

Estimating Considerations for Indoor Fuel Oil Storage Systems



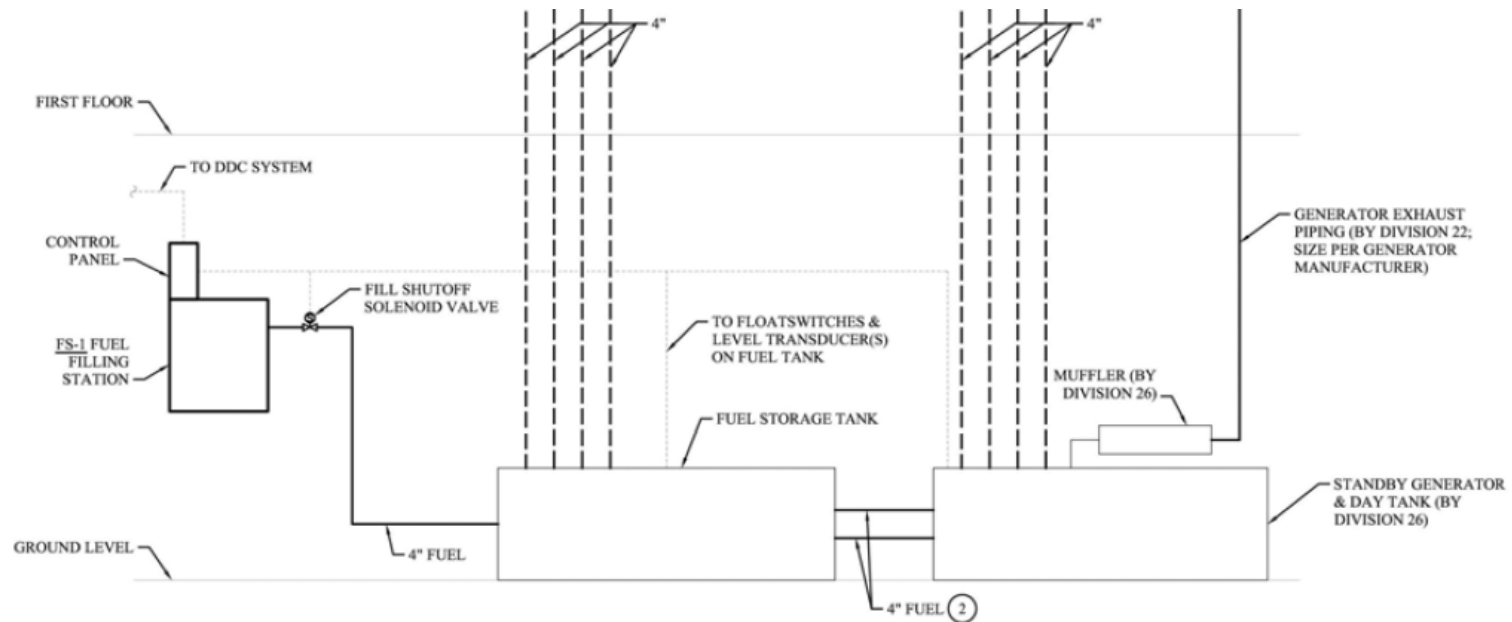
Plans and Specifications

Estimating stored fuel systems on plan/spec projects often requires in-depth knowledge of the equipment, industry standard practices and local codes.

Because most Engineering Firms do not specify fuel systems regularly, the design is often incomplete, inaccurate or simply a 'cut & paste' from a "similar" project.

Plans and Specifications

- Here is an example of a 'typical' drawing



STANDBY GENERATOR SYSTEM PIPING DIAGRAM

SCALE: NONE

Plans and Specifications

When estimating fuel systems, follow a logical path through the system to ensure all system aspects and equipment are covered.

- Tank selection
- Filling the Tank
- Venting the Tank
- Monitoring the Tank
- Fuel Oil Supply / Return to the Generator
- Filtration (if applicable)

Follow the fuel through the system.

1. Tanks –

- Main Fuel Storage Tank –
 - Free-Standing Tank
 - Sub-Base (Belly) Tank



1. Tanks –

- a. Single wall.
- b. Double wall
- c. Listing –
 - 1)UL 142
 - 2)UL 2085
 - What's the difference???

1. Tanks –

- Tank Openings
 - Enough for tank requirements?
 - Proper Sizing
 - Base Tank Challenges

Extra 4” tank fittings cost ~\$120.00 each for a typical new storage tank

2. Tank Filling –

International Fire Code 2012 Requirements

- a. 5 Gallon (minimum) Fill / Spill Containment
- b. Audible/Visual Overfill Alarm @ 90% rated capacity
- c. Positive Shut-Off @ 95% rated capacity
- d. Kamlock Fill Connection
- e. Check Valve within 12” of Fill Point
- f. Metallic Fill/Drop Tube
- g. Isolation Valve
- ***Some jurisdictions require double-wall piping*
– (i.e. Redmond, WA)

2. Tank Filling –

- a. Remote Fill / Spill Container
 - Type
 - In-Wall
 - Surface Mount
 - Free-Standing
 - Location
 - 5' minimum from building openings
 - Not more than 10' inside exterior opening of a loading dock
 - Options

2. Tank Filling –



2. Tank Filling –

- b. Overfill Alarm
 - 90% Audible/Visual Alarm Indication



2. Tank Filling –


- c. Overfill Prevention
 - 95% Positive Shut-Off System
 - Can be either Mechanical or Electric Actuated
 - May be set at a percentage lower than 95%
 - Mechanical valves may be difficult to install on belly tank systems due to shallow depth

2. Tank Filling –

- Overfill Prevention Valves



3. Venting –

- Why is it important?
- Flame Arresting normal (breather) vent
- Emergency Vent Caps
- Where do the vents terminate?
 - Minimum 12' above finished grade
 - Minimum 5' from any building openings
 - Minimum 10' from any intake louvers
-  Listing required

3. Venting –

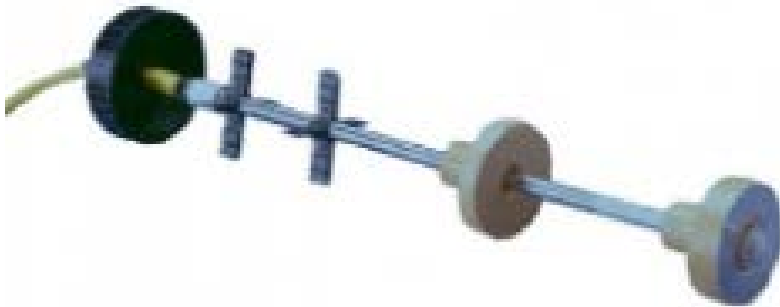
- Flame Arresting Vent Cap and Emergency Vent Cap



4. Monitoring Systems -

- Mechanical / Manual Gauging
 - Gauge Stick
 - Clock Level Gauge
- Electronic Monitoring Systems
 - Basic High/High-High Alarms
 - Complete Tank Monitoring & Leak Detection
 - BAS Interface
- Remote Fill Alarm Options
 - Indicator Lights
 - Digital Display

4. Monitoring Systems -



5. Supply & Return Piping –

- Line Size Considerations
 - Consumption Rate vs. Fuel Flow Rate
 - Oversized Return
 - Elevation of Tank, Day Tank and Generator
- Threaded or Welded connections
- Valves and Accessories
 - Foot Valve
 - Isolation Valve
 - Flexible Connectors
 - Fusible Valve
 - Anti-Syphon Valve
 - Electric vs. Mechanical

6. Polishing System–

- Why Polish Diesel Fuel?
 - Diesel Storage Life Expectancy
 - Microbial Growth
 - NFPA 110
 - Remove and Replace
 - Consume within lifespan of stored fuel
 - Maintain fuel to ASTM standards
 - At a minimum, provisions should be made for future addition of polishing system (i.e. extra fittings)

Fuel Polishing Systems



Mascott Equipment

- Mascott Equipment:
 - Since 1960 is a full-service Petroleum Equipment Distributor
 - is a member of the Petroleum Equipment Institute
 - offers support throughout the design, procurement, installation, start-up and commissioning process
 - offers a full array of on-going testing and compliance services

Service Department



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Stuart Trebelhorn

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Compliance Testing



PEI/RP1400

The Petroleum Equipment Institute has assembled a National committee to develop RP1400, *“Recommended Practices for Design and Installation of Emergency Generator and Oil Burner Fuel Systems”*.

Mascott Equipment is the only company in the Pacific Northwest to be accepted to serve on this committee.

If you would like to be notified when the document is published, send an e-mail to: strebelhorn@mascottec.com using the subject title “RP-1400”.