

Bunding Chemical Areas

ENVIRONMENTAL NUISANCE

Bunding and Spill Containment Information

What should your business know about bunding?

Bunding should be used for the storage of all liquids except rainwater. All businesses working with bunds should know how to carry out preventative maintenance and use standard operating procedures to stop escaping substances from entering the environment.

So what is bunding?

A bund is an embankment or wall of brick, stone, concrete or other impervious material, which may form part or the entire perimeter of a compound and provides a barrier to retain liquid. Since the bund is the main part of a spill containment system, the whole system (or banded area) is colloquially referred to within the industry as the 'bund'. The bund is designed to contain spillages and leak from liquids used, stored or processed above ground, and to facilitate clean up operations. As well as being used to prevent pollution of the receiving environment, bunds are also used for fire protection, product recovery and process isolation.

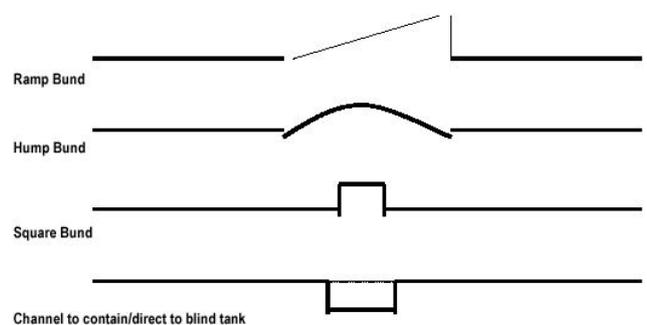
Common substances that should be banded include:

- * New and waste oil
- * Paint
- * Coolant
- * Acids and alkalis
- * Diesel
- * Lacquers and varnishes

Facilities that should have banded areas include:

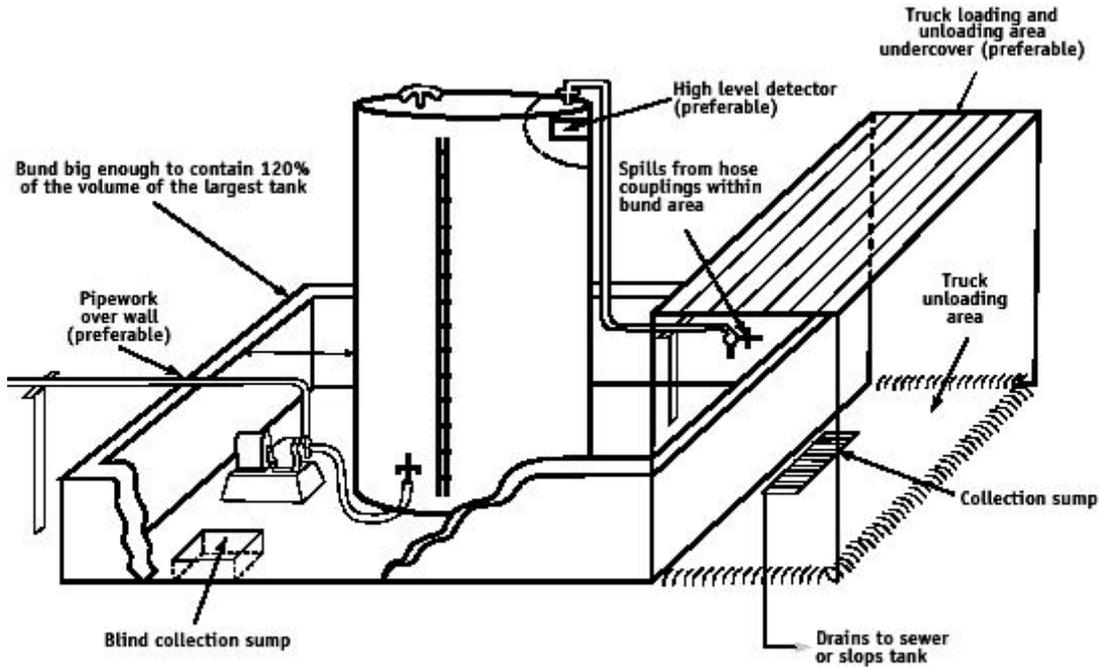
- Storage facilities for chemicals, pesticides or petroleum
- Facilities used to transfer stored liquids (such as transport facilities)
- Drum storage areas, either temporary or permanent
- Processing areas
- Wineries, breweries and milk processing plants
- Any other facilities that store substances other than water or uncontaminated stormwater
- Any other locations where spills are common, including transfer points, workshops, factories, service stations, wash bays, and other areas in which a material is transferred from its container.

There are several different types of bunds:

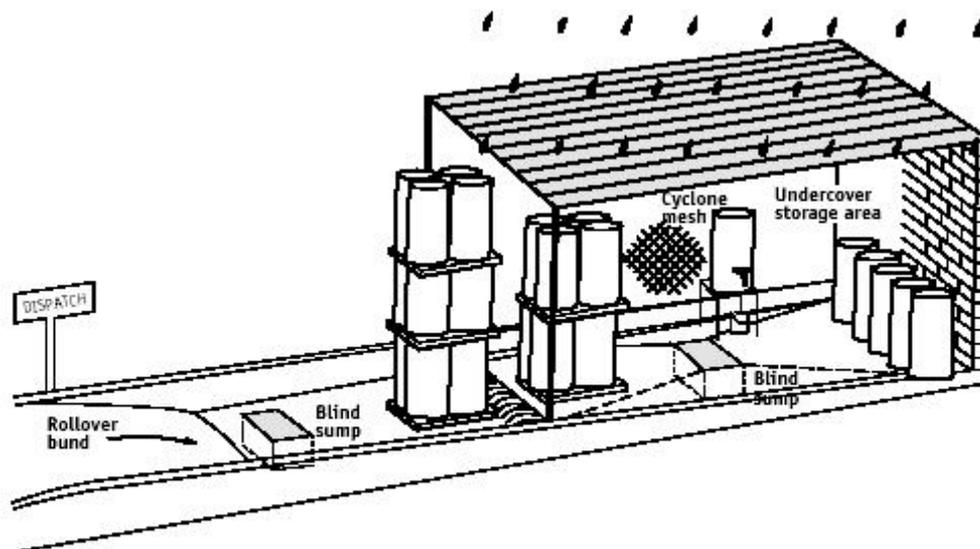


Criteria for design and construction of a bunded storage area

Some general rules should be followed when designing and constructing bunds; the two diagrams below illustrate many of the points that should be incorporated into bund design.



Example of bunding for bulk liquid storage tanks (adapted from EPA Victoria and NSW EPA)



Example of bunding for liquid drums and containers (adapted from EPA Victoria and NSW EPA)

Approvals

Before any work starts on the construction of bunds, check with Council for any necessary approvals that may be required.

Bund Capacity and Sizes

The net capacity of a bunded compound in a storage facility must be at least 110% of the net capacity of the largest tank. You should take into consideration the capacity displaced by other tanks within the same bunded area and any foundations. Treat interconnected tanks as a single tank of equivalent total volume when designing the bunded area.

For flammable liquids, bund capacity should be at least 133% of the net capacity of the largest tank.

For the storage of any flammable materials, refer to the Australian Standard 1940 *The storage and handling of flammable and combustible liquids*, and to the *Dangerous Substances Act 1979*.

If an automatic fire sprinkler system is installed in or over any bunded tank or drum storage area, the capacity of the bund should be increased either by a volume equal to the output from the sprinkler system for a period of at least 20 minutes, or to 133% of the capacity of the largest tank, whichever is greater.

Package Storage

If the material to be bunded is contained in drums (or other small containers), the bunded area must contain at least 25% of the total volume of the stored products.

You should also allow for the containment of fire water on-site by designing and constructing adequate drainage controls, and by developing emergency response plans.

Materials used for bunding

The bund floor and wall must be built of materials impervious to the contents of any tank or container within the bund. It should be of sufficient strength to ensure that it is unlikely to burst or leak in ordinary use, and should not have a damp course. The use of un-reinforced materials is not recommended for bund wall construction.

The bunded area must be capable of preventing the migration of any spillage or leakage to the surrounding environment, such as the stormwater system. Earthen bunds are not recommended, except where there is no other viable alternative.

Bund heights and tank distance from the wall

Wall-type bunds at tank storage facilities should be from 0.5 m to 1.5 m high, depending on the required containment capacity and the distance to the tank, the closer the wall to the tank, the higher the wall has to be. The distance between the tank and bund walls must be at least 1m. If the bund walls are more than 1 m above the compound floor, steps or ladders should be provided for a quick escape.

For bund walls close to the tank or higher than 1.5m, apply the rules for confined spaces. If vehicles will need access to the bunded area, use ramps, a change in grade, or speed humps to maintain an effective bund height.

Storage of liquid classed as a dangerous substance

If the liquid to be stored is classed as a dangerous substance, make an allowance for the flow of a liquid leak, assuming a full tank with an elevated point of leakage. You might need to install a splatter shield, or have a generous distance between the tank and the bund wall; half the height of the tank would be appropriate.

Drainage

A collection of sump should be provided in the bund floor to make it easy to remove liquids, and the floor must be graded in such a way that liquids collect in the sump. The sump must not be connected to stormwater or sewer drainage systems, it is only a collection point from which to pump out the liquid. Bund drain valves must not be installed, and the pump controls must be outside the bunded area. Although rainwater will often evaporate from within an open bund, if there is no rainwater in the bund after heavy rainfall the bund must not be properly sealed and should be inspected and repaired as appropriate.

Removal of accumulated rainwater should be done with a manually operated pump or by baling from the sump. This water may be contaminated and must not be disposed of to the stormwater drainage system. Options for the treatment and disposal of this water are:

- Re-use on site
- Off-site disposal by an authorised liquid waste contractor
- Disposal to a sewer with a trade waste approval

Piping and pumping facilities

Piping and pumping facilities must be arranged so that no leaks escape the confines of the bund, and so that the pumps will still operate when the bund is full of liquid. All pipe work should go over the bund walls, not through them. All valves, filters, sight gauges, vent pipes and other equipment should be situated within the bund and arranged so that discharges are contained.

All pipe work should be sited above ground and properly supported to make inspections and repair easier. Fill pipes, draw-off pipes and vent pipes should be positioned away from vehicle traffic to avoid collision damage.

Roof Design

If possible provide a roof to stop rainwater entering the bund. Make sure that the roof will not cause a build-up of dangerous or poisonous gases, or restrict the application of water in an emergency.

Incorporate an overhang, 12 degrees from vertical, to help stop rain entering the bund from the side. Professional risk assessment and planning processes should be done on a case-by-case basis; they should explore the options of roofing or of safely disposing of rainwater that might collect in an open bund.

Temporary Storage

It is sometimes acceptable to store drums temporarily on spill containment pallets. Each pallet should be capable of capturing the contents of at least one of the drums if there is a leak. If these pallets are to be used, the drums must be stored in a level area (to ensure full spill storage capacity), and they must be covered so that the pallets do not fill with rainwater. Storage for more than 24 hours is not considered temporary.

Temporary bunding arrangements should ensure that there is only localised contamination in the event of a spill. An example of temporary bunding is that needed for storage of fuel during forestry or mining operations.

Testing and disposing of bund water

When the bund needs to be emptied it should be pumped or baled out by a licensed waste contractor or by an approved method to a sewer, never disposed of to stormwater unless appropriately treated.

Take into account the volume displaced by containers stored within the bunded compound.

General Maintenance

All bunds, tanks and pipe works should be inspected regularly for signs of damage. To ensure the bund retains its integrity, any defects in the bund wall or lining should be repaired promptly using the appropriate technique. Damage to the tank or pipe work should be dealt with immediately.

Bunds should not be used to store materials or wastes, as this will reduce their capacity. Any accumulated debris should be removed and disposed of properly.