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WASTE MANAGEMENT PLAN GREEN STAR

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Waste Management Plan – Green Star

University of Newcastle

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REV	DATE	DETAILS
01	18/03/2021	Waste Management Plan – Green Star (DRAFT)
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1 SUMMARY

WSP have been engaged by University of Newcastle to prepare an Operational Waste Management Plan (OWMP) for the proposed commercial development at 16B Honeysuckle drive in Newcastle, prepared in accordance with Credit 8A (Operational Waste) of *Green Star Design & As Built v1.2*. The complete report must be read in detail prior to implementing the waste management plan.

The development will deliver commercial spaces along 4 storeys, the subject development will comprise of:

- 540m² Office
- 440m² Informal learning
- 542m² Formal teaching spaces
- 300m² Public/shared areas
- 325m² Ancillary areas

The following waste systems and collection arrangements are proposed for the development:

Stream	Equipment	Collections per Week	Collection Operator
General Waste	2no. 1100L Bins	1	Private Contractor
Commingled Recycling	1no. 660L Bins	1	Private Contractor
Paper / Cardboard	1no. 1100L Bins	1	Private Contractor
Food Organics	2no. 120L Bins	3	Private Contractor
Extended Waste Streams (i.e. soft plastics, glass) *	Bins or Allocated Storage Area as Appropriate	As Required*	Private Contractor

** Extended waste streams (i.e. glass or soft plastic) will be collected on an as required basis due to the requirement to accumulate a sufficient volume of material prior to collection. Anticipated collection of approx. 1 per month per stream.*

All waste collections will occur on-street, directly from the Wright Lane frontage via private collection. A 10.4m or smaller collection vehicle will be utilised to perform all collections, with operators to collect the material directly from the waste rooms and return empty storage containers (if appropriate) immediately upon emptying.

Bins will not be stored outside of the title boundary or presented to kerb for collection at any time.

Building management will ensure sufficient access is provided for operators during collection times.

2 INTRODUCTION

WSP have been engaged by University of Newcastle to prepare an Operational Waste Management Plan (OWMP) for the proposed commercial development at 16B Honeysuckle drive in Newcastle.

This Waste Management Plan (WMP) has been prepared based on *Department of Environment and Climate Change NSW's Better Practice Guide for Waste Management in Multi-Unit Dwelling (2008)* and best practice waste management methodology and technologies commonly available in Australia.

The waste generation rates provided within have been prepared based on *City of Newcastle's Technical Manual Waste Management (2012)* and case study data held by WSP acquired from similar sites.

Construction waste management details and strategy are provided within Appendix C as a separate waste management plan prepared by Hansen Yuncken.

2.1 LAND USE

Client: University of Newcastle

Land Use Type: Commercial

Number Levels: 4 levels

Table 1 Development Summary

Use	Area (m ²) / Quantity
Office	540m ²
Internal Learning	440m ²
Formal Teaching Spaces	542m ²
Public/Shared Areas	300m ²
Ancillary Areas	325m ²

Figure 1 Subject Site Layout (Indicative)



3 GREEN STAR CRITERIA ASSESSMENT

The Operational Waste Management Plan (OWMP) within this document follows best practice waste engineering systems. Section Table 2 provides a review of Credit 8A (Operational Waste) of *Green Star Design & As Built v1.2* criteria in comparison to this OWMP.

A summary of Credit 8A requirements is provided in Table 2 below.

Table 2 Green Star Criteria Assessment (Credit 8A)

Green Star Credit 8A Criteria	Operational Waste Management Plan Response
Identify the site boundary, the waste streams relevant to the project, and the individual roles responsible for delivering and reviewing the OWMP;	Appendix A identifies the site boundaries Section 5.2 identifies the relevant waste streams, such as general waste and commingled recycling Section 6.2 identifies the individual roles with regard to delivery and review of the OWMP
Set diversion from landfill targets and/or targets for reducing total materials generation (general waste materials and recyclable/reusable materials), as well as monitoring and measurement procedures for waste and recycling streams by weight;	Sections 6.1 through 6.2 detail required diversion targets, and monitoring and measurement procedures
Outline methods for encouraging the separation of waste streams, such as bins, storage areas, or recycling facilities in public areas as required;	Sections 5.2 through 5.8 contain relevant information regarding the provision of bin storage, recycling facilities and encouragement for waste stream separation
Identify storage areas for all waste streams and outline best practice safety and access requirements for their collection;	Sections 5.5 and 5.8 detail the bin storage requirements and collection methods respectively, adhering to best practice waste design and safety
Identify safe methods for vehicle access and transfer of waste; and	Section 5.8 identifies the waste collection method in accordance with best and safe practices
Incorporate a review process to assess the success of the OWMP and make improvements, based on operational experience.	Section 6.2.1 identifies the review process to be implemented for the OWMP

4 SSD D15 CONDITIONS

The Operational Waste Management Plan (OWMP) within this document follows and complies with SSD D15 conditions shown in Table 3.

Table 3 SSD D15 Criteria Assessment

SSD D15 Criteria	Operational Waste Management Plan Response
Be prepared in consultation with Council	Section 2 identifies the relevant council guidelines and waste management best practices relevant to this project.
Confirm the location of waste collection point and establish appropriate routes to the collection point	Section 5.8 identifies the waste collection method in accordance with best and safe practices
Provide confirmation of the engagement of a qualified private waste collection contractor	Section 5.8 identifies proper engagement of a qualified private contractor.
Detail the type and quantity of waste to be generated during construction and operation of the development;	Appendix C details construction and operational waste of the development
Describe the handling, storage and disposal of all waste streams generated on site, consistent with the Protection of the Environment Operations Act 1997, Protection of the Environment Operations (Waste) Regulation 2014 and the Waste Classification Guideline (Department of Environment, Climate Change and Water, 2009);	Systems described throughout report as compliant with relevant authority requirements.
Detail the materials to be reused or recycled, either on or off site; and	Section 5.2 identifies the materials to be recycled and reused.
Include the Management and Mitigation Measures included in the EIS.	The EIS requires a WMP to be created, as such this document complies with the measures of the EIS.

5 WASTE MANAGEMENT PLAN

The residential waste management strategy for University of Newcastle - Q Building has been developed in alignment with the services typical of the University.

This waste strategy considers the anticipated diversion from landfill when the development commences operations, with improvements anticipated over time as tenant education persists and guidance is provided by facilities management.

5.1 WASTE GENERATION

Waste generation rates per week are shown in Table 4 and are based on a 5 day per week operation for all uses.

Table 4 Waste Generation Rates

Use	Weekly Generation Rate (Litres / 100m ² / Week)			
	General Waste	Recycling	Paper/Cardboard	Organics
Office	78	35	70	18
Internal Learning	210	13	56	-
Formal Teaching Spaces	28	6	35	-
Public/Shared Areas	210	105	70	140
Ancillary Areas	23	9	26	7

Weekly waste generation assessment for the development is shown in Table 5.

Table 5 Waste Generation Assessment

Use	Quantity / Area (Net Leasable)	Weekly Waste Volume (Litres / Week)			
		General Waste	Recycling	Paper /Cardboard	Organics
Office	540m ²	50	25	50	13
Internal Learning	440m ²	150	9	40	0
Formal Teaching Spaces	542m ²	20	5	25	0
Public/Shared Areas	300m ²	150	75	50	100
Ancillary Areas	325m ²	17	6	19	5
TOTAL	1,822m²	1,544	446	793	386

5.2 WASTE SYSTEMS

Waste shall be sorted on-site by building management as appropriate into the streams as nominated within Table 6 below.

Table 6 Core & Extended Waste Streams

Core Streams	Extended waste streams will be provided for further diversion of waste from landfill, to comprise of:
<ul style="list-style-type: none"> ▪ General Waste (Garbage) ▪ Commingled Recycling ▪ Paper/Cardboard ▪ Organics 	<ul style="list-style-type: none"> ▪ Glass ▪ Soft Plastic ▪ Expanded Polystyrene (EPS) ▪ Hard Waste ▪ E-waste (Electronic Waste) ▪ Unique Recyclables including (but not limited to): <ul style="list-style-type: none"> ▪ Fluorescent Tubes (Lighting) ▪ Metals ▪ Batteries ▪ Secure Paper

Throughout the development it will be ensured that it is as easy to dispose of all core streams as it is general waste. This will be achieved by ensuring the development is appropriately furnished with bin stations (refer Figure 2 for examples) throughout the various learning spaces, ancillary spaces and communal areas. The bin stations are to be clearly signed such that waste stream separation is easily identifiable and correct use of the bins is upheld.

Bin stations encourage the separation of recyclable materials. This system incorporates the provision of multiple bins for different waste streams at central locations and common areas for ease of disposal. This system is beneficial, as users are required to make a conscious decision as to which bin they place their items. This typically results in a reduced volume of general waste (landfill).

In addition, the use of bin stations minimises the number of locations cleaners are required to service throughout the development.

Figure 2 Example of Office Bin Station Application



Brand: *Ecobin*



Brand: *Method Bins*

5.2.1.1 DESK TIDIES

Desk tidies (refer to Figure 3) will sit on the desk replacing the redundant and old fashioned under-desk bins. Each staff member will be responsible for their desk tidy and will empty it daily into the waste stations. The desk tidies aim to increase individual responsibility for waste created, reduce plastic liners going to landfill and reduce cleaning time on rubbish removal. Cleaners/staff will **NOT** empty the desk tidies.

Figure 3 Example 1L Office Desktop Bin



Brand: *Ecobin*

5.2.2 CORE WASTE STREAMS

5.2.2.1 GENERAL WASTE, COMMINGLED RECYCLING, PAPER/CARDBOARD, & GLASS

Each space of the development shall have provision for temporary holding of garbage, commingled recycling, and paper/cardboard to have minimum cumulative capacities as shown within Table 7.

The “Transfer Rate” refers to the frequency at which waste should be transferred by cleaners/staff from the temporary holding bins to the ground level waste room for disposal per day.

Table 7 General Waste, Commingled Recycling, Paper/Cardboard, Organics – Temporary Waste Storage Requirements

Use	Temporary Storage (Litres / 100m ²)				Transfer Rate
	General Waste	Commingled Recycling	Paper /Cardboard	Organics	
Office	12	5	11	3	Once per day
Internal Learning	30	2	8	-	Once per day
Formal Teaching Spaces	4	1	5	-	Once per day
Public/Shared Areas	30	15	10	20	Once per day
Ancillary Areas	4	2	4	1	Once per day

In disposing of waste generated throughout the all spaces, cleaning staff will utilise trolleys to collect and transfer waste from these temporary holding bins to the ground level waste room (see Appendix A).

General waste will be dispose of bagged, with all other streams to be disposed of loosely within the provided bin(s), bag(s) or marked storage area.

5.2.2.2 FOOD ORGANICS

To assist in the transfer of organic waste, areas in which food is either prepared or eaten shall have provision for “kitchen caddys” (refer to Figure 5) for the temporary holding of food organics. Kitchen caddys may be lined with paper (i.e. newspaper) if desired. Cleaning staff will transfer and empty these bins into the larger 120L organics bins provided at the waste room.

Figure 4 Example 120L Food Organics Bins



Brand: *SULO*

Figure 5 Example Kitchen Caddy



Brand: *Maze*

5.2.3 EXTENDED WASTE STREAMS

All extended waste streams will be provided with drop-off locations to meet the requirement of the applicable stream. Waste generated will be transferred directly to the allocated ground level storage area as required.

5.2.4 SECURE PAPER

Office spaces may be furnished with secure paper bins as deemed appropriate by the building management. Secure paper collections will be performed on an “as required” basis via an authorised contractor.

Collection contractors will enter the building, collect and exchange the secure paper bins directly from the individual office space on each floor, as per common practice. Building management (or equivalent) will coordinate collection services.

5.2.5 GLASS

Glass waste extending from the development is to be disposed within the 120L bin provided in the ground floor waste room. Additional capacity is provided to allow for separation of glass by the office if sufficient volumes are experienced and separation is desired.

5.2.6 SOFT PLASTICS

Soft Plastic waste extending from the development is to be disposed within the gathering stand (refer to Figure 6) provided in the ground floor waste room. Additional capacity is provided to allow for separation of soft plastic by the office if sufficient volumes are experienced and separation is desired.

5.3 WASTE MANAGEMENT EQUIPMENT

Table 8 details the storage method, size, capacity and frequency of collection required for the development.

Table 8 Waste Storage & Capacity

Stream	Storage Method	Size	Qty	Collections per Week	Weekly Capacity (L)	Weekly Volume (L)
General Waste	Bin Based	1,100 Litre	2	1	2,200	1,544
Commingled Recycling	Bin Based	660 Litre	1	1	660	446
Paper/Cardboard	Bin Based	1100 Litre	1	1	1,100	793
Food Organics	Bin Based	120 Litre	2	3	720	386

Table 9 Typical Storage Unit Dimensions

Unit	Width (mm)	Depth (mm)	Height (mm)
120 Litre Bin	480	545	930
660 Litre Bin	1,260	780	1,330
1100 Litre Bin	1,240	1,070	1,330

5.3.1 EXTENDED WASTE STREAMS

0 below describes the systems for the extended waste streams. Refer to Appendix A for a complete layout.

Due to the requirement for a suitable volume of each waste to be generated prior to collection, all extended streams will be collected on an as-required basis by a private collection contractor once the storage area capacity is reached.

Table 10 Extended Waste Stream Storage

Waste Stream	Storage Method
Soft Plastic	To be bagged using a gathering stand (refer to Figure 6 below for example)
Expanded Polystyrene (EPS)	To be stored within a gathering stand (refer to Figure 6 below for example) or an 1100 litre bin subject to collection contractor preference
Hard Waste	Dedicated caged or line-marked storage area adjacent to loading dock
Electronic Waste (E-Waste)	Dedicated line-marked storage area and/or 660 litre bin within waste store
Unique Recyclables	<p>Each tenancy will be fitted with recycling stations for the separation and disposal of unique recyclables. Stations are typically provided in easily accessible locations such as foyers, print/copy rooms or tenancy BoH.</p> <p>Unique recyclables may include the following items:</p> <ul style="list-style-type: none"> ▪ Printer Cartridges ▪ Batteries ▪ Florescent Tubes ▪ Small e-waste items ▪ Used pens and markers <p>Maintenance staff will be responsible for the separation and disposal of unique recyclables, which will be transferred to the loading dock and collected via a private contractor on an “as required” basis.</p>

Figure 6 Example Soft Plastic Gathering Stand



Figure 7 Example Unique Recyclables Disposal Unit



Mobile Disposal Station



Batteries Bin



Unique Recyclables Drop Off

5.4 INTERNAL WASTE TRANSFER & HANDLING

All waste transfer paths are to be exclusively within the site title boundary and do not require cleaners/tenants to exit title to perform operations. Transfer routes for waste collections do not include stairs or gradients greater than 1:14.

Bins / bin stations must be provided by building management. These are anticipated to be cleared by cleaning staff in accordance with building management operations. Cleaners will manually empty these bins utilising cleaners' trolleys.

Material from the trolleys is to be decanted into the appropriate larger collection receptacle(s) (or area) provided in the ground level waste room. Waste transfer will generally occur via the goods lift, primarily outside of standard office operational hours.

5.5 WASTE STORAGE AREA & LOCATION

Table 11 demonstrates the cumulative area requirements (excluding circulation) in comparison to the designed provision of ground level waste storage to demonstrate the adequacy of the area provided.

Table 11 Waste Storage Area Requirements

Waste Equipment	Area Required	Area Provided
3no. 1100L Bin	3.96	23.00
1no. 660L Bin	0.98	
3no. 120L Bin	0.79	
Temporary Holding Bins & Extended Streams Storage (Estimate)	3.00	
Hard Waste	1.00	
TOTAL	9.73	23.00

5.6 BIN SUPPLIER AND COLOURS

All bins will be provided by private supplier. The below bin colours are specified by Australian Standard AS4123.7 2006, however due to the private nature of the collection, these are only recommendations and are not mandatory:

- Garbage (general waste) bins shall have red lids with dark green or black body.
- Recycle bins shall have yellow lids with dark green or black body.
- Cardboard bins shall have blue lids with blue body.
- Organics bins shall have green lids with dark green or black body.

Private collection contractors often supply their own bins for collection.

5.7 SIGNAGE

Waste drop-off areas and bins will be clearly marked and signed with the approved NSW EPA waste disposal signage, or equivalent, examples of which are provided in Figure 8.

Figure 8 Example Waste Management Signage



5.8 WASTE COLLECTION METHODOLOGY

Waste will be collected as outlined in Table 12.

Table 12 Waste Collection Summary

Stream	Equipment	Collections per Week	Collection Operator
General Waste	2no. 1100L Bins	1	Private Contractor
Commingled Recycling	1no. 660L Bins	1	Private Contractor
Paper / Cardboard	1no. 1100L Bins	1	Private Contractor
Food Organics	2no. 120L Bins	3	Private Contractor
Extended Waste Streams (i.e. soft plastics, glass) *	Bins or Allocated Storage Area as Appropriate	As Required*	Private Contractor

** Extended waste streams (i.e. glass or soft plastic) will be collected on an as required basis due to the requirement to accumulate a sufficient volume of material prior to collection. Anticipated collection of approx. 1 per month per stream.*

All waste collections will occur on-street, directly from the Wright Lane frontage via private collection. A 10.4m or smaller collection vehicle will be utilised to perform all collections, with operators to collect the material directly from the waste rooms and return empty storage containers (if appropriate) immediately upon emptying.

Bins will not be stored outside of the title boundary or presented to kerb for collection at any time.

Building management will ensure sufficient access is provided for operators during collection times.

6 OPERATIONAL WASTE MANAGEMENT

6.1 OPERATIONAL WASTE TARGETS

A commitment to operational waste minimisation initiatives will be observed across the development. All reporting and required agreements therein are the responsibility of the occupiers (building management or equivalent). All streams except for prescribed waste, are subject to comprehensive waste audit for benchmarking.

Waste generation and diversion targets throughout the development are as follows:

6.1.1 OFFICE

Table 13 shows the estimated waste generation per 100m² of floor space for the office space. Diversion targets have been formulated based upon results of waste audits commissioned for a comparable office space, the results of which are held by WSP.

Landfill diversion minimisation targets as shown within Table 14 will be achieved through the provision of adequate separation systems and education programs.

Table 13 Office Material Generation Minimisation Targets

Stream Destination	Office Waste Generation				
	Expected (L/100m ² /wk)	Expected (% of total)	Target (L/100m ² /wk)	Target (% of total)	Potential Change (L/100m ² /wk)
Garbage	78	39%	60	30%	-9
Subtotal - Landfill	78	39%	60	30%	-9
Recycling	35	17%	39	20%	+3
Paper/Cardboard	70	35%	81	40%	+5
Food Organics	18	9%	21	10%	+1
Subtotal - Diversion	123	61%	141	70%	+9
TOTAL	201	100%	201	100%	nil

Table 14 Office Landfill Diversion Minimisation Targets

Office – Landfill Diversion	
Typical Diversion from Landfill	Target Diversion from Landfill
57%	70%

6.1.2 INTERNAL LEARNING

Table 15 shows the estimated waste generation per 100m² of floor space for the internal learning space. Diversion targets have been formulated based upon results of waste audits commissioned for a comparable space, the results of which are held by WSP.

Landfill diversion minimisation targets as shown within Table 16 will be achieved through the provision of adequate separation systems and education programs.

Table 15 Internal Learning Space Material Generation Minimisation Targets

Stream Destination	Internal Learning Waste Generation				
	Expected (L/100m ² /wk)	Expected (% of total)	Target (L/100m ² /wk)	Target (% of total)	Potential Change (L/100m ² /wk)
Garbage	210	75%	84	30%	-45
Subtotal - Landfill	210	75%	84	30%	-45
Recycling	13	5%	35	12%	+7
Paper/Cardboard	56	20%	160	58%	+38
Food Organics	0	0%	0	0%	+0
Subtotal - Diversion	69	25%	216	70%	+45
TOTAL	279	100%	279	100%	Nil

Table 16 Internal Learning Spaces Landfill Diversion Minimisation Targets

Internal Learning Spaces – Landfill Diversion	
Typical Diversion from Landfill	Target Diversion from Landfill
25%	70%

6.1.3 FORMAL LEARNING

Table 17 shows the estimated waste generation per 100m² of floor space for the formal learning space. Diversion targets have been formulated based upon results of waste audits commissioned for a comparable space, the results of which are held by WSP.

Landfill diversion minimisation targets as shown within Table 18 will be achieved through the provision of adequate separation systems and education programs.

Table 17 Formal Learning Space Material Generation Minimisation Targets

Stream Destination	Formal Learning Waste Generation				
	Expected (L/100m ² /wk)	Expected (% of total)	Target (L/100m ² /wk)	Target (% of total)	Potential Change (L/100m ² /wk)
Garbage	28	41%	21	30%	-11
Subtotal - Landfill	28	41%	21	30%	-11
Recycling	6	9%	7	10%	+1
Paper/Cardboard	35	50%	41	60%	+10
Food Organics	0	0%	0	0%	+0
Subtotal - Diversion	41	59%	48	70%	+11
TOTAL	69	100%	69	100%	Nil

Table 18 Internal Learning Spaces Landfill Diversion Minimisation Targets

Internal Learning Spaces – Landfill Diversion	
Typical Diversion from Landfill	Target Diversion from Landfill
59%	70%

6.1.4 PUBLIC SPACES

Table 19 shows the estimated waste generation per 100m² of floor space for the public spaces. Diversion targets have been formulated based upon results of waste audits commissioned for a comparable space, the results of which are held by WSP.

Landfill diversion minimisation targets as shown within Table 20 will be achieved through the provision of adequate separation systems and education programs.

Table 19 Public Spaces Space Material Generation Minimisation Targets

Stream Destination	Public Spaces Waste Generation				
	Expected (L/100m ² /wk)	Expected (% of total)	Target (L/100m ² /wk)	Target (% of total)	Potential Change (L/100m ² /wk)
Garbage	210	40%	158	30%	-10
Subtotal - Landfill	210	40%	158	30%	-10
Recycling	105	20%	123	23%	+3
Paper/Cardboard	70	13%	82	16%	+3
Food Organics	140	27%	163	31%	+4
Subtotal - Diversion	315	60%	368	70%	+10
TOTAL	525	100%	525	100%	Nil

Table 20 Public Spaces Landfill Diversion Minimisation Targets

Public Spaces – Landfill Diversion	
Typical Diversion from Landfill	Target Diversion from Landfill
60%	70%

6.1.5 ANCILLARY SPACES

Table 21 shows the estimated waste generation per 100m² of floor space for the ancillary spaces. Diversion targets have been formulated based upon results of waste audits commissioned for a comparable space, the results of which are held by WSP.

Landfill diversion minimisation targets as shown within Table 22 will be achieved through the provision of adequate separation systems and education programs.

Table 21 Ancillary Spaces Material Generation Minimisation Targets

Stream Destination	Ancillary Spaces Waste Generation				
	Expected (L/100m ² /wk)	Expected (% of total)	Target (L/100m ² /wk)	Target (% of total)	Potential Change (L/100m ² /wk)
Garbage	23	35%	20	30%	-5
Subtotal - Landfill	23	35%	20	30%	-5
Recycling	9	14%	10	15%	+1
Paper/Cardboard	26	40%	28	43%	+3
Food Organics	7	11%	8	12%	+1
Subtotal - Diversion	42	65%	46	70%	+5
TOTAL	65	100%	65	100%	Nil

Table 22 Ancillary Spaces Landfill Diversion Minimisation Targets

Ancillary Spaces – Landfill Diversion	
Typical Diversion from Landfill	Target Diversion from Landfill
65%	70%

6.2 OPERATIONAL WASTE PERFORMANCE MEASUREMENT PROCEDURES

Quarterly reports produced by development managerial staff will provide analysis regarding current landfill diversion rates, specified by stream. Reports are to be provided to stakeholders as deemed appropriate by the occupier. Data will be accumulated based on the number of bin tips performed each week for each stream as follows:

- Garbage (general waste)
- Commingled Recycling
- Paper/Cardboard
- Food Organics

A baseline value is to be established within the first three months of operation via a waste audit conducted by an accredited auditor.

An accredited waste auditor is defined as one of the following:

- An auditor employed by a waste management organisation, possessing a minimum of five years' experience, working in waste auditing in the built environment, with specific experience in conducting commercial audits in line with guidelines issued by State/Territory waste authorities; or
- A waste auditor or waste specialist, working for a consultant, building owner or contractor, possessing a minimum of three years' experience developing OWMPs; or
- An auditor who has undertaken at least one NABERS Waste audit as a certified assessor; or
- An auditor holding Environmental Management Systems Auditor certification issued by Exemplar Global (formerly RABQSA Inc.)
 - To find a certified auditor, refer to the 'Search for Certified Individuals' section of the Exemplar Global website (<http://www.exemplarglobal.org/what-we-offer/search-for-certified-individuals-or-organizations/>).

Management/cleaners will implement a recording system to analyse the waste generation trends of each use of the development. This will be achieved through:

- Manual recording of bin tips per week and/or weight of waste collected per stream, with **regular audits** undertaken by facilities management.

Waste collectors and maintenance staff will provide further data regarding bin weights at the point of collection, which are measured and recorded in electronic form as standard practice at the point of collection. These values should be compared to the management records to ensure accuracy.

The following performance metrics are recommended to be present in each report:

- Total waste volumes per week, measured in accordance with waste generation rates as follows:
 - Litres of waste, per stream, per 100m² floor space, per week for all uses.
- Percentage recovery rate relative to total landfill volume.

Waste collectors should also make note of any contamination in the recycling streams and provide feedback to facilities management to address such issues where appropriate.

It will be the responsibility of facilities management to analyse the metrics to provide required actions going forward regarding either increasing or maintaining performance.

6.2.1 ONGOING MONITORING AND REVIEW

Managerial staff will be responsible for the delivery and review of this Operational Waste Management Plan on an annual basis in accordance with best practice waste management and Green Star Criteria.

The review process should include (but not limited to) the following:

- Address any feedback or issues that have been raised in regards to waste management within the previous reporting period.
 - A summary of waste volumes generated and comparison to landfill diversion targets.
 - Identify areas for potential improvement in regards to waste management systems and increased recycling rates.
 - Revise and set landfill diversion minimisation targets based on past performance and current best practice for upcoming reporting periods.
-

6.3 EDUCATION

Education programs will be provided to staff, cleaners and students by the occupant at the expense of the occupant.

The below is a complimentary listing of resources available to provide education. The occupant is not obligated to use these materials. This is not, nor is it intended to be, a complete list of available materials.

WSP does not warrant (or make representations for) the below materials.

- Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities (NSW EPA, 2012)
- NSW Waste Avoidance and Resource Recovery Strategy 2014–21 (NSW EPA, 2014)
- Resource Smart: Recycling and Reusing in Your Workplace (Sustainability Victoria, 2008)
- Simple Changes to Make Your Workplace Resource Smart (Sustainability Victoria, 2011)
- Operational Waste Guidelines: Procurement, Management and Reporting (Better Building Partnership, 2015)
- National Waste Policy – Less Waste, More Resources (Department of Environment and Energy, 2018)

7 STANDARDS & COMPLIANCE

7.1 VENTILATION

Ventilation will be provided in accordance with Australian Standard AS1668.

7.2 BIN WASHING

Bin washing will be undertaken by a third party contractor.

7.3 NOISE REDUCTION

All waste areas shall meet BCA and AS2107 acoustic requirements as appropriate with operational hours and collection times assigned to minimise acoustic impact on surrounding premises.

8 HIGH LEVEL PURCHASING SCHEDULE

Table 23 and Table 24 list the equipment supply required for the core waste streams and extended waste streams respective as per the conditions proposed within this report.

All service requirements noted are indicative only and must be confirmed with the supplier prior to commencement of construction.

Table 23 Equipment Supply Schedule -Core Streams

Item	Quantity	Typical Services Requirement(s)*	Supplier
1100L Bin	3 No. Garbage 2 No. Paper/Cardboard	Nil	Private Supplier (SULO or equivalent)
660L Bin	1 No. Recycling	Nil	Private Supplier (SULO or equivalent)
120L Bin	2 No. Organics	Nil	Private Supplier (SULO or equivalent)
* Services requirements are indicative only and must be confirmed with the manufacture prior to commencement of construction			

Table 24 Equipment Supply Schedule – Extended Streams

Item	Quantity	Typical Services Requirement(s)*	Supplier
120L Bin	1 No. E-Waste 1 No. Glass	Nil	Private Supplier (SULO or equivalent)
Gathering Rack (Recycle Rack)	1 No. for Soft Plastic 1 No. for EPS (alternatively use 1no. 1100L bin)	Power: 415V 32A Power per unit-	Private Supplier (Wastech or equivalent)
* Services requirements are indicative only and must be confirmed with the manufacture prior to commencement of construction			

8.1 SUPPLIER CONTACT INFORMATION

A complimentary listing of contractors and equipment suppliers is provided in Table 25 below for your reference. WSP is not associated with these suppliers. There exists no obligation to procure goods/services from these companies. This is not, nor is it intended to be, a complete list of available suppliers. WSP does not warrant (or make representations for) the goods/services provided by these suppliers.

Table 25 Supplier Contact List

Service Type	Contractor / Supplier Name	Phone	Website
Private Waste Collectors	Citywide Service Solutions Pty Ltd	(03) 9261 5000	www.citywide.com.au
	SUEZ Environment	13 13 35	www.sita.com.au
	Cleanaway	13 13 39	www.cleanaway.com.au
	Veolia	132 955	www.veolia.com
Equipment Suppliers	Sulo Australia (Bins)	1300 364 388	www.sulo.com.au
	Sitecraft (Bin Tug Equipment)	1300 363 152	www.sitecraft.net.au
Bin Washing Services	The Bin Butlers	1300 788 123	www.thebinbutlers.com.au
	Kerbside Clean-A-Bin	(03) 9830 7381	www.kerbsidecleanabin-srp.com.au
	Calcorp Services	1800 225 267	www.calcorpservices.com.au
E-waste Collection Services	WBCM Environmental Australia	1300 800 621	www.wbcm-aust.com.au
	TechCollect	1300 229 837	www.techcollect.com.au
	Mobile Muster	1800 249 113	www.mobilemuster.com.au
	ToxFree	1300 869 373	www.toxfree.com.au

APPENDIX A

SCALED DRAWINGS





WSP Australia Pty Limited
 Level 15, 28 Freshwater Place
 Southbank, VIC
 3006 Australia

Project
 University of Newcastle
 Q Building

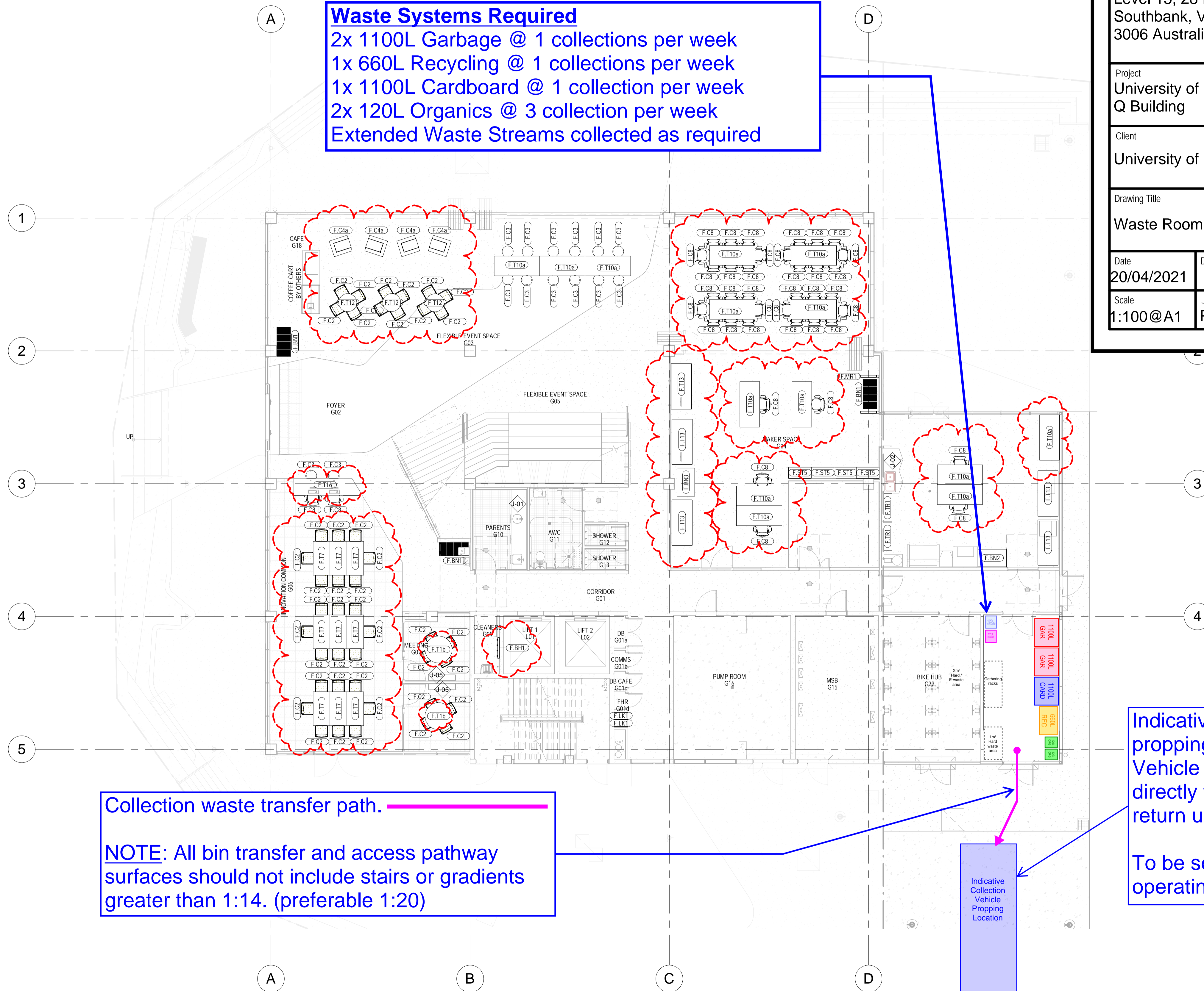
Client
 University of Newcastle

Drawing Title
 Waste Room Layout

Date	Drawn	Checked	Approved
20/04/2021	FL1	BP2	BP2
Scale	Job No.	Sheet No.	Rev.
1:100@A1	PS111682	1 OF 1	3

Waste Systems Required

- 2x 1100L Garbage @ 1 collections per week
- 1x 660L Recycling @ 1 collections per week
- 1x 1100L Cardboard @ 1 collection per week
- 2x 120L Organics @ 3 collection per week
- Extended Waste Streams collected as required



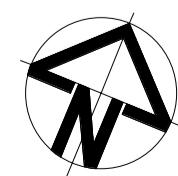
Collection waste transfer path.

NOTE: All bin transfer and access pathway surfaces should not include stairs or gradients greater than 1:14. (preferable 1:20)

Indicative waste collection vehicle propping location at Wright Lane. Vehicle operator to collect bins directly from bin enclosure and return upon emptying.

To be scheduled outside of office operating periods.

EJE ARCHITECTURE
 ACN 002 912 843 | ABN 82 644 649 849
 NSW Architects Registration No: 4438
 P+61 2 4929 2353 | F+61 2 4929 3069 | E mail@eje.com.au | W www.eje.com.au
 A 412 KING STREET, NEWCASTLE, NSW 2300



REV	DATE	COMMENTS
A	20190520	ISSUE FOR INFORMATION
B	20190626	ISSUE FOR TENDER REVIEW
T1	20190716	ISSUE FOR TENDER
T2	20190802	ISSUE FOR TENDER
T3	20191003	ISSUE FOR TENDER ADENDUM
T4	20200302	ISSUE FOR TENDER
0	20200525	ISSUE FOR CONSTRUCTION CERTIFICATE 4
1	20200715	REVISED FURNITURE LAYOUT
2	20200717	REVISED FURNITURE LAYOUT

DRN	CHKD	VRFD
JE	AKF	
JE	AKF	
NJH	JE	AKF
JE	AKF	
JE	AKF	
JE	AKF	
MV	AKF	
JE	AKF	

PROJECT: HCCD STAGE 1A

CLIENT: UNIVERSITY OF NEWCASTLE

SITE: 16B HONEYSUCKLE DRIVE
 NEWCASTLE, NSW, 2300

DRAWING: GROUND FLOOR FF&E PLAN

WORK IN FIGURED DIMENSIONS IN PREFERENCE TO SCALE. CHECK DIMENSIONS AND LEVELS ON SITE PRIOR TO THE ORDERING OF MATERIALS OR THE COMPLETION OF WORKSHOP DRAWINGS. IF IN DOUBT ASK. REPORT ALL ERRORS AND OMISSIONS.

BIM 360/5196 UON Honeysuckle Stage 1A/HCCD-EJE-Avt

DRAWN: NJH DATE: JUL 2019 SCALES: 1:100@A1 1:200@A3

PROJECT No: 11749 PHASE: CC DRAWING No: A-140 REV: 2



APPENDIX B

COLLECTION VEHICLE
SWEPT PATHS



APPENDIX C

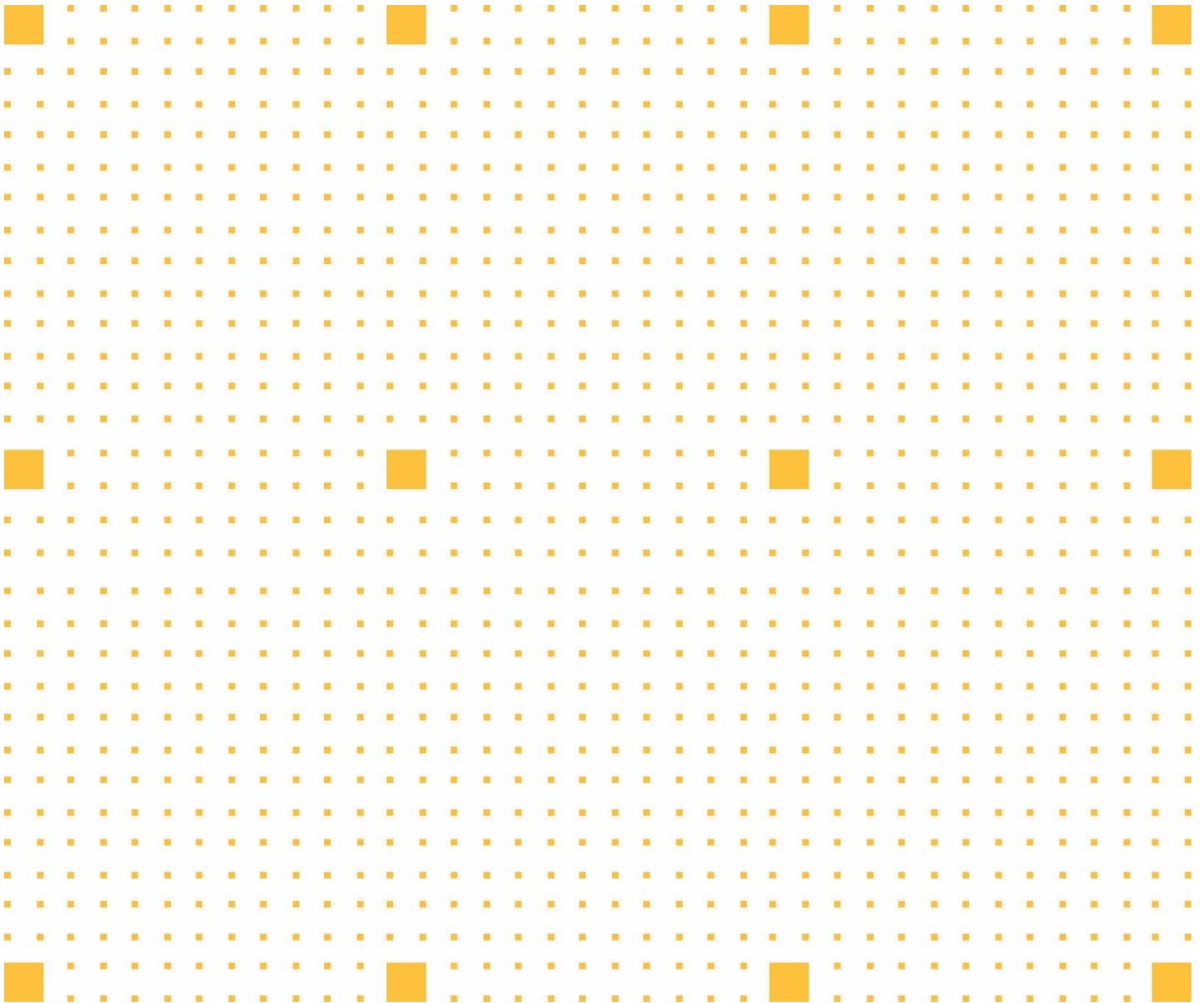
CONSTRUCTION WASTE MANAGEMENT PLAN



Waste Management Plan

Project: Honeysuckle City Campus Development – Stage 1A

Job No: SN965



Rev: A – Jan 2020

—

Uncontrolled Document in Hard Copy

Copies shall not be made without the written permission of Hansen Yuncken Project Manager

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1 Document Information

1.1 Review and Approval

Position	Name	Sign	Date
Review			
Project Director	Pat McAllister		
Project Manager	Jonathan Russell		
Site Manager	Dale Reith		
Contracts Administrator	Michael Pratt		
Contracts Administrator	Peter Slavin		
Site Safety Officer	Dale Reith		
Site Engineer	Brianna Barnes		
Site Engineer	James Fearnly		
Foreman	Michael Stevens		
Approval			
Construction Manager	Mick Parker		
HSE Manager	Pater Fay		

1.2 Document Control

Revision	Description	Issued by	Issue date

2 Definitions

The following definitions and abbreviations have been used in this Waste Management Plan. Further definitions and abbreviations are provided in referenced procedures and plans.

EPA	Environmental Protection Authority
HY	Hansen Yuncken
WMP	Waste Management Plan (this document)

3 Commitment & Policy

3.1 Purpose

To manage the construction waste including the re – use, recycle and dispose of all excavated material and other wastes generated on construction site.

This plan applies to the lawful disposal of construction materials on “The Project” development during the construction period.

3.2 Scope of Works

The University of Newcastle Honeysuckle City Campus Development (HCCD) - Stage 1A project features construction of a 4 Storey, Cross-Laminated Timber structure with a precast concrete core and is primarily wrapped in a glass curtain wall facade. The ground level is of traditional slab-on-ground construction.

The development includes hard landscaping at ground level to unite the building with the public domain.

3.3 Objectives

The objectives of this plan is to identify, improve and monitor:

- Waste minimisation and resource recovery –
 - To avoid waste through design and ordering correct material quantities.
 - To encourage improved environmental outcomes through increased source separation of materials.
 - To ensure more efficient management of waste and recyclable materials.
 - To maximise reuse and recycling of building construction materials, household generated waste and industrial commercial waste.
- Access – to ensure waste systems are easy to use and that collection vehicles are able to access buildings to remove waste safely and easily;
- Safety – to ensure safe practices for storage, handling and collection of waste and recycling;
- Pollution prevention – to prevent stormwater pollution that may occur as a result of poor waste storage and management practices;
- Ecologically Sustainable Development (ESD) – to promote the principles of ESD through resource recovery and recycling leading to a reduction in the consumption of finite natural resources;
- Hygiene – to ensure health and amenity for residents, visitors and workers in the City of Newcastle; and
- Noise minimisation – to minimise noise during use by residents and collection of waste and recyclables.

4 Construction Waste

During construction it is anticipated that a variety of waste will be generated consistent with project scope and size. The major waste streams to be expected from the project are:

- Excavation:
 - General Spoil/Fill – landfill
 - Natural Material (VENM) – Recyclable
- Construction:
 - Concrete – Recyclable
 - Plastics – Recyclable
 - Timber – Recyclable
 - Glass – Recyclable
 - Metal – Recyclable
 - Tiles – Recyclable
 - General Waste – landfill

Hansen Yuncken's goal for building waste management is primarily the reduction of waste generated during construction activities. Waste reduction is the responsibility of all trades on site, as it relates to materials procurement, handling, storage and use. Waste generated during construction will be reused (where possible), recycled or disposed to landfill.

4.1 General Waste Management Strategies

Waste management activities are to be in accordance with Hansen Yuncken Project Environmental Management plan

The main goal in construction will be to reduce the total volume of waste produced, which is to be achieved by effective materials procurement, management and supply.

Hansen Yuncken shall focus on minimising waste by implementing the following:

4.1.1 Reducing Organic Waste

Organic waste consists of the following:

- Pruning and clippings
- Vegetation clearance
- Tree trunks and large branches from land clearance
- Weeds, leaf litter, mulch

To counter the amount of organic waste that will be encountered, it shall be chipped, mulched, composted and reused on site or sent to an off-site compost facility wherever possible.

4.1.2 Reducing solid waste

Solid waste consists of the following:

- Packaging from site materials
- Excess materials, unused products
- Soil from excavations
- Sediment retained in sediment traps

To counter the amount of solid waste that will be encountered, HY shall endeavour to:

- Buy materials with minimum packaging.
- Not over-order.
- Stockpile and reuse it on site.
- Recycle it off site or return to the supplier

4.1.3 Reducing liquid waste

Liquid waste can consist of the following:

- Site clean up
- Wash down areas
- Brick/tile /concrete cutting waste
- Dust control waste

To counter liquid waste, HY shall only discharge clean water into the stormwater. Where possible HY shall avoid generating any dirty water and when encountered, shall attempt to use such grey water for irrigation or as a means of suppressing dust.

HY shall also ensure that any waste stored for reuse, recycling or disposal cannot be washed or blown away.

4.1.4 Waste Minimisation

Major subcontractors will be encouraged to submit waste minimisation details including the following:

- Practical measures associated with their works to prevent waste entering the site
- Waste resulting from their work which can be recycled are to be actively managed as part of their waste reduction plan
- Alternative products containing recycled materials that could be utilised in their works which conform and meet the design specification
- Ordering the right quantities of materials and prefabrication of materials where possible
- Minimising site disturbance and to limit unnecessary excavation
- Careful sourcing separation of off-cuts to facilitate re-use, resale or efficient recycling

In order to reduce waste on site during the construction stage, all HY personnel and sub-contractors will be instructed to perform the following:

- Order materials to size
- Don't over-order
- Order pre-cut or prefabricated materials (where appropriate)
- Reduce packaging at source—buy materials with minimal packaging
- Separate reusable or recyclable materials from waste
- No rubbish is to be buried or burned on sit
- A designated concrete wash down area will be established on site for concrete trucks and pumps. Such an area will be adequately signed and designed so that any excess drainage from the area will be contained within the site boundaries
- Bins to be inspected regularly

4.1.5 Site Bin System

A site waste bin system will be achieved through the use of sealed bins for putrescible waste, separate portable bins for recyclable materials and non-recyclable waste materials.

Additional bins will be provided where practical to further separate waste between different recyclable materials.

Materials collected for recycling include:

- Glass
- Concrete, bricks and tiles
- Timber
- Aluminium
- Steel and other metals
- Plastic
- Plasterboard
- Paper, cardboard

The subcontractors will be responsible for the daily cleaning of their respective work areas and for placing all their waste in the nominated waste bins.

4.1.6 Packaging

All suppliers of building materials will be encouraged to nominate packaging minimisation and reuse initiatives. Bulk handling and reusable transport containers will be encouraged.

4.1.7 Waste Quantities:

The quantity of potential waste material is estimated by:

- Quantifying materials for the project
- Applying waste margins allowed in ordering materials
- Copying these amounts of waste into the waste management plan.

Normal waste percentages applicable to our work include:

- Timber 5 - 7%
- Plasterboard 5 - 15%
- Concrete 3%
- Bricks / Blocks 5%
- Tiles 5 – 10%

Conversion to volume of waste materials:

- Timber 0.5 tonne per m³
- Concrete 2.4 tonne per m³
- Bricks / Blocks 1.0 tonne per m³
- Tiles 0.75 tonne per m³
- Steel 2- 4 tonne per m³

4.1.8 Waste Management

Waste will be separated and / or stored onsite for re-use and recycling – where applicable.

Site operations will ensure minimal waste creation and maximum reuse and recycling by:

- Staff training
- Employment of a specialised waste Management contractor
- Recycled materials used in construction
- Waste management requirements stipulated in sub-contracts
- On-going checks by site supervisors
- Separate area or bins set aside for sorted waste
- Clear signage of waste areas.

4.1.9 Training and Consultation

Waste minimisation will be part of the site environmental awareness program that will be incorporated into the site induction program.

The responsibility to ensure that waste materials go into the correct bins will be with everyone on site.

4.1.10 Measure of Performance

A waste management contractor shall be involved in the project to ensure effective planning for waste management.

The Waste Management Contractor will coordinate waste recycling, measurement, recovery and disposal. HY shall ensure 80% or more (by mass) of all construction waste generated on this project is reused or recycled.

4.1.11 Monitoring

The Waste Management Contractor will be responsible for providing monthly reports to the Site Manager. These reports will measure the number and size of bins, waste type in each bin, total tonnage / cubic metres generated and total tonnage / cubic metres recycled.

Waste reports will be collated and uploaded onto HYway via BIM360 Field monthly waste reports. Cumulative summaries of generated waste and recycling statistics are readily available and auditable.

Regular project audits shall be conducted to ensure their compliance with this plan, standards, and requirements of the contract.

4.1.12 Corrective Actions

Where a subcontractor has caused a bin to be contaminated unduly, the Site Manager will be advised, by a non-conformance report procedure. All corrective actions taken by the subcontractor shall be monitored and recorded against the non-conformance procedure, all of which shall be at the cost of the offending subcontractor.

4.1.13 Disposal

Dispose of waste to landfill will be as a last resort only. Landfill sites or waste transfer stations will require correct handling for dusty or hazardous waste and offer discounts for sorted wastes such as brick, metal and timber.

Records of disposals shall be kept on site. Any disposal of waste that is deemed hazardous shall be disposed of by approved EPA hazardous disposal unit

5 Waste Management Details

Waste Management Estimations					
Materials On-Site			Destination		
			Reuse & Recycling		Disposal
Type of Materials	Est. qty Total incl. Waste	Est. Wt. (t) Total incl. Waste	ON-SITE Specify proposed reuse or on site recycling methods	OFF-SITE Specify contractor and recycling outlet	Specify contractor and landfill site
Excavated Materials	-	-	N/A	Waste Management Contractor Recycling Centre Re-processed into recycled products (such fill recycled soil, sand, aggregates, road base) by crushing and screening	
Garden Organics	-	-	N/A	Waste Management Contractor Recycling Centre Re-processed into woodchip and mulch by shredding	
In-Situ Concrete (m3)	910	2186	N/A	Waste Management Contractor Recycling Centre Re-processed into recycled products (such fill sand, aggregates, road base) by crushing and screening	

Waste Management Estimations					
Materials On-Site			Destination		
			Reuse & Recycling		Disposal
Type of Materials	Est. qty Total incl. Waste	Est. Wt. (t) Total incl. Waste	ON-SITE Specify proposed reuse or on site recycling methods	OFF-SITE Specify contractor and recycling outlet	Specify contractor and landfill site
Steel Reinforcement		127t exc. mesh	N/A	Reinforcement Suppliers Recycling Service (Sell & Parker or similar)	
Non-structural Timber (m2)	133	-	N/A	Waste Management Contractor Recycling Centre Waste Management Contractor Recycling Centre Re-processed into woodchip and mulch by shredding	
Plasterboard (m2)	9340		N/A	Recycling service to be Established by Dry Wall Subcontractor	
Structural Steel (t)		1,869	N/A	Waste Management Contractor Recycling Centre Sorted and sent to recycling plant (Sell & Parker or similar)	

Waste Management Estimations					
Materials On-Site			Destination		
			Reuse & Recycling		Disposal
Type of Materials	Est. qty Total incl. Waste	Est. Wt. (t) Total incl. Waste	ON-SITE Specify proposed reuse or on site recycling methods	OFF-SITE Specify contractor and recycling outlet	Specify contractor and landfill site
Aluminium (l/m)	357,271		N/A	Waste Management Contractor Recycling Centre Sorted and sent to recycling plant (Sell & Parker or similar)	
Ceramic Tiles (m2)	562	8.4	N/A	Waste Management Contractor Recycling Centre Re-processed into recycled products (such fill recycled soil, sand, aggregates, road base) by crushing and screening	