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Discovery Point Pty Ltd
Report for Discovery Point
Waste Master Plan
January 2011



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1. Introduction

1.1 Discovery Point

Discovery Point is a major residential development at Wolli Creek in Sydney. When complete, Discovery Point will consist of up to 17 buildings, almost all of which will provide high rise residential accommodation, along with a number of retail outlets including a supermarket, and a commercial office building.

Two buildings are already complete and a third is under construction. These three buildings are covered by their own waste management plan and not included in this waste master plan. Details of the buildings covered by this plan are shown in Table 1 below.

Table 1 Discovery Point Buildings Covered by Waste Master Plan

Site	Residential Dwellings					Gross Floor Area		Expected Grouping for Shared Residential Waste Facilities	Expected Completion Order	Zone
	Studios	1 bed	2 bed	3 bed	Total	Commercial	Retail			
1B	1	5	4	1	11			Shared	1	South
1C	6	50	44	11	115		667		1	South
2	9	81	72	18	181		832		2	South
3	4	36	32	8	80		817		3	South
4	5	42	37	9	94		154		3	South
5	6	52	47	12	117		338		3	South
6	0	43	42	11	96			Shared	1	North
7	4	32	28	7	70		316		4	North
8	7	65	58	14	144				5	North
9	2	19	17	4	42				5	North
10	7	61	54	14	136				5	North
11	5	48	43	11	106				6	North
12	5	43	38	10	95					North
13	9	85	76	19	189					North
14						5,576			7	South
Total	69	662	592	148	1,475	5,576	3,124			



The table shows that groups of buildings in close proximity to each other will share central waste storage rooms. These rooms will be for the storage of residential garbage and recycling between regular collection services and will be the point from which bins will be collected for servicing.



2. Residential Waste

2.1 Disposal, Storage and Collection System

Residents will dispose of their garbage by way of a chute system. A waste chute will run through the residential floors in all buildings. Access to the chutes will be by a hatch which will be located in a cupboard in the main hallway on each floor of each block.

Bins for recycling will be stored in the spaces adjacent to the garbage chutes on each floor. The proximity of the garbage chutes and recycling bins to each other allows residents to place their garbage in the chute and their recycling in bins at the same time.

Cleaners will empty the recycling bins as often as required and take the recyclables to the central residential waste room for that building, where they will be stored for collection. The exact method used and frequency for collection of the recyclables will be determined by building management in consultation with the cleaners.

At the base of each chute a compactor will be fitted for use with 1100 litre bins. This system has a footprint of about 2.9 m² (See Appendix A for details of an example system). Each compactor room is expected to have an area of about 6.4 m². This will be enough space to contain the compaction equipment and a spare empty 1100 L bin.

When full, or as often as required, the 1100 litre garbage bins under the chutes will be replaced by empty bins. The full bins will be transported by the cleaners to the central bin storage room for that building. As shown in Table 1 groups of buildings will share a common waste bin storage room.

Council or a contractor will collect the garbage and recycling bins from the bin storage rooms according to the established collection frequency, currently expected to be three times per week for garbage and twice a week for recycling.

2.2 Storage Requirements

Table 2 below shows the amount of residential garbage and recycling estimated to be produced from all the site's southern buildings that will be sharing a central bin room. It also shows the number of bins required to store this waste and the amount of space needed to accommodate the bins.

Table 2 South Buildings Residential Storage Requirements

Building	Units	Total generated per building per week (litres)			Number of 1100 L bins		Storage Area Required (m ²)	
		Recycling	Garbage	Garbage and recycling	Equivalent	Actual	Raw (bins only)	Including Access and Manoeuvring
1C	115	6,900	13,800	20,700	4.5	5	8.8	17.5
1B	11	660	1,320	1,980	0.4	1	1.8	3.5
2	181	10,836	21,671	32,507	7.1	7	12.3	24.6
3	80	4,770	9,540	14,311	3.1	3	5.3	10.5
4	94	5,616	11,231	16,847	3.7	4	7.0	14.0
5	117	6,994	13,988	20,982	4.6	5	8.8	17.5
Total South	596	35,776	71,551	107,327	23.5	24	42.1	84.2

Table 2 shows that the residential bin storage area for all the southern buildings will need to have an area of 84.2 m².

Table 3 below shows the amount of residential garbage and recycling estimated to be produced from Buildings 6 to 13 in the site's northern zone. It also shows the number of bins required to store this waste and the amount of space needed to accommodate the bins.

Table 3 Buildings 6-13 Residential Storage Requirements

Building	Units	Total generated per building per week (litres)			Number of 1100 L bins		Storage Area Required (m ²)	
		Recycling	Garbage	Garbage and recycling	Equivalent	Actual	Raw	Including Access and Manoeuvring
6	96	5,760	11,520	17,280	3.8	4	7.0	14.0
7	70	4,223	8,447	12,670	2.8	3	5.3	10.5
8	144	8,646	17,291	25,937	5.7	6	10.5	21.0
9	42	2,497	4,994	7,490	1.6	2	3.5	7.0
10	136	8,151	16,301	24,452	5.4	6	10.5	21.0



11	106	6,376	12,752	19,127	4.2	5	8.8	17.5
12	95	5,707	11,413	17,120	3.7	4	7.0	14.0
13	189	11,342	22,684	34,026	7.4	8	14.0	28.1
Total	878	52,701	105,401	158,102	34.6	38	66.6	133.3

Table 3 shows that the residential bin storage area for Buildings 6 to 13 will need to have an area of 133.3 m². During construction, a temporary waste storage room will be used until the permanent northern waste storage room is complete.

A number of assumptions have been made in calculating these figures:

- ▶ Garbage capacity is provided at the equivalent of Council's minimum of 120 L per dwelling per week;
- ▶ Recycling capacity is provided at the equivalent of Council's minimum of 60 L per dwelling per week;
- ▶ 1100 L wheeled mobile bins are used;
- ▶ Garbage is compacted 3:1 at the base of the chute;
- ▶ Garbage is collected three times per week;
- ▶ Recyclables are not compacted;
- ▶ Recyclables are collected twice per week; and
- ▶ Because it is not possible to have fractions of bins, the number of bins has been rounded up or down, as may be most appropriate, to calculate the absolute number of bins required.



3. Retail Waste

3.1 Disposal, Storage and Collection System

As shown in Table 1, retail areas are proposed for Buildings 1C, 2, 3, 4, 5 and 7. Retailers in each block will take their own garbage and recycling direct to a common retail waste bin storage room in that block.

Bins will be serviced from these bin store rooms by collection contractors according to a frequency to be arranged between building management and the contractors involved. The collection frequency is expected to range between daily collections for putrescible waste to weekly collections for some recyclable materials.

Some larger waste generators such as restaurants and fruit and vegetable retailers may make their own waste collection arrangements independent of building management.

3.2 Storage Requirements

Table 4 below shows the proposed retail mix for the site, the gross floor area proposed for each type of retailer and the average amount of garbage estimated to be produced by each type of retailer.

Table 4 Garbage Average Retail Waste Generation

Retail Type	GFA (m ²)	Garbage generation rate by use (L/100 m ² /day)	Percent of GFA	Weighted garbage generation factor after percent mix applied (L/100 m ² /day)
Supermarket	Excluded - waste to be handled separately in loading dock			
Chemist	250	50	10.4%	5.2
Bakery	80	80	3.3%	2.7
Butcher	80	80	3.3%	2.7
Bank	150	50	6.3%	3.1
Fruit & Veg	200	240	8.4%	20.1
Optician	80	50	3.3%	1.7
Cafe	124	666.7	5.2%	34.5
Restaurant	200	666.7	8.4%	55.7
News Agent	120	80	5.0%	4.0
Deli	90	80	3.8%	3.0
Flower Shop	40	80	1.7%	1.3



Retail Type	GFA (m ²)	Garbage generation rate by use (L/100 m ² /day)	Percent of GFA	Weighted garbage generation factor after percent mix applied (L/100 m ² /day)
Hair & Beauty	80	60	3.3%	2.0
Travel Agent	80	50	3.3%	1.7
Dry cleaner	50	50	2.1%	1.0
Real Estate	90	50	3.8%	1.9
Optometrist	80	50	3.3%	1.7
Medical	300	50	12.5%	6.3
RHPP Facilities (cafe)	150	666.7	6.3%	41.8
RHPP Facilities (news agent)	150	80	6.3%	5.0
Total	2394	195.3	100%	195

Using the percent of GFA proposed for each type of retailer a weighted factor can be calculated for each, that when added up provides an average garbage generation rate per 100 m² for this retail mix of 195 L.

Table 5 below shows the proposed retail mix for the site and the gross floor area and the average amount of recycling estimated to be produced by each type of retailer.

Table 5 Recycling Average Retail Waste Generation

Retail Type	GFA (m ²)	Recycling generation rate by use (L/100 m ² /day)	Percent of GFA	Weighted recycling generation factor after percent mix applied (L/100 m ² /day)
Supermarket	Excluded - waste to be handled separately			
Chemist	250	50	10.4%	5.2
Bakery	80	25	3.3%	0.8
Butcher	80	25	3.3%	0.8
Bank	150	50	6.3%	3.1
Fruit & Veg	200	120	8.4%	10.0
Optician	80	25	3.3%	0.8
Cafe	124	50	5.2%	2.6
Restaurant	200	133.3	8.4%	11.1
News Agent	120	50	5.0%	2.5



Retail Type	GFA (m ²)	Recycling generation rate by use (L/100 m ² /day)	Percent of GFA	Weighted recycling generation factor after percent mix applied (L/100 m ² /day)
Deli	90	25	3.8%	0.9
Flower Shop	40	25	1.7%	0.4
Hair & Beauty	80	25	3.3%	0.8
Travel Agent	80	25	3.3%	0.8
Dry cleaner	50	25	2.1%	0.5
Real Estate	90	25	3.8%	0.9
Optometrist	80	25	3.3%	0.8
Medical	300	50	12.5%	6.3
RHPP Facilities (cafe)	150	50	6.3%	3.1
RHPP Facilities (news agent)	150	50	6.3%	3.1
Total	2394	55.0	100%	55

Using the percent of GFA proposed for each type of retailer a weighted factor can be calculated for each that when added up provides an average recycling generation rate per 100 m² for this retail mix of 55 L.

These figures are then used to calculate the possible waste generation rates for other retail areas and the amount of bin storage space required.

The estimated retail garbage storage requirements by building are shown in Table 6 below.

Table 6 Retail Garbage Storage Requirements

Building	GFA	Weighted garbage generation rate (L/100m ² / day)	Garbage quantities (L/Week)	Collections per week	Total garbage storage (L/ building)	Number of equivalent 1100 L bins	Number of actual 1100 L bins	Total garbage storage area (m ²)
1C ¹	654	N/a	10,327	7	1,475	1.3	2	3.5
2	815	195	2,854	7	408	0.4	1	1.8
3	801	195	10,947	7	1,564	1.4	2	3.5
4	151	195	2,064	7	295	0.3	1	1.8
5	331	195	4,529	7	647	0.6	1	1.8
7	310	195	4,234	7	605	0.5	1	1.8

The table shows that based on a daily collection frequency, two 1100 L bins would be required in buildings 1C and 3, and one each in the other buildings. Each 1100 L bin occupies a footprint of 1.8 m². These area figures do not include any space allowances for access and manoeuvring.

The estimated retail recycling storage requirements by building are shown in Table 7 below.

Table 7 Retail Recycling Storage Requirements

Building	GFA	Weighted recycling generation rate (L/100m ² / day)	Recycling quantities (L/Week)	Collections per week	Total recycling storage (L/ building)	Number of equivalent 1100 L bins	Number of actual 1100 L bins	Total recycling storage area (m ²)
1C ²	654	N/a	1,351	3	450	0.4	1	1.8
2	815	50	1,223	3	408	0.4	1	1.8
3	801	50	1,201	3	400	0.4	1	1.8
4	151	50	226	3	75	0.1	1	1.8

¹ Quantities for Building 1C have been calculated using the proposed retail mix for this area

² Quantities for Building 1C have been calculated using the proposed retail mix for this area

Building	GFA	Weighted recycling generation rate (L/100m ² /day)	Recycling quantities (L/Week)	Collections per week	Total recycling storage (L/ building)	Number of equivalent 1100 L bins	Number of actual 1100 L bins	Total recycling storage area (m ²)
5	331	50	497	3	166	0.2	1	1.8
7	310	50	465	3	155	0.1	1	1.8

The table shows that, based on a three times per week collection frequency, one 1100 L bin would be required in each building. Each 1100 L bin occupies a footprint of 1.8 m². These area figures do not include any space allowances for access and manoeuvring. It should be noted that the amounts of recyclables likely to be generated at Buildings 4, 5 and 7 are so small that 1100 L bins could be emptied less frequently than weekly, or 240 L bins used instead.

Table 8 below shows the combined storage areas for garbage and recycling.

Table 8 Total Combined Retail Waste Storage

Building	Total storage area (m ²)			
	Garbage	Recycling	Raw Storage	Including Access and Manoeuvring
1C ³	3.5	1.8	5.3	10.5
2	1.8	1.8	3.5	7.0
3	3.5	1.8	5.3	10.5
4	1.8	1.8	3.5	7.0
5	1.8	1.8	3.5	7.0
7	1.8	1.8	3.5	7.0

The table shows that the area required to store 1100 L garbage and recycling bins with enough space to allow access and manoeuvring is calculated to be 10.5 m² in Buildings 1C and 3 and 7 m² in the other buildings. These figures presume that the bins would be stored in enclosed areas with a single doorway and that space would be required inside to allow for access and manoeuvring. Bin rooms may be designed to allow direct access to individual bins, in which case additional space would not be required.

³ Quantities for Building 1C have been calculated using the proposed retail mix for this area

4. Commercial Waste

4.1 Disposal, Storage and Collection System

As shown in Table 1, Building 14 is proposed as commercial office space. As is the normal practice in commercial office buildings it is expected that at the end of each work day, contract cleaners will take garbage and recycling in bags from each floor to the loading dock or waste storage area. Where clearance is adequate, garbage is placed by the cleaners into compactors or front lift bulk bins which are serviced from the loading dock. Otherwise 1100 L bins are used which are suitable for collection by rear lift vehicles with lower clearance requirements.

Garbage bins will be serviced by collection contractors according to a frequency to be arranged between building management and the contractors involved. Usually this is daily.

Most recycling generated from offices is paper and this is typically stored in 240 L bins for collection by a contractor at an agreed frequency. Recyclable bottles and cans can be collected in a similar way. Each tenant usually makes their own arrangements for security destruction services and other recycling such as toner cartridges and batteries.

4.2 Storage Requirements

Table 9 shows the amount of garbage, number of bins and storage areas required for Building 14.

Table 9 Garbage Storage Requirements

Stream	Gross Floor Area	Occupants at 1 per 10 (m ²)	Quantity per person per week (L)	Quantity per week (L)	Collections per week	Total storage (L/building/day)	Number of equivalent 1100 L bins	Number of actual 1100 L bins	Total storage area (m ²)
Garbage	5576	558	2	5,855	5	1,171	1.1	2	3.5
Recycling			5	13,939	5	2,788	2.5	3	5.3
Total				19,793		3,959		5	8.8

The table assumes the occupancy density will be one person per 10 m². Confidential office waste audit data held by GHD shows that typical waste generation rates per person in offices are about 2 L of garbage and 5 L of recycling per week. The calculations also assume the office is occupied five days per week and that waste collections will also take place five days per week. The total raw storage area for the



number of 1100 L bins proposed is 8.8 m². This does not allow any space for access and manoeuvring in which case twice as much space (17.6 m²) is recommended.

5. Summary

5.1 Disposal, Storage and Collection System

Garbage and recycling generated from the different occupants of the buildings at Discovery Point are expected to be handled as follows:

- ▶ **Residential Garbage** – placed in chutes by residents, then into 1100 L bins, then taken to central storage area for collection three times per week;
- ▶ **Residential Recycling** – placed in bins on each floor by residents, then collected by cleaners and taken to central storage area for collection twice a week;
- ▶ **Retail Garbage** – placed in bins in central storage area by retailers for collection by contractor at an agreed frequency;
- ▶ **Retail Recycling** – placed in bins in central storage area by retailers for collection by contractor at an agreed frequency;
- ▶ **Commercial Garbage** – collected by cleaners and placed bins in central storage area for collection by contractor at an agreed frequency; and
- ▶ **Commercial Recycling** – collected by cleaners and placed bins in central storage area for collection by contractor at agreed frequency.

5.2 Storage Requirements

Table 10 below shows the bin storage requirements for the Discovery Point site. Each row shows details for each bin storage room required. The residential bin rooms are shared between several buildings while there is one room for retail and commercial waste at each building

Table 10 Bin Room Storage Requirements Summary

Waste Source	Building	Number of 1100 L Bins	Storage Area (m ²)	
			Raw Storage	Including Access and Manoeuvring
Residential	1C, 1B, 2, 3, 4 and 5	24	42.1	84.2
Residential	6, 7, 8, 9, 10, 11, 12 and 13	38	66.6	133.3
Retail	1B and 1C	3	5.3	10.5
Retail	2	2	3.5	7.0
Retail	3	3	5.3	10.5
Retail	4	2	3.5	7.0
Retail	5	2	3.5	7.0
Retail	7	2	3.5	7.0
Commercial Office	14	5	8.8	17.6



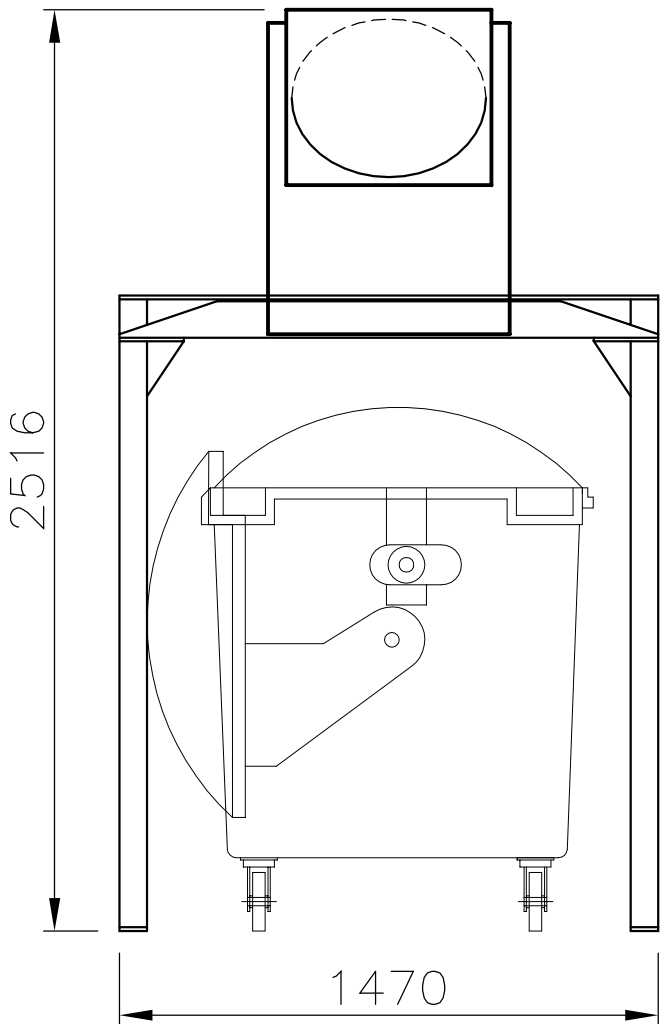
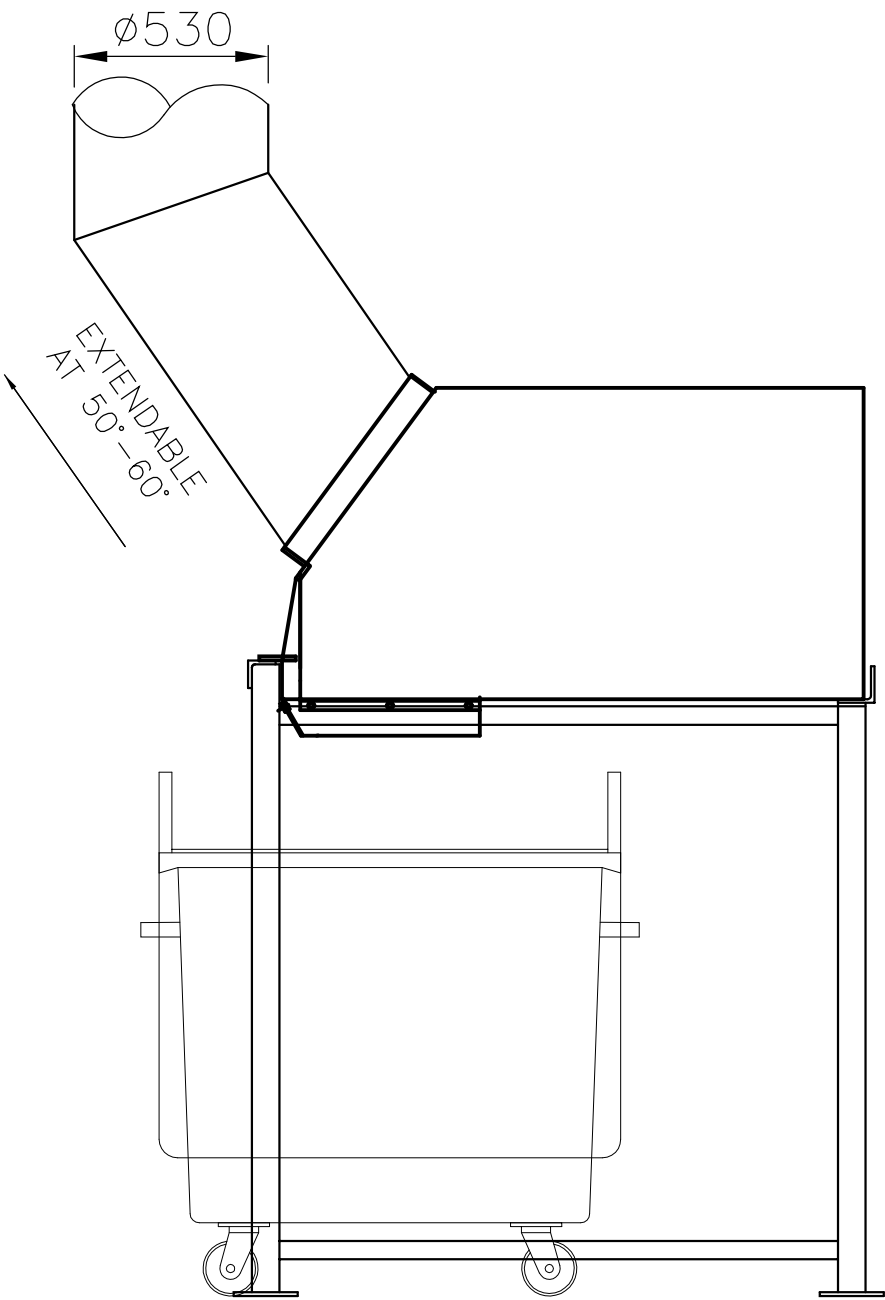
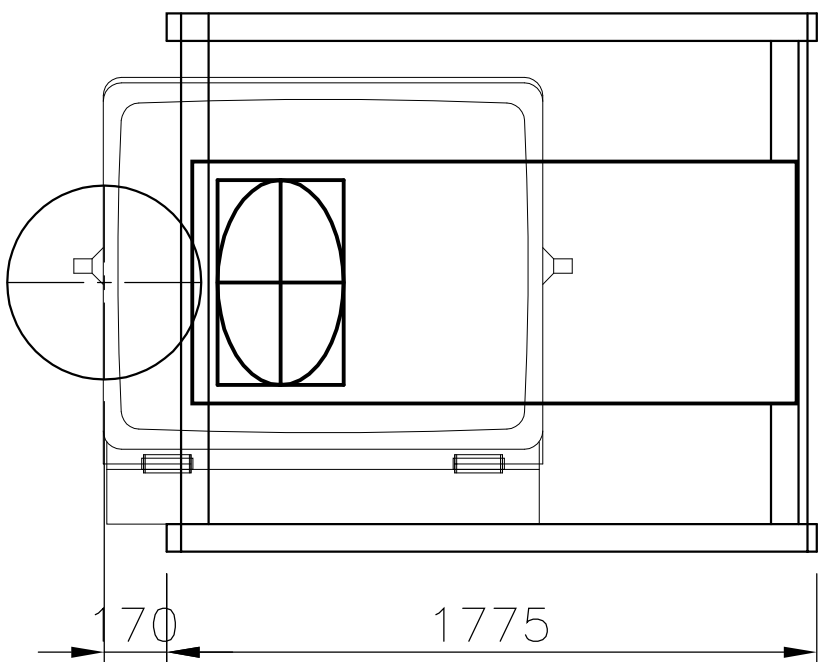
Appendix A

Example Compactor

Wastetech Engineering's Automated Ecopack system for
1100 litre bins

AUTOMATED ECOPACK
COMPACTOR WITH A
SINGLE 1100 LT BIN.
WASTECH
ECOPACK & STAND.DWG

(END LOADING)



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	DRN C.G	TITLE STAND SYSTEM		
	CKD ---	SINGLE 1100 LT BIN		
	APP ---	SCALE D.N.S	CAD FILE NAME	REV.
	DATE 28/09/06	VIEWS ---	ECOPACK&STAND	0



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