### LEGEND

 $O^{\mathsf{MH}}$ MANHOLE COVER СВССВ CATCH BASING / AREA DRAIN S SANITARY SEWER MANHOLE COVER oWH MONITORING WELL HEAD LOCATION WV

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WM

O

WATER VALVE

FIRE HYDRANT

WATER METER

BOLLARDS

D STORM DRAIN MANHOLE ATTACHMENT B Site Plan





#### project:

### **ORION HQ & TESTING** FACILITY

1690 Orion Street Alameda, California 94501

architect:

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drawing issue:

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phase: USE PERMIT
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date: 30 MAY 2017

sheet title:

### SITE PLAN



### **CONSTRUCTION NOTES**

#### GENERA

- ALL WORK SHALL BE PERFORMED IN COMPLIANCE WITH THE PRINCIPLES OF GOOD CONSTRUCTION PRACTICE.
- B. DURING THE CONSTRUCTION PERIOD THE CONTRACTOR SHALL BE RESPONSIBLE FO THE SAFETY (INCLUDING FIRE SAFETY) OF THE NEW, AS WELL AS EXISTING. STRUCTURES, THE CONTRACTOR SHALL RROVIED ADEQUATE SHORING, BRACING, AND GUYS IN ACCORDANCE WITH ALL NATIONAL, STATE, AND LOCAL SAFETY ORDINANCES, AND FEVRITON FEOD SUCH ORDINACES MUST BE APPROVED PRIOR TO ERECTION. THAT RESPONSIBILITY SHALL APPLY CONTINUOUSLY AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS.
- 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.
- . ALL CONSTRUCTION WORK (INCLUDING, BUT NOT LIMITED TO, MEANS, METHODS, SEQUENCES, TECHNIQUES, PROCEDURES, ETC.) IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- THE RECOMMENDATIONS (IF ANY) ON THESE PLANS REGARDING THE MEANS, METHODS, SEQUENCES, TECHNIQUES, PROCEDURES, ETC. OF CONSTRUCTION SHALL BE CONSIDERED AS MINIULAR REQUIREMENTS. THE CONTRACTOR SHALL NOT DEVINE FROM THESE RECOMMENDATIONS UNLESS SUCH DEVIATION IS TOWARD MORE STRINGENT REQUIREMENTS.
- THE CONTRACTOR SHALL BE RESONABLE FOR THE RESTORATION OF WORKING CONDITION OF ALL EXISTING COMMENTS AND STRUCTURES AFFECTE BY THEIR CONSTRUCTION THE CONTRACTOR SHALL CONSTANTLY KEEP THE AFEA OF CONSTRUCTION FROM ACCUMULATION OF WASTE MATERIALS AND DEBRIS. AT TH END OF WORK, THE CONTRACTOR SHALL REMOVE ALL WASTE, SURPLUS MATERIA TOGS, AND EQUIPMENT.
- THE CONTRACTOR SHALL DEFEND, INDEMNEY, AND HOLD THE ENGINEER HARMLE FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONJINCTION WITH THIS PROJECT EXCEPT FOR LIABILITY RISING FROM THE SOLE NEGLEDREC OF THE ENGINEER, ANY LIABILITY BY SGE AS RELATED TO THIS PROJECT IS LIMITED TO THE REVISITER ANY LIABILITY BY SGE AS RELATED TO THIS PROJECT IS LIMITED TO THE REVISITER ANY LIABILITY BY SGE AS RELATED TO THIS PROJECT IS LIMITED TO THE REVISITER ANY LIABILITY OF THE SERVICES REMORERD.
- DESIGN CONSIDERATIONS
- THESE STRUCTURAL PLANS AND CALCULATIONS WERE DEVELOPED BY SGE RESTRICTIVELY IN REGARD TO THE INSTALLATION OF NITROGEN, OXYGEN, AND HELIUM EQUIPMENT AT VENTIONS LLC.
- 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:
- ALL MATERIALS. STRUCTURES, AND WORKMANSHIP SHALL CONFORM TO THESE PLANS, CALCULATIONS, AS WELL AS TO THE ESTABLISHED GUIDELINES SETFORTH 2016 CBC, AISC MANUAL OF STEEL CONSTRUCTION (14TH EDITION), AO 1316-14, AND OTHER APPLICABLE REGULATIORY DOCUMENTS. IN CASE OF ANY CONFLICTS IN SPECIFICATIONS, THE ONES) OF THE APPLICABLE CODE SHALL GOVERN.
- 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. 480-282-6457).
- THIS DESIGN SHALL BE USED EXCLUSIVELY BY AIR PRODUCTS & CHEMICALS, INC., AS WELL AS THERE CONTRACTOR(S), ANY OTHER USE (INCLUDING, BUT NOT LAMITED TO, PORTION THEREO, AS VIEL LAS ANUSE OF THOSE MATERIALS BY ANY PARTY OR PORTION THEREOF, AS VIEL LAS ANUSE OF THOSE MATERIALS BY ANY PARTY OR PARTIES OTHER THAN THE ONES SPECIFIED ADOVE, ARE STRICTLY PROHIBITED ULLESS UNDER A WRITTEN PERMISSION BY SGE.
- DO NOT SCALE THE PLANS.
- . THESE PLANS SUPERSEDE ANY OTHER PLANS PREVIOUSLY ISSUED BY SGE FOR THE SUBJECT JOB.
- 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 OF THE ACTUAL EQUIPMENT PRIOR TO ANY CONSTRUCTION ACTIVITIES. 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). 2 <u>
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А.	WIND DESIGN DATA	
	BASIC WIND SPEED (3-SECOND GUS	T), MPH 115
	RISK CATEGORY	
	WIND EXPOSURE	D
в.	EARTHQUAKE DESIGN DATA	
	SITE LONGITUDE	-122.28535
	SITE LATITUDE	37.7764
	SITE CLASS	D
	SPECTRAL RESPONSE COEFFICIENT	s
	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

#### SOILS

- THE DESIGN WAS BASED UPON THE GEOTECHNICAL MEMO FOR THE SUBJECT SITE BY STORESUND CONSULTING (DATED MARCH, 2017).
- THE GEOTECHNICAL MEMO SHALL BE USED AS A PRIMARY SOURCE OF ALL GEOTECHNICAL INFORMATION AND SPECIFICATIONS.
- 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.
- TRACTOR SHALL IMMEDIATELY INFORM SGE IF SOILS OF DIFFERENT NATURE OF PROPERTIES (GROUND WATER, APPARENTLY LOWER CAPACITY SOILS, OR AGGRESSIVE SOILS) WERE ENCOUNTERED DURING THE CONSTRUCTION.
- THE CONTRACTOR SHALL LOCATE, REMOVE, OR PROTECT ALL UNDERGROUND PIPING CONDUITS, VAULTS, ETC. AS REQUIRED BY THE APPLICABLE CODE AND JURISDICTION
- THE NEW PAOS SHALL NOT BE PLACED AT THE FOLLOWING LOCATIONS: a OVER NWY EXISTING STRUCTURE, AND/OR CAST AGAINST SUCH STRUCTURES; c) COSEN THAN 24 TO ANY EXISTING WALL: c) COSEN THAN 24 TO ANY EXISTING WALL: d) ATIABOVE 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.
- AS A MINIMUM. THE SOIL IMPROVEMENTS SHALL INCLUDE THE FOLLOWING. 5 THE NEW PADS SHALL BE UNDERLAIN BY A 10° MIN. LAYER OF STRUCTURAL FLL S2 CONSISTING OF CLEAN CRUSHED STONE, GRAVEL, OR CLASS II BASE COMPACTED TO A FIRM AND UNFLEDING CONSISTENCY WITH A MINIMUM OF PASSES OF A VIBATORY PLATE COMPACTOR OR DRUM ROLLER WITH A MINIMUM OF PASSES OF A OF 500 POINTS.
- 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 DIS57.
- 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.
- ALL EARTHWORK IS RECOMMENDED TO BE CONDUCTED UNDER THE GUIDANCE OF A REGISTERED GEOTECHNICAL OR CIVIL ENGINEER. 3. A GEOTECHNICAL ENGINEER FAMILIAR WITH THE SITE IS RECOMMENDED TO REVIEW THESE PLANS, AS WELL AS THE EXCAVATION AND IMPROVEMENTS OF SOL. THE PLACEMENT OF REPARS AND CONCRETE IS RECOMMENDED NOT TO COMMENCE WITHOUT A WRITTEN AUTHORIZATION (MEMO) FROM THE GEOTECHNICAL ENGINEER STATING THE ADEQUACY OF THE DESIGN ASSUMPTIONS AND THE ACTUAL EXCAVATION.
- SETTLEMENT MUST BE MONITORED AND DOCUMENTED BY GEOTECHNICAL ENGINEER OF RECORD AT 0, 3, 6 AND 12 MONTHS

- A ALL NEW REINFORCED CONCRETE SHALL BE OF NORMAL WEIGHT (145 PCF): a.MINIMUM COMPRESSIVE STRENGTH OF IN 28 DAYS b. PORTLAND CEMENT TYPEN GTH OF IN 28 DAYS c. MAXIMUM AGGREGATE SIZE 1 ASTM C33; a. MINIMUM COMPRESSIVE STRENGT b. PORTLAND CEMENT TYPE c. MAXIMUM AGGREGATE SIZE d. MAXIMUM WATER-CEMENT RATIO e. AIR ENTRAINED 0.45 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 (18" MAX. UNFLATNESS UNDER 10-FT STRAIGHTEDGE), AND SHALL HAVE ROUGH BROOM FINISH. FORM 34" CHANFER: AT ALL EXPOSED EDGES OF CONCRETE. UNLESS NOTED OTHERWISE, THE SURFACE OF CONCRETE SHALL SLOPE AT 0.75% 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.
- ALL REINFORCING STEEL SHALL BE SPLICED WITH CLASS B SPLICES. SPLICE LENGTHS SHALL BE AS FOLLOWS: MINIMUM SPLICE LENGTH NWC

fc=4,500 PSI		TOP REBAR		BOTTOM REBAR
PA	D THICKNESS	>12"	≤12"	ANY
	#4	19"	15"	15"
E	#5	24"	18"	18"
S	#6	28"	22"	22"
3AF	#7	41"	32"	32"
ш	#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.
- 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) <u>IS</u> REQUIRED DURING THE INSTALLATION OF THE CAST-IN-PLACE ANCHORS.
- 8. POST-INSTALLED ANCHORS
- 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 <u>STRICTLY</u> MEET THE NOTED ASTM SPECIFICATIONS, PARTICULARLY: THREADED RODS F1554 GRADE AS SHOWN; NUTS ASTM A563 GRADE C; PLATE WASHERS A36; CIRCULAR 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.
- I. 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 ANI STRUCTURAL STEEL (NEW HOM TEXTES) STALL BE DETAILED, PARICATED 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. DODS (E. TOYO, DE ETTIES UNITED MAY DE REPORTED LOIS NOT A REPORTED TO DODS (E. TOYO, DE ETTIES UNITED MAY DE REPORTED LOIS NOT ARC PROCESS WITH AUTOMATIC WELDING (SAW-1), PERFORM SHOP WELDING BY AN APPROVED FARICATOR.
- C. UNLESS A LARGER SIZE FILLET WELD IS INDICATED, PROVIDE MINIMUM SIZE OF WELL PER AISC MANUAL TABLE J2.4. WELD LENGTHS INDICATED ARE THE NET EFFECTIVE

- 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:
- a. PREP: SSPC SP 1 SOLVENT CLEAN AND SSPC 2 AND 3 HAND AND POWER TOOL CLEAN. b. PRIME: MACROPOXY 646-100 5-10 MILS c. INTERMEDIATE: MACROPOXY 646-100 5-10 MILS d. FINISH: HI SOLIDS POLY 2-3 MILS
- 10. ABBREVIATIONS BOLT CIRCLE DIAN BOTH WAYS CENTERLINE CLEAR CONTINUOUS DIAMETER EACH EXPANSION JOINT EXISTING COMPONE IFUTURE COMPONE EMBEDMENT CALVAWIZED BCD BW CL CLR CONT DIA EJ (E) (F) EMB GALV HORIZ LAR LIN LONGIT LOX MIN





(E) BUILDING WALL

# THE SHOWN MINIMAL DISTANCES TO TH PAD EDGES, ANCHOR EDGE DISTANCES NUMBER AND TYPE OF ANCHORS, AND EQUIMENT CLEARANCE DISTANCES SHALL BE MAINTAINED. FOR SITE PLAN, EQUIPMENT LAYOUT A ORIENTATION, AND OTHER INFORMATI REFER TO PLANS BY OTHERS. FOR ADDITIONAL INFORMATION FER TO CONSTRUCTION N RTICULARLY, TO SECTIONS



ANCHORAGE SCHEDULE (EPOXY) 4



SPECIAL INSPECTION SCHEDULE

**S-1** 

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



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



OBSOLETE

. 14

57





# ATTACHMENT D RP tank elevations



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



# Floor Plan Locations of Hazmats 1690 Orion St

