MULTIPLEX

CONSTRUCTION AND OPERATION WASTE MANAGEMENT PLAN

New Maitland Hospital – State Significant Infrastructure Application – Stage 2

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1. Executive Summary

This waste management plan addresses those parts of the Secretary's Environment Assessment Requirements (SEARs) for waste generation and management associated with The New Maitland Hospital (Stage 2).

The Strategy:

- Identifies likely waste streams to be generated during construction and operation and commits to quantify and classify the waste streams prior to commencement of Hospital operations.
- Describes the measures to be implemented to manage, reuse, recycle and safely dispose of this waste.
- Identify appropriate servicing arrangements (including but not limited to, waste management, loading zones, mechanical plant) for the site.

The waste management strategy demonstrates how:

- Multiplex, the design and construction contractor for the construction phase of the project understands the critical importance of providing a waste management system that protects the health and safety of personnel, patients and the public and minimises overall environmental impacts by focusing on strategies for minimisation, disposal and recycling of materials during construction.
- We also understand the need for providing a design flow for waste that allows for safe and efficient disposal of waste.
- Multiplex takes a proactive approach to accurately segregating waste and identifying opportunities for recycling of building materials where possible and feasible.

2. Description of The New Maitland Hospital (NMH)

A new seven storey Acute Services Building, including:

- Emergency services
- Medical, surgical, paediatric and maternity services
- Critical care services for adults and babies, including a special care nursery
- Operating theatres, delivery suites and assessment rooms
- Palliative care and rehabilitation services
- Mental health services
- Satellite renal dialysis
- New chemotherapy services
- Oral health service
- A range of ambulatory care and outpatient clinics.
- Internal road network and car parking for staff, patients and visitors
- Signage
- Site landscaping and open space improvements
- Tree removal
- Utility and services connection and amplifications works.

1.1 Scope of Work

The proposed Stage of The New Maitland Hospital Includes:

- Construction of a 7 storey Hospital Building
- Site Works including Staff, Patient and Visitor car parking

1.2 The New Maitland Hospital

The NMH will comprise a new hospital including, but not limited to:

- Emergency services;
- Medical, surgical, paediatric and maternity services;
- Critical care services for adults and babies, including a special care nursery;
- Operating theatres, delivery suites and assessment rooms;
- Palliative care and rehabilitation services;
- Mental health services;
- Satellite renal dialysis;
- A new chemotherapy service;
- Expanded oral health service;
- A range of ambulatory care and outpatient clinics.

3. Waste

This section of the report provides:

- a plan to quantify and classify the likely waste streams generated during construction and measures to be implemented to manage, reuse, recycle and safely dispose of this waste to reduce the load on landfill availability;
- a description of the likely waste streams to be generated during operation and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste; and
- Identify appropriate servicing arrangement (including but not limited to, waste management, loading zones, mechanical plan) for the site.

1.3 Waste Management (During Construction)

Quantities of waste likely to be generated can be calculated based on benchmarks provided by the UK Building Research Establishment (See Table 1).

Table 1 Average Volume of Waste Produced by Different Project Types

Project Type	Average volume (m^3) of waste per 100 m^2
Residential	18.1
Public buildings	20.9
Leisure	14.4
Industrial Buildings	13.0
Healthcare	19.1
Education	20.7
Commercial Other	17.4
Commercial Offices	19.8
Commercial Retail	20.9

Source: BRE (2012)

If the average volumes in table 1 are then cross referenced against ratios of likely waste streams provided by the Sustainability Victoria Waste Wise Tool Kit (2013) in Table 2 we can estimate the likely waste streams and quantities for the project.

Table 2: Guideline to Waste Composition and Volumes - Construction

Material	Estimated Waste %	Conversion Factor (Density) (Tonne per m^3)
Hard material	32%	1.2
Timber	24%	0.3
Plastics	15%	0.13
Cement sheet	9%	0.5
Gypsum material	6%	0.2
Metals	6%	0.9
Paper / card	4%	0.1
Vegetation	3%	0.15
Soil	1%	1.6
Other	0.3%	0.3

In Table 3 we have cross referenced the area of the project with Tables 1 & 2 to provide the estimate of total quantity of waste for the project.

Table 3: Likely Waste Quantities During Construction

Material	Average Volume /100m2	Total (m3)	Total (t)
Hard Materials (32%)	6.1	2933.8	3520.5
Timber (24%)	4.6	2200.3	660.1
Plastics (15%)	2.9	1375.2	178.8
Cement Sheet (9%)	1.7	825.1	412.6
Gypsum Material (6%)	1.1	550.1	110.0
Metals (6%)	1.1	550.1	495.1
Paper / Card (4%)	0.8	366.7	36.7
Vegetation (3%)	0.6	275.0	41.3
Soil (1%)	0.2	91.7	146.7
Other (0.3%)	0.1	27.5	8.3
Total Waste	**19.1**	**9195.5**	**5609.9**

Multiplex will engage an external contractor to manage the collection of waste and sort off-site at a purpose made Bingo's Tomago facility or similar. Records will be collected for each month's collections and will be reported monthly and collated at the completion of the project.

Further measures to manage waste can be are located below in section 1.3.1 Construction Waste Management.

1.3.1 Construction Waste Management Procedures and Strategies

The following construction waste management strategies and procedures have been developed to manage the waste generated and encountered over the course of the Project to achieve the Objectives and Targets indicated below.

1.3.1.1 Objectives and Targets

Objective	Target	Key Performance Indicator
Solid and liquid waste to be disposed of as per Regulatory requirements.	All waste to be disposed of by a licensed waste contractor at licensed waste facilities only.	Onsite waste disposal facilities confirmed and documented.
MPX aim to maximise landfill diversion.	Recycle 80% of demolition and construction waste.	Waste reporting by waste contractors.
No waste to affect nearby premises.	No complaints related to construction waste affecting nearby premises during construction.	No. of complaints relating to waste.

1.3.1.2 Management Strategies

Parameter	Action	Timing	Responsibility
Induction	During inductions all personnel are to be made aware of individual responsibilities in regards to waste management, including the understanding that all personal rubbish and construction rubbish generated is to be properly disposed of in designated disposal facilities.	Establishment	All subcontractors
Waste Reduction	Design in waste minimisation during the design phases by standard sizing of materials, the use of modular and prefabricated construction techniques. Stockpile clean fill during the excavation phase by for use as backfill on-site. Provide sub-contractors during the construction phase with clear guidance for reducing packaging on their own materials by both their suppliers and subcontractors, by accurate ordering and handling of materials. Specify reusable, stackable and returnable packaging.	Establishment / Construction	MPX, Consultants and Subcontractors
Waste disposal Storage area	Appropriate waste disposal facilities (e.g. bins) shall be provided in strategic locations onsite. Waste bins shall be located such that they do not affect the community and not close to surrounding premises. Separation of waste for recycling will be enforced and monitored.	Establishment / Construction	MPX
	Waste disposal facilities shall be regularly collected or emptied by a licensed waste collector in accordance with Local Council Health Laws.	Construction	MPX
	Where possible a storage area allocated for the separation, collection and recycling of wastes will be established.	Establishment	MPX
Waste contractors	Licensed contractors shall be engaged to remove construction waste. A minimum target of 80% landfill waste diversion will be achieved. In	Establishment	MPX
Putrescibles waste (Organic waste)	All putrescibles waste to be placed in a lidded bin and removed separately.	Establishment	MPX
Recycling / waste reduction	Waste contractors will collect the waste in a single stream (or two or three if we separate steel, general rubbish, etc. on-site) from site and sort the waste back at their processing yard. All waste stream quantities removed from the site will be tracked, including the collection of disposal dockets from licensed waste management faciliites, and reported on a monthly-basis. Reporting will details the quantities of each waste type generated during construction. Refer to 'Waste Streaming' section below for proposed reuse, recycling and disposal locations. **Note**: Cleared vegetation needs to be chipped for re-use on-site for ground stabilisation and erosion control.	Establishment / Construction	MPX / All subcontractors
Site office	The site office shall implement the following office waste minimisation techniques: » Organising recycling paper bins in the office for waste paper » Recycle toner cartridges pick-ups » Using electronic storage to reduce use of paper » Purchasing products in bulk to reduce packaging	Establishment	MPX

Hazardous waste	Hazardous waste will be managed and disposed of as per the Safety Data Sheet requirements and Environmental Protection (Controlled Waste) Regulations 2004. A site-specific Contamination Management Plan will be developed and methods for the containment of air-borne fibre emissions will be included in the Plan. Likely controls include the following: • Dust suppression of asbestos-contaminated soils using on-site stationary sprinklers; • Dust suppression of asbestos-contaminated soils using hand-held gurneys. All hazardous waste will be disposed of at approved waste facilities only in accordance with the requirements of the relevant legislation.	Construction	MPX / All subcontractors
Material Tracking Plan	A site-specific Material Tracking Plan will be developed to track: • All material from source to final placement (including interim movements); • As well as material descriptions, volumes, dates and locations/movements (from/to); and • Material verified as uncontaminated.	Construction	MPX / Civil subcontractor
Servicing	Where practicable plant will be serviced offsite to reduce the generation of hydrocarbon waste onsite and potential for spills.	Construction	All Subcontractors

1.3.1.3 Monitoring and Reporting

Type of Monitoring / Reporting	Timing	Responsibility	Record
Contaminated Material Notice	As required	MPX	Incident notification form
Percentage of diversion from landfill	Monthly	MPX	Monthly Waste Report
Health Infrastructure progress report	Every 2-months	MPX	Progress Waste Recycling and Purchasing Report
Health Infrastructure summary report	Before Completion	MPX	Summary Waste Recycling and Purchasing Report
Segregated waste and appropriate waste placement	Weekly	MPX	Environmental Site Inspection

Note: Under clause 6.3 of the GC21 Contract Preliminaries, all reporting will be in the form ***'Waste Recycling and Purchasing Report'*** which is available on the ProcurePoint website.

This reporting also includes the quantities for the '***total material purchased***' and the '***total material purchased with recycled content***'.

1.3.1.4 Works Phase waste streaming

MATERIALS ONSITE	REUSE AND RECYCLING		DISPOSAL
ONSITE		OFF-SITE	
Type of Materials	**Specify methods**	**Specify contractor and recycling outlet**	**Disposal**
EXCAVATION			
Clean Fill	Assess, excavate & stockpile	Transport & fill	No excavated material to be removed from site unless approved by the Client.
GENERAL WASTE			

General waste	On-site skip bins/ front lift bins and sort waste streams at off-site facility	Dial-A-Dump Bingo Recycling Centre, Tomago	Local licensed waste facility
Concrete	Skip bin and sort waste streams at off-site facility	Dial-A-Dump	Local licensed waste facility
Cardboard	Skip bin and sort waste streams at off-site facility	Bingo Recycling Centre, Tomago	Local licensed waste facility
Metal	Skip bin and sort waste streams at off-site facility	Dial-A-Dump	Local licensed waste facility
Paper	Skip bin and sort waste streams at off-site facility	Bingo Recycling Centre, Tomago	Local licensed waste facility
Packaging	Skip bin and sort waste streams at off-site facility	Dial-A-Dump	Local licensed waste facility
Timber	Skip bin and sort waste streams at off-site facility	Bingo Recycling Centre, Tomago	Local licensed waste facility

Any hazardous waste will be isolated and managed as per the legislation for hazardous waste. 100% of the clean excavation material will be retained on-site (unless otherwise approved by Health Infrastructure) and thoroughly documented in the Project's 'Material Tracking Plan' in preparation for the creation of the Long Term Environmental Management Plan (LTEMP) for the NMH site.

1.4 Waste Management (During Operations)

Operational waste management services for the NMH will be provided in accordance with all relevant regulations and Codes of Practice, including infection control guidelines, Department of Environment and Conservation guidelines, and the Industry Code of Practice for the Management of Clinical and Related Wastes.

As part of logistics planning of the new hospitals operations likely waste streams have been identified. The likely waste streams include:

- General waste
- Clinical waste
- Anatomical waste
- Cytotoxic waste
- Sharps
- Cartridges
- Intershred

Quantities of these likely waste stream have been calculated using data provided in:

- Logistics Design Strategy (S2D - 26/7/18)
- Dangerous Goods Management Report (WHS&E Consultants 8/3/19)
- Benchmarks from other recent hospital developments

Table 4: Waste Quantities and Service Frequency

Waste & Recycling Management	Bins	Frequency	Comments
General Waste	25m3 Auger Compactor	2 collections / Week	Source: S2d Logistics Report 26/7/18
Clinical Waste	14 x 240L Bins	Weekly	Benchmark NBH
Anatomical Waste	50kg	2 collection / Day	Source: WHS&E Consultants Report (8/3/19)
Cytotoxic Waste	50kg	2 collection / Day	Source: WHS&E Consultants Report (8/3/19)
Sharps	Various	1 Collection /day	Benchmark NBH
Cartridges	Various	Adhoc	
Intershred	14 x 240L Bins	Weekly	Benchmark NBH

Logistics of managing the waste streams have been assessed and will be serviced as per the below tables:

Table 5: Operational Waste Management Logistics

Good/Service	Supplier(s)	Delivery Vehicle	Delivery Format and Premise	Delivery Capacity	Internal Distribution
GENERAL WASTE Collection for NMH & Other Campus Assets	Selected Waste Service Contractor	HRV Multiple Times Per Week	General Waste Compactor	1 X General Compactor a General Waste Holding Room at NMH that can stage XX 660L Bins and YY 240L	BINS from the NMH and Other Campus Assets are collected and taken to the NMH Environmental Services Area BINS are emptied into the compactor as soon as they arrive at the NMH - they are washed or returned into circulation asap to prevent Bin Overflow
RECYCLABLE WASTE Collection for NMH & Other Campus Assets	Selected Waste Service Contractor Multiple Times Per Week	HRV Multiple Times Per Week	Recyclable Waste Compactor holding plastic, glass, aluminium, paper and cardboard	1 X Recyclable Waste Compactor and a Recyclable Waste Holding Room at NMH that can stage XX 660L Bins and YY 240L	BINS from the NMH and Other Campus Assets are collected and taken to the NMH Environmental Services Area BINS are emptied into the compactor as soon as they arrive at the NMH Waste Area - they are washed or returned into circulation asap

Table 6 Operational Waste Management Logistics

Good/Service	Supplier(s)	Delivery Vehicle	Delivery Format and Premise	Delivery Capacity	Internal Distribution
MEDICAL/CLINICAL/ HAZARDOUS WASTE from NMH Collection and Bin Exchange	Selected Waste Service Contractor	HRV Multiple Times Per Week/ Daily	BIN (660L and 240L) & DEDICATED SHARPS CONTAINERS	NMH ESA can Hold 36X240L and 4X660L Clinical Waste Bins	BIN exchange will need to be scheduled to prevent overflow
MEDICAL/CLINICAL/ HAZARDOUS WASTE from NMH Collection and Bin Exchange	Selected Waste Service Contractor	HRV Multiple Times Per Week/ Daily	BIN (660L and 240L) & DEDICATED SHARPS CONTAINERS	Other Campus Assets Hazardous Waste Holding Room can hold Hold YY X 240L and ZZ X 660L Clinical Waste Bins	BIN exchange will need to be scheduled to prevent overflow
SANITARY WASTE Collection and Bin Exchange NMH and Other Campus Assets	Selected Waste Service Contractor	HRV 2 Times Per Week ALL DAY	Custom Secure Receptacle	120 toilets across 9 locations across NMH and Other Campus Assets	Receptacle exchange from NMH will be via NMH dock a

Area allocated for waste rooms has been assessed as follows:

Table 7: Operational Waste Management Spatial metrics

FACTORS AND SIZES			NMH Movement Estimates from SUPPORT SERVICE	FLOOR STORAGE AREA FOR ONE DAY m²	Delivery Mode Footprint Area m²	ROOM TOTAL AREA FOR ONE DAY m²
ELEMENT	METRIC	DESCRIPTION				
CIRCULATION	3					
LANDFILL WASTE		MGB to Waste Compactor at MMC	50	45	0.90	135
RECYCLABLE WASTE		MGB to Waste Compactor? at MMC	50	45	0.90	135
MEDICAL WASTE		MGB to Cinical Waste Room at MMC	50	45	0.90	135
					TOTAL	405m2

The areas allocated within the design for waste management include 265m2 of storage space in the Back of House Lower Ground Floor area with supplementary disposal rooms throughout the building of 211m2. This equates to a total of 467m2 throughout the building exclusive of the waste compactor zone.

The Waste compactor zone houses 2 off compactors for waste compacting. These compactors are serviced via an external service provider and all waste is sorted using the Bedminster system at an external facility. The compactors are serviced via a 12m Roll-on Roll-off Style Collection System that extracts and swaps in new compactors up to 4 times per week.

Figure 1: Loading Dock Waste Management Area

The flow of waste to the loading dock collection space is as follows:

- Waste generated at the source will be segregated into the waste streams identified in the Plan. This waste will be moved to a central disposal hold which in turn will be transferred to the central waste disposal
- From there, the waste management contractor will collect the waste for treatment, disposal or recycling. NMH will also execute contracts for hygiene waste for correct disposal of sharps and syringes.

The internal movements and logistics of this waste flow is outlined below:

Table 7: Waste Stream Logistics

Good/Service	Delivery Vehicles/Day	Delivery Format and Premise	Operating Hours	Internal Movements
WASTE (7 Streams)	4/week	Bins Various	0600-2100 (7 Days/Week)	60