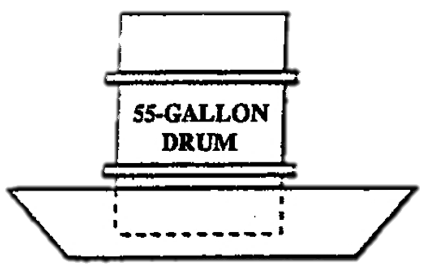
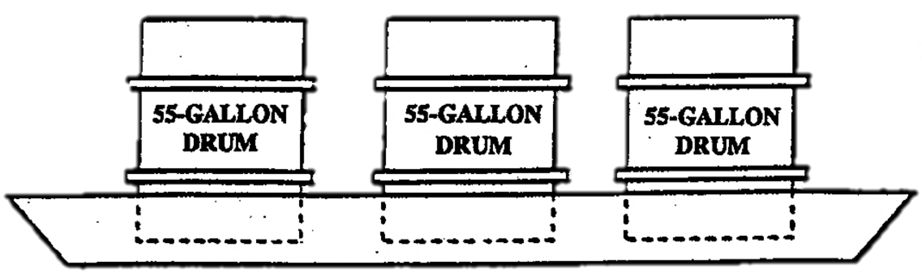
SECONDARY CONTAINMENT

The City of Hayward Hazardous Materials Storage Ordinance (Sec. 3-8) requires that vessels containing hazardous materials have a secondary container which will be able to contain the hazardous material in the event of a failure in the primary container. The vessels containing hazardous materials are to be of such construction as to be impervious, and resistant to the contained materials.

The volume of the secondary containment shall be 110% of the volume of the primary container, unless there are multiple containers stored in the secondary containment. If there are multiple containers stored in the secondary containment, then the contained area shall be 150% of the volume of the largest container stored, or 10% of the aggregate volume of all containers, whichever is greater. If open to rainfall, the secondary container must additionally accommodate a 24-hour rainfall as determined by a 25-year storm history. This is an additional 4 inches in depth. If open to building sprinklers, the secondary container must additionally contain a volume of water equal to a 20-minute flow of sprinklers over floor area of the secondary container or the design area of the sprinkler system, whichever is smaller. Examples:



SECONDARY CONTAINMENT VOLUME
60.5 GALLONS



SECONDARY CONTAINMENT VOLUME
82.5 GALLONS

Materials of Construction

1. For flammable materials, secondary containment must be noncombustible. Reinforced secondary containment vessels for flammable materials can be fabricated in any sheet metal shop.

2. Concrete secondary containment must be coated with a material that will seal the concrete and be resistant to the contained material.

3. Plastic containers can be used for most corrosives and oxidizers.

CONTAINMENT CALCULATION EXAMPLE

A 10 feet by 10 feet chemical storage area contains four 55-gallon drums of flammable liquid. The area is sprinklered at a sprinkler density rate of 0.5 gallons per minute per square foot.

SOLUTION:
Amount of Product to Contain:

Total gallons = 4 drums x 55 gallons per drum = 220 gallons.
10% of product = 0.10 x 220 gallons = 22.0 gallons.
150% of the largest container = 1.50 x 55 gallons = 82.5 gallons.

- Since 150% of the largest container is greater than 10% of the total amount of product, then 82.5 gallons of product is required to be contained.

Amount of Sprinkler Water to be Contained:

Area of containment exposed to sprinklers = 10 feet x 10 feet = 100 square feet.
100 square feet x 0.50 gallons per square foot per minute x 20 minutes =

- 1,000 gallons of sprinkler water to be contained.

Total Amount of Liquid to be Contained:

1,000 gallons of sprinkler water + 82.5 gallons of product = 1,082.5 gallons total liquid to be contained. Convert gallons to cubic feet.

- 1,082.5 gallons of liquid ÷ 7.5 gallons per cubic foot = 144.3 cubic feet of liquid to be contained.

Height of Containment Side:

144.3 cubic feet of liquid to contain ÷ 100 square feet of area = 1.4 feet height required to contain the liquid. Convert to inches.

- 1.4 feet high x 12 inches per foot = ***16.8 inches, height required for the side.***

Containment size:

- 10 feet x 10 feet x 16.8 inches