

A Brief Course on Secondary Containment of Regulated Materials

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Abstract

In a manufacturing facility, there are obligations to prevent the regulated materials used on site from entering the environment. Good secondary containment design can help. Unfortunately there is no single regulatory source for all materials that can define these design requirements.

In collectively reviewing these regulations, a general spirit of what is desired as well as basic requirements can be identified. Good secondary containment design is not terribly difficult, but requires understanding of goals and attention to detail.

Abstract (continued)

Objective - Review the need and requirements of good secondary containment design for areas containing regulated materials (oils, chemicals, hazardous wastes, etc.) in a manufacturing environment.

Scope - A graduated discussion on the regulatory requirements, goals, and strategies of good secondary containment design. Presentation will include defining primary and secondary containment, examples of design situations, the "squirt factor", and design details. Presentation is based on the experience and approach taken at Chrysler Group manufacturing facilities.

Abstract (continued)

Issues - How to define the need for secondary containment; passive versus active secondary containment; spill prevention versus remediation.

Developments - Review of SPCC changes (if they ever are published!). Review of chemical and oil resistant construction materials and design details.

Conclusions - It has been our experience that good secondary containment designs not only meet regulatory requirements, but also cost less in the long run of a facility.

**A Brief Course on
Secondary Containment of
Regulated Materials**

(In 3 E-Z Sections)

Presented by Richard Hingst
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Secondary Containment 101

The Basics.



This is the environment we live in.



This is useful stuff for making things
with in our factories.



... but not good stuff to let into our environment.



Keep the stuff for making things with out of the environment. Good secondary containment design can help.


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Intermediate Study.

Regulated Materials and the Environment

- Regulated materials must be kept out of the environment. These materials include:
 - petroleum products
 - chemical substances
 - hazardous substances
 - hazardous wastes.
- The environment is considered to be the soil, groundwater, surface water, and air.

Understanding Primary and Secondary Containment



- Let's pretend the coffee in this mug is our regulated material and the desktop is our environment.
- The coffee mug is the primary containment for the coffee. (It's what normally contains the coffee.)
- The tray would be the secondary containment for the mug. If the coffee gets out of the mug, the tray will keep it from the desk, and give us a chance to clean things up.

Influencing Federal Regulations

- Specific Regulations
 - 40 CFR 112.7 (Spill Prevention Control and Countermeasure) - for petroleum products
 - 40 CFR 262 - hazardous waste
- Non-Specific Regulations
 - 29 CFR 1910 - requires emergency response plans to protect employees from hazardous materials
 - 40 CFR 300 - requires emergency response plans to hazardous material discharges
 - 40 CFR 355.10 - requires emergency planning and notification of releases of extremely hazardous substances

Qualifications of Good Secondary Containment Of Regulated Materials

- Where regulated materials are handled, stored, used in machinery and processes, there must be a means of
 - Detecting material loss from the primary container
 - Sufficient/compatible containment of the loss
 - Retrieving the loss
 - Correcting the deficiency.

Is this an example of good secondary containment?

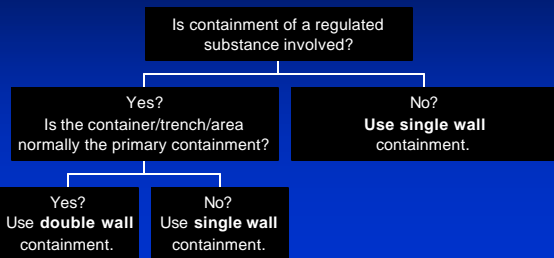
- Is there a means of detecting material loss?
- Is there sufficient/compatible containment for the loss?
- Can lost material be retrieved?
- Can something be done about the leaking primary container?



Containment: Single Wall vs. Double Wall How do you Select?

Determining Containment Requirements

- Use the following decision tree diagram to determine the type of containment required:



Single Wall Vs. Double Wall Containment

- **Single wall** containment is adequate for liquid non-regulated material collection (e.g., water), loading dock areas, tanker truck unloading areas, and areas normally free of hazardous materials.
- **Double wall** containment is required for liquid regulated materials in messy operations, oily chip trenches, catch basins, areas for draining of chips or filters, sumps/lift stations, and areas normally containing these materials.

Proper Containment for Drainage?



- Would this be a satisfactory design for a general refuse dumpster and a nearby city sewer catch basin?
- Would this be satisfactory for an oily chip dumpster and a WWTP catch basin?

leakage
catch basin

Temporary Secondary Containment of Regulated Materials Must be Considered During Construction Projects.





The Squirt Factor

- Sufficient space must be allowed between a storage tank and its secondary containment to prevent material from squirting over it.
- The State of Michigan DEQ, for example, provides a formula to calculate the space, but in general states: “the distance between the storage container and the SC should be the same as the difference between the height of the storage container and the height of the containment structure.”

Bulk Hazmat Unloading Areas

- Under SPCC rules in 40 CFR 112, bulk unload areas for oil products “should” have sufficient secondary containment for bulk unloading. This containment can either be:
 - Passive - meaning drains are blocked (e.g., with spill covers) and (if necessary) absorbent booms are laid around the area
 - Active - the area is specifically designed to provide spill containment.

Bulk Hazmat Handling Areas “Passive Containment Design”

For a loading/unloading area utilizing a passive design of secondary containment, the containment materials must be in place before unloading commences.

This catchbasin going to a storm sewer must be covered prior to loading/unloading.



Bulk Hazmat Unloading Area “Active Containment Design”

•Must be designed to contain 100% of the largest tank onboard the delivery truck + additional for precipitation (unless there is a roof.)



Design notes in this photo:

Valve to storm sewer - remains open except during delivery.

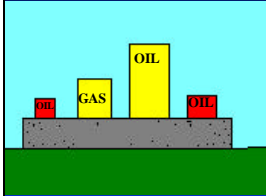
Tanker truck unload area - pitched & curbed with sump

Bulk Hazmat Unloading Area “Active Containment Design”

The pavement slopes down to a trench in the back. The trench is connected to a drainpipe leading to a storm sewer with a manual valve in between.



Secondary Containment for a Group of Tanks/Containers

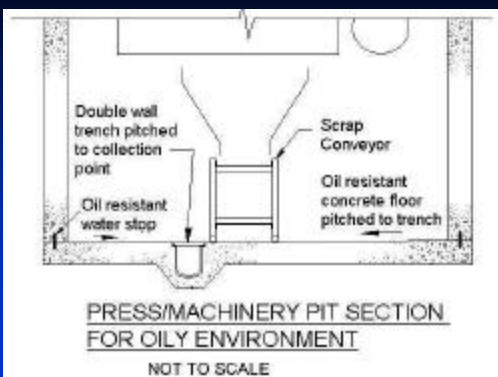


- In general, Federal SPCC and hazardous waste rules requires secondary containment to be able to hold the contents of the largest tank plus precipitation (if no roof).
- State rules vary and can exceed these requirements.

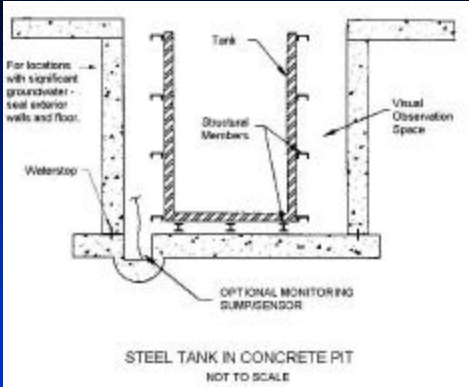
Secondary Containment 103

Design Examples and Details.

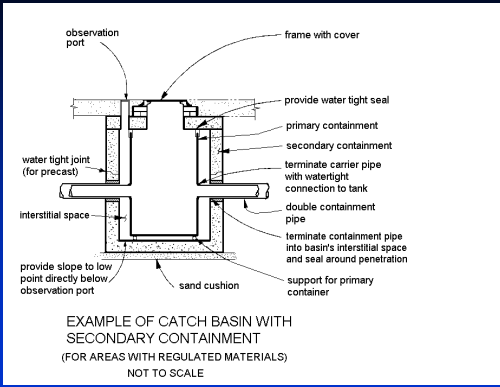
Design Example



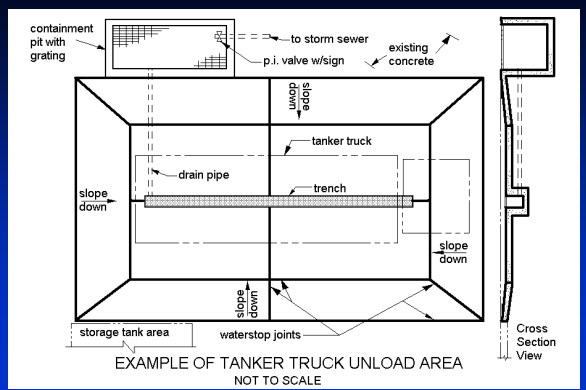
Design Example



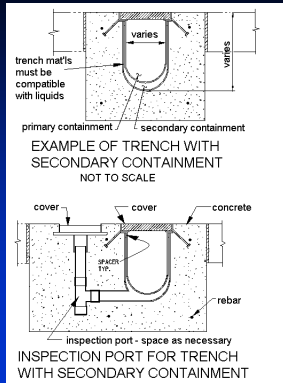
Design Example



Design Example



Design Example



Design and Selection of Containment Materials

Materials used in concrete construction must be resistant and of sufficient design to provide good secondary containment to the regulated substances common in the area.

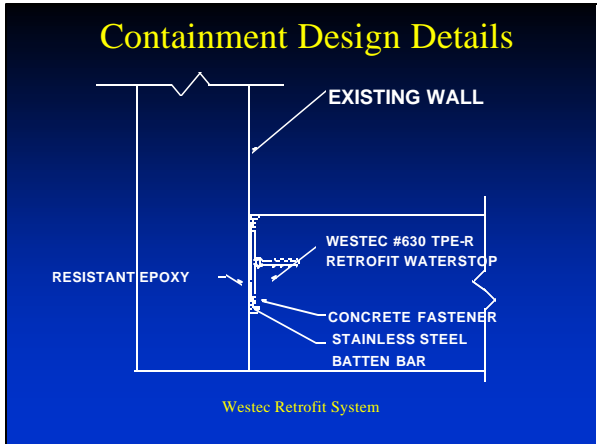


This concrete catch basin near an acid unloading area has corrosion. Bare concrete often requires a protective finish.

Secondary Containment Design Details



- Chemical and/or oil resistant materials must be used in concrete crack and control joints, intersections, and any other area requiring a waterstop.
- Concrete sometimes cracks where it feels like it! Cracks that appear on their own must be repaired/sealed.



Containment Design Details

Review the properties of joint details before selecting...one size does not always fit all.



- *Stainless Steel Waterstop*
- Various Alloys Available
- Excellent Chemical and Temperature Resistance
- Susceptible to Attack From Chlorides and Aggressive Acids
- Flex Fatigue a Problem
- Difficult to Install and Fabricate
- Specialty welding required

Secondary Containment Of Regulated Materials

- Construction practices and methods that we have used in the past may not be sufficient for good secondary containment design for several reasons. Consider:
 - New oil and chemical management practices as well as new regulations
 - Chemical and oil resistant joint and waterstop materials may not have been available.

Secondary Containment Of Regulated Materials

- What happens if secondary containment is not part of a design?
 - Potential fines, imprisonment, or operations can be halted.
 - Potential localized soil contamination that when uncovered, will halt all new construction projects and drive up costs.

Secondary Containment Of Regulated Materials

- It is our experience in the Chrysler Group that after-the-fact remediation costs much more than up-front preventative measures.
- Get involved with reviewing any new building additions or equipment changes, and review for secondary containment requirements. Your opinion counts!

Chrysler Group practices?

Trench design?

Questions?

New Regulations?

Primary vs. Secondary Containment?

End of Course.

Congratulations!
