

Underground Compactors

FACT SHEET

RESIDENTIAL FLAT BUILDING WASTE
COLLECTION INFRASTRUCTURE

Overview

Small to large compactors, capable of storing more than 20 times the volume of waste that standard bins can contain, are placed below ground on a platform that is raised to street level using hydraulic lifts. The hydraulic function can be powered either on-site using mains power supply or by vehicle. Disposal inlets sit above ground and can be designed for varying capacities.



Hydraulic Underground Compactor in a Residential Area

Technical Information

- Compactors range from 5 to 20 cubic metres in capacity with compaction ratios of 5:1 to 25:1
- Collection of only one waste stream per unit
- Multiple units can be co-located
- Inlets have a capacity of 45 to 80 litres
- Structure is housed in a pre-cast concrete pit
- The capping platform is waterproof and can be insulated to prevent odour generation
- Platforms open in a lift motion (platform raised straight up) or in a hatch door motion (known as a "swing lift")
- Hook-lift vehicle required to remove and replace the compactor
- Civil engineering works must incorporate appropriate water proofing measures
- Key access control with control panel and remote control option or automatic vehicle lock
- Compatible with user recognition system and pay by weight technology
- Alerts via SMS to indicate when compactor is 80% full or in case of fault
- Requires maintenance every 3 months, plus an oil level check and lubrication of parts once monthly
- Required excavation depth ranges from 2.5 to 3.5 metres
- Required height clearance ranges from 3.5 to 9.0 metres
- Indicative dimensions (in metres) for a for a 5 to 20 cubic metre compactor are (2.3 to 3.4) x (4.5 to 7.8) (w x l).

Suitable Building Types

Best suited to residential areas where a central point of collection is preferred to multiple collection points, and there is limited space for above-ground storage of waste bins. Also useful in situations where commercial dumping of waste into residential bins is common. May require location outside site boundary due to size and vehicle access requirements.

Education Needs

Residential education to target:

- Disposal of small to medium sized bags of garbage as residents travel in and out of their building and past disposal inlets
- Disposal of hazardous wastes such as batteries, and bulky items such as cardboard boxes, via other building collection systems to prevent dumping of waste around the disposal inlets
- Disposal of bulky wastes away from around the inlets to avoid the need for collection contractors to remove waste items each time they need to access the compactors.

This project is a NSW EPA Waste Less, Recycle
More initiative funded from the waste levy.



Advocating for the people of Western Sydney

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Case Studies

In **Abu Dhabi, the United Arab Emirates**, more than 100 hydraulic underground garbage compactors have been installed in residential areas and tourist neighbourhoods in the capital. The compactors have built-in sensors that detect when the compactors need to be emptied. Compactors with capacities of 7 and 20 cubic metres are used. The Centre of Waste Management has reported that the underground systems remove many of the hazards associated with waste left outside premises, such as foraging by pests. The number of daily vehicle movements has also been reduced by 25%. Above-ground bins are being removed from many parts of the city.

Underground compactors have also been installed at city central and busy market locations in countries such as China, Austria, Sweden, Switzerland, Finland, the UK and in Italy, and other international cities such as Cambridge, Athens, Rio de Janeiro, Dubai and Doha. Many of these installations have been operational for over 15 years.



Source: Copyright Envac

Raised Hydraulic Platform, Abu Dhabi

Strengths

- Increased waste storage capacity provided underground
- Fewer collections and ability to adjust to fluctuations in waste volumes
- Limited manual handling by waste operations staff
- Improved visual amenity and reduced odour and vermin with containment of waste underground
- Pin access system can be incorporated to prevent dumping of commercial waste into bins
- Improved worker health and safety as system operatives are not required to manually handle bins
- Increased safety for the public with the reduction of stop and start waste collection vehicles given a single collection point
- Inlets are robust, are unable to be moved or stolen, and are therefore less susceptible to damage than typical bins

Weaknesses

- Requires removal of dumped waste from around inlets prior to emptying bins
- Power or parts failure requires suitably trained personnel to resolve issue
- Moderate civil works required to excavate and install the underground unit
- Power supply is required to raise the hydraulic platform
- Co-location of multiple underground compactors may be difficult due to size
- Space constraints may exist for vehicle access and manoeuvring
- High upfront capital costs to install unit and on-going maintenance costs
- Potential collection contract implications given changes to standard collections and vehicle used

Compliance

- Weather proofing of the unit and associated parts, and investigation of drainage patterns is required as part of the installation
- Confined space permit needed to enter the underground pit to perform maintenance
- Maintenance and user protocols need to be developed
- Electronics components require suitably trained staff to maintain
- Compaction of mixed recycling is not typically supported given the potential for glass breakage and the difficulties in sorting compacted materials for recycling

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