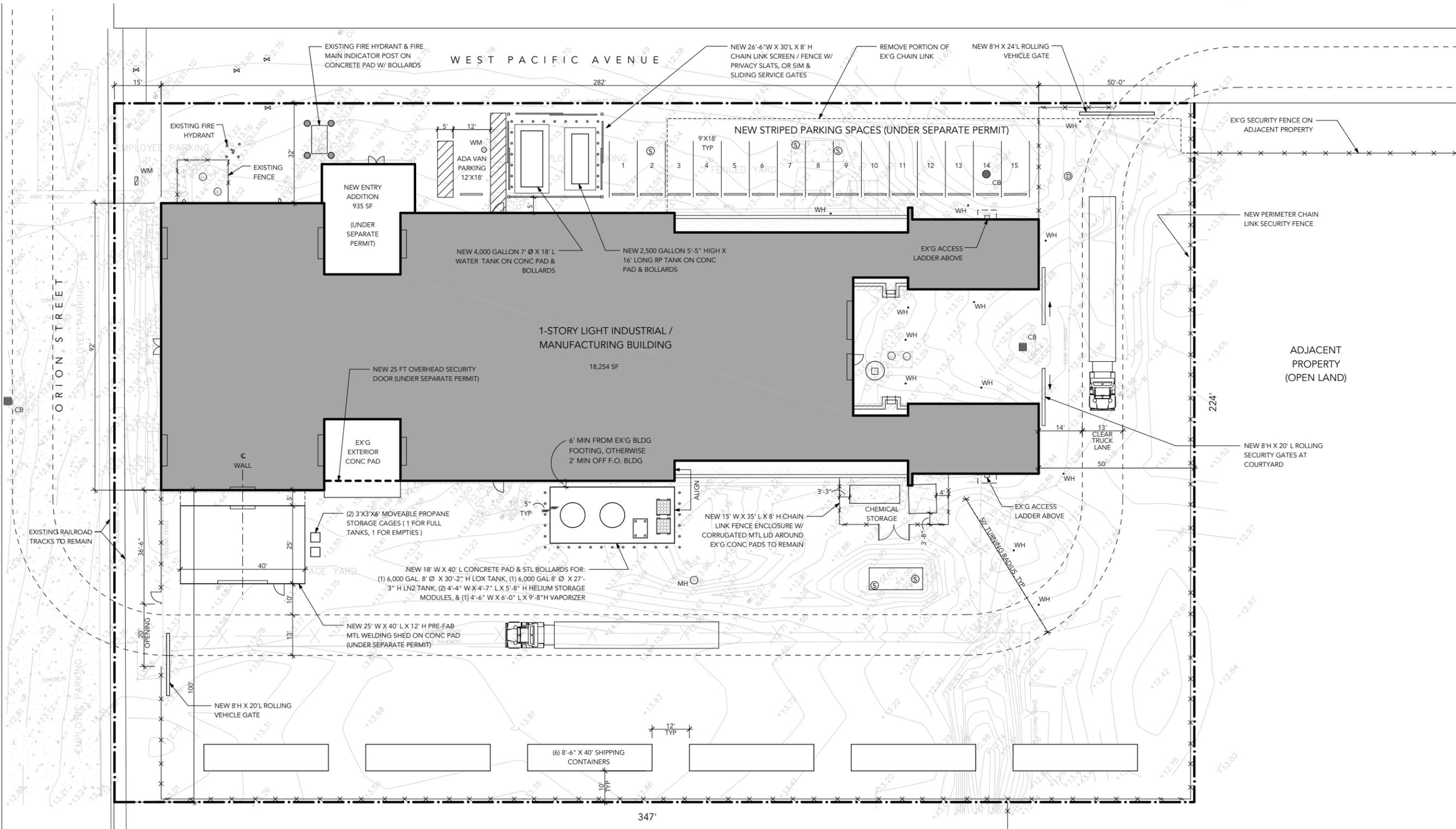


**LEGEND**

- MH MANHOLE COVER
- CB CATCH BASING / AREA DRAIN
- SS SANITARY SEWER MANHOLE COVER
- WH MONITORING WELL HEAD LOCATION
- SD STORM DRAIN MANHOLE
- WV WATER VALVE
- HYD FIRE HYDRANT
- BOLLARDS
- WM WATER METER

# ATTACHMENT B

## Site Plan



**1 SITE PLAN**  
1/16" = 1'-0"

project:  
**ORION HQ & TESTING FACILITY**

1690 Orion Street  
Alameda, California 94501

architect:  
**The Shift Group, Inc.**

1059 Union Street, Suite B  
San Francisco, California 94133  
415.260.8061  
theSHIFTgroup.co

consulting architect:  
**Peter Benoit Architect, Inc.**

3015 Hyperion Avenue  
Los Angeles, California 90027  
www.peterbenoitarchitect.com  
t 323.363.6466



drawing issue:


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phase: USE PERMIT  
date: 30 MAY 2017

sheet title:

**SITE PLAN**

**A0.2**

# CONSTRUCTION NOTES

- 1. GENERAL**
- A. ALL WORK SHALL BE PERFORMED IN COMPLIANCE WITH THE PRINCIPLES OF GOOD CONSTRUCTION PRACTICE.
- B. DURING THE CONSTRUCTION PERIOD THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY (INCLUDING FIRE SAFETY) OF THE NEW, AS WELL AS EXISTING, STRUCTURES. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING, BRACING, AND GUYS IN ACCORDANCE WITH ALL NATIONAL, STATE, AND LOCAL SAFETY ORDINANCES. ANY DEVIATION FROM SUCH ORDINANCES MUST BE APPROVED PRIOR TO ERECTION. THAT RESPONSIBILITY SHALL APPLY CONTINUOUSLY AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS.
- C. THE CONTRACTOR SHALL CHECK ALL INFORMATION ON THE PLANS (INCLUDING DIMENSIONS) PRIOR TO COMMENCING THE WORK. ALL DISCREPANCIES SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER, AND SHALL BE RESOLVED BEFORE PROCEEDING WITH THE WORK.
- D. ALL CONSTRUCTION WORK (INCLUDING, BUT NOT LIMITED TO, MEANS, METHODS, SEQUENCES, TECHNIQUES, PROCEDURES, ETC.) IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- E. THE RECOMMENDATIONS (IF ANY) ON THESE PLANS REGARDING THE MEANS, METHODS, SEQUENCES, TECHNIQUES, PROCEDURES, ETC. OF CONSTRUCTION SHALL BE CONSIDERED AS MINIMAL REQUIREMENTS. THE CONTRACTOR SHALL NOT DEVIATE FROM THESE RECOMMENDATIONS UNLESS SUCH DEVIATION IS TOWARD MORE STRINGENT REQUIREMENTS.
- F. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESTORATION OF WORKING CONDITION OF ALL EXISTING COMPONENTS AND STRUCTURES AFFECTED BY THIS CONSTRUCTION. THE CONTRACTOR SHALL CONSTANTLY KEEP THE AREA OF CONSTRUCTION FROM ACCUMULATION OF WASTE MATERIALS AND DEBRIS. AT THE END OF WORK, THE CONTRACTOR SHALL REMOVE ALL WASTE, SURPLUS MATERIAL, TOOLS, AND EQUIPMENT.
- G. THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THIS PROJECT EXCEPT FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE ENGINEER. ANY LIABILITY BY SGE AS RELATED TO THIS PROJECT IS LIMITED TO THE ENGINEERING FEES RECEIVED FOR THE SERVICES RENDERED.

- 2. DESIGN CONSIDERATIONS**
- A. THESE STRUCTURAL PLANS AND CALCULATIONS WERE DEVELOPED BY SGE RESTRICTIVELY IN REGARD TO THE INSTALLATION OF NITROGEN, OXYGEN, AND HELIUM EQUIPMENT AT VENTIONS LLC.
- B. THIS DESIGN DOES NOT CONSIDER THE STRUCTURAL ADEQUACY OF THE EQUIPMENT LEGS, BASEPLATES, AND CONNECTIONS BETWEEN THESE MEMBERS BY OTHERS. FOR THE PURPOSES OF THIS DESIGN, ALL NEW EQUIPMENT WAS ASSUMED TO BE STRUCTURALLY ADEQUATE.
- C. ALL MATERIALS, STRUCTURES, AND WORKMANSHIP SHALL CONFORM TO THESE PLANS, CALCULATIONS, AS WELL AS TO THE ESTABLISHED GUIDELINES SET FORTH BY 2016 CBC, AISC MANUAL OF STEEL CONSTRUCTION (14TH EDITION), AND OTHER APPLICABLE REGULATORY DOCUMENTS. IN CASE OF ANY CONFLICTS IN SPECIFICATIONS, THE ONE(S) OF THE APPLICABLE CODE SHALL GOVERN.
- D. THESE PLANS AND CALCULATIONS ARE BASED UPON THE ASSIGNMENT FROM, AS WELL AS ON THE INFORMATION ABOUT, THE NEW EQUIPMENT, AS PROVIDED BY AIR PRODUCTS & CHEMICALS, INC. (MR. LORENZO CABALLERO, TEL: 480-282-4047).
- E. THIS DESIGN SHALL BE USED EXCLUSIVELY BY AIR PRODUCTS & CHEMICALS, INC., AS WELL AS THEIR CONTRACTORS, ANY OTHER USE (INCLUDING, BUT NOT LIMITED TO, REVIEW, DISSEMINATION, OR COPYING) OF THESE DESIGN MATERIALS AND ANY PORTION THEREOF, AS WELL AS AN USE OF THESE MATERIALS BY ANY PARTY OR PARTIES OTHER THAN THE ONE(S) SPECIFIED ABOVE, ARE STRICTLY PROHIBITED UNLESS UNDER A WRITTEN PERMISSION BY SGE.
- F. DO NOT SCALE THE PLANS.
- G. THESE PLANS SUPERSEDE ANY OTHER PLANS PREVIOUSLY ISSUED BY SGE FOR THE SUBJECT JOB.
- H. THE MEASUREMENTS SHOWN ON THE PLANS ARE BASED UPON THE CATALOGUED IDEAL DIMENSIONS OF THE EQUIPMENT. THE CONTRACTOR SHALL VERIFY THE DIMENSIONS AGAINST THOSE OF THE TEMPLATE AND/OR THE ACTUAL EQUIPMENT PRIOR TO ANY CONSTRUCTION ACTIVITIES.

- 3. LOADS**
- THESE STRUCTURAL PLANS AND CALCULATIONS WERE BASED UPON THE FOLLOWING MINIMAL LOADS COMPLIANT WITH CHAPTER 16 OF THE 2016 CBC AND ASCE 7-10 (REFER TO SEISMIC PARAMETER SCHEDULE).

<b>2 S1</b>	
<b>A. WIND DESIGN DATA</b>	
BASIC WIND SPEED (3-SECOND GUST), MPH	115
RISK CATEGORY	III
WIND EXPOSURE	D
<b>B. EARTHQUAKE DESIGN DATA</b>	
SEISMICITY	-122.282535
SITE LATITUDE	37.7764
SITE CLASS	D
<b>C. SPECTRAL RESPONSE COEFFICIENTS</b>	
SS	1.5
S1	0.6
SDS	1.0
SD1	0.6
SEISMIC DESIGN CATEGORY	D
RISK CATEGORY	III
ANALYSIS PROCEDURE USED	EQUIVALENT LATERAL FORCE

- 4. SOILS**
- A. THE DESIGN WAS BASED UPON THE GEOTECHNICAL MEMO FOR THE SUBJECT SITE BY STORESUND CONSULTING (DATED MARCH, 2017).
- B. THE GEOTECHNICAL MEMO SHALL BE USED AS A PRIMARY SOURCE OF ALL GEOTECHNICAL INFORMATION AND SPECIFICATIONS.
- C. THE BEARING CAPACITY OF SOIL UNDER THE NEW PADS WAS ASSUMED AT 750 PSF AND 1500 PSF FOR SEISMIC LOADING. THE SOIL PRESSURE UNDER THE NEW EQUIPMENT PAD IS NOT EXPECTED TO EXCEED 750 PSF UNDER THE DEAD AND LIVE LOADS, AND 1500 PSF UNDER DEAD, LIVE, AND SEISMIC LOADS.
- D. CONTRACTOR SHALL IMMEDIATELY INFORM SGE IF SOILS OF DIFFERENT NATURE OR PROPERTIES (GROUND WATER, APPARENTLY LOWER CAPACITY SOILS, OR AGGRESSIVE SOILS) WERE ENCOUNTERED DURING THE CONSTRUCTION.
- E. THE CONTRACTOR SHALL LOCATE, REMOVE, OR PROTECT ALL UNDERGROUND PIPING, CONDUITS, VAULTS, ETC. AS REQUIRED BY THE APPLICABLE CODE AND JURISDICTION.
- F. THE NEW PADS SHALL NOT BE PLACED AT THE FOLLOWING LOCATIONS:
- OVER ANY EXISTING STRUCTURE, AND/OR CAST AGAINST SUCH STRUCTURES;
  - CLOSER THAN 6" (CLEAR) TO ANY EXISTING FOOTINGS;
  - CLOSER THAN 24" TO ANY EXISTING WALL;
  - AT ABOVE EXISTING RETAINING WALLS UNLESS FURTHER AWAY (CLEAR) THAN THE DEPTH OF THE WALL.
- ANY OF THE ABOVE CONDITIONS SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF SGE PRIOR TO THE BEGINNING OF CONSTRUCTION OR UPON DISCOVERY. NO WORK SHALL BE CONDUCTED ON THE PADS AT SUCH LOCATIONS UNTIL WRITTEN AUTHORIZATION BY SGE.
- G. AS A MINIMUM, THE SOIL IMPROVEMENTS SHALL INCLUDE THE FOLLOWING:
- D. THE NEW PADS SHALL BE UNDERLAIN BY A 10" MIN. LAYER OF STRUCTURAL FILL CONSISTING OF CLEAN CRUSHED STONE, GRAVEL, OR CLASS II BASE COMPACTED TO A FIRM AND UNYIELDING CONSISTENCY WITH A MINIMUM OF 4 PASSES OF A VIBRATORY PLATE COMPACTOR OR DRUM ROLLER WITH A MINIMUM STATIC WEIGHT OF 500 POUNDS.
- E. A MINIMUM OF 8-INCH DEEP LAYER OF SOIL UNDERLYING THE STRUCTURAL FILL SHALL BE SCARIFIED AND RECOMPACTED TO MINIMUM 95% RELATIVE COMPACTION OF MAXIMUM DRY DENSITY PER ASTM D1557.
- F. ALL SOIL IMPROVEMENT WORK (INCLUDING, BUT NOT LIMITED TO, ON SOIL COMPACTION) IS SUBJECT TO SPECIAL INSPECTION IN COMPLIANCE WITH IBC/CBC SECTIONS 1705.6 AND 1804.6.
- G. ALL EARTHWORK IS RECOMMENDED TO BE CONDUCTED UNDER THE GUIDANCE OF A REGISTERED GEOTECHNICAL OR CIVIL ENGINEER.
- H. A GEOTECHNICAL ENGINEER FAMILIAR WITH THE SITE IS RECOMMENDED TO REVIEW THESE PLANS, AS WELL AS THE EXCAVATION AND IMPROVEMENTS OF SOIL. THE PLACING OF REBARS AND CONCRETE IS RECOMMENDED NOT TO COMMENCE WITHOUT A WRITTEN AUTHORIZATION (MEMO) FROM THE GEOTECHNICAL ENGINEER STATEMENT OF THE ADEQUACY OF THE DESIGN ASSUMPTIONS AND THE ACTUAL EXCAVATION.
- I. SETTLEMENT MUST BE MONITORED AND DOCUMENTED BY GEOTECHNICAL ENGINEER OF RECORD AT 0, 3, 6 AND 12 MONTHS

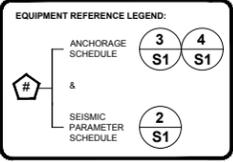
- 5. CONCRETE**
- A. ALL NEW REINFORCED CONCRETE SHALL BE OF NORMAL WEIGHT (145 PCF);
- MINIMUM COMPRESSIVE STRENGTH OF IN 28 DAYS 4,500 PSI ASTM C39;
  - PORTLAND CEMENT TYPE III ASTM C150;
  - MAXIMUM AGGREGATE SIZE 1" ASTM C33;
  - MAXIMUM WATER-CEMENT RATIO 0.45
  - AIR ENTRAINMENT 4.0% ±1.5% ASTM C260.
- B. CONCRETE SHALL BE MAINTAINED IN A MOIST CONDITION FOR A MINIMUM OF SEVEN (7) DAYS AFTER PLACEMENT. ALTERNATE METHODS WILL BE APPROVED IF SATISFACTORY PERFORMANCE CAN BE ASSURED.
- C. THE SURFACE OF ALL NEW CONCRETE SHALL BE FLAT (1/8" MAX UNFLATNESS UNDER 10-FT STRAIGHTEDGE), AND SHALL HAVE ROUGH BROOM FINISH, FORM 3/4" CHAMFERS AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE. THE SURFACE OF CONCRETE SHALL SLOPE AT 1% MAX. FOR DRAINAGE.
- D. CONCRETE SURFACE TO ASSURE FULL AND UNIFORM CONTACT WITH EQUIPMENT BASEPLATES, IF NECESSARY, USE NON-SHRINK GROUTING UNDER BASEPLATES (SIKAGROUT 212 OR APPROVED EQUAL).
- E. UNLESS SPECIFICALLY AUTHORIZED BY SGE, INSTALLATION OF EQUIPMENT MAY BEGIN NOT EARLIER THAN 7 DAYS AFTER POURING OF CONCRETE.
- F. SPECIAL INSPECTION OF CONCRETE (2016 CBC CHAPTER 17) IS NOT REQUIRED (DESIGNED AS 2500 PSI CONCRETE).

- 6. REINFORCING STEEL**
- A. UNLESS NOTED OTHERWISE, ALL REINFORCING STEEL SHALL CONFORM TO ASTM SPECIFICATION A615 GRADE 60. ALL REBARS CONNECTED BY, OR SUBJECTED TO, WELDING SHALL BE OF ASTM SPECIFICATION A706.
- B. ALL REINFORCING STEEL SHALL BE SPLICED WITH CLASS B SPLICES. SPLICE LENGTHS SHALL BE AS FOLLOWS:

REBAR SIZE	MINIMUM SPLICE LENGTH		
	TOP REBAR	BOTTOM REBAR	
#4	19"	15"	15"
#5	24"	18"	18"
#6	28"	22"	22"
#7	41"	32"	32"
#8	46"	35"	35"
#9	58"	45"	45"

- C. REBARS SHALL BE HELD IN THE REQUIRED POSITION BY MEANS OF APPROVED DEVICES.
- D. REBAR SPACING SHOWN IS MAXIMUM DISTANCE BETWEEN REBAR CENTER LINES.
- E. REBARS SHALL BE CLEAN OF DIRT, OIL, SCALE, AND FOREIGN MATERIALS.
- 7. CAST-IN ANCHORS**
- A. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO ENSURE THE PRECISE INSTALLATION OF THE ANCHORS.
- B. THE DIMENSIONS BETWEEN THE ANCHORS SHALL BE VERIFIED AGAINST THOSE OF THE ACTUAL TANK OR FULL-SCALE TEMPLATE.
- C. SPECIAL FORMS SHALL BE INSTALLED TO PREVENT ANY MOVEMENT OF ANCHORS FROM THE EXACT POSITION DURING THE POURING OF CONCRETE.
- D. ALL ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH THESE PLANS AND WITH THE EQUIPMENT LAYOUT BY VENTIONS LLC.
- E. ALL CAST-IN ANCHORS SHALL STRICTLY MEET THE NOTED ASTM AND GRADE SPECIFICATIONS, WITH HEAVY HEX NUTS PER ASTM A563 GRADE C.
- F. **STEELS OF HIGHER GRADES OR DIFFERENT ASTM SPECIFICATIONS SHALL NOT BE USED WITHOUT A REVIEW AND WRITTEN APPROVAL BY SGE.**
- G. TIGHTEN ALL NUTS TO A SNUG CONDITION AISC SPECIFICATIONS.
- H. SPECIAL INSPECTION (2016 CBC CHAPTER 17) IS REQUIRED DURING THE INSTALLATION OF THE CAST-IN-PLACE ANCHORS.
- 8. POST-INSTALLED ANCHORS**
- A. POST-INSTALLED ANCHORS SHALL BE USED FOR THE CONNECTION OF THE EQUIPMENT.
- B. ALL POST-INSTALLED ANCHORS SHALL BE HILTI HIT HY 200 PER ICC ESR3187.
- C. UNLESS NOTED OTHERWISE, OTHER ANCHORAGE HARDWARE DOES NOT NEED TO BE GALVANIZED. ALL VAPORIZER ANCHORAGE HARDWARE (THREADED RODS, NUTS, AND WASHERS) SHALL BE GALVANIZED.
- D. THE ANCHORAGE HARDWARE SHALL STRICTLY MEET THE NOTED ASTM SPECIFICATIONS, PARTICULARLY: THREADED RODS - F1554 GRADE AS SHOWN; NUTS - ASTM A563 GRADE C; PLATE WASHERS - A36; GRATE WASHERS - F436.
- E. **STEELS OF HIGHER GRADES OR DIFFERENT ASTM SPECIFICATIONS SHALL NOT BE USED WITHOUT A REVIEW AND WRITTEN APPROVAL BY SGE.**
- F. SPECIAL INSPECTION (2016 CBC CHAPTER 17) IS REQUIRED DURING THE INSTALLATION OF THE ANCHORS.
- G. THE SET ANCHOR ROD SHOULD NOT BE DISTURBED OR LOADED BEFORE DURING THE SPECIFIED CURING TIME. REFER TO ICC ESR3187 FOR CURING TIMES AND TEMPERATURES.
- H. UNLESS SPECIFICALLY AUTHORIZED BY SGE, INSTALLATION OF THE ANCHORS AND EQUIPMENT MAY BEGIN NOT EARLIER THAN 7 DAYS AFTER POURING OF CONCRETE.
- I. USE EQUIPMENT BASEPLATES AS A TEMPLATE FOR THE INSTALLATION OF THE ANCHORS. REFER TO PLANS BY OTHERS FOR THE ORIENTATION OF THE EQUIPMENT ON THE PADS.
- J. INSTALL ALL SPECIFIED ANCHORS IN STRICT COMPLIANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
- K. USE HAMMER DRILL AND CARBIDE BITS TO DRILL ANCHOR HOLES.
- L. INSTALL WASHERS AND THREAD DOUBLE NUTS, TIGHTENING/COUNTER-TIGHTENING TO SNUG CONDITION.
- 9. STRUCTURAL STEEL**
- A. STRUCTURAL STEEL (NEW HSM PLATES) SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE AISC SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL BUILDINGS (14TH EDITION), AND THE ASTM SPECIFICATION A36.
- B. WELD STRUCTURAL STEEL IN COMPLIANCE WITH ANSIAWS D1, LATEST EDITION. WELDERS SHALL BE CERTIFIED AS REQUIRED BY THE GOVERNING CODE AUTHORITY. WELDING SHALL BE DONE BY THE ELECTRIC ARC PROCESS USING APPROVED COATED RODS (E-70XX OR BETTER); WELDING MAY BE PERFORMED USING THE SUBMERGED ARC PROCESS WITH AUTOMATIC WELDING (SAW-1). PERFORM SHOP WELDING BY AN APPROVED FABRICATOR.
- C. UNLESS A LARGER SIZE FILLET WELD IS INDICATED, PROVIDE MINIMUM SIZE OF WELD PER AISC MANUAL TABLE J2.4. WELD LENGTHS INDICATED ARE THE NET EFFECTIVE LENGTH REQUIRED.
- D. FIELD CUTTING OR BURNING OF STRUCTURAL STEEL IS NOT PERMITTED WITHOUT WRITTEN APPROVAL OF THE ARCHITECT.
- E. REMOVE ALL BURRS AND SMOOTHEN ALL CORNERS TO 1/8" CHAMFER MINIMUM.
- F. ALL NEW BOLTS SHALL BE ASTM A307, GALVANIZED, WITH MATCHING NUTS, UNLESS NOTED OTHERWISE. ALL BOLTED CONNECTIONS SHALL BE TIGHTENED SNUG.
- G. ALL NEW STEEL SHALL BE SANDBLASTED, THOROUGHLY CLEANED, AND PAINTED.
- H. CORROSION PROTECTION:
- PREP: SSPC SP 1 SOLVENT CLEAN AND SSPC 2 AND 3 HAND AND POWER TOOL CLEAN.
  - PRIME: MACROPOXY 646-100 5-10 MILS
  - INTERMEDIATE: MACROPOXY 646-100 5-10 MILS
  - FINISH: HI SOLIDS POLY 2-3 MILS

- 10. ABBREVIATIONS**
- |        |                      |        |                        |
|--------|----------------------|--------|------------------------|
| BCD    | BOLT CIRCLE DIAMETER | (N)    | NEW COMPONENT          |
| BW     | BOTH WAYS            | NIC    | NOT IN THIS CONTRACT   |
| CL     | CENTERLINE           | NTS    | NOT TO SCALE           |
| CLR    | CLEAR                | NWC    | NORMAL WEIGHT CONCRETE |
| CONT   | CONTINUOUS           | OC     | CENTER-TO-CENTER       |
| DIA    | DIAMETER             | PL     | PLATE                  |
| EA     | EACH                 | PSF    | POUNDS PER SQUARE FOOT |
| EXP    | EXPANSION JOINT      | PSI    | POUNDS PER SQUARE INCH |
| (E)    | EXISTING COMPONENT   | REIN   | REINFORCEMENT          |
| (F)    | FUTURE COMPONENT     | RPT    | REPORT                 |
| EMB    | EMBEDMENT            | STD    | STANDARD               |
| GALV   | GALVANIZED           | T&B    | TOP AND BOTTOM         |
| HORIZ  | HORIZONTAL           | TBD    | TO BE DETERMINED       |
| LAR    | LIQUID ARGON         | TOC    | TOP OF CONCRETE        |
| LIN    | LIQUID NITROGEN      | TOS    | TOP OF STEEL           |
| LONGIT | LONGITUDINAL         | TRANSV | TRANSVERSE             |
| LOX    | LIQUID OXYGEN        | TYP    | TYPICAL                |
| MAX    | MAXIMUM              | UNO    | UNLESS NOTED OTHERWISE |
| MIN    | MINIMUM              | VERT   | VERTICAL               |



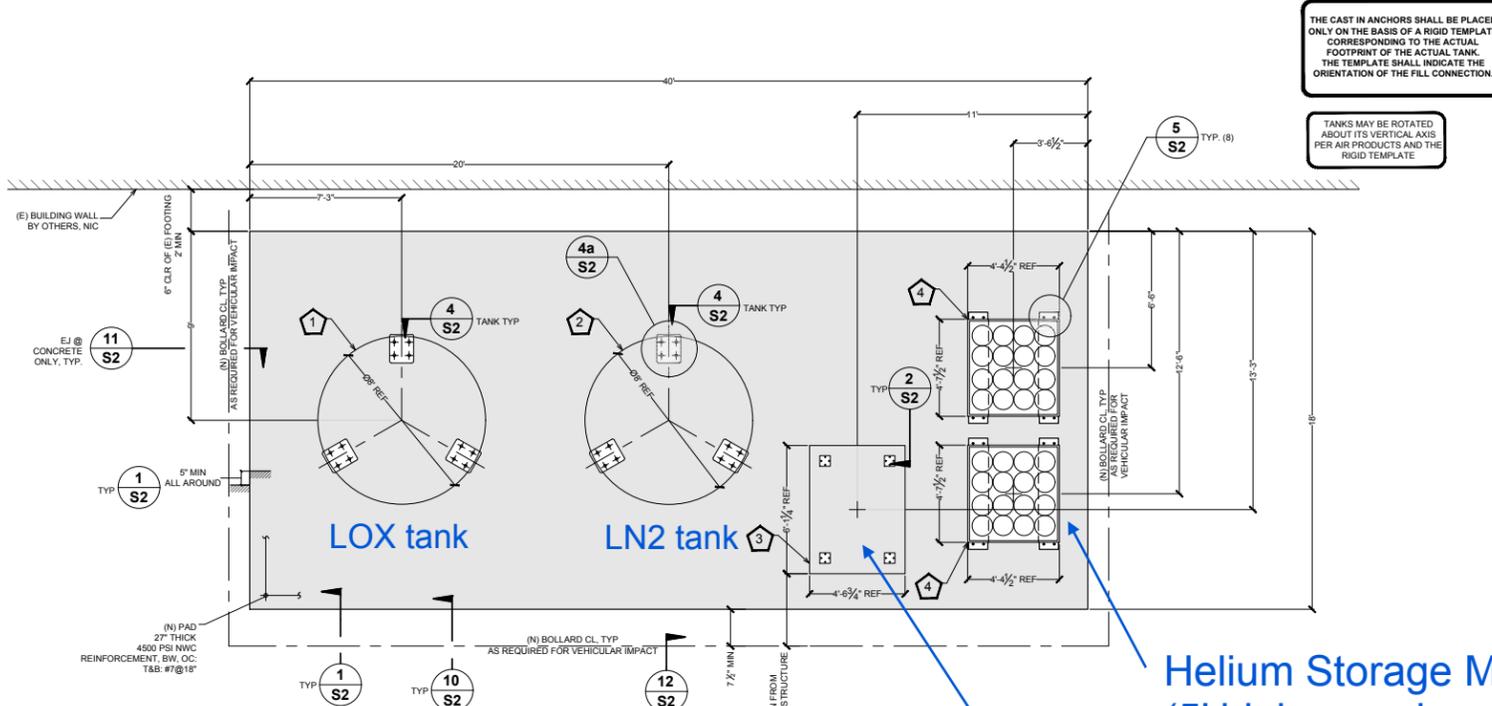
THE SHOWN MINIMAL DISTANCES TO THE PAD EDGES, ANCHOR EDGE DISTANCES, NUMBERS AND TYPE OF ANCHORS, AND EQUIPMENT CLEARANCE DISTANCES SHALL BE MAINTAINED.

FOR SITE PLAN, EQUIPMENT LAYOUT AND ORIENTATION, AND OTHER INFORMATION REFER TO PLANS BY OTHERS.

FOR ADDITIONAL INFORMATION, PARTICULARLY, TO SECTIONS:

- "SOILS"
- "CONCRETE"
- "REINFORCEMENT"
- "CAST-IN ANCHORS"
- "POST-INSTALLED ANCHORS"
- "STRUCTURAL STEEL"

# ATTACHMENT C LOX, LN2, Helium Storage Module & Vaporizer tank pad



THE CAST-IN ANCHORS SHALL BE PLACED ONLY ON THE BASIS OF A RIGID TEMPLATE CORRESPONDING TO THE ACTUAL FOOTPRINT OF THE ACTUAL TANK. THE TEMPLATE SHALL INDICATE THE ORIENTATION OF THE FILL CONNECTION.

TANKS MAY BE ROTATED ABOUT ITS VERTICAL AXIS PER AIR PRODUCTS AND THE RIGID TEMPLATE

**1** (N) PAD AND (N) TANK LAYOUT  
PLAN, SCALE: 1" = 4'-0"

Helium Storage Modules  
(5' high open box for std. helium tanks)

Vaporizer

SYMBOL	EQUIPMENT UNIT	DESIGN PARAMETER	WEIGHT/MASS		SEISMIC DESIGN DATA (STRENGTH)						
			EMPTY KIPS	FULL OR ICED KIPS	HEIGHT FT	I <sub>p</sub>	R	RP	SEISMIC COEFF.	BASE SHEAR, KIPS	
1	(N) TANK: 6,000-GALLON LOX OR LN2 (V-6050-B-250-A-S-O)		33.0	89.3	30.2	1.25/1.5	2	2.5	0.625	55.8	
2	(N) TANK: 6,000-GALLON LOX OR LN2 (VCS-6000T-NC-250-AP-A)		26.3	83.4	27.3	1.25/1.5	2	2.5	0.625	52.2	
3	(N) VAPORIZER: HAI-848-566		1.6	4.0	9.7	1.25/1.5	2	2.5	0.625	2.5	
4	(N) HELIUM STORAGE MODULE		4.9	5.1	5.7	1.25/1.5	2	2.5	0.450	2.3	

**2** SEISMIC DESIGN PARAMETER SCHEDULE

SYMBOL	EQUIPMENT UNIT	ANCHORAGE	CAST-IN ANCHORS, TYP - SPECIAL INSPECTION REQ'D						WASHERS, (1) EACH ANCHOR			
			Ø IN	EMB IN	STEEL GRADE	EXT. IN	# PER LEG	# PER UNIT	SIZE	THK IN	HOLE Ø, IN	MATERIAL
1	(N) TANK: 6,000-GALLON LOX OR LN2 (V-6050-B-250-A-S-O)		1 1/2	22	55	6	4	12	STANDARD STEEL WASHER			
2	(N) TANK: 6,000-GALLON LOX OR LN2 (VCS-6000T-NC-250-AP-A)		1 1/2	22	55	6	4	12	STANDARD STEEL WASHER			

REFER TO PLANS AND CONSTRUCTION NOTES FOR ADDITIONAL INFORMATION

**3** ANCHORAGE SCHEDULE (CAST-IN)

SYMBOL	EQUIPMENT UNIT	ANCHORAGE	EPOXY ANCHORS, TYP - SPECIAL INSPECTION REQ'D						WASHERS, (1) EACH ANCHOR			
			Ø IN	EMB IN	STEEL GRADE	EXT. IN	# PER LEG	# PER UNIT	SIZE	THK IN	HOLE Ø, IN	MATERIAL
3	(N) VAPORIZER: HAI-848-566		3/8	6	105	3	4	16	STANDARD GALVANIZED STEEL WASHER			
4	(N) HELIUM STORAGE MODULE		3/8	6	105	3	2	8	STANDARD STEEL WASHER			

REFER TO PLANS AND CONSTRUCTION NOTES FOR ADDITIONAL INFORMATION

**4** ANCHORAGE SCHEDULE (EPOXY)

VERIFICATION AND INSPECTION TASK	CONTINUOUSLY DURING TASK LISTED	PERIODICALLY DURING TASK LISTED	REFERENCED STANDARD	REPORT
<b>CONCRETE</b>				
1. INSPECT ANCHORS CAST IN CONCRETE	-	X	ACI 318: 17.8.2	UPON INSPECTION
2. INSPECTION OF ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS - ADHESIVE ANCHORS	-	X	ACI 318: 17.8.2	UPON INSPECTION
3. INSPECTION OF CONCRETE CONSTRUCTION	-	-	CBC 1705.3 EXCEPTION 2.3	-
<b>SOILS</b>				
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY	-	X	-	-
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL	-	X	-	-
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS	-	X	-	-
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL	X	-	-	-
5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY	-	X	-	-

DEPUTY INSPECTORS ARE REQUIRED TO BE REGISTERED AND APPROVED BY THE AHJ

SPECIAL INSPECTION SCHEDULE

CLIENT

AIR PRODUCTS & CHEMICALS, INC.

3100 W. Ray Road, Suite 310  
Chandler, AZ 85226

**INSTALLATION OF NITROGEN, OXYGEN, AND HELIUM EQUIPMENT**

LOCATION  
**VENTIONS LLC**  
 397 W Pacific Ave., Alameda, CA 94501

THESE PLANS WERE DEVELOPED RESTRICTIVELY FOR USE ON THE STRUCTURES AND BY PERSONS COMPANY AS SPECIFIED IN THE TITLE BLOCK. ANY OTHER USE (INCLUDING, BUT NOT LIMITED TO, DISSEMINATION AND COPYING) OF THESE PLANS AND ANY PORTION THEREOF, AS WELL AS ANY USE OF THE PLANS BY ANY PARTY OR PARTIES OTHER THAN THE ONE(S) SPECIFIED IN THE TITLE BLOCK, ARE STRICTLY PROHIBITED UNLESS UNDER A WRITTEN PERMISSION BY SGE.

S. GORDIN STRUCTURAL DESIGN & ENGINEERING SERVICES (SGE), INC.  
2881 Business Cir. Dr., Ste. 105, Irvine, CA 92612  
TEL: (949) 552-5244 FAX: (949) 552-5243

March 2, 2017

SGE JOB No. 517.022.488

VENTIONS

**REVISIONS**

REV	DATE	DESCRIPTION	BY
	March 2, 2017	DESIGNED BY DT	
		APPROVED BY VSG	

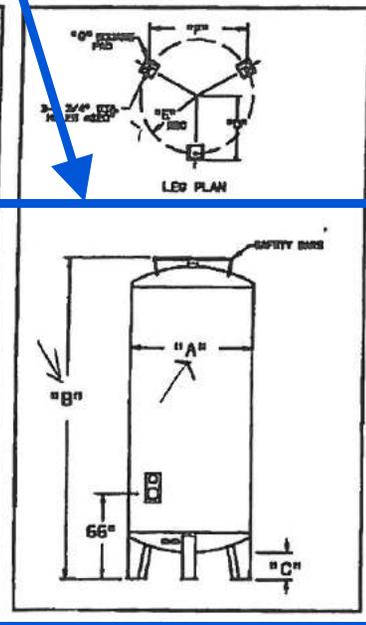
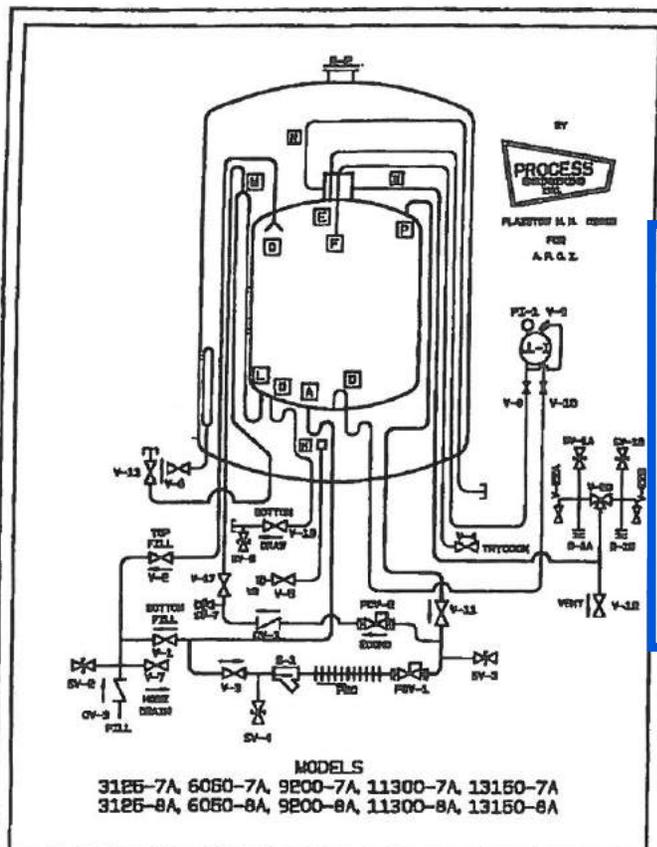
TOTAL STRUCTURAL SHEETS - 2

**STRUCTURAL NOTES AND PLAN**

S-1

LOX tank elevation (8' dia X 30'-2" high)

600m-250-589  
355



**PROCESS ENGINEERING INC.**

ITEM	FUNCTION	DESCRIPTION	3125	6080	9200	11300	13150
1	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...
3	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...
5	...	...	...	...	...	...	...
6	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...
26	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...
28	...	...	...	...	...	...	...
29	...	...	...	...	...	...	...
30	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...
32	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...
35	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...
41	...	...	...	...	...	...	...
42	...	...	...	...	...	...	...
43	...	...	...	...	...	...	...
44	...	...	...	...	...	...	...
45	...	...	...	...	...	...	...
46	...	...	...	...	...	...	...
47	...	...	...	...	...	...	...
48	...	...	...	...	...	...	...
49	...	...	...	...	...	...	...
50	...	...	...	...	...	...	...
51	...	...	...	...	...	...	...
52	...	...	...	...	...	...	...
53	...	...	...	...	...	...	...
54	...	...	...	...	...	...	...
55	...	...	...	...	...	...	...
56	...	...	...	...	...	...	...
57	...	...	...	...	...	...	...
58	...	...	...	...	...	...	...
59	...	...	...	...	...	...	...
60	...	...	...	...	...	...	...
61	...	...	...	...	...	...	...
62	...	...	...	...	...	...	...
63	...	...	...	...	...	...	...
64	...	...	...	...	...	...	...
65	...	...	...	...	...	...	...
66	...	...	...	...	...	...	...
67	...	...	...	...	...	...	...
68	...	...	...	...	...	...	...
69	...	...	...	...	...	...	...
70	...	...	...	...	...	...	...
71	...	...	...	...	...	...	...
72	...	...	...	...	...	...	...
73	...	...	...	...	...	...	...
74	...	...	...	...	...	...	...
75	...	...	...	...	...	...	...
76	...	...	...	...	...	...	...
77	...	...	...	...	...	...	...
78	...	...	...	...	...	...	...
79	...	...	...	...	...	...	...
80	...	...	...	...	...	...	...
81	...	...	...	...	...	...	...
82	...	...	...	...	...	...	...
83	...	...	...	...	...	...	...
84	...	...	...	...	...	...	...
85	...	...	...	...	...	...	...
86	...	...	...	...	...	...	...
87	...	...	...	...	...	...	...
88	...	...	...	...	...	...	...
89	...	...	...	...	...	...	...
90	...	...	...	...	...	...	...
91	...	...	...	...	...	...	...
92	...	...	...	...	...	...	...
93	...	...	...	...	...	...	...
94	...	...	...	...	...	...	...
95	...	...	...	...	...	...	...
96	...	...	...	...	...	...	...
97	...	...	...	...	...	...	...
98	...	...	...	...	...	...	...
99	...	...	...	...	...	...	...
100	...	...	...	...	...	...	...

MODELS  
3125-7A, 6080-7A, 9200-7A, 11300-7A, 13150-7A  
3125-8A, 6080-8A, 9200-8A, 11300-8A, 13150-8A

**DIMENSION DATA - VERTICAL TANKS**

MODEL	3125	6080	9200	11300	13150
A	98	98	120	120	120
B	220	362	334	298	443
C	1.0	1.0	1.0	1.0	1.0
D	49	49	61	61	61
E	41.8	41.8	52	52	52
F	71.878	71.878	81.053	81.053	81.053
G	1.0	1.0	1.0	1.0	1.0

**VESSEL DESIGN DATA**

MODEL	3125	6080	9200	11300	13150
Capacity	3125	6080	9200	11,300	13,150
Weight	3000	6000	9000	11,000	12,600
MAWP	400 PSIG				
Design Temp	-40 to 200 F				
Material	316 SS				
Corrosion Allowance	0.001 in				
Wind Load	15 PSF				
Seismic	0.2	0.2	0.2	0.2	0.2
Code	ASME Sect. VIII Div. 1				

**WEIGHT DATA**

MODEL	SHIPPING WEIGHT	NET WEIGHT	NET WEIGHT	NET WEIGHT	NET WEIGHT
3125	3125	3125	3125	3125	3125
6080	6080	6080	6080	6080	6080
9200	9200	9200	9200	9200	9200
11300	11300	11300	11300	11300	11300
13150	13150	13150	13150	13150	13150

NOTES:  
1. MODEL -7A INNER VESSELS ARE OF SA-240, T304SS  
2. MODEL -8A INNER VESSELS ARE OF SA-303 & SA-304, 304L

**INTERNAL LINE SIZE DATA**

LINE	FUNCTION	3125	6080	9200	11300	13150
A	BOTTOM FILL	1.5" ID				
B	VENT	1.5" ID				
C	TOP FILL	1.5" ID				
D	ROTTING GAGE LINE	1.5" ID				
E	TOP GAGE LINE	1.5" ID				
F	THROCK	1.5" ID				
G	BOTTOM DRAIN	1.5" ID				
H	LIQUID DRAIN CAPTURE	1.5" ID				
I	BOILER/STEAM RETURN	1.5" ID				
M	VAPOR RETURN (EMPTY)	1.5" ID				
N	REFRESHABLE LIQUID RETURN	1.5" ID				

**ASSIGNED CANADIAN REGISTRATION NUMBERS - INNER VESSELS**

MODEL/SIZE	3125	6080	9200	11300	13150
7A	8499, 80124687	18878, 80124678	8499, 80124687	8497, 80124687	NOT REGISTERED
8A	01130, 80124678	01130, 80124678	01130, 80124687	01130, 80124678	01130, 80124687

**ASSIGNED CANADIAN REGISTRATION NUMBERS - EXTERNAL PIPING**

MODEL/SIZE	3125	6080	9200	11300	13150
7A/8A	02827, B				

AIR PRODUCTS & CHEMICALS, INC.  
VERTICAL CUSTOMER STATIONS  
APCI MODELS V-SIZE-MAT'L-250-A-S-0

**PROCESS ENGINEERING INC.**

TITLE: CUSTOMER DRAWING FOR AIR PRODUCTS & CHEMICALS, INC. T-304SS (-7A) AND 304 L (-8A) VERTICAL CUSTOMER STATIONS

JOB NO. STD U/M PART No. N/A

APPROVALS BY DATE SHEET 1 OF 1

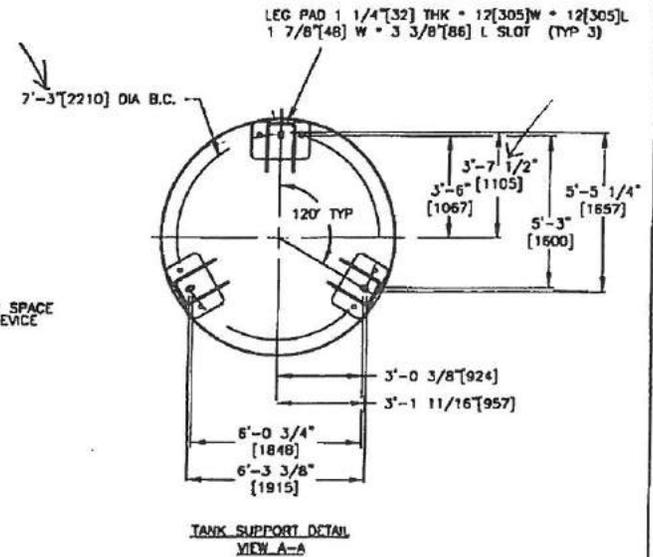
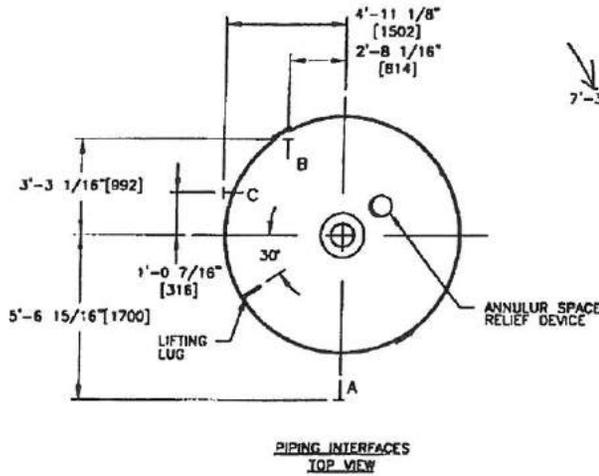
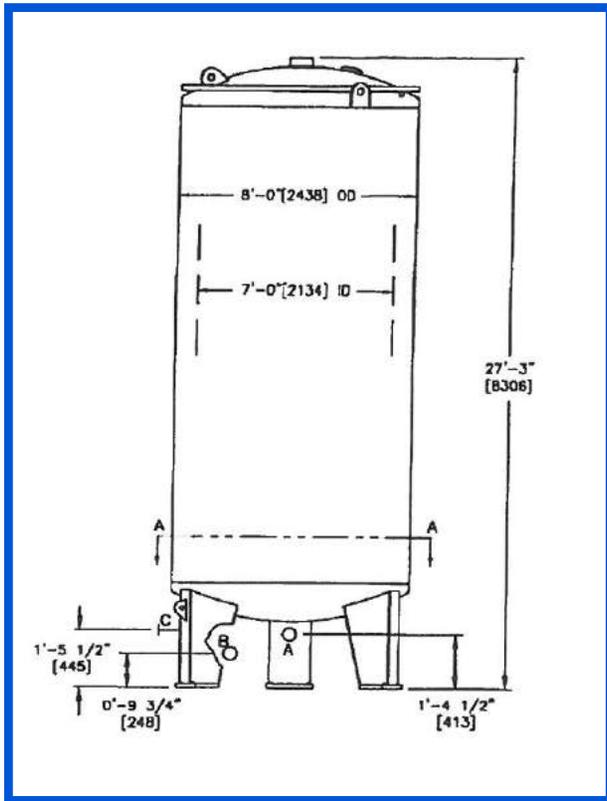
DRAWN BY JMD  
CHECKED BY JMD  
ENGINEERING DESIGN BY JMD

CS-10271 3  
DRAWING NO. REV.

V-6050 - 8 - 250 - A - S - 0

LN2 tank elevation (8' dia. X 27'-3" high)

DWG NO. B-10880312



- CONNECTIONS**  
 A - FILL CONNECTION - 1 1/2" PS  
 B - AUX LIQUID WITHDRAWAL - 1 1/2" PS  
 C - GAS USE - 1 1/2" PS

NOTE: DIMENSIONS ARE IN FEET-INCHES[MILLIMETERS].

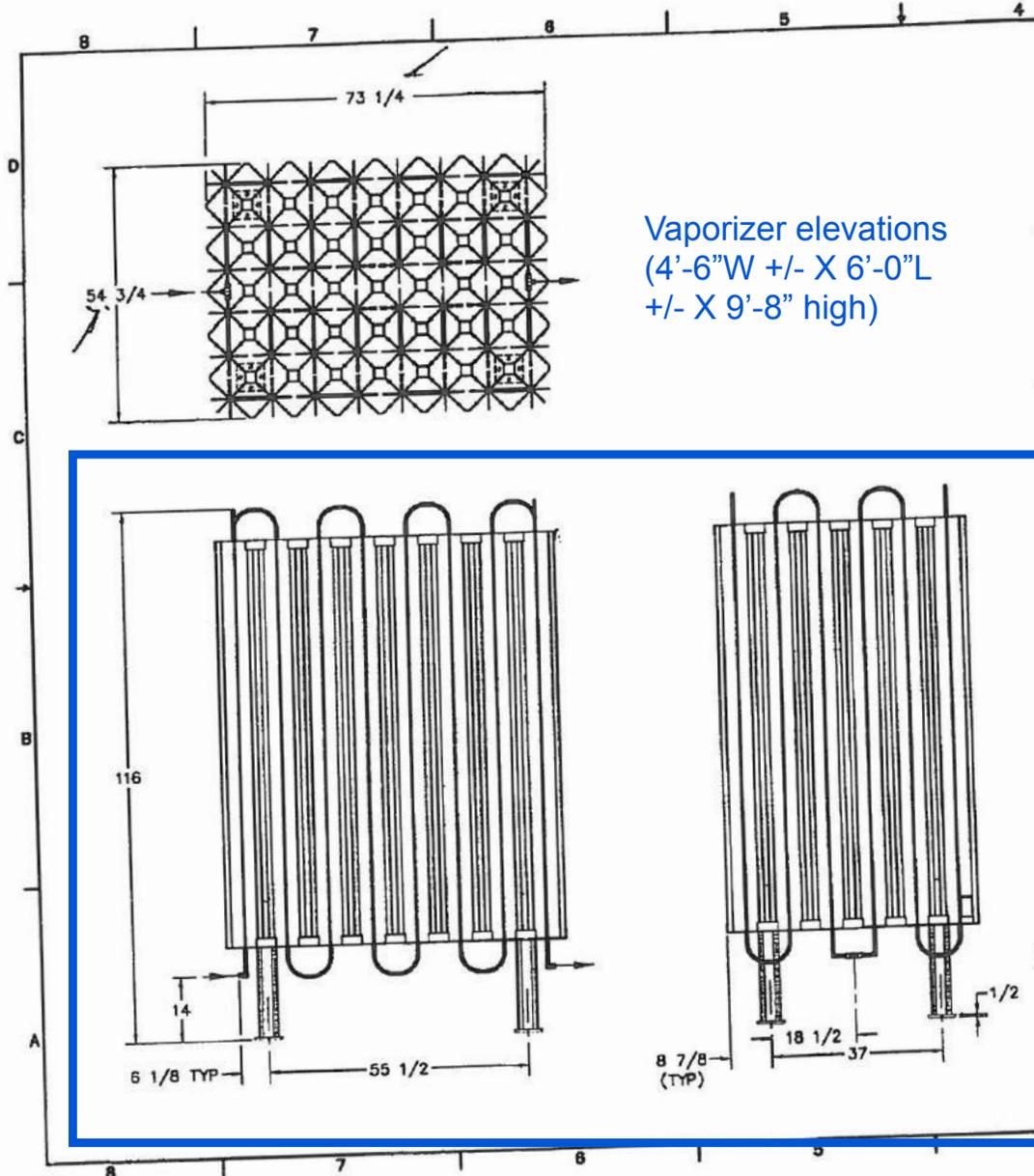
**SPECIFICATIONS**

CAPACITY: GAL / LITERS		
GROSS LIQUID	6,250	23,659
NET LIQUID	6,000	22,712
GASEOUS EQUIVALENT AT 1 ATM AND 70°F / 1 ATM AND 0°C: SCF / NM <sup>3</sup>		
OXYGEN	691,176	18,165
NITROGEN	559,126	14,894
ARGON	675,563	17,757
MAWP: PSIG / BARG	250	17.2
WEIGHT (CALCULATED): LBS / KG		
EMPTY	26,270	11,918
FULL OXYGEN	83,432	37,845
FULL NITROGEN	86,740	39,273
FULL ARGON	96,050	43,568
MATERIAL:		
INNER VESSEL	9% NICKEL STEEL SA353-SA553	
OUTER VESSEL	CARBON STEEL A36	
INSULATION	COMPOSITE	
SHIPPING ENVELOPE: L*W*H		
	27'-4" / 8,331	9'-1" / 2,768
	8'-6" / 2,642	

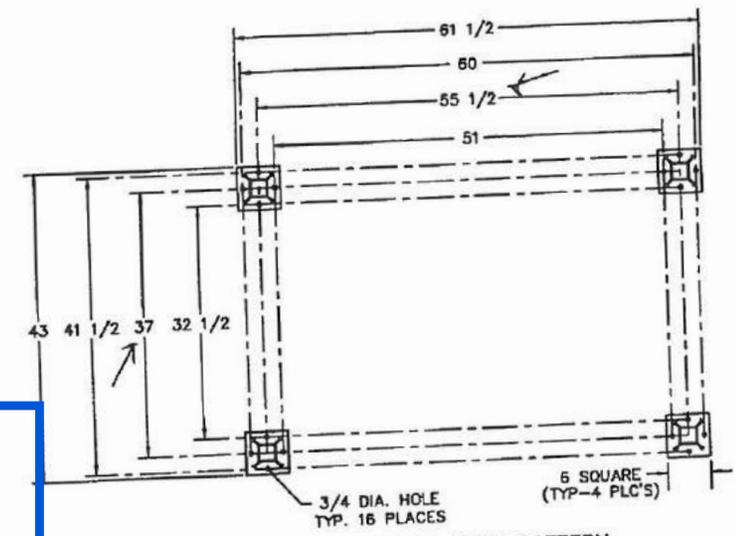
REV.	ECO #	REVISION DESCRIPTION	BY	DATE	APPROVED	DATE	NEXT ASSY	USED ON	NEXT ASSY	FINAL ASSY
A	10900	OBS TO HIST	JF	12-14-98	CHK'D BY FCK	3/5/97	APPLICATION		QUANTITY REQ'D	
					PROJ ENGR. JJS	3/5/97	MVE, Inc. NEW PRAGUE, MINNESOTA 56071			
THE MATERIALS AND INFORMATION, INCLUDING THE PRINCIPLES OF DESIGN PRESENTED BY THIS PRINT, IS THE EXCLUSIVE PROPERTY OF MVE, INC. AND IS CONFIDENTIAL INFORMATION. ACCORDINGLY, THIS INFORMATION IS SUBMITTED TO YOU WITH THE AGREEMENT THAT IT IS NOT TO BE REPRODUCED, COPIED, OR LOANED, IN PART OR IN WHOLE, NOR IS THE INFORMATION TO BE RELAYED TO ANY COMPANY. ACCEPTANCE OF THIS DRAWING WILL BE CONSTRUED AS AN AGREEMENT TO THE ABOVE.					MAT'L APPLIES TO FINAL ASSY 10870270		TITLE: OUTLINE AND DIMENSION VCS-6000T-NC-250-AP-A DRAWING NO. B-10880312 SCALE: NA DO NOT SCALE SHEET DRAWING			
					PART NUMBER 10880312		REV. A 1 OF 1			

OBSOLETE

REV	DESCRIPTION	DATE	APPROVED



Vaporizer elevations  
 (4'-6"W +/- X 6'-0"L  
 +/- X 9'-8" high)



**ANCHOR BOLT PATTERN**

6. APPROXIMATE WEIGHT 1600 LBS.
5. CONNECTIONS ARE.....INLET/OUTLET, 1/2" MPT.
4. SURFACES OF VAPORIZER OPERATE AT LOW TEMPERATURES AND SHOULD BE PROTECTED FROM INADVERTENT TOUCHING.
3. FOUNDATION SHOULD HAVE PROVISIONS FOR DRAINAGE AND LOW TEMPERATURES.
2. ALLOW AT LEAST 3 FEET CLEARANCE TO ADJACENT STRUCTURES FOR COLD AIR REMOVAL.
1. DO NOT IMPOSE LOADS ON FITTINGS, USE STANDS FOR SUPPORT.

NOTES:  
 PER CLIENT: 25% ICED WEIGHT = 4,000 lbs

DO NOT SCALE DRAWING		CONTRACT NUMBER	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		SIGNATURES DATE	
TELEPHONE OR		DRAWN J. Estro 5/1/78	
REVISIONS IN INCHES & FT		CHECK	
JOB # JOB FRANCHISE #		ENGR	
APPD		APPROVED	
PART CITY MUST BE USED IN ALL APPLICATIONS		REV D 7X733	
DRAW # 44661001		DATE NO 4466100	
		SCALE 1/2" = 1'-0" SHEET 1 OF 1	

7



ATTACHMENT E  
Propane tank storage cages, 3'X3'X 6' high, moveable



# Floor Plan Locations of Hazmats 1690 Orion St

