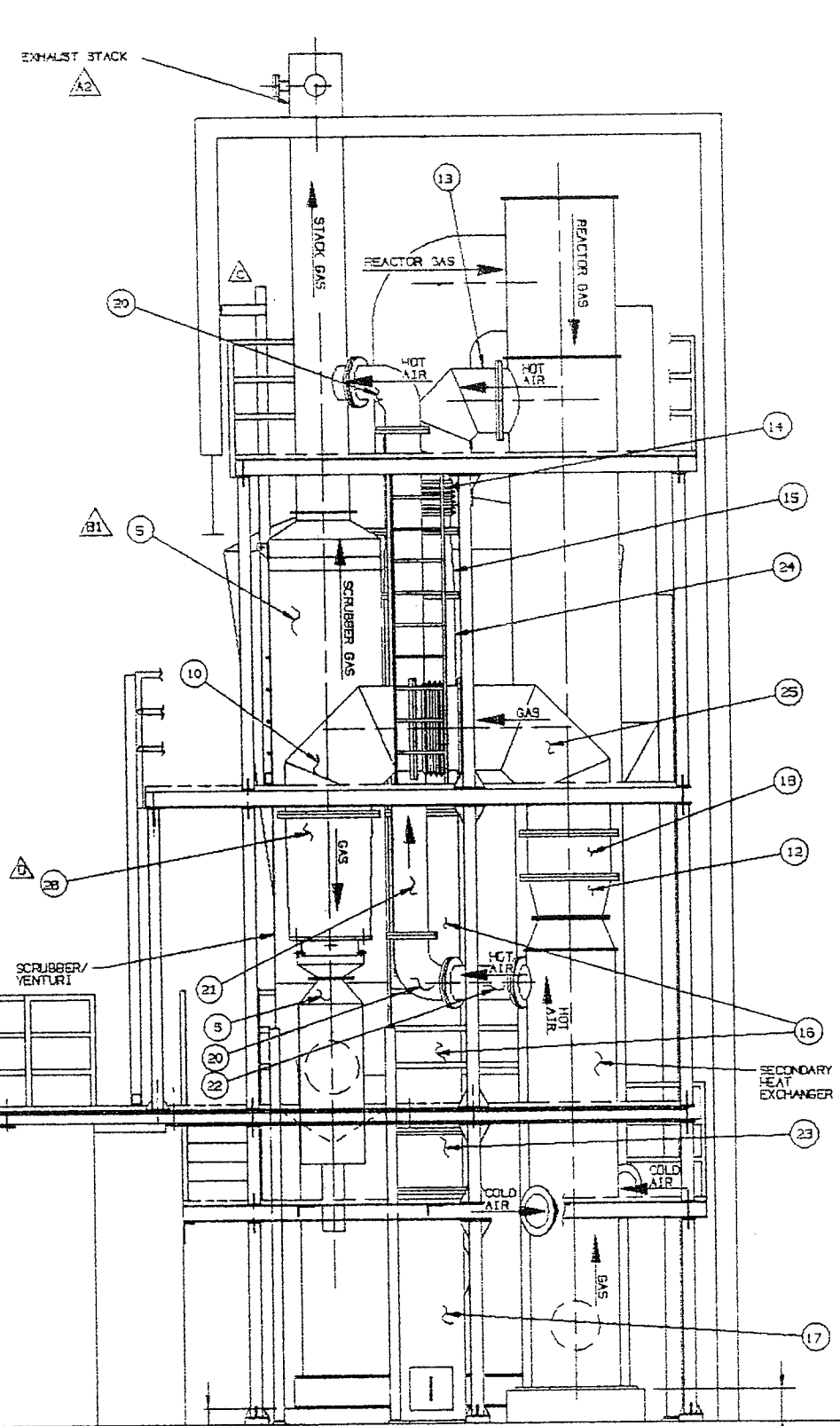
PLAN AND EAST ELEVATION VIEWS OF EQUIPMENT

CITY OF LYNNWOOD, WASHINGTON

DWG. NO. **FO011D** SHT. 1 OF 13

BILL OF MATERIAL

ITEM	QTY	PART NO.	PART NAME	DESCRIPTION
1	1	FO0010	REACTOR	
2	1		PRIMARY HEAT EXCHANGER	AMERICAN SCHACK #89-7346-05
3	1		SECONDARY HEAT EXCHANGER	AMERICAN SCHACK #89-7346-05
4	1	FO0020	SAND SILO SYSTEM	
5	1		SCRUBBER W/ VENTURI	SMEMCO #SW-0-32892-100
6	1	FO014C-1	90° ELBOW (38" O.D.)	
7	1		EXPANSION JOINT (36" O.D.)	HYSPAN #41991
8	1	FO022C	BREECHING (38" O.D.)	
9	1	FO023C	TRANSITION (36" O.D. TO 32" O.D.)	
10	1	FO013C-1	90° ELBOW (32" O.D.)	
11	1		EXPANSION JOINT (32" O.D.)	HYSPAN #41993
12	1	FO018C-2	TRANSITION (32" O.D. TO 24" O.D.)	
13	1	FO013C-2	ELBOW (24" O.D.)	
14	1		EXPANSION JOINT (24" O.D.)	HYSPAN #41992
15	1	FO015C-3	TRANSITION (25" O.D. TO 24" O.D.)	
16	2	FO015C-8	BREECHING (28" O.D.)	
17	1	FO017C	BASE TEE (26" O.D.)	
18	1	FO015C-3	BREECHING (28" O.D.)	
19	1	FO028C	EXHAUST STACK (20" O.D.)	
20	2	FO021C	90° ELBOW (12" I.P.S.)	
21	1	FO020C-1	PIPE (12" I.P.S.)	
22	1	FO020C-2	PIPE (12" I.P.S.)	
23	1	FO015C-4	BREECHING (26" O.D.)	
24	1	FO015C-7	BREECHING (28" O.D.)	
25	1	FO013C-4	90° ELBOW (32" O.D.)	
26	1	FO028C	TRANSITION (32" O.D. TO 30" O.D.)	
27				
28				
29	1	FO015C-5	BREECHING (26" O.D.)	
30	1		FLUIDIZING AIR BLOWER	FBR LAMSON FRAME #855
31	1		STACK REHEAT BLOWER	FBR LAMSON FRAME #851
32	1		PREHEAT BURNER BOOSTER BLOWER	FBR LAMSON FRAME #3105
33	1		QUENCH WATER PUMP	AURORA TURBINE PUMP #EX4-BF
34	1		PREHEAT BURNER OIL PUMP	FBR VIKING #F432
35	1		INJECTION OIL PUMP	FBR VIKING #F432
36	1		ASH TRANSFER PUMP	FBR GALIGHIER #VP-315
37	1		ASH THICKENER	WESTECH #D101
38	1		ASH THICKENER UNDERFLOW PUMP	HILDEN - DIAPHRAGM TYPE
39	2		POLYMER DRUM	
40	2		POLYMER FEED PUMP	FBR LMI #A151-88
41	1		VACUUM FILTER	WESTECH #0023-0270
42	1		SPENT COOLING WATER PUMP	FBR GALIGHIER #VP-315



SECTION C-I

SECTION B-I

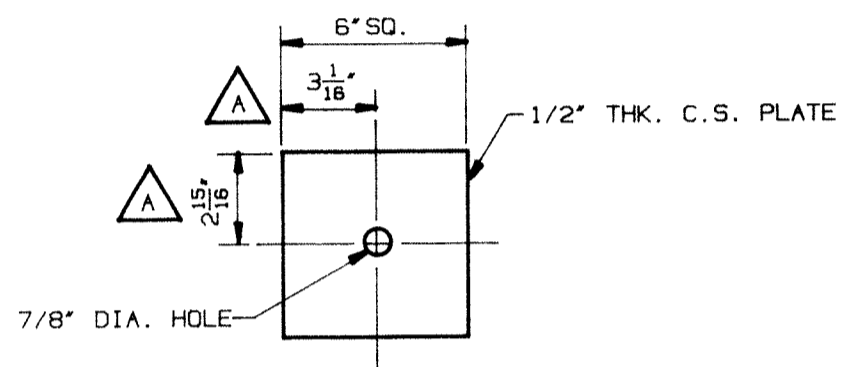
REV	DESCRIPTION	BY	DATE
D	ITEM 25 (FO028C WAS FO015-1) (32" TO 30" WAS 32" TO 21")	DMS	2-9-90
C	LADDER #2 RELOCATED	CM	12-20-89
B	SCRUBBER/VENTURI SUPPORTED FROM ELEV. 5.32 WAS AT 16.82. ADDED DESCRIPTION TO BILL OF MAT'L FOR PUMPS & BLOWERS.	DMS	10-31-89
A	RELOCATED SAND SILO. ADDED ITEM 19. INCREASED EXHAUST STACK HEIGHT & RELOCATED TEST PORT. QTY. OF ITEMS 39 & 40 WAS 1.	DMS	7-14-89
A	REVISED HEIGHT OF HEAT EXCHANGERS PER REVISED VENDOR DRAWING. QTY. 2 WAS 3 ON ITEM 15. ADDED ITEMS 24, 25, AND 42. ADDED PART NO'S TO BILL OF MAT'L.	DMS	7-10-89

REV	DESCRIPTION	BY	DATE
A	REVISED TITLE PER INDEX. DELETED DOORS AND RAIL ON SECTION C-I. ELEV. 15.82 AND OUTSIDE RAIL ON SECTION B-I ELEV. 18.32. CORRECTED SECTION NUMBERS 31 WAS 32, C1 WAS 102, 37 WAS 05, E7 WAS E6, F3 WAS F7, G8 WAS 97.	A	7-10-89

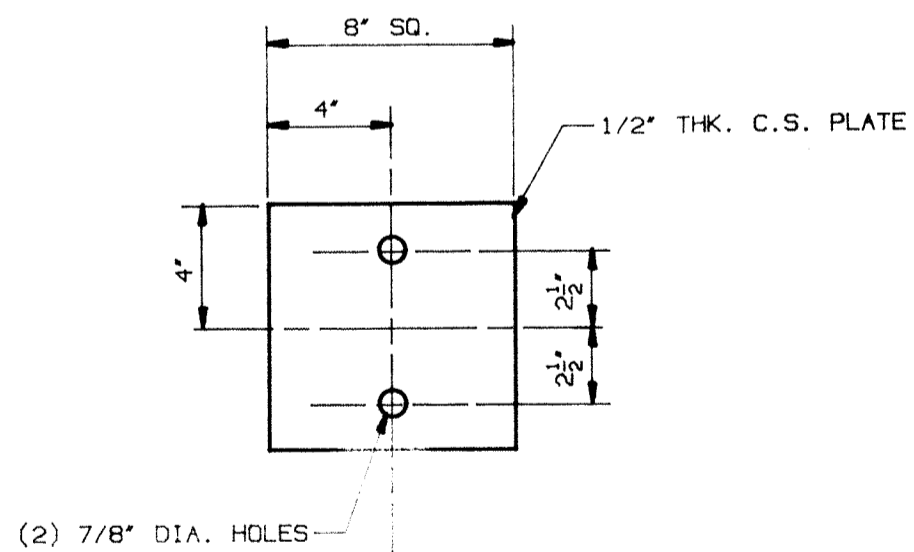
REV	DESCRIPTION, SIZE, DIMENSIONS AND MATERIAL	WEIGHT (TOTAL)	QTY
1			

DRAWING NO. JOY ENERGY SYSTEMS, INC. A Joy Technologies Company
 DATE 10-22-89
 SCALE: 3/8" = 1'-0"
 SHEET 2 OF 13
 CITY OF LYNNWOOD, WASHINGTON
 PROJECT NO. FO010

SYMBOL	COMPONENT	REACTION	EFFECTIVE BEARING AREA	BEARING PRESSURE	ELEV. (RELAT.)
Ⓐ	SCRUBBER	15,375 LBS	144 SQ. IN.	106.77 PSI	16.62 FT
Ⓑ	VENTURI	3,169 LBS	36 SQ. IN.	88.02 PSI	16.62 FT

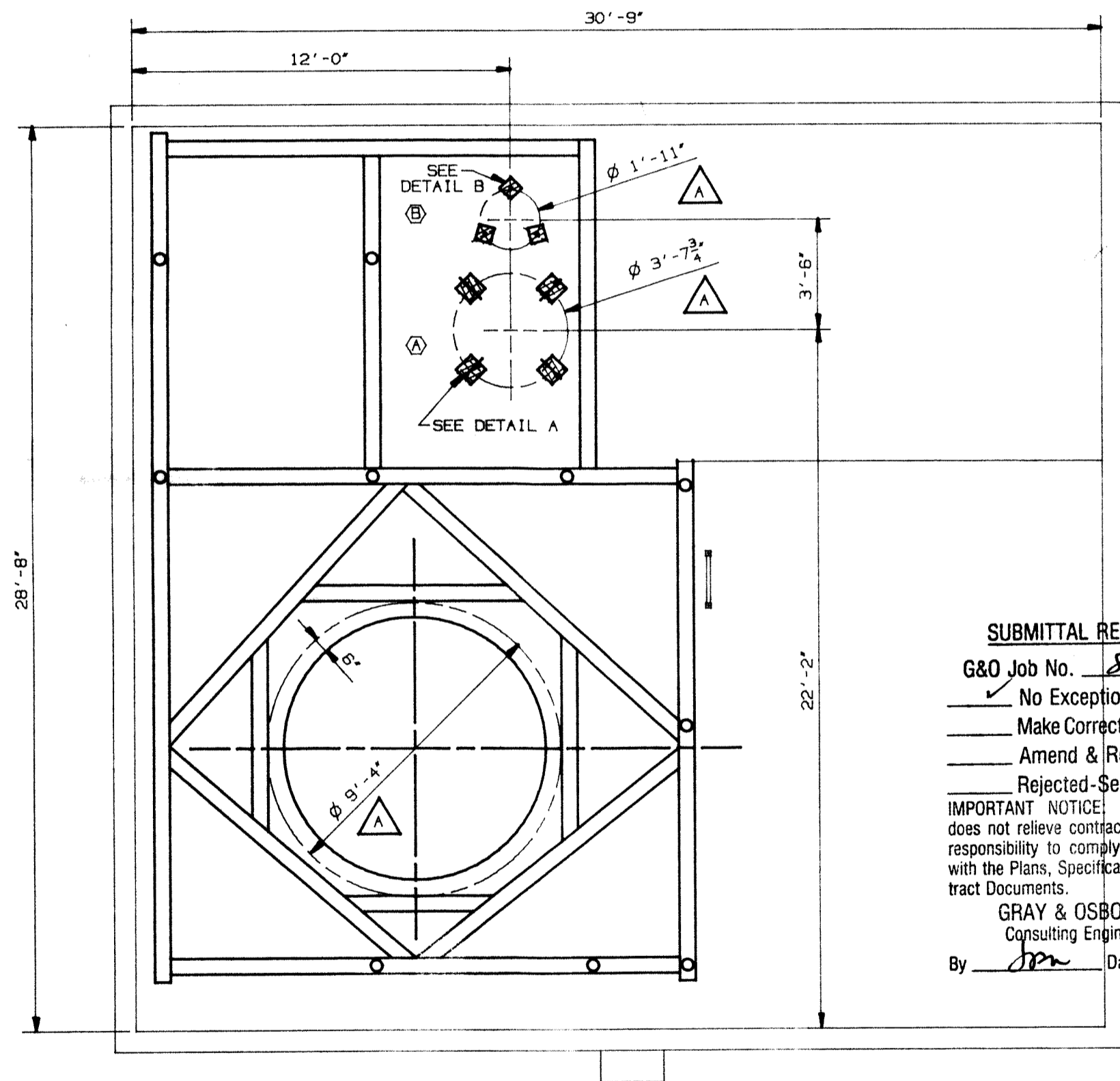


DETAIL B
SCALE: 1/4" = 1"



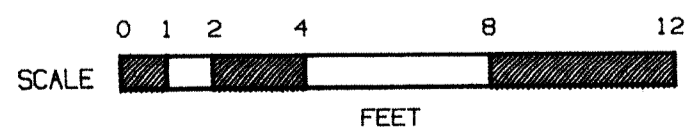
DETAIL A
SCALE: 1/4" = 1"

LOAD BEARING DIAGRAM
SCRUBBER AND VENTURI

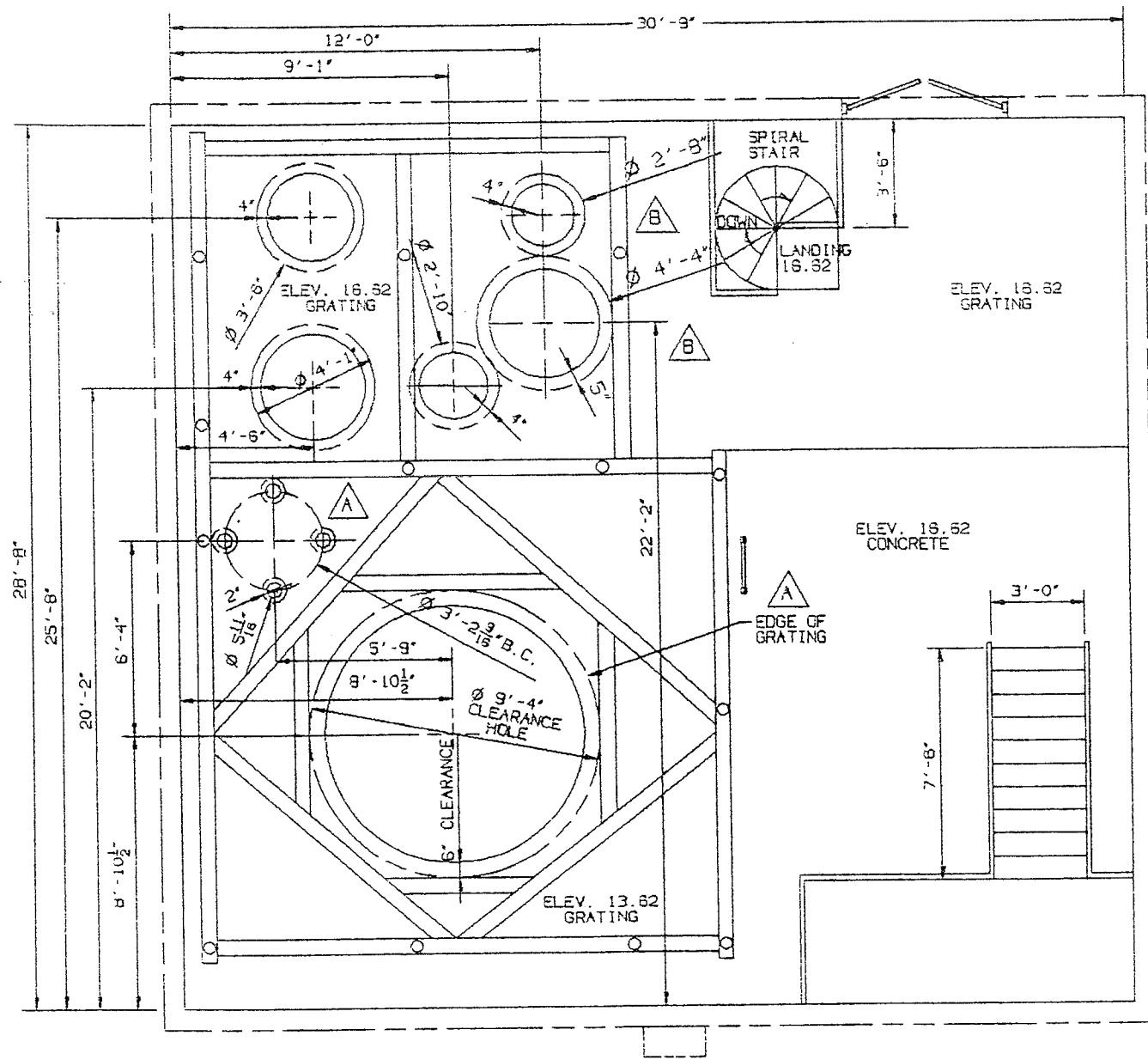


ELEV. 16.62

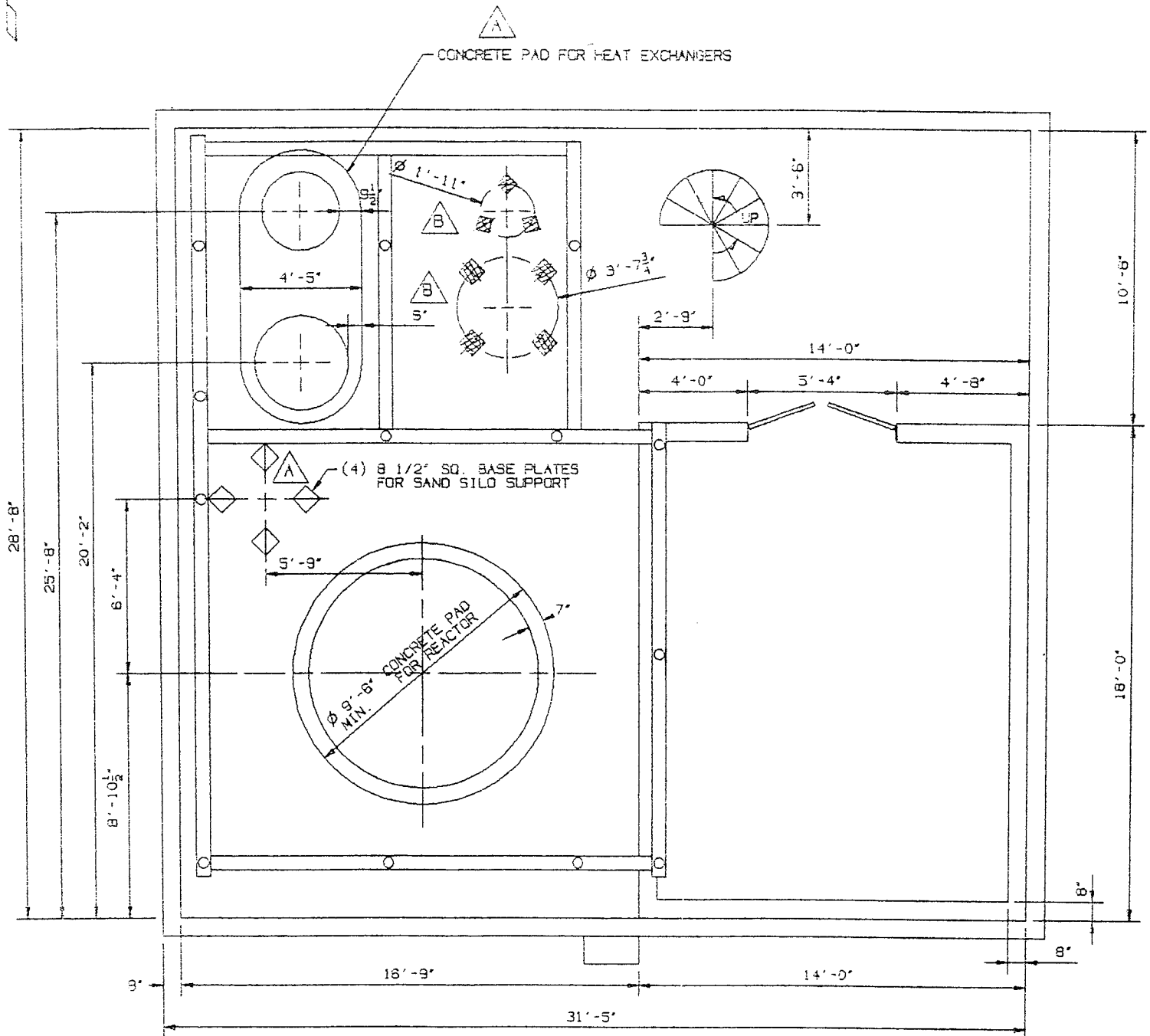
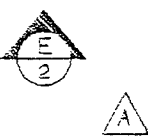
SUBMITTAL REVIEW
G&O Job No. 87662
 No Exceptions Taken
 Make Corrections Noted
 Amend & Resubmit
 Rejected-See Remarks
 IMPORTANT NOTICE: This review does not relieve contractor from his responsibility to comply & conform with the Plans, Specifications & Contract Documents.
 GRAY & OSBORNE
 Consulting Engineers
 By Jpn Date 9-21-89



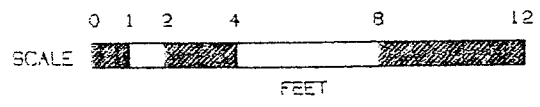
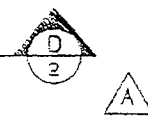
A REVISED DIMENSIONS PER VENDOR DRAWING UPON CUSTOMER REQUEST. OPENING IN GRATING FOR REACTOR 9'-4" WAS 8'-11 5/16".	DMS 7-26-89	UNLESS NOTED OTHERWISE TOLERANCES ± 1/32" OF DIMENSION -DO NOT SCALE DRAWING -BREAK ALL SHARP EDGES. DATE OF PRINT	DMS 5-23-89	LOAD BEARING DIAGRAM FOR SCRUBBER AND VENTURI CITY OF LYNNWOOD, WASHINGTON DMS. NO. F0011D
	DMS 7-26-89		DMS 5-23-89 CHK. <u>CCF</u> 7-28-89 DMS. <u>CHS</u> 8-18-89 SCALE 3/8" = 1'-0" MATERIAL NEXT ASB'Y BBS CODE	



PLAN a ELEV. 13.62 & 16.62

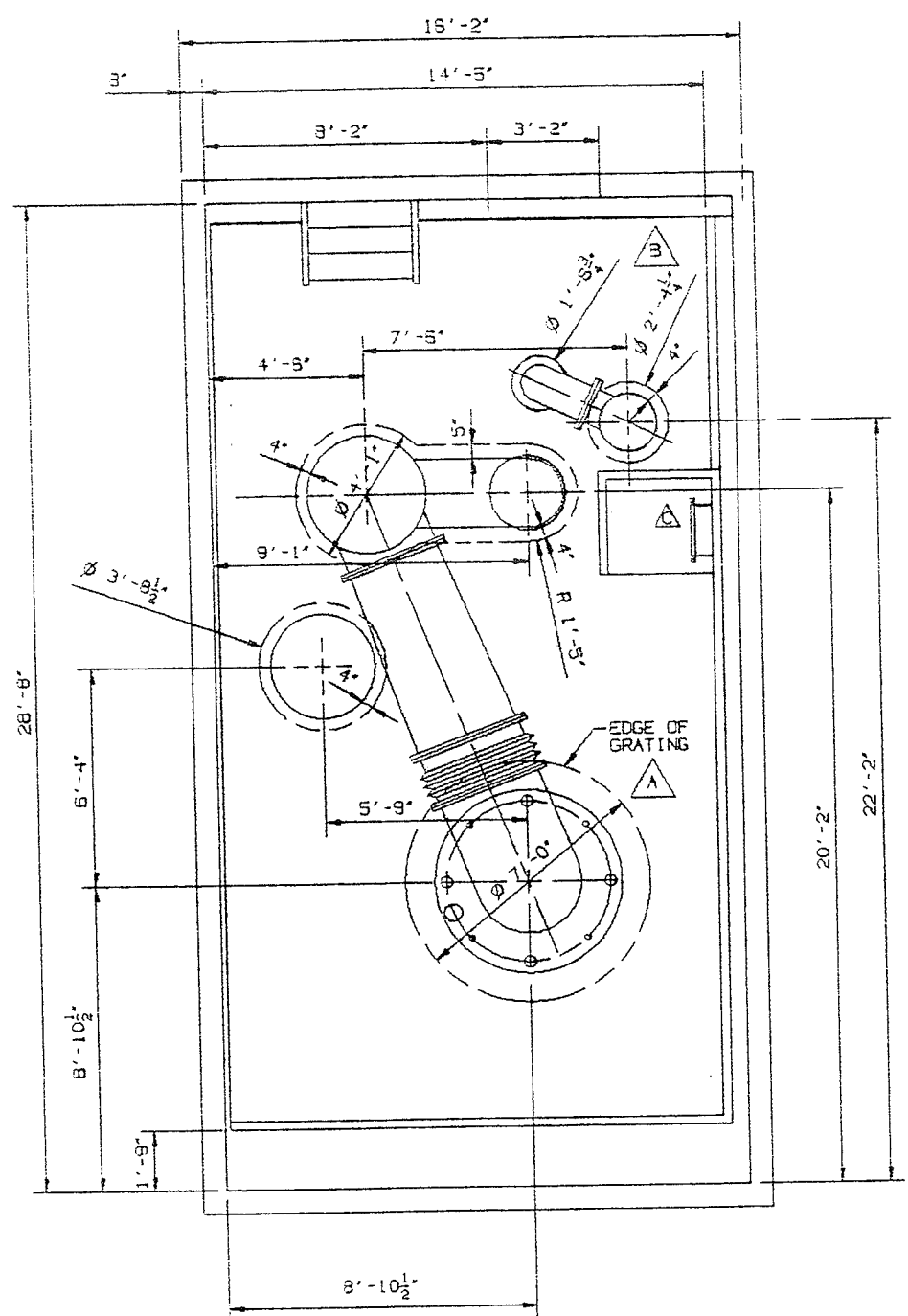


PLAN VIEW a ELEV. 6.62

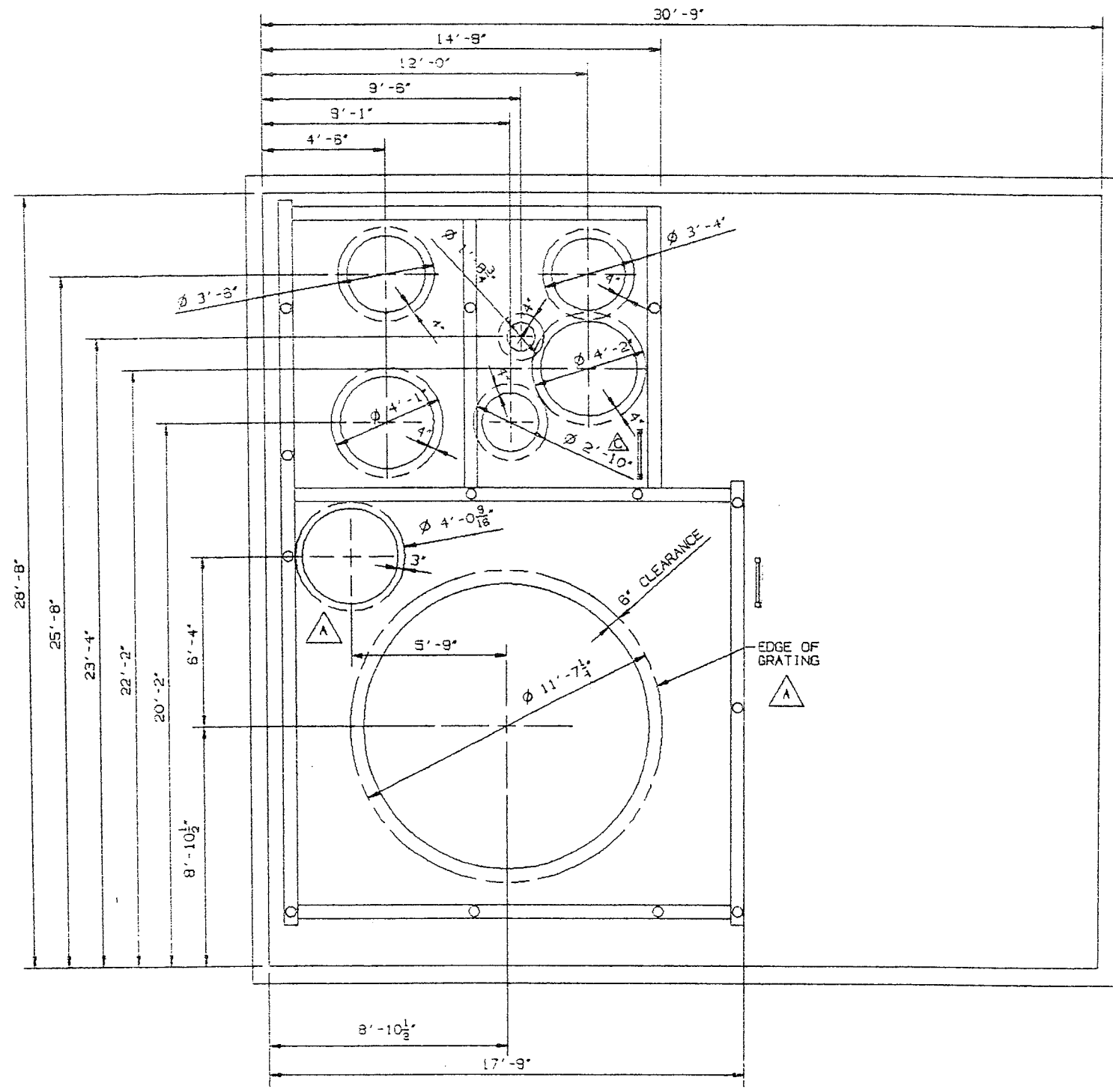


REV	DESCRIPTION	BY	DATE
B	ADDED SCRUBBER & VENTURI CLEARANCE HOLES IN GRATING ON ELEV. 16.62 & FOOTPRINT OF BASE PLATES FOR SCRUBBER MOUNTING ADDED TO ELEV. 6.62.	DMS	10-30-89
A	ADDED BASE PLATES OF SAND SILO ON ELEV. 6.62 AND OPENINGS IN GRATING FOR ANGLE LEGS SUPPORTING SAND SILO ON ELEV. 16.62. INDICATED EDGE OF GRATING AND CONCRETE PAD FOR HEAT EXCHANGERS. CORRECTED SECTION PAGE NUMBERS FROM D6 TO D2 AND E5 TO E2.	DMS	7-25-89

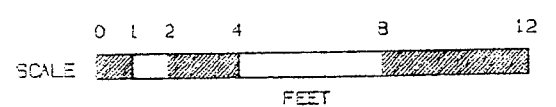
1					
DESCRIPTION, SIZE, DIMENSIONS AND MATERIAL	HEIGHT (TOTAL)	QTY			
CLEARANCE HOLES FOR EQUIPMENT & ELEVATIONS 6.62, 13.62, AND 16.62					
CITY OF LYNNWOOD, WASHINGTON					
JOB NO. 046, NO. F0110					



PLAN @ ELEV. 37.00



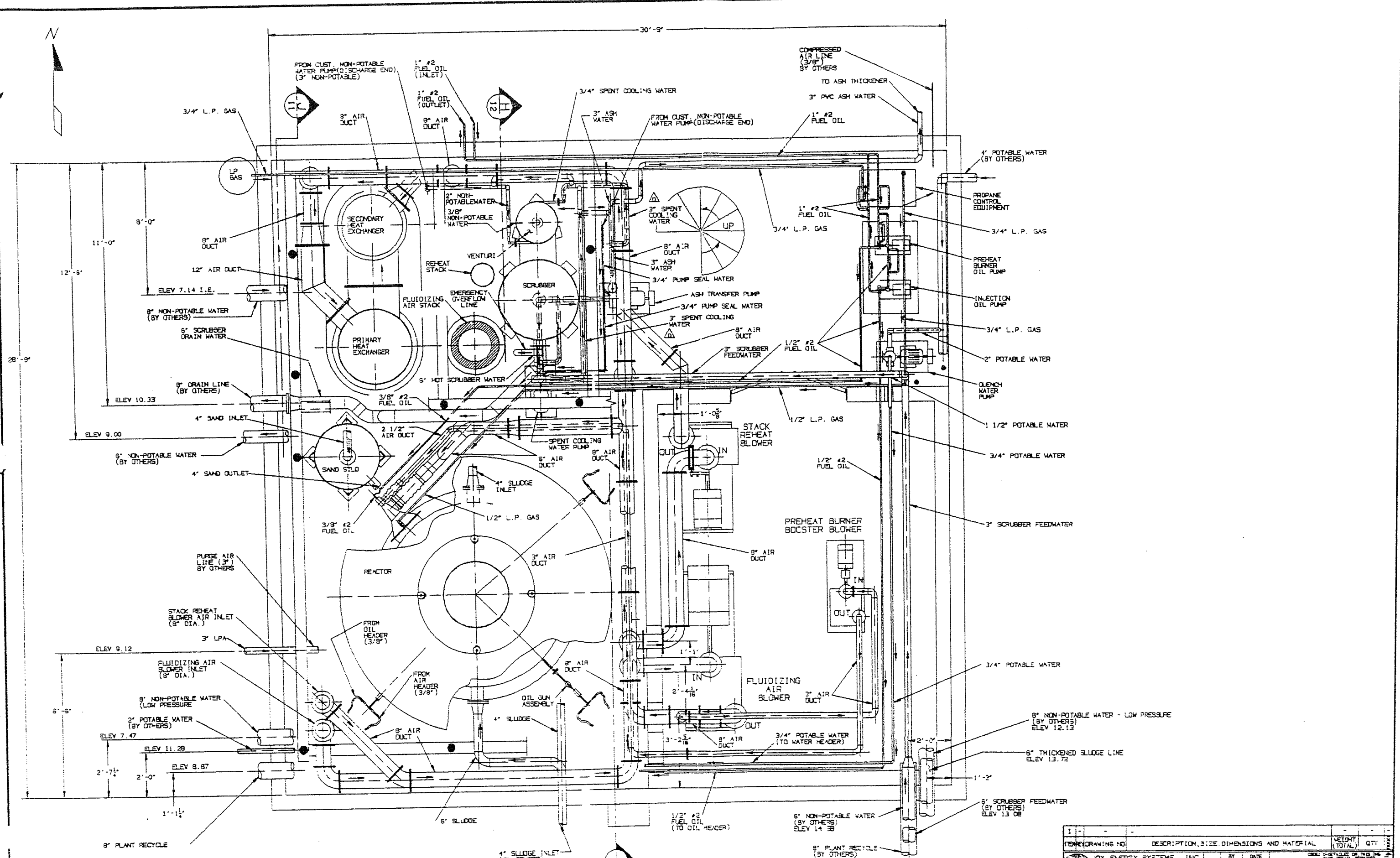
PLAN @ ELEV. 26.62



C	RELOCATED LADDER #2	CM	12-19-89
B	2'-4 1/4" DIA. CLEARANCE HOLE THRU GRATING ON ELEV. 37.00 FOR SCRUBBER STACK WAS 3'-6" DIA.	DMS	10-31-89
A	REVISED OPENING FOR REACTOR ON ELEV. 37.00 & OPENING FOR SAND SILO ON ELEV. 26.62 TO INCLUDE SPACE FOR ANGLE LEGS SUPPORTING IT. INDICATED EDGE OF GRATING AND CORRECTED SECTION PAGE NUMBERS FROM F7 TO F2 AND G7 TO G2.	DMS	7-26-99
REV	DESCRIPTION	BY	DATE

NO.	DESCRIPTION, SIZE, DIMENSIONS AND MATERIAL	HEIGHT (TOTAL)	QTY
1			
2			
3			

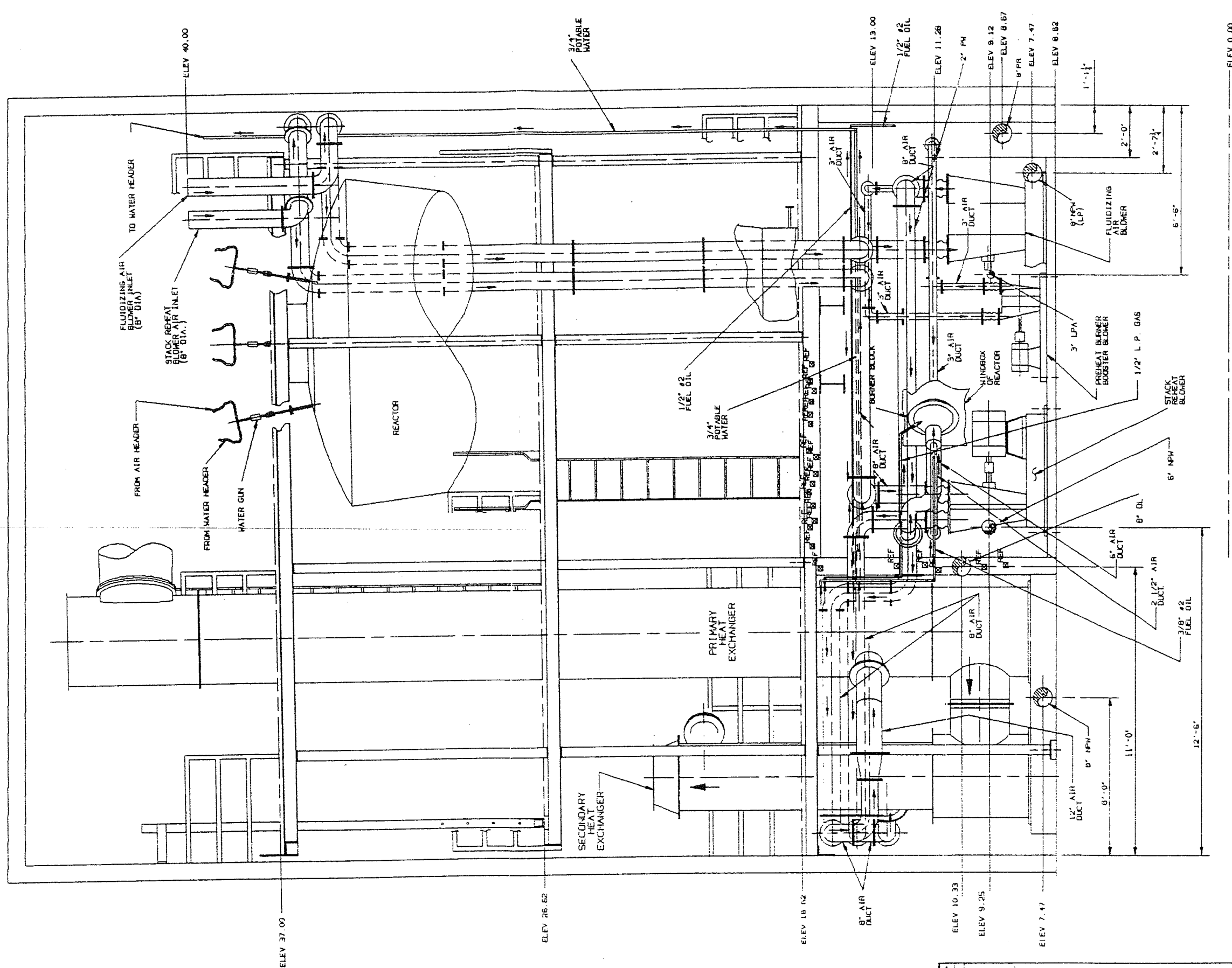
JOY ENERGY SYSTEMS, INC.
 A Joy Technologies Company
 DATE: 5-22-89
 SCALE: 3/8" = 1'-0"
 CITY OF LYNNWOOD, WASHINGTON
 SHEET 2 OF 13
 JOB NO. F00110



ITEM NO.	DESCRIPTION, SIZE, DIMENSIONS AND MATERIAL	QTY	WEIGHT (TOTAL)
1	3/4" L.P. GAS		
2	1" #2 FUEL OIL (INLET)		
3	1" #2 FUEL OIL (OUTLET)		
4	3/4" SPENT COOLING WATER		
5	3" ASH WATER		
6	FROM CUST. NON-POTABLE WATER PUMP (DISCHARGE END)		
7	1" #2 FUEL OIL		
8	3/4" L.P. GAS		
9	1" #2 FUEL OIL (3/8")		
10	3/4" L.P. GAS		
11	2" POTABLE WATER		
12	1/2" #2 FUEL OIL		
13	3/4" POTABLE WATER		
14	1/2" #2 FUEL OIL		
15	3/4" POTABLE WATER		
16	3" SCRUBBER FEEDWATER		
17	3/4" POTABLE WATER		
18	6" NON-POTABLE WATER - LOW PRESSURE (BY OTHERS) ELEV 12.13		
19	6" THICKENED SLUDGE LINE ELEV 13.72		
20	6" SCRUBBER FEEDWATER (BY OTHERS) ELEV 13.08		
21	6" NON-POTABLE WATER (BY OTHERS) ELEV 14.38		
22	8" PLANT RECYCLE (BY OTHERS) ELEV 14.48		
23	1/2" #2 FUEL OIL (TO OIL HEADER)		
24	3/4" POTABLE WATER (TO WATER HEADER)		
25	8" AIR DUCT		
26	3" AIR DUCT		
27	2" - 1/8"		
28	3" - 2 1/8"		
29	8" AIR DUCT		
30	3" AIR DUCT		
31	3/4" POTABLE WATER		
32	2" - 0"		
33	1" - 2"		
34	6" SCRUBBER FEEDWATER (BY OTHERS) ELEV 13.08		
35	6" NON-POTABLE WATER (BY OTHERS) ELEV 14.38		
36	8" PLANT RECYCLE (BY OTHERS) ELEV 14.48		
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40	3" AIR DUCT		
41	2" - 1/8"		
42	3" - 2 1/8"		
43	8" AIR DUCT		
44	3" AIR DUCT		
45	3/4" POTABLE WATER		
46	2" - 0"		
47	1" - 2"		
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84	3" - 2 1/8"		
85	8" AIR DUCT		
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114	3" AIR DUCT		
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154	3" - 2 1/8"		
155	8" AIR DUCT		
156	3" AIR DUCT		
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158	2" - 0"		
159	1" - 2"		
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188	6" SCRUBBER FEEDWATER (BY OTHERS) ELEV 13.08		
189	6" NON-POTABLE WATER (BY OTHERS) ELEV 14.38		
190	8" PLANT RECYCLE (BY OTHERS) ELEV 14.48		
191	1/2" #2 FUEL OIL (TO OIL HEADER)		
192	3/4" POTABLE WATER (TO WATER HEADER)		
193	8" AIR DUCT		
194	3" AIR DUCT		
195	2" - 1/8"		
196	3" - 2 1/8"		
197	8" AIR DUCT		
198	3" AIR DUCT		
199	3/4" POTABLE WATER		
200	2" - 0"		
201	1" - 2"		
202	6" SCRUBBER FEEDWATER (BY OTHERS) ELEV 13.08		
203	6" NON-POTABLE WATER (BY OTHERS) ELEV 14.38		
204	8" PLANT RECYCLE (BY OTHERS) ELEV 14.48		
205	1/2" #2 FUEL OIL (TO OIL HEADER)		
206	3/4" POTABLE WATER (TO WATER HEADER)		
207	8" AIR DUCT		
208	3" AIR DUCT		
209	2" - 1/8"		
210	3" - 2 1/8"		
211	8" AIR DUCT		
212	3" AIR DUCT		
213	3/4" POTABLE WATER		
214	2" - 0"		
215	1" - 2"		
216	6" SCRUBBER FEEDWATER (BY OTHERS) ELEV 13.08		
217	6" NON-POTABLE WATER (BY OTHERS) ELEV 14.38		
218	8" PLANT RECYCLE (BY OTHERS) ELEV 14.48		
219	1/2" #2 FUEL OIL (TO OIL HEADER)		
220	3/4" POTABLE WATER (TO WATER HEADER)		
221	8" AIR DUCT		
222	3" AIR DUCT		
223	2" - 1/8"		
224	3" - 2 1/8"		
225	8" AIR DUCT		
226	3" AIR DUCT		
227	3/4" POTABLE WATER		
228	2" - 0"		
229	1" - 2"		
230	6" SCRUBBER FEEDWATER (BY OTHERS) ELEV 13.08		
231	6" NON-POTABLE WATER (BY OTHERS) ELEV 14.38		
232	8" PLANT RECYCLE (BY OTHERS) ELEV 14.48		
233	1/2" #2 FUEL OIL (TO OIL HEADER)		
234	3/4" POTABLE WATER (TO WATER HEADER)		
235	8" AIR DUCT		
236	3" AIR DUCT		
237	2" - 1/8"		
238	3" - 2 1/8"		
239	8" AIR DUCT		
240	3" AIR DUCT		
241	3/4" POTABLE WATER		
242	2" - 0"		
243	1" - 2"		
244	6" SCRUBBER FEEDWATER (BY OTHERS) ELEV 13.08		
245	6" NON-POTABLE WATER (BY OTHERS) ELEV 14.38		
246	8" PLANT RECYCLE (BY OTHERS) ELEV 14.48		
247	1/2" #2 FUEL OIL (TO OIL HEADER)		
248	3/4" POTABLE WATER (TO WATER HEADER)		
249	8" AIR DUCT		
250	3" AIR DUCT		
251	2" - 1/8"		
252	3" - 2 1/8"		
253	8" AIR DUCT		
254	3" AIR DUCT		
255	3/4" POTABLE WATER		
256	2" - 0"		
257	1" - 2"		
258	6" SCRUBBER FEEDWATER (BY OTHERS) ELEV 13.08		
259	6" NON-POTABLE WATER (BY OTHERS) ELEV 14.38		
260	8" PLANT RECYCLE (BY OTHERS) ELEV 14.48		
261	1/2" #2 FUEL OIL (TO OIL HEADER)		
262	3/4" POTABLE WATER (TO WATER HEADER)		
263	8" AIR DUCT		
264	3" AIR DUCT		
265	2" - 1/8"		
266	3" - 2 1/8"		
267	8" AIR DUCT		
268	3" AIR DUCT		
269	3/4" POTABLE WATER		
270	2" - 0"		
271	1" - 2"		
272	6" SCRUBBER FEEDWATER (BY OTHERS) ELEV 13.08		
273	6" NON-POTABLE WATER (BY OTHERS) ELEV 14.38		
274	8" PLANT RECYCLE (BY OTHERS) ELEV 14.48		
275	1/2" #2 FUEL OIL (TO OIL HEADER)		
276	3/4" POTABLE WATER (TO WATER HEADER)		
277	8" AIR DUCT		
278	3" AIR DUCT		
279	2" - 1/8"		
280	3" - 2 1/8"		
281	8" AIR DUCT		
282	3" AIR DUCT		
283	3/4" POTABLE WATER		
284	2" - 0"		
285	1" - 2"		
286	6" SCRUBBER FEEDWATER (BY OTHERS) ELEV 13.08		
287	6" NON-POTABLE WATER (BY OTHERS) ELEV 14.38		
288	8" PLANT RECYCLE (BY OTHERS) ELEV 14.48		
289	1/2" #2 FUEL OIL (TO OIL HEADER)		
290	3/4" POTABLE WATER (TO WATER HEADER)		
291	8		

VENTILATIONS

- PW - POTABLE WATER
- NPW - NON-POTABLE WATER
- LPA - LOW PRESSURE AIR
- DL - DRAIN LINE
- PR - PLANT RECYCLE
- LP - LOW PRESSURE



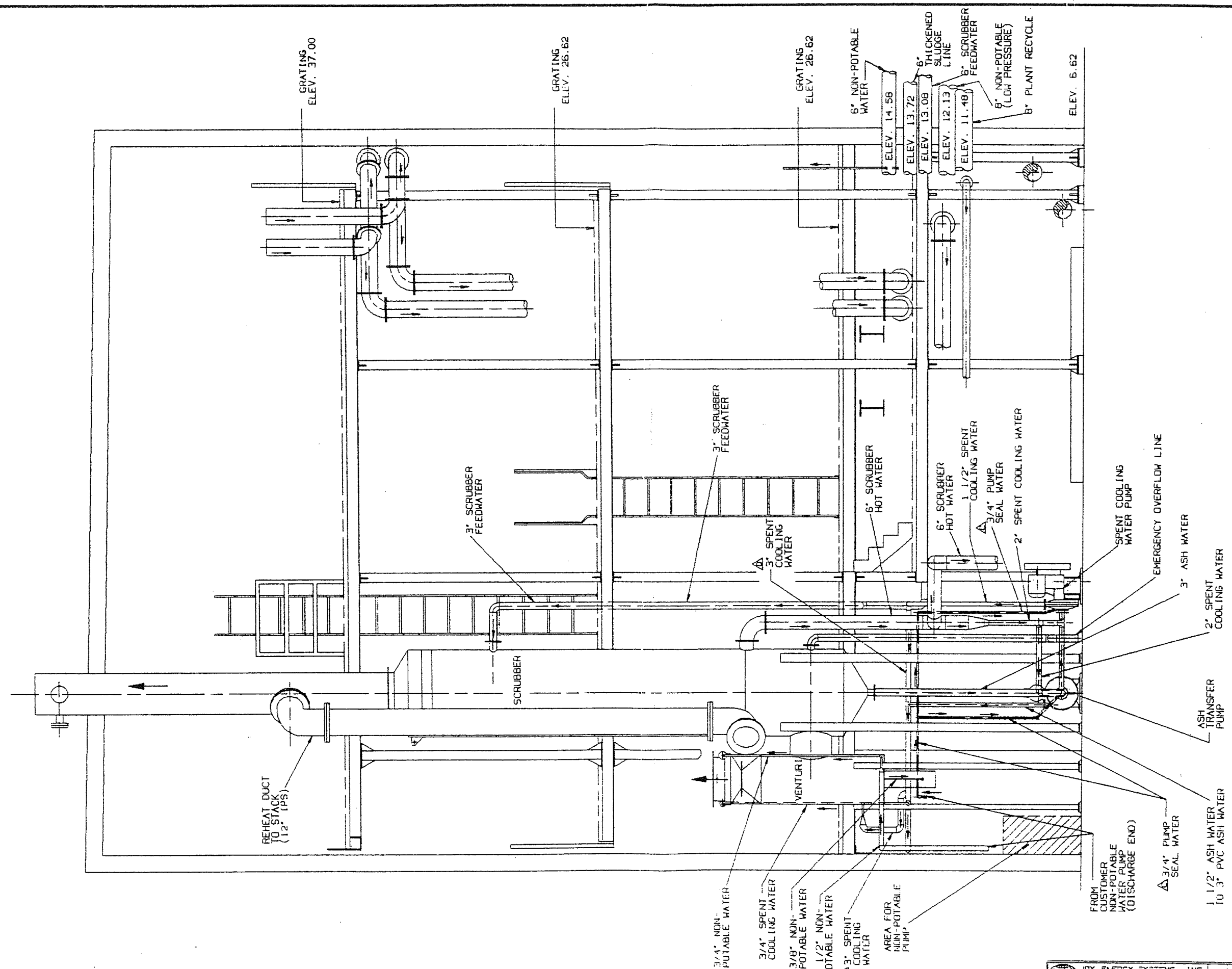
SECTION
10

NO.	DESCRIPTION	BY	DATE	SCALE	TOTAL WT.	NO. OF SHEETS	DESCRIPTION	WEIGHT (TOTAL)	QTY
A	RELOCATED STACK REHEAT BLOWER INLET	CM	03-08-90						
B	REVISED DWG PER C & D COMMENTS	CM	12-19-89						
C	UPDATED DWG TO SHOW CONNECTION POINTS AND PIPE LOCATIONS	CM	10-27-88						

REVISION DRAWING NO.	DESCRIPTION, SIZE, DIMENSIONS AND MATERIAL	WEIGHT (TOTAL)	QTY
1	RELOCATED STACK REHEAT BLOWER INLET		
2	REVISED DWG PER C & D COMMENTS		
3	UPDATED DWG TO SHOW CONNECTION POINTS AND PIPE LOCATIONS		

PROJECT NO.	DATE	SCALE	TOTAL WT.	NO. OF SHEETS
1045	10-27-88	1/8" = 1'-0"	100	11 OF 12

CITY OF	LYNNWOOD WASHINGTON
DWG NO.	FOOTING

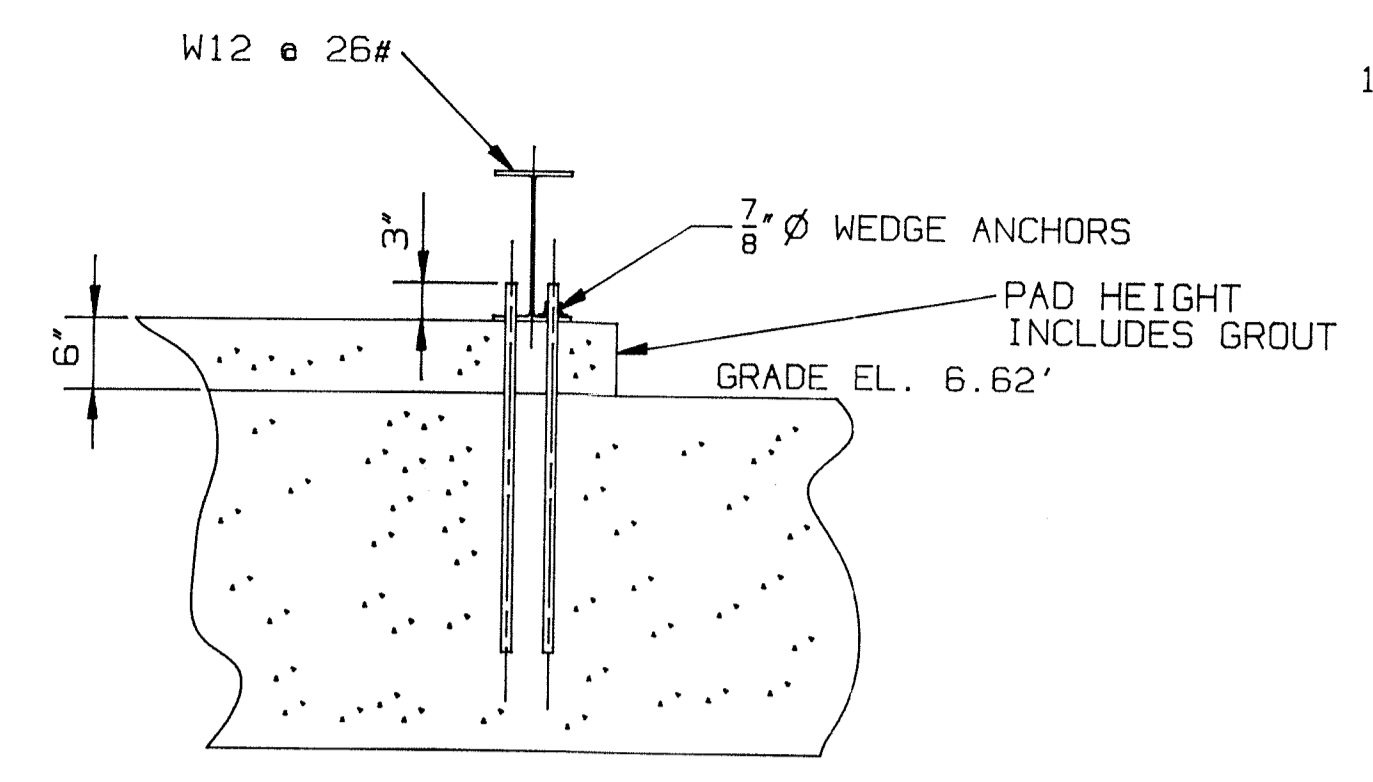


SECTION
H
10

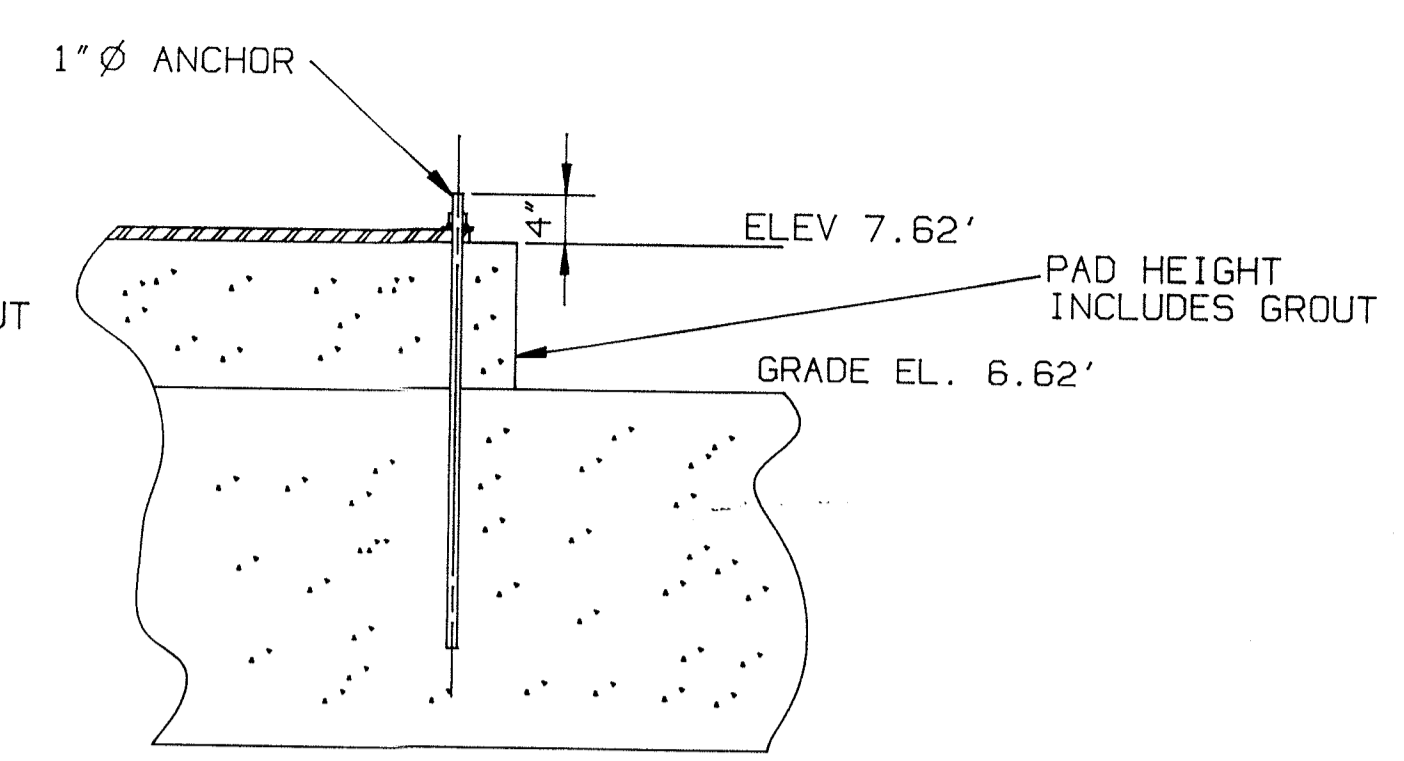
JOY ENERGY SYSTEMS, INC. A Joy Technologies Company		BY	DATE
3/4" NON-POTABLE WATER 3/4" SPENT COOLING WATER 3/8" NON-POTABLE WATER 1 1/2" NON-POTABLE WATER 3" SPENT COOLING WATER AREA FOR NON-POTABLE PUMP	3/4" PUMP SEAL WATER 1 1/2" SPENT COOLING WATER 6" SCRUBBER HOT WATER 1 1/2" SPENT COOLING WATER 3/4" PUMP SEAL WATER 2" SPENT COOLING WATER 6" SCRUBBER HOT WATER 1 1/2" SPENT COOLING WATER 3/4" PUMP SEAL WATER 2" SPENT COOLING WATER FROM CUSTOMER NON-POTABLE WATER PUMP (DISCHARGE END) 3/4" PUMP SEAL WATER 1 1/2" ASH WATER TO 3" PVC ASH WATER ASH TRANSFER PUMP 3" ASH WATER SPENT COOLING WATER PUMP EMERGENCY OVERFLOW LINE 6" NON-POTABLE WATER 6" SCRUBBER FEEDWATER THICKENED SLUDGE LINE 6" NON-POTABLE WATER 6" SCRUBBER FEEDWATER 8" NON-POTABLE (LOW PRESSURE) 8" PLANT RECYCLE	CM 10-18-89	ELEVATION VIEW OF SCRUBBER VENTURI PIPING RUNS CITY OF WAINWOOD, WASHINGTON
3/4" PUMP SEAL WATER 1 1/2" SPENT COOLING WATER 6" SCRUBBER HOT WATER 1 1/2" SPENT COOLING WATER 3/4" PUMP SEAL WATER 2" SPENT COOLING WATER FROM CUSTOMER NON-POTABLE WATER PUMP (DISCHARGE END) 3/4" PUMP SEAL WATER 1 1/2" ASH WATER TO 3" PVC ASH WATER ASH TRANSFER PUMP 3" ASH WATER SPENT COOLING WATER PUMP EMERGENCY OVERFLOW LINE 6" NON-POTABLE WATER 6" SCRUBBER FEEDWATER THICKENED SLUDGE LINE 6" NON-POTABLE WATER 6" SCRUBBER FEEDWATER 8" NON-POTABLE (LOW PRESSURE) 8" PLANT RECYCLE	3/4" PUMP SEAL WATER 1 1/2" SPENT COOLING WATER 6" SCRUBBER HOT WATER 1 1/2" SPENT COOLING WATER 3/4" PUMP SEAL WATER 2" SPENT COOLING WATER FROM CUSTOMER NON-POTABLE WATER PUMP (DISCHARGE END) 3/4" PUMP SEAL WATER 1 1/2" ASH WATER TO 3" PVC ASH WATER ASH TRANSFER PUMP 3" ASH WATER SPENT COOLING WATER PUMP EMERGENCY OVERFLOW LINE 6" NON-POTABLE WATER 6" SCRUBBER FEEDWATER THICKENED SLUDGE LINE 6" NON-POTABLE WATER 6" SCRUBBER FEEDWATER 8" NON-POTABLE (LOW PRESSURE) 8" PLANT RECYCLE	CM 10-18-89	ELEVATION VIEW OF SCRUBBER VENTURI PIPING RUNS CITY OF WAINWOOD, WASHINGTON

FBR AREA

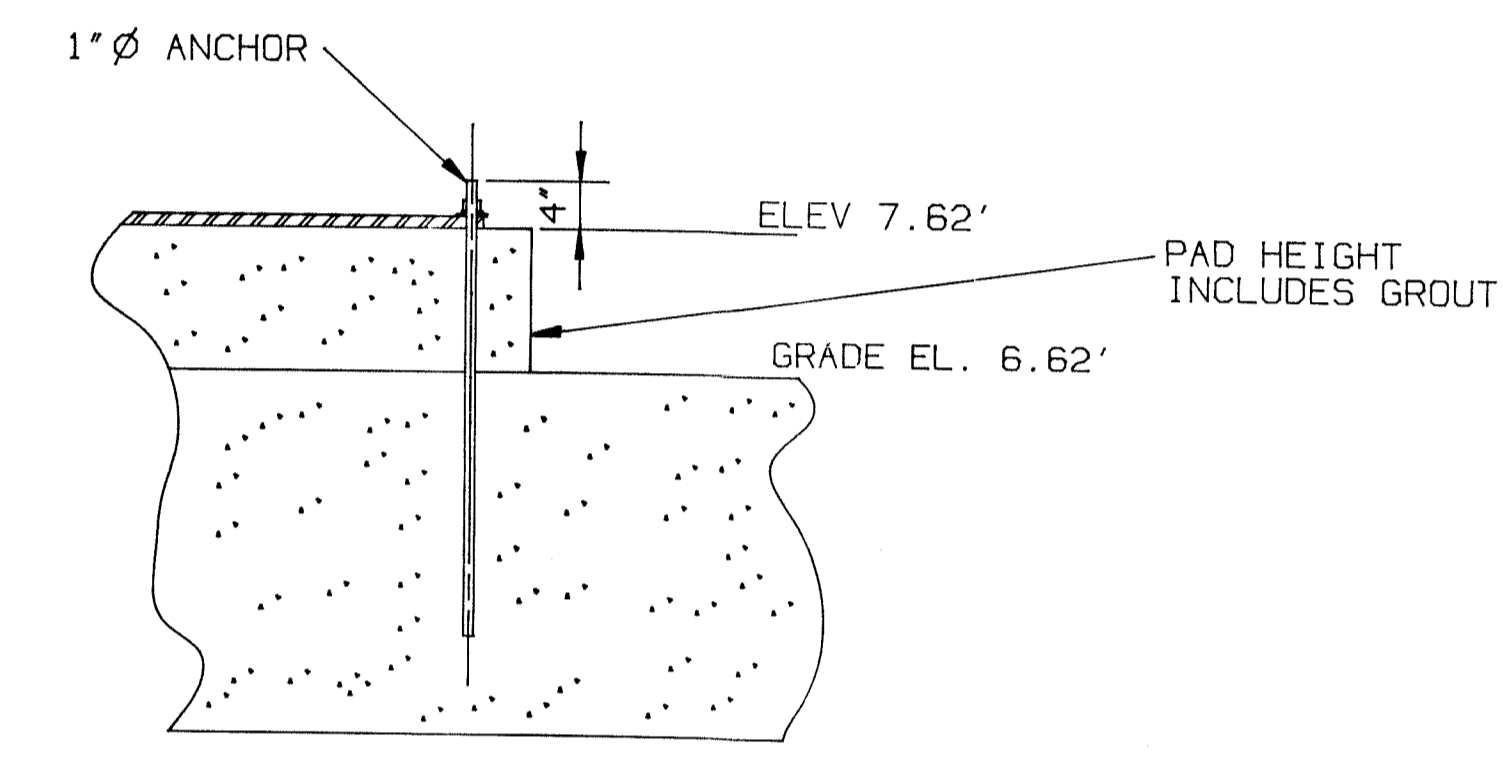
LOCATION	EQUIPMENT	ELEVATION	NO. OF ANCHOR	DIA. OF ANCHOR	PROJECTION OF ANCHOR
(A)	REACTOR	7.12 FT	104	7/8"	3"
(B)	PRIMARY HEAT EXCHANGER	7.62 FT	12	1"	4"
(C)	SECONDARY HEAT EXCHANGER	7.62 FT	12	1"	4"
(D)	SAND SILO	6.62 FT	4	7/8"	4"
(E)	STACK BASE	6.62 FT	12	7/8"	4"
(F)	SCRUBBER	6.62 FT	8	3/4"	4"
(G)	VENTURI	6.62 FT	3	3/4"	4"



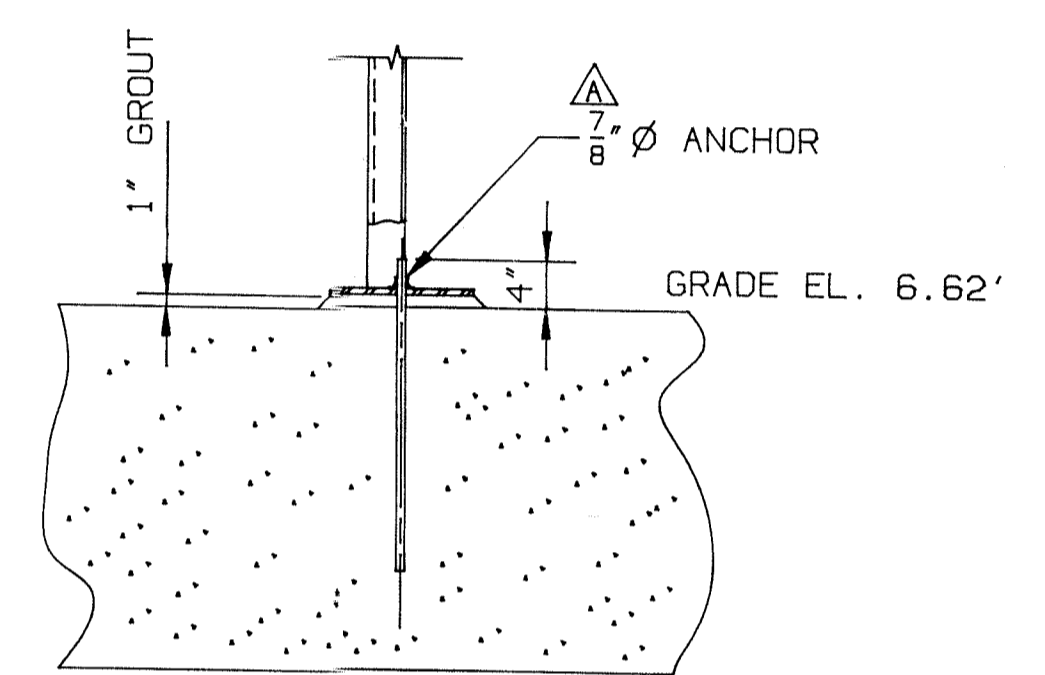
SECTION A-A



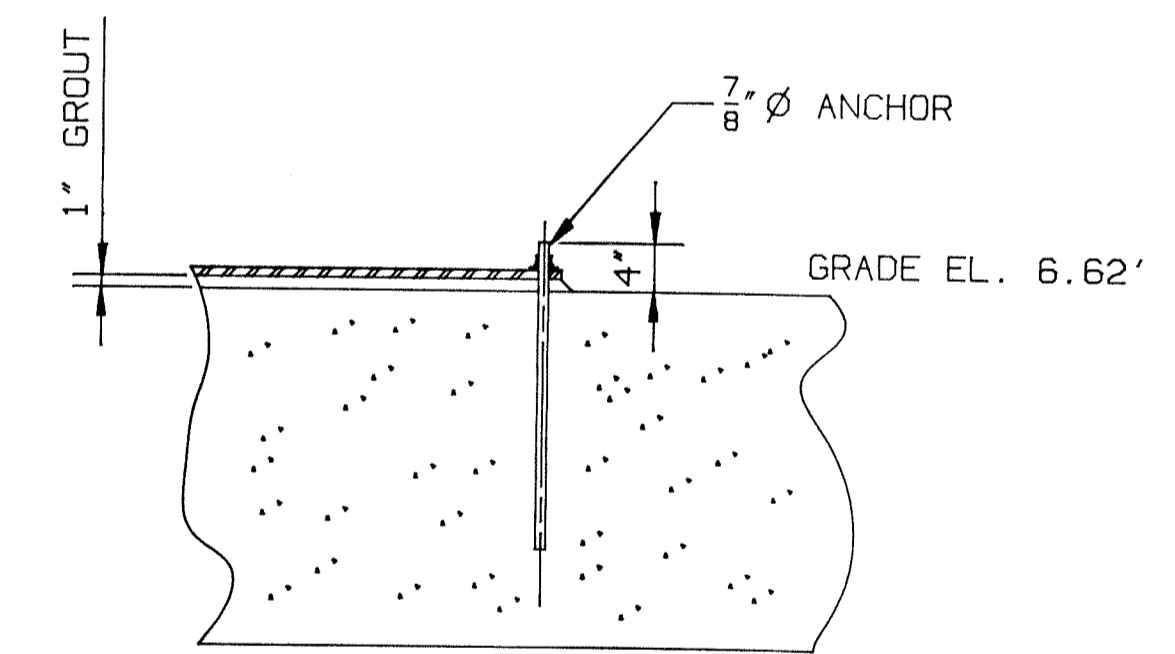
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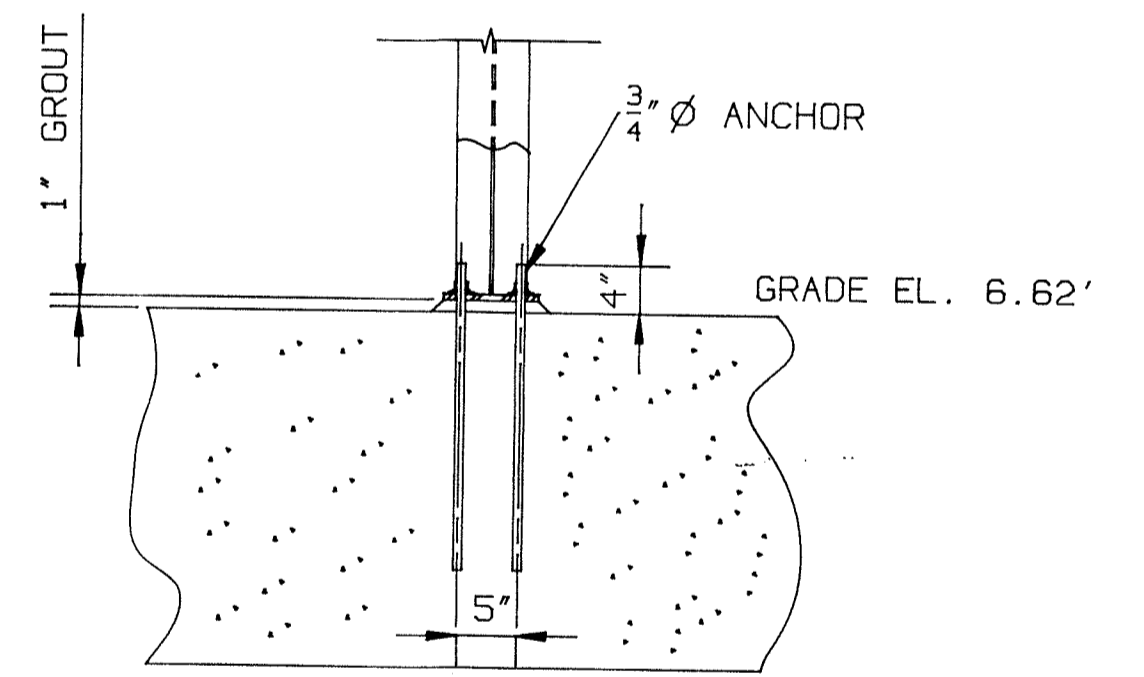
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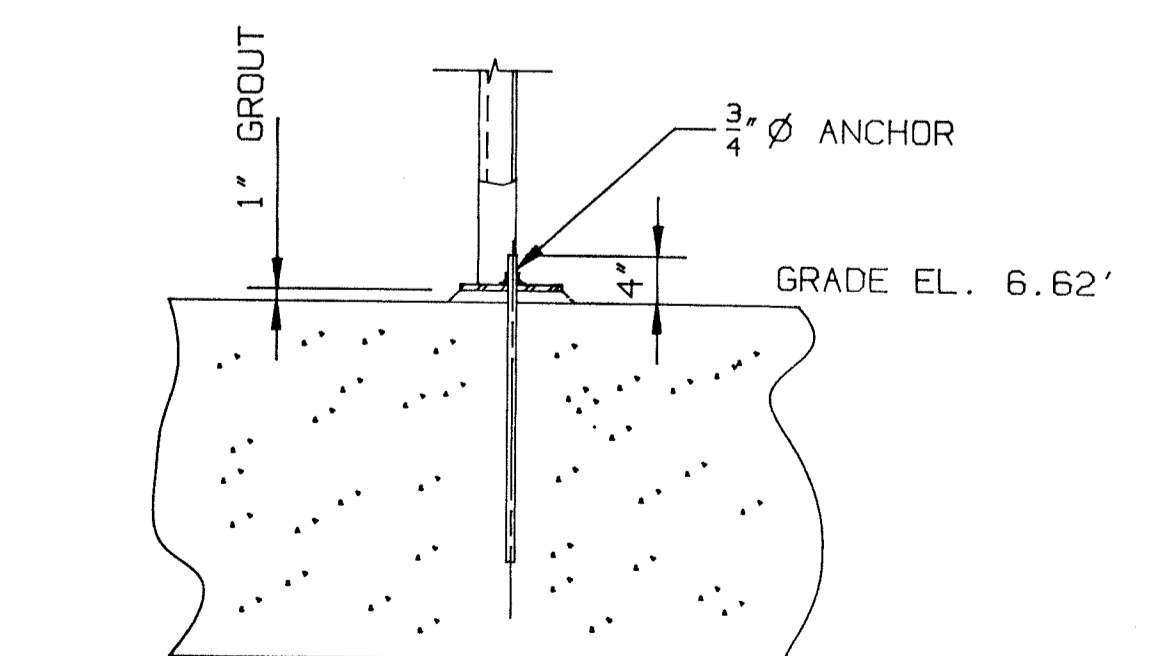
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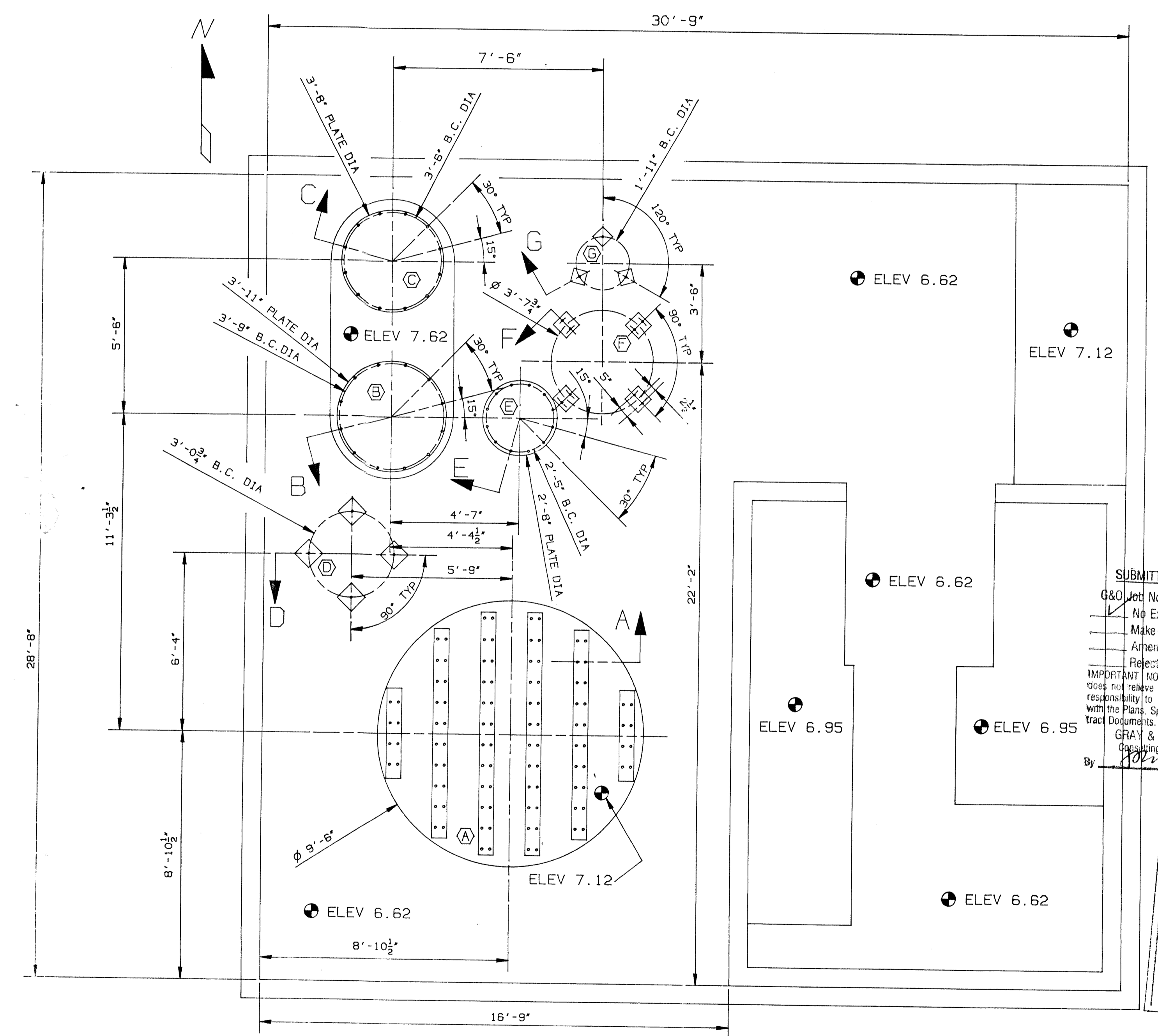
SECTION E-E



SECTION F-F

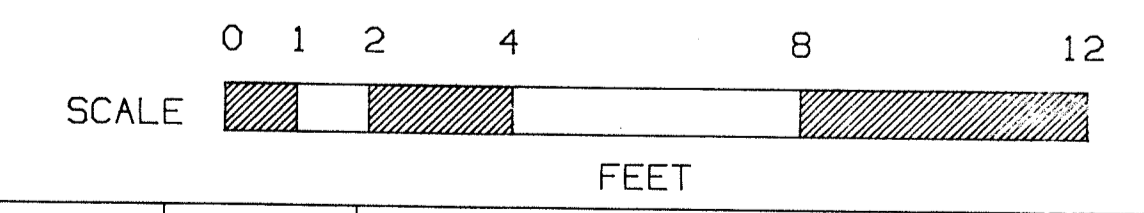


SECTION G-G



SUBMITTAL REVIEW
 G&O Job No. 8762
 No Exceptions Taken
 Make Corrections Noted
 Amend & Resubmit
 Rejected-See Remarks
 IMPORTANT NOTICE: This review does not relieve contractor from his responsibility to comply & conform with the Plans, Specifications & Contract Documents.
 GRAY & OSBORNE
 Consulting Engineers
 By: [Signature] Date: 9-90

REVIEWED
 KIEWIT CONSTRUCTION CO.
 DATE: 8/20/90
 BY: [Signature]
 SPEC. SECTION: [Signature]

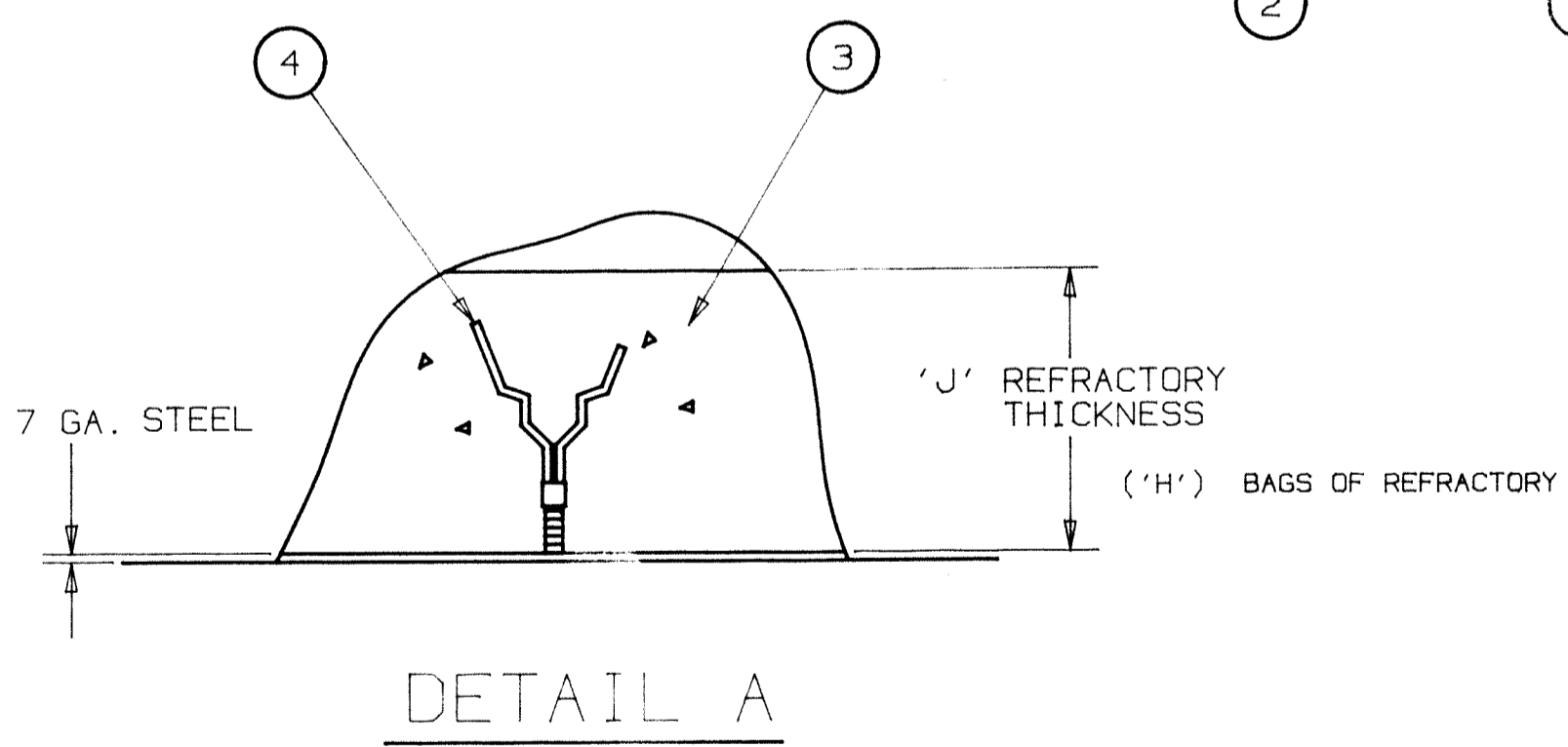
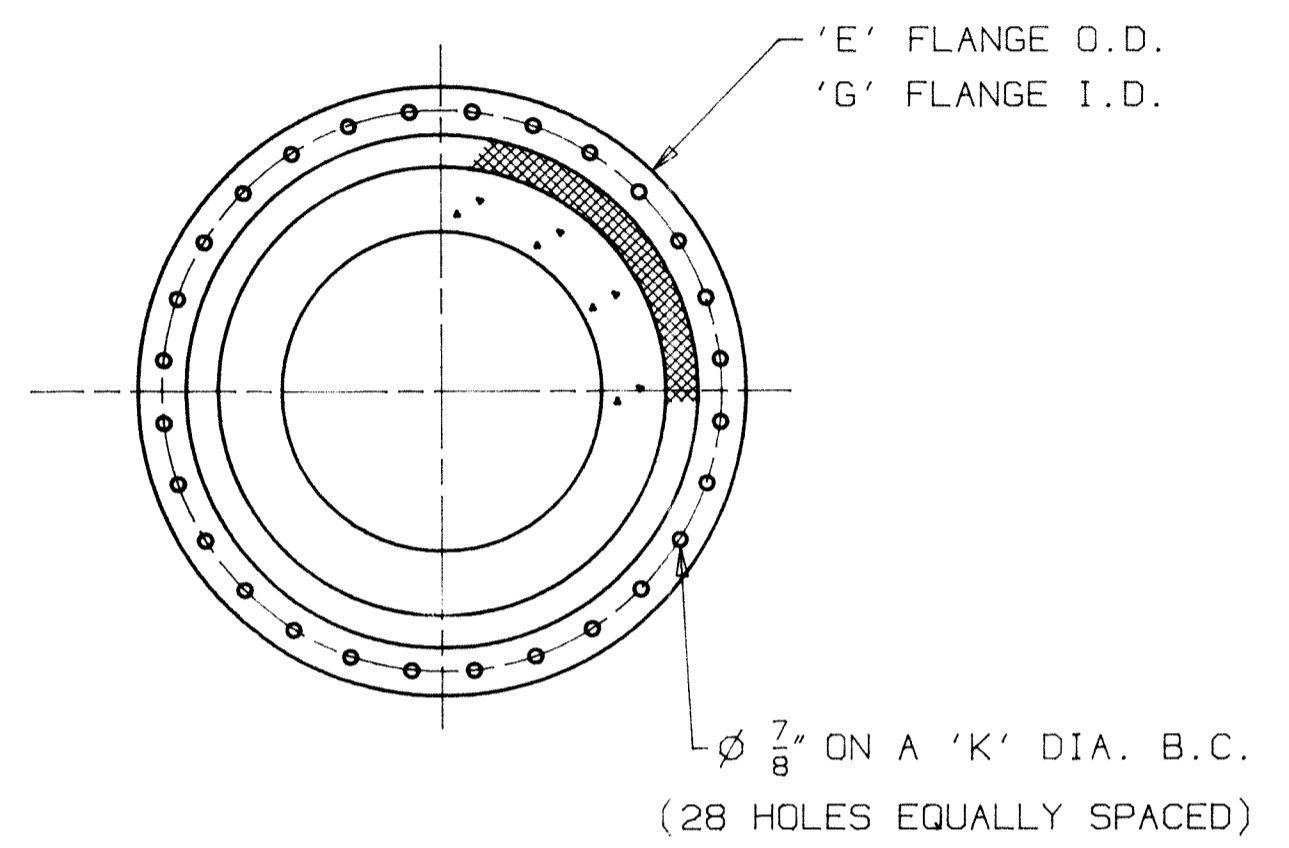
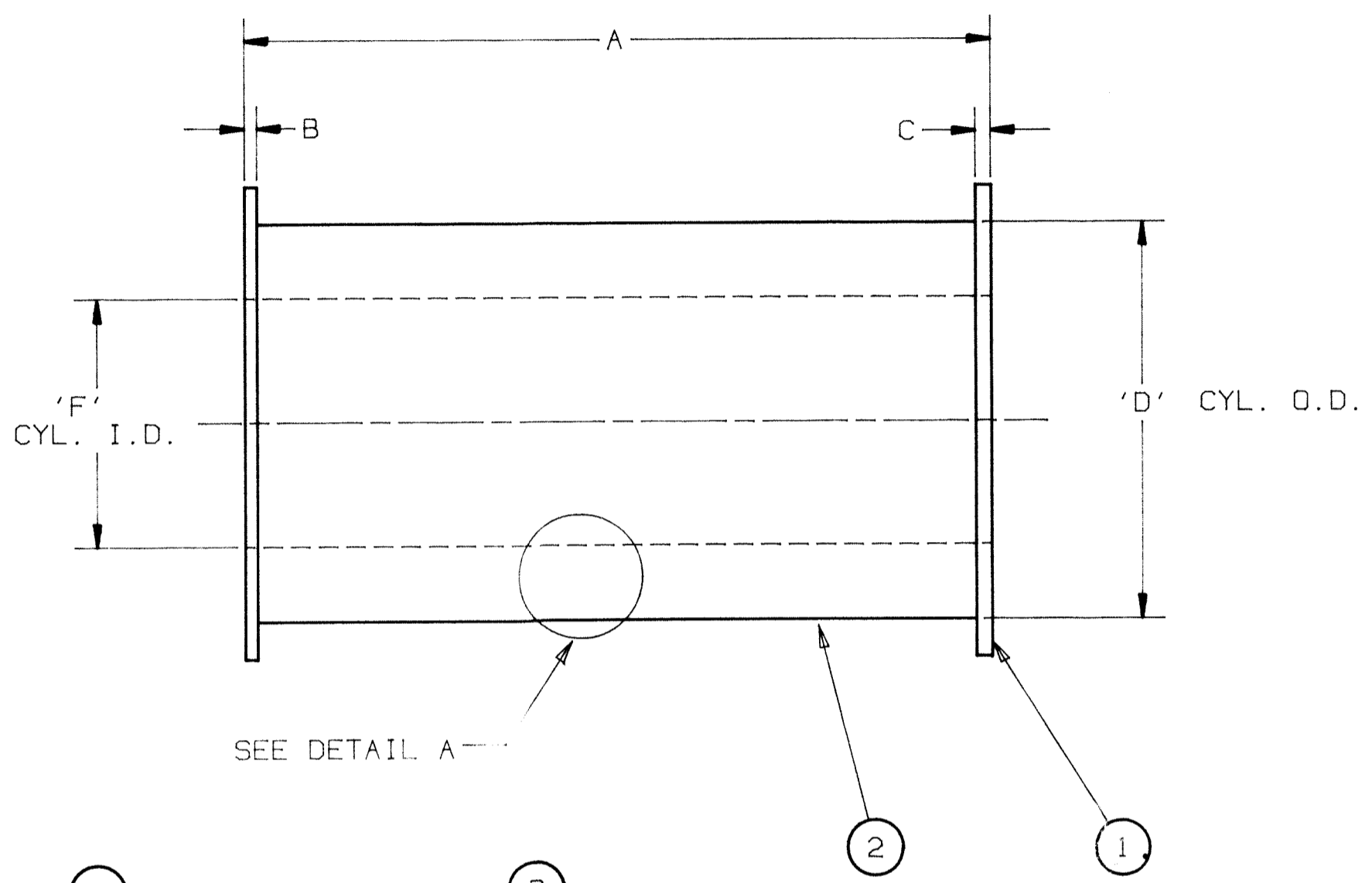


JOY ENERGY SYSTEMS, INC. A Joy Technologies Company		DWN. CM 12-28-89 CHK. ENG. SCALE 3/8" = 1'0" MATERIAL NEXT ASS'Y G&S CODE	EQUIP. ANCHOR DIAGRAM FOR FLUIDIZING BED EQUIPMENT CITY OF LYNNWOOD, WASHINGTON DWG. NO. F0011D SHT. 13 OF 13
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DATE OF PRINT: JUL 16 1990	ISSUE/LOCAT: A Δ ANCHOR SIZE WAS 3/4" AT SECTION D-D REVISION: CM 3-8-90 ECD: DATE:		

BILL OF MATERIAL



ITEM	QTY.	PART NO.	PART NAME	DESCRIPTION
1	2		FLANGE	1 1/4" C.S. X 'E' O.D. X 'G' I.D.
2	1		CYLINDER	7 GA. C.S. X 'D' O.D. X 'A' LG.
3	'H'		REFRACTORY	'J' A.P. GREEN VSL-35 (25# BAGS)
4			REFRACTORY ANCHOR	



NOTE: REFRACTORY ANCHORS TO BE LOCATED ON 12" TRIANGULAR CENTERS.

* WEIGHTS ARE CALCULATED USING DRY WEIGHT OF REFRACTORY.

ITEM	A	B	C	D	E	F	G	H	J	K	■ WEIGHT
A1 F0015C-1											
A1 F0015C-2											
A1 F0015C-3	16 11/16"	1 1/4"	1 1/4"	32"	38"	20"	32 1/8"	6	6"	35"	244#
A1 F0015C-4	22 3/16"	1 1/4"	1 1/4"	26"	32"	18"	26 1/8"	5	4"	29"	203#
A1 F0015C-5	57 1/2"	1 1/4"	1 1/4"	26"	32"	18"	26 1/8"	12	4"	29"	538#
A1 F0015C-6	60"	1 1/4"	1 1/4"	26"	32"	18"	26 1/8"	12	4"	29"	561#
A1 F0015C-7	81 13/16"	1 1/4"	1 1/4"	26"	32"	18"	26 1/8"	16	4"	29"	760#

SUBMITTAL REVIEW
 G&O Job No. 87662
 No Exceptions Taken
 Make Corrections Noted
 Amend & Resubmit
 Rejected-See Remarks
 IMPORTANT NOTICE: This review does not relieve contractor from his responsibility to comply & Conform with the Plans, Specifications & Contract Documents.
GRAY & OSBORNE
 Consulting Engineers
 By Jaw Date 8-21-89

STEEL	
PLATES	A-283 GRADE C OR A-36
STRUCTURAL MEMBERS	A-36
PIPE	A-53
FLANGES	FLAT FACE PLATE FLANGE MATERIAL: A-283 GR. C

ISSUE	LOCAT	REVISION	ECO	DATE
A	A1	REVISED DIMENSIONS ON F0015C-3. ADDED F0015C-7. LENGTH 'A' ON F0015C-5 57 1/2" WAS 42". ADDED BILL OF MAT'L. REMOVED ITEM# F0015C-1 & F0015C-2.	DMS	7-24-89

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 A Joy Technologies Company

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 -DO NOT SCALE DRAWING
 -BREAK ALL SHARP EDGES.

DATE OF PRINT

DWN. AR 5-31-89
 CHK.
 ENG. UHS 8179
 SCALE N.T.S.
 MATERIAL
 NEXT ASS'Y
 G&S CODE

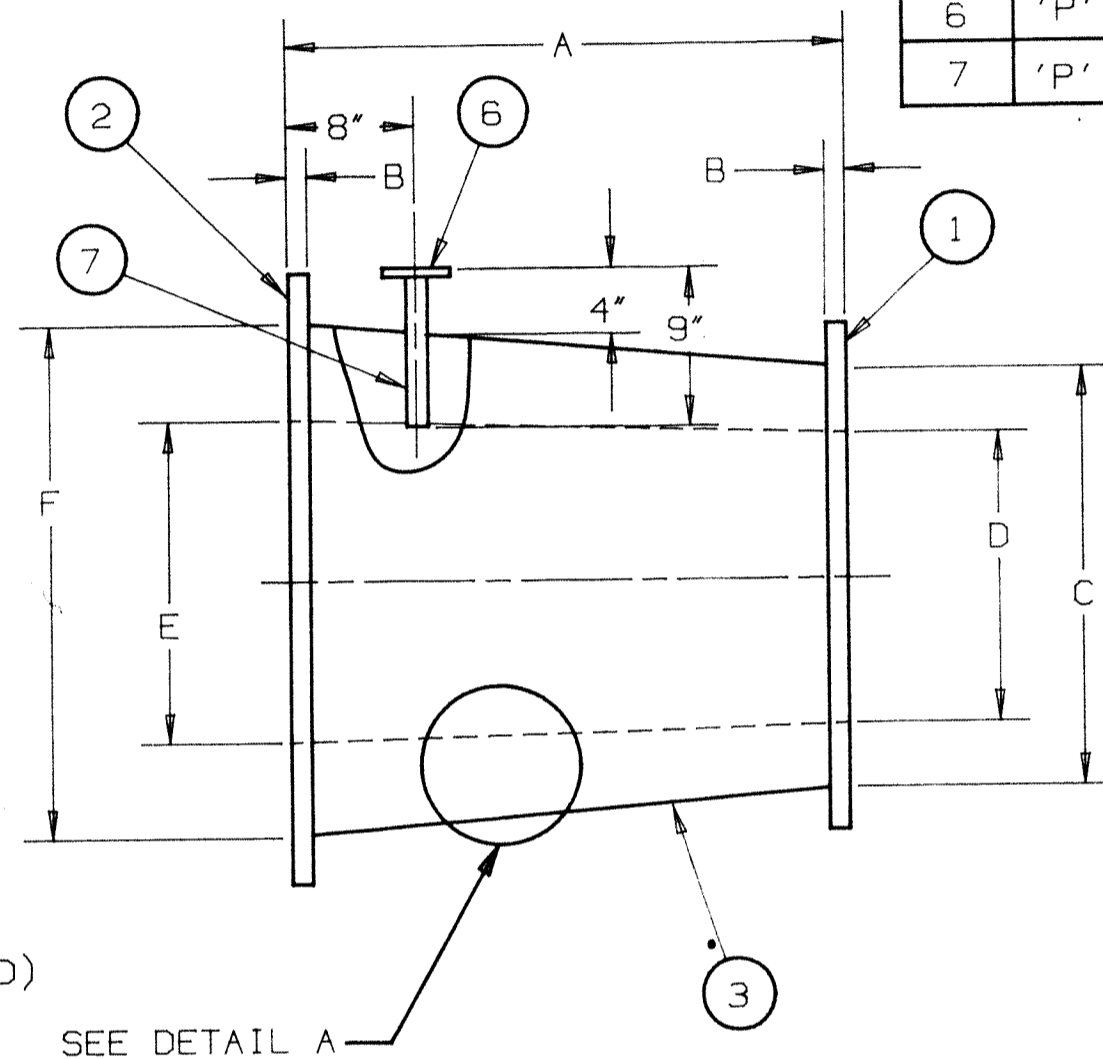
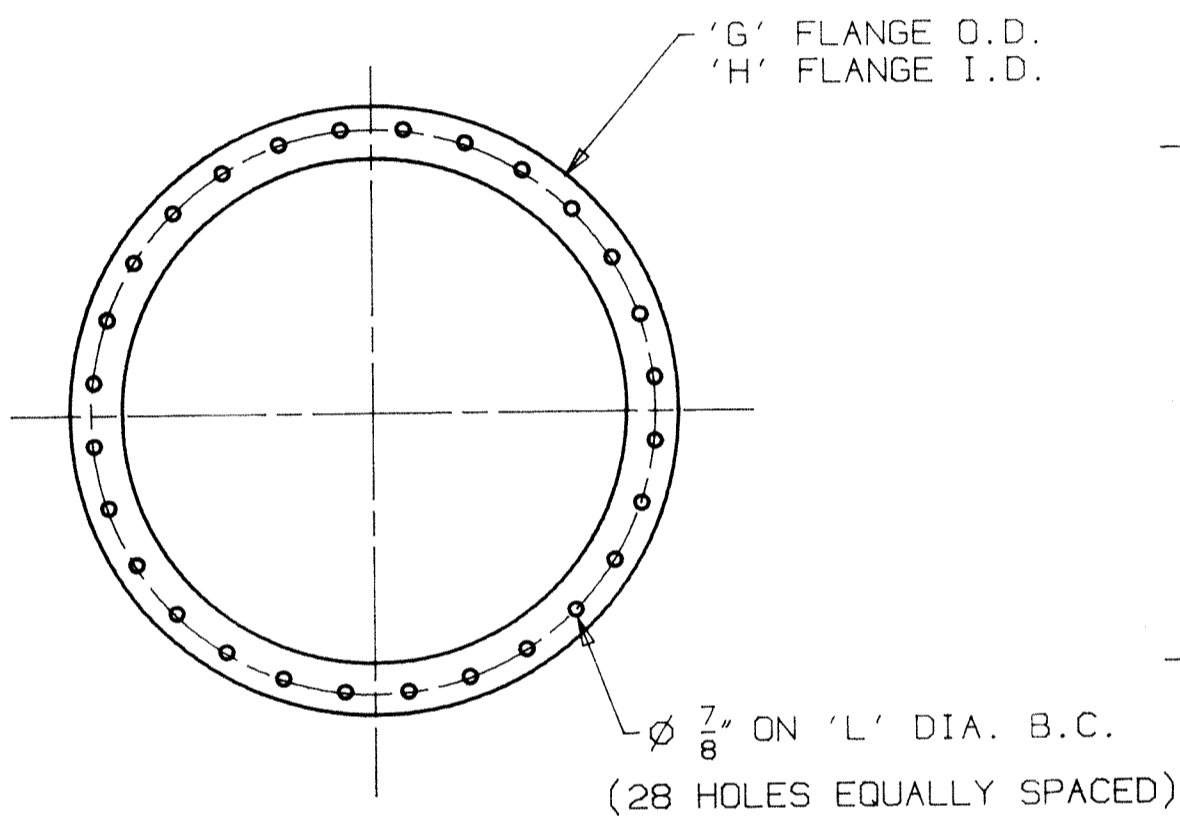
STRAIGHT STACK

FLUID BED REACTOR
 LYNNWOOD, WASHINGTON
 89-302

DWG. NO. **F0015C** SHT. 1 OF 1

BILL OF MATERIAL A1

ITEM	QTY	PART NO.	PART NAME	DESCRIPTION
1	1		FLANGE	1 1/4" C.S. X 'J' O.D. X 'K' I.D.
2	1		FLANGE	1 1/4" C.S. X 'G' O.D. X 'H' I.D.
3	1		CYLINDER	7 GA. C.S. X 'F' O.D. X 'C' O.D. X 'A' LG
4	'N'		REFRACTORY	A.P. GREEN VSL-35 (25# BAGS)
5			REFRACTORY ANCHOR	
6	'P'		FLANGE	1" Ø F.F 150# SLIP-ON 304 SS FLANGE
7	'P'		PIPE	1" Ø SCH 40 PIPE 310 SS

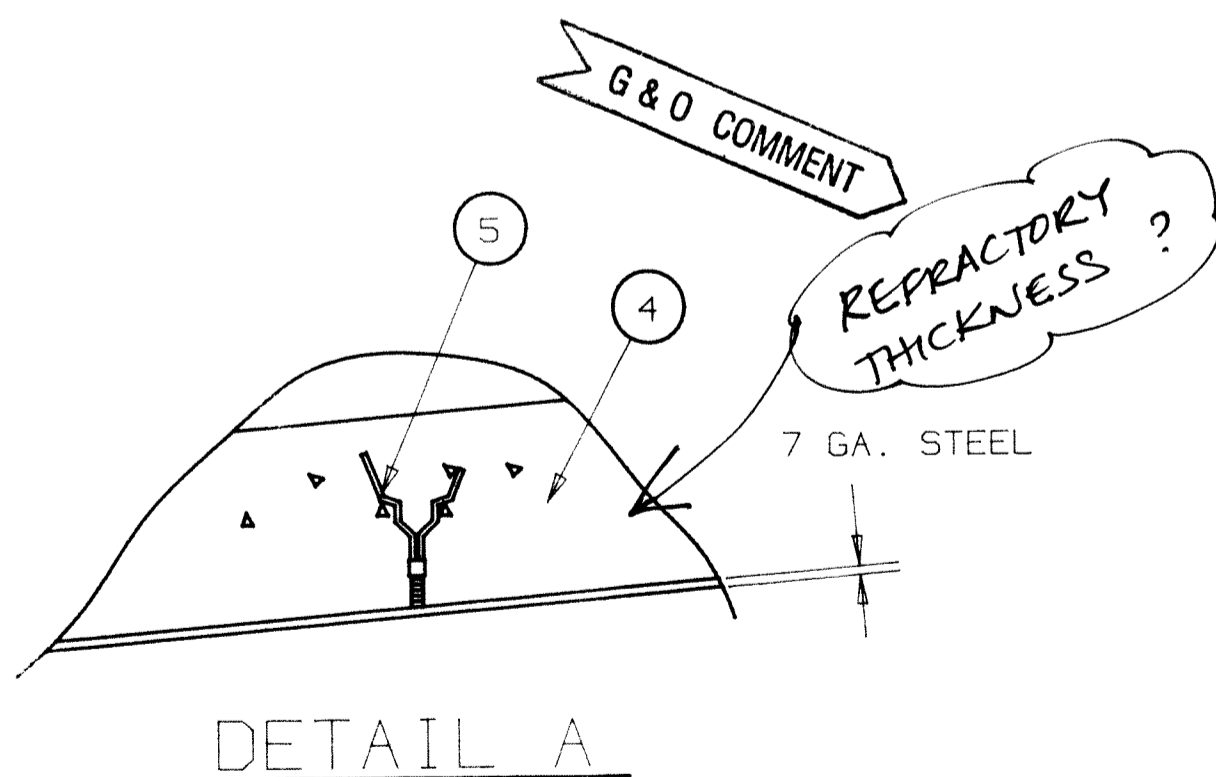


J' FLANGE O.D.
K' FLANGE I.D.

Ø 7/8" ON 'M' DIA. B.C.
(28 HOLES EQUALLY SPACED)

* WEIGHTS ARE CALCULATED USING DRY WEIGHT OF REFRACTORY.

ITEM	A	B	C	D	E	F	G	H	J	K	L	M	N	P	*WEIGHT
FO016C-1	18"	1 1/4"	21"	18"	20"	32"	38"	32 1/8"	27"	21 1/8"	35"	25"	4	1	174#
FO016C-2	15 1/2"	1 1/4"	24"	16 1/2"	20"	32"	38"	32 1/8"	30"	24 1/8"	35"	27"	4	0	176#
FO016C-3	24"	1 1/4"	24"	14 1/2"	18"	26"	32"	26 1/8"	30"	24 1/8"	29"	27"	4	0	193#



A1 NOTE: REFRACTORY ANCHORS TO BE LOCATED ON 12" TRIANGULAR CENTERS.

G&O Job No. 87662

- No Exceptions Taken
- Make Corrections Noted
- Amend & Resubmit
- Rejected-See Remarks

IMPORTANT NOTICE: This review does not relieve contractor from his responsibility to comply & Conform with the Plans, Specifications & Contract Documents.

GRAY & OSBORNE
Consulting Engineers

By JH Date 9-21-89

STEEL

PLATES	A-283 GRADE C OR A-36
STRUCTURAL MEMBERS	A-36
PIPE	A-53
FLANGES	FLAT FACE PLATE FLANGE MATERIAL: A-283 GR. C

ISSUE	LOCAT	REVISION	ECO	DATE
A	A1	ADDED BILL OF MATERIAL AND NOTE.	DMS	7-21-89

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A Joy Technologies Company

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-DO NOT SCALE DRAWING
-BREAK ALL SHARP EDGES.

DATE OF PRINT

DWN. AR 5-31-89

CHK. 1

ENG. EHS 8189

SCALE N.T.S.

MATERIAL

NEXT ASS'Y

G&S CODE

DUCT TRANSITION

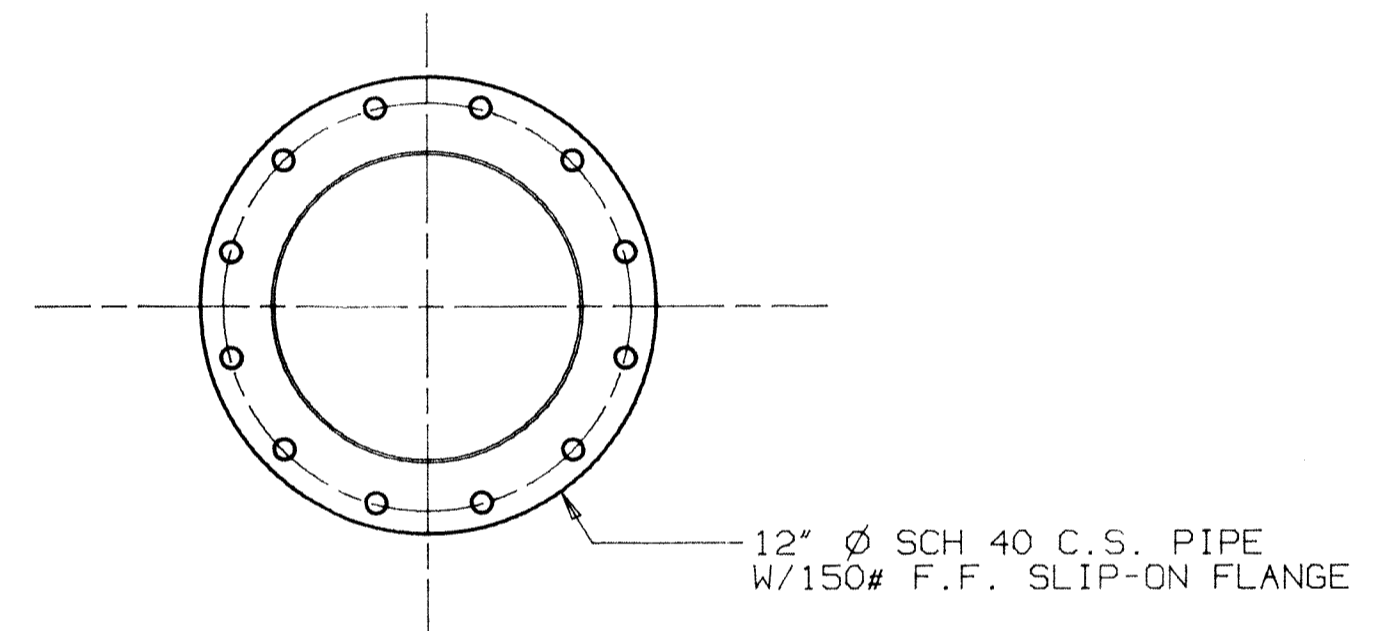
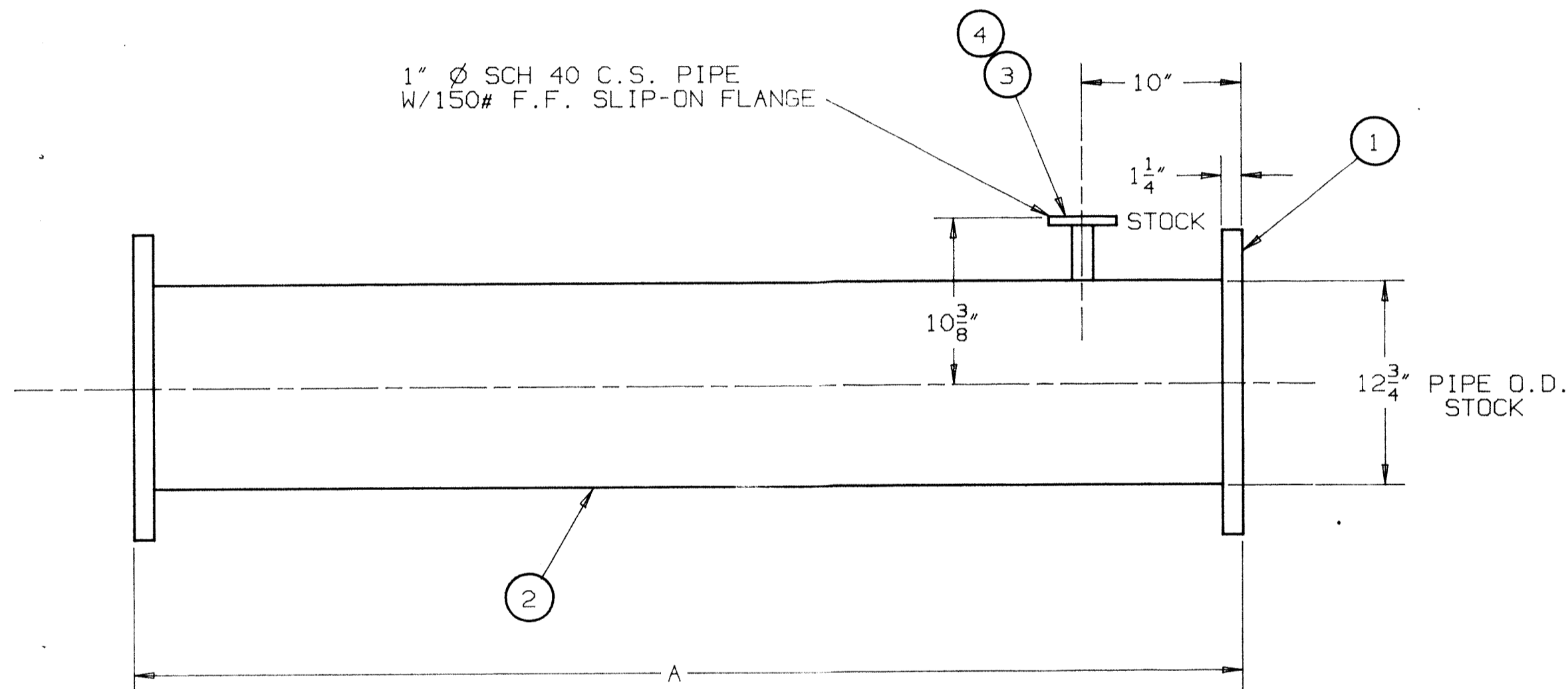
FLUID BED REACTOR
LYNNWOOD, WASHINGTON
89-302

DWG. NO. **F0016C**

SHT. 1 OF 1

BILL OF MATERIAL

ITEM	QTY.	PART NO.	PART NAME	DESCRIPTION
1	2		FLANGE	12" Ø 150# F.F. SLIP-ON C.S. FLANGE
2	1		PIPE	12" Ø SCH. 40 C.S. PIPE X 'A' LG.
3	'B'		FLANGE	1" Ø F.F. 150# SLIP-ON C.S. FLANGE
4	'B'		PIPE	1" Ø SCH. 40 C.S. PIPE X 4" LG



ITEM	'A'	'B'	WEIGHT
F0020C-1	190 1/4"	0	414#
F0020C-2	28 3/16"	1	70#

SUBMITTAL REVIEW

G&O Job No. 87662

No Exceptions Taken

Make Corrections Noted

Amend & Resubmit

Rejected-See Remarks

IMPORTANT NOTICE: This review does not relieve contractor from his responsibility to comply & Conform with the Plans, Specifications & Contract Documents.

GRAY & OSBORNE
Consulting Engineers

By SP Date 9-21-89

STEEL

PLATES	A-283 GRADE C OR A-36
STRUCTURAL MEMBERS	A-36
PIPE	A-53
FLANGES	FLAT FACE PLATE FLANGE MATERIAL: A-283 GR. C

ISSUE	LOCAT	REVISION	ECO	DATE

JOY ENERGY SYSTEMS, INC.
A Joy Technologies Company

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-DO NOT SCALE DRAWING
-BREAK ALL SHARP EDGES.

DATE OF PRINT

DWN. A.R. 5-30-89

CHK.

ENG. E.H.S. 8-1-89

SCALE 1 1/2" = 1'-0"

MATERIAL

NEXT ASS'Y

G&S CODE

STRAIGHT STACK

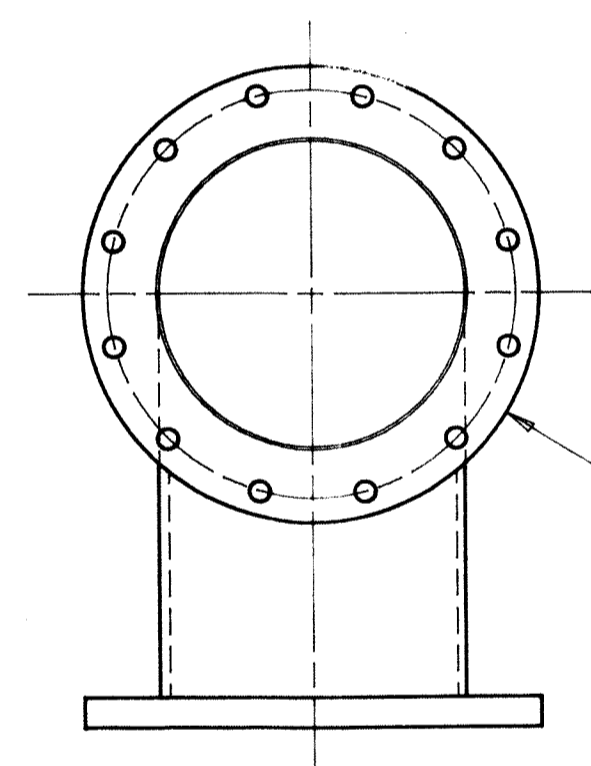
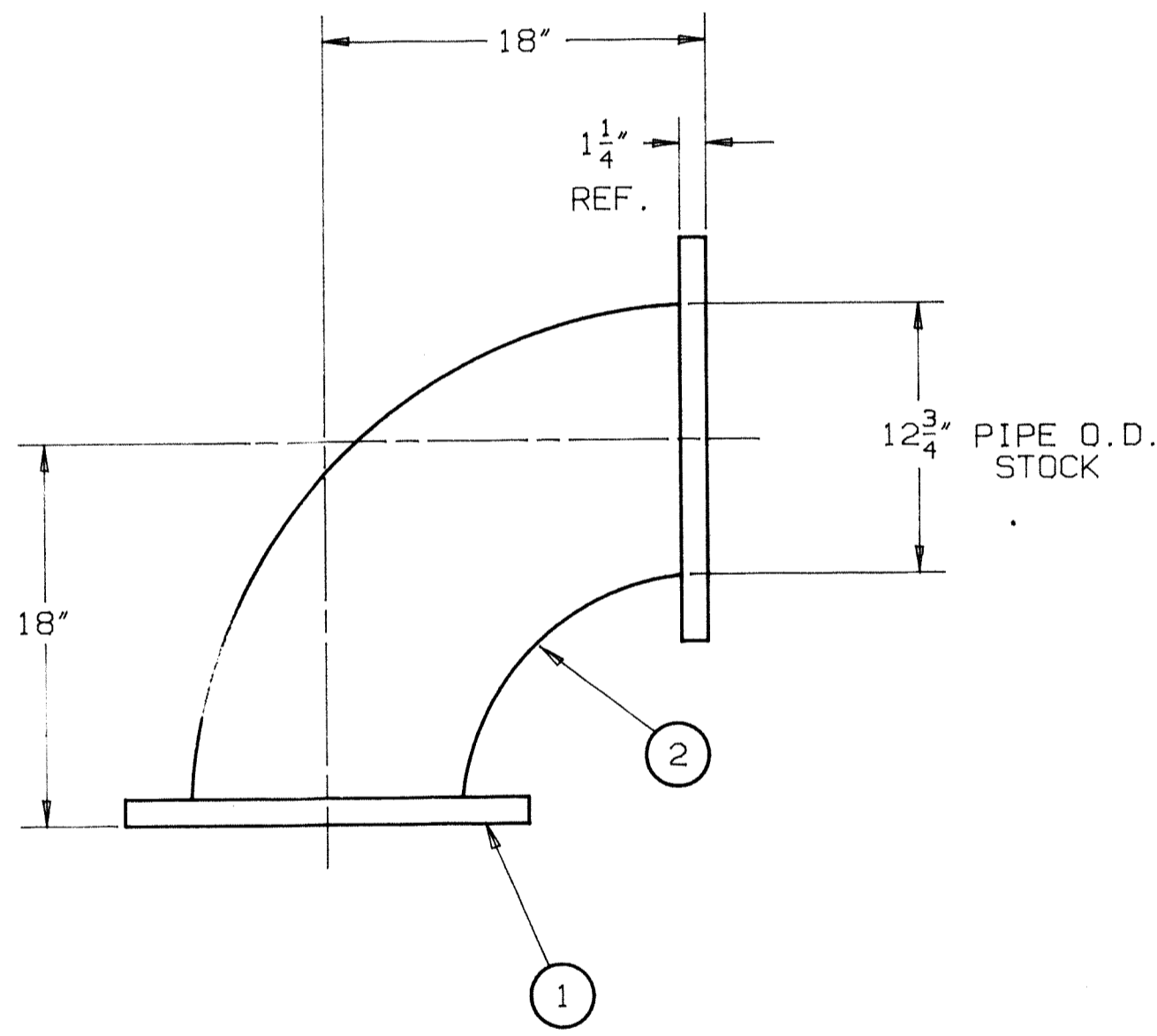
FLUID BED REACTOR
LYNNWOOD, WASHINGTON
89-302

DWG. NO. **F0020C**

SHT. 1
OF 1

BILL OF MATERIAL

ITEM	QTY.	PART NO.	PART NAME	DESCRIPTION
1	2		FLANGE	12 Ø 150# F.F SLIP-ON C.S. FLANGE
2	1		90° ELBOW (LONG RADIUS)	12" N.P.S. STD. WEIGHT (12 ³ / ₄ " O.D. STOCK)



12" Ø SCH 40 C.S. PIPE
W/150# F.F. SLIP-ON FLANGE

SUBMITTAL REVIEW

G&O Job No. 87662

No Exceptions Taken

Make Corrections Noted

Amend & Resubmit

Rejected-See Remarks

IMPORTANT NOTICE: This review does not relieve contractor from his responsibility to comply & conform with the Plans, Specifications & Contract Documents.

GRAY & OSBORNE
Consulting Engineers

By sm Date 9-21-89

G & O COMMENT

REVISE TITLE PER CONTENTS SHEET

TOTAL WEIGHT: 218#

STEEL	
PLATES	A-283 GRADE C OR A-36
STRUCTURAL MEMBERS	A-36
PIPE	A-53
FLANGES	FLAT FACE PLATE FLANGE MATERIAL: A-283 GR. C

ISSUE	LOCAT	REVISION	ECO	DATE

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A Joy Technologies Company

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DATE OF PRINT

DWN. A.R. 5-31-89

CHK.

ENG. EHS 8-1-89

SCALE 1 1/2" = 1'-0"

MATERIAL

NEXT ASS'Y

G&S CODE

STACK SECTION

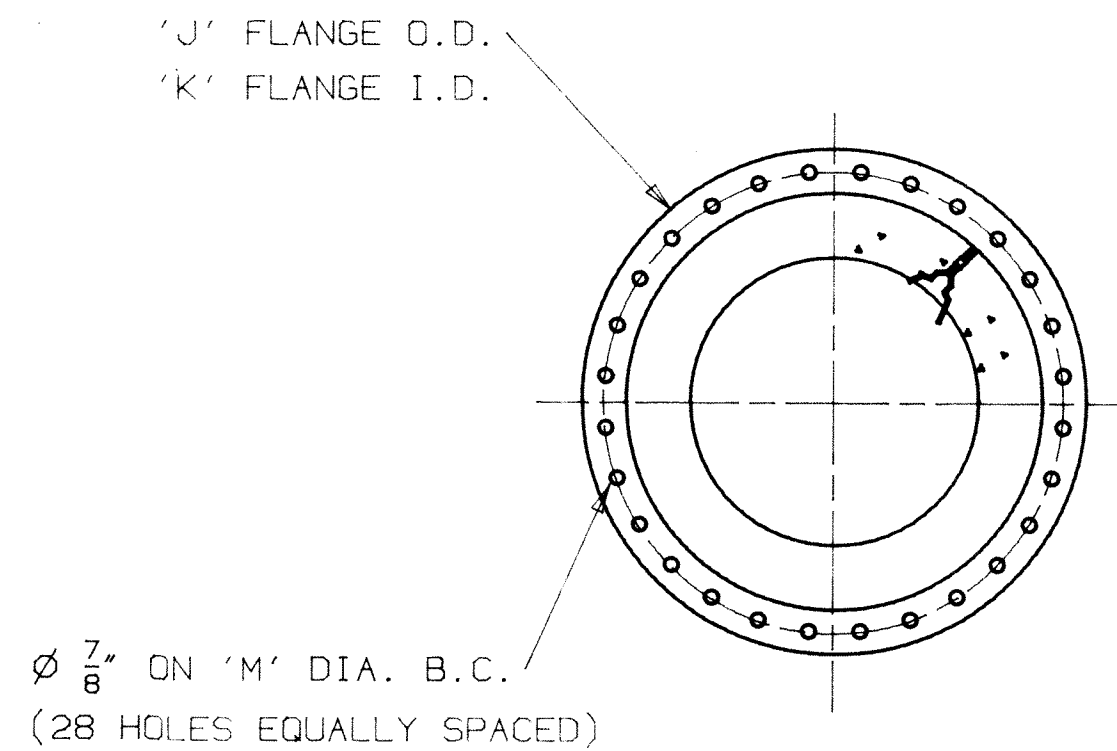
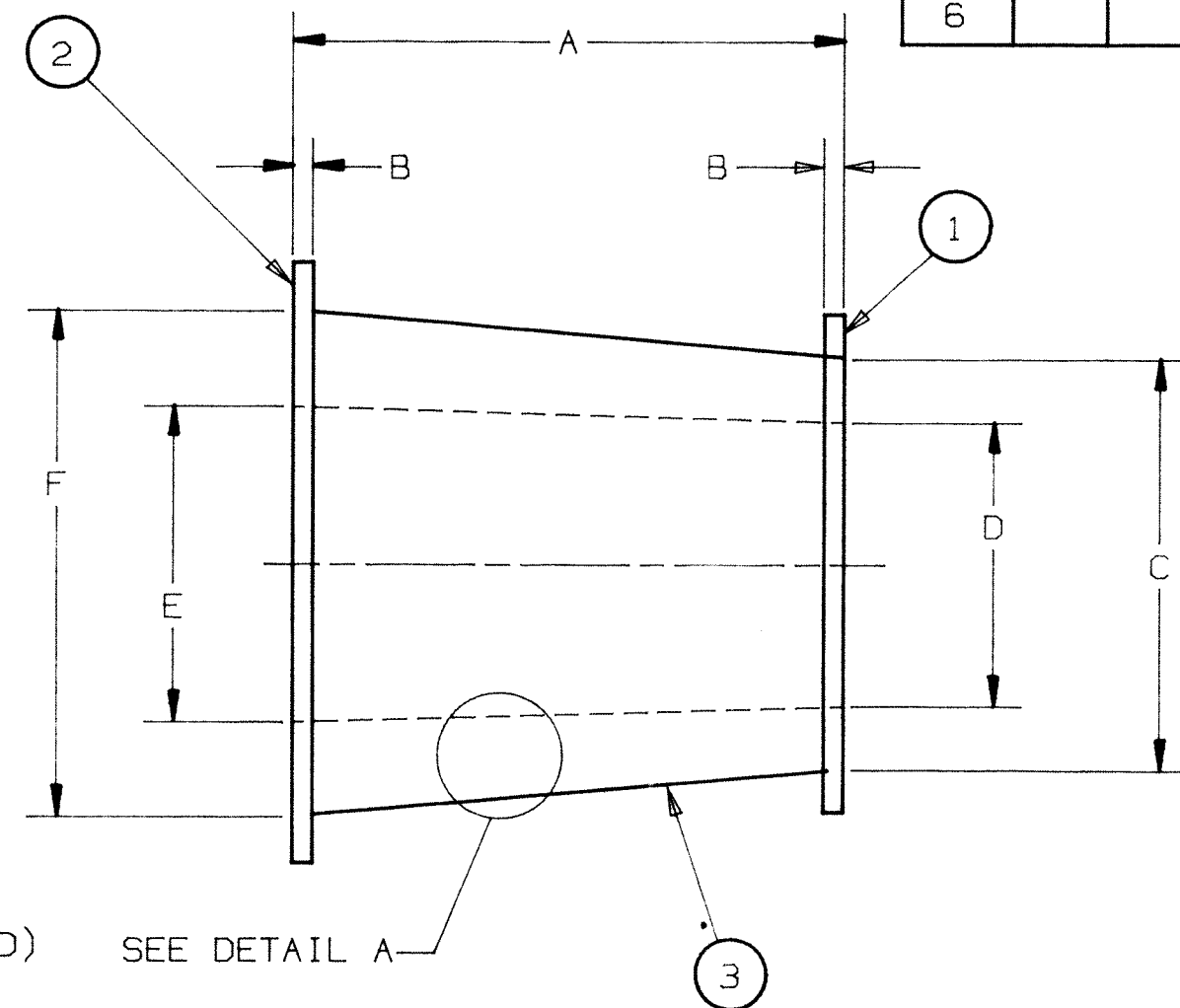
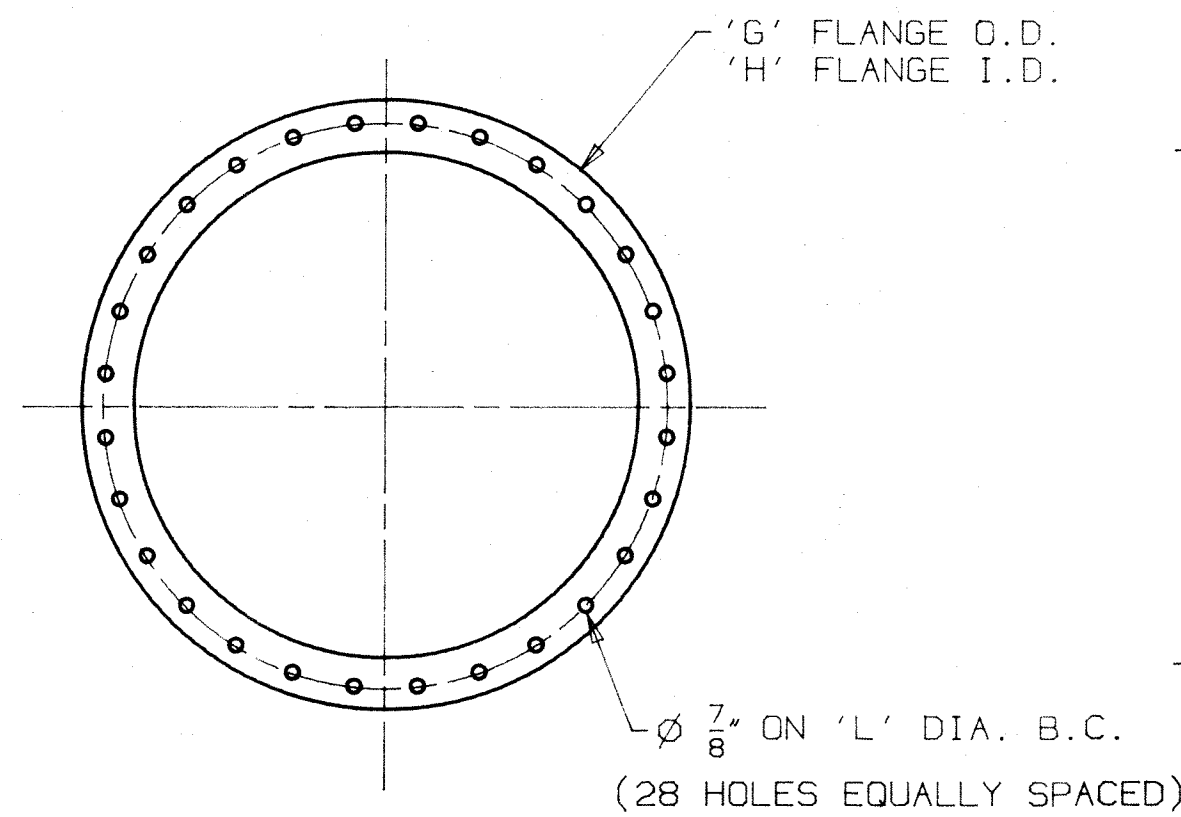
FLUID BED REACTOR
LYNNWOOD, WASHINGTON
89-302

DWG. NO. **F0021C**

SHT. 1 OF 1

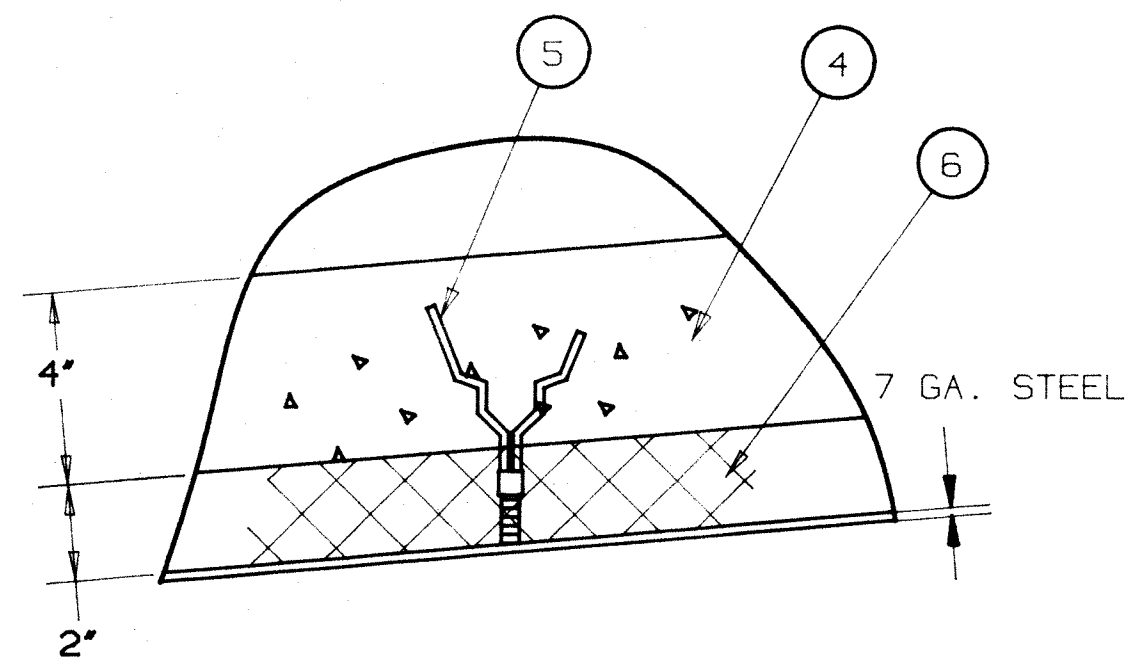
BILL OF MATERIAL

ITEM	QTY.	PART NO.	PART NAME	DESCRIPTION
1	1		FLANGE	1 1/4" C.S. X 38" O.D. X 32 1/8" I.D.
2	1		FLANGE	1 1/4" C.S. X 42" O.D. X 36 1/8" I.D.
3	1		CYLINDER	7 GA. C.S. X 36" O.D. X 32" O.D. X 67 5/16" LG.
4	'N'		REFRACTORY	4" THK A.P. GREEN VSL-35 (25# BAGS)
5			REFRACTORY ANCHOR	
6			BLOCK INSULATION	2" BLOCK INSULATION



* WEIGHTS ARE CALCULATED USING DRY WEIGHT OF REFRACTORY.

ITEM	A	B	C	D	E	F	G	H	J	K	L	M	N	*WEIGHT
F0023C	67 5/16"	1 1/4"	32"	19 1/2"	24"	36"	38"	36 1/8"	38"	32 1/8"	39"	35"	18	836#



DETAIL A

SUBMITTAL REVIEW

G&O Job No. 87062

- No Exceptions Taken
- Make Corrections Noted
- Amend & Resubmit
- Rejected-See Remarks

IMPORTANT NOTICE: This review does not relieve contractor from his responsibility to comply & conform with the Plans, Specifications & Contract Documents.

GRAY & OSBORNE
Consulting Engineers

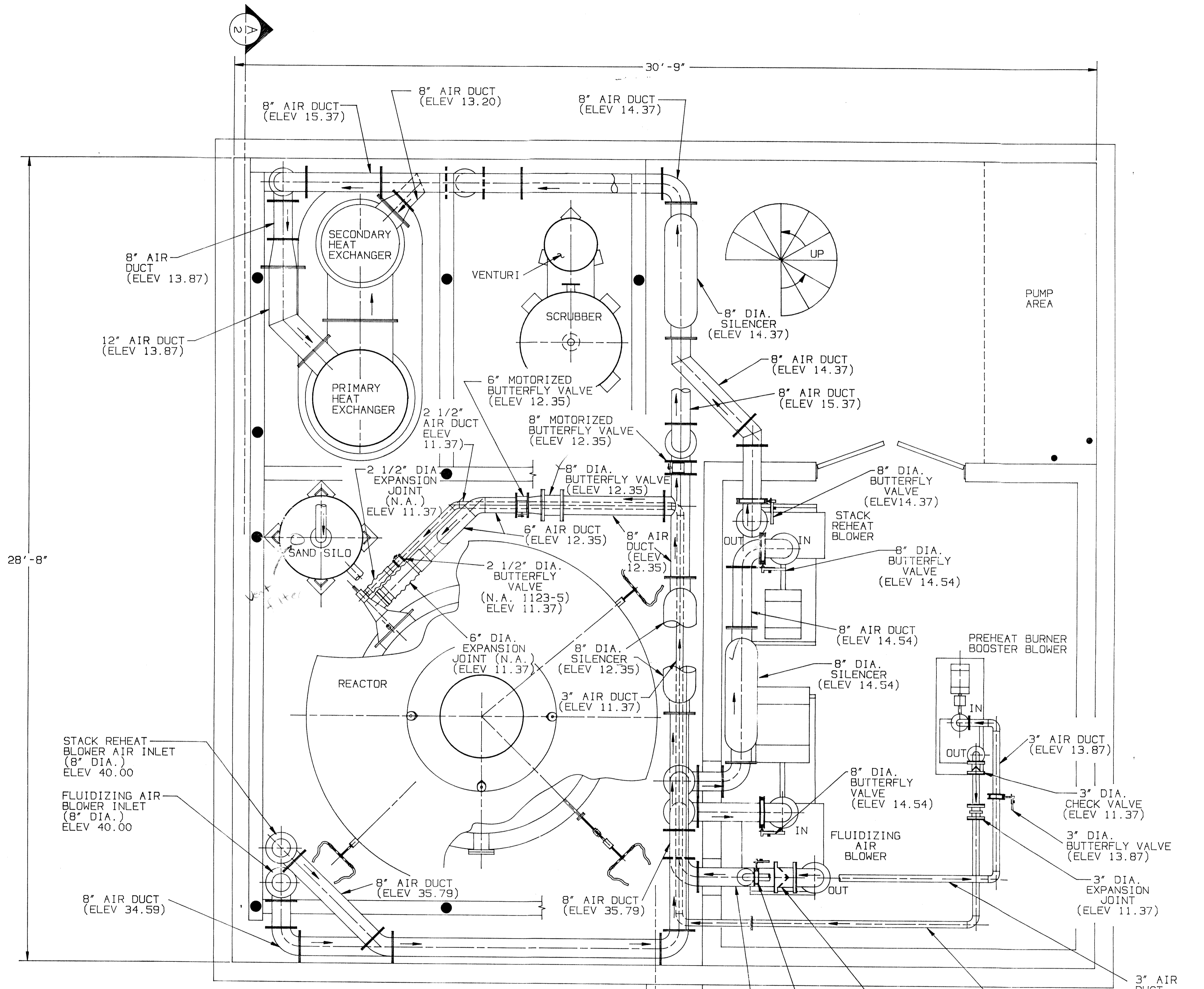
By JPW Date 9-21-89

NOTE: REFRACTORY ANCHORS TO BE LOCATED ON 12" TRIANGULAR CENTERS.

STEEL	
PLATES	A-283 GRADE C OR A-36
STRUCTURAL MEMBERS	A-36
PIPE	A-53
FLANGES	FLAT FACE PLATE FLANGE MATERIAL: A-283 GR. C

ISSUE	LOCAT	REVISION	ECO	DATE

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	ENG. <u>EHS 8-1-89</u> SCALE N.T.S.	
	MATERIAL NEXT ASS'Y	
	DATE OF PRINT G&S CODE	
DWG. NO. F0023C		SHT. 1 OF 1



VALVES AND ACCESSORIES ELEVATIONS

KIEWIT CONSTRUCTION CO.
REVIEWED
 BY: 417
 DATE: 7-20-90
 SUBMITAL NO.: 1183
 SPEC SECTION: 11.13

ISSUE	NO.	REVISION	DATE
B	1	MOVED STACK REHEAT BLOWER INLET	CM 2-8-90
A	1	ADDED DUCTS ELEV.	CM 12-20-89

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DATE OF PRINT: APR 16 1990

DWN. DMS	11-6-89
CHK.	
ENG.	
SCALE	1/2" = 1'-0"
MATERIAL	
NEXT ASS'Y	
GAS CODE	

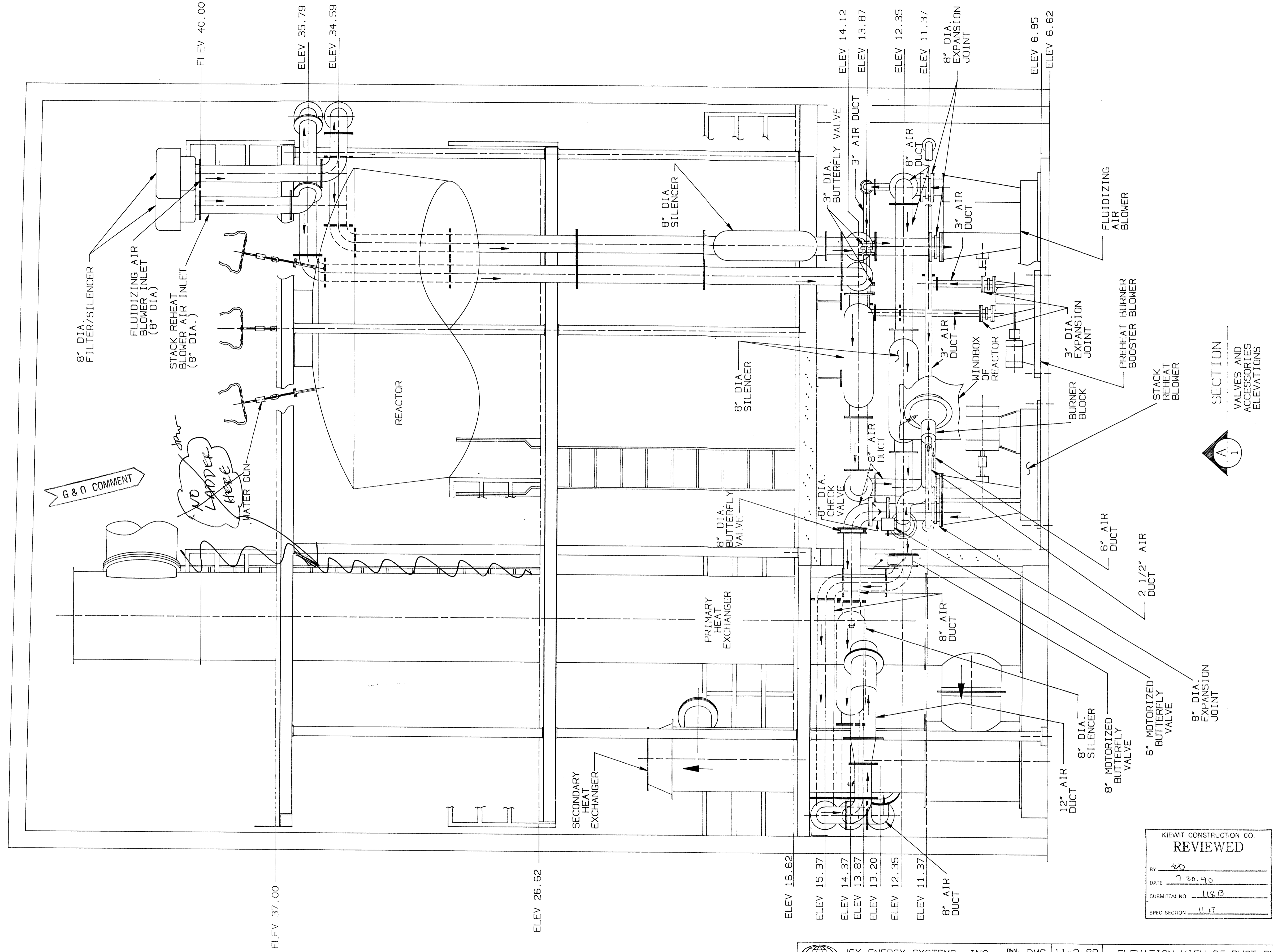
PLAN VIEW OF DUCT RUNS

FBR AREA

CITY OF LYNNWOOD, WASHINGTON

DWG. NO. **F0025D**

SHT. 1 OF 2



SECTION
A
1
VALVES AND ACCESSORIES ELEVATIONS

KIEWIT CONSTRUCTION CO.
REVIEWED
BY: ED
DATE: 7.20.90
SUBMITTAL NO: 11813
SPEC SECTION: 11.17

JOY JOY ENERGY SYSTEMS, INC.
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-BREAK ALL SHARP EDGES.

DWN. DMS 11-2-89
CRK.
ENG.
SCALE 1/2" = 1'-0"
MATERIAL
NEXT ASS'Y
G&S CODE

ELEVATION VIEW OF DUCT RUNS
FBR AREA
CITY OF LYNNWOOD WASHINGTON
DWG. NO. **F0025D**
SHT. 2 OF 2

ISSUE/LOCAT	REVISION	ECO	DATE
B	STACK REHEAT BLOWER INLET RELOCATED	CM	2-8-90
A	REVISED DWG TO SHOW DUCT ELEV.	CM	12-20-89

DATE OF PRINT: **JUL 16 1990**