

BRIEF BACK-TO-BASICS GUIDE CONTAINMENT WALLS

This WISH reference document is aimed at health and safety improvements in the waste management industry. This document is linked to WISH WASTE 32 Containment wall safety (please see below) but is not a formal part of that guidance.

This 'back-to-basics' brief guide to containment walls is primarily aimed at operational employees and small organisations. Its purpose is to provide short, practical and operational information on what is often considered to be a technical topic.

Please note that those seeking to ensure regulatory compliance and similar should **not** rely on this document alone and should also read WISH's formal guidance WASTE 32 'Containment wall safety', available at <https://www.wishforum.org.uk/wish-guidance/>.



Typical examples of some of the types of containment walls used at waste and recycling sites

What's in this back-to-basics guide

This guide and its associated guidance WISH WASTE 32 have been developed by WISH to help control safety and health risks in the waste management industry associated with containment walls, such as bunker, bay, push walls, and similar. Typically the main purpose of containment walls is to separate and contain waste in bays, although there are other uses. The bays usually comprise of a rear wall and then dividing wall/s.

The following provides information on what needs to be considered during the design, construction and ongoing use of containment walls. These measures will help reduce the risk of failure of the structure. Key points to take-away from this guide include:

- Site operators need to understand the design constraints of their bays, including the type and quantity of waste that can be stored safely in them and the mobile plant to be used – using the wrong type of wall construction for the wrong wastes and/or using the wrong type of mobile plant are common causes of wall collapse and damage
- Mobile plant operators need to be trained on the operational procedures and their competency tested – inappropriate plant use, overly aggressive plant use etc can result in wall failure
- Walls need to be inspected regularly, and any defects reported - this needs to be documented

Before installing your wall/s

Any containment wall needs to be suitable for the material that is stored in the bays. This may seem an obvious thing to say but often the material being stored can change over time and the design needs to be re-considered for each type of material. For example, the design requirements for loose paper will be very different to one storing hardcore.

Before building a containment wall for the first time or modifying an existing wall, issues to consider include:

- What types of waste will you store in or adjacent to the containment wall?
- What are the properties of those materials? Are they dense and heavy? Do they flow, shift or settle easily? The aim is the right wall for the right waste
- What will the maximum tonnage be?
- Will the walls be moved regularly?
- How will the bay be used? You should consider the type of waste vehicles tipping/discharging into it, type of mobile plant to be used etc
- Will the walls experience any chemical attack that may occur? For example, if food, compost or similar material is stored
- Will the wall need to provide fire resistance, such as if combustible wastes are stored?

The bay and its associated containment walls need to be designed by a competent person to ensure that they are suitable for the intended use.

There are various different types of containment wall used within the waste industry. The most commonly used are discussed in section 3 of WISH WASTE 32, including the 'pros-and-cons' of each type – you need to select the type of wall appropriate to the type, volume etc of waste you will store in a bunker.

Installing your wall

All walls should be installed in accordance with the design and where relevant the manufacturer/supplier's instructions. Once complete the site should have copies of the 'as built drawings', any operational and maintenance manuals and details of any limitations that are built into the design or the materials from which the wall is built (such as waste heights, weight limits on walls and plant limitations).

Depending on the design of the wall, it may be worth considering these good practice ideas for the walls:

- Paint on fill lines to show maximum height permitted to reduce risk of overloading. This might also discourage future manipulation of the walls and highlight if wall blocks have been moved. Note, that most bays are designed with a freeboard being left of at least 1 metre rather than being filled to the top
- Paint the end of the walls which will be exposed to operational vehicles movements to highlight their presence and reduce chance of them being struck
- Install spill plates between perimeter walls and the cladding to prevent waste getting between the walls and the cladding below the top of wall level making cleaning difficult

Following installation, you will need to review your risk assessment and traffic management plan to ensure any changes are reflected in these documents. It is important that pedestrian access around any bays is carefully controlled to ensure adequate segregation between people and vehicles.

Some types of wall, such as permanent concrete, steel etc walls, are typically installed by a supplier or other competent third party. Other types are modular (such as interlocking concrete blocks) and/or can be moved around site (such as concrete 'A' frames). If you build or move-around your walls the employees involved need to be competent and understand how to do so and the design limitations. If in doubt contact your supplier or other competent person for advice.

Operational use

Once the walls/bays are installed operational controls need to be introduced to ensure that the walls do not become damaged and continue to be safe structures. Any damage is likely to be caused by mobile plant, either being incorrectly used or equipment being used that is not suitable and/or inappropriate use of the bunker, such as over-filling, wrong waste type in wrong bunker etc. Do make sure you remind your operatives to report any damage when it occurs.

Mobile plant type

The mobile plant type should be suitable for the type of wall and vice-versa. The difference between a static 360 'picking and placing' waste into a bunker and a loading shovel 'pushing against a wall' should be appreciated – the latter is likely to place more pressure on a wall than the former. Make sure you know what was considered in the design of your walls and ensure that if any changes are made in the type of mobile plant used that this is risk assessed.

Operation of mobile plant

Following selection of suitable mobile plant, correct operation should be managed. If walls are designed for 'picking and placing' of material or 'pushing against', the specified plant should continue to be used. The consequences of changing type of plant may include dislodging or pushing over component blocks or panels.

If your bunker/bay has been designed for mobile plant to push against the walls, then this needs to be carried out sensibly to prevent excessive damage. The design will have considered maximum permissible impact loads. For example it may be acceptable to drive a 20-tonne machine at the base of the wall at 3mph maximum but not at 10mph. This type of information needs to be incorporated into any operational information, procedures etc and be included in operator training (which might need to be refreshed from time to time).

For loading shovel operations the bucket should be pushed into the waste pile low down and with the bucket horizontal to the floor, then lifted and curled when picking up the material, so that maximum volume is picked up. There is no need to drive at the pile at speed, leading to spinning wheels or even lifting rear wheels because the bucket is driven too deeply into the material - such behaviour is very likely to result in damage to your walls and a higher risk of collapse.

Training

Safe driving is critical to minimising damage to walls and machinery alike. Think carefully about who you select as a plant operator, train them and assess their competence on an ongoing basis. This should cover site rules and procedures as well as the correct methods of using the mobile plant including travelling at a low speed and with the bucket low for as long as possible (but not on the ground/slab) and using smooth rather than jerky movements or rapid changes of direction.

Sites need to thoroughly assess workplace transport risks and devise site rules covering good practice for driving and emptying bays. Plant operatives must be aware of these rules. They must be consistently enforced – this is a key role of site managers and supervisors, and they should be supported in this. Failure to challenge poor driving practice is a major factor in ensuring future non-compliance. All operators should be encouraged to report accidents, damage, near-misses and any defects to the walls/bunkers etc.

Monitoring and checking

The vast majority of sites will experience some level of bay/bunker wall damage as a result of plant interaction/contact - frequently emptied bays usually suffer the most. The frequency and level of damage needs to be monitored and assessed as to whether it is acceptable wear-and-tear or significant damage. If an operator is repeatedly causing damage, then greater observation or retraining/reassessment may be required. Investigation may also identify a mismatch of plant and task as well as operator skill or poor decision making. Regular checks should be carried out on these walls, with the most likely defects to be:

- Cracks and holes in wall
- Broken blocks, panels etc
- Mis-aligned blocks, panels
- Bowing/leaning/distortion of the wall

Sections of walls may not be visible for periods of time because there is waste in the bunker, therefore the opportunity to make unplanned/unscheduled inspections should be taken. Ideally, waste piles should be rotated to empty bays/clear walls to enable regular inspection.

Written records of inspections should be made, usually supported by photographs, which can aid analysis and identifying any trends of common defects. An example of a wall inspection form is provided in Appendix 3 of WISH WASTE 32, and an inspection checklist is given in Appendix 4.

The inspection of walls should be risk assessed to ensure those carrying-out the task are not put at risk. Controls should include the suspension of all vehicle movements in the area, the segregation of the area by parked mobile plant (preventing any tipping) and the use of two-way radios between staff so that communications can be maintained at all times.

If a wall has failed or looks like it could, then the area should be cordoned off to prevent any pedestrian access. Before repairs are undertaken a risk assessment should be carried out to detail how these works can be completed safely. Any modifications or repairs that have been made should be recorded and referenced in the site containment wall records.



Examples of damaged and collapsed walls