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PCD File
PPR2527

Prepared for:
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# Fire Protection Report for 1185 N Curtis Rd

**Owner:** Andrii Varko
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4410000052
RR-5, Residential Rural District
N2NW4SW4NW4 EX W 30 FT FOR CURTIS ROAD SEC
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## 1. Purpose

This Fire Protection Report has been prepared in accordance with the El Paso County Land Development Code, Fire Protection and Wildfire Mitigation Section, to evaluate fire protection capabilities, water supply, access, and wildfire mitigation measures for the proposed development.

The purpose of this report is to ensure that the proposed development:

- Minimizes hazards to public health, safety, and welfare
- Provides adequate fire protection
- Reduces wildfire risk
- Complies with applicable fire code requirements

## 2. Project Description

The subject property is located in unincorporated El Paso County and is zoned RR-5 (Rural Residential) with an approved variance of use for RV and container storage.

The proposed development consists of:

- 10 RV storage spaces
- 24 steel shipping containers used for storage
- Outdoor storage yard (gravel surface)
- Existing single-family residence, which will remain on site but is not intended to be inhabited
- There are no new buildings proposed as part of this development.
- The total site area is approximately 4.95 acres, consisting of gravel-covered operational areas and prairie grass vegetation.

## 3. Fire Authority and Response Capabilities

The property located at 1185 N Curtis Rd is within the boundaries of the Ellicott Fire Protection District and approximately 10 miles from the Ellicott Fire Station located at 75 N Ellicott Hwy, Calhan, CO 80808. The average emergency response time to this address is 11 minutes.

The district serves a rural area and operates using a combination of:

- Fire engines
- Water tenders (tanker shuttle operations)
- Brush trucks for wildland response

Due to the rural nature of the service area, hydrant infrastructure is limited or unavailable and fire suppression operations rely on transported water supply. Response times are consistent with rural fire districts.

The Fire Authority has the capability to respond to the site; however, on-site conditions must support fire apparatus access and operations.

## 4. Water Supply and Fire Protection

### 4.1 Existing Conditions

The property is served by an on-site domestic water well. The well is intended for domestic use and is not designed to provide the flow, pressure, or storage required for structural firefighting operations. No fire hydrants or municipal water systems are available to serve the site. The nearest fire water line is along State Highway 94.

### 4.2 Proposed Fire Protection Approach

Because the project is not served by a central water system, fire protection water supply requirements are subject to:

- El Paso County Land Development Code
- National Fire Protection Association
- NFPA 1142

The proposed use consists solely of:

- Outdoor RV storage
- Outdoor storage utilizing steel shipping containers
- No new enclosed or occupied commercial structures

Due to no new building being proposed and the open storage nature of the site, the anticipated fire flow demand is significantly lower than that of a conventional self-storage facility.

### 4.3 Fire Water Supply Determination

Per El Paso County requirements, developments without central water systems typically require a fire cistern unless an alternative is approved by the Fire Authority.

The potential for fire spread and hazard level is low, given:

- The outdoor storage configuration
- Limited combustible materials
- Noncombustible steel container construction

- Absence of new habitable or commercial buildings

Based on the determination made by the Ellicott Fire Protection District of fire protection water supply being required, a fire cistern is proposed to serve as the water source for fire protection.

As supported by the NFPA 1142 calculations in **Appendix A**, the fire cistern must hold a minimum volume of 2,000 gallons of water. To meet this demand, a 3,000-gallon cistern is proposed, as detailed on the Site Plan and **Appendix B**, and shall be constructed in accordance with NFPA 1142 and Fire Authority requirements. Construction details are provided in the Site Development Plan.

## 5. Roadways and Emergency Access

### 5.1 Site Access

Access to the site is provided via existing roadway connections and internal gravel drive aisles. The site layout is designed for the fire truck to be able to reach the far end of the site and turn around in a loop at the east end of the site. The soil has adequate structural properties based on the USDA soil maps and the Geological and Geotechnical Report for this project to support the weight of the fire truck.

### 5.2 Emergency Vehicle Access

Emergency access will be provided in accordance with El Paso County standards:

- Drive aisles will support fire apparatus loading
- Minimum unobstructed widths will be maintained
- Vertical clearance in excess of 13 feet 6 inches is provided everywhere
- Turning radii will accommodate fire apparatus
- Turnarounds are provided where required
- Gravel surfaces will be maintained to provide all-weather access capability.

### 5.3 Gates

Gates are locked during non-business hours. The gates will comply with Fire Authority requirements, including emergency access provisions.

## 6. Wildfire Hazard and Mitigation

The site is characterized by prairie grass and open gravel areas. While not heavily forested, the site is subject to potential grass fire exposure, particularly under wind-driven conditions. The following wildfire mitigation measures are implemented:

- Maintenance of vegetation through mowing and fuel reduction

- Removal of combustible debris
- Maintenance of defensible space around the existing residence
- Provision of unobstructed emergency access routes
- Clearly visible address signage for emergency response
- Fence and tree buffer around the site to protect from wind driven fires
- Large gravel area to prevent spread of fires across the site

These measures reduce wildfire risk and improve fire response effectiveness.

**7. Compliance with Fire Protection and Wildfire Mitigation Code**

The proposed development complies with the intent of El Paso County Fire Protection and Wildfire Mitigation requirements as follows:

- Water Supply:
  - Fire protection water supply will be provided as required by the Ellicott Fire Protection District. Due to the outdoor storage nature of the use, reduced fire flow demand is anticipated.
- Access:
  - Emergency vehicle access meets County requirements for width, clearance, and apparatus loading.
- Fire Authority Coordination:
  - Final fire protection design will be reviewed and approved by the Ellicott Fire Protection District.
- Wildfire Mitigation:
  - Vegetation management and site design reduce wildfire hazards consistent with County standards.

**8. Conclusion**

The proposed development consists of an outdoor RV and container storage facility with no new enclosed structures and one existing residence that will remain unoccupied.

The site is not served by a municipal water system; therefore, fire protection water supply requirements are determined in accordance with NFPA 1142 and applicable County standards.

Given the low hazard nature of the outdoor storage use, the required fire protection measures are anticipated to be less than those of conventional building developments. Final requirements, including the proposed 3,000-gallon fire cistern, will be established through coordination with the Fire Authority. Similar storage-type developments within El Paso County have demonstrated that outdoor RV and container storage facilities with minimal fire load and no enclosed or occupied structures may not require the same level of fire protection water supply as conventional building developments. In particular, projects consisting primarily of gravel surfaces, limited combustible materials, and

noncombustible storage units have been evaluated by Fire Authorities as presenting a reduced fire risk. Consistent with these precedents, the proposed development is an outdoor storage yard with no new buildings, limited fuel continuity, and low occupancy, and therefore may warrant consideration of reduced fire flow demand, subject to review and approval by the Ellicott Fire Protection District.

# Appendix A

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# 1185 N Curtis Road RV & Mixed Storage Fire Water Cistern Calculations

Work Type: DFC
Revision 0

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Table of Contents:



## Technical Summary

### Task Scope

The purpose of this analysis is to determine the required fire protection water storage volume for the proposed RV and shipping container storage development located in unincorporated El Paso County, Colorado.

The project consists of:

- Outdoor storage of recreational vehicles (10 spaces)
- Outdoor storage utilizing steel shipping containers (24 units)
- No new enclosed or occupied commercial structures
- One existing, abandoned, single-family residence remaining on site (not intended for occupancy)

The site is not served by a municipal or central water distribution system and does not have access to fire hydrants. Therefore, a fire protection water supply system, if required, must be provided through a static water source such as a fire cistern.

This analysis evaluates the required fire protection water volume in accordance with applicable codes and standards and provides a recommended cistern storage volume subject to review and approval by the Fire Authority.

### Design Criteria/References

- NFPA 1142
- International Fire Code (as adopted by AHJ)
- El Paso County Land Development Code
- Requirements and recomendations of the Ellicott Fire Protection District

Key Design Considerations:

- Rural site conditions without central water supply
- Use of static water supply (fire cistern)
- Low hazard classification associated with outdoor storage
- Absence of new enclosed or occupied structures
- Limited fuel continuity due to gravel surface and noncombustable container construction

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**Design Methodology**

The required fire protection water storage volume was determined using a methodology consistent with NFPA 1142, which defines fire flow requirements based on site hazard and applies a required duration to establish total water volume.

The general relationship used is:

Required Water Volume = Fire Flow (gpm) x Duration (minutes)

*Fire Flow Determination:*

Due to the absence of a new enclosed building, the proposed development is not classified as a conventional structure-based fire flow scenario. Instead, the fire risk is associated with:

- Vehicle fires (RVs)
- Contents within shipping containers
- Grass fire exposure

Based on these conditions, the site is considered a low hazard outdoor storage use.

A reduced fire flow is appropriate relative to typical commercial structures. Fire flow selection is based on:

- Limited combustible structural materials
- Noncombustible steel container exteriors
- Lack of continuous fuel loading
- Outdoor configuration allowing fire department access and suppression

A representative fire flow within the lower range of NFPA 1142 guidance for low hazard conditions is utilized.

*Duration of Flow:*

The duration of fire flow is selected based on rural firefighting operations and anticipated response conditions.

Typical durations per NFPA 1142 range from:

- 30 minutes (low hazard)
- up to 120 minutes (higher hazard)

Given the site characteristics and lack of enclosed structures, a shorter duration consistent with low hazard conditions is considered appropriate.

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*County Minimum Requirement Check:*

In addition to NFPA-based methodology, the calculated volume is compared to the minimum requirement established by El Paso County for developments with a single cistern:

- 300 gallons per acre

The governing required volume is taken as the greater of:

- NFPA 1142-based calculated volume
- County minimum requirement

Final Design Volume:

The final recommended fire cistern volume is selected based on:

- NFPA 1142 methodology
- County minimum requirements
- Site-specific hazard conditions
- Practical considerations for fire department operations

The selected volume represents a reasonable and defensible fire protection water supply for the proposed development and is subject to final review and approval by the Ellicott Fire Protection District.

**Volume Calculation**

**NFPA 1142**

$VS_{connex} := 20 \cdot 8 \cdot 10 = 1600$ cu-ft — Volume of Structure (Shipping Container)

$VS_{RV} := 30 \cdot 10 \cdot 10 = 3000$ cu-ft — Volume of Structure (RV)

$VS_{tot} := (20 \cdot VS_{connex}) + (10 \cdot VS_{RV}) = 62000$ cu-ft — Total Volume of Structures

$OHC_{connex} := 4$ — Occupancy Hazard Classification Number (Shipping Container), treated as Warehouse Storage [NFPA 1142 5.2.2]

$OHC_{RV} := 6$ — Occupancy Hazard Classification Number (RV), treated as parking use (not occupied in storage) [NFPA 1142 5.2.4]

$CC_{connex} := 0.75$ — Construction Classification Number (Shipping Container), treated as Type II noncombustible [NFPA 1142 6.2.1]

$CC_{RV} := 1.5$ — Construction Classification Number (RV), treated as Type V combustible construction using engineering assumption, not NFPA assignment [NFPA 1142 6.2.1]

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$$WS_{connex} := \frac{VS_{connex}}{OHC_{connex}} \cdot \left(CC_{connex}\right) \cdot gal = 300\ gal$$

Minimum Water Supply (shipping container)

$$WS_{RV} := \frac{VS_{RV}}{OHC_{RV}} \cdot \left(CC_{RV}\right) \cdot gal = 750\ gal$$

Minimum Water Supply (RV)

$$WS_{tot} := WS_{connex} + WS_{RV} = 1050\ gal$$

Calculated Minimum Water Volume Requirement (NFPA 1142)

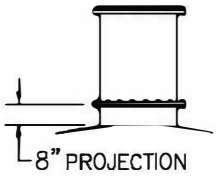
One existing single-family residence remains on the property but is not part of the proposed outdoor storage development and is not intended for occupancy. Accordingly, the NFPA 1142 water supply calculation is based on the proposed RV and shipping-container storage use. The existing residence is noted for site context only

Per NFPA 1142 4.3.2, the minimum water supply required shall be capped at 2,000 gallons as the lower limit. Thus, this calculation recommends a cistern volume of 2,000 gallons be installed for the 1185 Curtis Road storage development.

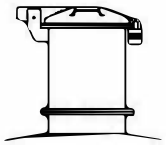
Final Cistern Volume Requirement: 2,000 gallons

# Appendix B

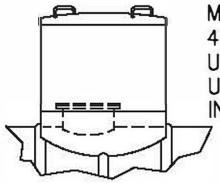
## MANWAY ACCESSORIES




FLANGED MANWAY EXTENSION WITH BOLTED COVER 24"–30"–36" DIA. UP TO 60" TALL



LOCKABLE HINGED MANWAY COVER AVAILABLE FOR 24" AND 30" DIA. EXTENSIONS ONLY

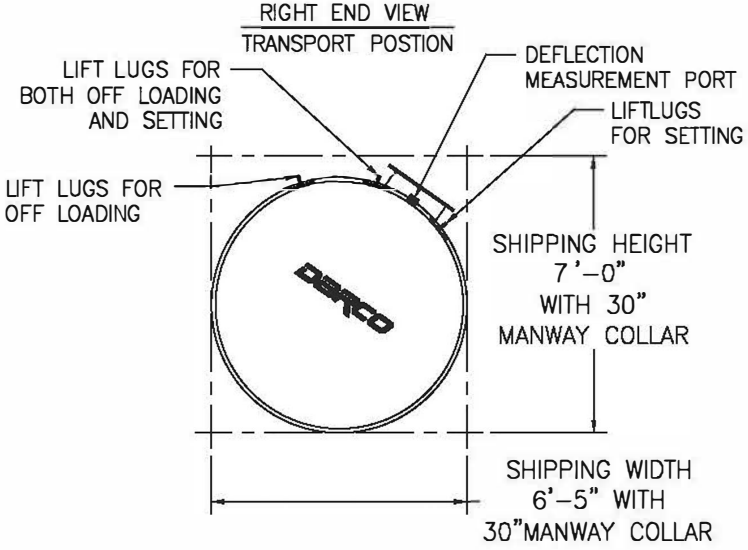


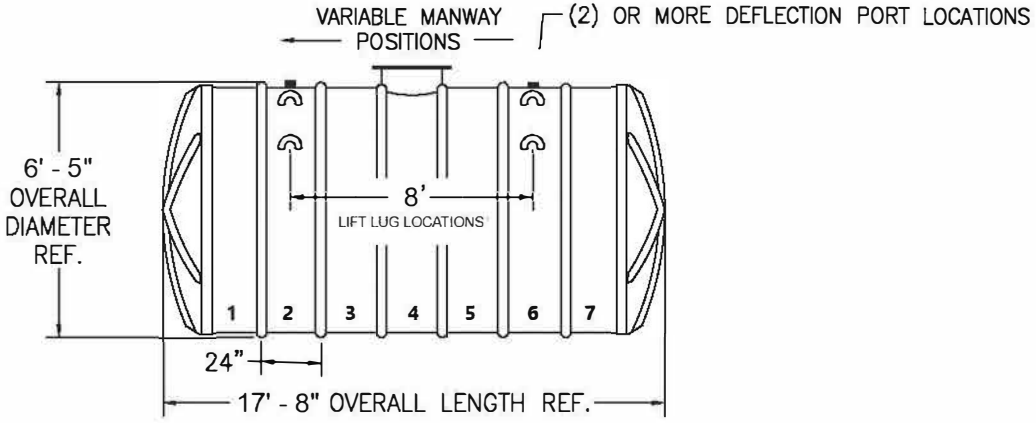
MANWAY ENCLOSURE 48" DIAMETER UP TO 60" TALL USING 20" I.D. INTERNAL MANWAY

NOMINAL SHIPPING WEIGHT: 1500 POUNDS

| KEY | |
|---|---|
| LIFT LUG | ⋒ |
| ANCHOR STRAP | ▼ |
| DEFLECTION PORT | ■ |
| DEADMAN | ▨ |

RIGHT END VIEW
TRANSPORT POSTION




⚠ WARNING
MINIMUM SOIL DEPTH ABOVE TANK WHEN USING DEADMAN ANCHORS IS 2 FEET.

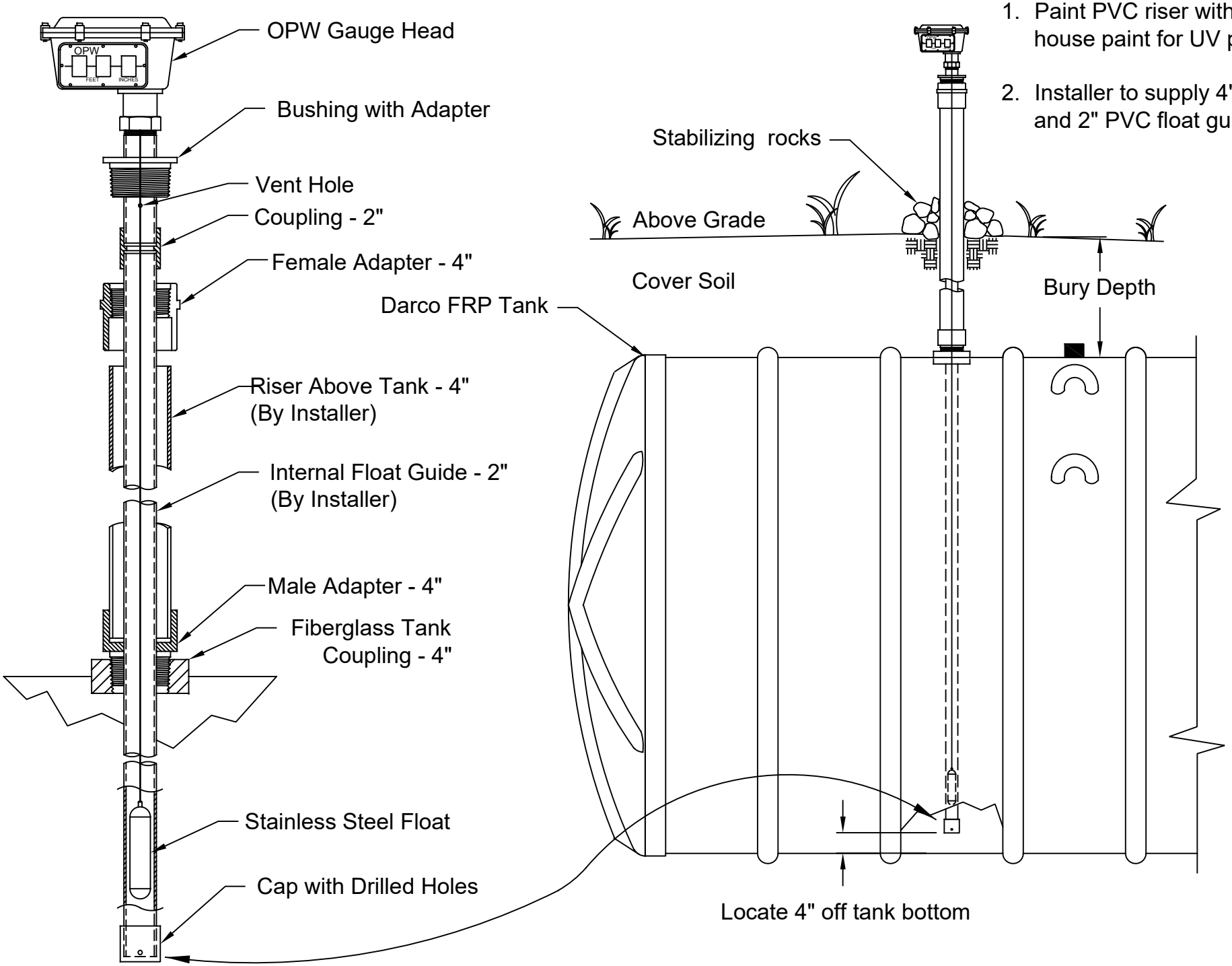
NOTE:
THE DECISION TO USE AN ANCHORING SYSTEM IS THE RESPONSIBILITY OF THE OWNER OR HIS REPRESENTATIVE. NOT EVERY TANK WILL REQUIRE ANCHORING.

DARCO TANKS

| Rev Date | 6'–0" I.D. 3,000 GAL. FIBERGLASS HORIZONTAL TANK | Sheet |
|---|---|---|
| 3/2/22 | | 1 of 1 |
| Rev Let A | | |

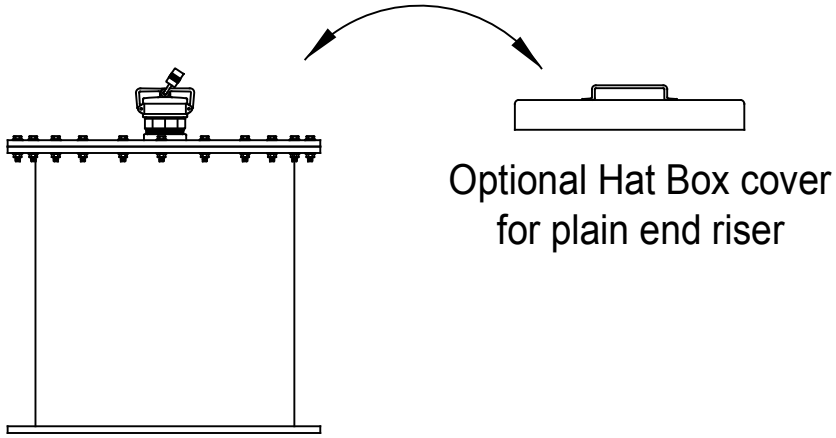
Darco Tanks, LLC
2521 E Mtn. Village Dr, Suite B-974, Wasilla, AK99654
800-232-8660 www.darcotanks.com

# OPW Level Gauge

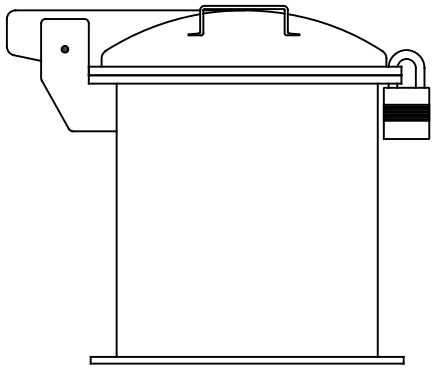



Notes:

1. Paint PVC riser with exterior house paint for UV protection.
2. Installer to supply 4" PVC riser and 2" PVC float guide piping.




Bolted flat cover <u>with bolted tank flange</u>
and optional 4" locking inspection hatch



Locking hinged cover
<u>with bolted tank flange</u>