



ENVIRONMENTAL EDUCATION SERIES
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Design Specifications For Chemical Containment And Mixing/Loading Pad Requirements

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Concrete Design Specifications

Watertight concrete must be used to avoid leakage from sumps and the pad containment area. To resist moisture and chemical penetration, concrete mixtures for the slab surface should include the following specifications:

1. Stiff, dry mix for maximum strength, chemical and freeze resistance, and water tightness; water cement ratio of 0.40 to 0.45 at a 1.5 to 3 inch slump.
2. Type I or II cement with air-entrainment (Type IA or IIA) at 4,000 to 4,500 psi comprehensive strength (Type II provides moderate sulfate resistance).
3. 5.5% to 7% air-entrainment in cement to improve workability of the stiff mix while coating all aggregate particles for maximum water seal.
4. Concrete plasticity admixture for easier workability at placement and improved water tightness and strength of low slump concrete.
5. Vibration at 5,000 to 15,000 RPM for minimum aggregate segregation.
6. Powered steel trowel surface finish for improved washing and cleanup.
7. Immersion or moist cure for 14 days minimum.
8. No more than 30 minutes between truck loads during placement.
9. 70 to 100 revolutions at **mixing speed**; 200 to 300 revolutions at **agitating speed**.

Tank Mounting

To minimize corrosion, large tanks (12 ft. diameter or larger) should be elevated at least 4-8 inches above concrete floors on a base of smooth or wash stone. This provides for drainage away from steel bottoms. Raised stone bases are used to level tanks on sloped floors. Tanks must be anchored to prevent overturning and damage to adjacent tanks and rigid plumbing.

Mixing And Loading Pad

Surface Slopes -2 percent minimum slope to facilitate washing.

Pad Thickness - 6 inches with reinforcement steel at 12 inch centers in both directions.

Rinsate Storage - Separate storage tanks for each chemical applied. Cross-linked polyethylene or fiberglass tanks of 300 to 600 gallon volumes are a good selection. All rinsate storage tanks should be mounted 3 to 5 inches above the concrete floor for location

of tank leaks. Fiberglass, stainless, glass-lined, or epoxy-lined tanks are normally used for liquid fertilizer.

Sumps - Sumps should be located near the rinsate storage tanks and should be covered with steel grating . The minimum size should be 2' x 2' x 2'.

Curbing - The mixing/loading pad should be trimmed by a 3 inch drive-over curb. This minimizes chemical spillage and increases containment volume.

Management - Sprayer systems should be rinsed with the vehicle parked on the wash pad. Pesticide sprayer hoppers or holding tanks and plumbing which contain 4 to 10 gallons of field strength pesticides should be rinsed with 50 to 80 gallons of water. This rinsate can be used later as 20% of makeup water. Rinsate at 5 to 10% of field strength adds only 1 to 2% to total AI in new mixtures.

When switching crops and pesticides, double or triple rinse and use detergents and/or ammonia solutions to minimize pesticide residual in the plumbing (similar to triple rinsing pesticide containers).

Liquid Fertilizer Containment

The major problem in designing containment sections is determining the best combination of containment area and wall height to provide the 125% of volume of the largest tank. The area displaced by all tanks, including the area of the largest tank plus any equipment in the containment area, must be added to the net fluid volume that can be released in the largest tank.

Containment Volume is computed by the following equation:

$$NCV = \frac{(LTV - (GPF \times CVD)) \times 1.25}{7.5}$$

Where: NCV = New Containment Section Volume,
Cubic Feet

LTV = Largest Tank Volume, Gallons

GPF = Gallons Per Foot of Depth of Largest Tank

CVD = Containment Volume Depth, Feet

Containment Pad Area is computed as follows:

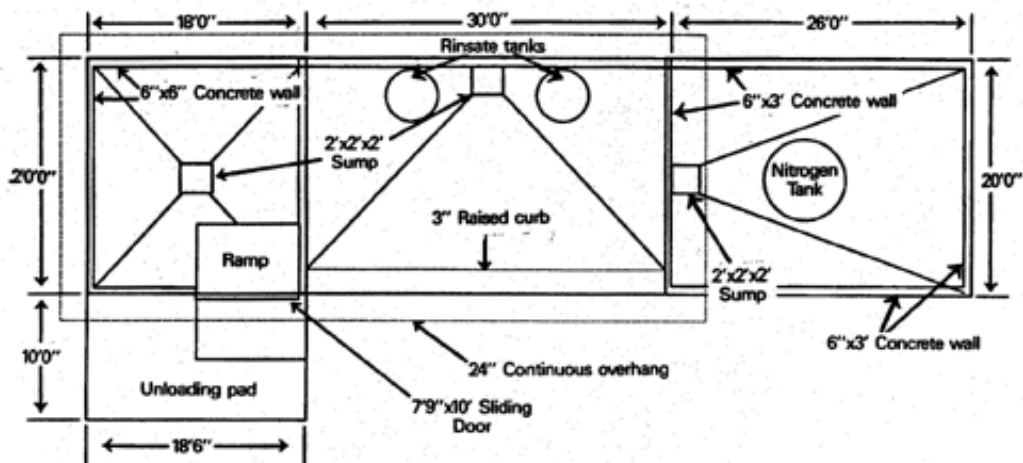
$$PA = NCV/CVD$$

Where:

PA = Containment Pad Area

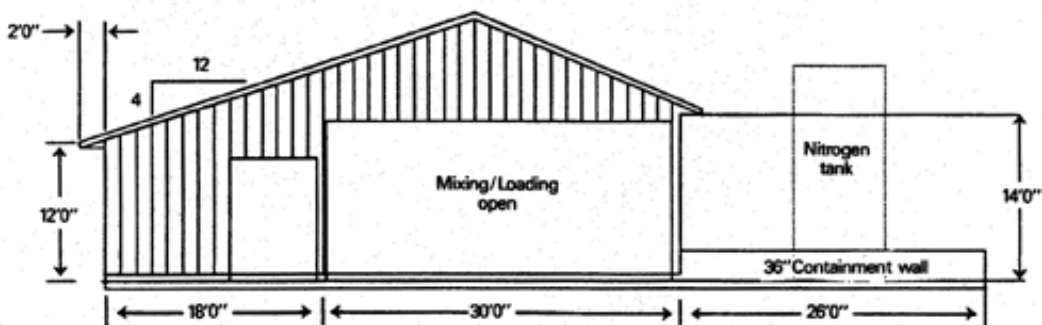
Floor Plan

Scale: 3/32" = 1'0"



Elevation

Scale: 3/32" = 1'0"



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