



UST PLAN CHECK: VPH SYSTEM INSTALLATION AFTER REMOVAL

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Introduction

- **Why are we covering VPH Plan Check?
Today's focus is Title 23 and CHSC
although there is an emphasis on
manufacturer guidelines.**
- **Breaks at the top of each hour.**
- **Time for questions at the end... have some!**



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.
- The Clean-Up Fund is set to sunset and along with it that very accessible means of CFR.
- Single-Walled (SW) USTs are set to sunset.

But Wait; There's More!!



No more Ball Floats



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

2023 New Normal - Patience

- Normally, those with the 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; Sewering agency.
 - 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.



DW 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/matrixjan14.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

<http://ulstandardsinfontet.ul.com/scopes/0971.html>

Nonmetallic Underground Piping For Flammable Liquids

UL 971

1 Scope

- 1.1 These requirements cover primary carrier, secondary containment, integral primary/secondary containment, normal vent and vapor recovery, nonmetallic pipe, fittings, and systems (products) intended for use underground in the distribution of petroleum-base flammable and combustible liquids, alcohols, and alcohol-blended fuels as identified in this standard.
- 1.1 revised effective July 1, 2005 1.2 The piping covered by these requirements is intended to be installed and used in accordance with the Flammable and Combustible Liquids Code, NFPA 30 and the Standard for Automotive and Marine Service Station Code, NFPA 30A.
- 1.3 These requirements cover nonmetallic thermoplastic (flexible) and thermoset (rigid) plastic piping with manufacturer-supplied fittings for underground use only. The products covered by this standard have been evaluated for assembly in normal soil applications by qualified persons in accordance with the manufacturer's instructions.
- 1.3 revised effective July 1, 2004 1.3.1 The products covered by this standard have not been evaluated for applications in sumps [more than 12 inches (30.5 cm) from sump wall], as connector pipe (between underground pipe and dispensing device), aboveground or marine use, or other applications exceeding ambient temperatures of 75°F (23°C).
- 1.3.1 added effective July 1, 2005 1.4 A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this standard, and that involves a risk of fire or of electric shock or injury to persons shall be evaluated using appropriate additional component and end-product requirements to maintain the level of safety as originally anticipated by the intent of this standard. A product whose features, characteristics, components, materials, or systems conflict with specific requirements or provisions of this standard does not comply with this standard. Revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this standard.
- **1 Scope**
- 1.1 These requirements cover primary carrier and secondary containment nonmetallic pipe and fittings (piping) intended for use underground in the distribution of petroleum-base flammable and combustible liquids, alcohols, and alcohol-blended fuels. Unless otherwise stated, requirements apply to both primary carrier and secondary containment pipe and fittings.
- 1.3 In applying these requirements to flexible piping, a separate examination and unique tests are needed to determine whether the piping is appropriate for that purpose.

VPH PLAN REVIEW

Before you Start

Gather your references:

- Current Piping Matrix
- 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/Retrofiter

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/component 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

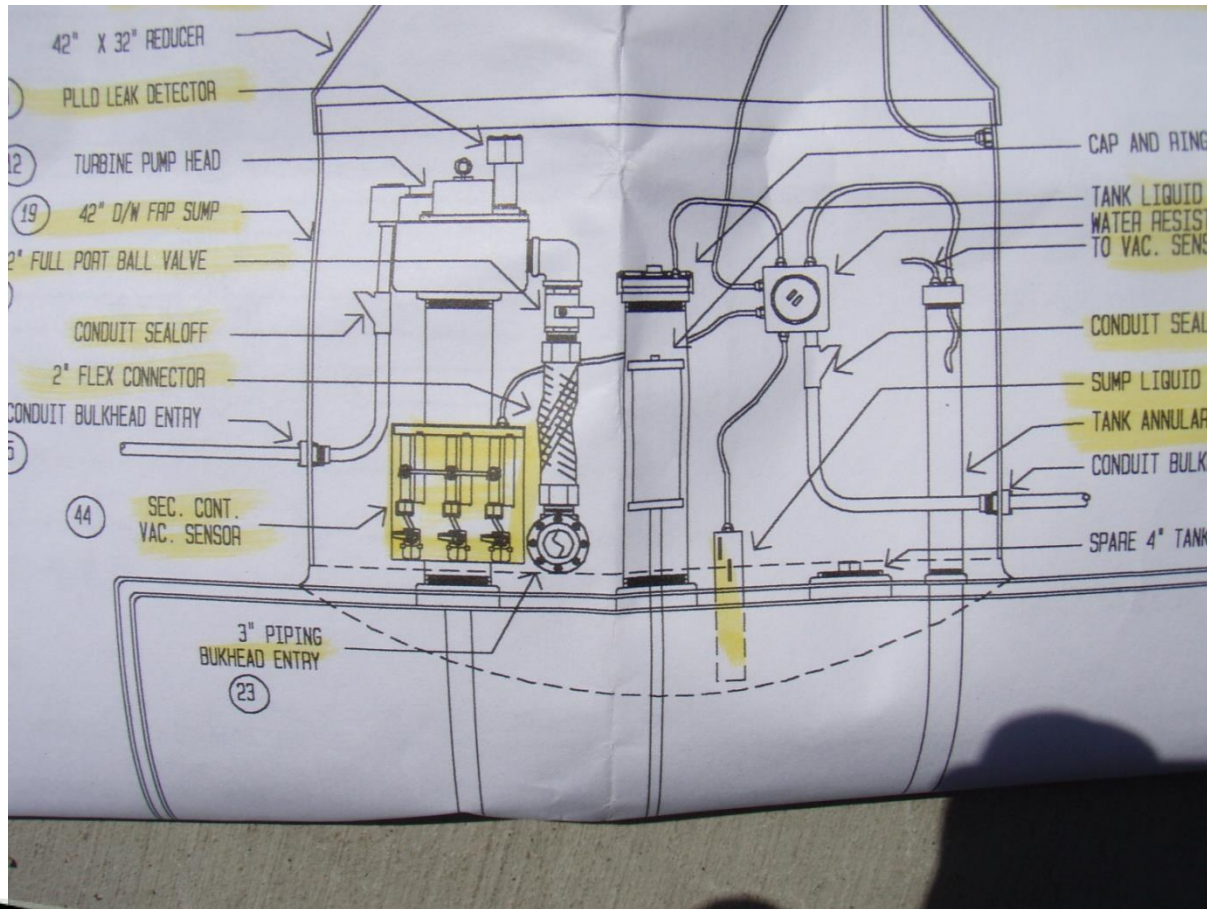
Plans

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.

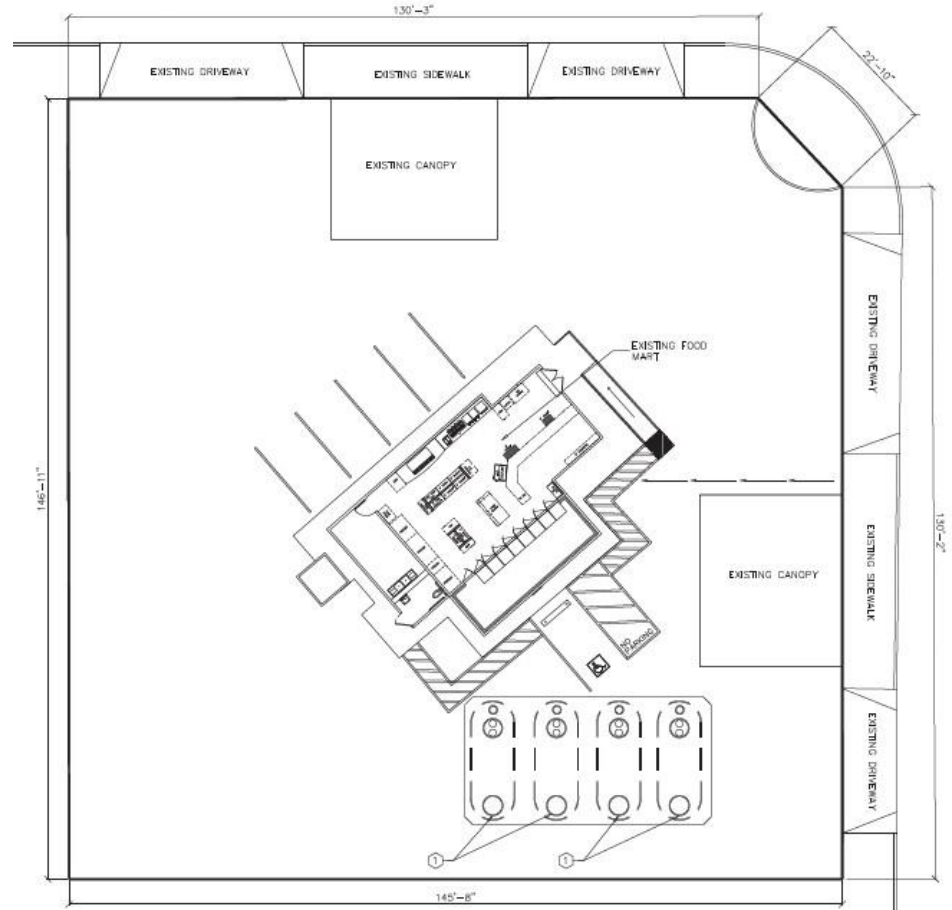
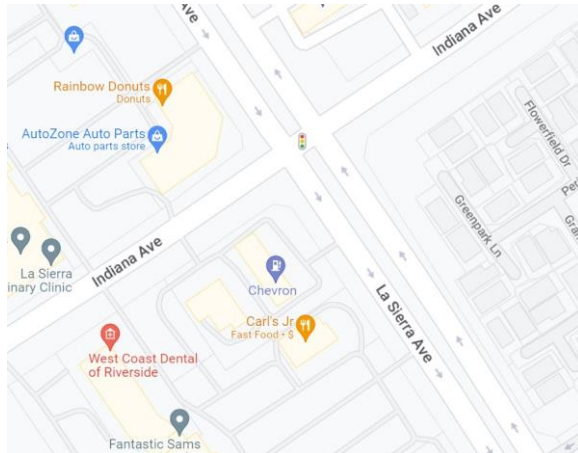
The Plans



Checklist - Submittal

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SMALL LOCATION MAP



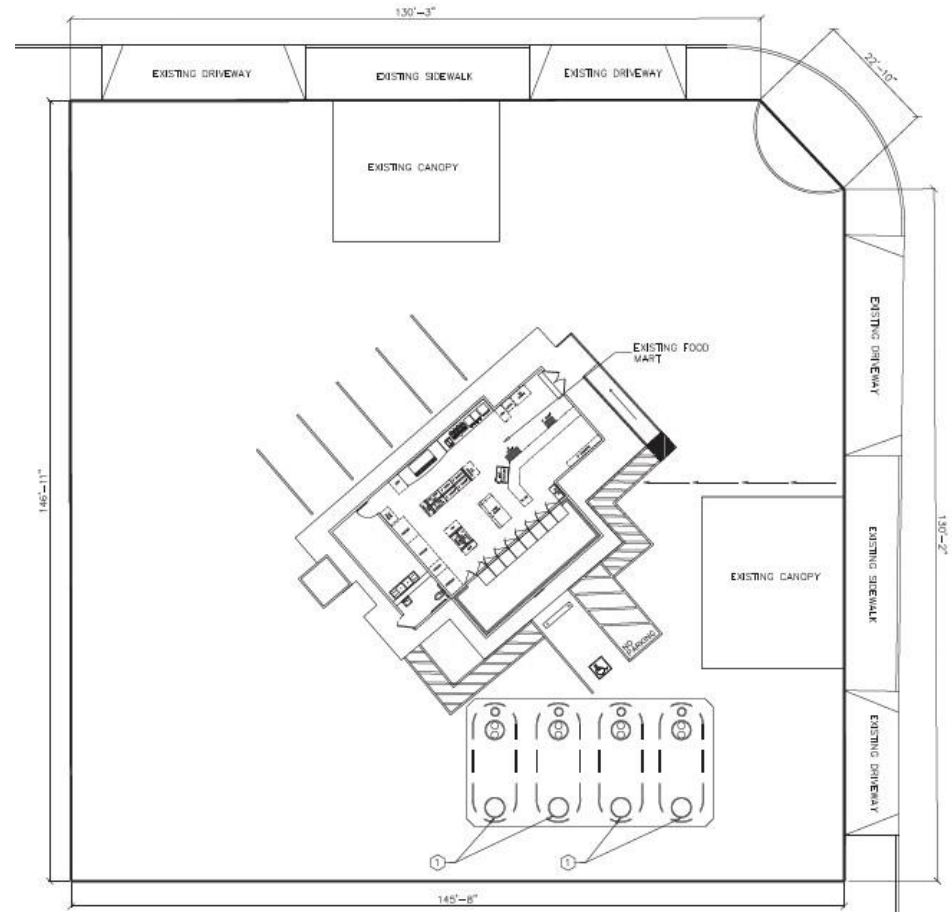
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Checklist - Submittal

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SCOPE OF WORK:

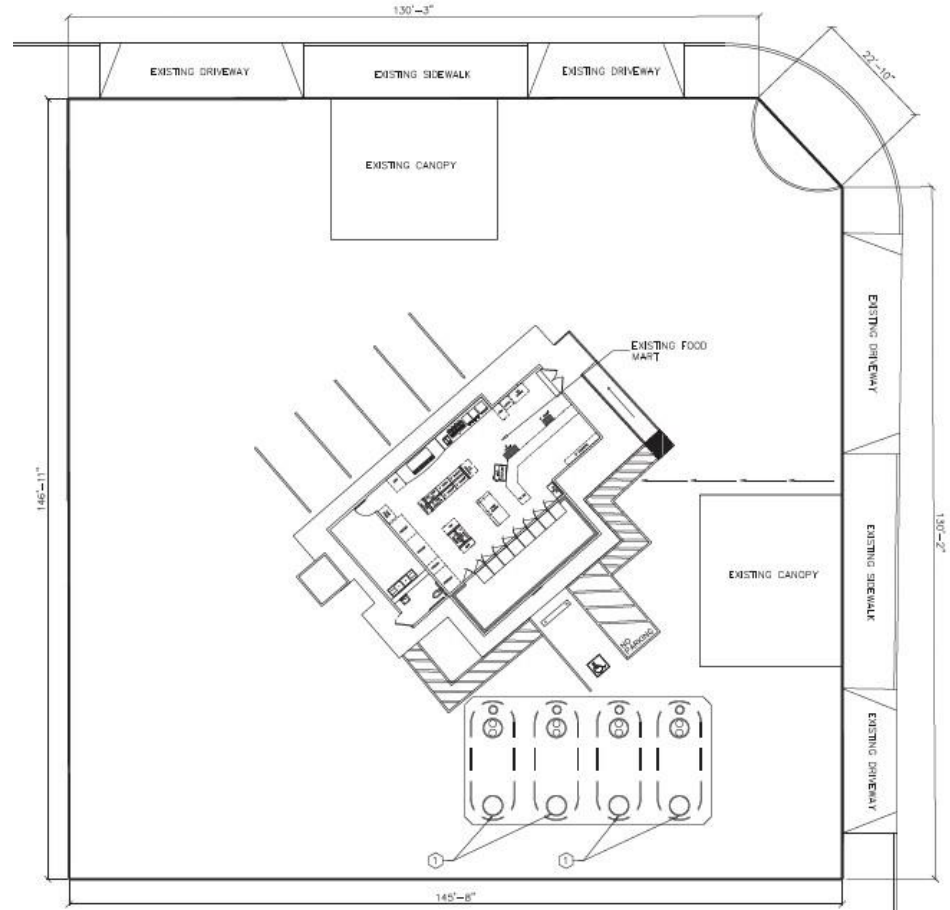
INSTALLATION OF FOUR
USTS, ____ MANUFACTURER
FIBERGLASS DOUBLEWALLED
MONITORED HYDROSTATICALLY
EACH UST IS 10,000 GAL.
TANK 1 WILL STORE E85
TANK 2 WILL STORE B20
TANK 3 WILL STORE 91
TANK 4 WILL STORE 87



Checklist - Submittal

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LOCATION ADDRESS.
MAP SHOWN SHOULD REFLECT
ACTUAL LOCATION.



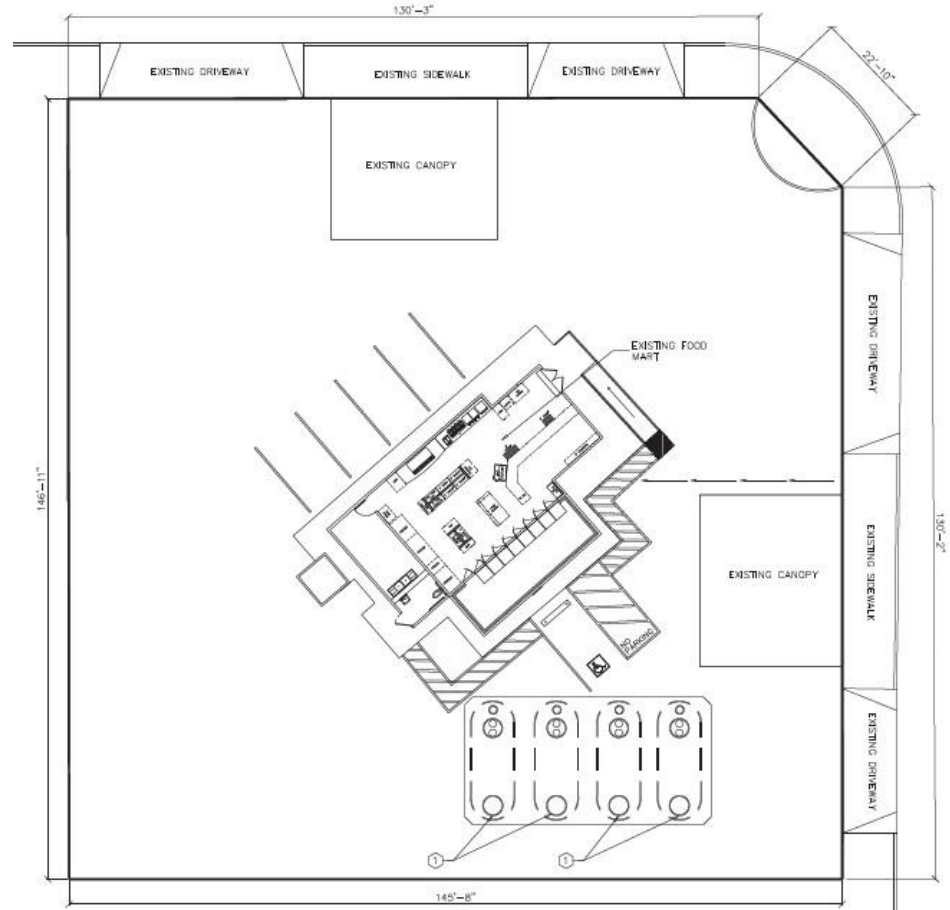
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Checklist - Submittal

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FACILITY INFORMATION
SHOULD BE IN THE TITLE ROW

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



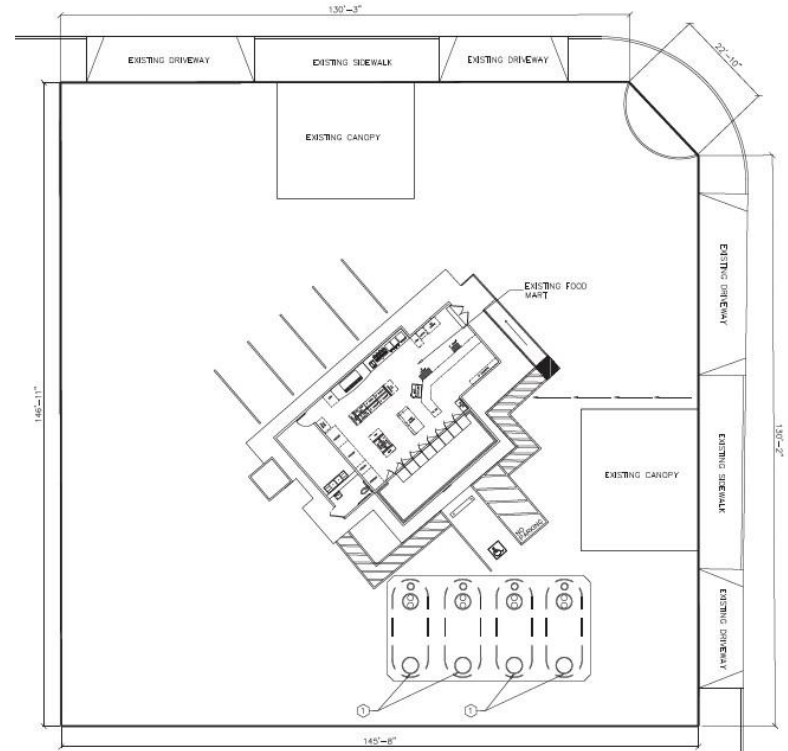
Checklist - Submittal

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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.

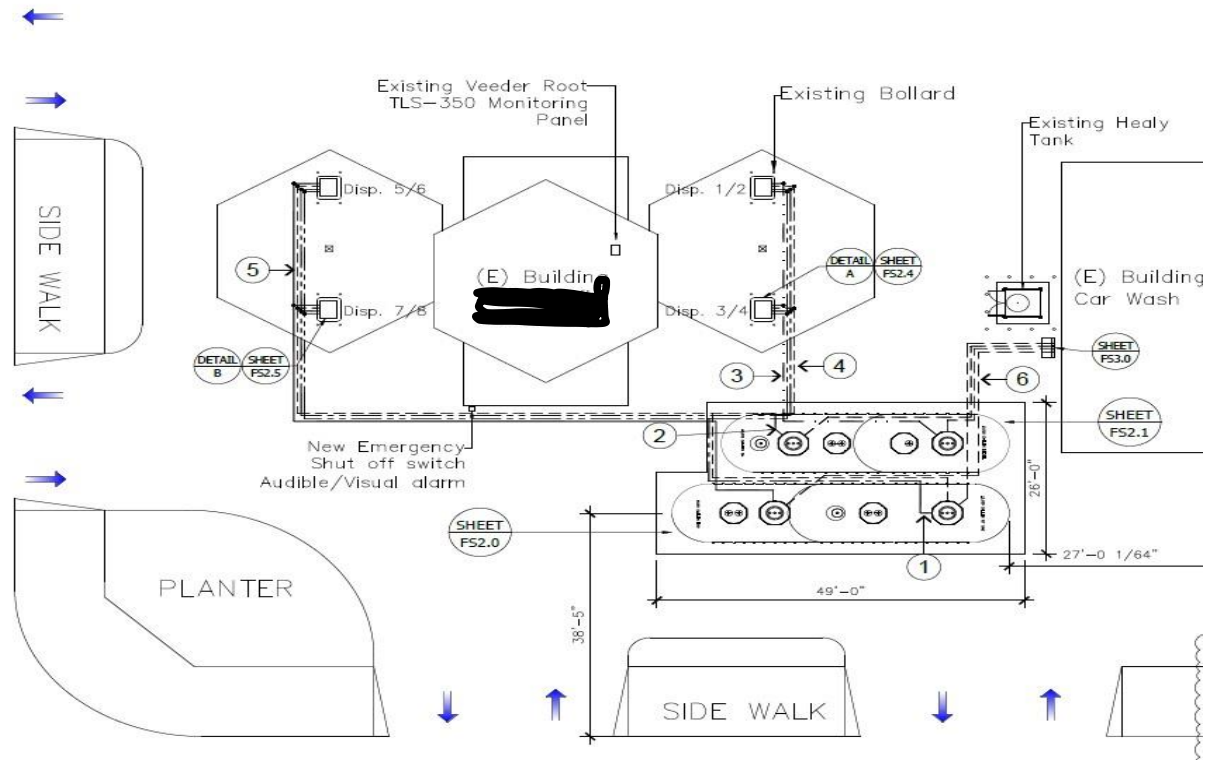
IMPORTANT TO REMEMBER THAT OFTEN YOUR STAMPED PLANS ARE SUBMITTED FOR ADDITIONAL REVIEW BY FIRE DEPARTMENTS.



Checklist - Submittal

PIPING AND TANK LAYOUT

MUST SHOW TANK AND PIPING RUNS



Checklist - Submittal

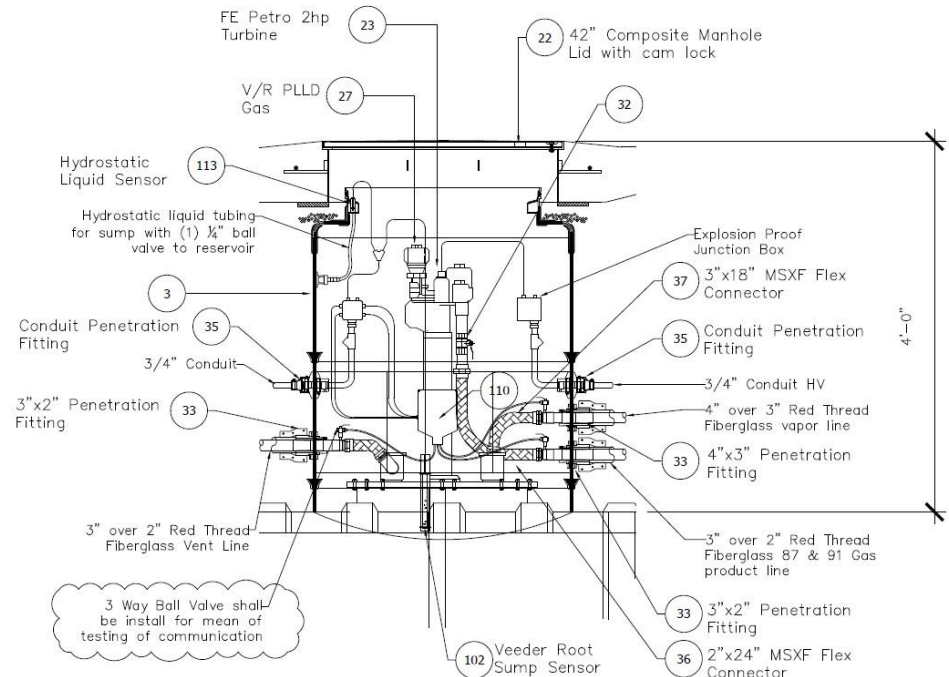
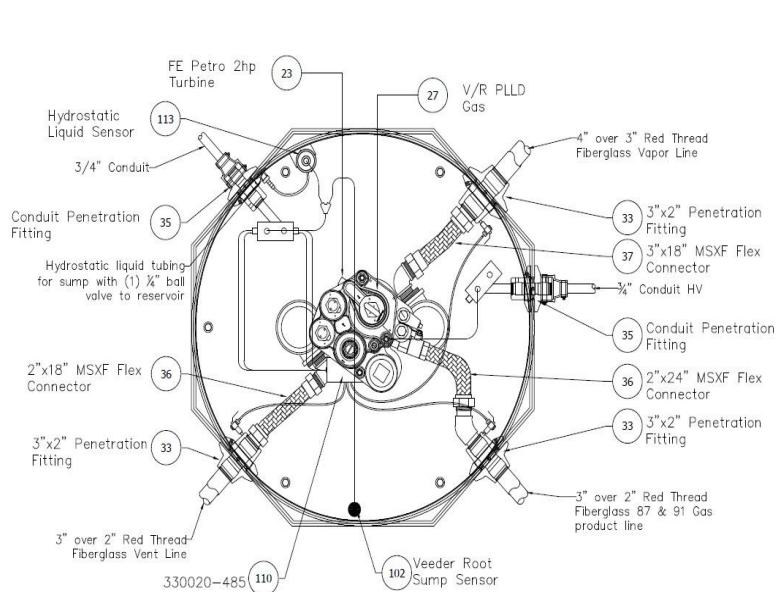
PARTS LIST

#	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
			<u>Dispenser Trim</u>
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
7		ENCORE-E85 ADDER	2 - Flex fuel E85 adder per hydraulic inlet

Checklist - Submittal

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

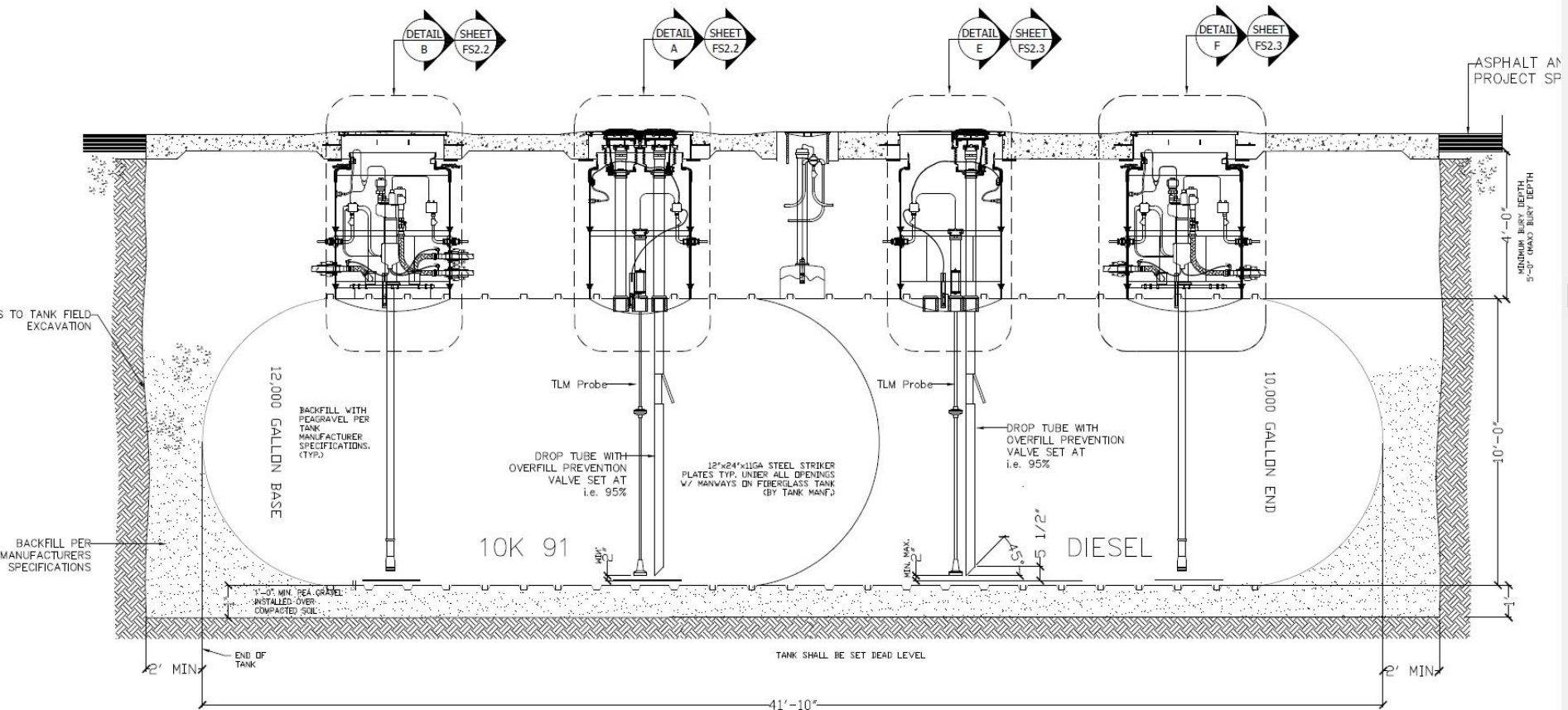
WITH PARTS LIST YOU CAN VERIFY COUNTS AND LOCATIONS – DO NOT ASSUME IF YOU DO NOT SEE IT.



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:



CUSTOMER/JOB: ██████████
TIME: ████████ DATE: ████████ 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"
DISTANCE FROM END ONE TO ANCHOR 2: 11'12.25" or 133.25"



Checklist - Submittal

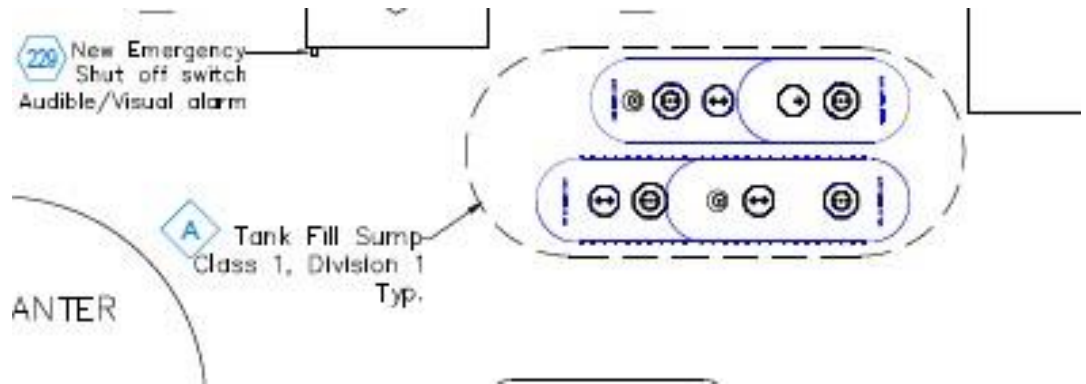
DETAIL CUT SHEETS – FIRE CODE CLASSIFIED AREAS AND HAZMAT NOTES. REMEMBER THESE GO TO THE FIRE DEPT AFTER CUPA STAMP.

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)
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.
EXTENT OF CLASS 1, GROUP D, DIVISION 2 LOCATION:
UP TO 18 INCHES ABOVE GRADE LEVEL, WITHIN A HORIZONTAL RADIUS OF 10 FEET FROM A LOOSE FILL CONNECTION AND WITHIN 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:
WITHIN 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 ANSIUL 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 1:
 - 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 2:
 - a. ALL AREA WITHIN 20'-0" HORIZONTALLY FROM THE EDGE OF THE DISPENSER TO A LEVEL 18" ABOVE THE GROUND.
 - b. ALL THE AREA 3'-0" FROM A TIGHT FILL CONNECTION OF THE UNDERGROUND TANKS.
3. PVC COATED RIGID CONDUIT IF INSTALLED UNDERGROUND OR THROUGH HAZARDOUS AREAS (E.G. FOR CANOPY LIGHTING, INTERCOM SYSTEM, ATN, ETC.) SHALL COMPLY WITH 2007 C.E.C. 4614.
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

Ok, so you know what they want to do...

CAN THEY DO IT?



Starting Your Review

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

Piping: California has a Matrix of approved Piping

http://www.waterboards.ca.gov/ust/leak_prevention/docs/matrix091912.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!



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>



The Plans

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



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

- 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 Sumps

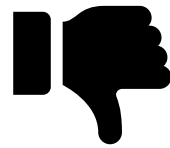
Due at Final

- 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, overflow prevention inspection and spill container test report.

*Uploaded to CERS.







Vacuum sensors

UST Monitoring Panel



See you in a year!



25th California Unified Program
Annual Training Conference
March 20 - 23, 2023

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



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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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