FORESIGHT ENVIRONMENTAL

Harbord Diggers

Operational Waste Management Plan

30th June 2015

s96 Rev. 2 - Final

This report has been prepared is based on information provided by Mount Pritchard & District Community Club coupled with Foresight Environmental's knowledge of waste generated within the commercial sector. To that extent this report relies on the accuracy of the information provided to the consultant. It has been compiled by Foresight Environmental on behalf of Mount Pritchard & District Community Club.

This report is not a substitute for legal advice on the relevant environmental related legislation, which applies to businesses, contractors or other bodies. Accordingly, Foresight Environmental will not be liable for any loss or damage that may arise out of this project, other than loss or damage caused as a direct result of Foresight Environmental negligence.

The contents of this document may not be referenced or used in any way by parties other than Mount Pritchard & District Community Club without the written permission of Foresight Environmental.

Revision No.	Issue date	Author	Reviewed by	Reason/comments
1	29 June 2015	Scott Ebsary	Patrick Arnold	Initial issue
2	30 June 2015	Scott Ebsary	Bridget Allen	Final issue – no changes

Table of Contents

1. Executive Summary

This waste management plan has been prepared by Foresight Environmental on behalf of Mount Pritchard & District Community Club. This plan details the way in which the proposed redevelopment at the Harbord Diggers club will manage the waste and recycling generated from the ongoing use of the club. Specifically, this plan addresses the proposed changes under the s96 submission to confirm they comply with the existing conditions and recommendations detailed in the original waste management plan for DA. This plan confirms that the waste facilities proposed under the s96 submission will adequately cater for the projected waste generation rates and address the objectives of the Warringah Council Development Control Plan 2011.

2. Introduction

The redevelopment consists of the adaptive reuse of elements of the existing structure to deliver new club facilities along with other lifestyle components including seniors residential living, childcare, restaurants, fitness centre/pool and retail. From a waste management perspective, the most relevant of the proposed changes under the s96 submission involves the redesign of back of house waste facilities and a new waste storage area located adjacent to the loading dock.

3. Waste Generation Estimate

The data provided in this report has been calculated using information provided from;

- existing club operations;
- the projected club activities;
- senior living operations;
- industry benchmarks; and
- historical audit data of similar mixed use developments.

An estimated waste profile for the development has been calculated based on the activity type, usage anticipated by the club operator, and utilising waste metrics from the above-mentioned sources.

The waste estimates have been split into club/other ground level functions (function room, restaurants, gym/health centre and retail) and senior living waste.

The primary waste streams expected to be generated in the ongoing operation of the development would be:

- Cardboard/paper recycling
- Glass recycling
- Comingled recycling
- Food organics recycling
- General waste
- Bulky waste

Additional smaller waste streams may include toner cartridge recycling, fluoro tube/globe recycling and battery recycling.

3.1 Club/other ground floor functions

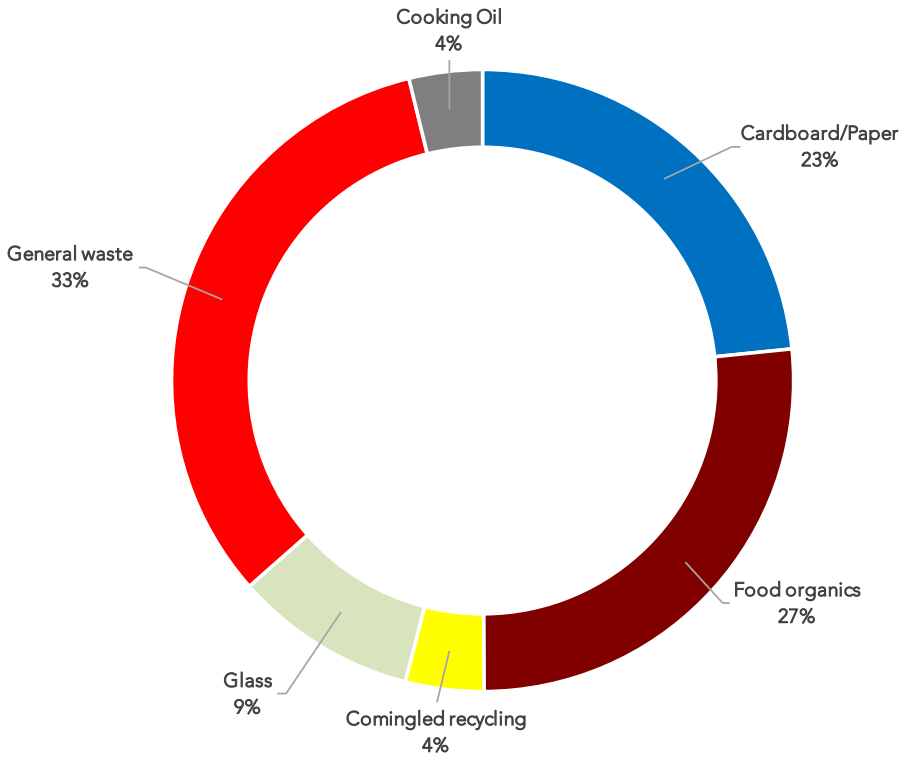
Table 1 shows the estimated waste profile by weight and volume for club/other ground floor functions.

Table 1 – Total Club Waste Estimate (club/other ground floor functions)

	KG/day	L/day	KG/Wk	L/Wk
Cardboard/Paper	184	3534	1289	24739
Food organics	209	934	1464	6535
Mixed recycling	32	654	224	4581
Glass	75	1527	524	10690
General waste	258	3064	1803	21448
Cooking Oil	30	33	210	231
Total	**788**	**9746**	**5515**	**68224**

Chart 1 shows the compostion by weight from the following components - club area (café, bar, gaming, admin), function room, restaurants, gym/health centre and retail.

Chart 1 – Estimated club/other operations waste composition (weight)



3.2 Senior Living

The following waste estimate for the senior living levels are based on current generation rates at Watermark Castle Cove – i.e. 1x240L general waste bin per 5 apartments and 1x240L mixed recycling bin per 5 apartments collected weekly.

Given the nature and behaviour of a "typical" tenant in a senior living scenario it is common for waste generation rates to be much lower than that of conventional residential accommodation. The data obtained and behaviours observed at Watermark Castle Cove supports that notion and thus forms the basis of the estimation in this application.

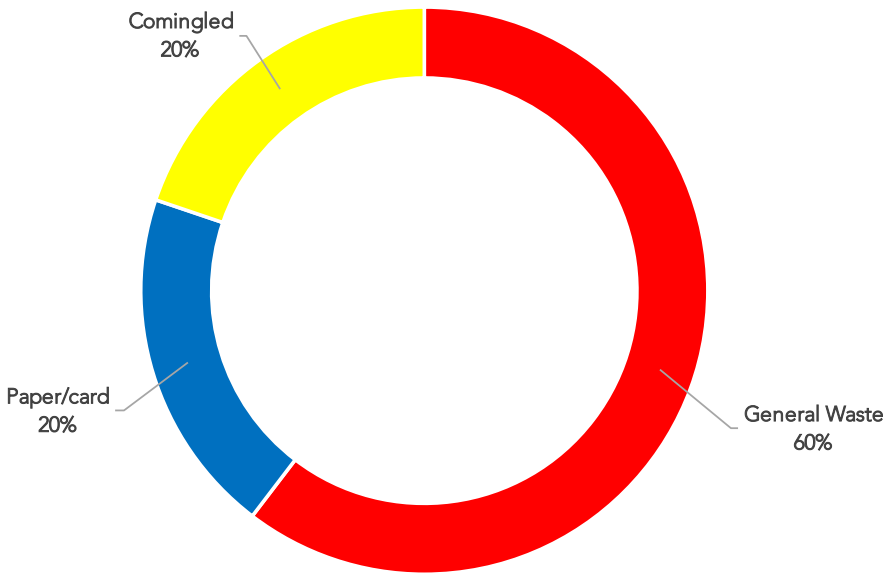
Table 2 shows the estimated waste profile by weight and volume for the senior living levels based on a total of 98 units.

Table 2 – Total Waste Estimate (senior living levels)

Waste Type	Est. waste/unit/week		Est. Waste/week (based on 98 units)	
	kg	L	Kg	L
General Waste	3.84	48	372	4,656
Paper/cardboard	1.26	24	122	2,328
Comingled	1.26	24	122	2,328
TOTAL	**6.36**	**96**	**617**	**9,312**

Chart 2 shows the composition by weight for the senior living levels.

Chart 2 – Estimated senior living waste composition (weight)



4. Waste Management Systems

Table 3 below details the recommended systems and collection frequency to manage the estimated waste profile provided in Table 1. The systems detailed in Table 3 will be housed within the waste storage area adjacent to the loading dock on lower ground level – with the exception of the general waste compactor which will be located in the loading dock.

Table 3: Recommended equipment and collection frequency

Waste Stream	Bin Type	No. of Bins	Clearance Frequency	Capacity	Estimated volume / event/day	Footprint per bin (m2)	Total bin Footprint
Cardboard/ Paper Recycling	Baler	1	-	Ample	3,534	4.00	4.00
	Bale storage	Approx. 16 bales per week	2 x weekly	-	-	3.00 (approx. room required for 8 bales)	3.00
	660L MGB	1	Internal Transfer only	-	-	0.98	0.98
Food Organics	Pulpmaster	Tank in waste room - pulping units TBD	1 x weekly	Ample	934	Storage tank is 2.31	2.31
Comingle Recycling	240L MGB	10	3 x weekly	7,200	654	0.43	4.26*
Glass	Crusher + 50L MGB	12	4 x weekly	8,640	1,527	0.20 for bins + 1 for crusher	3.40
General Waste	240L MGB	15	Transfer only	Unlimited – disposed into compactor	1,803	0.43	6.39*
	10m3 Compactor	1	1 x weekly	Ample		10.00	Located in dock
Oil Recycling	Oil Silo	1	As required	Adequate	33	2.00	2.00
TOTAL							**26.35**

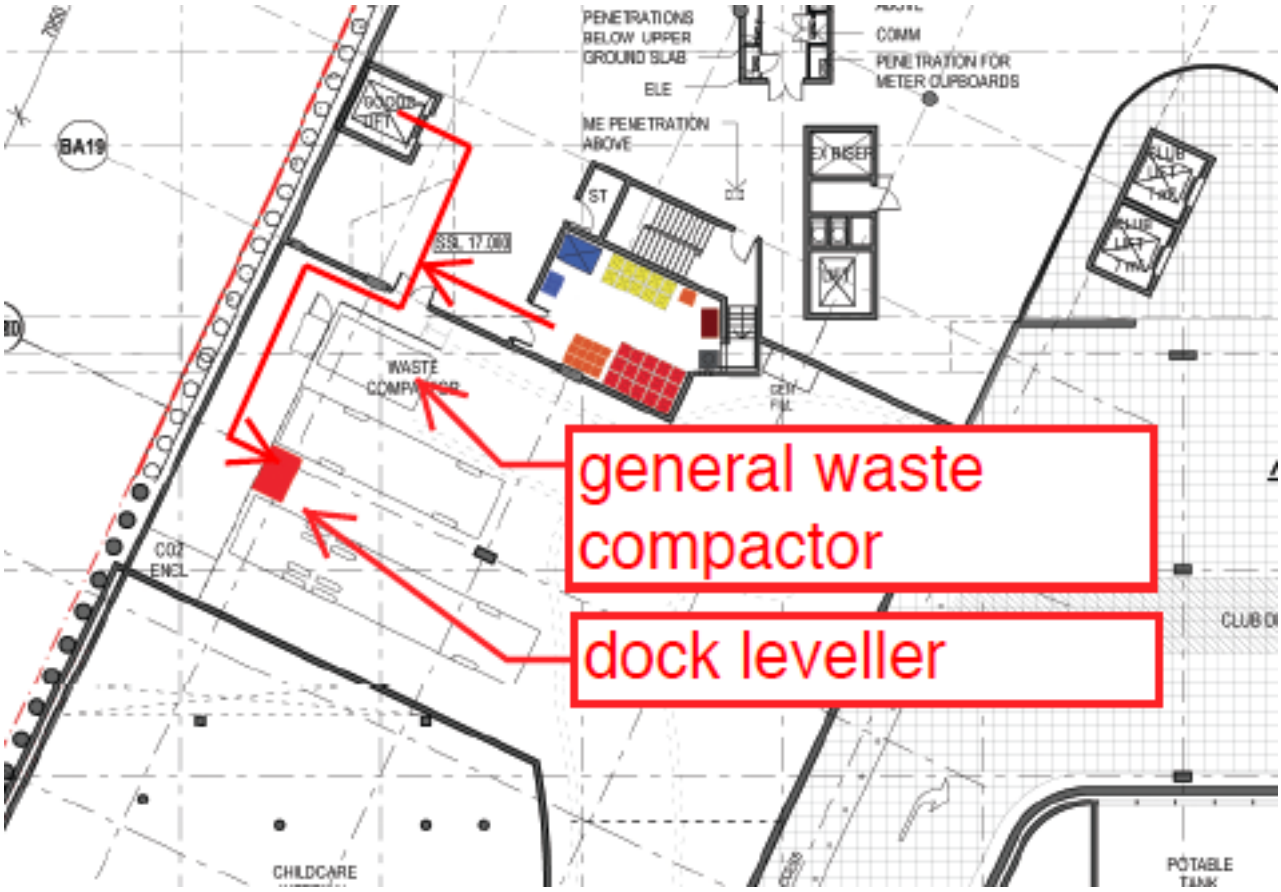
It should be noted that the total footprint figure refers only to actual bin footprint. Currently, the bin storage area provides an area of 35m^2 which is suitable for the storage and functionality of the proposed waste systems.

*Note: the bins proposed for comingled recycling and general waste will be used throughout the club in kitchen and bar areas and thus are unlikely to all be stored in the waste room at any one time – in practice this frees up additional space in the waste room for increased manoeuvrability.

5. Waste and Recycling Storage Area

Figure 1 shows the location and indicative layout of the waste storage area on lower ground level. The path of access is highlighted in red from the goods lift accessing the other floors. The proposed systems detailed in Table 3 have been shown, demonstrating the capacity of the waste room to house the required systems.

Figure 1 – Waste storage area location and layout on lower ground level



The waste storage room has an area of 35m^2 and provides adequate storage and circulation space for the proposed systems.

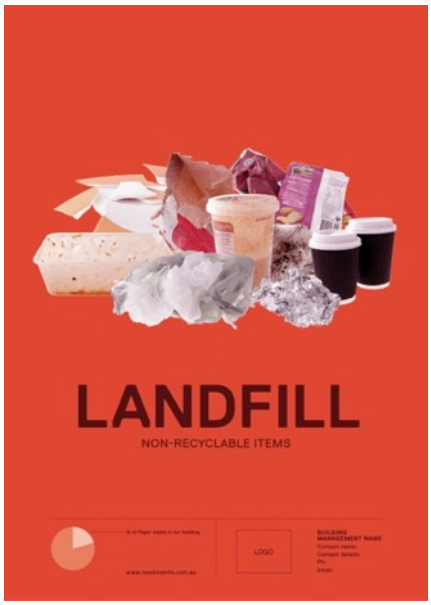
An additional internal bin store room has been provided on the basement level for the storage of additional bins should they be required throughout the club.

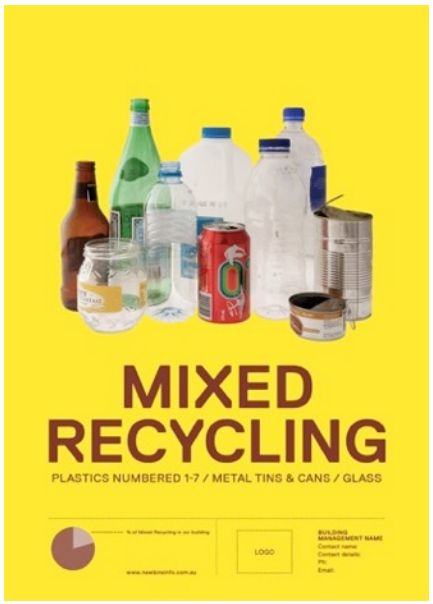
The central waste and recycling storage area will have the following features:

- Mechanically exhausted in accordance with AS 1668.2-2002
- Internal walls of the storage areas must be cement rendered or tiled with glazed tiles to allow easy cleaning. The floor/wall intersection must be coved.
- Storage area floors are to be graded and drained to a Sydney Water approved drainage connection located onsite i.e. grease arrestor
- Floors must have an impervious, non-slip and non-abrasive finish with no protrusions to enable easy cleaning and manoeuvrability of bins.
- Waste areas must be serviced by a cold water tap.
- No other service infrastructure is to be located within waste storage areas.

5.1 Signage

All waste and recycling streams should be differentiated with clear signage on all bins and on walls within the waste storage area. Below are examples of appropriate signage incorporating textual information, pictures and colour-coding to communicate the message.





5.2 Colour-coding

To further reinforce the differentiation between waste and recycling streams, it is recommended that the bin storage area be colour-coded to ensure bins are stored in the correct area and to enable easy identification of the streams provided. This can be done by painting borders on the floor or walls indicating where bins should be stored. The colour of the paint should be consistent with the waste stream e.g. yellow paint for mixed recycling, red paint for general waste.

Photograph 1 – Examples of appropriate colour-coding

6. Onsite Management Protocols

Table 4 outlines the proposed operational management protocols for each waste stream. Refer to appendix for details on equipment.

Table 4: Internal collection practices by stream

Stream	System	Comment
Paper/ Cardboard Recycling	Autobaler	Cardboard will be baled using baler in waste room. Majority of cardboard will be generated through unpacking stock in adjacent store-rooms. Complete bales will be stored in waste room until collection days. Bales will be transferred to the loading dock on collection days using a pallet jack (or similar). Bales will be collected by a flat-bed truck.
Used cooking oil	Oil recycling tank/silo	Used cooking oil will be transferred to the waste room as required to be vacuumed into oil storage silo. Oil silo is then pumped out by a small tanker truck (SRV equivalent)
Comingled Recycling	10 x 240L MGB	Comingled recycling (plastic bottles, cans, tins etc) will be collected using 240L bins in bar/kitchen areas. Bins will then be transferred to waste room when full to be stored until collection day. Full bins will be collected directly from the waste storage room by the waste contractor on collection days to be collected by rear-lift truck. Spare empty bins will be available in waste area to be swapped for full bins as required by staff during service.
Glass Recycling	Bottle crusher + 50L bins	Glass will be collected in bar areas in 240L bins and transferred to waste room on Lower Ground Floor as required to be crushed using bottle crusher. Due to reduction in volume after crushing, smaller 50L bins are used to store crushed glass from crusher until collection days in the waste storage room. Full bins will be collected directly from the waste storage room by the waste contractor on collection days to be collected by rear-lift truck.
Organics Recycling	Pulpmaster	Food organics (kitchen prep and post-consumer food scraps) will be processed through a Pulpmaster system – pulping units will be located located in kitchens – one unit in main club kitchen and two units servicing the three restaurants (max of 3 units can feed into one holding tank). The holding tank will be located in waste room. Tank is then pumped as required to a small tanker truck (SRV equivalent) from loading dock – likely once per week.

Stream	System	Comment
General Waste	10m3 compactor and 15 x 240L MGBs	General waste will be collected using 240L bins in bar/kitchen areas. Bins will then be transferred to waste room when full to be stored until end of service. Bins will then be transferred to the loading dock to be deposited into the compactor and empty bins will be returned to waste room for continued use. Spare empty bins will be available in waste room to be swapped for full bins as required by staff during service.

All waste streams detailed above using wheelie bins for storage and transfer (general waste, glass, comingled) will operate on a bin swap system i.e. bin is located at point of generation (kitchen/bar) which is then transferred to the waste room when full to be stored until collection. An empty bin is then taken from the waste room back to the point of generation for continued use.

6.1 Other non-residential areas

Other areas/facilities within club level i.e. fitness centre, pool, childcare, members services etc will manage waste and recycling with smaller bins that will be serviced by cleaning/operator staff at the end of shifts or periodically throughout the day as required.

In an effort to maximize recycling throughout all club and it is recommended that general waste, paper/cardboard and comingled recycling bins be provided in all areas. Waste and recycling from these bins will be transferred to the waste storage area on lower ground to be disposed into the systems provided there.

The exception to that practice may be the childcare due to its close proximity to the loading dock whereby 240L MGBs may be practical for internal use which would then be presented to the loading dock on the relevant collection day – with general waste being disposed directly into the compactor as required. Additionally, dedicated nappy bins are recommended for the hygienic disposal and storage of nappy waste generated from childcare operations. It should be noted disposable nappies and sanitary wipes etc have been pre-classified by the NSW EPA as "general solid waste (putrescible)"[1] and are therefore able to be disposed in the general waste stream.

[1] *Waste Classification Guidelines Part 1: Classifying Waste.* Department of Environment, Climate Change and Water NSW (December 2009).

6.2 Senior Living

The residential senior living component will be managed via a three-stream system consistent with Warringah Council's residential waste services – general waste, paper/cardboard recycling and mixed recycling.

Two garbage chutes will be provided in each residential building – one for general waste and one for comingled recycling (refer to appendix 8.5). On each level residents will have access to both chutes along with a 240L MGB for paper cardboard recycling which will be located within the chute access room.
At the base of each chute 2x 240L MGBs will be located for each stream. This provides ample capacity for the expected waste to ensure one bin can always be left under the chute whilst the other is transferred to the loading dock for collection on collection days.

Table 5 shows the total number of bins required for the residential buildings.

Table 5: Residential waste equipment and spatial requirements

	Bin Type	No. of Bins	Weekly Clearance Frequency	Capacity (weekly)	Estimated volume / week	Footprint per bin (m2)	Total Bin Footprint (m2)
Paper/Cardboard recycling	240L MGB	16	1 or as required	3,840	2,352	0.43	6.88
Mixed Recycling	240L MGB	10	1 or as required	6,600	2,352	0.43	4.3
General Waste	240L MGB	10	2 or as required	13,200	4,704	0.43	4.3
TOTAL		**36**		**23,640**	**9,408**		**15.48**

6.2.1. Senior Living waste collection

The proposed strategy for the collection of the residential bins is to consolidate them with the commercial/club waste services. By having the residential bins consolidated and collected as part of the commercial/club waste services, the following benefits will be achieved

- Fewer truck movements onto the site as only the commercial waste contractor will be providing collection services – as opposed to a commercial contractor conducting collections for the club and Council contractor conducting collections for residential.
- Greater flexibility in the residential waste system – i.e. general waste can be disposed into the compactor as required and both comingled and paper/cardboard streams are collected more

frequently under the club services and thus residential recycling can be serviced more frequently if required – thus fewer bins are required to deliver appropriate capacity.

- Residential paper and cardboard material will be consolidated with baled club cardboard resulting in greater total tonnages which is beneficial as the club should receive a rebate for their baled cardboard from their waste contractor.

It is assumed that the senior living operator will provide an onsite maintenance/cleaner who will have the responsibility of monitoring the bins at the base of the chutes and the paper/cardboard bins on the floors as part of their daily duties. Table 6 below outlines the management protocols associated with each residential stream.

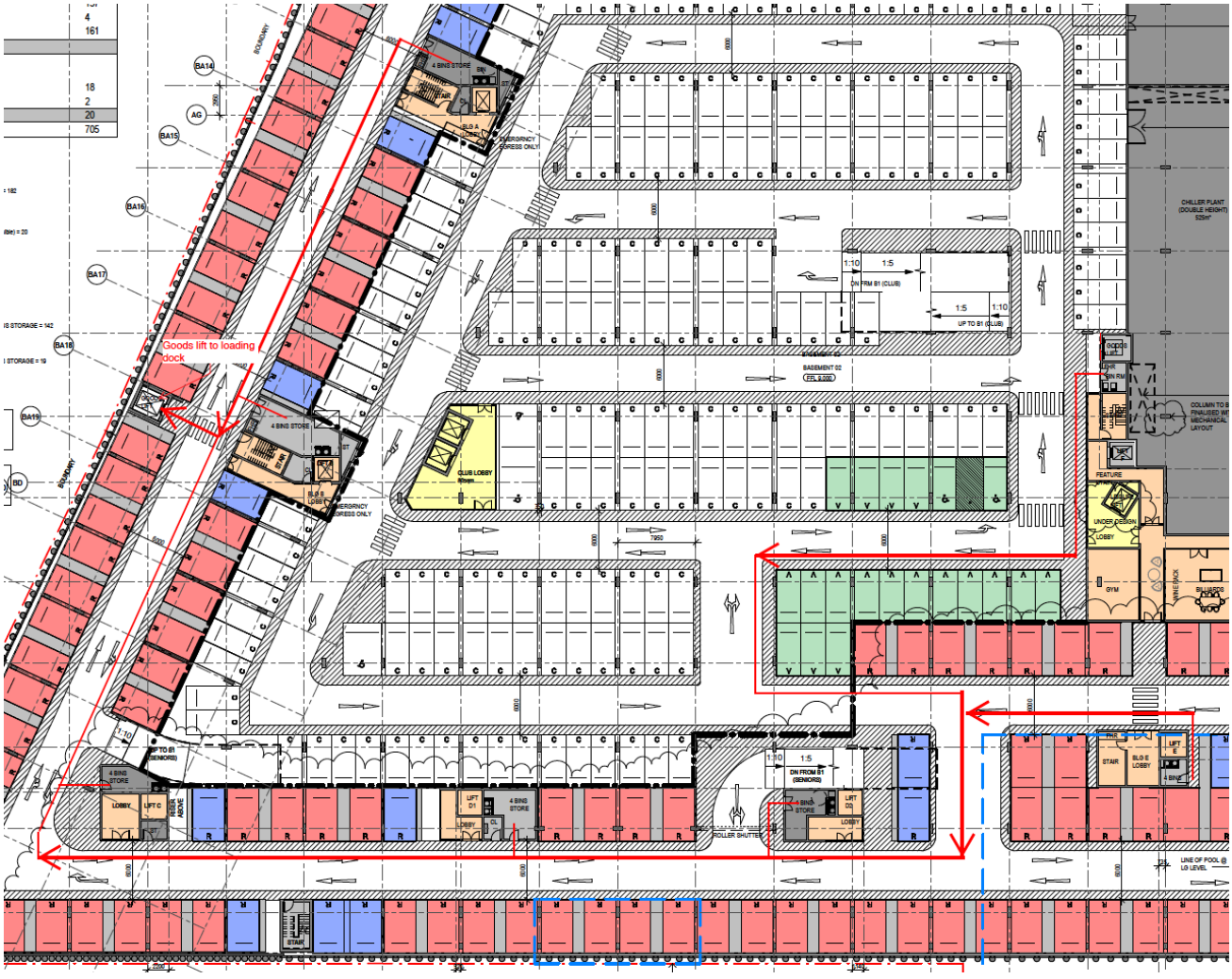
Table 6: Residential internal collection practices

Stream	System	Comment
Paper/ Cardboard Recycling	240L MGB on each residential floor	Paper/cardboard bins will be transferred to the waste area on lower ground as required to be baled with club cardboard material. Bins will be moved from the storage location on the residential floor down to B2 via the residential lifts and then to the baler in the waste room on lower ground via the goods lift adjacent to residential lobby B. Complete bales will be stored in waste room until collection days. Bales will be transferred to the loading dock on collection days using a pallet jack (or similar). Bales will be collected by a flat-bed truck. Empty bins will be returned to residential floors immediately after baling.
Mixed Recycling	2x 240L MGB under chute in each building	Full mixed recycling bins will be transferred to the loading dock on the relevant collection day - expected to be 3 mixed collections per week so residential bins can be brought to the dock on any one of those days. Due to this flexibility in the collection schedule, there will only be the need to transfer one bin at a time, ensuring that one bin is always left under the chute during collection days. Bins will be transferred to the dock from the chute rooms in the residential lobbies on B2 via the goods lift adjacent to residential lobby B which provides direct access to the loading dock. After collection, the empty bins will be returned to the respective chute rooms.

Stream	System	Comment
General waste	2x 240L MGB under chute in each building	Full general waste bins will be transferred to the loading dock as required to be emptied into the general waste compactor. Empty bins will be returned to the respective chute rooms immediately after emptying. Bins will be transferred to the dock from the chute rooms in the residential lobbies on B2 via the goods lift adjacent to residential lobby B which provides direct access to the loading dock. Only one bin from each chute room will be required to be transferred at any one time ensuring one bin is always left under the chute during transfer.

Figure 2 below shows the path from the residential lifts to the goods lift on B2 to access the loading dock. To aid in the movement of bins throughout the basement levels a power-assisted tug should be considered – this would enable the consolidated movement of several bins at once (refer to appendix 8.6).

Figure 2 – Path from residential lifts to goods lift on B2 to access loading dock



6.2.2. Senior Living Chute Service Rooms

The chute service rooms where the chutes terminate on B2 require the following provisions in accordance with Warringah Council Development Control Plan 2011:

- Service rooms must be ventilated to external air or mechanically exhausted in accordance with AS 1668.2-2002
- Internal walls of the service rooms must be cement rendered or tiled with glazed tiles to allow easy cleaning. The floor/wall intersection must be coved.
- Service room floors are to be graded and drained to a Sydney Water approved drainage connection located onsite
- Service room floors must have an impervious, non-slip and non-abrasive finish with no protrusions to enable easy cleaning and manoeuvrability of bins.
- Service rooms must be serviced by a cold water tap.
- No other service infrastructure is to be located within chute service rooms.

7. Collection

Table 3 details the suggested collection frequency for all waste and recycling streams. The proposed collection process entails the waste contractor collecting the relevant bins from the waste storage room which is directly adjacent the loading zone and then returning the bins to the waste room once emptied.

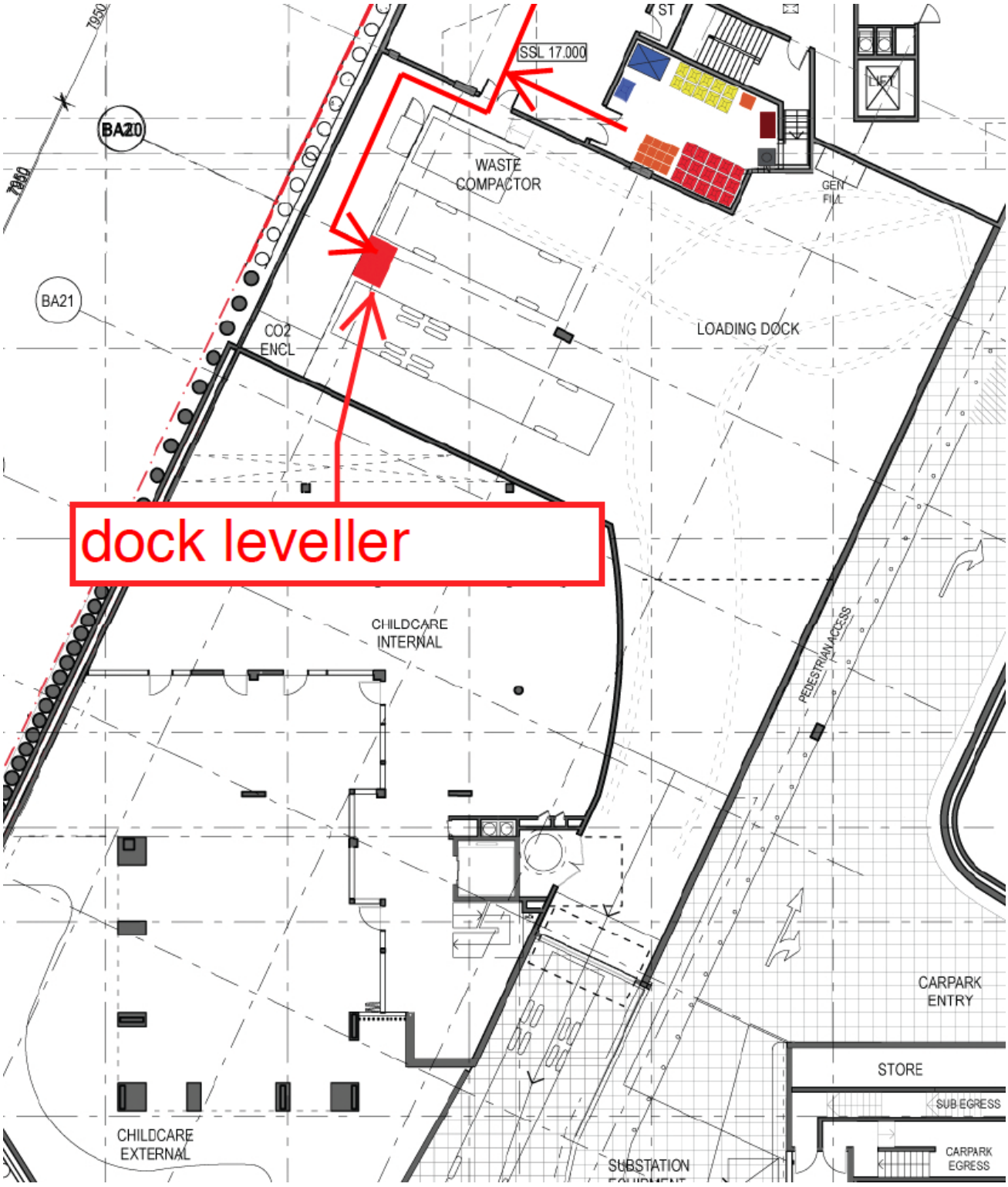
A dock leveller will be required to transfer the mixed recycling and glass recycling bins from the raised dock height to the loading dock floor for collection by rear-lift truck. Refer to appendix 8.7 for indicative images – detailed specifications and design will be confirmed in later detailed design stages.

Cleaning staff and other club staff will transfer waste and recycling material to the waste storage room on lower ground level via the goods lift which provides access to all lower floors.

Waste truck specifications will vary slightly between contractors however as a guide, all streams and bins recommended in this report would typically be collected by a MRV rear lift waste truck – indicative specifications as follows:
Overall length: 8.0m
Overall width: 2.5m
Height (travel and operation): 2.5 - 3.4m (depending on contractor)
Turning circle: 17 - 25.0m (depending on contractor)

Figure 3 shows the loading dock and the swept path for the compactor collection. Also shown is the indicative location for the dock leveler platform.

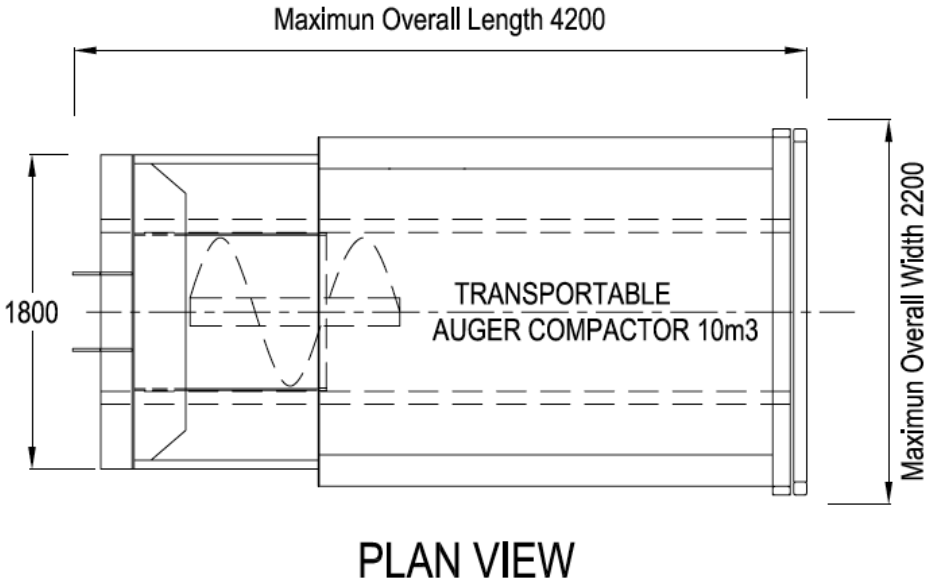
Figure 3 – Loading/collection zone on basement level



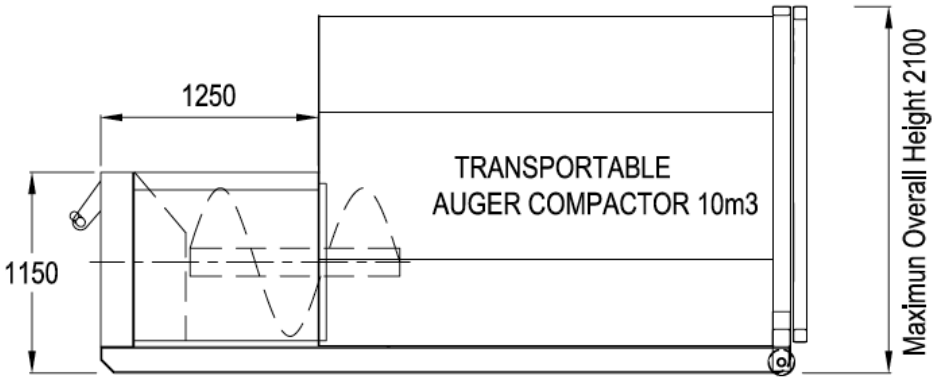
8. Appendix

8.1 General waste compactor indicative specifications

These indicative specifications were provided by Pakmor Waste Equipment on the 19/6/14 and remain current.



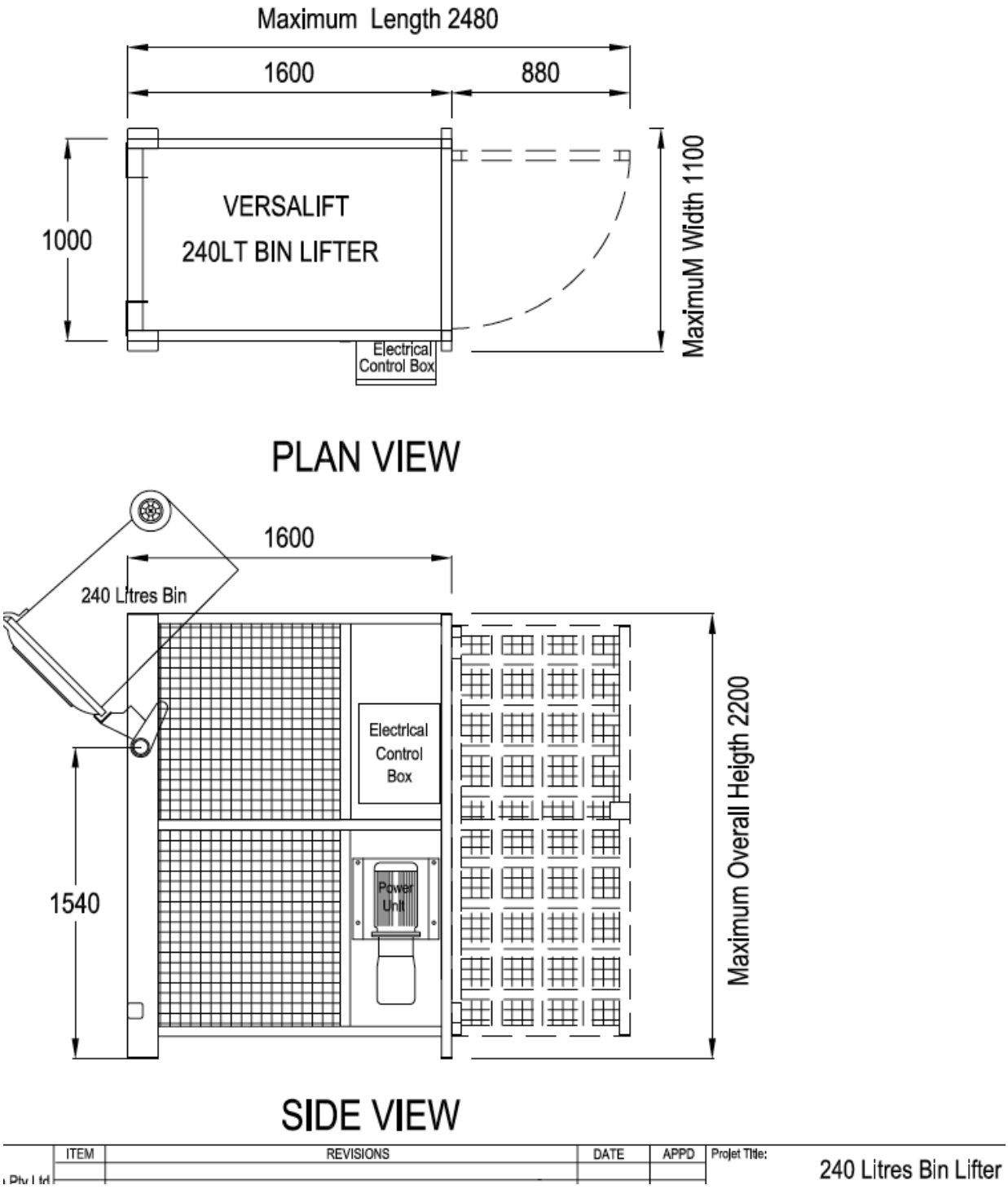
PLAN VIEW



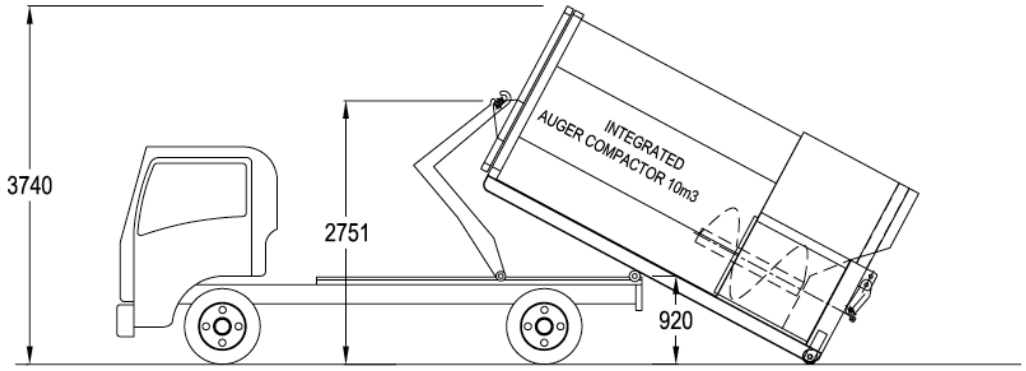
SIDE VIEW

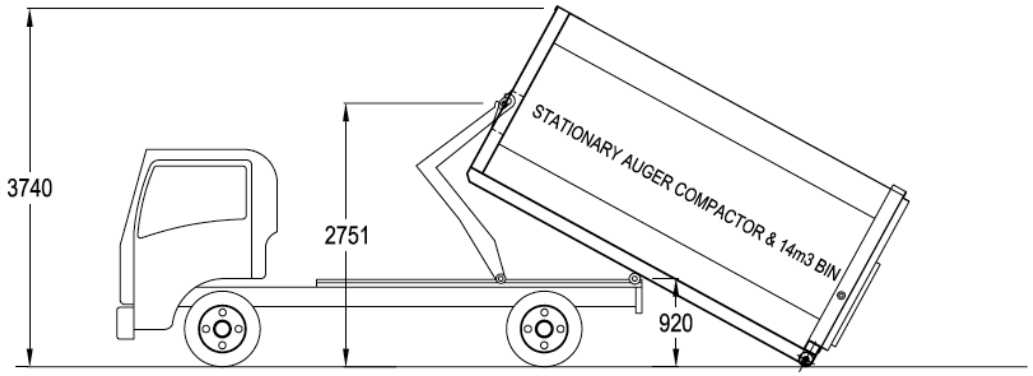
ITEM	REVISIONS	DATE	APPD	Projet Title: Transportable Auger Compactor 10 Cubic Metre
				Customer Name: Dwg No: TRC10-A-90.10m Project No:

8.2 General waste bin lifter indicative specifications



8.3 General waste compactor collection indicative specifications





	ITEM	REVISIONS	DATE	APPD	Projet Title:
Australia Pty Ltd					Small Hook 10m Integrated & 14m Container

8.4 Pulpmaster organics system

The Pulpmaster organics system is comprised of a pulping unit (refer to figure 4) which is proposed to be located within the main club kitchen and within the restaurant kitchens. All food scraps/waste and liquids can be processed through the Pulpmaster system – with the exception of Oyster shells, mussel shells, pineapple tops and corn husk.

The unit pulps the food waste which is then pumped to a central holding tank located in the waste storage room on lower ground floor (refer to figure 5). The holding tank can be connected to a maximum of three pulping units. The holding tank is then pumped out using a small tanker truck once per week (refer to figure 6). The mini-tanker will connect the vacuum hose directly to the holding tank from the loading dock. It is proposed that the organic slurry will be pumped from the holding tank in the waste room on Lower Ground Floor to an outlet valve in the loading dock. The mini-tanker will conduct collections from this outlet in the loading dock.

Figure 4: Pulpmaster 3000 pulping unit located in kitchens

Pulpmaster 3000 machine dimensions – H: 900mm, W: 670mm, D: 680mm

Figure 5: Examples of Pulpmaster storage tank located in waste storage area on lower ground floor

Figure 6: Examples Pulpmaster mini tanker

SPECIFICATIONS

Pulpmaster Mini Tanker

Height	2100mm
Width	2000mm
Length	5500mm

The Mini Tanker has on board water to rinse out the Pulpmaster Tank after each pump out

8.5 Chutes

The following diagrams are indicative of standard chute installations. Detailed installation specifications and guidelines should be sought in direct consultation with manufacturer.

Figure 7: indicative chute installation section

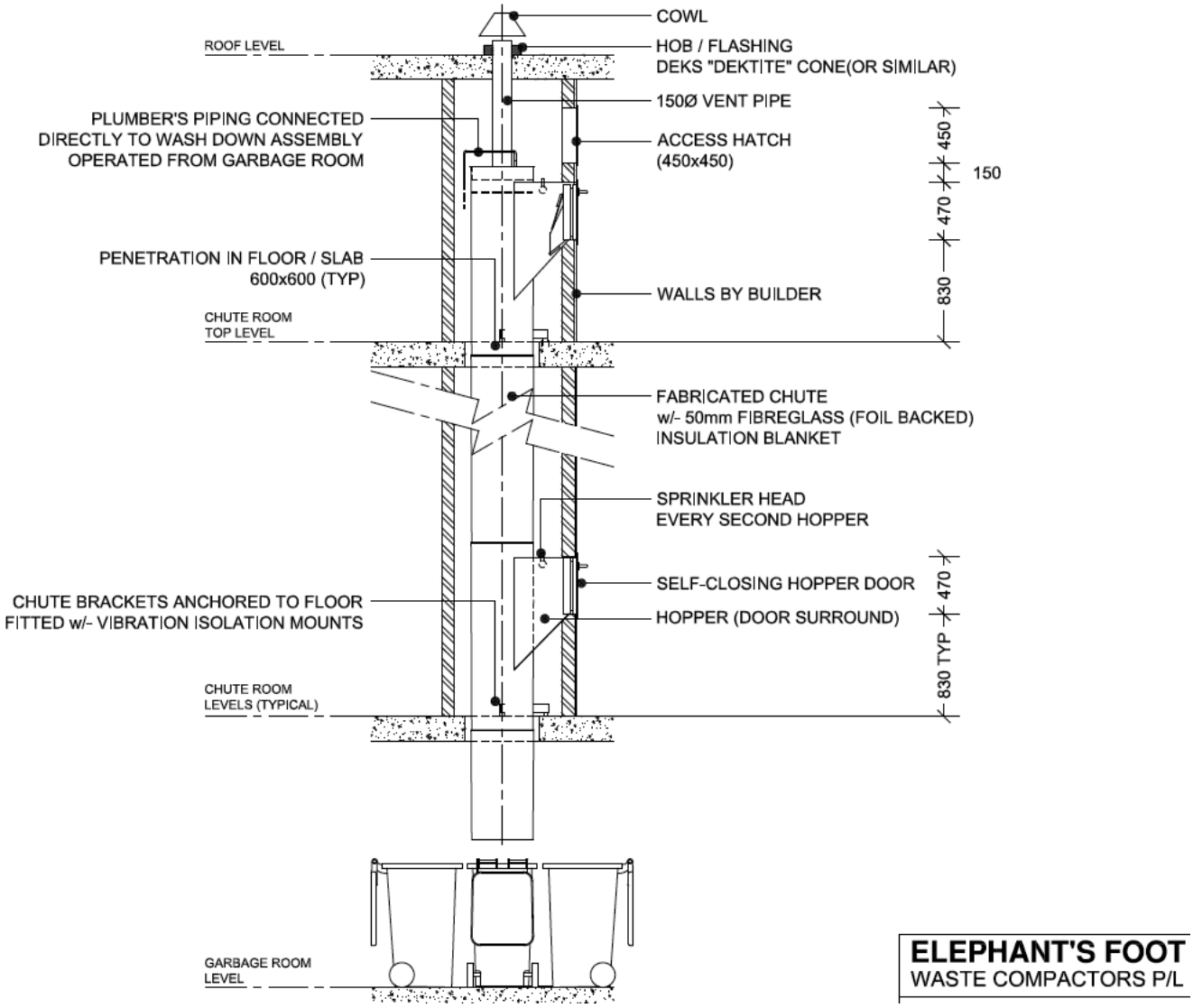


Figure 8: Standard chute door

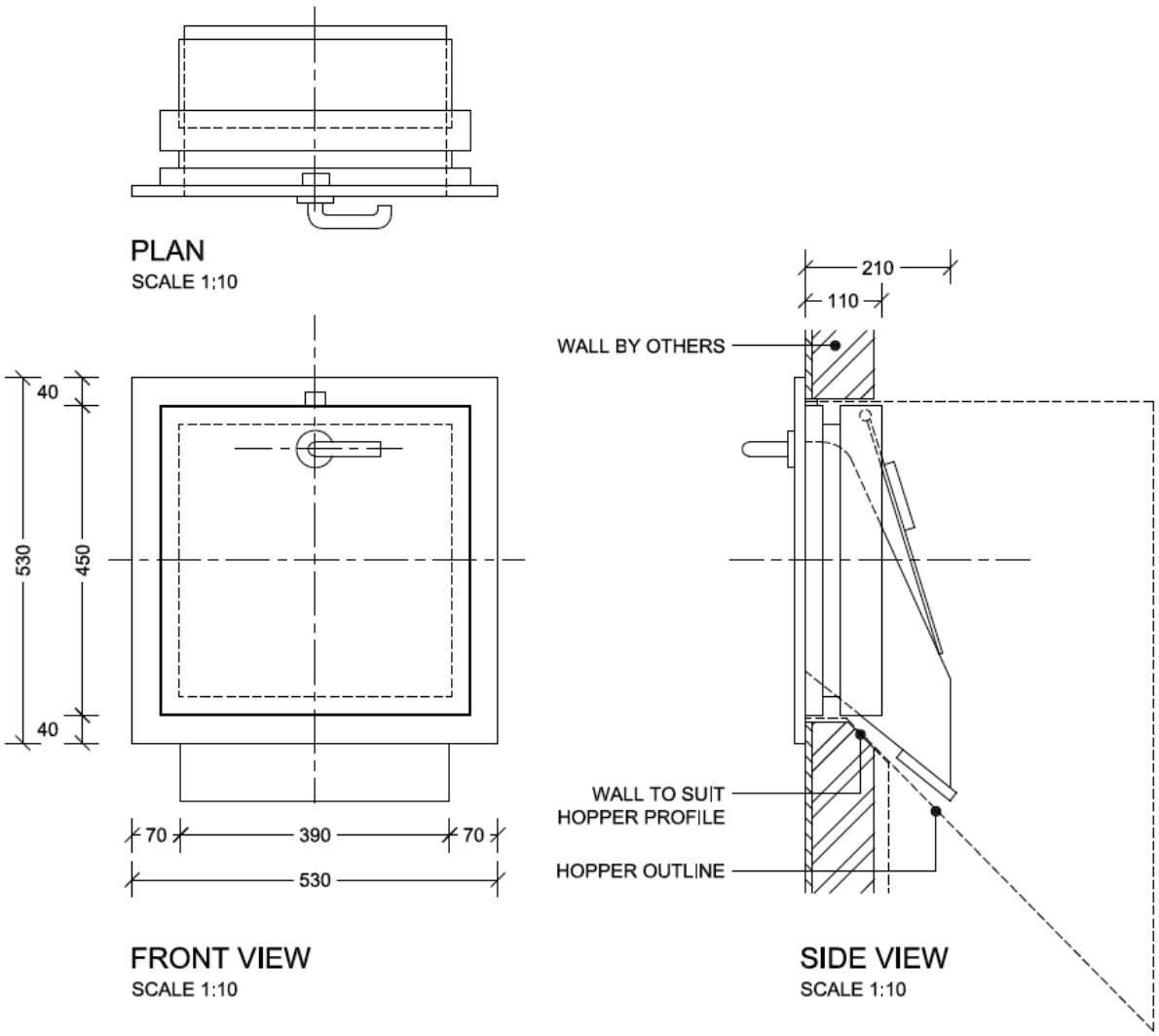
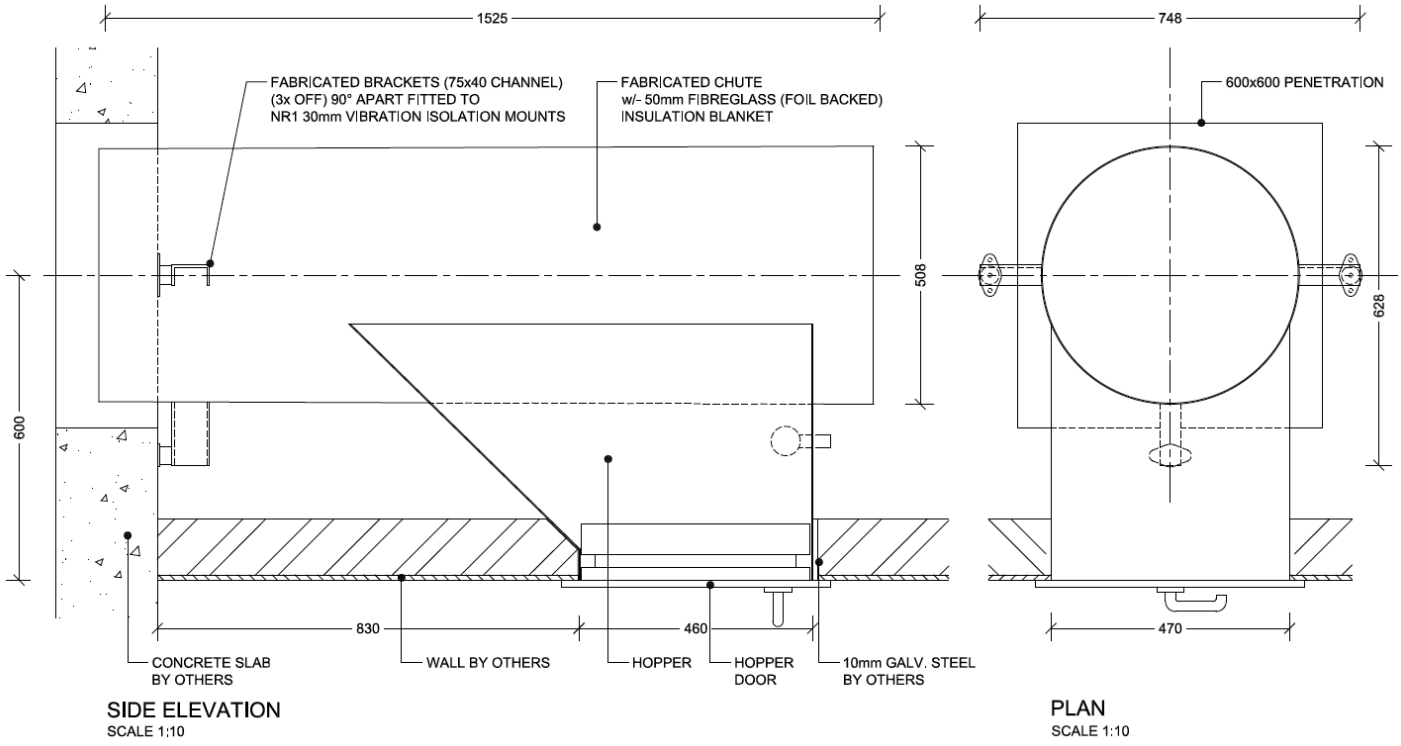


Figure 9: Standard chute and hopper sections



8.6 Power-assisted tug

Example of power-assisted tug to assist in transferring residential bins from chute service rooms to goods lift on B2 (www.spacepac.com.au).

8.7 Dock leveler