CLIENTS | PEOPLE | PERFORMANCE

Discovery Point Pty Ltd

Report for Discovery Point

Waste Master Plan

20 November 2012

INFRASTRUCTURE | MINING & INDUSTRY | DEFENCE | PROPERTY & BUILDINGS | ENVIRONMENT

Contents

Table Index

Appendices

1. Introduction

1.1 Discovery Point

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

This Master Plan is an update of a version issued in August 2012. It includes new information on Building 4. Details of the buildings covered by this plan are shown in Table 1 below.

Table 1 Discovery Point Buildings Covered by Waste Master Plan

	Residential Dwellings					Gross Floor Area				
Site	**Studios**	**1 bed**	**2 bed**	**3 bed**	**Total**	**Commercial**	**Retail**	**Expected Grouping for Shared Residential Waste Facilities**	**Expected Completion Order**	**Zone**
1B	0	1	4	0	5		1484		1	South
1C	0	51	60	10	121		[1]695		1	South
2	0	60	100	24	184		835	Shared	2	South
3	4	36	32	8	80		817		3	South
4	0	29	41	0	70				3	South
5	6	52	47	12	117		338		4	South
6	0	30	52	6	88				1	North
7	0	34	30	10	74				4	North
8	0	26	78	26	130				5	North
9	0	7	18	5	30			Shared	5	North
10	0	51	70	17	138				5	North
11	5	48	43	11	107				6	North
12	5	43	38	10	96					North
13	9	85	76	19	189					North
14						5,576			7	South
Total	**29**	**553**	**689**	**158**	**1429**	**5,576**	**4,169**			

[1] Includes 175 m^2 medical centre

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.

Please note that the number of unit shown for future stages of the development are indicative only and subject to change or confirmation.

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.

Where required cleaners will empty the recycling bins as often as necessary 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 carousel compactor will be fitted for use with 240 litre bins. This system can have a footprint of as much as 28 m^2 depending on its bin capacity (See Appendix A for details of an example system). Each compactor room is expected to have enough space to contain the compaction equipment and spare empty 240 L bins.

When full, or as often as required, the 240 litre garbage bins in the compactor 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 rooms.

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 Buildings 1B, 1C, 2, 3, 4 and 5. 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 240 L bins		Storage Area Required (m^2)	
		Recycling	Garbage	Garbage and recycling	Equivalent	Actual	Raw (bins only)	Including Access and Manoeuvring
1C	121	7,260	14,520	21,780	21.8	22	9.4	**18.8**
1B	5	300	600	900	0.9	1	0.4	**0.9**
2	184	11,040	22,080	33,120	33.2	33	14.1	**28.2**
3	80	4,770	9,540	14,311	14.4	15	6.4	**12.8**
4	70	4,200	8,400	12,600	12.6	13	5.4	**10.8**
5	117	6,994	13,988	20,982	21.0	22	9.4	**18.8**
Total South	**577**	**34,564**	**69,128**	**103,693**	**103.9**	**106**	**45.1**	**90.3**

Table 2 shows that the storage area required for residential bins only from South Buildings will be 90.3 m^2.

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 North Buildings Residential Storage Requirements

Building	Units	Total generated per building per week (litres)			Number of 240 L bins		Storage Area Required (m^2)	
		Recycling	Garbage	Garbage and recycling	Equivalent	Actual	Raw	Including Access and Manoeuvring
6	88	5,280	10,560	15,840	15.9	16	6.8	13.6
7	74	4,440	8,880	13,320	13.4	14	5.7	11.4
8	130	7,800	15,600	23,400	23.5	24	10.0	20.0
9	30	1,800	3,600	5,400	5.4	6	2.3	4.6
10	138	8,280	16,560	24,840	24.9	25	10.6	21.2

11	107	6,420	12,840	19,260	19.3	20	8.3	16.6
12	96	5,760	11,520	17,280	17.3	18	7.4	14.8
13	189	11,340	22,680	34,020	34.1	35	14.6	29.2
Total	**852**	**51,120**	**102,240**	**153,360**	**153.8**	**154**	**65.7**	**131.4**

Table 3 shows that the residential bin storage area for North Buildings will need to have an area of 131.4 m^2.

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;
- 240 L wheeled mobile bins are used;
- Garbage is compacted 3:1 at the base of the chutes;
- 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.

2.3 Temporary Waste and Permanent Storage

2.3.1 Building 5

A permanent waste storage area for all buildings in the southern precinct is planned to be located in the basement under Building 5. Until Building 5 is constructed, a temporary waste storage area is proposed to be located on the Building 5 site. Bins would be collection from Spark Lane.

Table 2 shows that the size of this waste storage area should be 90.3 m^3. Despite being for temporary waste storage, this area should be built on a concrete slab, be fenced with lockable gates, screened and covered, if possible, and have easy access for building management and waste contractor staff and vehicles.

Discovery Point Building Management has a tow motor or tractor and a bin trailer which are proposed to be used to transport 240 L bins to and from this temporary waste storage area. Full bins would be stored under each building in the compactor room and brought to the temporary storage area when required for short term storage until collection. Mostly empty bins would then be stored in this temporary area until required to replace full bins in the under-building bin rooms.

2.3.2 Building 2

When Building 2 is complete, waste will be collected in a carousel compactor at the base of the garbage chute on Basement 1. Currently a five-bin carousel is proposed. When all five bins are full, facilities management staff will exchange the full bins for empty bins and transport the full bins to a temporary waste storage area on the site of the proposed Building 5 for collection from Spark Lane. Similarly, full recycling bins positioned on each floor will be exchanged for empty bins and transported to the same location. The bins will be transported using a tractor and trailer and travel over the surface.

Construction of Building 2 will result in the demolition of a ramp on which bins from the Verge and Vine buildings are placed for collection. After the ramp is demolished these bins will be collected from street level on Brodie Spark Drive.

2.3.3 Building 4

When Building 4 is complete, waste will be collected in a carousel compactor at the base of the garbage chute in the basement. Currently a five-bin carousel is proposed. When all five bins are full, facilities management staff will exchange the full bins for empty bins and transport the full bins to a waste storage are on the site of the proposed Building 5 for collection from Spark Lane. Similarly full recycling bins positioned on each floor will be exchanged for empty bins and transported to the same location. The bins will be transported using a tractor and trailer over the surface.

2.3.4 Buildings 6 and 7

A temporary bin storage room is also proposed for Buildings 6 and 7, which will be the first buildings to be built in the North Zone. A permanent bin storage room is planned for the north west corner of the site under Building 10, and when this is built waste from all the North buildings will be stored and serviced there. Until then, a temporary bin storage room will be constructed as part of Building 6 and has been sized so that can also be used for Buildings 6, 7, 8 and 9 will also be used by Buildings 7 and 8 when they are constructed soon after.

The room is secured with roller shutters but is accessible for collection from the temporary turning circle within the Stage 1 works.

3. Retail Waste

3.1 Disposal, Storage and Collection System

As shown in Table 1, retail areas are proposed for Buildings 1B, 1C, 2, 3 and 5. 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 Buildings 1B and 1C, 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 Buildings 1B and 1C

Retail Type	GFA (m^2)	Garbage generation rate by use (L/100 m^2/day)	Percent of GFA
Food Providor	737	667	33.8%
Coffee Shop	60	667	2.8%
Hairdresser	109	50	5.0%
Bar, pizza, pasta	170	667	7.8%
Newsagent	168	80	7.7%
Restaurant	223	667	10.2%
Florist	49	80	2.2%
Dry Cleaner	95	50	4.4%
Bakery	85	80	3.9%
Sushi	49	80	2.2%

Retail Type	GFA (m^2)	Garbage generation rate by use (L/100 m^2/day)	Percent of GFA
Takeaway Chicken	60	240	2.8%
Tobacconist	49	50	2.2%
Chemist	150	50	6.9%
Medical Centre	175	80	8.0%
Total	**2,179**	**3,508**	**100%**

Table 5 below shows the proposed retail mix for Buildings 1B and 1C 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 Buildings 1B and 1C

Retail Type	GFA (m^2)	Recycling generation rate by use (L/100 m^2/day)	Percent of GFA
Food Providor	737	133	33.8%
Coffee Shop	60	133	2.8%
Hairdresser	109	25	5.0%
Bar, pizza, pasta	170	133	7.8%
Newsagent	168	25	7.7%
Restaurant	223	133	10.2%
Florist	49	25	2.2%
Dry Cleaner	95	25	4.4%
Bakery	85	25	3.9%
Sushi	49	25	2.2%
Takeaway Chicken	60	120	2.8%
Tobacconist	49	25	2.2%
Chemist	150	25	6.9%
Medical Centre	175	25	8.0%
Total	**2,179**	**877**	**100%**

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

Table 6 Retail Garbage Storage Requirements

Building	GFA	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)
1B[2]	1,484	48,272	7	6,896	6.3	7	12.3
1C[3]	695	12,600	7	1,800	1.6	2	3.5
2	835	11,398	7	1,628	1.5	2	3.5
3	801	10,947	7	1,564	1.4	2	3.5
5	331	4,529	7	647	0.6	1	1.8
Total	**4,146**	**87,746**	**7**	**12,535**	**11.4**	**14**	**24.6**

The table shows that based on a daily collection frequency, seven 1100 L bins would be required in building 1B, two each in 1C, 2 and 3, and one in 5. Each 1100 L bin occupies a footprint of 1.8 m^2. 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.

[2] Quantities have been calculated using the proposed retail mix for this area

[3] Quantities have been calculated using the proposed retail mix for this area

Table 7 Retail Recycling Storage Requirements

Building	GFA	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)
1B[4]	1,484	10,332	3	3,444	1.3	2	3.5
1C[5]	695	2,905	3	968	1	1	1.8
2	835	1,253	3	418	0.4	1	1.8
3	801	1,201	3	400	0.4	1	1.8
5	331	497	3	166	0.2	1	1.8

The table shows that, based on a three times per week collection frequency, two 1100 L bins would be required in Building 1B and one each in the other buildings. Each 1100 L bin occupies a footprint of 1.8 m^2. These area figures do not include any space allowances for access and manoeuvring.

[4] Quantities have been calculated using the proposed retail mix for this area

[5] Quantities have been calculated using the proposed retail mix for this area

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
1B[6]	12.3	3.5	18.8	37.6
1C[7]	3.5	1.8	5.3	10.5
2	3.5	1.8	5.3	10.5
3	3.5	1.8	5.3	10.5
5	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 37.6 m^2 in Building 1B, 10.5 m^2 in Buildings 1b, 1C, 2 and 3 and 7 m^2 in Building 5. 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.

[6] Quantities have been calculated using the proposed retail mix for this area

[7] Quantities 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 m^2. 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 m^2. This does not allow any space for access and manoeuvring in which case twice as much space (17.6 m^2) 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 compacted into 240 L bins in a carousel compactor and 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 1100 L bins in central storage area by retailers for collection by contractor at an agreed frequency;
- **Retail Recycling** – placed in 1100 L 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. Until construction of Building 3 is completed, a temporary bin room will be used by residents of Building 2.

Table 10 Bin Room Storage Requirements Summary

Waste Source	Building	Number of Bins		Storage Area (m^2)	
		1100 L	240 L	Raw Storage	Including Access and Manoeuvring
Residential	1C, 1B and 2-5		106	45.1	90.3
Residential	6-13		154	65.7	131.4
Retail	1B and 1C	12		21.1	42.2
Retail	2	3		5.3	10.5
Retail	3	3		5.3	10.5
Retail	5	2		3.5	7.0
Commercial Office	14	5		8.8	17.6

Appendix A

Example Compactor

Wastetech Engineering's Automated Ecopack system for 240 litre bins

WASTECH ENGINEERING

Eco-Pack
WASTE CHUTE COMPACTOR

Eco-Pack Waste Chute Compactor

The Patented Eco-Pack compactor has been specifically developed for compaction of waste delivered via an overhead chute in multi story apartments and entertainment venues.

Designed to suit tight room restraints, the Eco-Pack is a true hydraulic compactor that contains the high packing forces within itself to eliminate O,H&S issues and bin damage.

SPECIAL FEATURES

- High Compaction to reduce number of bins required thus reducing floor space.
- Compaction blade and ejection door constantly seal the waste chute to reduce odour and also eliminate the risk of fire transfer up the waste chute.
- Autocycle operation via 'photo cell' to reduce power consumption.
- Enclosed chamber design provides protection from glass explosion if bottles are dropped from upper levels.
- Ejection of compacted waste plugs into Bins sized from - 240 to 1,500 Ltr.
- Robust High tensile steel construction to Australian Standards AS4100.
- Compliance to all current O,H&S and WorkCover requirements.
- Quiet and efficient hydraulic system.
- Option of Roto Feed or Conveyor Feed to suit all installations.

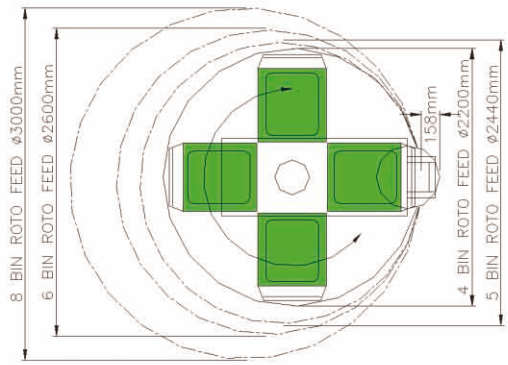
Eco-Pack

APARTMENT COMPACTOR

Specifications

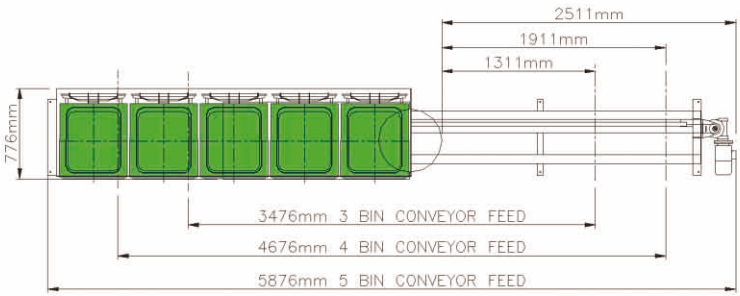
Compaction Ratio :	3:1 to 10:1 dependent on waste types.
Construction :	5mm and 20mm grade 350 high tensile steel plate.
Chamber dimensions :	560 wide x 600mm long.
Waste Capacity :	80 Ltr per 15 second cycle = 20m³/hr
Power requirements :	415v / 20A / 5pin power point .
Hydraulic Specs :	12 Lpm Pump, 5.5Kw Motor
Compaction Force :	62 kn or 6.3 tonnes force @ 14 Mpa
Waste bin Qty :	1 x 240 Ltr bin to 8 bins on Roto Feed and up to 660, 1500 litre bin Roto Feed.
Electric Control :	PLC control with electronic cycle control and photo cell monitoring.
Service :	Comprehensive fixed price service / inspection program available.
Warranty :	12 Month Warranty subject to our Standard Terms and Conditions.

ROTO FEED SYSTEM

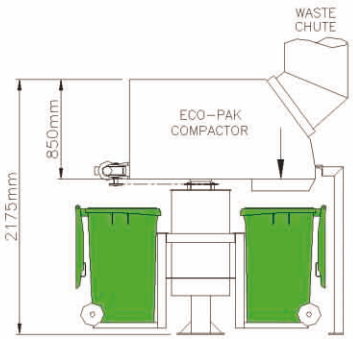


4 BIN ROTO FEED ILLUSTRATED
ALLOW MINIMUM 100mm CLEARANCE (EACH SIDE)

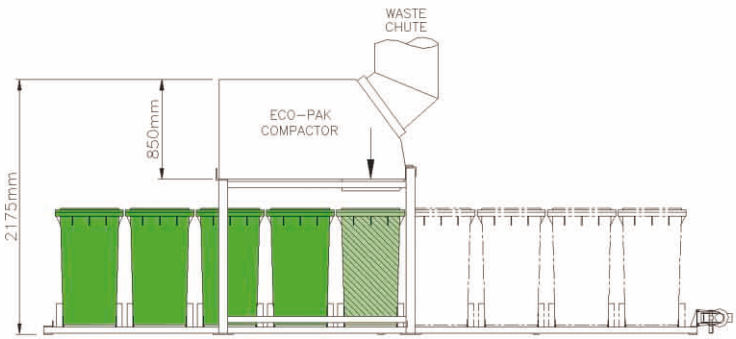
CONVEYOR FEED SYSTEM



5 BIN CONVEYOR FEED ILLUSTRATED
ALLOW MINIMUM 100mm CLEARANCE (EACH SIDE)



4 BIN ROTO FEED SYSTEM
ALLOW MINIMUM 2500 CEILING HEIGHT (W/O SERVICES)



5 BIN CONVEYOR FEED SYSTEM
ALLOW MINIMUM 2500 CEILING HEIGHT (W/O SERVICES)

WASTECH ENGINEERING

Wastech Head Office
21 Capital Drive,
Dandenong Victoria 3175
PO Box 4182
Dandenong South 3164
Phone: (03) 9794 7155
Facsimile: (03) 9794 7636
info@wastech.com.au
www.wastech.com.au

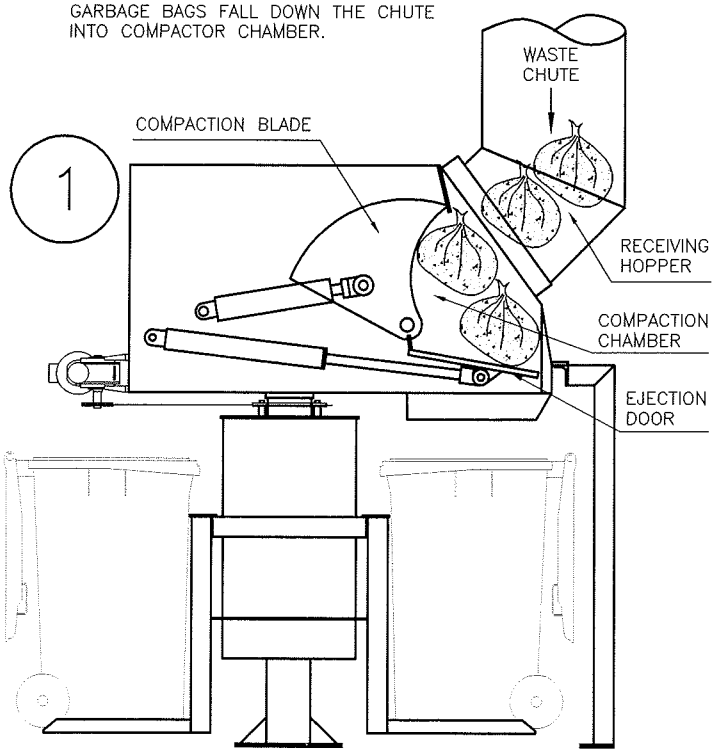
FOR YOUR LOCAL AGENT IN YOUR STATE PLEASE CALL

FREE CALL: 1800 465 465

Your Local Agent:

1) REST POSITION:

GARBAGE BAGS FALL DOWN THE CHUTE INTO COMPACTOR CHAMBER.

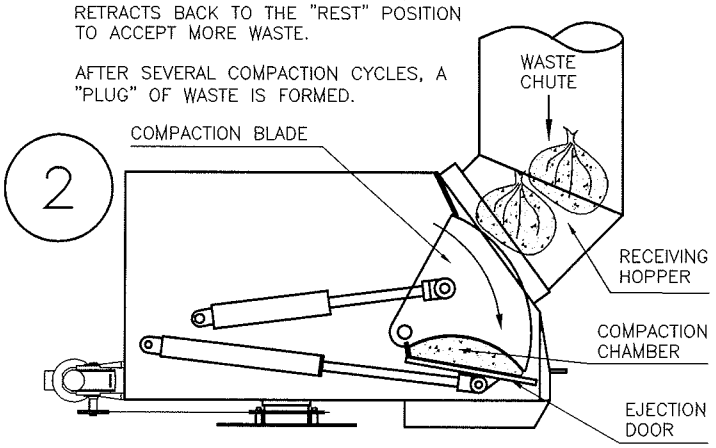


2) COMPACTION CYCLE:

A PHOTO CELL LOCATED IN THE CHUTE SIGNALS THE START OF COMPACTION CYCLE.

COMPACTION BLADE ROTATES, CRUSHING BAGS AGAINST THE EJECTION DOOR, THEN RETRACTS BACK TO THE "REST" POSITION TO ACCEPT MORE WASTE.

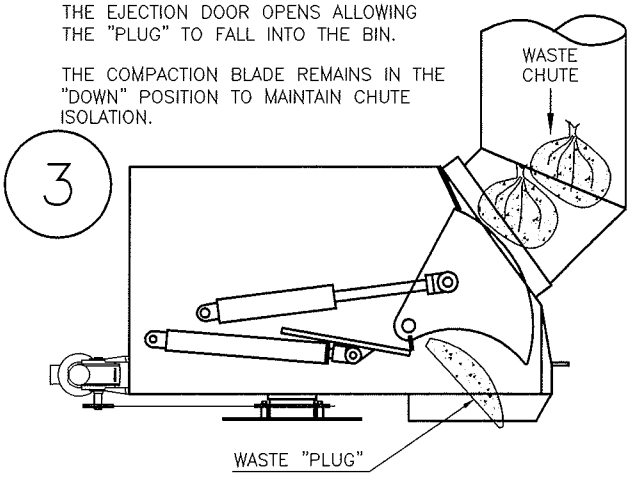
AFTER SEVERAL COMPACTION CYCLES, A "PLUG" OF WASTE IS FORMED.



3) EJECTION CYCLE:

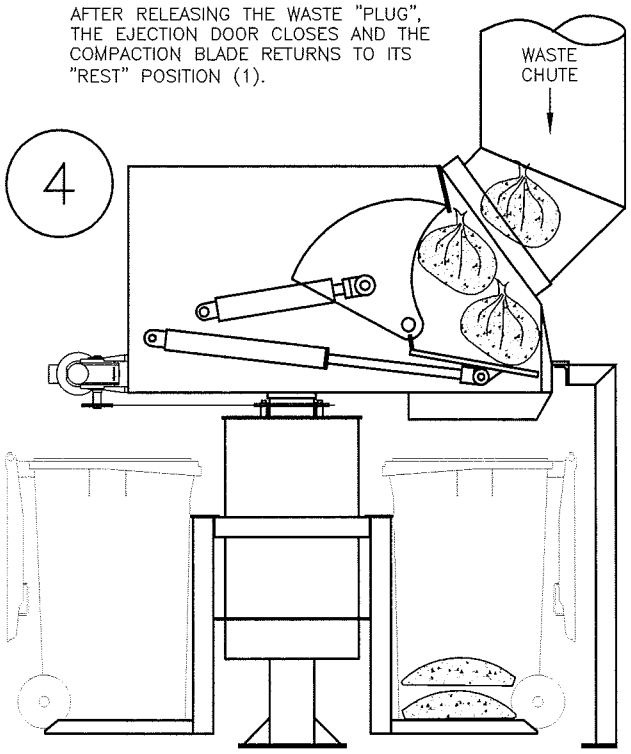
THE EJECTION DOOR OPENS ALLOWING THE "PLUG" TO FALL INTO THE BIN.

THE COMPACTION BLADE REMAINS IN THE "DOWN" POSITION TO MAINTAIN CHUTE ISOLATION.



4) RETURN TO REST POSITION:

AFTER RELEASING THE WASTE "PLUG", THE EJECTION DOOR CLOSES AND THE COMPACTION BLADE RETURNS TO ITS "REST" POSITION (1).



240 LITRE BIN ROTOFEED CAROUSEL SHOWN (OTHER BIN FEED SYSTEMS ARE AVAILABLE). THE CAROUSEL ROTATES AUTOMATICALLY TO FILL THE BINS. THE UNIT STOPS WHEN ALL BINS ARE FULL AND ALERTS CARETAKER.

NOTE:
ECOPACK DESIGN AND COMPACTING ACTION IS PATENT-PROTECTED.

WASTECH ENGINEERING
SPECIALISING IN: DESIGN, MANUFACTURE AND SERVICE OF WASTE DISPOSAL AND RECYCLING EQUIPMENT
21 CAPITAL DRIVE, DANDENONG ,VIC. 3175 PHONE (03) 97947155 FAX (03) 9794 7636

DRN C.L.	TITLE ECOPACK 100 ACTION		
CKD C.G.			
APP S.F.	SCALE D.N.S	CAD FILE NAME EP-01-03663	REV. 0
DATE 10-9-03	VIEWS ---		

GHD

133 Castlereagh St Sydney NSW 2000

-

T: 2 9239 7100 F: 2 9239 7199 E: sydmail@ghd.com.au

Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	A. Quinn	D Gamble		DRAFT		19/11/10
1	A. Quinn	D Gamble		D Gamble		28/01/11
2	A. Quinn	D Gamble		D Gamble		18/11/11
3	A. Quinn	D Gamble		D Gamble		22/11/11
4	A. Quinn	D Gamble		D Gamble		13/2/12
5	A. Quinn	D Gamble		D Gamble		14/6/12
6	A. Quinn	D Gamble		D Gamble		18/6/12
7	A. Quinn	D Gamble		D Gamble		23/7/12
8	A. Quinn	D Gamble		D Gamble		26/7/12
9	A. Quinn	D Gamble		D Gamble		2/8/12
10	A. Quinn	D Gamble		D Gamble		21/11/12