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The King's School, North Parramatta

Concept Proposal and Stage 1:
Operational Waste
Management Plan
SSD-48497708

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1. Introduction

This waste management plan for The King's School has been prepared by Waste Audit & Consultancy Services (Aust) Pty Ltd for TSA and The King's School to provide guidance on the management of operational general waste and recyclable materials generated by the proposed development according to conform with EP&A SEARS regulations at 87-129 Pennant Hills Road, North Parramatta NSW.

The King's School (TKS) is a single-educational school that is located at 87-129 Pennant Hills Road. Seated within 115.395 acres of Australian native landscape in Parramatta, Western Sydney, the Senior School provides education for boys Year 7 to Year 12 & Boarding Years 7-12 to develop their learning, develop skills and build strong community relationships.

This State Significant Development Application (SSDA) seeks consent for the staged redevelopment of The King's School, including:

- **Concept Proposal for the provision of new and upgraded facilities, including:**
 - Building envelope for a new Sports Pavilion within the western sports field precinct (subject to further detailed approval).
 - Building envelope for a new Boarding House within the northern residential precinct to the north of the Doyle Sports Fields and adjacent building envelope for Staff Quarters (subject to further detailed approval).
 - Building envelope for a new Day Boy House between Dalmas House and Burkitt House, including the associated relocation of Ryrie Road (subject to further detailed approval).
 - Earthworks and the associated demolition of existing buildings and structures, and removal of trees and landscaping.
 - Staged increase in staff and student numbers.
 - Detailed Stage 1 works (as outlined below).
- **Detailed Stage 1 works including:**
 - Earthworks and the associated demolition and existing buildings and structures.
 - Traffic upgrade works including the construction of a new vehicular entrance into the site from Masons Drive, new drop-off pick up facilities, internal access roads and increased car parking and bus parking.
 - The construction of a new Staff Residence Building comprising residences for staff and their families within the Senior School Boarding Precinct.
 - The construction of a new building for Science, Technology, Engineering, Arts and Maths (the 'STEAM building') within the Senior School and associated landscaping.
 - The staged construction of new buildings required to upgrade the Preparatory School, including:
 - Construction of a new Performing Arts and Music Centre comprising a dedicated performance space and music practice rooms to the northwest of Horrocks Road.
 - Construction of a new General Learning Unit building comprising additional classrooms / general learning spaces adjacent to the existing dam.
 - Upgrades to pedestrian access throughout the school.
 - Staged increase in staff and student numbers.
 - The removal and replacement of trees and associated landscaping.

Arrangements for management of the general waste and recyclable materials that will be generated during the development's operational phase have been incorporated into the Operational Waste Management Plan taking into account SEARS concept proposal and the overall strategy indicated in point 19. These are detailed in Section 6, with demolition and construction waste addressed in a separate report.

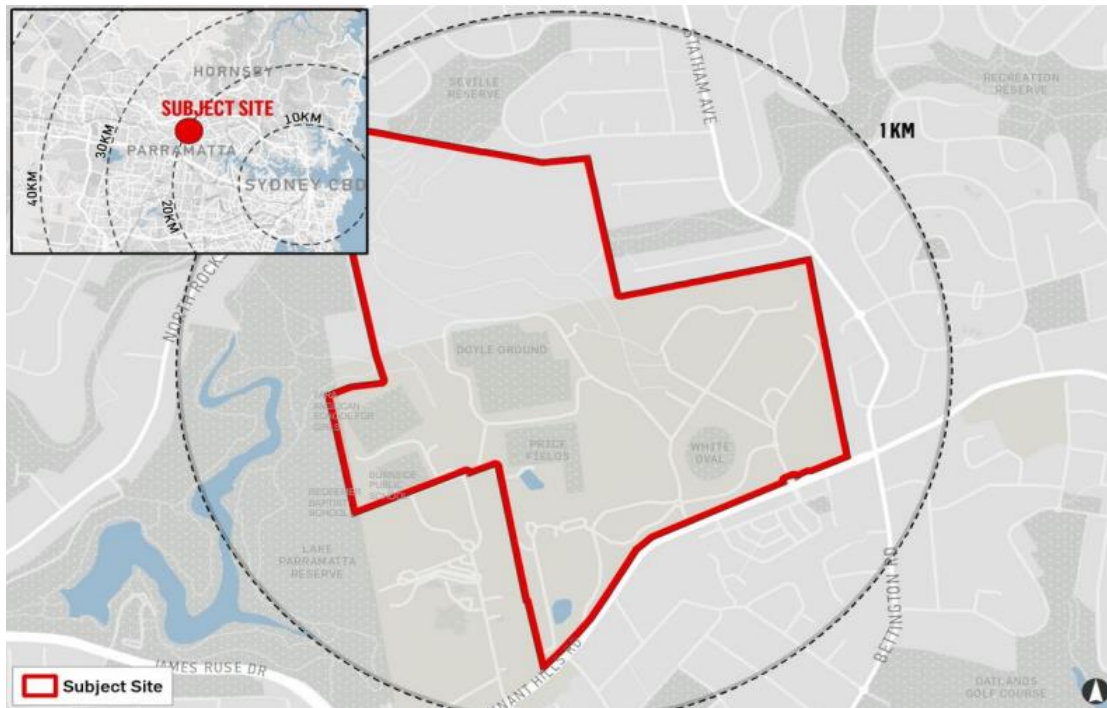
All waste management provisions, including internal bins, storage areas, management and handling protocols, and contractor requirements, have been designed to ensure safe and sustainable management of all materials, consistent with best practice standards and the SEARs requirements applicable to the development.

Hazardous materials survey completed by JBS&G and not included in this report.

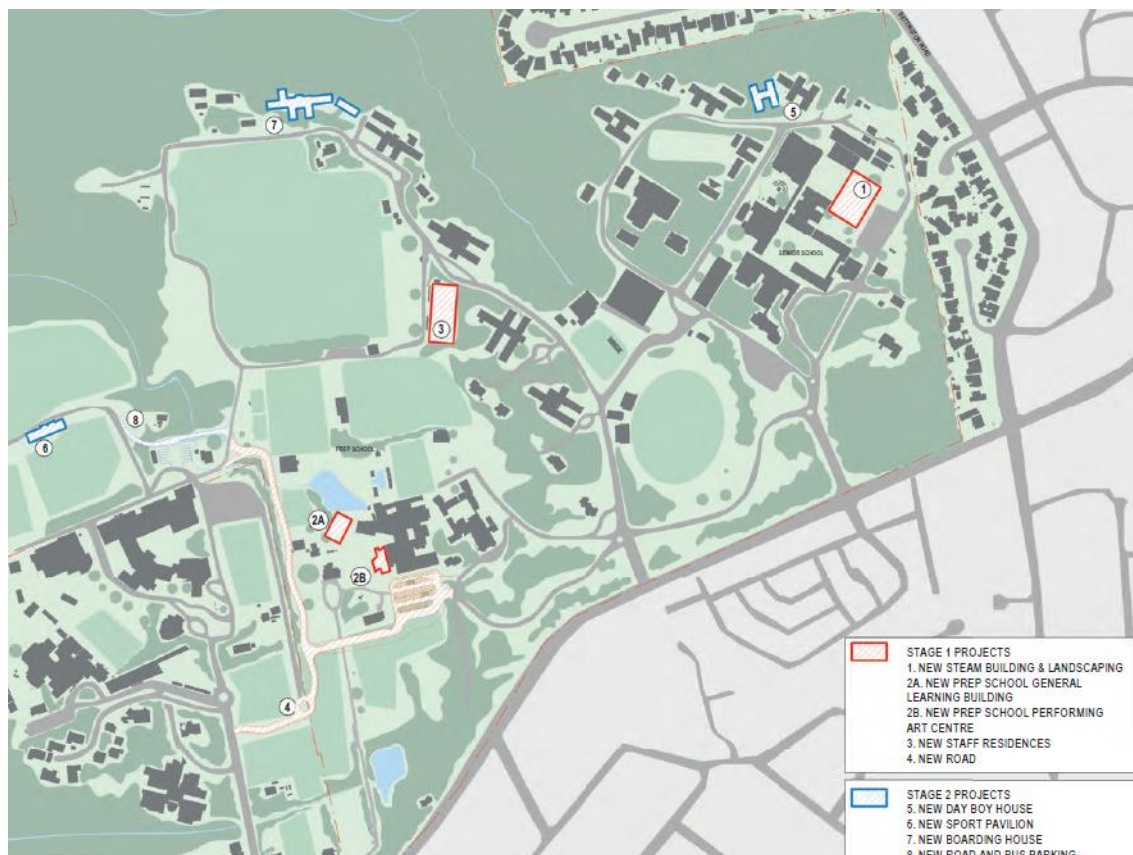
SEARS REQUIREMENTS:		Operational Waste Management Plan (OWMP)
Concept Proposal		C&D Waste Management Plan (CDWMP)
19. Waste Management		- Hazardous Material Survey (Completed by another consultant)
- Provide details of an overall strategy to be implemented to manage, reuse, recycle and safely dispose of this waste.		OWMP Page 9
- Identify appropriate servicing arrangements for the site		OWMP Page 15
Stage 1 Works		
8. Waste Management		
- Identify, quantify and classify the likely construction and operational waste streams to be generated during construction and operation of the Stage 1 works.		C&DWMP Page 10 OWMP Page 15
- Provide the measures to be implemented to manage, reuse, recycle and safely dispose of this waste and identify appropriate servicing arrangements for the site.		OWMP Page 15
22. Waste Management		- Hazardous Material Survey (Completed by another consultant)
- Identify, quantify and classify the likely waste streams to be generated during construction and operation of the Stage 1 development.		C&DWMP Page 10 OWMP Page 6
- Provide the measures to be implemented to manage, reuse, recycle and safely dispose of this waste.		C&DWMP Page 8, 10, 13
- Identify appropriate servicing arrangements for the site.		OWMP Page 9

2. Site Boundary

The site boundary relevant to this waste management plan is shown below:



The development sites related to this waste management plan are shown below, including Stage 1 projects and the proposed Stage 2 projects;



3. Stage 1 Operational Waste & Recycling: Generation Rates

To calculate total operational volumes, the following rates in litres/day/100 m² of GFA have been used for each area type as shown in Table 1. These rates are based on typical waste and recycling generation rates for educational facilities and other supporting functions.

The Parramatta DCP 2011 does not specifically outline waste generation rates for Non-Residential developments therefore the following rates are taken from the *City of Sydney's Guidelines for Waste Minimisation in New Developments 2018* and *The City of Melbourne Waste Generation Rates for 2015* - educational facilities, have been used to calculate the volumes of materials that will be produced from the development's operations:

Table 1: Waste Generation Rates in Litres/Day per 100 m²

Area	General Waste	Paper/Cardboard Recycling	Commingle Recycling	Food Organics/ Green Organics
Teaching/Office/Support/Admin/ Rehearsal/ Studio	5	5	5	2
Café	100	250	250	100
Food Technology & Hospitality	50	50	50	100
Games Area/ Breakout Space/ Recreation Area	5	3	2	3
Boarding House	30	15	15	30

*Operational waste generating area excludes non generating area such as hallways, walkways, foyers and storage areas.

4. Stage 1 Operational Waste & Recycling: Total Volumes

Total predicted daily and weekly operational general waste and recycling volumes are shown in Tables 1 - 4, based on completion of Stage 1 at full occupancy, with 7 days per week (Monday-Sunday) operation, based on provided GFA.

Table 2: Predicted Waste Generation - New STEAM Building

Area	GFA m ²	General Waste	Commingle Recycling	Food/ Green Waste
Teaching/Office/Support/Admin	2,746.4	961	1,922	384
Food Technology/ Hospitality	445	1,558	3,115	3,115
Café	13.3	93.0	466	93
Total Weekly Waste		2,612	5,503	3,593

Table 3: Predicted Waste Generation - 2A Prep Performing Arts & 2B Prep General Learning

Area	GFA m ²	General Waste	Commingle Recycling	Food/ Green Waste
Teaching/Office/Support/Admin/ Rehearsal/ Studio	1,739.4	609	1,218	244
Total Weekly Waste		609	1,218	244

Table 4: Predicted Waste Generation - New Staff Residences (8 Residences plus a GAP Accommodation)

Residences 8 + 1	Bins		Weekly Capacity	Weekly Generation	Collections per Week	Total Footprint m ²
	Size	No.				
General Waste	120	9	1,080	720	1	3.2
Mixed Recycling	120	9	1,080	360	1	3.2
Total		18	2,160	1,080		
Total Storage Area						6.4 m ²

5. Concept Proposal and Stage 2

The concept proposal, outlined as Stage 2 Works, consists of;

- A new Sports Pavilion between the Wanderers' Field and Old Boys' Field and the Massie Fields within the western sports field precinct.
- A new Boarding House within the northern residential precinct to the north of the Doyle Sports Fields, including the relocation of junior boarders from the existing Gowan Brae residence. It is proposed the new facility include up to 89 accommodation spaces.
- A new Day Boy House for Year 7 students between Dalmas House and Burkitt House, including the associated relocation of Ryrie Road.

All detailed design for Stage 2 is subject to further approval. The below table is the indicative waste generation for Concept Proposal.

Table 5: Indicative Waste Generation – Concept Proposal (Litres p/w)

Area	GFA m ² / Accommodation	General Waste	Commingle Recycling	Food/ Green Waste
Sports Pavilion	264	352	1,523	305
Boarding House	89 Acc	3,560	3,560	460
Day Boy House	802	380	1,076	215
Total Weekly Waste		4,292	6,159	980

*Operational waste generating area excludes non generating area such as hallways, walkways, foyers and storage areas.

The following waste hierarchy will be used as an overall strategy in Stage 2 Works:

Avoid and Reduce

Minimize the production of waste materials in the construction process by:

- Assessing and taking into consideration the resultant waste from different design and construction options
- Purchasing materials that will result in less waste, which have minimal packaging, are pre-fabricated.
- Not over ordering products and materials

Reuse

Ensure that wherever possible, materials are reused either on or offsite.

- Identify all waste products that can be reused
- Put systems in place to separate and store reusable items
- Identify the potential applications for reuse both onsite and offsite and facilitate reuse

Recycling

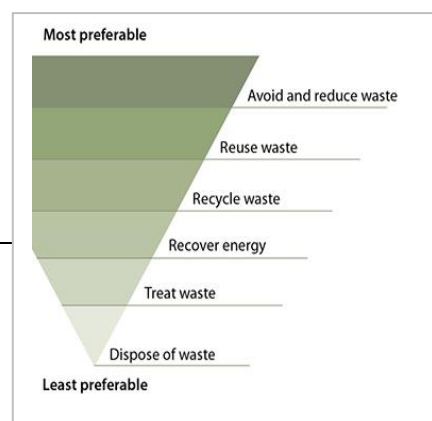
Identify all recyclable waste products to be produced on site.

- Provide systems for separating and stockpiling of recyclables
- Provide clear signage to ensure recyclable materials are separated
- Process the material for recycling either onsite or offsite

Disposal

Waste products which cannot be reused or recycled will be removed and disposed of. The following will need to be considered:

- Ensure the chosen waste disposal contractor complies with regulatory requirements
- Implement regular collection of bins



6. Storage Facilities & Equipment

6.1 Storage Space Calculations & Requirements

Total predicted weekly operational general waste and recycling storage volumes are shown in Tables 6 - 8.

Table 6: Storage Space Calculations - New STEAM Building

Material Stream/Function	Weekly Litres Generated	Bin Size Litres	No. of Bins	Collections per Week	Required Area (m ²)*
General Waste	2,612	1100	2	2	3.4
Commingled Recycling	5,503	1100	3	2	8.5
Food/ Green Waste	3,593	660	3	2	15.4
TOTALS	11,707		8		17.9 m ²

Table 7: Storage Space Calculations - 2A Prep Performing Arts & 2B Prep General Learning

Material Stream/Function	Weekly Litres Generated	Bin Size Litres	No. of Bins	Collections per Week	Required Area (m ²)*
General Waste	609	240	2	2	0.9
Commingled Recycling	1,218	240	3	2	1.3
Food/ Green Waste	244	240	1	2	0.4
TOTALS	2,070		6		2.6

Table 8: Storage Space Calculations – New Staff Residences (8 Residencies plus a GAP Accommodation)

Material Stream/Function	Weekly Litres Generated	Bin Size Litres	No. of Bins	Collections per Week	Required Area (m ²)*
General Waste	720	120	9	1	3.2
Commingled Recycling	360	120	9	1	3.2
TOTALS	1,080		18		6.5 m ²

* Includes 30% allowance for circulation space between bins and bin movement in and out of the storage room

* Bin sizes will be a combination of 120, 240, 660 and 1100 litres, all with castors, in a spread that delivers the weekly capacity

The above bin numbers and weekly collection frequencies are predicated on the maximum predicted generation of each of the expected materials streams, based on the development's area schedule and full student and staff occupancy following completion of Concept Proposal and Stage 1.

6.2 Storage Area Location & Access

The proposed areas will be sufficient for the projected numbers of bins required for each project stage, and their locations will provide easy access for waste contractor vehicles and their staff, who will be responsible for loading bin contents into collection vehicles.

All TKS areas are collected at a schedule of 2 times per week, with the exception of Staff Residences which will be collected according to council at once per week.

Private collection schedules are to be arranged with the private waste collector.

Cleaners and staff will bring general waste and recyclables to each storage area every night. The storage area as currently designed is adequately sized to accommodate bins for all waste and recycling generated on the site between collections.

The day before the designated collection day, the school staff will transfer the waste and recycling bins from each buildings waste storage area to the designated internal road kerbside, to await collection by the contractor.

Once all bins have been collected and emptied by collection contractor, the staff members will return the bins to each buildings waste storage area in an orderly manner. All general waste and recycling bins will be differentiated through clear signage and colour coding to reflect the materials contained, to enable easy identification by staff, cleaners, and members of the general public.

Waste collection vehicles will approach along the internal roads (Cedars, Hake, Wade and Russell Roads) and collect bins from the kerbside. The waste contractor will ensure that no litter is created during the bin emptying process and will clean up any spills that occur.

All waste and recycling containers will be clearly differentiated through appropriate signage and colour coding to reflect the materials contained, with each different stream located in a designated area to assist in easy identification by cleaners and other users.

Figure 1: New STEAM Building

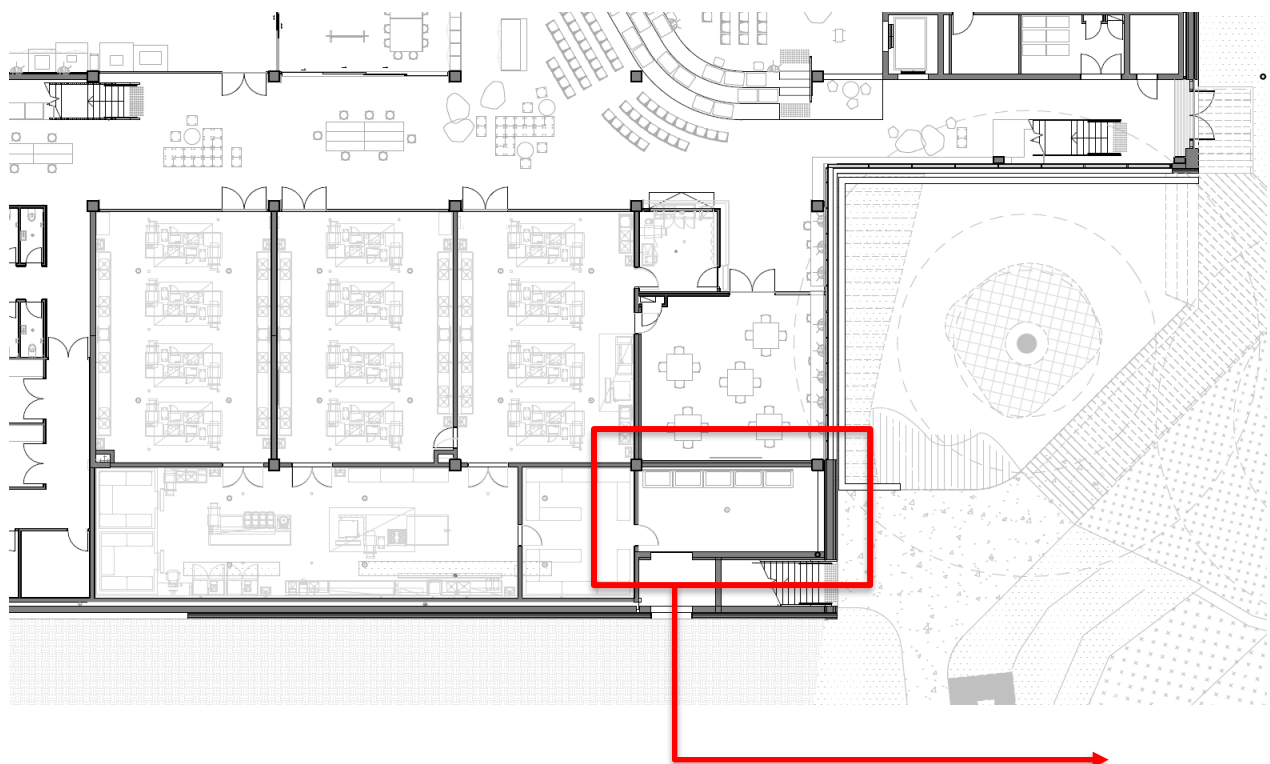
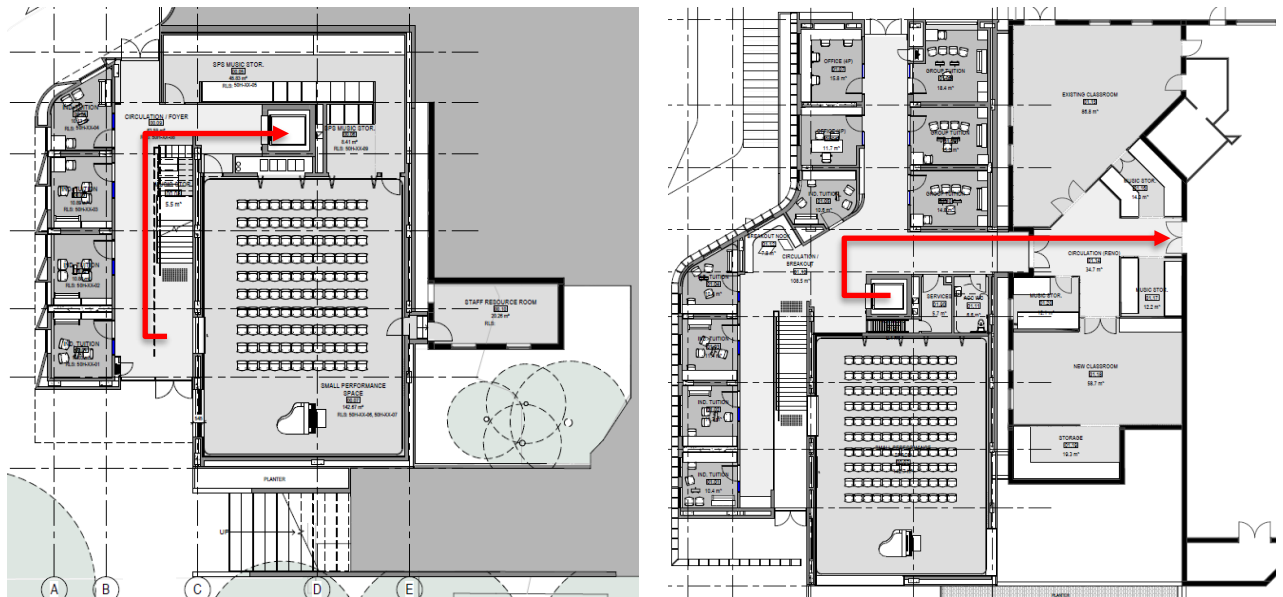
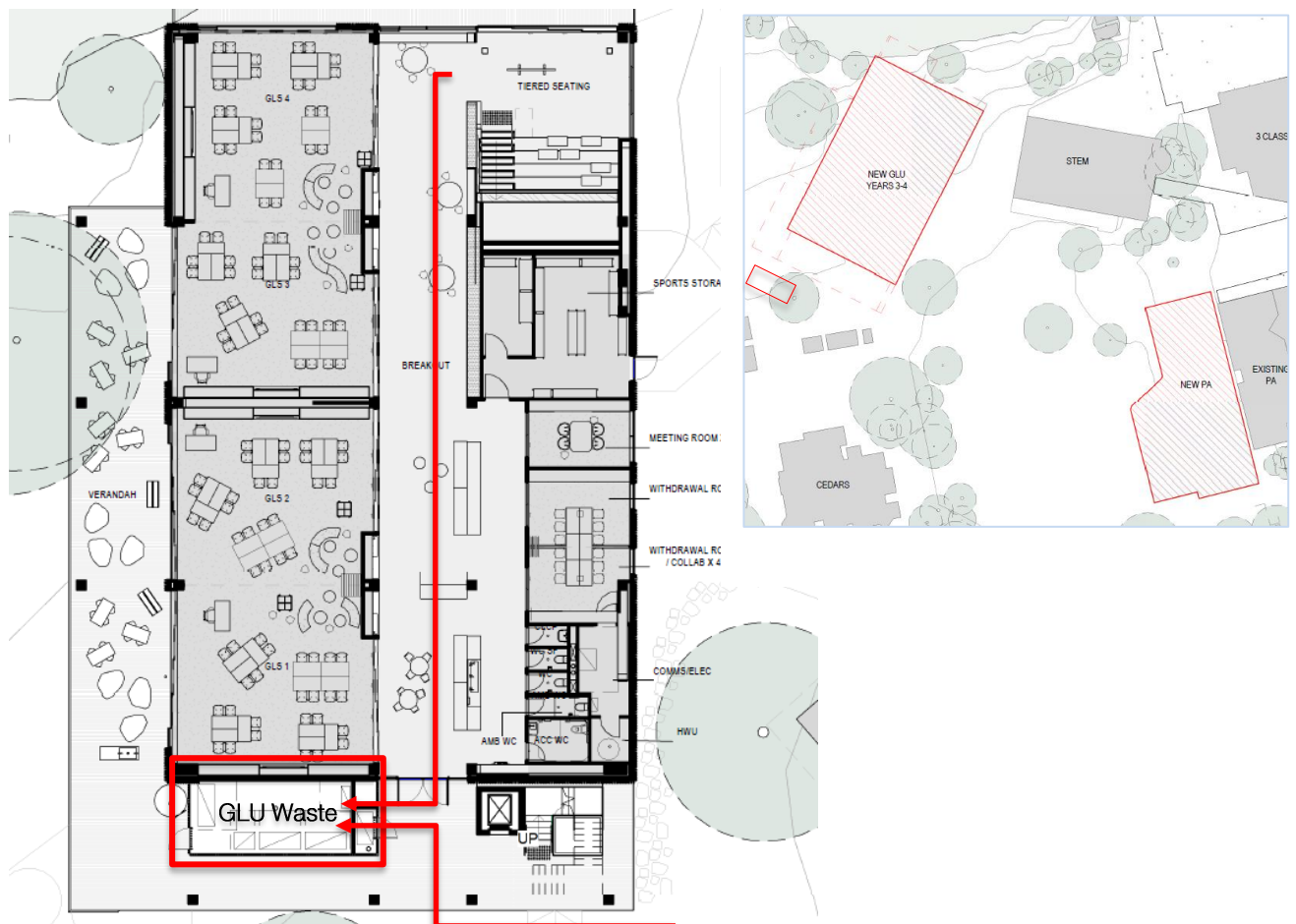


Figure 2: 2A Prep Performing Arts & 2B Prep General Learning

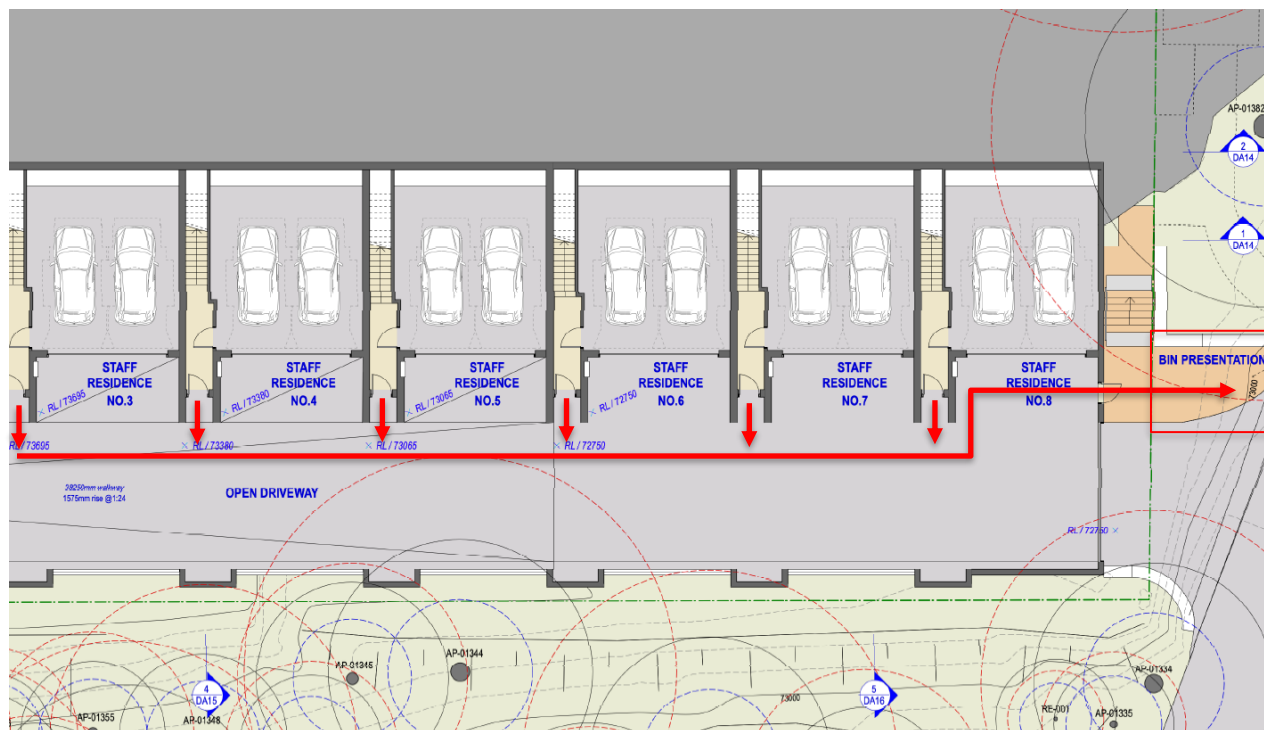


At the end of the night cleaners and staff will deliver waste from the Performing Arts centre to the bin room located in the existing/ adjoining building.



At the end of the night cleaners and staff will deliver waste from the General Learning Unit to the bin room located to the rear of the building

Figure 3: New Staff Residences



Residents will present their bins to the bin presentation area, on the night before scheduled collections are to take place.

6.3 Storage Space Requirements

All storage areas as currently designed are adequately sized to accommodate bins for all waste and recycling generated between collections in operational Stage 1.

These areas have been designed with safety and accessibility in mind, with no steps or grade changes to impede bin movement and loading.

All waste and recycling containers will be clearly differentiated through appropriate signage and colour coding to reflect the materials contained, with each different stream located in a designated area to assist in easy identification by cleaners and other building users.

The storage room will also have the following features:

- Mechanically ventilated (ref. AS 1668.2)
- Walls to be constructed from masonry or similar, washable, and painted with light colour
- Floors to be sealed, with flat and even surface and graded drains to sewer connection
- All corners coved and sealed 100 mm up to eliminate build-up of dirt
- Storm water entrance preventative measures in place
- Brightly lit to Australian standard and light switches at 1.6 m height
- Where required, all doors are lockable, tightly fitted, self-closing and of at least 2 m width
- Conformance with the Building Code of Australia, Australian standards, and local laws
- Childproofing and public/operator safety assessed and ensured
- A regular cleaning schedule and documented pest control regime
- All bin lids to be kept closed when not being used
- Bin wash facilities provided with an adequate supply of water mixed through a centralised mixing valve with hose cock, and floor graded to a 100 mm diameter floor drain outlet

7. Demolition & Construction Waste

A separate plan detailing the management of waste resulting from demolition and construction activities has been prepared, using the templates provided by the Parramatta Council for guidance. Both plans should be submitted as part of the State Significant Development Application (SSDA) for the project.

Waste contractors and construction contractors will be the primary transporters of waste off-site and will be required to provide monthly reports to the Project Manager on waste reused, reprocessed/recycled, and sent to landfill.

All reports will include the following information:

- Date and time material removed
- Material type and amount (in kg and/or cubic metres)
- Processing facility material taken to, and facility licensing information
- Vehicle registration and waste contractor's company details

This information will also be kept on site in a waste data file (printed and/or electronic) and made available for inspection to any authorised council officer at any time during site works. At the conclusion of site works, the construction contractor will retain all waste documentation and make this documentation available for inspection.

The project's waste management objectives and targets will include:

- Meeting all waste management standards while ensuring the health and safety of all workers on the project during demolition and construction
- Maximising the quantities of materials diverted from landfill by reusing materials onsite and offsite, and recycling/reprocessing materials off-site
- The diversion from landfill of 80% of construction waste by weight, to meet the criteria of the NSW State Government's waste legislation, policy settings and regulatory regime
- Disposal of no more than 20% of residual waste materials to a licensed landfill in accordance with both regulatory and legal requirements

7.1 Hazardous Materials Management

The Asbestos & Hazardous Materials Survey (Rev 2) produced by JBS&G Pty Ltd in August 2023 lists the following identified or suspected hazardous materials (page 16 onwards):

- Asbestos (Chrysotile & Amosite)
- Synthetic Mineral Fibers (SMF)
- Lead dust & paint

These materials will be managed through standard procedures during the project's demolition stage by qualified contractors. Please refer to the JBS&G report for a specific description of findings and management processes.

The process for managing any materials suspected of being, or containing, asbestos is¹:

- i. Treat the material as asbestos unless proven otherwise
- ii. Do not disturb the material (i.e., shift or place into a container)
- iii. Seek advice from a suitably qualified laboratory to test the material(s) to determine if it is or is not asbestos

¹ Alternatively, any material suspected of being asbestos can simply be classified as such, and then managed accordingly.

- iv. If determined not to be asbestos, then it can be managed as an inert waste
- v. If determined to be asbestos then it must be managed by a licenced contractor for packaging, removal and disposal
- vi. If the material has accidentally been uncovered, then the area should be cleared, barriers erected to prevent access, NSW WorkCover and EPA notified, and if the material is broken, it should be covered with a fine spray/mist of water.

For what has been conclusively identified as asbestos-containing materials (including soils), a specialist/licensed asbestos contractor will be used.

There are strict regulatory requirements under Clause 42 of the *Protection of the Environment Operations (Waste) Regulation 2005* that apply to management of asbestos waste, including:

- Non-friable asbestos material must be securely packaged at all times.
- Friable asbestos material must be kept in a sealed container.
- Asbestos-contaminated soil must be wetted down.
- All asbestos waste must be transported in a covered, leak-proof vehicle.
- It is illegal to re-use, recycle or dump asbestos waste.

8. Operational Recycling & General Waste

8.1 Cardboard & Paper Recycling

Most cardboard packaging will originate from deliveries of supplies and stationery. Paper materials such as non-confidential office paper, newspapers, magazines, etc. will be generated from teaching areas, learning spaces, and offices, and will be managed as follows:

- Staff and students dispose of material into designated bins
- Cleaners collect materials and transfer to the bins within storage room
- Recycling contractor services bins to designated schedule

8.2 Commingled Recycling

Commingled recycling consists of all mixed plastic bottles and containers, glass bottles, and steel and aluminium cans. This material will be managed as follows:

- Staff and students dispose of material into designated bins
- Cleaners collect materials and transfer to the bins within storage room
- Recycling contractor services bins to designated schedule

8.3 General Waste

All materials other than those discussed above will be classified as general waste, and will be disposed of and collected accordingly as follows:

- Staff and students dispose of material into designated bins
- Cleaners collect materials daily and transfer to the bins within storage room
- Waste contractor services bins to designated schedule

8.4 Monitoring, Measurement & Target Setting

TKS will implement systems for monitoring, measurement, and reporting of operational waste management performance, with reports and invoices providing weights of general waste and recycling, streams and numbers of bins collected.

TKS facilities management will conduct annual performance and contract reviews with its waste contractor to assess progress towards annual waste diversion targets and other KPIs, identify operational issues, and address any shortcomings.

We recommend setting an initial diversion target of 50% (proportion of overall waste diverted from landfill disposal through waste avoidance, reuse, and/or recycling). This target should be reviewed by TKS after the first year of operations, and annually thereafter, and adjusted accordingly based on actual measured performance.

8.5 Roles & Responsibilities

TKS Facilities Management team will have responsibility for reviewing the Operational Waste Management Plan annually, ensuring that the objectives of the Plan are met, and making adjustments where required, to ensure continued accuracy and relevance to actual operations.

9. Internal Bins

It is recommended that all internal spaces of TKS are equipped with 3-stream bin hubs for:

- Paper & Cardboard Recycling
- Commingled Recycling
- General Waste

Bins should be situated in areas which effectively service a group of workstations and offices, with no bins under desks; this improves cleaning staff efficiencies by reducing the number of bins that require collection, and also reduces the number of bin liners required.

Examples of bins that are commonly used in office or educational settings are also shown below. Differently coloured bin liners (general waste-black; paper-clear; commingled-blue) are recommended to assist cleaning staff to distinguish the different streams and enable them to identify contamination, prior to final disposal in the bins in the central storage room.



For areas with bins kept within housings or pull-out drawers in kitchens and central areas, care must be taken to ensure these systems are well designed and provided with clear signage to foster proper separation. An example of best practice drawer design is shown below which provides for two or three streams (paper recycling, commingled recycling, and general waste).



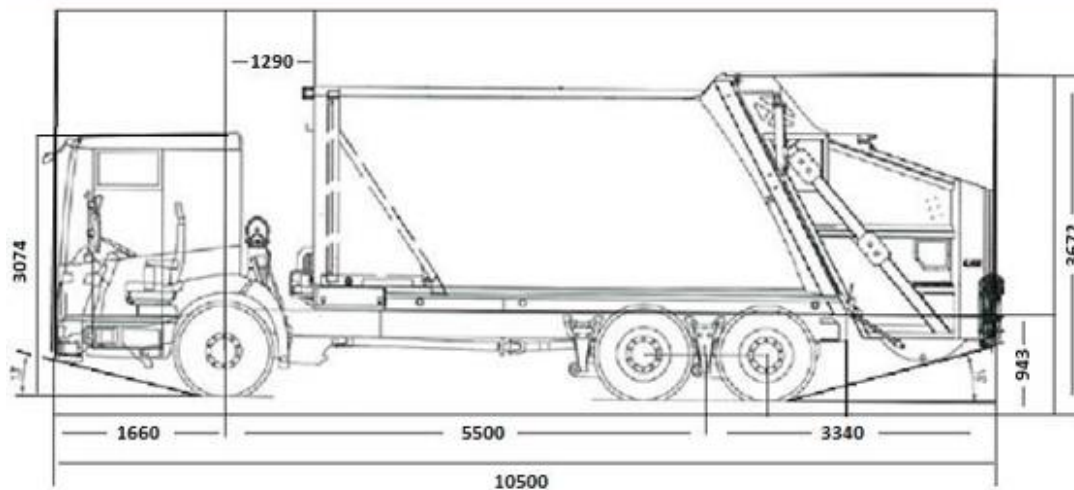
10. Vehicle Access & Site Safety

All contractors responsible for the removal of general waste and recycling will be required to undertake a site-specific induction process to ensure their operational practices are conducted safely and efficiently. This is critical given the steepness of the development site and the heightened need to ensure safe storage and loading of bins on level surfaces.

Additional specific requirements for waste contractors are listed in Section 12.

Appendices 1 and 2 show waste storage and loading areas for 87-129 Pennant Hills Road.

General waste, recycling and green waste will be collected in standard trucks as shown below:



11. Stakeholder Education

For the proposed waste management systems to be successful an intensive education program will be implemented for staff and students. Examples of signage that could be used to support these initiatives are shown in Appendix 2.

New procedures may need to be written into contract specifications, including requirements for monitoring and feedback to TKS on waste management performance (e.g. visual observations of recycling stream contamination, condition of bins and equipment, etc.).

12. Waste Contractor Requirements

TKS's waste contractors will comply with the following specific requirements:

- Reliable and efficient servicing, and meeting agreed schedules
- Working with the site to achieve continuous improvements in recovery rates
- Providing monthly reports on diversion and financial outcomes
- Providing tenant engagement and education programs
- Maintaining current details of processing facilities used
- Having collection vehicles fitted with weighing technology
- Maintaining evidence of compliance with relevant Green Star reporting criteria

13. Relevant Legislation, Standards and Guidelines

The following guidelines and standards have been used as references in compiling this waste management plan:

- *Parramatta Development Control Plan 2011, Appendices – A8 Waste Management Guidelines*
- NSW EPA *Protection of the Environment Operations Act 1997* and *Protection of the Environment Operations (Waste) Regulation 2014, Part 11*
- NSW EPA *Waste Classification Guidelines* 2014
- *AS 1668.1 Mechanical Ventilation and Air Conditioning code, Part 1* and *AS 1668.2 Mechanical Ventilation and Air Conditioning code, Part 2*
- GBCA *Green Star Operational Waste Criteria*
- *SEARs Requirements SSD-48497708*

Appendix 1: Vehicle Travel & Loading Areas



Appendix 2: Signage Examples

