Preliminary Construction and Operational Waste Management Plan for

Bank St Commercial Wharf S75W Application

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Preliminary Construction and Operational Waste Management Plan for

Bank St Commercial Wharf S75W Application

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This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with the Client. Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
610.16833-R01-v0.2	25 May 2017	I-hui Waung	Lono Tyson	Lono Tyson
610.16833-R01-v0.1	19 May 2017	I-hui Waung	Lono Tyson	Lono Tyson

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1 INTRODUCTION

SLR Consulting Australia Pty Ltd (SLR) was engaged by Bennett and Trimble Pty Ltd (the Client) to prepare a Waste Management Plan (WMP) in support of a S75W Application to the Department of Planning and Environment for the proposed development of "Blackwattle Bay Marina". The formal project name, with regards to the S75W Application, is "Bank St Commercial Wharf S75W Application". Further details of the proposed redevelopment are provided in **Section 4**.

UrbanGrowth NSW is preparing a modification application in relation to the earlier Part 3A approval for Sydney Heritage Fleet facilities at 5 Bank Street, Pyrmont (MP 11_0001). The proposal involves the relocation of a RMS licensed Commercial Operator from Pyrmont Bridge Road, Glebe to the Bank Street, Pyrmont site to enable the development of the New Sydney Fish Market. The proposal is in effect a decanting of water-based operations within Blackwattle Bay and allows a working harbour use to continue in generally the same location with similar operational parameters to its current use.

This WMP report has been prepared based on architectural drawings and email correspondences provided to SLR by the Client.

1.1 Site Identification

The development site is located at 5-11 Bank Street, Pyrmont, NSW 2009 and comprises the following real property titles:

- Lot 19, Portion Lot 20 and Lot 21 on DP 803159; and
- Lot 5 on DP 1209992.

The site is located within the City of Sydney (Council) local government area (LGA).

1.2 Scope

This WMP applies to the proposed demolition of existing infrastructure within 8-9 Bank Street and the construction and operation of a commercial marina facility.

The provisions contained in this WMP are to be implemented at all stages of the development and may be subject to review upon expansion or changes in construction and/or operational procedures.

Waste management for the demolition and construction stages of the development is described in **Section 5**. Waste management for the operational stage is described in **Section 6**.

1.3 Objectives

The principal objective of this WMP is to identify potential wastes likely to be generated at the site during the demolition, construction and operational stages of the proposed development, including a description of how waste would be handled, processed and disposed of (or re-used/recycled), in accordance with Council requirements and Condition 12 *Waste Management* of the NSW Planning & Environment Secretary's Environmental Assessment Requirements (SEARs: reference MP 11_0001 MOD3).

2 BETTER PRACTICE FOR WASTE MANAGEMENT AND RECYCLING

2.1 Waste Management Hierarchy

This WMP has been prepared in line with the following approaches of the waste management hierarchy, as established under the *Waste Avoidance and Resource Recovery Act 2001*:

- Waste avoidance through prevention or reduction of waste generation. Waste avoidance is best achieved through better design and purchasing choices.
- Waste reuse, without substantially changing the form of waste.
- Waste recycling, through the treatment of waste that is no longer usable in its current form to produce new products.
- Energy recovery, through thermal treatment of residual waste materials and from green waste processing.
- Waste disposal, in a manner that causes the least harm to the natural environment.

The order of preferences of approaches of the waste management hierarchy is shown in **Figure 2**.

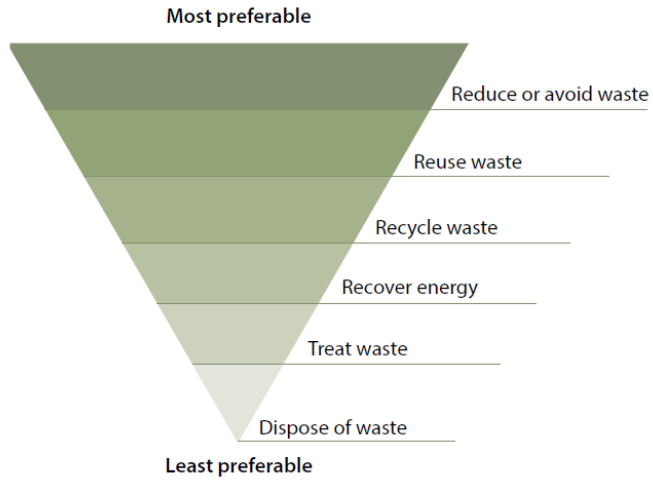


Image source: NSW EPA (2014) *NSW Waste Avoidance and Resource Recovery Strategy 2014-21.*

Figure 1 Waste management hierarchy

2.2 Benefits of Adopting Better Practice

Benefits of adopting better practice principles in waste management and recycling include:

- Enhanced social and environmental reputation of an organisation;
- Reduced costs associated with waste disposal;
- Benefits to all stakeholders and the wider community; and
- Improved environmental outcomes.

3 WASTE LEGISLATION AND GUIDANCE

The legislation and guidance outlined in **Table 1** should be referred to during all stages of the development.

Table 1 Waste Legislation and Guidance

Legislation / Guidance	Objectives
Waste Avoidance and Resource Recovery Act 2001	To promote extended producer responsibility in place of industry waste reduction plans. Specific objectives include: • To encourage efficient use of resources. • To minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste. • To ensure that industry shares with the community the responsibility for reducing and dealing with waste. • To ensure the efficient funding of waste and resource management planning, programs and service delivery.
Protection of the Environment Operations Act (POEO) 1997 & Amendment Act 2011	Administered by the Environmental Protection Authority (EPA) to enable the Government to establish instruments for setting environmental standards, goals, protocols and guidelines. The owner of a premises, the employer or any person carrying on the activity which causes a pollution incident is to *immediately* notify the relevant authorities when material harm to the environment is caused or threatened. A list of each relevant authority is provided in the POEO Amendment Act and will be noted in the site's incident register.
POEO (Waste) Regulation 2014	Contains provisions relating to the waste levy, waste tracking and management requirements for certain waste types, payment schemes for local councils, consumer packaging recycling and other miscellaneous provisions.
Marine Pollution Act 1987	The Marine Pollution Act 1987 includes the Marine Pollution Regulation 2006 which concerns sewage from vessels, other discharges from vessels and provision of waste collection facilities.
NSW EPA's Waste Classification Guidelines (Part 1) 2014	To assist waste generators to effectively manage, treat and dispose of waste to ensure the environmental and human health risks associated with waste are managed appropriately and in accordance with the POEO Act and is associated regulations.
Building Code of Australia (BCA) and relevant Australian Standards	The BCA has the aim of achieving nationally consistent, minimum necessary standards of relevant health and safety, amenity and sustainability objectives efficiently.
Sydney Development Control Plan 2012	In conjunction with the *City of Sydney Policy for Waste Minimisation in New Developments* (see below), the DCP aims to: • Reduce the amount of construction and demolition waste going to landfill; • Reduce the amount of waste generated in the operation of a development from going to landfill; and • Ensure waste from within developments can be collected and disposed in a manner that is healthy, efficient, minimises disruption to amenity and is conducive to the overall minimisation of waste generated.
City of Sydney Policy for Waste Minimisation in New Developments 2005	The policy is aimed at: • Encouraging efficient waste minimisation and resource recovery for demolition, construction and ongoing facility management; • Facilitate the efficient and safe waste and recycling collection from all premises in the Council LGA; and • To assist all stakeholders (including Council staff, planners, architects and builders) to design for sustainable, safe and healthy waste management systems.
NSW EPA's Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities 2012	The Better Practice Guidelines (EPA 2012) encourages efficient waste minimisation and resource recovery for commercial and industrial facilities and is used as a benchmark document when assessing waste production rates within Australia and details a range of waste management provisions.

Legislation / Guidance	Objectives
NSW EPA (2014) NSW Waste Avoidance and Resource Recovery Strategy 2014-21	A key component of the State Government's vision for the environmental and economic future of the state that will be supported financially by the *Waste Less, Recycle More* funding initiative providing long-term targets for 6 key result areas including reduced illegal dumping.
Department of Environment and Climate Change NSW (2007) Environmental Action for Marinas, Boatsheds and Slipways	Guide designed to help NSW marinas, boatsheds and slipway operators to: • Understand the environmental risks and responsibilities associated with the boating industry; • Take action to improve the environmental management of their operations; and • Take advantage of the business benefits that result from improved environmental practices.

4 PROJECT DESCRIPTION

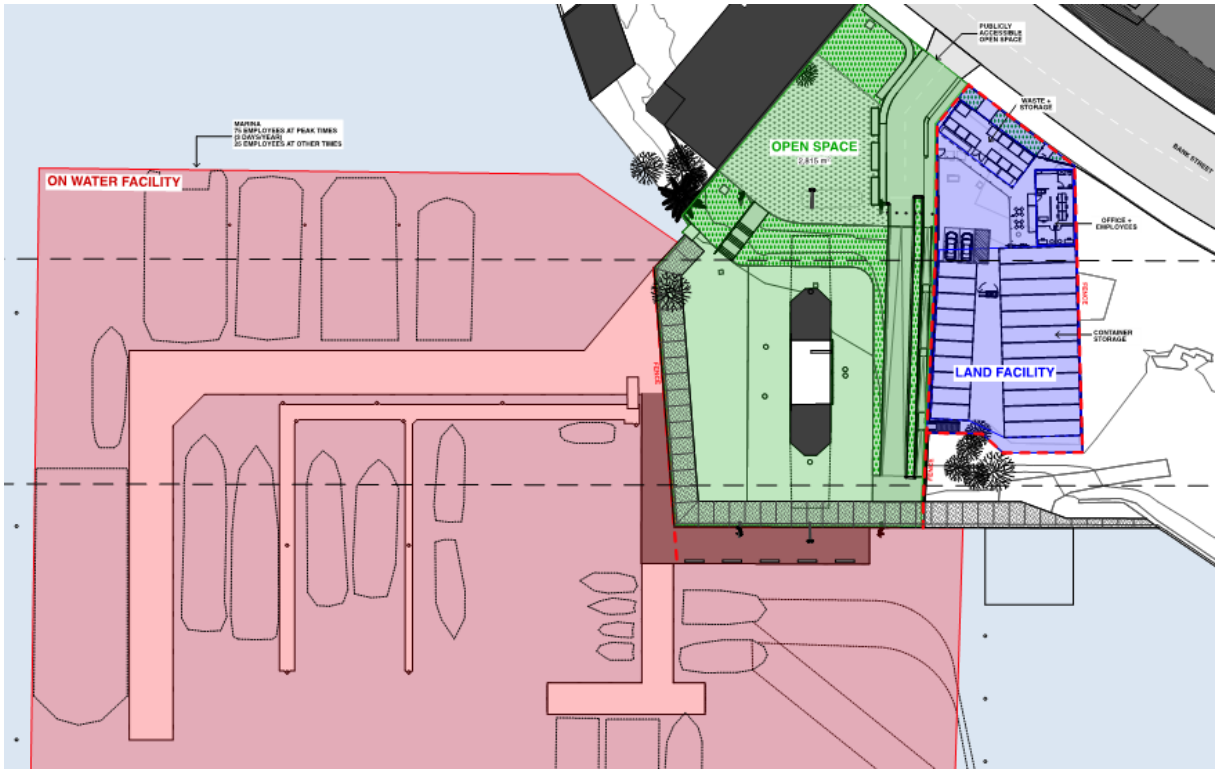
The formal project name, with regards to the S75W application, is “Bank St Commercial Wharf S75W Application”.

The proposed work for the marina development, to be called “Blackwattle Bay Marina”, comprises:

- Demolition of existing infrastructure;
- Excavation and filling for site levelling purposes;
- Construction of:
    - “Land Facility”, comprising hardstand, street-level car park spaces, a single-level office building (based on a demountable building) and enclosure/cages for waste bins, gas cylinders and ice machines;
    - “Open Space”, comprising hardstand, driveways and landscaped area; and
    - “A waste water collection and discharge-to-sewer system for wastewater from marine vessels.

The proposed layout of the development is shown in **Appendix A**. An isometric interpretation of the proposed development is shown in **Figure 2**.

Construction of the “On Water Facility” is under a separate approval and is therefore not within the scope of this WMP.



Adapted from drawing provided to SLR by Client (Drawing S75W-04, Project 160316, dated 18 May 2017)

Figure 2 **Layout of proposed marina development**

5 DEMOLITION AND CONSTRUCTION WASTE MANAGEMENT PLAN

The demolition and construction stages of developments have the greatest opportunities for waste minimisation.

5.1 Key Activities

Key demolition and construction activities at the site are anticipated to include:

- Demolition of existing infrastructure;
- Excavation and filling for site levelling purposes;
- Construction of landscaped area;
- Construction of hardstand area, driveway and carpark;
- Construction of office building; and
- Construction of enclosure for storing ice machines, gas cylinders and waste bins.

5.2 Waste Streams and Classifications

The demolition and construction stages of the proposed redevelopment are anticipated to generate the following broad waste streams:

- Demolition and excavation waste, including potentially contaminated soils;
- Construction waste;
- Plant maintenance waste;
- Packaging waste;
- Work compound (on-site employees) waste; and
- Wastewater.

Based on a review of recent aerial images of 5-11 Bank Street, the site appears to be unoccupied with the ground surfaced by concrete or bitumen.

A summary of likely waste types arising from demolition and construction activities, along with their waste classifications and proposed management methods, is provided in **Table 2.**

For further information on how to determine a waste's classification refer to the NSW EPA (2014) *Waste Classification Guidelines*[1]*.*

[1] Available online from http://www.epa.nsw.gov.au/wasteregulation/classify-guidelines.htm

Table 2 Potential waste types, classifications and management methods – demolition and construction

Waste Types	NSW EPA Classification	Proposed Reuse / Recycling / Disposal Method
Site Preparation, Demolition and Excavation		
Hardstand rubble (e.g. asphalt, concrete)	General solid waste (non-putrescible)	Reuse on-site where possible or recycled off-site
Excavation spoil	Non-putrescible waste. Waste classification depends on concentration of contaminants.	Beneficial re-use (if assessed to meet criteria for beneficial re-use) or off-site disposal
Sediment fencing, geotextile materials	General solid waste (non-putrescible)	Reuse at other sites where possible or disposal to landfill
Steel reinforcing, other metal (e.g. wire mesh)	General solid waste (non-putrescible)	Off-site recycling
Conduits and pipes	General solid waste (non-putrescible)	Off-site recycling
Timber formwork	General solid waste (non-putrescible)	Reuse on-site or off-site recycling
Metals and bulk electrical cabling	General solid waste (non-putrescible)	Off-site recycling
Glass	General solid waste (non-putrescible)	Off-site recycling
Light bulbs	Hazardous waste	Off-site recycling
Plant Maintenance		
Empty oil and other drums / tins (e.g. fuel, chemicals, paints, spill clean ups)	Hazardous waste if the containers were previously used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) and from which residues have not been removed by washing or vacuuming. General solid (non-putrescible) waste if the containers have been cleaned by washing or vacuuming.	Transport to comply with the transport of Dangerous Goods Code applies in preparation for off-site recycling or disposal at licensed facility. (Note: Discharge to sewer is likely to be subject to Trade Waste Agreement with Sydney Water)
Air filters and rags	General solid (non-putrescible) waste	Disposal at landfill
Oil filters	Hazardous waste	Off-site recycling
Batteries	Hazardous waste	Off-site recycling
Packaging		
Packaging materials, including wood, plastic (including stretch wrap or LLPE), cardboard and metals	General solid (non-putrescible) waste	Off-site recycling
Wooden crates	General solid (non-putrescible) waste	Reused for similar projects, returned to suppliers, or off-site recycling
Work Compound and Associated Offices		
Recyclable beverage containers (glass and plastic bottles, aluminium cans), tin cans	General solid (non-putrescible) waste	Co-mingled recycling at off-site licensed facility
Clean paper and cardboard	General solid (non-putrescible) waste	Paper and cardboard recycling at off-site licensed facility
General domestic waste generated by workers (soiled paper and cardboard, food stuffs, polystyrene)	General solid (non-putrescible) waste mixed with putrescible waste	Disposal at landfill
Pump-out waste and sewage	Liquid (trade) waste	Off-site disposal at licensed facility or disposal direct to sewer where arranged with Council

Source: http://www.epa.nsw.gov.au/wasteregulation/classify-waste.htm

5.3 Estimated Quantities of Demolition and Construction Waste

Demolition of existing site infrastructure is anticipated to produce primarily excavation spoil and hardstand rubble. The estimated quantities of excavation spoil and hardstand rubble (**Table 3** and **Table 4**) are based on the combined area of the "Land Facility" and "Open Space" as shown on Drawing S75W-04, less the area of the footprint of the Anzac Bridge pylon footprint. Assumed average depth of excavation across the site is 1 m. Assumed depth of concrete/hardstand across the site is 0.1 m.

Table 3 Estimated density and quantity of excavation spoil

	Area (m^2)	Depth (m)	Volume (m^3)	Density (t/m^3)[1]	Quantity (t)
Total area	4,145	1	4,145	1.9	7,876
Pylon footprint area	530	1	530	1.9	1,007
Earthworks area (total area less pylon area)	**3,615**	**1**	**3,615**	**1.9**	**6,869**

1. Low range bulk density for "medium-dense sands and gravels" (Table 6-1-1 from Tomlinson (1986)[2])

Table 4 Estimated density and quantity of hardstand rubble

	Area (m^2)	Depth (m)	Volume (m^3)	Density (t/m^3)[1]	Quantity (t)
Total area	4,145	0.1	414.5	1.9	788
Pylon footprint area	530	0.1	53.0	1.9	101
Earthworks area (total area less pylon area)	**3,615**	**0.1**	**361.5**	**1.9**	**687**

1. Low range bulk density for "medium-dense sands and gravels" (Table 6-1-1 from Tomlinson (1986))

Construction of the landscaped and hardstand areas is primarily filling/surfacing work. As such, constructing the landscaped and hardstand areas is not anticipated to generate a significant quantity of waste beyond the spoil and rubble from the excavation works.

The proposed office building is indicated on the architectural drawings as a "demountable office building" and the enclosure for storing ice machines, gas cylinders and waste bins is assumed to be a prefabricated structure. Other features of the proposed development include hardstand ground cover and landscaping. The amount of waste anticipated from construction of these site features is therefore expected to be minimal.

In the absence of waste generation rates for construction activities from City of Sydney, SLR has adopted the waste types and quantities for construction of a factory building provided in *The Hills Development Control Plan 2012* to provide an estimate of construction wastes for the development (**Table 5**). Of the buildings types available in *The Hills Development Control Plan 2012*, the rates for a factory building were chosen as a factory best reflects the construction of pre-fabricated structures onsite. As the proposed marina structures are substantially smaller than, different to and comprise a larger proportion of prefabricated components compared to a typical factory, the estimates in **Table 5** should be interpreted as being conservative.

Areas for the office building and storage enclosure used in **Table 5** are as per dimensions shown on Drawing S75W-09.

[2] Tomlinson M.J. (1986) *Foundation design and construction.* John Wiley & Sons.

Table 5 Estimated waste types and quantities for construction of office building and storage enclosure

Feature	Area (m^2)	Estimated quantity (tonnes)							
		Timber	Concrete	Bricks	Gyprock	Sand/Soil	Metal	Other	**Total**
Office	72	0.02	0.15	0.12	0.03	0.35	0.04	0.04	**0.75**
Enclosure	94	0.02	0.20	0.16	0.04	0.45	0.06	0.05	**0.98**
	Total	**0.04**	**0.35**	**0.28**	**0.07**	**0.80**	**0.10**	**0.09**	**1.73**

Based on waste types and rates (t/1000m^2) for construction of a "factory" building[3]

5.4 Waste Avoidance

The building designer should consider:

- Using recycled steel;
- Reducing the use of PVC;
- Preferentially using paints, floor coverings and adhesives with low VOC (volatile organic compound) content;
- Using low formaldehyde wood products, post-consumer reused timber and/or Forest Stewardship Council (FSC) certified timber;
- Using fittings and furnishings that have been recycled, are made from or incorporate recycled materials and have been certified as sustainable or environmentally friendly by a recognised third party certification scheme; and
- Preferentially using building materials, fittings and furnishings (including structural framing, roofing and façade cladding) that have longer life and better re-use and/or recycling potential.

The building contractor should:

- Apply practical building designs and construction techniques;
- Sort and segregate demolition and construction wastes to ensure efficient recycling of wastes (see also **Section 5.6.1**);
- Store wastes on site appropriately to prevent cross-contamination and/or mixing of different waste types (see also **Section 5.6.1**);
- Exercise a preference for long lifespan and/or high potential for re-use in selecting construction materials;
- Re-use formwork where appropriate;
- Reduce packaging waste by:
    - Returning packaging to suppliers where possible and practicable;
    - Purchasing in bulk;
    - Requesting cardboard or metal drums rather than plastics;
    - Requesting metal straps rather than shrink wrap;
    - Using returnable packaging such as pallets and reels; and
- Ensure subcontractors are informed of and implement site waste management procedures.

[3] *The Hills Development Control Plan 2012* – Appendix A Waste Management Plan (p 6).

5.5 Re-use, Recycling and Disposal

The building contractor is to implement the following with respect to re-use, recycling and disposal of demolition and construction waste:

- Provide separate waste bins for recyclable and non-recyclable general wastes;
- Hardstand rubble to be re-used on site or recycled off-site;
- Assess excavation spoil for contamination status and beneficial re-use;
- Waste oil to be recycled or disposed of in an appropriate manner;
- Retain used crates for storage purposes unless damaged;
- Recycle glass and steel;
- Recycle or dispose of solid waste timber, brick or concrete (where such waste cannot be re-used on site) to an appropriately licenced construction and demolition (C&D) waste recycling facility or an appropriately licenced landfill;
- Dispose of all asbestos, hazardous and/or intractable wastes in accordance with WorkCover NSW and NSW EPA requirements; and
- Batteries to be delivered to off-site recycling facilities/centres.

5.6 Waste Segregation, Storage and Servicing

5.6.1 Waste Segregation and Storage

Waste materials produced from demolition and construction activities are to be segregated and stored separately on site.

It is anticipated that the site will provide allowances for separate storage (e.g. separate skip bins and/or appropriately managed stockpiles) of the following waste types:

- Hardstand rubble;
- Excavation spoil;
- Steel/scrap metal;
- General waste; and
- Materials with potential for off-site re-use.

If there is insufficient space on site for full segregation of waste types, the building contractor should consult with recycling facilities to determine which waste types may be stored together and not cause difficulties in recycling the waste.

5.6.2 Waste Storage Areas

Areas designated for waste storage should:

- Allow unimpeded access by site personnel and waste disposal contractors;
- Have in place adequate environmental management controls to prevent off-site migration of waste materials and/or contamination from the waste; and
- Not present hazards to human health or the environment.

5.6.3 Waste Servicing and Transport Off-site

The building contractor is to:

- Arrange for suitable waste collection contractors to remove construction and demolition waste from site;
- Ensure waste bins are not filled beyond recommended filling levels;
- Ensure that all bins and loads of waste materials leaving site are covered;
- Maintain waste disposal documentation detailing, at a minimum:
  - Descriptions and estimated amounts of all waste materials removed from site;
  - Details of the waste/recycling collection contractor(s) and facilities receiving the waste/recyclables;
  - Records of waste/recycling collection vehicle movements (e.g. date and time of loads removed, licence plate of collection vehicles, tip dockets from receiving facility);
  - Waste classification documentation for materials disposed to off-site recycling or landfill facilities.

Removal of waste is anticipated to be carried out during hours approved by Council.

5.7 Contaminated / Hazardous Waste

Contaminated materials, where identified, are to be removed by appropriately licenced contractors and transported to facilities licenced to accept such materials for treatment and/or disposal in accordance with NSW EPA regulations. Further details on contaminants of concern and areas of environmental concern identified at the site are provided in Consara Pty Ltd (2017)[4].

Where unexpected materials are encountered which are, or are suspected of being, contaminated or hazardous, at a minimum, the following shall be undertaken:

- Work in the vicinity of the suspect material is to stop immediately and the area isolated;
- Site manager is to contact a relevant hazardous materials assessor and/or environmental consultant (as necessary) to arrange an assessment of the suspect material and advise on subsequent management procedures; and
- The building contractor's unexpected finds protocol, if available, be implemented.

Refer also to the Construction Environmental Management Plan[5] for further site-specific details on management of contaminated/hazardous waste.

5.8 Liquid Waste Management

Wastewater or liquid waste generated from site demolition or construction activities is not permitted to enter the stormwater system or migrate off-site.

Areas, if any, designated on site for wash-down of equipment plant or machinery are to be appropriately bunded and isolated from the local stormwater system and groundwater.

[4] Consara Pty Ltd (2017) *Final Report Assessment of Environmental Condition Bank Street Commercial Wharf 5-11 Bank Street Pyrmont NSW.* Report dated 22 May 2017.
[5] Consara Pty Ltd (2017) *Final Report Construction Environmental Management Plan Bank Street Commercial Wharf, 5-11 Bank Street Pyrmont NSW.* Report dated 22 May 2017.

Liquid waste / wastewater are to be removed by a suitably qualified liquid waste contractor and transported to an appropriately licenced facility for treatment and/or disposal in accordance with NSW EPA regulations.

Refer also to the Soil and Erosion Management Plan[6] and the Construction Environmental Management Plan for further site-specific details on wastewater and liquid waste management, treatment and/or disposal.

5.9 Spills Management

Spillages are to be immediately contained (if safe to do so) and the site manager notified immediately.

Spill containment kits and spill control equipment are to be provided and maintained in sufficient numbers and at appropriate locations to allow ready and rapid access by site personnel. Safety Data Sheets (SDSs) should also be available to provide advice on spill clean-up and disposal.

Refer also to the Construction Environmental Management Plan for further site-specific details on spills management.

5.10 Signage

Standard signage is to be posted in all storage/waste collection areas.

All waste containers are required to be labelled correctly and clearly to identify materials stored within.

Signs approved by the NSW EPA for labelling of waste materials are available online (http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm) and should be used where applicable. A selection of signs prepared by NSW EPA is provided in **Figure 4**.

Figure 3 Example NSW EPA signs for labelling of waste materials

5.11 Site Inductions

Waste management measures and procedures are to be included in the site induction for all personnel working at the site.

With respect to waste management, the site induction is to include, at a minimum:

- An outline of this WMP;

[6] Section 6 of Warren Smith & Partners (2017) *Civil Engineering Services Bank Street Commercial Wharf Upgrade Stormwater Management Report.* Report dated 17 May 2017.

- Legal obligations;
- Emergency response procedures on site;
- Waste storage locations and separation of waste;
- Litter management in transit and on site;
- Implications of poor waste management practices;
- Correct use of spill kits; and
- Responsibility and reporting (including identification of personnel responsible for onsite waste management and individual responsibilities).

5.12 Monitoring and Reporting

Records of volumes or tonnages of waste re-used, recycled or disposed to landfill are to be maintained by the building contractor. Additionally, dockets/receipts verifying recycling and/or disposal in accordance with the WMP must be retained and presented to Council if requested.

Daily visual inspections of waste storage areas will be undertaken by site personnel to identify and rectify any issues concerning waste management at the site, as well as identifying opportunities to improve waste management at the site. A written record of these inspections, which will include observations made and the results of any remedial actions taken, is to be undertaken and retained by the building contractor as part of the construction environmental management documentation.

Refer also to the Construction Environmental Management Plan for further site-specific details on waste monitoring and reporting requirements.

5.13 Roles and Responsibilities

Suggested roles and responsibilities for waste management at the site are provided in **Table 6**.

Where possible, a construction environmental manager should be appointed for the demolition and construction work. Where a construction environmental manager is not appointed, responsibilities in **Table 6** for the construction environmental manager will become those of the site manager.

Table 6 Suggested roles and responsibilities for demolition and construction work

Site Manager	• Ensuring plant and equipment are well maintained. • Ordering only the required amount of materials. • Keeping materials segregated to maximise reuse and recycling. • Ensuring that waste sorting and storage areas are maintained in a tidy and functional state and do no present hazards to human health or the environment. • Ensure hazardous/contaminated materials are appropriately managed and disposed of. • Ensure site records and documentation is kept and is complete. • Ensure this WMP is implemented. • Liaise with Council as required.
Construction Environmental Manager or equivalent	• Ensuring staff and contractors are aware of site requirements for waste management. • Developing or identifying, and using, local commercial opportunities for re-use of materials where re-use on-site is impractical. • Facilitate waste collection by Council. • Engage suitable waste collection/disposal contractors. • Approval of off-site waste disposal locations and checking licensing requirements. • Arranging for the assessment of potentially hazardous and/or contaminated materials and liquid wastes. • Monitoring, inspection and reporting requirements.

6 OPERATIONAL WASTE MANAGEMENT PLAN

6.1 Targets for Resource Recovery

The waste management performance of each development should contribute to the overall NSW State target for recycling, which is expected to increase from 52% (2010 to 2011) to 70% (by 2021 to 2022) of the total waste generation per capita (NSW EPA (2014) *NSW Waste Avoidance and Resource Recovery Strategy 2014-21*).

6.2 Waste Streams and Classifications

Operation of Blackwattle Bay Marina is anticipated to generate the following broad waste streams:

- General waste and co-mingled recycling (from boats and from the marina office);
- Bulk packaging wastes, including polystyrene and cardboard boxes;
- Grey water and black water from boats; and
- Stores, plant and general maintenance wastes.

Potential waste types, their associated waste classifications, and management methods are provided in **Table 7**.

For further information on how to determine a waste's classification, refer to the NSW EPA (2014) *Waste Classification Guidelines.*

6.3 Waste Management Overview

Operational waste management is proposed to comprise:

- Garbage receptacles to receive waste from users of / visitors to the marina. Waste in garbage receptacles to be transferred to waste storage bins (see below) by marina staff.
- Marina staff must promptly remove anything that may have been spilled from the receptacles and must take each action as may be necessary to clean the area within which it was spilled.
- A bin storage enclosure (**Figure 4**) for general wastes and recycling. The bin storage enclosure will have an area (based on Drawing S75W-09, the) of approximately 70 m^2 accommodating fourteen (14) 3000 L capacity front-lift bins.
- As an alternative to 3000 L bins, smaller-capacity mobile garbage bins (MGBs) can be used to store general wastes and recyclables.
- Garbage bins should be mobile, because the current configuration of the site layout will require the bins to be moved by marina staff to the kerbside for collection and then returned to the storage enclosure.
- Bins are to be collected by waste contractors. It is recommended that recyclable waste is collected separately (and segregated) from non-recyclable waste.
- Grey water and black water from vessels will be disposed of in an on-site waste water collection facility connected to the sewer. Discharges to the sewer will likely be under a Trade Waste Agreement with Sydney Water. The location and specifications of the wastewater collection are currently unknown, although it is anticipated to be located away from the water's edge and away from stormwater drains.
- No garbage or other stock is permitted to be stored temporarily or permanently on the wharves, gangways, boardwalk or common areas.
- The marina operator must not dispose, or allow disposal, of any chemical, biological, toxic or other hazardous waste in a manner that would contravene any relevant law applying to the disposal of such waste.

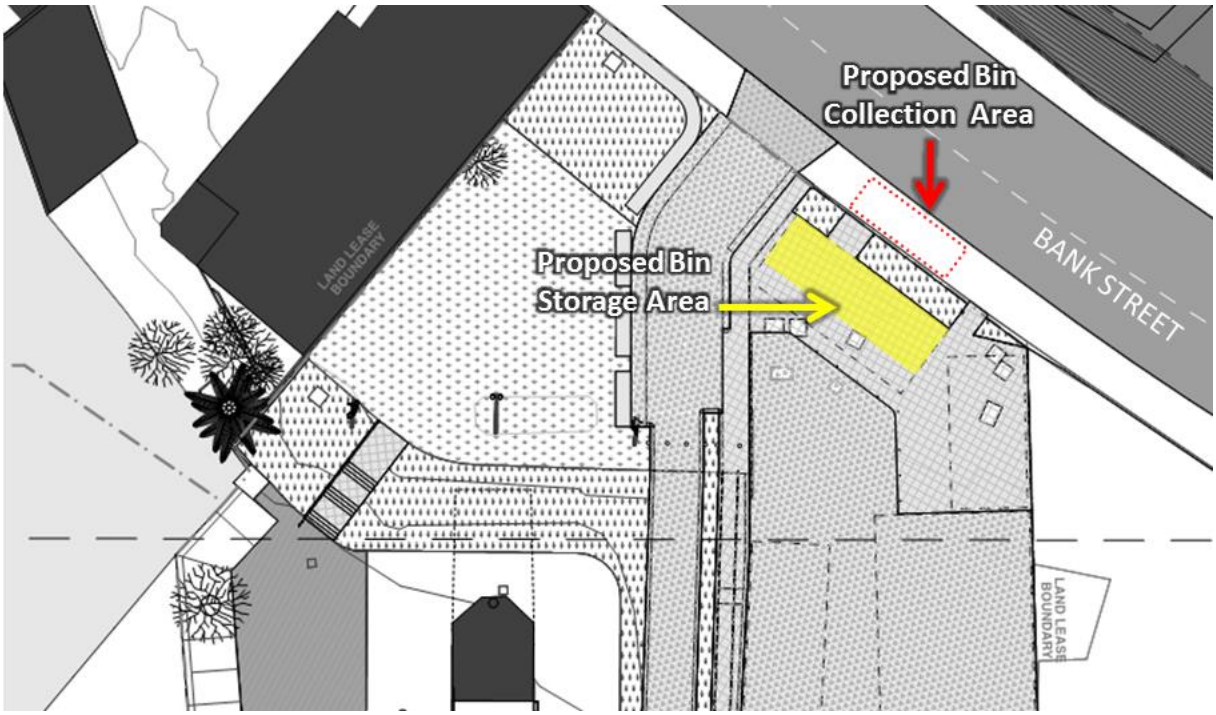
- The marina operator must ensure that, between collection periods, any food scraps are securely wrapped and covered to prevent permeation of odours.
- Rubbish may be removed from vessels upon returning to the marina only between the hours of 8:00am and 4:00pm.

Table 7 Potential waste types, classifications and management methods - operation

Waste Types	NSW EPA Classification	Proposed Reuse / Recycling / Disposal Method
General		
General garbage (including non-recyclable plastics)	General solid (putrescible and non-putrescible) waste	Disposal at landfill
Recyclable beverage containers (glass and plastic bottles, aluminium cans), tin cans	General solid (non-putrescible) waste	Co-mingled recycling at off-site licensed facility
Food waste	General solid (putrescible) waste	Option to compost on site. Alternatively dispose to landfill with general garbage
Cardboard / bulky cardboard boxes	General solid (non-putrescible) waste	Cardboard recycling at off-site licensed facility
Bulky polystyrene	General solid (non-putrescible) waste	Disposal at landfill
Furniture	General solid (non-putrescible) waste	Off-site reuse or disposal to landfill
E-waste, batteries, printer toners and ink cartridges	Hazardous waste	Off-site recycling (free disposal box / bags and pickup service exists for printer toners and ink cartridges)
Vessels		
General garbage, recyclable containers, food waste.	General solid (putrescible and non-putrescible) waste	Disposal at landfill, recycling at off-site facilities or compost on site if feasible.
Grey water	Liquid waste	Waste water collection facility Discharge to sewer is likely subject to Trade Waste Agreement with Sydney Water
Black water	Liquid waste	Waste water collection facility, preferably connected to an effluent reuse scheme Discharge to sewer subject is likely subject to Trade Waste Agreement with Sydney Water Alternatively, direct removal from vessel holding tank by a licensed waste contractor
Maintenance		
Spent smoke detectors[1]	General solid (non-putrescible) waste OR Hazardous waste (some commercial varieties)	Disposal to landfill, or off-site disposal at licensed facility
Glass (other than containers)	General solid (non-putrescible) waste	Off-site recycling
Light bulbs / fluorescent tubes	Hazardous waste	Off-site recycling
Cleaning chemicals, anti-fouling agents, solvents, area wash downs, empty oil / paint drums / chemical containers	Hazardous waste if containers used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) and residues have not been removed by washing or vacuuming. General solid (non-putrescible) waste if containers cleaned by washing or vacuuming.	Transport to comply with the transport of Dangerous Goods Code applies in preparation for off-site recycling or disposal at licensed facility. Discharge to sewer likely to be subject to Trade Waste Agreement with Sydney Water.

1. The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) require that when more than 10 smoke alarms (particularly americium-241 sources) are collected for bulk disposal they must be treated as radioactive waste and the requirements of the National Health and Medical Research Council's *Code of practice for the near-surface disposal of radioactive waste in Australia (1992)* must be met. Contact ARPANSA for more information. http://www.arpansa.gov.au/radiationprotection/factsheets/is_smokedetector.cfm

Source: http://www.epa.nsw.gov.au/wasteregulation/classify-waste.htm



Adapted from Drawing S75W-08

Figure 4 Proposed bin storage enclosure and bin collection area

6.4 Estimated Waste Generation

6.4.1 Waste Generation Rates

SLR used the following resources to estimate the operational waste generation rates (**Table 8**) for Blackwattle Bay Marina:

- Office building: Appendix B of *City of Sydney Policy for Waste Minimisation in New Developments 2005*;
- Wastewater from Office building: Wastewater generation rates from TasWater's *Price and Service Plan 2015-18* Version 3;
- General comingled waste from vessels: Table 17 of Appendix A of NSW EPA's *Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities*;
- Grey water from vessels: Table 2 of US EPA (2011) *Graywater discharges from vessels*; and
- Black water from vessels: Table 1 of EPA SA (2010) *Water Quality Guidelines Managing vessel wastewater for black and/or grey water*.

6.4.2 Estimated Operational Waste Quantities

Estimated operational waste quantities for the Blackwattle Bay Marina are presented in **Table 9**. The quantities in **Table 9** are based on the waste generation rates described in **Section 6.4.1** and **Table 8**. The quantities have been rounded up to the nearest 1.0 L.

As the waste quantities are estimates only, it is recommended that waste audits be conducted approximately one month into the operational phase of the development to improve understanding of the actual rates of waste generation. Furthermore, given that waste from boats can change significantly, we recommend the size of the bin storage area, as shown on the architectural drawings, be maintained.

Table 8 Operational waste generation rates

Feature	Adopted Waste Generation Rate		Source / Notes
	Waste	Recycling	
Office: waste	10 L / 100 m^2 / day	10 L / 100 m^2 / day	Rate for "Offices"
Office: wastewater	1,600 L / m^2 / annum	not applicable	Marina = 0.008 ET / m^2
Vessels: waste	13.7 L / day / vessel	no information	Rate for "Motel with restaurant, per occupied room per night"
Vessels: grey water	170 L / person / day	not applicable	US rate = 45 gallons / day / person
Vessels: black water	15 L / person / day	not applicable	Based on upper-limit capacity of marine toilets per person per day

ET = An Equivalent Tenement (ET) is a measure of the load a property places on the sewerage system. One ET is considered to be the sewage discharge from an average single residential house, under dry weather flows. This has been determined to be 200 kL / annum. ET rates for different land uses are calculated as being a factor of this average sewage discharge rate.

Table 9 Estimated operational waste quantities

Feature	Size / Number	Waste per day (L)		Waste per week (L)	
		Waste	Recycling	Waste	Recycling
Office: waste	72 m^2	8	8	51	51
Office: wastewater	72 m^2	370	not applicable	2,216	not applicable
Vessels: waste	22 vessels	302	no information	2,110	no information
Vessels: grey water	22* vessels, 4 persons per vessel	14,989	not applicable	104,920	not applicable
Vessels: black water	22* vessels, 4 persons per vessel	1,320	not applicable	9,240	not applicable
	Total solid waste	**310**	**8**	**2,161**	**51**
	Total grey wastewater	**14,989**	not applicable	**104,920**	not applicable
	Total black wastewater	**1,690**	not applicable	**11,456**	not applicable

* Proposed maximum number of berths available.

Numbers may not tally due to rounding. One week comprises seven days. Wastewater from the office is considered to be black water.

6.5 Waste Storage

6.5.1 Garbage Receptacles and Bins

Garbage receptacles are to be provided and maintained in clean, dry, adequately covered areas approved by the Roads and Maritime Services.

The architectural drawings indicate 3000 L capacity front-lift bins will be used for waste storage. However, it is anticipated the type of bins will be reviewed as the development progresses. In any case, the current site layout requires bins to be mobile to facilitate their movement to the kerbside for collection and return to the designated storage enclosure.

6.5.2 Wastewater Collection Facility

The location and specifications of the wastewater collection facility are to be confirmed. It should, however, be:

- Located away from the water's edge and away from stormwater drains;

- Have the capacity to hold, at a minimum, the estimated volumes[7] of grey water and black water indicated in **Table 9**; and
- Discharge to sewer only under conditions as stipulated in a Trade Waste Agreement with Sydney Water.

6.5.3 Bin Storage Space Requirements

Based on the estimated waste quantities (**Section 6.4.2**), the estimated numbers of bins required to hold garbage and recycling and the associated sizes of bin storage space are shown in **Table 10**. The estimates in **Table 10** are based on a minimum bin collection frequency of one collection per week and have been rounded up to the nearest whole number.

For the 240 L and 1000 L capacity bins, the size of the bin storage space is calculated using the length and width of each bin as per Appendix F of the *City of Sydney Policy for Waste Minimisation in New Developments 2005* and does not consider additional space required to move bins in and out of the storage area.

The current bin storage area, at approximately 70 m^2, is considered sufficient in size to store the number of bins required to hold the quantities of waste estimated in **Table 10**.

As the waste quantities are estimates only, it is recommended that waste audits be conducted approximately one month into the operational phase of the development to improve understanding of the actual space requirements for bin storage. Furthermore, given that waste from boats can change significantly, we recommend the size of the bin storage area, as shown on the architectural drawings, be maintained.

Table 10 Estimated numbers of bins and bin storage space

Bin Capacity (L)	Dimensions per bin (m)	Number of bins required		Bin storage space size (m^2)
		Waste	Recycling	
240	0.735 x 0.580	10	1	5
1000	1.160 x 1.360	3	1	7
3000	1.5 x 1.8[1]	1	1	6

1. http://www.instantwaste.com.au/services/front-lift-bins/

6.5.4 Bin Storage Area Requirements

In accordance with Council's planning requirements, the proposed bin storage area is to have the following features:

- Must comply with the Building Code of Australia and relevant Australian Standards;
- Be ventilated with unobstructed natural ventilation openings direct to the external air, not less than 1/20th of the floor area;
- The bin storage area should be at street level;
- The path for bins between the storage location and collection point is to be level and free of steps or kerbs;

[7] As the waste quantities are estimates only, it is recommended that waste audits be conducted approximately one month into the operational phase of the development to improve understanding of the actual capacity required of the waste water collection facility.

- Maximum travel distance between the bin storage location and collection point is to be:
    - 10 m (for 240 L and 1000 L bins)
    - < 3 m (for 3000 L bins)
- The floor of the bin storage area should be constructed of approved, solid, impervious material and be cement rendered internally to a smooth even surface;
- The walls and floor of the enclosure should be finished in a light colour;
- Have a close-fitting and self-closing door, openable from within the enclosure;
- An adequate supply of hot and cold water be provided via a centralised mixing valve, with hose cock located as close as practicable to the doorway;
- Clear and easy-to-read “No Standing” signs and “Danger” warning signs for children must be fixed to the external face of the enclosure where appropriate;
- Clear and easy to read sign(s) designating storage of recyclable is to be fixed to the internal walls;
- Prevent the entry of vermin;
- Protect equipment from theft and vandalism;
- Be well-lit;
- Smoke detectors be installed in accordance with Australian Standards and connected to the fire prevention system of the marina; and
- Any facet of the waste management system visible from the outside of the enclosure must blend in with the development.

6.6 Waste Transfer and Servicing

Site staffs are to move the garbage bins to the kerbside for collection, then return the empty bins to the bin storage area after collection.

6.7 Bulky Waste Storage

Sufficient space will be provided within the development for the storage of large and/or bulky items that cannot be deposited in the general waste or recyclables bins.

Space will also be allocated to store reusable items, such as crates, so that storage in a public place is avoided.

The marina manager may consider organising a skip bin to remove bulky waste and equipment as required, or engage a contractor to collect and transport these items for re-use, recycling or disposal at a NSW EPA licensed facility.

A suitably licensed e-waste recycling contractor will be engaged to collect and recycle all e-waste items generated at the facility.

6.8 Communication Strategies

Waste management initiatives and management measures should be clearly communicated to site staff, visitors and cleaning staff. Benefits of effective communication include:

- Improved satisfaction with services;
- Increased ability and willingness to participate in recycling;
- Improved amenity and safety;

- Improved knowledge and awareness through standardisation of services;
- Increased awareness or achievement of environmental goals and targets;
- Reduced contamination of recyclables stream;
- Increased recovery of recyclables and organics (where implemented) material; and
- Greater contribution to state-wide targets for waste reduction and resource recovery.

To realise the above benefits, the following communication strategies should be considered by the marina manager:

- Use of consistent signage and colour coding throughout the marina;
- Ensure all staff, visitors and contractors are informed of correct waste separation and management procedures, including this WMP;
- Provide directional signage to show location of and routes to the waste storage enclosure; and
- General waste bins and co-mingled waste bins should be clearly labelled to ensure no cross contamination and to identify the types of waste that may be disposed of in each bin.

Signs approved by the NSW EPA for labelling of bins and waste storage areas are available online (http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm).

6.9 Monitoring

Auditing and visual monitoring of bins, the bin storage enclosure prior to collection and the waste water collection system should be undertaken by the marina manager at the following frequencies:

- Weekly within the first two (2) months of operation to ensure the waste management system is sufficient for the operation; and
- Every six (6) months, to ensure waste is being managed appropriately.

The wastewater collection system is to be regularly monitored and appropriately serviced and maintained. Discharges from the wastewater collection system are to be monitored to ensure compliance with discharge conditions as per the Trade Waste Agreement.

Any deficiencies identified in the waste management system should is to be rectified by the marina manager as soon as practicable.

6.10 Roles and Responsibilities

It is the responsibility of the marina manager to implement this WMP and a responsibility of all staff and visitors to follow the waste management procedures set out by the WMP.

A summary of recommended roles and responsibilities is provided in **Table 11**.

Table 11 Suggested roles and responsibilities

Responsible Person	General Tasks
Marina Manager	Ensure the WMP is implemented throughout the life of the operation.
	Update the WMP as needed to ensure the plan remains applicable.
	Undertake liaison with and management of contractor collections.
	Conduct inspections of bins, the bin storage enclosure and waste water collection system.
	Manage any complaints and non-compliances reported through waste audits etc.
	Perform inspections of waste storage enclosure and waste water collection system on a regular basis for cleanliness.
	Organise cleaning and maintenance requirements for waste storage areas and bins as required.
	Ensure the waste water collection system is appropriately serviced and maintained, and that discharges are in compliance with Trade Waste Agreement conditions.
	Ensure effective signage, communication and education is provided to alert new staff and visitors about the provisions of this WMP.
	Monitor and maintain signage to ensure it remains clean, clear and applicable.
	Ultimately responsible for the management of all waste management equipment, cleaning requirements, waste transfer and collection arrangements.
Cleaners / Caretaker	Monitor waste water collection system to ensure it is operating correctly.
	Monitor bins to ensure no overfilling occurs.
	Ensure waste and recycling storage areas are kept tidy.
	Transfer of bins to the waste storage area and collection point as required.
	Cleaning of all bins and waste and recycling area as required.

ARCHITECTURAL DRAWINGS

BANK STREET COMMERCIAL WHARF S75W APPLICATION

Drawing No:

S75W-01	CONTEXT
S75W-02	SITE ANALYSIS
S75W-03	CONSTRAINTS PLAN
S75W-04	SITE PROGRAM
S75W-05	SITE PLAN
S75W-06	SITE PLAN 1:200
S75W-07	SITE PLAN 1:200
S75W-08	LANDSCAPE PLAN
S75W-09	ADMINISTRATION PLAN
S75W-10	ADMINISTRATION ROOF PLAN
S75W-11	BANK STREET ELEVATION
S75W-12	ELEVATIONS 1
S75W-13	ELEVATIONS 2
S75W-14	SECTIONS
S75W-15	Shadow Diagrams
S75W-16	Shadow Diagrams
S75W-17	Shadow Diagrams
S75W-18	Shadow Diagrams
S75W-19	Shadow Diagrams
S75W-20	Shadow Diagrams
S75W-21	VIEWS
S75W-22	VIEWS
S75W-23	VIEWS
S75W-24	VIEWS
S75W-25	VIEWS
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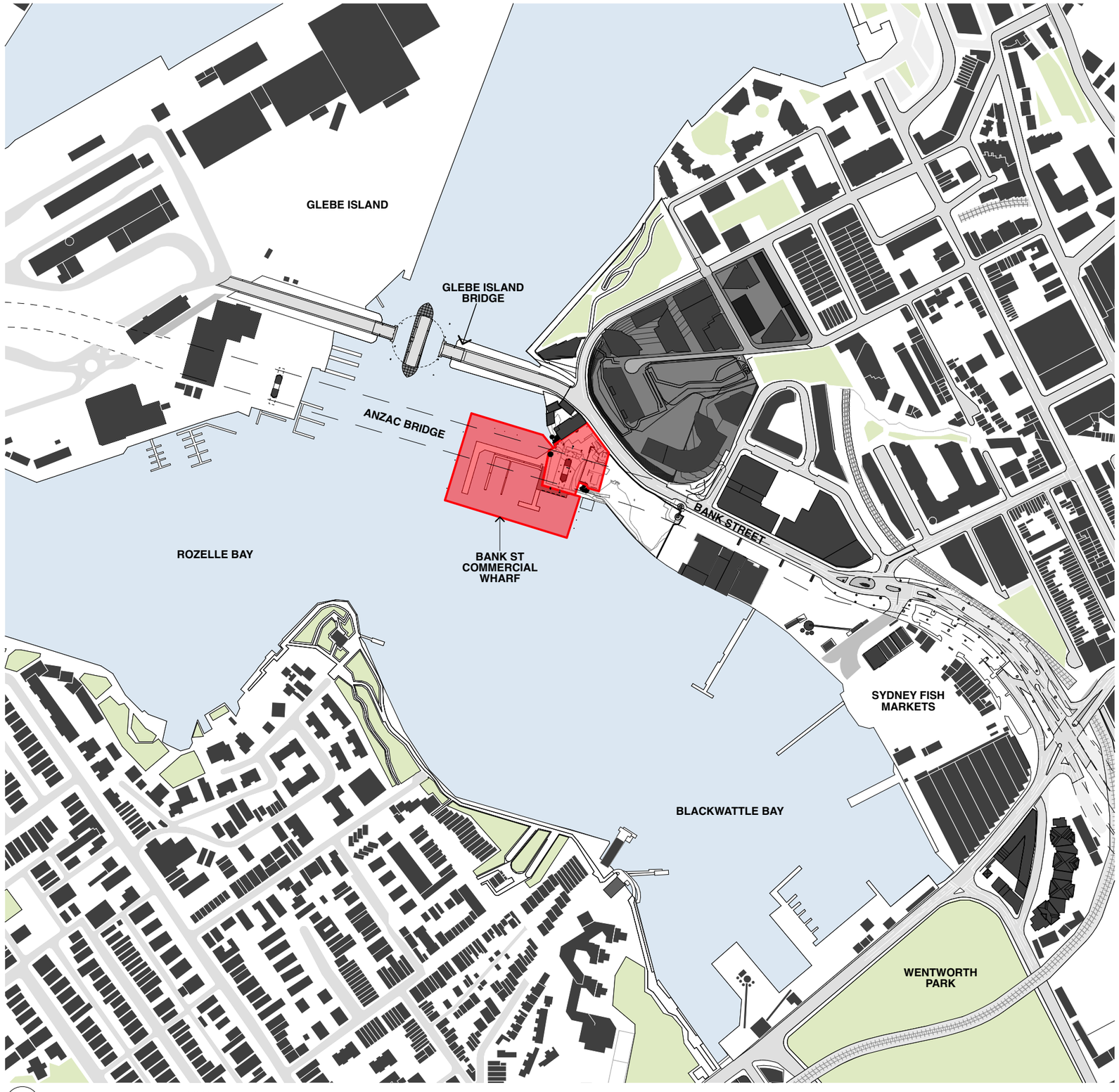
S75W-30	VIEWS
S75W-31	VIEWS



1 **CONTEXT PLAN**
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		DRAFT FOR DISCUSSION 03.05.17
		DRAFT FOR DISCUSSION 05.05.17
		DRAFT FOR DISCUSSION 10.05.17
		DRAFT FOR DISCUSSION 18.05.17

GENERAL NOTES
1. ALL WORKS TO BE IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA, AUSTRALIAN STANDARDS, AND WITH MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS.
2. CONTRACTOR TO CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATION OR SET OUT.
3. CONTRACTOR TO CONFIRM STRUCTURAL INTEGRITY OF ALL MEMBERS AND CONNECTIONS PRIOR TO FABRICATION.
4. SHOP DRAWINGS TO BE PROVIDED AND APPROVED BY ARCHITECT PRIOR TO CONSTRUCTION.

PROJECT NUMBER
160316

CLIENT
URBAN GROWTH NSW

PROJECT NAME
Bank St Commercial Wharf
S75W Application

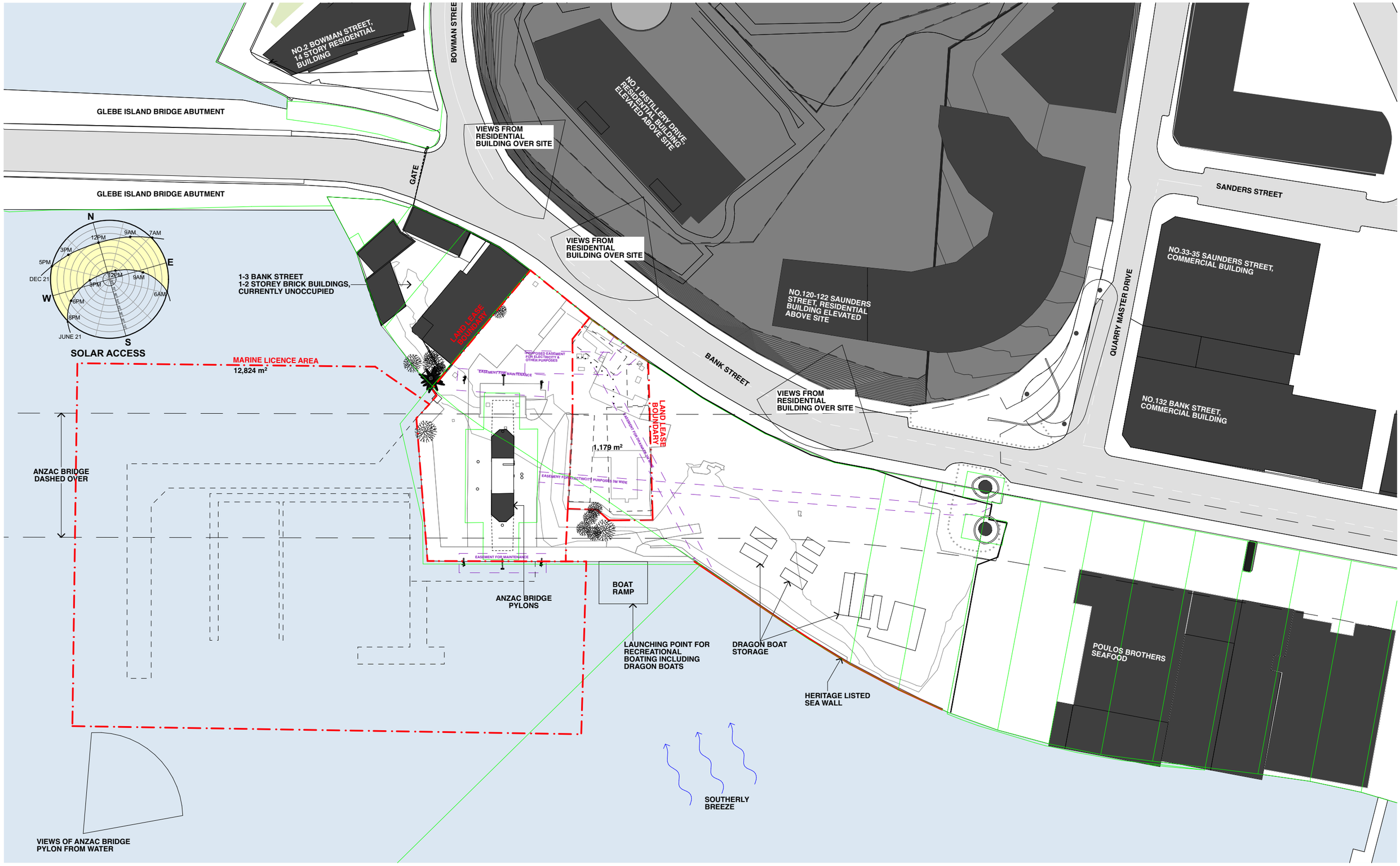
PROJECT NORTH

SCALE:
1:5000 @A3

STATUS
PRELIMINARY

DRAWING TITLE
CONTEXT

DRAWING NUMBER **REVISION**
S75W-01



1 SITE ANALYSIS
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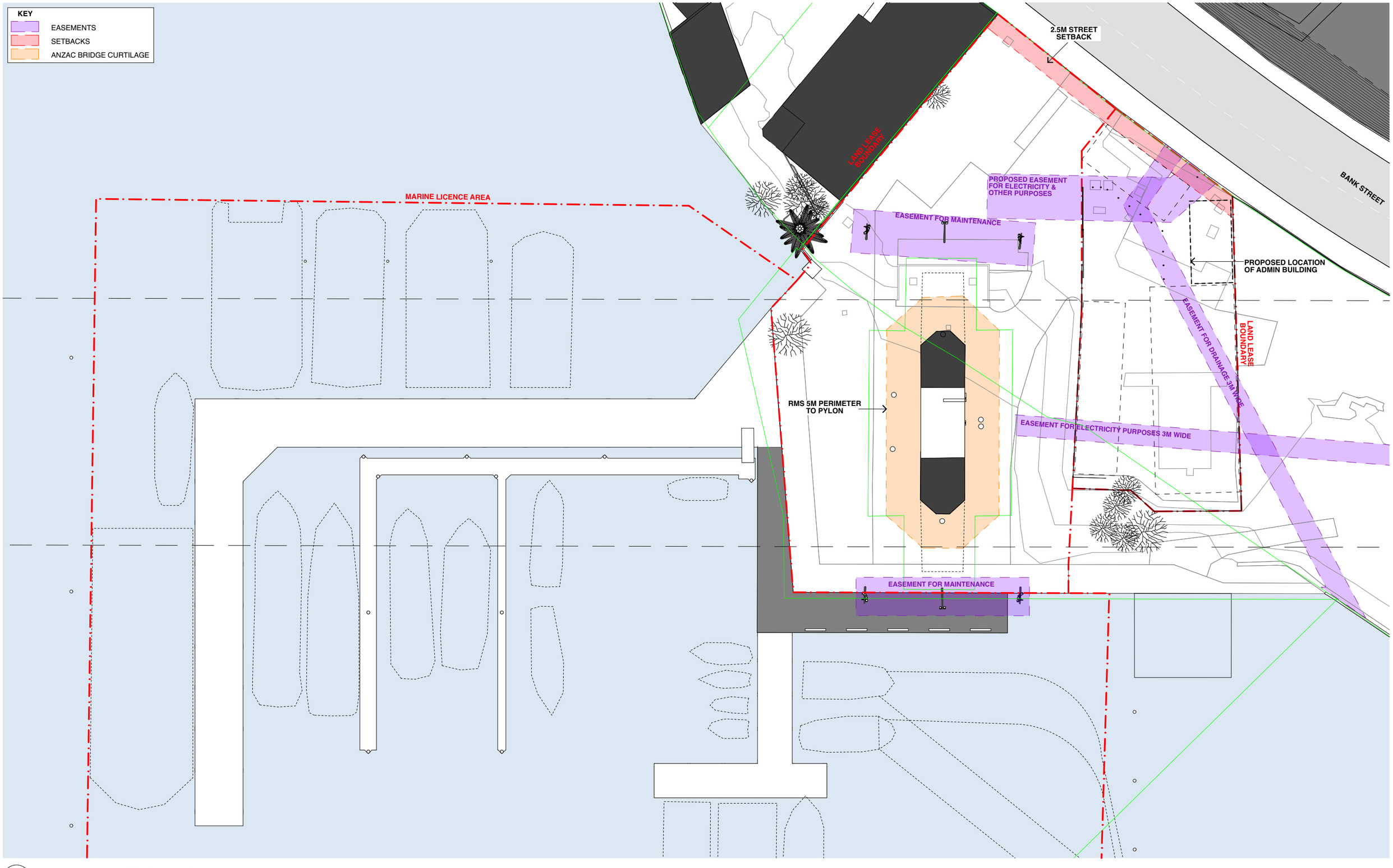

1 CONSTRAINTS PLAN
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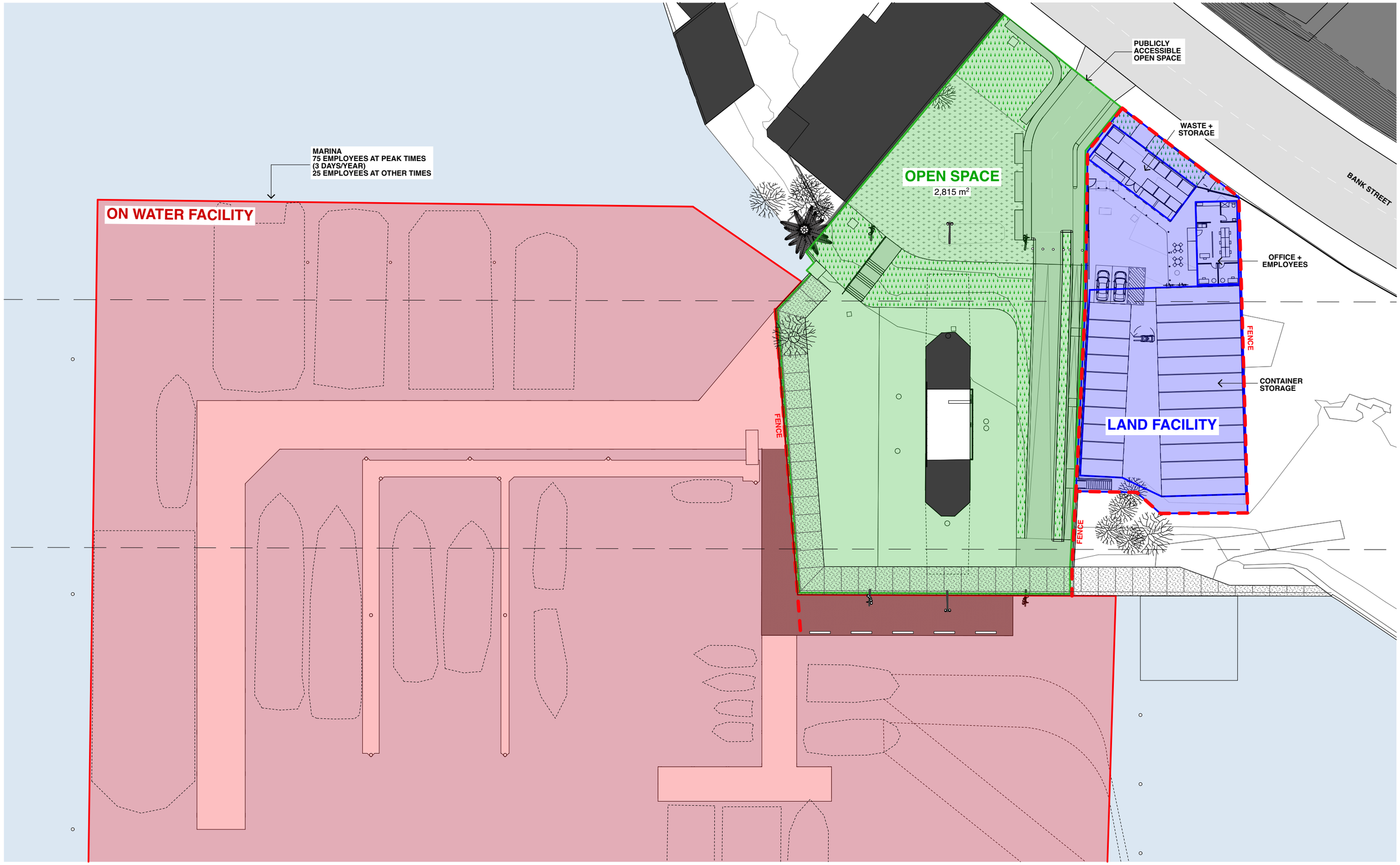

1 **PROGRAM**
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