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Waste Management Input for Environmental Impact Statement (EIS)

The Sutherland Hospital Operating Theatre Upgrade Project

Report for Health Infrastructure NSW

Waste Management Input for EIS for Health Infrastructure NSW

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Contents

Glossary

Abbreviation	Definition
AS	Australian Standards
BCA	Building Code of Australia
C&D	Construction and Demolition
C&I	Commercial and Industrial
CSSD	Central Sterile Services Department
CWMP	Construction Waste Management Plan
DWMP	Demolition Waste Management Plan
EIS	Environmental Impact Statement
GBCA	Green Building Council of Australia
GFA	Gross Floor Area
MRI	Magnetic Resonance Imaging
NSW EPA	New South Wales Environment Protection Authority
POEO	Protection of the Environment Operations Act 1997
SWMMP	Site Waste Management and Minimisation Plan
SSDCP	Sutherland Shire Development Control Plan 2015
SSLEP	Sutherland Shire Local Environmental Plan 2015
TSHOTUP	The Sutherland Hospital Operating Theatres Upgrade Project
WARR	Waste Avoidance and Resource Recovery
WMP	Waste Management Plan

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1. Background

Ricardo has been engaged by Health Infrastructure NSW to prepare waste management input for the Environmental Impact Statement (EIS) for the upgrade of The Sutherland Hospital Operating Theatres. The redevelopment of the operating theatre will involve the demolition, construction and refurbishment of facilities. Key components of the upgrade include:

- The operating theatres will increase from 5 to 8.
- Endoscopy suites increasing from 1 to 2, resulting in a total of 10 spaces with associated clinic rooms.
- Supporting spaces including recovery, day surgery, storage, staff amenities and other clinical and non-clinical support spaces.
- A new Central Sterile Services Department (CSSD) will be built immediately above the operating theatres.
- A new Magnetic Resonance Imaging (MRI) space will be built immediately below the operating theatres.

The Sutherland Hospital is a large metropolitan hospital in the Sutherland Shire in Sydney and is part of the South East Sydney Local Health District. The hospital is currently operational and proposes to undertake works while operating a 'live' hospital environment.

The development of an EIS is in response to the Planning Secretary's Environmental Assessment Requirements (SEARs) number SSD-11099584, for the upgrade of The Sutherland Hospital involving:

- Demolition and renovation of existing hospital suites
- Construction of an extension to house additional capacity
- Upgrades to the site access, including new road access, driveways and carpark areas

The location of the hospital in the metropolitan area means that the site is well-placed to manage waste as there is ample provision within the metropolitan area to waste processors to reuse and recycle materials, and if required, dispose of restricted and controlled waste. This report describes the resources and materials, including potential sources and the expected quantities that would be used to construct and operate the project.

1.1 Objective

The objective of this assessment is to outline operation and construction waste generation estimates, storage and mitigations measures relevant to the redevelopment works.

2. Overview of development

The site is an active hospital in the Sutherland Shire in Sydney and will continue to operate throughout the upgrade. Details of the site to be developed are detailed in **Table 1.**

Table 1 Site Details

Site details		Map
Site address	Kingsway & Kareena Rd, Caringbah NSW 2229	 Source: nearmap
Local Government Area	Sutherland Shire Council	
Applicants name	Health Infrastructure NSW	
Existing buildings	Hospital	

3. Legislative and Guidance Information

Waste legislation and guidance applicable to the development is outlined in **Table 2**.

Table 2 Legislative Guidance

Name of Legislation/ Guidance	Authority	Notes
Protection of the Environment Operations (POEO) Act 1997 & Amendment Act 2011	NSW EPA	The POEO Act enables the Government to establish legislative instruments and regulation for setting environmental standards, goals, protocols and guidelines.
POEO (Waste) Regulation 2014	NSW EPA	The Waste Regulation sets out legislation relating to the waste levy in NSW, waste tracking and management requirements for dangerous goods / hazardous wastes, resource recovery exemptions, and pollution offences.
Waste Classification Guidelines (Part 1) 2014	NSW EPA	The Guidelines provide information on how to classify, manage, treat and dispose of different classifications of waste to ensure risks to the environment and human health due to inappropriate management of waste are minimised.
Waste Avoidance and Resource Recovery (WARR) Act 2001	NSW Environment Protection Authority (EPA)	The WARR Act promotes extended producer responsibility of waste and resources through minimised consumption of natural resources, efficient use of natural resources, and minimised disposal of waste through waste avoidance, reuse and recycling. It promotes industry and community participation and responsibility for reducing and managing waste
Waste Avoidance and Resource Recovery (WARR) Strategy 2014-2021	NSW EPA	The WARR Strategy outlines the State Government's long-term targets for waste avoidance, resource recovery, and litter and illegal dumping for the domestic, construction and demolition, commercial and industrial sectors which are necessary for the environmental and economic future of the State.
Better Practice Guideline for Waste Management in Commercial and Industrial (C&I) Facilities 2012	NSW EPA	The Guidelines have been generated as a handy reference and resource for contractors, architects, designers, consultants, developers, building owners and managers.
Building Code of Australia (BCA)	Australian Building Codes Board	The BCA have the aim of achieving nationally consistent and minimum standards of relevant health and safety, amenity and sustainability objectives. The BCA is a set of technical provisions for the design and construction of buildings and other structures.
Relevant Australian Standards (AS)	Standards Australia	The Standards are specifications, procedures and guidelines which ensure products, services and systems are safe, reliable and consistent. Australian Standards which apply to waste management include AS 2890.2 (parking facilities for off-street commercial vehicles), AS1319 (safety signs) and AS4123.7-2006 (mobile waste containers and colour coding requirements).

4. Assessment Methodology

The assessment of resource use and waste management comprised:

- Review of the likely resources required for the construction and operation of the project.
- Review of the likely waste streams, volumes and classifications.
- Identification of opportunities for the avoidance, minimisation and reuse of wastes.
- Identification of the environmental impacts associated with resource use and the generation (and subsequent disposal) of residual waste materials.
- Management strategies for waste during construction and operation, including managing construction and operation waste through the resource management hierarchy established under the Waste Avoidance and Recovery Act 2001

5. Construction Waste Management

The Sutherland Shire Development Control Plan 2015 (SSDCP2015) provides detailed provisions with respect to carrying out development permissible under Sutherland Shire Local Environmental Plan 2015 (SSLEP2015). The plan provides objectives and development controls that establish clear guidelines for development and protection of the environment including waste management.

Additionally, the Sutherland Shire Council Local Waste Management Plan (2014) aims to reduce the amount of waste produced and to maximise the percentage that is diverted from landfill, during the demolition and construction process and ongoing life of the development.

5.1 Site Demolition

The demolition stage provides great scope for waste minimisation and the principal aim of managing this activity is to maximise resource recovery and minimise residual waste from demolition activities.

At this stage of the development, Health Infrastructure NSW has not yet decided upon a demolition contractor for detailed planning of demolition waste management. The management of wastes from demolition activities will be organised by the demolition company. The contractor engaged for demolition work will be responsible for completing a Demolition Waste Management Plan (DWMP) with all information relating to demolition to accompany the demolition application at the Construction Certificate stage.

Key objectives of the DWMP are to:

- Optimise adaptive reuse opportunities of existing building/structures.
- Maximise reuse and recycling of materials.
- Minimise waste generation.
- Ensure appropriate storage and collection of waste.
- Minimise the environmental impacts associated with waste management.
- Avoid illegal dumping.
- Promote improved project management.

As part of the DWMP scale drawings are to be submitted, clearly indicating the location of and provisions for the storage and collection of waste and recyclables during demolition. The site plans submitted along with the DWMP, prior to construction, will also detail the following during demolition activities:

- Size and location(s) of waste storage area(s)
- Access for waste collection vehicles
- Areas to be excavated
- Types and numbers of storage bins likely to be required
- Signage required to facilitate correct use of storage facilities

The application for demolition will:

- Identify all waste likely to result from the demolition, and opportunities for reuse of materials. (Refer to **Table 3** for common waste materials and reuse and recycling potential).
- Reuse or recycle salvaged materials onsite where possible.
- Allocate an area for the storage of materials for use, recycling and disposal (giving consideration to slope, drainage, location of waterways, stormwater outlets, vegetation, and access and handling requirements).
- Provide separate collection bins or areas for the storage of residual waste.
- Clearly 'signpost' the purpose and content of the bins and storage areas.
- Implement measures to prevent damage by the elements, odour and health risks, and windborne litter; and
- Minimise site disturbance, limiting unnecessary excavation.

When implementing the DWMP the applicant must ensure:

- Footpaths, public reserves, street gutters are not used as places to store demolition waste or materials of any kind without Council approval.
- Any material moved offsite is transported in accordance with the requirements of the Protection of the Environment Operations Act (1997).
- Waste is only transported to a place that can lawfully be used as a waste facility.
- Generation, storage, treatment and disposal of hazardous waste and special waste (including asbestos) is conducted in accordance with relevant waste legislation administered by the DECC and relevant Work Health and Safety legislation administered by WorkCover NSW.
- Evidence such as weighbridge dockets and invoices for waste disposal or recycling services are retained on site and kept readily accessible for inspection by regulatory authorities such as Council, DECC or Workcover NSW.

Common waste streams that could be generated from the project and opportunities for reuse or recycling are outlined in **Table 3**.

Table 3 Common Demolition Waste Types

Material	Reuse/ Recycling potential
Concrete	Reused for filling, levelling or road base
Bricks and Pavers	Can be cleaned for reuse or rendered over or crushed for use in landscaping and driveways
Asphalt	Can be removed for recycling
Roof Tiles	Can be cleaned and reused or crushed for use in landscaping and driveways
Untreated Timber	Reused as floorboards, fencing, furniture, mulched or sent to second-hand timber suppliers
Treated Timber	Reused as formwork, bridging, blocking and propping, or sent to second-hand timber suppliers
Doors, Windows, Fittings	Sent to second-hand suppliers
Glass	Reused as glazing or aggregate for concrete production
Metals (fittings, appliances and wiring)	Removed for recycling
Synthetic Rubber (carpet underlay)	Reprocessed for use in safety devices and speed humps
Contaminated and or Hazardous materials	Disposal to Licensed landfill facility: appropriate management methods to be specified by a licensed asbestos site hygienist or contractor. This material is to be treated and disposed of in accordance with NSW EPA and WorkCover requirements
Virgin excavated natural material (VENM)/ Excavated natural material (ENM)	Testing of material for contamination, Reuse on site or landfill disposal based on testing results
Topsoil	Testing of material for contamination, Reuse on site where possible, reuse or landfill disposal based on testing results
Garden Waste	Mulched, composted
Carpet	Can be sent to recyclers or reused in landscaping
Plasterboard	Removed for recycling, returned to supplier

5.2 Construction

At this stage of the development, Health Infrastructure NSW, has not yet decided upon a construction contractor for detailed planning of construction waste management. A detailed Construction Waste

Management Plan (CWMP) outlining the management of wastes during the construction works will be provided by the construction contractor once appointed.

The CWMP will outline how the construction contractor will maximise resource recovery and minimise residual waste from construction activities. In completing the CWMP the Construction contractor will:

- Estimate volumes of materials to be used and incorporate these volumes into a purchasing policy so that the correct quantities are purchased.
- Identify potential reuse/recycling opportunities of excess construction materials.
- Incorporate the use of prefabricated components and recycled materials.
- Arrange for the delivery of materials so that materials are delivered 'as needed' to prevent the degradation of materials through weathering and moisture damage.
- Consider organising the return of excess materials to the supplier or manufacturer.
- Allocate an area for the storage of materials for use, recycling and disposal (considering slope, drainage, location of waterways, stormwater outlets and vegetation).
- Arrange contractors for the transport, processing and disposal of waste and recycling.
- Ensure that all contractors are aware of the legal requirements for disposing of waste.
- Promote separate collection bins or areas for the storage of residual waste.
- Clearly 'signpost' the purpose and content of the bins and storage areas.
- Implement measures to prevent damage by the elements, odour and health risks, and windborne litter.
- Minimise site disturbance and limit unnecessary excavation.
- Ensure that all waste is transported to a place that can lawfully be used as a waste facility.
- Retain all records demonstrating lawful disposal of waste and keep them readily accessible for inspection by regulatory authorities such as Council, DECC or WorkCover NSW.

The CWMP will detail construction design measures including

- how measures for waste avoidance have been incorporated into the design, material purchasing and construction techniques for development for lifecycle and materials.

The site plans submitted along with the CWMP, prior to construction, will also detail the following during construction activities:

- Size and location(s) of waste storage area(s)
- Access for waste collection vehicles
- Areas to be excavated
- Types and numbers of storage bins likely to be required
- Signage required to facilitate correct use of storage facilities

The likely materials generated during the construction phase of the upgrade and an identified method for reuse, recycling and disposal are outlined in **Table 4**.

Table 4 Construction Waste Sources (indicative only)

Waste Type	Typical Method for Reuse, Recycling or Disposal
Concrete	Reuse onsite: to be kept separate where possible to enhance resource recovery Recycling/Reuse- Offsite C&D processor (e.g. recycled for filling, levelling or road base)
Brick	Reuse onsite: to be kept separate where possible to enhance resource recovery Recycling/Reuse- Offsite C&D processor (Can be cleaned for reuse or rendered over or crushed for use in landscaping and driveways)
Pavement, asphalt	Reuse onsite: to be kept separate where possible to enhance resource recovery Recycling/Reuse- Offsite C&D processor (Can be removed for recycling)
Metals	Reuse onsite: to be kept separate where possible to enhance resource recovery Recycling/Reuse- Offsite C&D processor for export and recycling

Waste Type	Typical Method for Reuse, Recycling or Disposal
Wood	Reuse onsite: to be kept separate where possible to enhance resource recovery Recycling/Reuse- Offsite C&D processor for resale or mulching
Timber (Treated and untreated)	Reuse onsite: to be kept separate where possible to enhance resource recovery Recycling/Reuse- Offsite C&D processor for resale or mulching
Plasterboard	Reuse onsite: to be kept separate where possible to enhance resource recovery Recycling/Reuse- Offsite C&D processor
Glass	Reuse onsite: to be kept separate where possible to enhance resource recovery Recycling/Reuse- Offsite C&D processor for reuse as glazing or aggregate for concrete production
Other (paints, light points, drains etc)	Reuse onsite: to be kept separate where possible to enhance resource recovery Landfill: disposal where materials cannot be separated or are unrecyclable (i.e. carpet) Alternative processing: specialised processing for material type (i.e. composting for organics)
General Waste	Licensed landfill facility

5.3 Waste Volume Targets for Demolition and Construction

Construction and demolition waste represents a significant proportion of waste that is sent to landfill. To reduce the amount of waste sent to landfill from construction and demolition works, the Green Building Council of Australia (GBCA) established a maximum benchmark of 17.5 kg of waste per square metre of gross floor area (GFA), for the total amount of waste to be sent to landfill for a construction and demolition project. This represents normal industry practice and best practice waste management is expected to generate substantially less than this amount.

Based on the preliminary plans for the upgrade works, the approximate floor area which will be upgraded is 6,078 m^2. This will generate up to approximately 106 tonnes of landfill material if working to the GBCA benchmark.

5.4 Waste Avoidance and Reuse Measures During Demolition and Construction

The following measures will be investigated and implemented (where economically feasible) to work towards maximising resource recovery and minimise residual waste from demolition and construction activities:

- During demolition activities, materials will be carefully dismantled and sorted for reuse and recycling where applicable.
- Framing timber, windows, doors and joinery will be recycled off site where feasible.
- Plumbing, fittings and metal elements will be recycled off site where feasible.
- Formwork (temporary or permanent moulds) will be reused where possible.
- Appropriate sorting and segregation of wastes will be undertaken to ensure efficient reuse and recycling of materials throughout construction and demolition activities.
- Site disturbance will be minimised to limit unnecessary excavation and excavated material will be reused on site where possible.
- Green waste (i.e. garden organics) will be reprocessed offsite.
- Construction materials will be selected taking into consideration their long lifespan and potential for reuse at the end of their initial use.
- Pre-cut and prefabricated materials will be carefully ordered to size, and prefabricated components will be used for internal fit outs where possible.

- Materials will be delivered on an ‘as needed’ basis to prevent degradation of materials through weathering and moisture damage.
- Materials, including reuse and recycling materials, will be stored and kept in good condition.
- Trade work on site will be coordinated and appropriately sequenced to increase efficiency and reduce waste materials.
- Packaging waste will be reduced by the return of packaging to suppliers where possible, use of returnable bulk packaging, through bulk purchasing and requesting cardboard or metal drums, and metal straps, in place of plastics that cannot be recycled.
- Staff/subcontractors will be informed of waste and resource management procedures and resource recovery targets.
- Contractors will be made aware of the legal requirements for disposing of waste in NSW.
- Contracts will include measures which reinforce the requirement to sort wastes effectively for reuse and recycling.

5.5 Submission Requirements for Construction and Demolition Works

At the time of reporting, a Building Contractor has not been decided upon for detailed planning of construction and demolition waste and resource management. It is expected that the Building Contractor will ensure that the construction and demolition waste management plans are in accordance with this document. The Principal will approve any waste management plans prior to commencement of the project.

The demolition contractor will complete all aspects of the DWMP relating to demolition waste management including:

- The Volume of Waste Table for Demolition to be completed with construction certificate
- Submit site drawings to scale, clearly indicating the location of and provisions for the storage and collection of waste and recyclables during demolition detailing:
    - Size and location(s) of waste storage area(s)
    - Access for waste collection vehicles
    - Areas to be excavated
    - Types and numbers of storage bins likely to be required
    - Signage required to facilitate correct use of storage facilities

The construction contractor will complete all aspects of the CWMP relating to construction waste management including:

- The Volume of Waste Table for Construction to be completed with construction certificate
- Construction Design requirements
- Submit site drawings to scale, clearly indicating the location of and provisions for the storage and collection of waste and recyclables during demolition detailing:
    - Size and location(s) of waste storage area(s)
    - Access for waste collection vehicles
    - Areas to be excavated
    - Types and numbers of storage bins likely to be required
    - Signage required to facilitate correct use of storage facilities

6. Operational Waste Management

This section provides a summary of the expected volumes of waste and recyclables that will be generated at the proposed development during the operational phase. It also provides details on the proposed on-site storage of the materials, the bin infrastructure and the anticipated frequency of collection.

Privately licensed waste and recycling contractors will be used for collections of the separated materials and will be chosen in line with current waste service procurement frameworks currently being used by the School at the site.

This report outlines the operational waste requirements detailed in the NSW Health Policy Directive – Clinical and Related Waste Management for health Services, PD2017_026, August 2017.

6.1 Waste Generation

The main operational waste generation sources are to be from an extension of existing services. A report entitled *The Sutherland Hospital Operating Theatre Upgrade Project, Waste Management Services - Perioperative Services,* 3 August 2020, provides a list of the likely operational waste types generated within the perioperative services at TSH. This includes existing and new operative spaces. These are outlined in **Table 5** below. This list is inclusive of the projected increase in waste streams for the upgrade works.

Table 5 Estimated Operational Waste Streams and Volumes

Waste Streams	Bin/Lid colour	Size of Waste Bin /L	Waste bins/day Mon-Fri	Waste bins/ day Sat & Sun	Waste bins/week
General waste	Green/Red	660	12	4	68
Comingled	Green/Yellow	660	3	1	17
Anatomical	Yellow/Orange (orange bin liners)	120	2	1	12
Clinical waste (Incl. Pathological Waste)	Yellow/Yellow (Yellow bin liners)	660	4	2	24
Kimguard		240	4	2	24
Clinical sharps waste (Daniels Sharpsmart S22, S32, L64)	Yellow/Yellow	14.5 23.5 64	4	3	26
Cytotoxic waste	Purple/Purple (purple bin liners)	40	As required		
Pharmaceutical waste	Red/Red	20	As required		
Radioactive waste	Red/Red (red bin Liners)	none	As required		
Confidential waste		240	As required		

Table 6 Estimated annual waste volumes

Waste Streams	Size of Waste Bin /L	Waste bins/week	Estimated Density	Annual generation (tonnes)
General waste	660	68	0.8	1,867
Comingled	660	17	0.8	467
Anatomical	120	12	1.0	75
Clinical waste (Incl. Pathological Waste)	660	24	0.2	165
Kimguard	240	24	0.2	60
Clinical sharps waste (Daniels Sharpsmart S22, S32, L64)	14.5 23.5 64	26	0.2	6.4
Cytotoxic waste	40	As required		
Pharmaceutical waste	20	As required		
Radioactive waste	N/A	As required		
Confidential waste	240	As required		

Average dimensions of bin sizes and footprints used for waste storage area requirements are provided in **Table 7** below.

Table 7 Bin size and footprint areas

Bin Size (L)	Height (mm)	Depth (mm)	Width (mm)	Approximate footprint (m^2)	Source
S22 -14.5	440	210	395	Wall mounted	https://www.danielshealth.com.au/solution-category/products/
S32 – 23.5	610	210	395	Wall mounted	https://www.danielshealth.com.au/solution-category/products/
L64 – 64L	726	354	398	~0.15	https://www.danielshealth.com.au/solution-category/products/
120	940	530	485	0.26-0.33	NSW EPA Better Practice Guide for Resource Recovery in Residential Developments 2019
240	1,080	735	585	0.41-0.43	NSW EPA Better Practice Guide for Resource Recovery in Residential Developments 2019
660	1250	850	1370	0.86-1.16	NSW EPA Better Practice Guide for Resource Recovery in Residential Developments 2019

6.2 Waste Generation Considerations

Ricardo's investigations, and *The Sutherland Hospital Operating Theatre Upgrade Project, Waste Management Services - Perioperative Services*, 3 August 2020 report, identified the following considerations with respect to waste management following the proposed upgrade works.

- There will be an increase in the movement of waste bins and/or containers overall with the new perioperative service design which requires additional storage and collection space
- Small 20/40L clinical waste bins within operating rooms will be removed as a contained unit and replaced with a clean empty bin.
- Management of smaller size waste bins needs to be carefully considered to ensure operational flows for the perioperative services activities continue smoothly.
- During the refurbishment of the existing perioperative services, waste stream logistics must be reviewed and access to an interim disposal room organised.
- The increase in waste will increase the frequency of movement from the Clean Up Rooms to the disposal rooms and to the waste dock. The logistics are to be designed carefully to protect the recycling and separation of waste types.

- The current waste dock holding areas and frequency of external contractor collection will not be adequate to maintain the increase of waste from the perioperative services. These will be increased to maintain performance in the pick-up/removal of waste from the TSH site.

6.3 Waste Store Area and Considerations

Given the increase in waste generation following the upgrade, sufficient space will need to be allowed for, to enable the collection the various waste types, and at a suitable frequency.

At a minimum the waste storage area must allow for collection of the following bins daily (numbers rounded to the nearest 0.5 m^2):

- 12 x 660L general waste bins (~ 14m^2)
- 3 x 660 L comingled recycling bins (~ 3.5 m^2)
- 2 x 120 L Anatomical bins (~2 m^2)
- 4 x 660 L clinical waste bins (~5 m^2)
- 4 x 240 L Kimguard bins (i.e. 2 m^2)
- Up to 4 Sharpsmart bins of various sizes (~ 0.5m^2)

These estimates exclude storage areas for cytotoxic waste, pharmaceutical waste, radioactive waste and confidential waste that need to be destroyed. Therefore, a waste storage area of at least 30 m^2 is likely to be required, assuming daily collection of waste. This would need to be increased if some waste types are collected less frequently.

It is noted that waste is currently compacted (general waste and cardboard) to reduce the frequency of collections however it is unclear whether this practice will continue.

Elements to be considered for bin storage design and implementation include:

- Waste/recycling storage areas to be constructed in accordance with the requirements of the Building Code of Australia (BCA).
- Waste/recycling storage areas to be located and designed in a manner that reduces adverse impacts upon neighbouring properties and the streetscape.
- Waste/recycling storage areas to be of adequate size to comfortably accommodate all waste and recycling bins associated with the development.
- Waste/recycling storage areas to be able to accommodate separate general waste bins and recycling bins which are of sufficient volume to contain the quantity of waste generated.
- Within waste/recycling storage areas, containers used for the storage of recyclable materials to be kept separate from (but close to) general waste containers — so that the potential for contamination of recyclable materials is minimised.
- Arrangements to be in place so that the waste/recycling storage area is not accessible to the general public.
- Vermin to be prevented from entering the waste/recycling storage area.
- Waste/recycling storage areas to have a smooth, durable floor and must be enclosed with durable walls/fences that extend to the height of any containers which are kept within.
- Doors/gates to waste/recycling storage areas to be durable. There must be a sign adjacent to the door/gate that indicates that the door/gate is to remain closed when not in use. All doors/gates are to be openable from both inside and outside the storage area and must be wide enough to allow for the easy passage of waste/recycling containers.
- Waste/recycling storage areas to be serviced by hot and cold water.
- The floor to be graded so that any water is directed to a sewer authority approved drainage connection located upon the site.
- Waste/recycling storage areas to include signage that clearly describes the types of materials that can be deposited into recycling bins and general garbage bins.

- Arrangements to be in place for the regular maintenance and cleaning of waste/recycling storage areas. Waste/recycling containers must only be washed in an area which drains to a sewer authority approved drainage connection.

6.4 Access

6.4.1 Staff Access during operations

Staff and visitors will have easy access to the following separated materials bins located in the communal areas:

- Co-mingled container recycling.
- General waste.

Medical staff and specialised waste contractors will have access to medical waste bins for the purposes of perioperative services.

Relevant staff and specialised waste collection contractors will have access to the waste dock.

6.4.2 Vehicle Access for collection

A motorised and pedestrian traffic management feasibility study will be conducted to evaluate the further pressure placed on the waste collection services space, including both motorised and pedestrian traffic. This study will include vehicle types and assessment of turning circles, volumes of activities etc as the zone currently becomes congested and blocked by assorted traffic movements.

For guidance, the vehicle access to waste collection point will be designed with consideration to the vehicle specifications included in **Table 8** below.

Table 8 Typical Collection Vehicle Specifications

Typical Council Garbage Truck used for Domestic Waste Collection	
Length Overall	8.0 metres
Width Overall	2.5 metres
Operational Height	4.3 metres
Travel Height	4.3 metres
Weight (vehicle and load)	22.5 tonnes
Weight (vehicle only)	13 tonnes
Turning Circle	25.0 metres

The development will be designed to allow access by collection vehicles used by the nominated waste contractor. Wherever possible, the site will be configured to allow collection vehicles to enter and exit the site in a forward direction and so collection vehicles do not impede general access to, from and within the site. Access driveways to be used by collection vehicles will be of sufficient strength to support such vehicles.

Servicing arrangements for the emptying of bins will be compatible with the operation of any other loading/unloading facilities on-site.

6.4.3 Signage

Signage will be provided in all waste disposal, storage and collection areas demonstrating how to use the waste management system, including what materials are acceptable in each recycling bins. In the bin storage area, all waste streams will be stored in clearly labelled, colour coded bins as appropriate to ensure that waste streams are not inadvertently mixed.

Signage should be displayed at eye level above waste and recycling bins, bin stickers should also be attached to each bin to inform staff and visitors which materials they can place in each bin.

7. Conclusion

Based on the preliminary plans for the upgrade works, the approximate floor area which will be upgraded is 6,078 m^2. There is likely to be approximately 106 tonnes of landfill material produced during demolition and construction activities associated with the building if the site is managed to achieve the maximum waste generation benchmark identified by the GBCA.

Waste generation associated with the perioperative activities includes, general waste, commingled recycling, anatomical clinical, kimguard, sharpsmart bins, cytotoxic waste, pharmaceutical waste, radioactive waste and confidential waste.

The upgrade works will lead to a considerable increase in operational waste volumes, as identified in **Section 6.1** above.

Waste generation estimates have been undertaken to determine the optimum waste storage areas required to meet the waste storage requirements based on the generation estimates provided. A waste storage area of 30m^2 is likely to provide sufficient onsite storage area based on a daily collection service and optimised layout. This area is to be developed in accordance with the relevant guidelines and best practice measures.

Once planning approval is granted for the proposed development, a WMP will need to be developed to:

1. Inform the development of a detailed DWMP and CWMP for the Construction Certificate application, which is to include details regarding disposal and recycling of different materials expected from demolition, construction, and the transport and destinations of these materials.
2. Provide guidance that detailed design and fit-out of the building is consistent with best practice standards and plans for waste management, and
3. Inform all plans and procedures for operational waste management.