UST INSTALLATION PLAN REVIEW 2024
WITH FIRE CODE

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Th-C1
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While there will be Fire Code citations within this presentation, it is the responsibility of the plan creator to ensure that the codes are appropriately applied.

For UST Plan Checkers – If applying Fire Code, ensure that your agency has an appropriate agreement with the AHJ on that activity.

For All – Reading Fire Code requires an understanding of applicability, so if you choose to dive into code, always be aware that there are "charging statements" that define applicability. For example, Chapter 23 has applicability in sections for more than just fuel storage USTs. And Chapter 23 isn't the only applicable chapter in the CFC that applies to a UST installation.

CSFM Statutes and Regulations – SAR0062 course that teaches you how to read Fire Code.

Introduction

- **Why are we covering VPH Plan Check? Today's focus is Title 23 and CHSC although there is an emphasis on manufacturer guidelines.**
- **2024 – Fire Code References added!**
- **Breaks at the top of each hour.**
- **Time for questions at the end… Get your questions ready!!**

AB1702

AB1702 effective July 1, 2003

- Any new UST installation after this date, requires the following:
  - Primary and Secondary containment is product tight and vapor tight,
  - Secondary containment must be constructed to prevent water intrusion,
  - The UST must be tested after installation (ELD Testing),
  - The definition of piping changed to include vent, vapor and fill pipes below the surface of the ground.

AB1702 POST JULY 1, 2003

PRODUCT AND VAPOR TIGHT

PREVENT WATER INTRUSION

PRE-JULY 2003 = WATER INTRUSION IS NOT A VIOLATION IF REMOVED IN A TIMELY MANNER.

POST JULY 2003 = WATER INTRUSION IS A VIOLATION

AB2481

AB2481 – effective July 1, 2004

- A new UST installation after this date, triggered all of the requirements in the previous slide, in addition to the following:
  - The UST system must be designed and constructed with a continuous monitoring system capable of (1) detecting entry of the liquid or vapor-phase of the substance stored and (2) detecting water intrusion into the secondary containment. (product and vapor tight)
  - The interstitial space of the UST must be maintained under continuous vacuum, pressure or liquid (hydrostatic). Interstitial liquid level measurement method, such as a brine, satisfies this requirement.

OK, SO WE ARE ALL AWARE ABOUT HOW TO BUILD VPH MONITORED UST SYSTEMS

WHAT MORE IS THERE?!!

- Some first generation DW USTs are having issues with fuel compatibility.
- Single-Walled (SW) USTs are set to sunset.
- New Regulations planned for 2026.

But Wait; There's More!!

No more

Ball Floats in New USTS

- We are looking for overfill prevention on new installs; ball float is no longer an option.
- LG 150-3 guidance was updated in 2021:

https://www.waterboards.ca.gov/ust/leak_prevention/lgs/docs/150-3.pdf

What's New?

Causes for Replacement

Increase in the replacement of USTs throughout California due to:

- Single-Wall Mandate
- Tank Failure
- Age-related Unable to insure?
- Adding a new UST at an existing UST site

New Normal - Patience

- Normally, those with the lot space to do so, are able to complete a text-book/planned installation.
- In the time since the pandemic, the UST industry has been mired with a variety of issues related to supply-chain.
  - What was normal and usual is a thing of the past.
  - Today, we are waiting for parts, adhesives, resins; you get the idea.

Typical Scenarios

- UST Owner knows they have to remove USTs due to _____ (SW/DW Fail/DW not insurable).
- UST Owner chooses from the limited available UST contractors for a bid and like most UST owners, an alternative fuel is included in the bid.
- UST Contractor shall then go to the local municipality to obtain permits to replace the UST system.
- Local Municipality will no longer approve the new tanks in the same excavation due to plans for sidewalk/road improvements.
  - No longer a quick tank replacement.

Onsite Implications to be aware of

Fire Code	Planning
Groundwater	Building & Safety
Stormwater	Electrical

Remember that we do not have the authority to waive or supersede any other agencies requirement; nor can we cause them to be out of compliance – **Story about the canopy and the storm drain.**

OLD TANKS REMOVED; WHEN CAN THE NEW TANKS BE INSTALLED???

It is important to observe and respect other jurisdictions.

- We should not allow or encourage a facility to violate another agency rule for the sake of our project. Examples? Dewatering permits; CalTrans; City Planning; Utilities; CARB, Sewering agency; snow pack 4 months a year, etc.
- Every region has varying “additional requirements”.
- It all takes time and adds time to the project.

Tank Removal With New Install

In most jurisdictions, two construction permits are issued:

- UST Removal Permit - oversee UST removal per CCR Title 23 and CHSC. Only LOP/RWQCB may issue NFA letter if applicable.
- UST Installation Permit - oversee UST Installation per CCR 23 and CHSC.
  - UST installation projects have a significant amount of Fire Code (CFC) and NFPA involved. If you are the AHJ, you may apply these codes to your review.

  NOT THE AHJ?
  - Not a problem.
    - Recommend meeting your AHJ counterpart; and
    - Remember that as a CUPA, the manufacturer install guidelines are an enforceable means of install/setup verification.

Many Codes and Standards Apply

NFPA

National Fire Protection As
1 Batterym
Quincy, MA 02

02—*20*: Hydrogen Technologies Code
1206.3, 1206.4, 2309.1, 2309.3.1.1, 2309.3.1.2, 2309.4, 2309.6, 2311.8, 2311.8.2, 2311.8.10, 2311.8.11, 5301.1, 5801.1

04—21: Standard for Integrated Fire Protection and Life Safety System Testing
901.6.2.1, 901.6.2.2

10—*21*: Standard for Portable Fire Extinguishers
Table 901.6.1, 906.2, Table 906.3(1), Table 906.3(2), 906.3.2, 906.3.4, 3006.3

Chapter 311, 31001

30—21: Flammable and Combustible Liquids Code
415.6.1, 415.6.2, 507.8.1.1.1, 507.8.1.1.2

30A—21: Code for Motor Fuel Dispensing Facilities and Repair Garages
406.2.9.2

31—20: Standard for the Installation of Oil-burning Equipment
2113.15

Chapter 23 Motor Fuel-dispensing Facilities and Repair Garages

Chapter 23 provides provisions that regulate the storage and dispensing of both liquid and gaseous motor fuels at public and private automotive, marine and aircraft motor fuel-dispensing facilities, and fleet vehicle motor fuel-dispensing facilities. In addition, this chapter addresses the various hazards created by the use of both liquid and gaseous fuels within repair garages.

Chapter 50 Hazardous Materials—General Provisions

Chapter 50 contains the general requirements for all hazardous chemicals in all occupancies. Hazardous chemicals are defined as those that pose an unreasonable risk to the health and safety of operating or emergency personnel, the public and the environment if not properly controlled during handling, storage, manufacture, processing, packaging, use, disposal or transportation. The general provisions of this chapter are intended to be companion provisions with the specific requirements of Chapters 51 through 67 regarding a given hazardous material.

Chapter 57 Flammable and Combustible Liquids

The requirements of Chapter 57 are intended to reduce the likelihood of fires involving the storage, handling, use or transportation of flammable and combustible liquids. Adherence to these practices

may also limit damage in the event of an accidental fire involving these materials. These liquids are used for fuel, lubricants, cleaners, solvents, medicine and even drinking. The danger associated with flammable and combustible liquids is that the vapors from these liquids, when combined with air in their flammable range, will burn or explode at temperatures near normal living and working environment. The protection provided by this code is to prevent the flammable and combustible liquids from being ignited.

CALIFORNIA CUPA FORUM

Double-Walled Steel UST

DW Fiberglass UST

DW Fiberglass UST

VPH Plan Review

Plan submissions and installation processes vary from jurisdiction to jurisdiction. Check with your local agency for their requirements. The following are items needed to conduct a thorough and complete review:

- Scope of work and site diagram,
- Site specific and detailed plans,
- Type/model of UST, piping and ancillary equipment, including manufacturer's installation requirements,
- Manufacturer's affirmative statement of compatibility for any UST component lacking UL listing,
- Piping matrix – UL 971 approved piping and penetration fittings - https://www.waterboards.ca.gov/ust/leak_prevention/docs/matrixapr14.pdf
- Local Application for Construction Permit

Piping – Open or Closed?

For VPH systems, you are always verifying that the piping is approved for a CLOSED system. No more boots pulled back for open drainage.

Piping secondary is monitored by Vacuum, Pressure, or Hydrostatic means.

So far, we've only seen Vacuum and Hydrostatic methods applied.

Piping UL 971 Standard

TABLE 5703.6.2
PIPING STANDARDS

PIPING USE	STANDARD
Power piping	ASME B31.1
Process piping	ASME B31.3
Pipeline transportation systems for liquid hydrocarbons and other liquids	ASME B31.4
Building services piping	ASME B31.9
Double containment piping	UL 971A, UL 1369

5703.6.2.2 Below-grade or underground piping systems connected to a tank in an underground area. *Below-grade or underground piping systems that are connected to a tank in an underground area shall have secondary containment. The building, room or area in which the flammable or combustible liquid is stored or located may be used as secondary containment if it meets the containment and drainage methods as described in Section 5004.2.2.1.*

UL 971 is identified for piping that conveys hazardous materials underground.

Did you know that California Fire Code added a reference to UL 971 in Chapter 57?

Chase Pipe – What's Required?

- Historical Overview of Chase pipe regulation since VPH started. To Monitor or Not to Monitor
- MONITOR
- How? DW piping with secondary being monitored by VPH means.
- Why? Because the tubing that is being conveyed has the possibility of storing a hazardous material in the event of a release of product into the secondary monitoring zone that the tubing is supporting by vacuum.
- Typically, a hydrostatically monitored site will have MANY reservoirs so you likely would not see a chase pipe being used in that application.

VPH PLAN REVIEW
Before you Start

Gather your references:

- Current Piping Matrix (2014 is still current)
- Manufacturer installation guidelines (Tank, pipe, UDC, monitoring system)
- PEI 100 – Installation of USTs
- Are you reviewing for Fire Code (MOU?)
- Your local ordinance(s) (if you have them)

Organize Your Review

Use a checklist to ensure that you are reviewing everything within your purview.

- Environmental Review
- CUPA with Fire Code review

Checklist

- Submittal of Plans
- What does a complete submittal have?

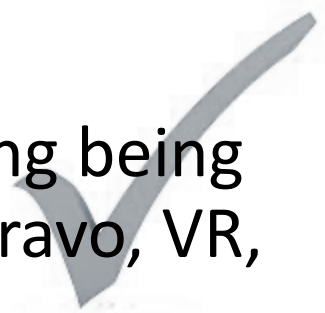
Checklist - Submittal

1. Application – whatever you use locally

2. Copy of Certifications required to evaluate qualifications.

ICC UST Installer/Retrofitter

UST Manufacturer Training for anything being installed, e.g. Xerxes, NOV, Flex-ing, Bravo, VR, Franklin Fuels, etc..



Is that all?

Checklist - Submittal

SWRCB issued clarification stating that each worker shall be certified for the UST equipment/compenent they are installing. For example Piping and Tank.

We still have to have that one qualified individual

With the ICC and certs, but all helpers have to have the manufacturer certs as well.

Do you check for anything more?

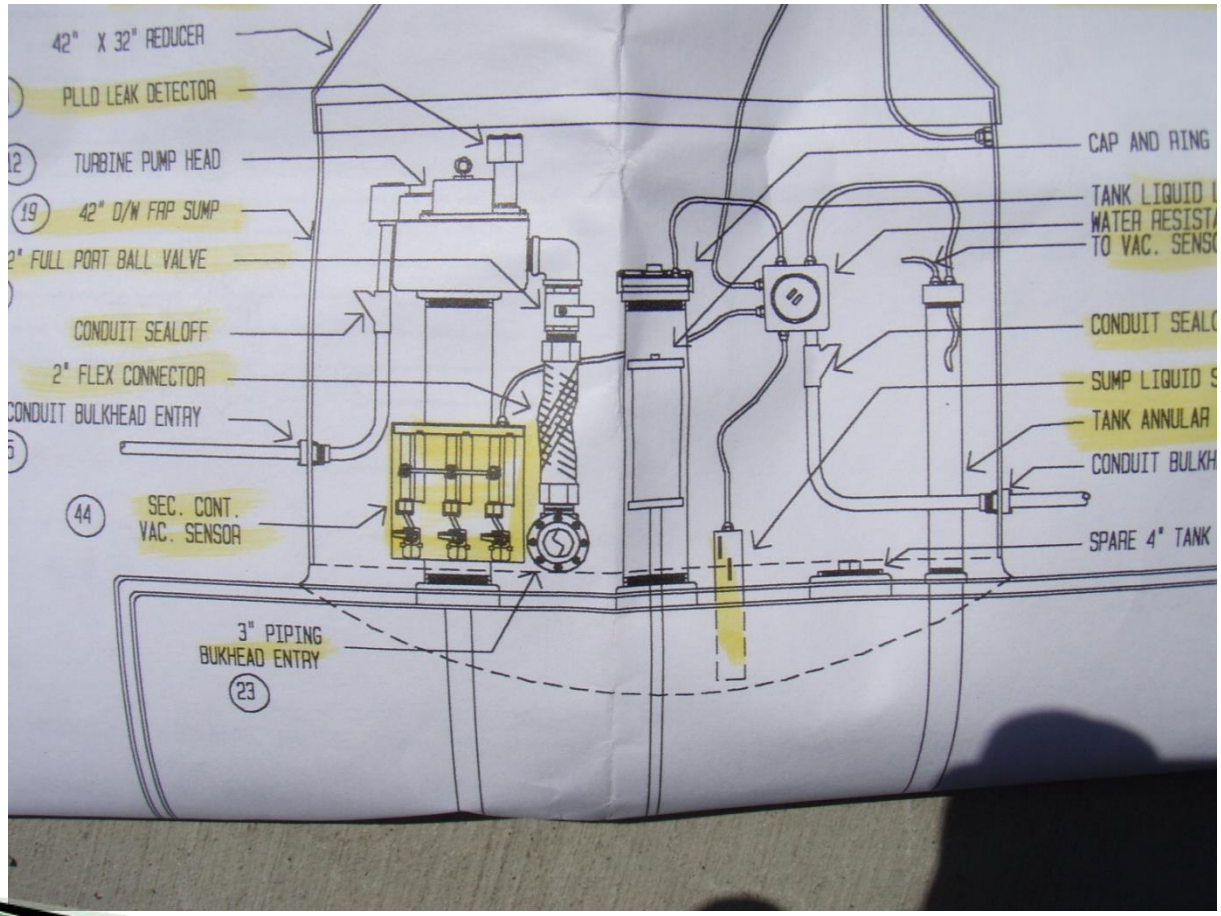
Checklist - Submittal

Plans

Whether Paper or Digital; all should have enough detail for you to determine compliance and be site specific.

*No "To Be Determined in Field". You are reviewing what you actually expect to see in the field.

The Plans


42" X 32" REDUCER
PLLD LEAK DETECTOR
12
TURBINE PUMP HEAD
19
42" D/W FRP SUMP
2" FULL PORT BALL VALVE
CONDUIT SEALOFF
2" FLEX CONNECTOR
CONDUIT BULKHEAD ENTRY
44
SEC. CONT.
VAC. SENSOR
3" PIPING
BUKHEAD ENTRY
23
CAP AND RING
TANK LIQUID
WATER RESISTA
TO VAC. SENSO
CONDUIT SEALO
SUMP LIQUID S
TANK ANNULAR
CONDUIT BULKH
SPARE 4" TANK

California Fire Code 2022
CHAPTER 23
MOTOR FUEL-DISPENSING FACILITIES AND REPAIR GARAGES

SECTION 2301
GENERAL

2301.1 Scope. Automotive motor fuel-dispensing facilities, marine motor fuel-dispensing facilities, fleet vehicle motor fuel-dispensing facilities, aircraft motor-vehicle fuel-dispensing facilities and repair garages shall be in accordance with this chapter and the *California Building Code*, *International Fuel Gas Code* and *California Mechanical Code*. Such operations shall include both those that are open to the public and private operations.

2301.2 Permits. Permits shall be required as set forth in Section 105.5.

2301.3 Construction documents. Construction documents shall be submitted for review and approval prior to the installation or construction of automotive, marine or fleet vehicle motor fuel-dispensing facilities and repair garages in accordance with Section 106.1.

Did you know

California Fire Code Requires submittal of construction documents in 106.1… it is also where it says at least two sets should be submitted!

105.5.33 Motor fuel-dispensing facilities. An operational permit is required for the operation of automotive, marine and fleet motor fuel-dispensing facilities.

Checklist - Submittal

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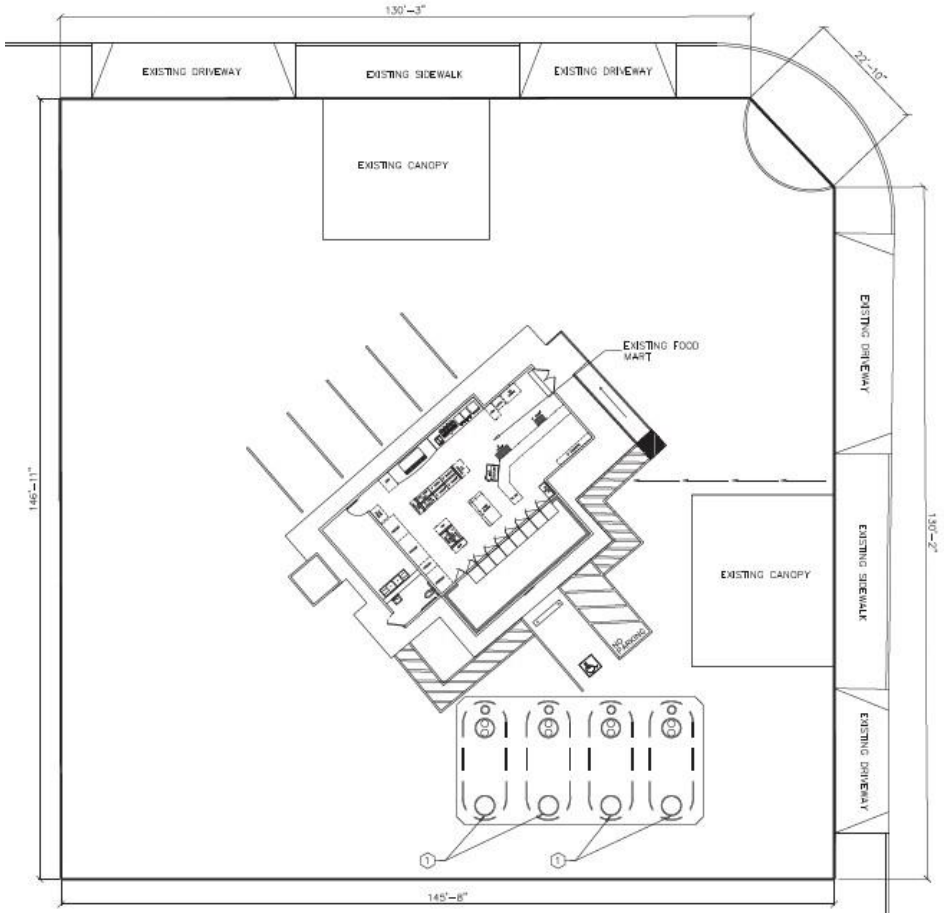
SMALL LOCATION MAP



Checklist - Submittal

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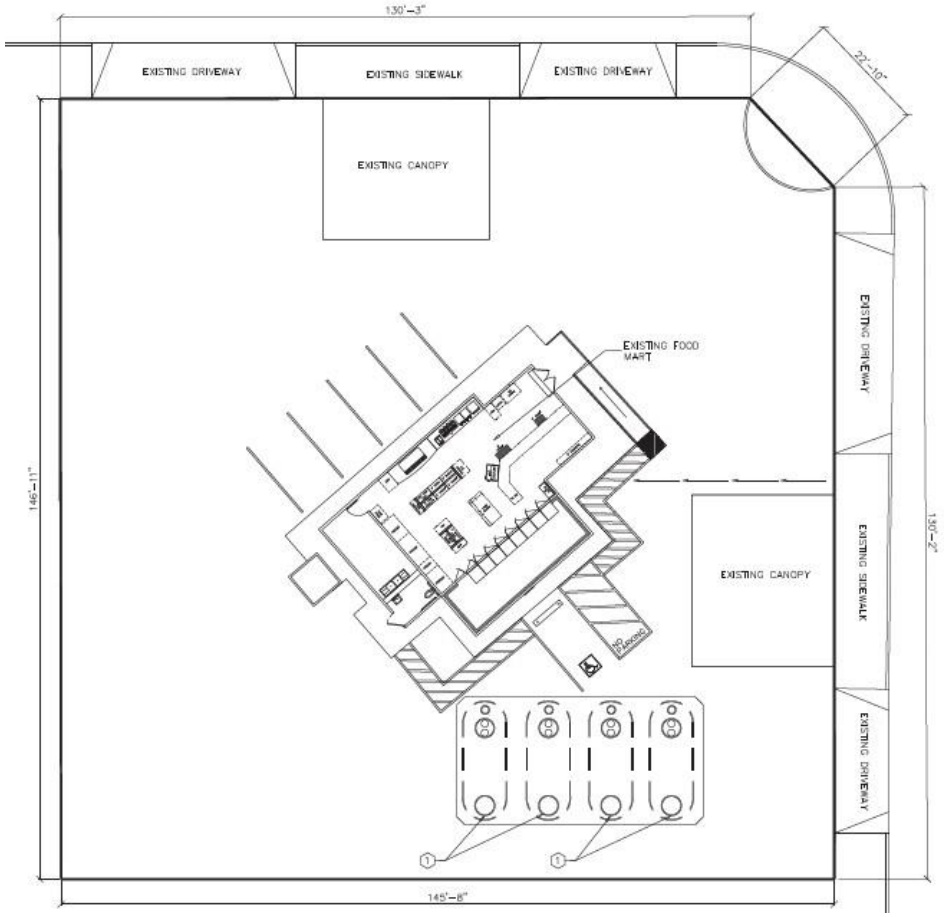
SCOPE OF WORK:

INSTALLATION OF FOUR USTS, ____ MANUFACTURER FIBERGLASS DOUBLEWALLED MONITORED HYDROSTATICALLY
EACH UST IS 10,000 GAL.
TANK 1 WILL STORE E85
TANK 2 WILL STORE B20
TANK 3 WILL STORE 91
TANK 4 WILL STORE 87



Checklist - Submittal

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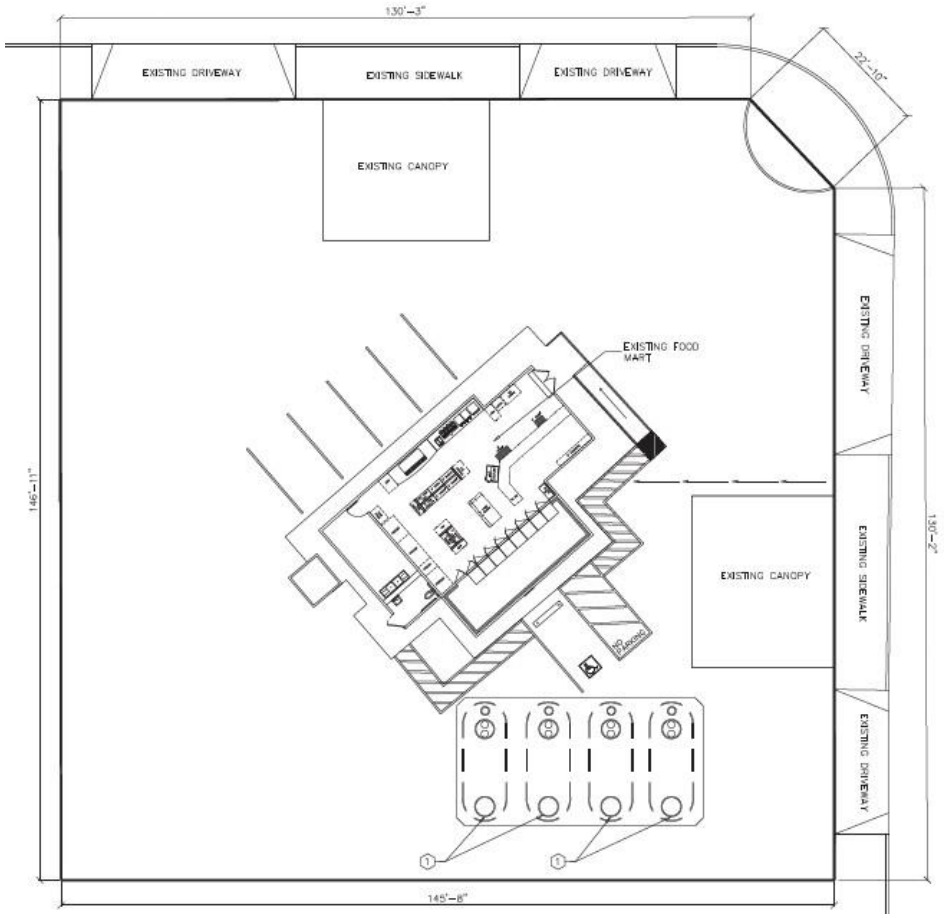
LOCATION ADDRESS.
MAP SHOWN SHOULD REFLECT ACTUAL LOCATION.



Checklist - Submittal

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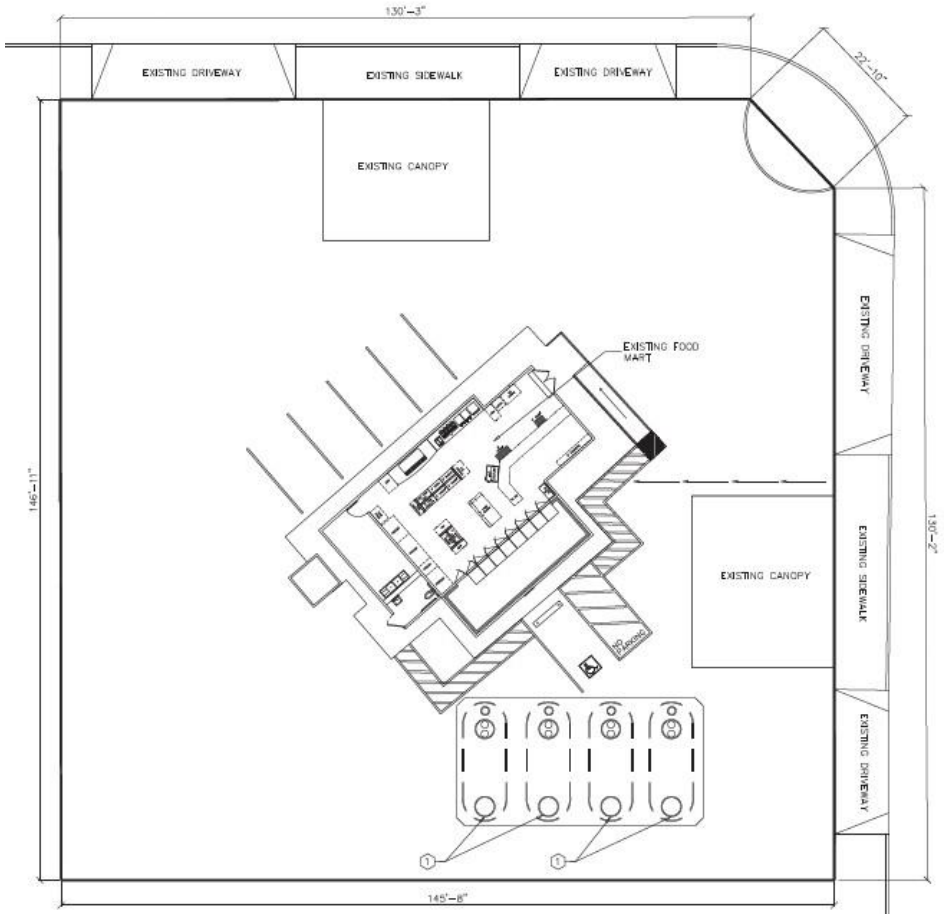
FACILITY INFORMATION
SHOULD BE IN THE TITLE ROW

CONTRACTOR INFORMATION
NAME, ADDRESS, CSLB LICENSE
AND EXPIRATION DATE.



Checklist - Submittal

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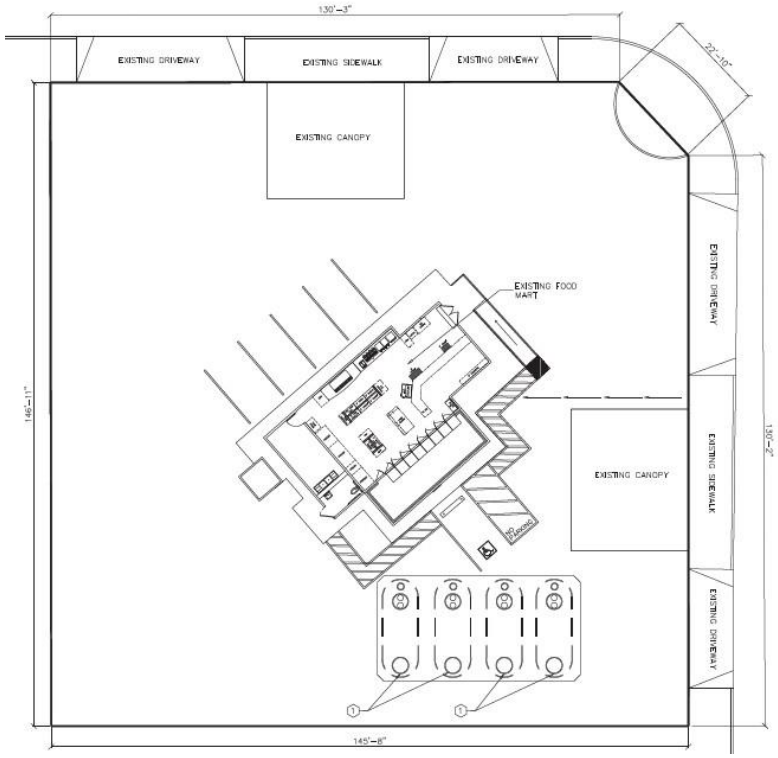
SCALE -
EVEN THOUGH WE DO NOT HAVE
PAPER SUBMITTALS
IN MANY JURISDICTIONS,
THE PLANS MUST STILL HAVE
A SCALE THAT THEY ARE
DRAWN TO FOR VERIFICATION
OF REQUIRED SETBACKS.

IMPORTANT TO REMEMBER THAT
OFTEN YOUR STAMPED PLANS ARE SUBMITTED
FOR ADDITIONAL REVIEW BY FIRE DEPARTMENTS.



Checklist - Submittal

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Setbacks of interest:

SECTION 2303
LOCATION OF DISPENSING DEVICES

2303.1 Location of dispensing devices. Dispensing devices shall be located as follows:

1. Ten feet (3048 mm) or more from lot lines.
2. Ten feet (3048 mm) or more from buildings having combustible exterior wall surfaces or buildings having noncombustible exterior wall surfaces that are not part of a 1-hour fire-resistance-rated assembly or buildings having combustible overhangs.

Exception: Canopies constructed in accordance with the *California Building Code* providing weather protection for the fuel islands.

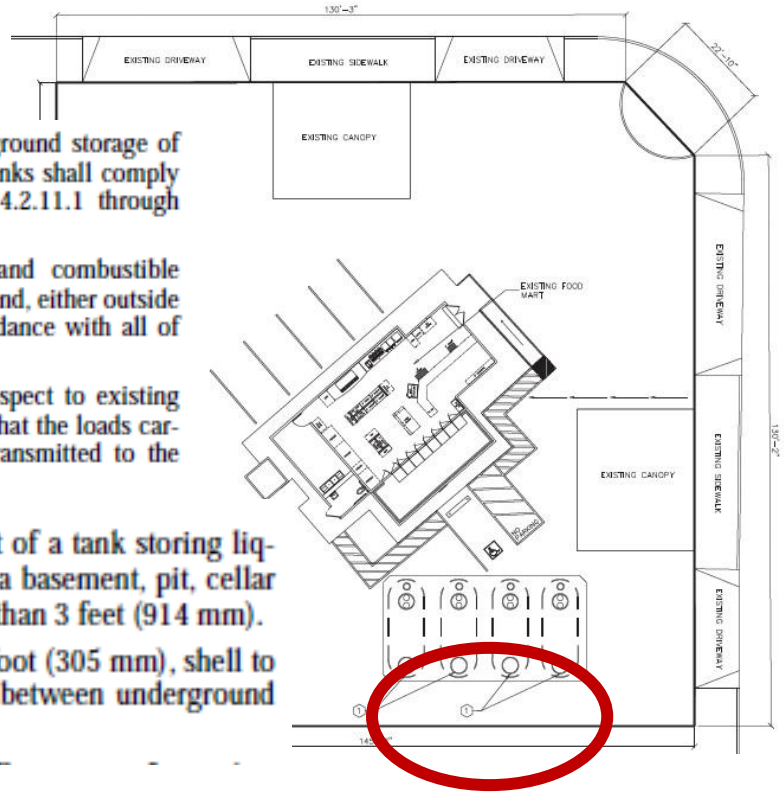
3. Such that all portions of the vehicle being fueled will be on the premises of the motor fuel-dispensing facility.
4. Such that the nozzle, where the hose is fully extended, will not reach within 5 feet (1524 mm) of building openings.
5. Twenty feet (6096 mm) or more from fixed sources of ignition.
6. Such that fuel dispensing is in view of the attendant at attended self-service motor fuel-dispensing facilities, as required by Section 2304.2.4.

2303.1.1 Protection of dispensing devices. *Where dispensing devices are mounted at grade, they shall be protected at each end with a minimum of two concrete*

5704.2.11 Underground tanks. Underground storage of flammable and combustible liquids in tanks shall comply with Section 5704.2 and Sections 5704.2.11.1 through 5704.2.11.4.2.1.

5704.2.11.1 Location. Flammable and combustible liquid storage tanks located underground, either outside or under buildings, shall be in accordance with all of the following:

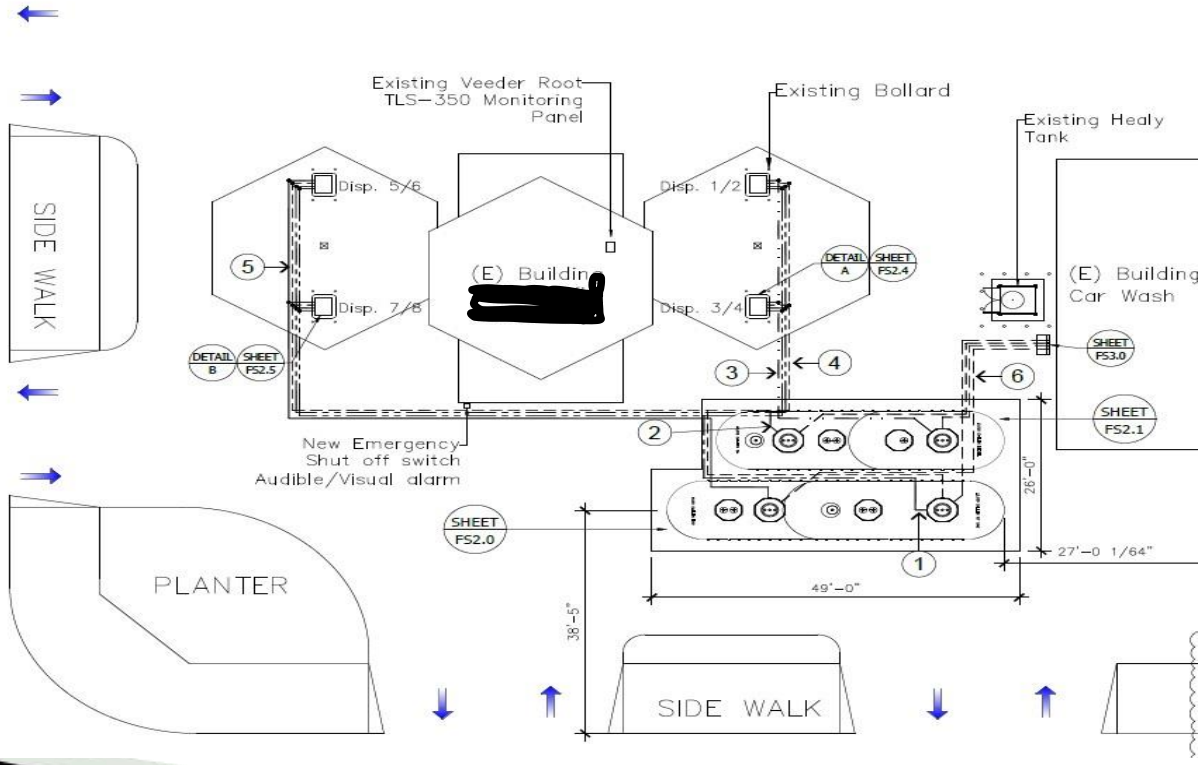
1. Tanks shall be located with respect to existing foundations and supports such that the loads carried by the latter cannot be transmitted to the tank.
2. The distance from any part of a tank storing liquids to the nearest wall of a basement, pit, cellar or lot line shall be not less than 3 feet (914 mm).
3. A minimum distance of 1 foot (305 mm), shell to shell, shall be maintained between underground tanks.



Checklist - Submittal

PIPING AND TANK LAYOUT

MUST SHOW TANK AND PIPING RUNS



Checklist - Submittal

PARTS LIST

#	QTY.	PART#	DESCRIPTION
1	1	CSI TANK-SPLIT	CSI DWT-6 Type II 24,000 gallon split double wall fiberglass tank, 16,000 / 8,000 10' Dia. x 46'-6"L, wet with brine filled interstice. Including: 1 ea. 22" manway - includes deflector plate & hardware 3 ea. 4" NPT threaded manway cover fittings 3 ea. 4" fittings 16" center tank top 2 ea. 48" Double wall secondary containment collar. 2 ea. 42" Double wall secondary containment collar.
2	1	CSI TANK-SPLIT	CSI DWT-6 Type II 20,000 gallon split double wall dual compartment 10' Dia. fiberglass tank split 10,000/10,000, 10' Dia. X 38'-6"L wet with brine filled interstice, including: 2 ea. 22" manway - 1 per compartment Includes deflector plate & hardware. 3 ea. 4" NPT threaded manway cover fittings - 4 per compartment. 3 ea. 4 fittings 16" center tank top - 2 per compartment. 2 ea. 48" Double wall secondary containment collar - 1 per compartment. 2 ea. 42" Double wall secondary containment collar - 1 per compartment.
3	4	CSI 48" DW SUMP	CSI 48" double wall sump 2pc 48"x48"ht+11"ht w/ 36" water tight lid, brine, DW collar included. (Turbine)
4	4	CSI 42" DW SUMP	CSI 42" double wall tank sump 2pc 42"x48"ht+11ht Open top, brine, DW collar included (fill sumps)
5	4	CSI	CSI Turbine lid for sump with 36" opening (included)
6	20	FRP bonding kits	FRP bonding kit for tank sump (4 kits per sump)
7	4	FILL/VAPOR LID	Xerxes fill/vapor sump lid (FV) w/15" access opening & 6" observation port
		Dispenser Trim	
5	2	EN-700NL 1-02	Gilbarco Encore 700 3+1 product blender dual sided dual hose per side to include: Mobil SPEC Dispenser with 5.7" color screen EMV Hybrid card reader dispenser control modules and Mobil Image
6	2	EN-700NL 1-02	Gilbarco Encore 700 3+1 (E85) product blender dual sided dual hose per side to include: Mobil SPEC Dispenser with 5.7" color screen EMV Hybrid card reader dispenser control modules and Mobil Image
		ENCORE-E85 ADDER	2 - Flex fuel E85 adder per hydraulic inlet
7			

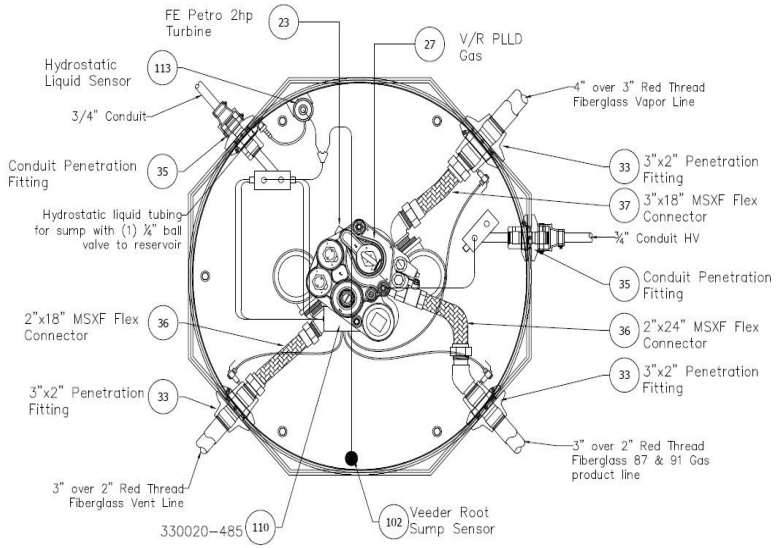
Checklist - Submittal

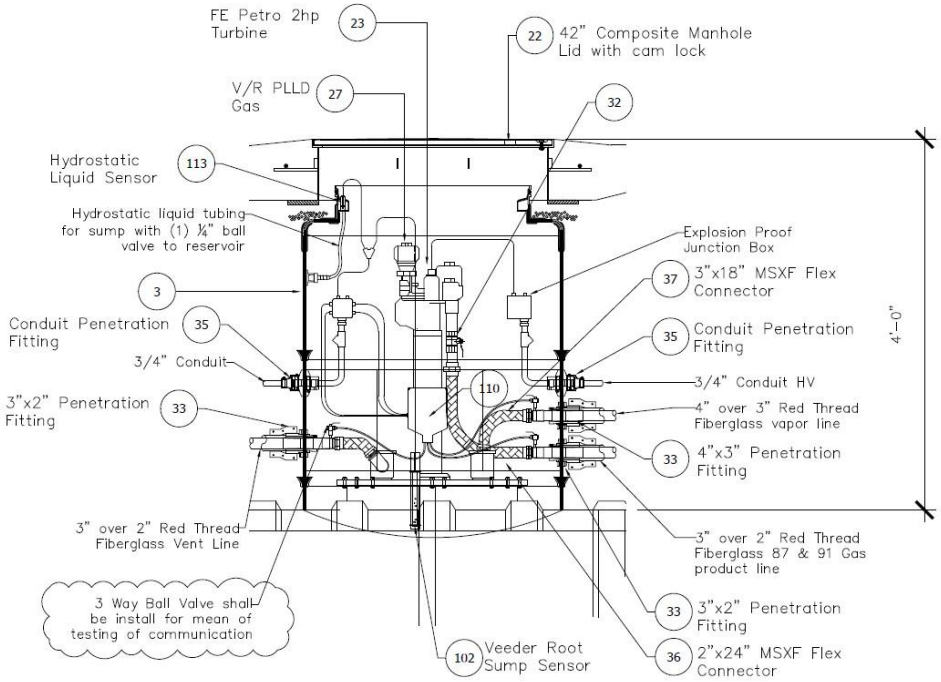
5703.6.9 Flexible joints. Flexible joints shall be listed and approved and shall be installed on underground liquid, vapor and vent piping at all of the following locations:

1. Where piping connects to underground tanks.
2. Where piping ends at pump islands and vent risers.
3. At points where differential movement in the piping can occur.

DETAIL CUT SHEETS – SUMPS, UDCS, VENT BOX, PIPING RUNS.

WITH PARTS LIST YOU CAN VERIFY COUNTS AND LOCATIONS – DO NOT ASSUME IF YOU DO NOT SEE IT.

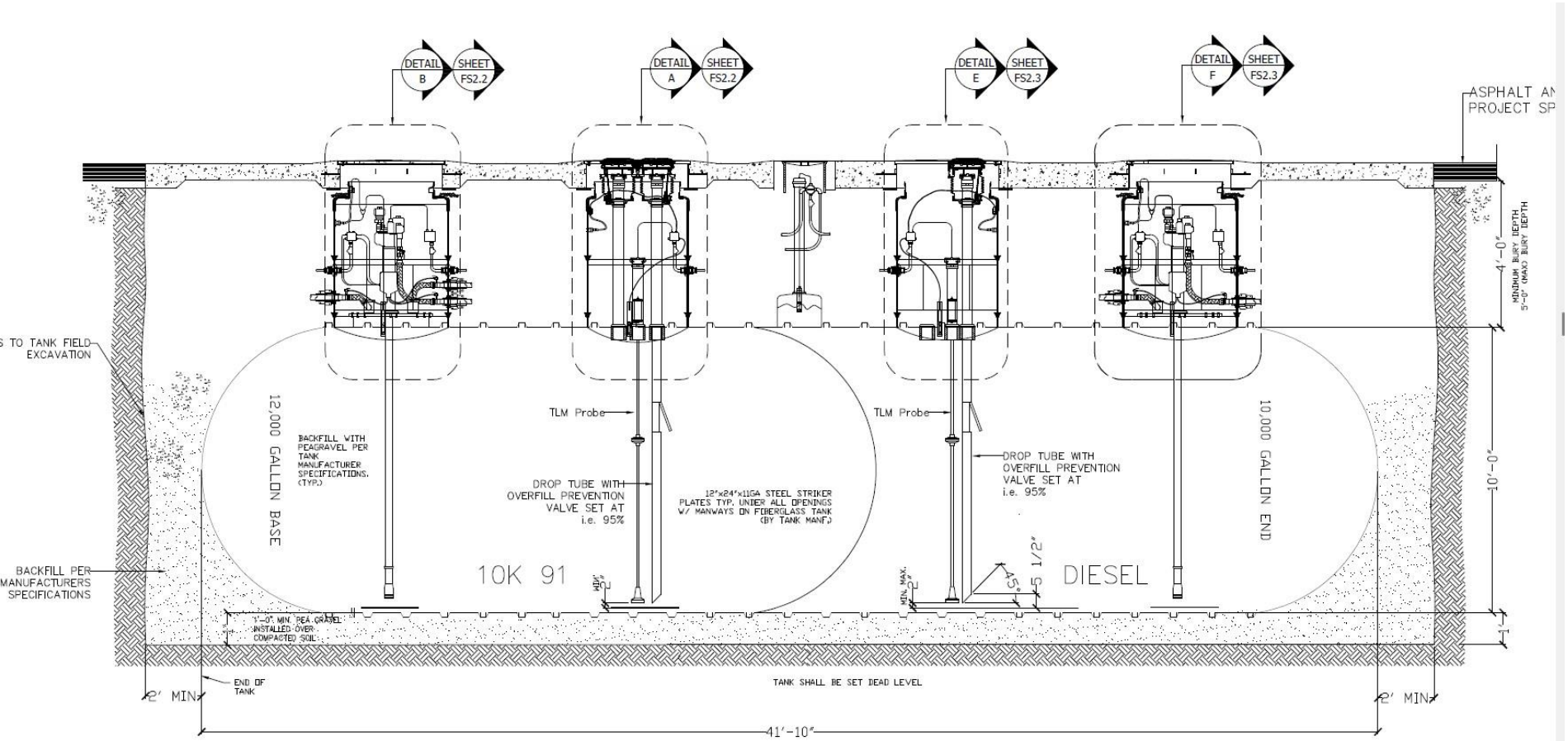




Checklist - Submittal

DETAIL CUT SHEETS – UST FRONT VIEW FOR EACH UST.

WITH PARTS LIST YOU CAN VERIFY COUNTS AND LOCATIONS – OVERFILL PREVENTION (NO BALL FLOATS), ACCURATE DETAILS PROVIDED.



NEW 20,000 GALLON SPLIT (10K 91 GASOLINE - 10K DIESEL UNDERGROUND TANK - FRONT VIEW

Checklist - Submittal

DETAIL CUT SHEETS – MFR BUOANCY CALCULATIONS AND ANCHORING

DEPENDING ON LOCATION OF GROUNDWATER; ANCHORING IS REQUIRED PER MANUFACTURER. SEE NUMBER OF REQUIRED ANCHOR POINTS:

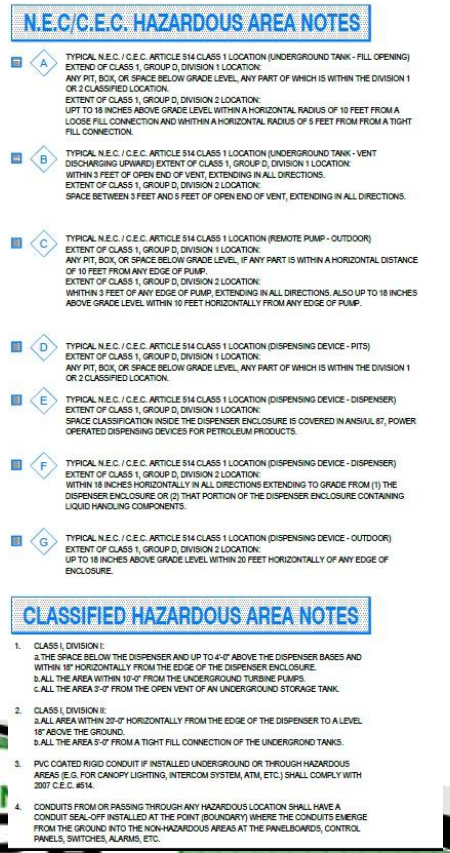
Fiber Glass Systems | NOV

Containment Solutions — Buoyancy Calculation

CUSTOMER/JOB: [redacted]
TIME: [redacted] DATE: [redacted] VERSION 80.8.17 03-02-2022
TANK DESCRIPTION: MODEL DWT6 DWB2 10'-17M/8M
INPUT FILES USED: MAT, 10DWDB2.178
TANK TYPE: DOUBLE WALL TYPE II COMPARTMENT TANK - Model DW3/6
INSIDE DIAMETER: 120 INCHES
INSIDE LENGTH COMPARTMENT (CAP TO CAP) A: 31'11.5" or 383.5"
INSIDE LENGTH COMPARTMENT (CAP TO CAP) B: 14'6.5" or 174.5"
NUMBER OF ANCHOR POINT PAIRS: 8
DISTANCE FROM END ONE TO ANCHOR 1: 5'6.25" or 66.25"

Checklist - Submittal

DETAIL CUT SHEETS – FIRE CODE CLASSIFIED AREAS AND HAZMAT NOTES. REMEMBER THESE GO TO THE FIRE DEPT AFTER CUPA STAMP.



N.E.C/C.E.C. HAZARDOUS AREA NOTES

A. TYPICAL N.E.C. / C.E.C. ARTICLE 514 CLASS 1 LOCATION (UNDERGROUND TANK - FILL OPENING)
EXTEND OF CLASS 1, GROUP D, DIVISION 1 LOCATION:
ANY PIT, BOX, OR SPACE BELOW GRADE LEVEL, ANY PART OF WHICH IS WITHIN THE DIVISION 1 OR 2 CLASSIFIED LOCATION.
EXTENT OF CLASS 1, GROUP D, DIVISION 2 LOCATION:
UPT TO 18 INCHES ABOVE GRADE LEVEL WITHIN A HORIZONTAL RADIUS OF 10 FEET FROM A LOOSE FILL CONNECTION AND WHITHIN A HORIZONTAL RADIUS OF 5 FEET FROM FROM A TIGHT FILL CONNECTION.

B. TYPICAL N.E.C. / C.E.C. ARTICLE 514 CLASS 1 LOCATION (UNDERGROUND TANK - VENT DISCHARGING UPWARD) EXTENT OF CLASS 1, GROUP D, DIVISION 1 LOCATION:
WITHIN 3 FEET OF OPEN END OF VENT, EXTENDING IN ALL DIRECTIONS.
EXTENT OF CLASS 1, GROUP D, DIVISION 2 LOCATION:
SPACE BETWEEN 3 FEET AND 5 FEET OF OPEN END OF VENT, EXTENDING IN ALL DIRECTIONS.

C. TYPICAL N.E.C. / C.E.C. ARTICLE 514 CLASS 1 LOCATION (REMOTE PUMP - OUTDOOR)
EXTENT OF CLASS 1, GROUP D, DIVISION 1 LOCATION:
ANY PIT, BOX, OR SPACE BELOW GRADE LEVEL, IF ANY PART IS WITHIN A HORIZONTAL DISTANCE OF 10 FEET FROM ANY EDGE OF PUMP.
EXTENT OF CLASS 1, GROUP D, DIVISION 2 LOCATION:
WHITHIN 3 FEET OF ANY EDGE OF PUMP, EXTENDING IN ALL DIRECTIONS. ALSO UP TO 18 INCHES ABOVE GRADE LEVEL WITHIN 10 FEET HORIZONTALLY FROM ANY EDGE OF PUMP.

D. TYPICAL N.E.C. / C.E.C. ARTICLE 514 CLASS 1 LOCATION (DISPENSING DEVICE - PITS)
EXTENT OF CLASS 1, GROUP D, DIVISION 1 LOCATION:
ANY PIT, BOX, OR SPACE BELOW GRADE LEVEL, ANY PART OF WHICH IS WITHIN THE DIVISION 1 OR 2 CLASSIFIED LOCATION.

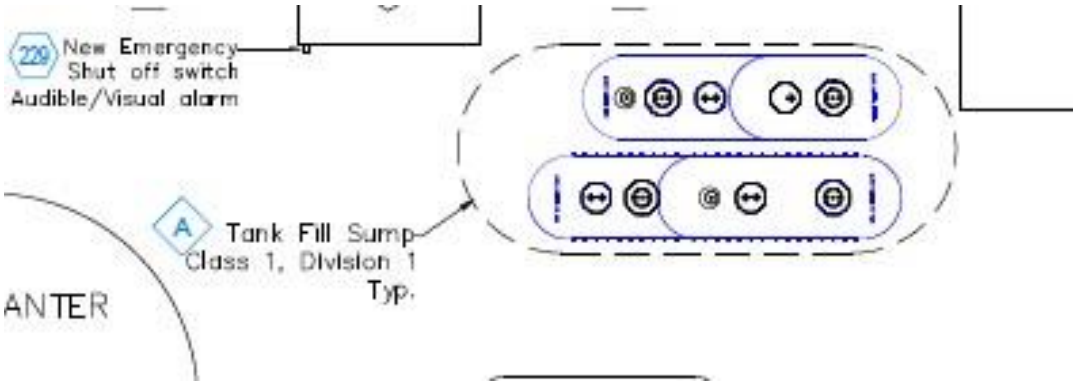
E. TYPICAL N.E.C. / C.E.C. ARTICLE 514 CLASS 1 LOCATION (DISPENSING DEVICE - DISPENSER)
EXTENT OF CLASS 1, GROUP D, DIVISION 1 LOCATION:
SPACE CLASSIFICATION INSIDE THE DISPENSER ENCLOSURE IS COVERED IN ANSI/UL 87, POWER OPERATED DISPENSING DEVICES FOR PETROLEUM PRODUCTS.

F. TYPICAL N.E.C. / C.E.C. ARTICLE 514 CLASS 1 LOCATION (DISPENSING DEVICE - DISPENSER)
EXTENT OF CLASS 1, GROUP D, DIVISION 2 LOCATION:
WITHIN 18 INCHES HORIZONTALLY IN ALL DIRECTIONS EXTENDING TO GRADE FROM (1) THE DISPENSER ENCLOSURE OR (2) THAT PORTION OF THE DISPENSER ENCLOSURE CONTAINING LIQUID HANDLING COMPONENTS.

G. TYPICAL N.E.C. / C.E.C. ARTICLE 514 CLASS 1 LOCATION (DISPENSING DEVICE - OUTDOOR)
EXTENT OF CLASS 1, GROUP D, DIVISION 2 LOCATION:
UP TO 18 INCHES ABOVE GRADE LEVEL WITHIN 20 FEET HORIZONTALLY OF ANY EDGE OF ENCLOSURE.

CLASSIFIED HAZARDOUS AREA NOTES

1. CLASS I, DIVISION I:
   a. THE SPACE BELOW THE DISPENSER AND UP TO 4'-0" ABOVE THE DISPENSER BASES AND WITHIN 18" HORIZONTALLY FROM THE EDGE OF THE DISPENSER ENCLOSURE.
   b. ALL THE AREA WITHIN 10'-0" FROM THE UNDERGROUND TURBINE PUMPS.
   c. ALL THE AREA 3'-0" FROM THE OPEN VENT OF AN UNDERGROUND STORAGE TANK.
2. CLASS I, DIVISION II:
   a. ALL AREA WITHIN 20'-0" HORIZONTALLY FROM THE EDGE OF THE DISPENSER TO A LEVEL 18" ABOVE THE GROUND.
   b. ALL THE AREA 5'-0" FROM A TIGHT FILL CONNECTION OF THE UNDERGROND TANKS.
3. PVC COATED RIGID CONDUIT IF INSTALLED UNDERGROUND OR THROUGH HAZARDOUS AREAS (E.G. FOR CANOPY LIGHTING, INTERCOM SYSTEM, ATM, ETC.) SHALL COMPLY WITH 2007 C.E.C. #514.
4. CONDUITS FROM OR PASSING THROUGH ANY HAZARDOUS LOCATION SHALL HAVE A CONDUIT SEAL-OFF INSTALLED AT THE POINT (BOUNDARY) WHERE THE CONDUITS EMERGE FROM THE GROUND INTO THE NON-HAZARDOUS AREAS AT THE PANELBOARDS, CONTROL PANELS, SWITCHES, ALARMS, ETC.



Checklist - Submittal

DETAIL CUT SHEETS – MONITORING ZONES DEFINED: INCLUDES THE PIPING RUN LENGTHS AND SECONDARY VOLUME CALCULATIONS:

VACUUM SENSOR ZONING MATRIX

QTY.	SENSOR MAKE/MODEL	LOCATION	MODE	VOLUME
1	3 ZONE VACUUM SENSOR KIT VEEDER ROOT #330020-485	UNL. 87 TANK	#1 UNL. 87 PRODUCT #2 UNL. 87 VAPOR #3 UNL. 87 VENT	87 Product 169ft (39.94 Gal) 87 Vapor 194ft (51.44 Gal.) 87 Vent 24' (5.2 Gal.)
1	2 ZONE VACUUM SENSOR KIT VEEDER ROOT #330020-480	UNL. 91 TANK	#1 UNL. 91 PRODUCT #2 UNL. 91 VENT #3 UNL. 91 VAPOR	91 Product 184ft (40.22 Gal.) 91 Vapor 194ft. (51.44 Gal.) 91 Vent 41' (9 Gal.)
1	2 ZONE VACUUM SENSOR KIT VEEDER ROOT #330020-480	DIESEL	#1 DIESEL PRODUCT #2 DIESEL VENT	Diesel Product 83ft (18.01 Gal) Diesel Vent 42' (9.2 Gal.)
1	2 ZONE VACUUM SENSOR KIT VEEDER ROOT #330020-480	E85	#1 E85 PRODUCT #2 E85 VENT	E85 Product 160ft (34.97 Gal) E85 Vent 52' (11.3 Gal.)

PLANS ARE COMPLETE; START THE REVIEW.

What do they want to do? Know first:

- Is it a new “ground-up” installation?
- Adding to an existing station?
- Connecting to an existing UST system?
- Is it a pressurized system?
- Is it a suction system? Conventional vs. Safe
- Is it an emergency generator system?
- Is it an install and a modification in one project?

Starting your review after the first read of plans

Ok, so you know what they want to do…

CAN THEY DO IT?

Yes! They can.

BUT…..

Are they able to provide the documentation to support it?

Appropriate Documentation

- Verify that **ALL** of the UST system components have UL (underwriters laboratory) or Third-party engineer approval for compatibility.
- Manufacturer's affirmative statement of compatibility, especially for alternative fuel locations.

Is that all?

Appropriate Documentation

NOPE!

Welcome to the Golden State!

USTs: UL 58 & UL 1746 for steel USTs in approved engineered backfill; or UL1316 for fiberglass reinforced plastic USTs in approved engineered backfill.

New Gasoline USTs in vaults do not currently have an approved executive order (E.O.) from CARB. Please refer to CARB for E.O. update information.

Appropriate Documentation

But Wait!!!

You want to install E85 and B20 or something else that is not our standard Gasoline or Diesel

Now you have to look at the project (and every project really) for compatibility.

Note that E85 and B20 DO NOT have Vapor Recovery. Also E85 cannot manifold vent lines with gasoline or diesel blends. (CARB)

Appropriate Documentation

But Wait! We are looking at Fire Code this year!

If looking at fire code,

- **Did they make an appropriate application locally?**
- **Did they make a submittal with all attachments for the AHJ (appropriate CSLB, Insurance, certifications, plans stamped by appropriate trades for items such as:**
  - **Shoring (confined space)**
  - **Anchoring (confined space)**
  - **Vehicle Protection**
  - **Fuel island**
- **Emergency Shut-off Switch locations**
- **Monitoring Panel Location (AHJ approves location)**
- **Fire Department Access**
- **Show Classified Area Locations**
- **Electrical**
- **Canopy**
- **Fire Extinguisher locations**
- **And more as called for due to location, climate, geography, etc.**

Appropriate Documentation

Piping: California has a Matrix of approved Piping

- https://www.waterboards.ca.gov/ust/leak_prevention/docs/matrixapr14.pdf

What it tells you

The piping size appropriate for an **Open System vs. Closed System**

Not all piping is currently approved for all configurations and all hazardous substances

Appropriate Documentation

Leak Detection

- Must be listed on Local Guidance 113

http://www.swrcb.ca.gov/water_issues/programs/ust/leak_prevention/lg113/index.shtml

LET'S CHECK IT OUT!

What if
the deadline is near and
usual LG-113 parts are
not attainable in time.

Can you use non-listed
parts??

Appropriate Documentation - Compatibility

Per 23 CCR 2631(j)and (l) a statement of compatibility is required prior to hazardous material being stored in a UST.

Link to 23CCR2631

Qualifications

Verify that there is at least one singularly qualified person onsite at all times during the project. The helpers only have to have the manufacturer cert for the components they are working on.

Are the stamped/approved plans available onsite?

What does that mean??

Qualifications -

Certifications that can be verified online:

ICC - https://www.iccsafe.org/verify/ If you have a number https://www.iccsafe.org/search-for-certified-professionals/ if you only have a name

Contractors License – I always check this to ensure it is currently active - https://www.cslb.ca.gov/onlineservices/checklicenseII/checklicense.aspx

Some manufacturers make the information available on their website: https://www.franklinfueling.com/en/certified-installer-search/

Where are the installation guides?

Here are some of the most common install guides we see.

I never just keep a copy of a manual. These are new systems and so you should always check for the current published guidelines and install manuals from the manufacturer.

Let's take a look!

Xerxes - https://www.xerxes.com/en/document-library/
Containment Solutions - http://containmentsolutions.com/assets/inst-6001j-frp-tank-installation-instructions2.pdf
Modern Welding - https://www.modweldco.com/resources/library/items/109

Where are the installation guides?

Youtube.com has videos from several manufacturers.
https://youtu.be/fDwjDXg87dM Link to Xerxes (ZCL).

Vaporless - https://www.vaporless.com/documents

Franklin Fuels - https://franklinfueling.freshdesk.com/support/solutions/folders/48000668872/page/5?url_locale=

Veeder Root - https://www.veeder.com/us/technical-document-library

OPW - https://www.opwglobal.com/emea/tech-support/retail-fueling/manuals-installation-instructions

NOV Piping - https://www.nov.com/products-and-services/document-library

We covered a lot, Lets Recap

Expected Detail Pages for an Installation:

Site Plan:

- Scale (include if checking setbacks for Fire Code)
- Accurate location detail
- Tank and piping layout
- Monitoring system location
- If outside enunciator planned; show location
- Dispenser locations
- Location information (facility address, cross-street, facility name)
- Detailed scope of work

DETAILS SHOWN = WORDS STATED

The Plans

- Detailed Equipment List with parts number and manufacturer grouped by function (i.e. monitoring, tank and piping).
- Cross-section of sumps, tanks, UDCs and EVR II equipment. ***Specific, not typical "generic" detail please***.
- One STP, Fill sump, UDC, vent transition box detail for each fuel type is fine.
  - Include all electrical, flex connectors, penetration fittings, liquid and vacuum sensors, leak detector, turbine, jomar ball valve (CFC), etc..

The Plans

- Monitoring System – table of vacuum monitoring zones. (7 Eleven vacuum monitors their sumps and UDCs together with 2-in-1 sensors)
- Enhanced Vapor Recovery Equipment (Fire code)

- Don’t need: wiring layouts (unless you are checking electrical for B & S Dept too)

Plan Attachments ARE ONLINE

- UST Facility Form
- UST Tank Form (one per tank)
- Business Owner/Operator Identification (or CERS confirmation of completion)

All to be entered into “CERS or local portal” with confirmation of submittal to local agency for plan review.

Construction Inspections

What do you want to see?

1) Tank Set Inspection – per manufacturer guidelines
2) Primary Piping Pressure Test at 150% of planned operating pressure for 60 min.
3) Secondary Piping Pressure Test at 5 psi for 60 min. and verification of secondary containment continuity (sumps, UDC, vent box and piping).
4) Final Inspection: Monitor Certification, Spill Container test, shear valve inspection and functionality, Overfill Prevention Inspection, and verification of any/all planning conditions.

Piping and Sums

Due at Final

- UST Certification of Installation *
- Monitoring plan and accurate plot plan with piping *
- Certificate of Financial Responsibility *
- Designated Operator Statement *
- UST DO Training Certificate
- UST Owner/Operator Agreement (if applicable) *
- ELD Test Results – Kept for life of tank
- Final monitoring system certification, overfill prevention inspection and spill container test report.

*Uploaded to CERS.


VENT LINES, DOX
VENT
-91 SUMP MANIFOLD
-91 TURBINE SUMP
-91 FILL SUMP
-91 PRODUCT LINE

Vacuum sensors

UST Monitoring Panel

See you in a year!

CALIFORNIA CUPA FORUM

After the installation:

Typical post-install failures

Hydrostatic loss

Vacuum Loss

Oh-Oh… It's losing _____

Bone-dry and Empty

Slimy

Oh-Oh… It's Losing _____

Vacuum

VPH Modifications

- Due to limited types of equipment available during the early VPH installations, problems such as leaking penetration fittings, loss of brine/glycol, vacuum alarms, etc.., have been common. Modifications to VPH systems have been needed.
- Repairs have included: replacement of non-rigid penetration fittings with manufacturer-approved rigid fittings, penetration fitting repairs with a manufactured fiberglass cuff system, replacement of UDCs, piping and tank sumps, etc..

Rusted and Dry

Cracked Fittings (Vac loss)

Pink Slime

What is in that vent?

Slimy sensor

What to Look For: Vacuum Loss

Vacuum loss is usually attributed to pin-hole leaks in some soft termination fittings and even some rigid termination fittings that formed weak spots in the fiberglass or adhesive.

Fix: Replacement of failed fitting(s); with or without breaking concrete depending on the replacement fitting.

Inspect: Verify that manufacturer installation guidelines were followed. Monitor for vacuum loss through review of alarm history pending manufacturer guidance on repairs.

What to Look For: Hydrostatic Loss

Hydrostatic loss is usually attributed to pin-hole leaks in fiberglass at sump seams, fill ports, cracked soft penetration fittings and even some rigid termination fittings that formed weak spots in the fiberglass or adhesive. Observed as liquid in the sump and low reservoir or dry sump with low hydrostatic reservoir.

Fix: Add fiberglass if leaking into the sump at the seams, and/or replacement of failed fitting(s); with or without breaking concrete depending on the replacement fitting.

Inspect: Verify that the manufacturer install guidelines were followed and monitor for hydrostatic loss through review of alarm history. A "Brine Log" is effective in identifying areas of alarm, frequency of addition of brine and to determine the areas of continued concern requiring action/correction pending manufacturer guidance on failure identification and repair process.

*Only ICC-Certified UST Technicians may add "brine".

What to look for with Water/liquid Intrusion

VPH systems cannot have/store/take on any liquid - Even vapor leaks require investigation. (product and vapor tight)

Fix: This fix may be as simple as adjusting sprinkler setting and as complex/invasive as breaking concrete to raise the man ways at the tank top to prevent water intrusion. Same for UDCs.

Inspect: Recheck after correction… should be dry.

Any Questions?

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