Southern California Edison Company

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ROSEMEAD, CALIFORNIA 91770

K. P. BASKIN
MANAGER, NUCLEAR ENGINEERING
AND LICENSING

August 29, 1980

Director of Nuclear Reactor Regulation
Attention: Mr. D. M. Crutchfield, Chief
Operating Reactors Branch No. 5
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Subject: Docket No. 50-206
Effects of Non-Category A Equipment Failure
San Onofre Nuclear Generating Station
Unit 1

On August 4, and 5, 1980, a meeting between the NRC, SCE and Lawrence Livermore National Laboratory (LLNL) was held at the San Onofre Nuclear Generating Station Unit 1. The purpose of the meeting was to resolve questions concerning potential flooding of safety-related equipment from non-seismically qualified sources. The purpose of this letter is to provide to the NRC and LLNL information requested at that meeting. That information is provided in Enclosure 1.

If you have any questions, please me know.

Very truly yours,

K P Baskin

Enclosures

cc: V. R. Latorre, Lawrence Livermore National Laboratory

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1/1

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ENCLOSURE 1

Item 1: Provide plan and elevation drawings for the reactor auxiliary building.

Response: Plans and elevations of the reactor auxiliary building are provided in SCE drawings 568703-3 and 568704-2. The drawings identify the major sources of flooding and the location of safety-related components.

Item 2: Provide an analysis of the consequences of rupture of the volume control tank.

Response: The volume control tank (VCT) is Seismic Category A and, therefore, does not need to be considered as a source of flooding. In addition, the capacity of the tank is 1,575 gallons and is smaller than the Boric Acid Tank (7,000 gallons and also located on the roof).

Item 3: What is the largest source of flooding water on the reactor auxiliary building roof (+20' elevation) and consequence of failure of that source.

Response: The largest tank located on the reactor auxiliary building roof is the 7,000 gallon Boric Acid Tank. If the entire contents of this tank were spilled onto the roof, the flooding would be less than 2 inches, not taking credit for any run off. This is not sufficient to flood any safety-related equipment on the roof.

Item 4: What is the largest source of flood water in the auxiliary building (+5' elevation) and the consequences of failure.

Response: The largest source of water located on the +5' level of the reactor auxiliary building is the 2,600 gallon decontamination drain tank. (The spent resin storage tank is larger but does not contain as much water.) Flooding from this tank would be approximately 1", not taking credit for run off down the stairs to the sump on the -5' level. (The maximum acceptable flood level on this floor is 6".)

The +5' level floor would drain water down the stairway to the -5' level. The capacity of the room at -5' and the adjacent tank room at the -2' level is approximately 86,000 gallons below the +5' level. There is a sump located at the -5' level with an alarm in the control room on high level (-5'8"). The sump is drained by an automatic sump pump with a capacity of 100 gal/min.

Flooding of the reactor auxiliary building is limited by the plant operators, who enter the building at least twice per shift. Any flood would be detected in less than eight hours and action taken. Thus, flooding rates up to approximately 180 gpm would not result in flooding any safety-related equipment on the +5' level, not taking credit for the sump pump or alarm. In addition, Emergency Procedure S-3-5.27, Rev. 9, Earthquake, provides that a plant inspection be conducted to assess damage following a moderate or strong earthquake. Therefore, rupture of any non-Seismic Category A pipe would not result in flooding of the auxiliary building.

Failure of one of the three liquid radwaste hold-up tanks on the -2' level would be completely contained below the +5' level and no safety-related equipment would be flooded.

Item 5: The March 21, 1975 submittal did not discuss the floor drains in the battery room. Describe in more detail how the rupture of water sources in the battery room and charger room would be mitigated.

Response: There are two floor drains located in the station battery room. The only sources of water are the 3/4" hot and cold domestic water lines. The maximum acceptable flood level in the battery room is 36" (floor to bottom of batteries). The drains would adequately drain the floor.

There are no floor drains in the battery charger room. The only water sources are the above mentioned domestic water lines. The maximum acceptable flood level in the charger room is 6 inches. There is a normally closed door between the charger room and the battery room. The door is 36 inches wide and there is a 1/2 inch gap between the bottom of the door and the floor. This would provide adequate space for water to drain from the charger room to the floor drains in the battery room (approximately 175 gpm). The door to the outside is relatively tight and drainage under that door would be minimal.

In addition, the plant operator enters this room at least twice per shift and after an earthquake and would detect any water leaking into the room.

The battery/charger rooms are located on the +20' level and the floor drains flow to the storm drains. This would preclude any flooding from backflow in the drain.

Item 6: Describe the non-Seismic Category A water sources in the diesel/ generator building and how flooding from these sources would be mitigated.

Response: The largest non-seismic piping in the diesel/generator building is the 1 1/2" service water header. There is a sump located at either end of the diesel/generator which would drain water from a broken service water header.

The sump drains to the storm drain systems; therefore, backflow through the drain would not be a source of flooding.

The battery room, located at the west end of the north diesel/generator building has an eye wash basin and a floor drain. Flooding of this room is incredible.

In addition, the station operators enter the building at least twice per shift and after an earthquake and would detect any water leakage.

Item 7: Describe how you plan to mitigate flooding due to the rupture of a condenser bellows.

Response: Potential flooding from the failure of a condenser bellows will be mitigated by either a "sleeve" around the bellows to limit flow rate or an automatic trip of the circulating water pumps on high water level in the condenser bay to limit flood volume. Design evaluation and analyses are being performed with an expected completion date of approximately October 15, 1980. Implementation of the selected method of limiting flooding will be installed by approximately June 1, 1981.

Item 8: Failure of the condensate storage tank could flood safety-related equipment on the +20' and +14' elevation of the turbine building. Describe how this will be mitigated.

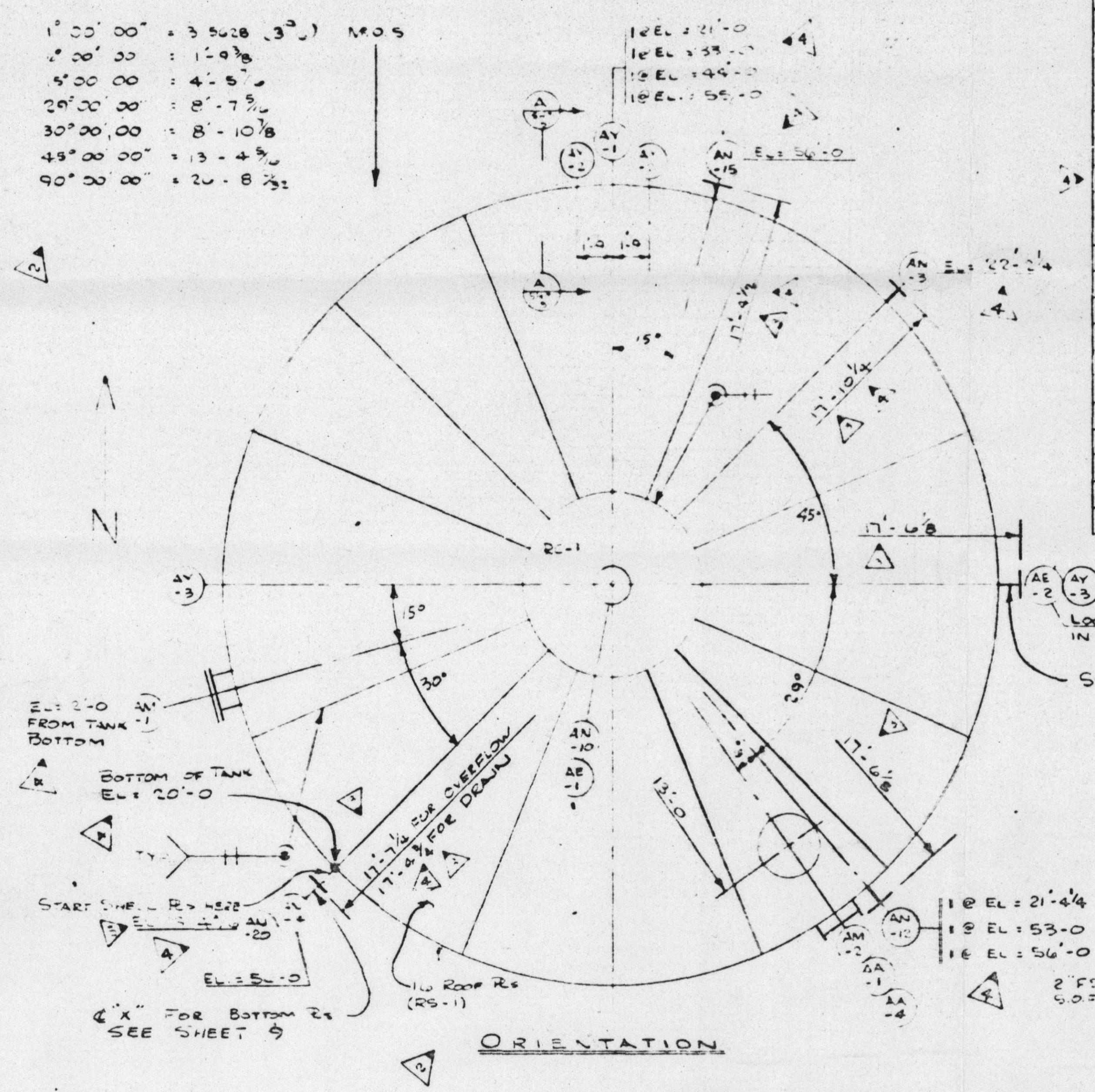
Response: Failure of the condensate storage tank (CST) could possibly cause flooding of MCC3, the remote shutdown panel, the uninterruptable power supply (UPS) for MOV-850C and the batteries for the UPS. However, as part of the seismic evaluation of San Onofre Unit 1, the CST is to be analyzed by June, 1981 to determine its seismic capability. Attached are specifications and drawings showing the similarity in design and construction of the CST and the Seismic Category A Refueling Water Storage Tank (RWST). If required, the tank will be upgraded to Seismic Category A following the seismic evaluation. This would remove the CST as a source of flooding for this review.

In the mean time, the door between the turbine building +20' level and the CST will be locked closed during normal plant operation and the air ventilator in the lower portion of the door and the glass window will be blocked off. These steps would minimize flooding in the unlikely event the CST should rupture.

Comparison of the Condensate Storage Tank

and Refueling Water Storage Tank

DATA	REFUELING WATER STORAGE TANK	CONDENSATE STORAGE TANK
Tank Height, Straight Shell	37 ft 1 in	37 ft 1 in
Tank Diameter, Mean	34 ft 0 in	34 ft 0 in
Number of Courses	5	5
Size of Courses	88-5/16 in	88-5/16 in
Plate Material	A283C	A283C
Plate Thickness		
Bottom	5/16 in	5/16 in
Roof	1/4 in	1/4 in
Course 1	0.329 in	.26 in
Courses 2, 3, 4, 5	1/4 in	.26 in
Size of Top Angle	3-1/2 x 3 x 1/4 in	3-1/2 x 3 x 1/4 in
Size Anchor Bearing Plates	3-1/8 x 5/8 x 7 in	None
Number of Anchor Bolts	34	None
Tank Capacity	240,000 gal	240,000 gal



DRAWING & ACCESSORY LIST

MARK	REQ'D	DESCRIPTION		DWGS
		ELEVATION ORIENTATION & DETAILS		1
		ROOF DETAILS		2
AX-1	1	OUTSIDE LADDER & CAGE		3
AN-14	1	4" OVERFLOW NOZZLE	50# FF	4
AN-3	1	14" INLET-OUTLET NOZZLE	50# FF	4
AN-15	1	3" FILL NOZZLE	50# FF	4
AN-20	1	4" DRAIN	50# FF	4, 8
AT-1	8	TROLLEY ATTACHMENT		4
AN-2	3	STNLS STL BAR SCREEN		4
AE-2	1	2" SHELL VENT (FLANGED)		1
AY-3	2	CATHODIC PROTECTION STUDS		1
AY-1	4	SHELL CLIPS		1
AN-10	1	8" ROOF NOZZLE		5
AE-1	1	8" S&J FIG 4650 FREEVENT W/S.S SCREEN		5
AN-12	3	2" SHELL NOZZLE		5
AM-2	1	24 Ø ROOF HATCH		6
AM-1		24 Ø SHELL MANHOLE		7
		BOTTOM PLATE LAYOUT		9
AY-2	2	FLOODLIGHT MOUNTING BRACKETS		5

GENERAL NOTES:

1. TANKS TO BE DESIGNED, FABRICATED AND ERECTED PER A.P.I. SPEC'S 650, 1ST EDITION AND/OR CUSTOMERS SPEC'S, WHICHEVER GOVERNS.
2. MATERIAL:

PLATE	ASTM	A283-C
SHAPES	ASTM	A36
PIPE	ASTM	A53
BOLTS	ASTM	A307-A

GASKETS SBR 75 B.F. GOODRICH RED SHEET PACKING

3. FOUNDATION FURNISHED FIRM AND TO GRADE BY OTHERS.
4. THE TANK BOTTOM, SHELL AND ROOF ARE TO BE TESTED WITH PDM VACUUM SEAM TESTER AFTER ERECTION. SEAMS INACCESSIBLE TO VACUUM SEAM TESTING SHALL BE TESTED WITH PENETRATING OIL. HYDROSTATIC TESTING IS NOT REQUIRED
5. INSPECTION SHALL BE BY RADIOGRAPHY PER API 650.
6. FIVE COPIES OF MILL TEST REPORTS ARE REQUIRED.
7. SHOP INSPECTION IS REQUIRED. NO FABRICATION MAY BEGIN UNTIL APPROVED BY BECHTEL'S INSPECTOR.
8. NO MATERIAL SHALL BE SHIPPED FROM PDM PLANT UNTIL A WRITTEN RELEASE HAS BEEN GIVEN BY BECHTEL AND THE CERTIFIED TEST REPORT HAS BEEN APPROVED BY BECHTEL.
9. P.D.M. STD NAME PLATE A550 REQUIRED.
10. ALL EXTERIOR ROOF AND SIDE SURFACES SHALL HAVE WELD SPLATTER REMOVED AND EXCESS WELD METAL REMOVED BY GRINDING. ALL INTERIOR SURFACES INCLUDING NOZZLE OPENINGS, ATTACHMENTS, ANGLES, LAPPED PLATES, RADIAL [illegible] ETC., SHALL HAVE UNDERCUTTING FILLED, EXCESS WELD METAL AND WELD SPLATTER REMOVED [illegible] AND IN ADDITION, ALL SHARP EDGES [illegible] LISTED ABOVE SHALL BE GROUND TO [illegible]

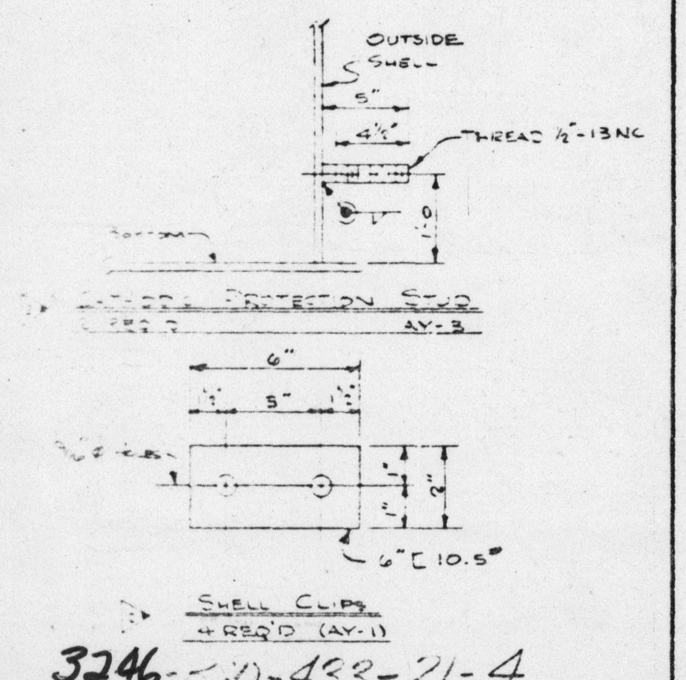
B/M 1

SHIP LIST 34822-02 BILL OF MATERIAL 1

NO. OF PIECES	MARK	NO. OF PIECES	MARK	SECTION	LENGTH FEET	LENGTH INCHES	REMARKS	WEIGHT
				SHELL PLATES				
1	SR-1A	1		R 88 5/16 x 1/4	16	8 7/16		1262
1	SR-1B	1		R 88 5/16 x 1/4"	10	0		743
1	SR-1C	1		R 86 3/16" x 1/4"	26	8 7/16		1960
1	SR-1D	1		R 86 3/16" x 1/4	26	8 7/16		1960
1	SR-1E	1		R 88 5/16 x 1/4	26	8 7/16		2008
16	SR-2-5	16		R 88 5/16" x 10.2#	26	8 7/16		32128
				TOP ANGLE				
6	SA-1	6		∠ 3 1/2" x 3" x 1/4	17	4 1/2	ARC ON BACK	618
				DIAPHRAGM SUPPORT ANGLE				1012
6	SA-2	6		∠ 4 x 3" x 1/4	17	5 5/16	ARC ON BACK	
1	AE-2			2" SHELL VENT				
				A 2 FS 150# F.F. S.O.F				5
				B 2 X.S PIPE .218 WALL	0	6		3
				CATHODIC PROTECTION STUDS				
2	AY-3	2		1/2 Ø SILICON BRONZE STUD	0	5	T.O.E	1
				SHELL CLIPS				
4	AY-1	4		6" C 10.5#	0	2		10

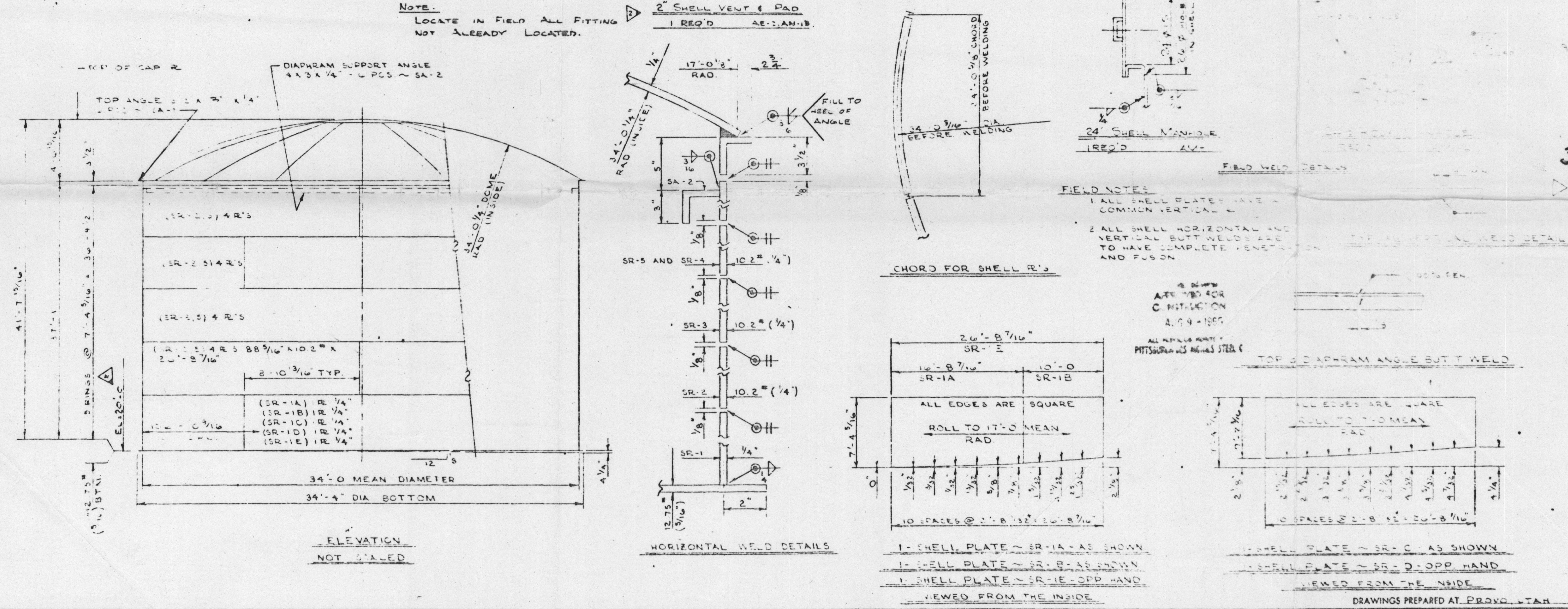
TOTAL = 417[illegible]

R = A283-C
PIPE = A53
FLGS = A181-GR1
SHAPES = A7 or A36



3246-220-433-21-4

BECHTEL'S TANK NO. D-2
BECHTEL CORPORATION'S
PURCHASE ORDER NO 850-433



NO.	DATE	DESCRIPTION OF REVISION	BY
5	[illegible]	ADDED 3/4" NOZZLE & 4" [illegible] 50# FF; ADDED NOTES	[illegible]
4	7-13-65	CHANGE ELEV DIMS., CHANGED RAD DIMS, DELETED 2" SHELL NOZZLE, CHANGED DWG. NO.	YG
3	6-9-65	ADDED DIMS PER CUSTOMER REQUEST	YG
2	5-25-65	ADD 3 SHELL NOZZLES, CATHODIC PROTECTION STUDS, ADD ORIENTATION, ADD ANGLE DIMS, DELETE 1 SHELL CLIP AND GROUNDING CONNECTION, CHANGED 2" SHELL VENT, ADDED SHELL CLIPS	YG
1	4-6-65	ADDED TANK NO.	YG

OPEN HOLES ______ GRIT BLAST YES [X] NO [ ]
SHOP PAINT YES (UNDERSIDE OF BTM ONLY)
PAINT CONTACT SURFACES YES [ ] NO [ ]

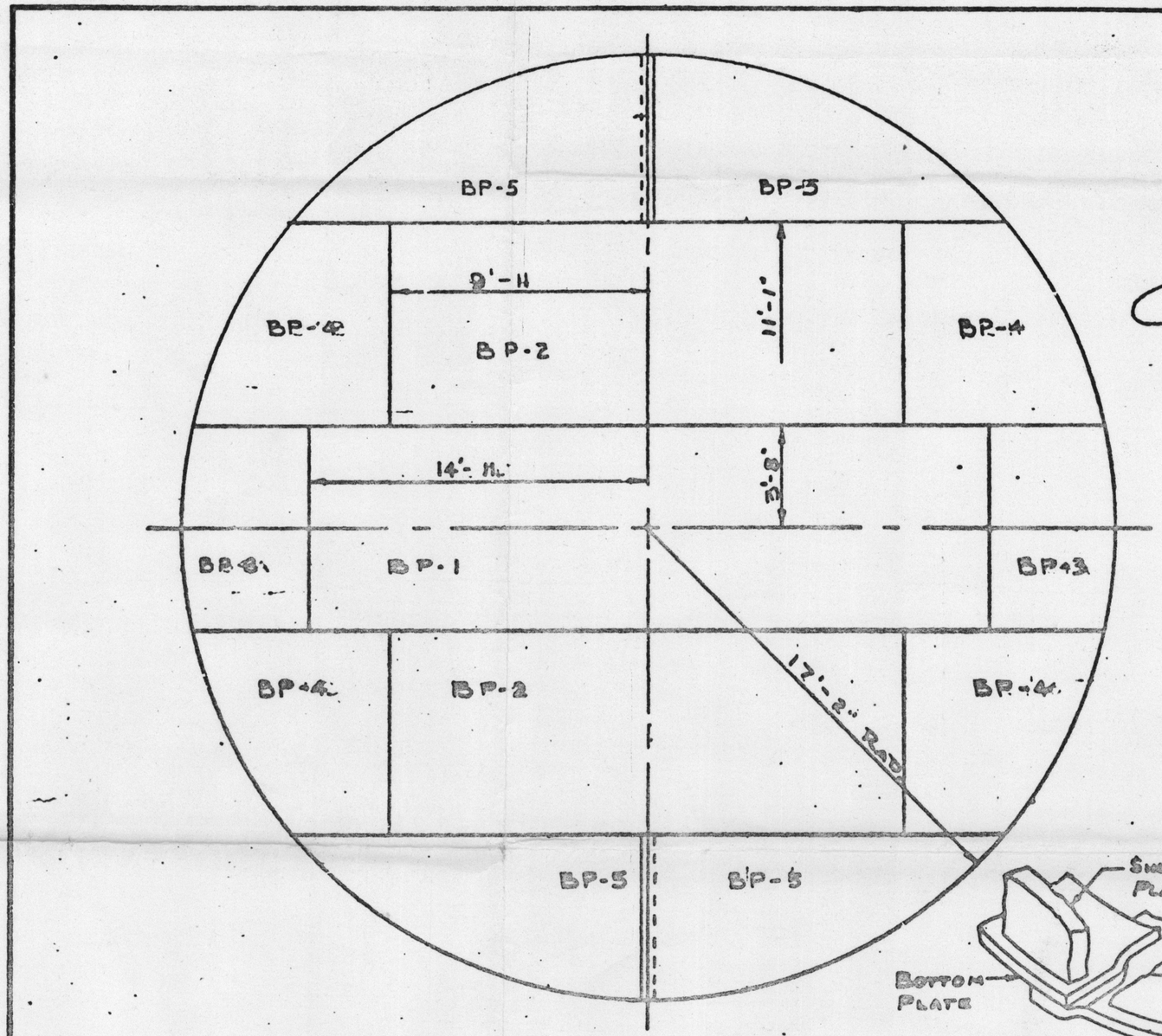
PITTSBURGH - DES MOINES STEEL CO.
ENGINEERS-FABRICATORS-CONTRACTORS
PITTSBURGH, PA. WARREN, PA. BRISTOL, PA. BALTIMORE, MD.
BIRMINGHAM, ALA. DES MOINES, IOWA PROVO, UTAH
STOCKTON, CALIF. SANTA CLARA, CALIF. FRESNO, CALIF.

1-34'Ø x 3?'-1 SHELL 240,000 GAL D R TANK
ELEVATION ORIENTATION AND DETAILS
SAN ONOFRE, CALIFORNIA

	BY	DATE	
DRAWN	SUGITA	1-27-65	DRAWING NO. 1
CHECKED	BR	4-13-65	CONTRACT NO. 34822-02

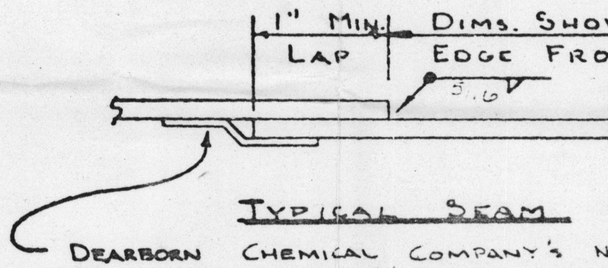
DRAWINGS PREPARED AT PROVO, UTAH

BILL PAGE ______



BOTTOM LAYOUT

12.75# PL



TYPICAL SEAM

DEARBORN CHEMICAL COMPANY'S NO-OXIDIZED #3 WRAPPER 6"x .025" (BP-6) UNDER ALL SEAMS AND ALSO UNDER SHELL CHIME WELD. FIELD CUT TO SUIT.

BREAK DOWN BOTTOM PLATES UNDER SHELL AS SHOWN TO FORM A SMOOTH BEARING SURFACE.

DRAWINGS PREPARED AT PROVO UTAH

34'-0"

BECHTEL CORPORATION'S
PURCHASE ORDER NO BSO-433
3246-01
BSO-433-20-0

FOR APPROVAL
PITTSBURGH-DES MOINES STEEL CO.
APR 12 1965

NO.	DATE	DESCRIPTION OF REVISION	BY

OPEN HOLES _____ GRIT BLAST YES ☒ NO ☐
SHOP PAINT YES (UNDERSIDE OF BTM PL'S ONLY)
PAINT CONTACT SURFACES YES ☐ NO ☐

PITTSBURGH-DES MOINES STEEL CO.
ENGINEERS-FABRICATORS-CONTRACTORS
PITTSBURGH, PA. WARREN, PA. BRISTOL, PA. BALTIMORE, MD.
BIRMINGHAM, ALA. DES MOINES, IOWA PROVO, UTAH
STOCKTON, CALIF. SANTA CLARA, CALIF. FRESNO, CALIF.

1-34'ϕ x 37'-1 240000 GAL FBDR K
BOTTOM LAYOUT
SAN ONOFRE, CALIFORNIA

	BY	DATE	
DRAWN	GVW	1-21-65	DRAWING NO. 10-01
CHECKED	BT	4-12-65	CONTRACT NO. 348220

BILL PAGE _____

4-12-65

MICRO-MASTER 105 mm

Southern California Edison Company

SCE

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