



Project Application

Volume 7



Inner West Marina

Parramatta River, Sydney

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ENVIRONMENTAL
MANAGEMENT PLAN**

Prepared for:

Breakfast Point Pty Ltd

51 Riley Street

Woolloomooloo NSW 2011



Construction Environmental Management Plan

Proposed Inner West Marina Kendall Bay, Parramatta River, NSW

Final

AECOM

30 September 2009

Document No.: J185612_CEMP_30Sep09

Environment

Distribution

**Construction Environmental Management Plan
Proposed Inner West Marina
Kendall Bay, Parramatta River, NSW**

30 September 2009

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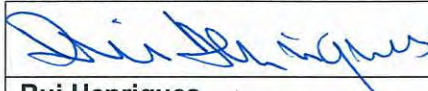
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Glossary of Terms

General Terms	
ANZECC	Australian and New Zealand Environment and Conservation Council
BTEX	Benzene, Toluene, Ethyl benzene and Xylene
DECC	NSW Department of Environment Conservation and Climate Change
CEMP	Environmental Management Plan
DECC	Environmental Protection Agency
HASP	Health and Safety Plan
ISQG	Interim Sediment Quality Guidelines
LOR	Limit of Reporting
NEHF	National Environmental Health Forum
NEPC	National Environment Protect Council
NEPM	National Environmental Protection Measure
NSW DECC	New South Wales Environment Protection Authority
OH&S	Occupational Health & Safety
POEO	Protection of the Environment Operations Act
SAC	Site Assessment Criteria
SPOCAS	Suspension Peroxide Oxidation Combined Acidity and Sulfate
PAH	Polycyclic Aromatic Hydrocarbons
TPH	Total petroleum hydrocarbons
TOC	Total Organic Carbon

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1.0 Introduction

ENSR Australia Pty Ltd (trading as AECOM and hereafter referred to as AECOM) was engaged by Breakfast Point Pty Ltd to develop a Construction Environmental Management Plan (CEMP) for the construction phase of the proposed Inner West Marina (the Marina), Kendall Bay, NSW (the Site).

It is noted that this CEMP is designed to address the environmental safeguards during the proposed Marina construction works only. The CEMP is not an environmental plan to address post-construction operations of the Marina.

The Site location is shown on **Figure F2** and layout of the proposed Marina is shown on **Figure F2**.

1.1 Site Background Information

Kendall Bay is located immediately east of the former Mortlake Gasworks. During operations of the gas works, a total of three wharves were located along the foreshore area of the former gas works. The wharves were used for coal and oil loading, and one was also an oil/tar pipeline wharf. All three wharves have been removed.

The former gas works site was remediated and now comprises the Breakfast Point residential development. The following sections provide a summary of relevant background information.

1.2 Contamination Issues

The former Mortlake Gasworks site was used by AGL as a gas making facility between 1886 and the 1990s, when all gas production operations at the works ceased. The facility contained purifier beds, a dam (water source for the works), large underground tar tanks, a benzol plant, oil tanks, a bitumen melting plant, and a sulphate plant.

Previous testing of the sediment in the vicinity of the former gas works, including the Site, has identified heavily impacted sediments, comprising heavy oils, elevated levels of polycyclic aromatic hydrocarbons (PAHs) and heavy metals above the Interim Sediment Quality Guidelines (ISQG's) (ANZECC & ARMCANZ 2000).

1.2.1 Significant Risk of Harm

The Environmental Protection Agency (EPA) [now a part of the Department of Environment and Climate Change (DECC)] has determined that the near shore sediments adjoining the former Mortlake Gasworks site pose a significant risk of harm (SRoH) for a number of reasons, as summarised below:

- Lack of benthic biota in the area suggests that Environmental Harm has occurred in. Although "cause and effect" has not been established, it is reasonable to assume that the nature and degree of the contaminants results in the "lack of benthic biota";
- Concentrations of total PAH are significantly elevated above ANZECC 2000 sediment quality guideline levels. Although there are no criteria for Total Petroleum Hydrocarbons (TPH), these are also present in the sediment in significant concentrations and separate phase product has been observed;
- Some of the identified PAHs are classifiable as human carcinogens;
- PAHs have the potential to Biomagnify through the food chain;
- Benthic Biota and humans could be exposed to the contaminants;

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- It is likely that further development of the area would increase the risk of harm; and
- Disturbance of the contaminants would mobilise contaminants and hence increase the risk of harm.

1.2.2 Remediation Order

On 25 May 2004, NSW EPA declared the sediments of the bed of Kendall Bay (and the Parramatta River) which fall within two hundred meters of the land based boundary of the former Mortlake Gasworks site, a remediation site under section 21 of the Contaminated Land Management Act 1997. The sediments in this area have been found to be contaminated with PAHs and TPHs.

A number of actions under the order are directly applicable to the proposed Marina development, which are summarised below:

- The NSW Maritime Authority (being the landowner) must refrain from carrying out, causing, permitting, or allowing another person to carry out works or activities at the site which would result in the disturbance or further disturbance of the bed sediment of Kendall Bay and the Parramatta River in the area adjacent to the Former Mortlake Gasworks site which fall within two hundred metres of the land based boundary of the former works. Specific reference is made to excavation activities and Proposed Marina developments;
- Prior to commencing works which have the potential to disturb bed sediments, the order requires that the person proposing to conduct the works must prepare and submit for the DECC's approval, a written plan with specific measures directed at minimising the disturbance and migration of contaminants in the bed sediments of the site;
- Prior to being provided to the DECC, the report must be reviewed by an DECC accredited Site Auditor, in relation to the suitability of the plans;
- Plans must be prepared in accordance with the DECC publication titled "Guidelines for Consultants reporting on Contaminated Sites" 1997, as it relates to investigation and/or remedial action;
- Works or activities must be undertaken in accordance with the management plan approved by the DECC; and
- On completion of the works or activities, the landowner must prepare and furnish the DECC with a report addressing the manner in which the works were implemented and how the plan was complied with.

1.3 Project Description

The proposed Marina covers an irregular shaped development footprint of approximately 20,000 m². The proposed Marina will contain up to 177 berths and will also include the following facilities:

- A fixed jetty;
- A small kiosk at the end of the proposed jetty;
- A managers office and small amenity area; and
- A new timber skid for access to the waterway for kayaks, small sailing vessels and other small water craft.

The location of the Site is shown on **Figure F1** and the proposed Marina location and layout is shown on **Figure F2**. Also refer to drawings **DA07** and **DA10** in **Appendix A**.

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1.4 Project Staging

The work would be undertaken as described below. It should be noted that this CEMP relates to the works proposed in the waterside area of Kendall Bay only.

The waterside works would be undertaken in six stages. Preliminary staging for the works to be undertaken is presented below:

- Stage 1 – Baseline monitoring and set up of environmental control measures, including bed disturbance minimisation measures.
- Stage 2 – Fixed Jetty including Kiosk and Managers Office.
- Stage 3 – Floating Structure – Arms 4, 5, 6 7 and 8.
- Stage 4 – Floating Structure – Arm 3.
- Stage 5 – Floating Structure - Arms 1 and 2.
- Stage 6 – Pontoon and Ramp Construction.

The proposed working methodologies are presented in more detail in **Section 3.0**.

1.5 Objectives of the CEMP

The purpose of the CEMP is to provide guidance on environmental control measures for the construction phase of the proposed Marina with regards to management of near shore sediments of Kendall Bay.

This CEMP provides an environmental manual for use by management and the construction team involved in the project. It also forms an advisory document for regulatory agencies and stakeholders.

The objectives of the CEMP are to:

- Manage and mitigate the potential for disturbance of the contaminated bed sediments of Kendall Bay during construction of the Marina;
- Outline proposed control measures to be implemented in order to prevent sediment disturbance during construction; and
- Demonstrate that the proposed management strategy is acceptable and adequately addresses compliance issues set under the remediation order, allowing approval from the DECC.

1.6 Scope of CEMP

The scope of this CEMP is as follows:

- Summarise background environmental information and Site conditions;
- Identify Site specific environmental hazards and outline proposed environmental control and mitigation measures;
- Develop a water quality monitoring plan (detailing monitoring frequency and criteria) appropriate for the nature of the construction activities and which considers possible environmental impacts recognising the extent of existing contamination;
- Discuss safety measures for on-site construction workers performing works which may result in expose to the contaminated bed sediments (i.e. details of appropriate Personal Protective Equipment (PPE) to be used during construction);

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- Outline Emergency response procedures related to environmental protection for the construction phase of the proposed Marina; and
- Outline proposed contingency measures in the event of environmental control or equipment failure.

1.7 Environmental Management Responsibilities

General responsibilities are outlined in the **Table 1** below.

Table 1: Roles and Responsibilities

Role	Responsibilities
Site Owner NSW Maritime Authority	• Manage boating activities on NSW waterways and protect marine environment; and • Review and Approve the CEMP.
Developer Breakfast Point Pty Ltd	• Ensure appropriate consents and licences are obtained for the construction works; and • Approve the CEMP.
Project Manager TLB Engineers Pty Ltd	• Review and comment on CEMP; • Ensure all contractors comply with statutory and licence requirements; • Oversee construction works and overall implementation of the CEMP; and • Undertake monitoring and inspections of the site, as required.
Contractor (to be appointed) The Contractors will report to the Project Manager	• Ensure that all OH&S regulatory requirements are met; • Prepare, maintain, implement and administer a Health and Safety Plan, ensuring that all OH&S regulatory requirements are met; • Ensure implementation of the CEMP at site level; • Ensure compliance with any relevant conditions of the DA Consent; • Ensure all necessary registers, databases, and records are completed as required in the CEMP; • Ensure that all site operations are carried out in an environmentally responsible manner on a day to day basis; • Ensure that all site operations are carried out in a safe and responsible manner on a day to day basis; • Ensure that all environmental protection measures (including silt curtain and protective boom) are in place and are functioning correctly; • Ensure daily site inspections (OH&S and environmental) are undertaken and recorded and reported as appropriate; • Undertake continual visual monitoring of surface water in the designated silt curtain containment areas. • Ensure incident reports and complaint reports are completed and followed up as required; • Ensure adequate training of all employees and contractors

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Role	Responsibilities
	through a site induction, and as required on an ongoing basis during the works; • Ensure monitoring is conducted as required in the CEMP; • Ensure audits of the project activities are undertaken on a monthly basis in accordance with the requirements of the CEMP; • Ensure non-conformance and corrective action reports are completed, and follow up corrective actions are undertaken, as required; • Ensure all non-conformances and/or complaints are reported to the construction Project Manager; • Ensure corrective actions are undertaken in response to requests made by the Project Manager regarding specific environmental or safety issues; • Ensure all works comply with relevant regulatory requirements; and • Ensure all sub-contractors comply with statutory and licence requirements and conditions of the CEMP.
Environmental Consultant AECOM The Environmental Consultant will report to the Project Manager and the Developer	• Monitor to ensure that all operations are carried out in an environmentally responsible manner through inspections (these may be weekly initially to monthly, or as required by the Project Manager) and monitoring of the surface water prior to, during and on completion of the works, or as directed by the Project Manager. • Monitor to ensure that the environmental protection measures put in place by the Contractor are appropriate and functioning correctly. • Sample and analyse any visually contaminated or unusual material uncovered during the works. • Notify the Project Manager of any significant environmental issues. • Provide summaries of monitoring results to the Project Manager and provide advice on environmental issues. • At the request of the Project Manager or the Developer, monitor surface water on a daily/weekly basis, sample and analyse water quality to determine if parameters are within acceptable limits; • Inspection of environmental controls; • Liaison with relevant agencies; • Notify Project Manager and the Developer of any significant environmental issues; and • Provide summaries of monitoring results to Project Manager or the Developer. • Preparation of a compliance report outlining how the works were conducted and how the CEMP was complied with.

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1.8 Application of the CEMP

This CEMP applies to the following:

- The Site (the area of the proposed Inner West Marina);
- Management of the contaminated sediments within the footprint of the proposed Marina; and
- Development of the proposed Marina.

The guidance and requirements presented in this CEMP are specific to works associated with the contaminated sediments and protection of the environment. They are to be adopted in addition to any specific Site safety plans, job safety analysis and/or safe work method statements that are to be implemented by the contractors.

This CEMP does not cover activities such as excavations or dredging and removal of the sediments.

1.9 Applicable Documents

In preparing this CEMP, AECOM has referred to the following documents/publications:

- Breakfast Point Master Plan 2002;
- *Environmental Management Systems Guidelines, NSW Department of Public Works and Services, November 1998;*
- *Guideline on Protection of Health and the Environment during the Assessment of Site Contamination (Assessment of Site Contamination) Measure. National Environment Protection Council. 1999;*
- Remediation Order 23022 Declaration number 21055 for area 3335 dated 22/6/2007;
- Director Generals requirements under Project Application 07_0006 dated 14 January 2008;
- URS, 2006a. *Human Health Risk Assessment of Estuarine Sediments Adjacent to the former AGL Mortlake Site. Draft Report;*
- URS, 2006b. *Environmental Risk Assessment of Estuarine Sediments Adjacent to the former AGL Mortlake Site. Draft Report;* and
- AECOM, 2009. *Sediment Investigation Report, Proposed Inner West Marina, Kendall Bay, Parramatta River.*

1.10 Document Revision

This CEMP may be reviewed and updated as necessary. Therefore it is the responsibility of the reader of this document to ensure they have the current version of the CEMP. The master document, with the up to date version of the CEMP will be available from Project Manager, Developer or AECOM.

2.0 Statutory and Licence Requirements

2.1 Legislation and Policy Affecting the Works

During the course of the works, all personnel working at the Site shall comply with the applicable environmental regulatory requirements, which include but are not limited to the following:

- Contaminated Land Management Act, 1997;
- Catchment Management Authorities Act 2003;
- Canada Bay Local Environmental Plan 2008;
- Concord Local Environmental Plan. No.117;
- Electricity Supply Act 1995;
- Electricity Supply (General) Regulation 2001;
- Environmentally Hazardous Chemicals Act, 1985;
- Environmental Planning and Assessment Act 1979;
- Environmental Planning and Assessment Regulation, 2000;
- Environmental Planning and Assessment Act, 1979 (State Environmental Planning Policy No 55 – Remediation of Land);
- Environmental Planning and Assessment Regulation 2000;
- Environmental Management Systems Guidelines, NSW Department of Public Works and Services, November 1998;
- Environmental Offences and Penalties Act, 1989; Repealed by the Protection of the Environment Operations Act 1997;
- Fisheries Management Act, 1994;
- Land and Environment Court Act 1979;
- Local Government Act 1993;
- Local Government (General) Regulation 2005
- Maritime Services Act 1935;
- Occupational Health and Safety Act 2000;
- Occupational Health and Safety Regulation 2001;
- Protection of the Environment Operations Act, 1997;
- Protection of the Environment Operations (General) Regulation 1998 No. 720;
- Protection of the Environment Operations (General) Regulation 2009 No. 211;
- Public Health Act 1991;
- Soil Conservation Act 1938;
- Sydney Harbour Foreshores and Waterways Area Development Control Plan 2005;
- Water Management Act 2000;

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- Waste Recycling and Processing Corporation Act, 2001; and
- Waste Avoidance and Resource Recovery Act, 2001.

Compliance with other relevant DECC guidelines including:

- DECC. 2008. *Waste Classification Guidelines: Part 1: Classifying Waste*. NSW Department of Environment & Climate Change. April, 2008;
- NSW Department of Environment and Conservation (DEC), 2006. *Guidelines for the NSW Site Auditor Scheme* (2nd edition);
- ANZECC/ARMCANZ. 2000. *Australia and New Zealand Guidelines for Fresh and Marine Water Quality, National Water Quality Management Strategy, Australia and New Zealand Environment Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand*; and
- NEPC. 1999. *National Environmental Protection Measure (Assessment of Site Contamination)*. National Environment Protection Council. December, 1999.

Additionally, all parties will generally abide by the actions required by the Remediation Order (Number 23022, Declaration 21055) under section 23 of the Contaminated Land Management Act 1997.

2.2 Licences and Approval Requirements

The Developer shall be responsible for ensuring all necessary approvals and licences are obtained prior to the commencement of any works. Contractors and any sub-contractors must comply with the terms and conditions of all approvals and licences obtained. They will include, but not limited to the following:

- Landowners Consent - NSW Maritime Authority;
- Development Approval - NSW Maritime Authority/ Department of Planning;
- Part 3A Permit - NSW Maritime Authority; and
- Section 73 Permits – Department of Environment Climate Change.

2.3 Environmental Criteria

Surface water monitoring results will be compared to ANZECC (2000) guidelines for fresh and marine water quality.

The guideline values provided in the following table (**Table 2**) will be used to evaluate the environmental performance of the works and requirements for modifying work procedures, as required. The water quality data will be assessed against these criteria and the background concentrations of samples collected from the proposed control locations (refer to **Section 4.2**).

Table 2: Surface Water Assessment Criteria

Analyte	ANZECC 2000 Marine Water Quality Guidelines(95% Protection Level) mg/l
pH	6.5 – 8.0 ^a
Suspended Solids	50 ^a
Turbidity	6 – 50 ^a (NTU)
Arsenic (As)	0.0023 ^b
Cadmium (Cd)	0.0055

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Analyte	ANZECC 2000 Marine Water Quality Guidelines(95% Protection Level) mg/l
Copper (Cu)	0.0013 ^c
Chromium (Cr)	0.0044 ^d
Lead (Pb)	0.0044 ^c
Nickel (Ni)	0.07 ^c
Mercury (Hg)	0.0004 ^c
Zinc (Zn)	0.015 ^c
Phenols	0.4
Polynuclear Aromatic Hydrocarbons (PAH)	nc
Naphthalene	0.07
Phenanthrene	0.002
Anthracene	0.0004
Fluoranthene	0.0014
Benzo(a)pyrene	0.0002
Total Petroleum Hydrocarbons (TPH)	nc
Benzene	0.7
Toluene	0.18
Ethylbenzene	0.005
Xylene	0.275

Notes: mg/l = milligrams per litre
nc = no established criteria
a = default trigger values for Lowland river applicable to south-east Australia
b = denotes a low reliability trigger value for As (III)
c = denotes high reliability trigger value
d = based on Cr (IV) criteria

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3.0 Proposed Construction Activities

A summary of the proposed works to be completed is included in the sections below. The works have been separated into three phases of work, which include:

- Phase 1 – Establishment;
- Phase 2 – Construction Works; and
- Phase 3 – Decommissioning of Control Features.

3.1 PHASE 1 – Establishment

3.1.1 Monitoring

Monitoring of baseline conditions of the water will be undertaken over a period of two months (on a weekly basis) prior to and during site establishment (i.e. prior to the installation of temporary piles or boom/silt curtains).

Additionally, monitoring of surface waters will also be undertaken to ensure that the conditions are similar to the baseline levels and/or to those in the rest of the harbour during and after the installation of the blanket and piling as set out in and **Section 4.2**.

The monitoring requirements will also ensure that the requirements (such as licensing requirements) of all relevant regulatory authorities are met throughout the proposed works.

3.1.2 Environmental Protection Measures

Prior to commencement of any construction works, floating silt curtains and booms will be installed around the work area. The floating silt curtains and booms will be set up for each construction stage of the proposed Marina.

Each Construction Stage will be enclosed and protected by a dual floating silt curtain / boom scheme. The aim of the silt curtains and booms is to ensure disturbances of potentially contaminated sediment and hydrocarbons leaks, spillages are contained within the work area during construction, therefore minimising impact to the surrounding environment.

The proposed silt curtain and boom are further discussed below. **Figure F3** presents a schematic showing the proposed silt curtain and floating boom set up.

The construction Contractor is responsible for ensuring effective installation and maintenance of all environment protection measures, including the silt curtains and booms. The floating boom and silt curtain arrangements shall be designed and constructed to accommodate the wave and current movements which arise at the Site and presented in **Table 3**:

Table 3: Summary of wave conditions

Origin	Wave Height (mm)	Frequency (sec)
Rivercat	200	6
Motor cruiser	800	3.6
Wind	500	2.4

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3.1.2.1 Installation of Floating Boom

The purpose of the floating boom is to confine any floating contaminants released from plant and equipment within the boomed enclosure.

An inner (primary) floating boom will be installed along the full perimeter of the work area prior to commencement of any works. An outer (secondary) floating boom will be placed outside the inner floating boom (placed outside of the blanket area), to minimise possible floating oil impact associated with pile or blanket installation. The floating boom/ silt curtain schematic is presented on drawings **CMP01**, **CMP02** and **CMP03** in **Appendix A**.

The following are required for the boom to operate effectively:

- The floating boom will be of a sufficient depth to allow variable wave conditions tidal movements. The boom design and installation should allow for wash effects by large watercrafts (e.g. Rivercats);
- The floating booms will be anchored to temporary piles;
- Access gates will located on the north eastern portion of the inner and outer floating booms for barges, construction vessels and floating structures;
- The silt curtain described in **Section 3.1.2.2** will be part of the floating boom;
- Oil absorbent booms will be used to allow the immediate recovery of any oil material released within the work area;
- Inspection of the floating booms will be undertaken to ensure functionality and integrity over the duration of the proposed Marina construction works. Inspection details are provided in **Section 6.0** of this document; and
- The inner floating boom will be progressively moved south over the blanket, as the blanket is laid. The outer floating boom will remain in place during the entire construction works.

The existence of the booms surrounding the development will be in addition to any other containment measures that may be applied to prevent the release of oil products during works.

3.1.2.2 Installation of Silt Curtains

The purpose of the silt curtains is to restrict the movement of fine sediment generated during the proposed works.

An inner (primary) silt curtain will be installed along the full perimeter of the work area prior to commencement of any works. An outer (secondary) silt curtain will be placed outside the inner silt curtain (surrounding the outside of the blanket area), to minimise possible floating oil impact associated with pile or blanket installation. The floating boom/ silt curtain schematic is presented on drawings **CMP01**, **CMP02** and **CMP03** in **Appendix A**.

The following are required for the silt curtain to operate effectively:

- The silt curtain should be of appropriate design and construction (heavy grade material) to prevent increased turbidity beyond the area of the proposed Marina;
- The silt curtain should of a sufficient length to accommodate changes in water level, and wave effects. The silt curtain design and installation should allow for wash effects by large watercrafts (e.g. Rivercats);
- The silt curtains will be anchored to temporary piles;

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- The floating boom described in **Section 3.1.2.1** will be part of the silt curtains;
- The access gate will be located on the north eastern portion of the silt curtain for barges, construction vessels and floating structures;
- Inspection of the floating boom will be undertaken to ensure functionality and integrity over the duration of the proposed Marina construction works. Inspection details are provided in **Section 6.0**, of this document; and
- The inner silt curtain will be progressively moved south over the blanket, as the blanket is laid, and will be moored by using mooring blocks on top of the newly constructed blanket. The outer silt curtain will remain in place during the entire construction works.

3.2 PHASE 2 – Construction Works

3.2.1 Placement and Installation of Sediment Protection System

The purpose of the sediment Protection System (SPS) is to minimise sediment disturbance during the construction and subsequent operation of the proposed Marina. The SPS will provide erosion protection of the contaminated sediment as well as providing a layer segregating and covering for the sediments. The SPS will also be easily removed if future sediment remediation is required. The SPS will comprise of the following:

- Geotextile: Elcomax 1200R polyester staple fibre geotextile, has a design life of greater than 100 years when submerged in saline water below a rock cover. Polyester is resistant to biological and hydrocarbon attack; and
- Rock armour: 300 mm of grade basalt rock.

The SPS will cover the entire development footprint of the proposed Marina, and include the floating structures, berths and access fairways and areas of potential bed disturbance in shallow water between the floating structure and the mean high water mark. The SPS will cover an area of approximately 57,000 m². The extent of the SPS is presented on drawing **CMP01** in **Appendix A**.

The geotextile will be supplied in rolls for ease of placement and transport on a barge. The barge will be maneuvered using mooring lines, not propellers or tugs, eliminating the risk of disturbing sediments through propeller wash.

The geotextile will be laid down in panels of approximately 40 m width by 150 m length. The approach will include the following:

- The works will commence from the northern portion of the proposed Marina area. The sheets will be laid continuously from west to east (perpendicular to the shore) by barge using a guide frame and nose board system to minimise sediment disturbance. The works on the western side will commence on the rising tide when the tidal level is at or above mid tide;
- The geotextile will be secured by placing basalt rock gravel on top. This process will involve the use of an excavator (fitted with a GPS controlled bucket guidance system), situated at the stern, which will carefully unload ballast directly onto the newly lain geotextile as the barge passes over the geotextile;
- The barge will be slowly moved from north to south as the geotextile is fed from the roll over the bow and beneath the hull;
- Adjacent sheets will be overlapped (2 m overlap) and secured in a similar way ensuring that no areas of the bed within the footprint of the Marina remain exposed. The overlap is designed to be sufficient to withstand the load of rock armour and

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edge displacement during construction without exposing the underlying sediment;
and

- As discussed above, the inner boom/silt curtain will be progressively moved south over the SPS, as the SPS is laid.

This approach is expected to minimise the release of contamination or contaminated sediments.

3.2.2 Piling for Marina Construction

Approximately 160 piles will be required for the proposed Marina construction. Areas for the piles will be cleared of ballast and holes cut by divers to minimise sediment release.

Once the piles have been driven, divers will be used to install a geotextile collar around the base of the pile on top of the geotextile blanket ensuring that the integrity of the blanket is not compromised by the pile driving. The gravel ballast would then be re-instated to the specified thickness by divers, and each pile penetration inspected

The position of the piles will be located using a GPS. The piles will be driven into the sediment through the ballast and blanket.

3.2.3 Marina Construction

Floating Structure

The floating structures of the proposed Marina will be assembled in segments off site and towed to Site as required to suit the construction programme. Once the first segment has been secured by two piles, further segments will be brought to Site and temporarily moored against previously installed segments until ready for installation.

Ingress and egress to the Site will be via the access gates on the north eastern portion of the booms/silt curtains.

Fixed Structure

Following installation of the piles as described in **Section 3.2.2**, the fixed structure will comprise the following:

- High density polyethylene (HDPE) jackets will be placed over each pile;
- Steel headstock will be inserted into the pile and secured in position; and
- Timber beams will be installed between the headstocks using a barge mounted crane; and
- Timber decking would be installed between the beams.

Barge moorings

Barges will be moored using mooring lines to piles.

It is envisaged that initially up to four temporary piles will be installed to secure and assist in the positioning of the barges for installation of piles. As piles are progressively installed the barges could use the pile for mooring points.

Mooring blocks on the bed of the bay will not be used.

3.3 PHASE 3 – Decommissioning of Control Features

3.3.1 Clean up within Enclosures

All construction waste will be placed in sealed bins on the barges for disposal at an approved landfill or waste processing facility.

3.3.2 Monitoring Prior to Removal of Boom/Silt Curtains

Monitoring of surface waters will be undertaken to ensure that the conditions are similar to the baseline levels and/or to those in the rest of the harbour prior to removal of the boom/silt curtains.

3.3.3 Removal of Environmental Controls

The silt curtain and boom are to remain in place and suitably maintained until a final monitoring report is issued to NSW Maritime, an inspection has been carried out by NSW Maritime and that NSW Maritime are satisfied that the works have been undertaken in a satisfactory manner and there is no evidence of impact from contaminants.

3.3.4 Monitoring Following Removal of Boom/Silt Curtains

Once the boom/silt curtains are removed monitoring at the same locations along the proposed Marina and at the control location will be undertaken as detailed in baseline sampling in **Section 3.1.1** and **Section 4.2**.

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4.0 Environmental Monitoring

4.1 Boom and Silt Curtain Monitoring

The surface of the water, water level floats and sections of the boom will be inspected from a boat. The inspection will be undertaken prior to the commencement of work. The inspections will be visual and will include an assessment of the conditions of:

- The floats;
- The connections between curtains and the floats supporting the floats;
- The connections between floats;
- The wires and line attached to the floats and the curtain including mooring lines; and
- The top section of the curtain.

The sections of the boom and silt curtain below the water will be inspected fortnightly by a diver, or more often if the condition of the boom and/or curtain is considered to have deteriorated, and in particular after an extreme storm event or extreme wave event. The frequency of inspections will be re-assessed after 3 months and revised, as required. The underwater inspection will be visual and include an assessment of:

- The drape of the curtain on the bed;
- The curtain over its full height and length, including joints between adjacent sheets of material making up the curtain; and
- The connections at mooring lines and mooring blocks.

The inspections will be undertaken in a systematic manner and each inspection will follow the same routine. Beginning at one end of the curtain and boom the divers are to ascend and descend the curtain at 20 m intervals along its length.

A written report of each inspection will be prepared identifying the condition of each of the elements inspected, and highlighting areas of wear and deterioration which require monitoring to ensure they are repaired/replaced before any local failure occurs.

Any breaches or release of contaminants observed during the inspection will be reported to the Project Manager and the NSW Maritime Authority.

All inspection reports are to be kept on site and be available for review by NSW Maritime Authority.

For the purposes of this work:

- An extreme storm event is defined as a period of 30 minutes or more, in which the average wind speed exceeds 17.5 m/s (35 km/hr) from any direction; and
- An extreme wave event is defined as five waves with a height of 500 mm or more occurring in any 30 minute period.

The wind speed information will be based on weather station data (or similar).

4.2 Water Quality Monitoring

4.2.1 Baseline Sampling

Baseline water quality samples will be collected from eight locations, with two immediately within the silt curtain and boom enclosed work areas and two adjacent to the proposed Marina and four at locations at a distance between 50 and 100 m from the proposed Marina. Sampling will be conducted from a small boat fitted with a GPS system. The sampling locations will be positioned using a GPS System on board the boat.

Water samples will be collected from the surface and near the river bed using a bomb sampler that will allow samples to be collected from discreet depths. The water from each location will be tested for the environmental parameters and potential contaminants outlined in **Section 4.2.3** (below).

4.2.2 Ongoing Monitoring

The monitoring during the construction works will involve testing of water from the following locations (refer to **Figure F3**):

- Two immediately outside the two curtains; and
- Four at a distance of 50 to 100 m from the outer curtain evenly spaced (distances and sampling locations will be measured using a GPS System).

Monitoring will be undertaken on a daily basis for two weeks and on a weekly basis thereafter on weekly (with the monitoring requirements re-assessed on a monthly basis) or as agreed by NSW Maritime. Monitoring should be conducted more frequently during periods when construction based activities such as piling or placement of the sediment blanket is being undertaken.

AECOM notes that the weekly monitoring results will be reviewed at the end of the first month. If the water quality remains consistent over this period, the monitoring requirements will be reviewed and possibly reduced (possibly to a monthly basis) following consultation with NSW Maritime.

The Contractor will undertake continual visual monitoring to identify any issues with water quality. Additional sampling events will be undertaken on occasions when environmental protection controls are compromised, un-seasonal or severe weather conditions occur and if a significant water quality issue becomes apparent. Water samples will be collected from the surface and near the river bed.

The water from each location will be tested for the environmental parameters outlined in **Section 4.2.4** (below).

4.2.3 Testing Requirements

The water from the above locations will be tested for the following environmental parameters and potential contaminants prior to the commencement of the works, during works and at the completion of the works by the Environmental Consultant:

- Turbidity;
- Suspended solids;
- Floating oils and hydrocarbons;
- pH;
- Metals (As, Cd, Cu, Cr, Pb, Ni, Zn, Hg);
- BTEX (benzene, toluene, ethylbenzene, xylene);

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- Total Petroleum Hydrocarbons (TPH);
- Polynuclear Aromatic Hydrocarbons (PAH); and
- Phenols.

Additional environmental parameters may be targeted based on observations (such as odour, staining, discolouration). Removal of protective measures emplaced for the duration of the works may only be undertaken when monitoring activities have confirmed stabilisation of waters within the boom / silt curtain enclosures.

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5.0 Summary of Work and Management Requirements

The environmental protection measures for the works have been outlined in **Section 3.0**, above. In addition to these measures all contractors and sub-contractors will need to comply with the environmental conditions provided below to ensure that the environmental risks are properly managed. In general, best practice procedures will be followed throughout the works to protect the environment within and around the proposed Marina. These procedures address:

- Odour control measures;
- Dust control measures; and
- Noise control measures.

5.1 Odour Control Measures

All activities conducted at the site will be controlled such that all equipment used is designed and operated to control the emission of smoke, fumes and vapour into the atmosphere and any odours arising from the works or stockpiled material is controlled. Control measures may include:

- Maintenance of construction equipment so that exhaust emissions comply with the Clean Air Regulations issued under the Protection of the Environment Operations Act;
- The spraying of a solution of Biosolve™ or other appropriate product if required to suppress any odours that may be generated by disturbed/excavated materials; and
- Use of covers (i.e. HDPE).

All practicable measures will be taken to help ensure that fugitive emissions emanating from the Site are minimised so that associated odours do not constitute a nuisance and that the ambient air quality is not adversely impacted.

AECOM notes that it is unlikely that odours may be released from sediment disturbance. However, the proposed site inspections allow for observations of odour at the Site boundary. Although, formal olfactory observations at the boundary are not proposed at this stage, if odorous conditions are present during the works and inspections, formal olfactory sensory monitoring will be undertaken.

The odour performance criteria specified in NSW DECC (2005) *Approved Methods and Guidance: for the Modelling and Assessment of Air Pollutants in New South Wales* will be used during odour assessment. The criterion is based on the 99th percentile highest odour concentration, and is a function of the population in the affected area.

Table 4: Odour performance criteria (nose-response-time-average, 99th percentile)

Population of affected community	Odour performance criteria (OU/m ³)
Urban (μ ~2,000)	2.0
~ 500	3.0
~ 125	4.0
~ 30	5.0
~ 10	6.0
Single residence (~2)	7.0

Notes: OU/m³ – Odour units per cubic unit.

5.2 Dust Control Plan

Dust generation is not anticipated during the proposed Marina construction phase, however all practicable measures will be taken to ensure that dust emanating from the site is minimised. Measures to minimise the potential for dust generation so that there is no visible dust at the site boundaries are summarised below:

- Use of water sprays or covers over surfaces, which are generating unacceptable amounts of dust; and
- Maintenance of all dust control measures to ensure good operating condition.

AECOM notes that dust monitoring is not proposed given the limited activities to generate air emissions.

5.3 Noise Control Plan

The noise control measures will conform to the Council requirements for the Kendall Bay proposed Marina project. The noise associated with the proposed Marina works will be controlled by the following means:

- Ensuring that no vehicles, vessels, machinery or equipment generate noise levels beyond applicable guidelines, and use of quieter equipment and acoustical enclosures;
- Approved silencing measures shall be provided and maintained on all power-operated plant used in construction works;
- Restricting the activities generating high noise and vibration levels to normal working hours (7am-5.30pm Monday to Friday, 7am-1pm on Saturday, with no work on Sunday and Public Holidays);
- All construction vehicles involved with the works will enter and leave the Breakfast Point property in accordance with the site entry requirements;
- Use of suitable construction techniques; and
- Hydraulic hammers will not be used before 9:00am on Saturdays.

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All practicable measures will be taken to minimise the generation of noise so that it remains within acceptable levels. In the event that short-term noisy operations are necessary, and where these are likely to affect residences, notifications will be provided to the Council and the residents by the Project Manager, specifying the expected duration of the noisy work.

The acceptable sound pressure levels of Site machinery is provided below:

- For a period of 4 weeks and under - the L10 level measured over a period of not less than 15 minutes during construction works must not exceed 75 dB(A); and
- For a period of 4 and 26 weeks and under - the L10 level measured over a period of not less than 15 minutes during construction works must not exceed 65 dB(A).

5.4 Acid Sulphate Soils

The Acid Sulfate Sediment Soil Map (Edition 2) for Prospect/Parramatta River, published by the Department of Land and Water Conservation (1997) indicates that there is a 'High Probability' of occurrence of ASS within the 'Bottom Sediments', and that there is a potential for severe environmental risk if bottom sediments are disturbed by activities such as dredging.

Confirmation the presence of acid sulphate soils was determined through laboratory analysis for Suspension Peroxide Oxidation Combined Acidity and Sulfate (SPOCAS) as part of the Sediment Investigation conducted by AECOM in 2009.

Given that the works will not involve excavation of the sediments, an acid sulphate management plan will not be required. However, if future works require removal of sediments and expose to air a plan should be prepared in accordance with New South Wales Acid Sulphate Management Advisory Committee (ASSMAC) Acid Sulphate Soil Manual (August 1998).

5.5 Summary of Environmental Management

The summary of environmental management requirements for each area of work is provided in the following diagram. This diagram highlights the specific environmental controls required for the works to be undertaken at the site.

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Table 5: Work and Management Requirements

Environmental Considerations								
Construction Tasks	Turbidity and silt prevention	Oil Release Prevention	Dust Control	Noise	Odour	Release of Contaminants from sediments	OH&S	Planning and Permits
Access restriction and Set Up Site Boundary				✓			✓	✓
Installation of silt curtains & boom	✓	✓		✓		✓	✓	
Placement of Sediment Blanket	✓	✓		✓	✓	✓	✓	✓
Installation of temporary piles and piling during Marina constructions works	✓	✓		✓	✓	✓	✓	✓
Barge arrival and departure (Storage of construction materials)	✓		✓	✓			✓	
Offsite Waste Removal and disposal from Barges	✓	✓	✓	✓	✓	✓	✓	
Removal of silt curtain & booms	✓	✓		✓		✓	✓	

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6.0 Site Inspections

The Contractor shall carry out daily site inspections to ensure that the recommendations in this CEMP are adhered to and responsibilities are met. The inspection findings will be recorded/documented in the Site diary.

An AECOM representative will also undertake detailed inspections and conduct environmental monitoring of the site. At a minimum AECOM will undertake site inspections during the following periods:

- Prior to the commencement of the works (during site establishment);
- At the commencement of the works;
- Stormy/windy/large swell conditions;
- Critical stages of the construction program including placement of the blanket and pile installation; and
- On completion of the works

AECOM will also undertake inspections on a monthly basis or as required by the Project Manager during the works. More frequent inspections will be conducted following incidents or complaints. The Site Inspection Report (or similar) as shown in **Appendix B** shall be completed, and performance reviewed against the requirements of this CEMP. A copy of the AECOM site inspection reports will be forwarded to the NSW Maritime Authority within two days of the inspection.

The inspection/monitoring of the boom and silt curtain will be undertaken as detailed in **Section 4.1** of this document.

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7.0 Reporting

7.1 Non Conformance and Corrective Action Reports

All non-conformances shall be reported to the Contractor's Site Manager and the Project Manager, and recorded in a Non-Conformance and Corrective Action Report (**Appendix C**), or similar. Details of the non-conformance, including any immediate corrective actions undertaken, are to be recorded by the Contractor's site manager /supervisor and reported to the Project Manager. The Project Manager may also initiate a Non-Conformance Report.

It is the responsibility of the Contractor to immediately initiate corrective actions, if required. Once completed, the Contractor shall provide details of the actions undertaken on the Non-conformance Report, sign, date and file the report. The Contractor shall monitor feedback and response to prevent future occurrences. A copy of the report is to be forwarded to the Project Manager, NSW DECC and the NSW Maritime Authority.

7.2 Complaints and Incident Reports

The Contractor shall be required to maintain a register of complaints from local residents, or other parties, which shall include a record of any action taken with respect to the complaints. Details of the complaint are to be documented by the Contractor in the site's Complaints Register (**Appendix D**), or similar. The Contractor's Site Manager or Supervisor shall be notified immediately should any incident affecting the environment or the surrounding community, occur. AECOM shall be notified upon the occurrence of any incidents affecting the environment. In accordance with the requirements of *Contaminated Land Management Act, 1997*, the DECC shall be notified as soon as practicable in the event of any incident potentially impacting upon the off-site environment.

If a complaint is related to a non-conformance, a Non-Conformance and Corrective Action report is to be initiated.

Records shall be kept of any environmental incidents, accidents, hazardous situations, unusual events and unsafe health exposures and the corrective action taken. A representative of the Contractor shall investigate the cause of any emergency so that necessary changes in work practices can be made to prevent the incident from recurring.

In the event of an incident or complaint, the contractor's site manager or supervisor shall be notified and the site manager/supervisor shall notify the Project Manager. The contractor's site manager or supervisor shall initiate the report.

Incidents and complaints will be reported to the NSW Maritime Authority immediately. Copies of all incidents report will be provided to the NSW Maritime Authority no longer than twenty four hours after the incident occurring.

7.3 Record Keeping

The Contractor shall ensure that records are kept on site of all documentation arising from implementation of this CEMP and environmental management. Records shall include:

- Approvals, licences and permits;
- Monitoring results;
- Site Inspection Reports;

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- Audit Results;
- Non-Conformance and Corrective Action Reports;
- Training Register;
- Complaints Register;
- MSDS Register;
- Chemicals Database;
- Waste Register;
- Environmental correspondence; and
- Miscellaneous items.

All records shall be kept on the site and maintained in a legible state. All records shall be made available to the Project Manager, authorised officers of the NSW DECC, NSW Maritime Authority, Council and other agencies, as required. All records should be retained by the Contractor for a minimum of three years from the date of completion of the project.

8.0 CEMP Audit and Review

The Contractor or a representative of the Contractor shall conduct an audit of the CEMP and construction activities every two weeks to ensure that the CEMP is being properly implemented and followed. A copy of the audit report shall be provided to the Project Manager.

The Project Manager or a representative of the Project Manager shall also conduct an Audit of this CEMP for the site every month.

Audits outside of the regular audit program may be conducted where:

- Major amendments occur to applicable legislation, policy or standards;
- Environmental feedback or complaints identify a major system non-conformance; and
- Significant risk to due diligence is identified.

The Project Manager shall review the CEMP to ensure its continuing suitability, adequacy and effectiveness.

Copies of all Audits should also be forwarded to the NSW DECC and NSW Maritime Authority.

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9.0 Environmental Training

The Contractor shall be responsible for ensuring that all employees and sub-contractors working on-site have received environmental training in relation to this CEMP during the On-Site Safety Induction Training Programme. Records of all persons that undergo environmental training are to be entered by the Contractor in the site's Training Register (**Appendix E** or similar). Reports on the environmental training programme shall be provided to the Project Manager for review.

Training shall be structured to ensure all workers understand their obligation to exercise due diligence in relation to environmental matters.

Issues to be covered include but may not be limited to:

- Relevant environmental legislation;
- Reporting procedures;
- Complaint management;
- General site issues;
- Traffic and access;
- Noise
- Air quality and dust control;
- Water quality management;
- Soil erosion and sedimentation;
- Vegetation management;
- Dangerous goods and chemicals / hazardous materials;
- Waste management;
- Emergency response and spill contingency procedures; and
- Heritage and archaeology.

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10.0 Occupational Health and Safety

Listed below are some general OH&S requirements of the Occupational Health and Safety Regulation 2001 under the Occupational Health and Safety Act 2000:

- Evaluation of onsite hazards and risks associated with these hazards;
- Particular risk control measures (including provisions regarding lighting, noise, atmosphere, electricity, confined spaces and manual handling);
- Definition of personal protection standards;
- Classification of onsite personnel and work zones;
- Details on work practices and restrictions, assessment of anticipated protection levels, controls on access to work zones and decontamination;
- The use of plant at places of work;
- Supervision of work practices and medical surveillance;
- The notification of accidents and other matters;
- Environmental monitoring protocols;
- Emergency information; and
- Risk assessment methods.

10.1 General

An exclusion area shall be enforced around the work site to assist in the safety of both onsite personnel and the public. Appropriate signs will be placed at the entry and along the boundary of the exclusion zone warning workers and public of the hazards associated with the project.

The Contractor must ensure all employees and visitors to the Site attend the contractor's health and safety induction before entry to the work area is allowed. All project related personnel and visitors must sign in and out to ensure there is strict control on access to the exclusion zone. The CEMP Acknowledgement Record and Project Personnel Register is presented in **Appendix F** of this CEMP. Project staff must sign the master copy of this document, indicating they have read and understand it. The employee's signature indicates acceptance and compliance with the requirements of the CEMP. Copies of this document must be made available for their review and readily available at the job Site.

Access via water will be restricted within the boom enclosure. Any gates on the boom will be pad-locked to prevent un-authorised entry to the exclusion zone. Signs and notices will be placed on the boom at a number of locations to inform non-project related waterways users that entry is prohibited.

10.2 Navigation

All vessel access to the site would be from the north of the proposed Marina construction area (work area). Vessels will approach the work area from the main channel of the Parramatta River, turning South at Breakfast Point towards the work area. It is anticipated that vessels would approach the Site on a path between 100 m and 190 m east of the foreshore mean high mark. This is approximately 60 m clear of the Sydney Ferry access path.

As part of the construction approval process navigation related matters will be discussed and agreed with the NSW Maritime Authority and STA – Sydney Ferries.

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The navigation control measures will include:

- Advice to the Sydney Ferries controller of ferry movements concerning the activities to be undertaken each week, which may affect Sydney Ferries;
- A zone of restricted vessel speed in the vicinity of the floating boom and silt curtain; a
- The delineation of a vessel exclusion zone around the floating boom and silt curtain. In consultation with the NSW Maritime Authority, this zone will be defined and marked by the placement of approved buoy east of the Site and approximately 50m west of the Sydney Ferries vessel path

10.3 Personal Protective Equipment

At a minimum, Level D Personal Protective Equipment (PPE) shall be worn by all site personnel involved with works on the site. This includes hard-hat, steel-toed boots, high-visibility vest.

Additional specific PPE shall include:

- Life Jackets for all personnel working on the proposed Marina structure over open waters;
- One-piece wet-suit to be worn by divers (with no exposed skin);
- Latex gloves and safety glasses for personnel in contact with any contaminated sediments or waters;
- Face masks shall be available for use during excavation and manual handling of soils or sediments, if dusty conditions develop; and
- Ear and eye protection during breaking of concrete and pile works.

All PPE shall meet the requirements of Australian Standards.

10.4 Prohibited Activities

Activities such as drinking, eating, food storage, smoking etc shall only be permitted in designated areas. Drinking of alcohol or drug use is strictly prohibited onsite or in the vicinity of the site. Any person entering the site, who is suspected of being under the influence of alcohol or drugs, will not be permitted to enter the site. All personnel working onsite will also be instructed to maintain good personal hygiene.

10.5 Potential Hazards and Prevention

The following prevention practices shall be employed (as a minimum), in addition to the HASP prepared and implemented by the Project manager:

Table 6: Hazard Prevention Practices

Hazard	Prevention
Contaminated soil/sediment coming in contact with skin.	Wear gloves and overalls. Personal protective equipment shall be provided in sufficient quantities to provide for the duties of each on-site individual.

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Hazard	Prevention
Dust inhalation	There is minimal potential for exposure to contaminants via inhalation as a result of dust creation during construction works. However should dust conditions arise, dust masks shall be made available on site by the contractor should these conditions arise, creating a potential (local) exposure to site staff. Dust shall be suppressed by spraying to prevent on-site and off-site impacts;
Underground and Overhead Services	Underground services shall be located by reviewing service plans and by the use of a service locator. Overhead services shall be located for the area in the immediate vicinity of the proposed Marina construction work.
Heavy Machinery	Safety vests shall be worn for visibility. Hardhats shall be worn at all times whilst working on the site. Prior to approaching heavy equipment, the operator shall be made aware by initially waving at the operator to receive their attention and proceeding once eye contact is made and the equipment is idle.
Open Water	Life Jackets to be worn at all times whilst working over open waters within the proposed Marina work area. This will apply to any activities over water including working on completed fixed or floating sections of the Marina. Floatation devices to be readily available to rescue anyone that might fall in the water.
Site Traffic	Site traffic shall be diverted or the area barricaded prior to commencement of the works. Warning signs shall be installed on/adjacent to all access points.
Slippery Surfaces	If possible site personnel should avoid working in areas with slippery surfaces. Wear rubber sole boots. Non-slip material shall be used to cover the surface, where appropriate. Warning signs shall be installed on/adjacent to all access points.
Heat	Hardhats with rims, long sleeved shirts, long pants and sunscreen shall be used. Plenty of liquids shall be available for all field personnel.
Noise	Noise attenuation equipment shall be used as necessary. All site personnel shall carry earmuffs or plugs for use during excessive noise.
Manual Handling and Lifting	Heavy loads shall not to be lifted alone. Mechanical aids shall be used. Gloves or hand tools shall be used when handling rough jagged or sharp objects.
Fatigue	Regular breaks shall be taken and equipment shall be used, where possible, to reduce heavy physical labour.

In addition to the above, the WorkCover OHS Safety Guide for *Preventing Death by Drowning* (issue: October 1996 Safety Guide No. 4510) specifies the following control measures to prevent death by drowning for people working in or near water, they include:

- Do not enter the water at all, if a hazard is present;
- If you must enter the water, stop the flowing water by turning off the pumps or closing valves or gates. To ensure the system cannot be turned on again accidentally, the

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procedure should involve a second isolation action, in order to ensure entry into the water is safe. Provide a warning sign at the isolation point that clearly identifies the dangers if operated; and

- If stopping the flow of water is not practicable, isolate the hazard by providing an effective physical barrier (a guard) to stop anyone entering the vicinity of the flowing water.

11.0 Emergency Response

11.1 Priority Actions

In the event of any environmental incident, the first priority shall be the safety of all personnel and the community in the immediate vicinity of the site. Following this, all practical steps should be taken as soon as possible after the event to minimise the risk of further environmental damage. The situation should be stabilised with regard for the appropriate incident management or contingency plan procedures. The appropriate staff should be notified and emergency procedures enacted.

11.2 Emergency Response Equipment and Personnel

The following Emergency Response equipment and material will be at the site at all times during the project for immediate use:

- Additional boom material to replace any damaged sections during the course of the project;
- Additional silt curtain material to replace any damaged sections during the course of the project;
- Absorbent material to collect surface oil and for use during pile removal. This material is to be stored adjacent to the proposed Marina and readily available for use;
- Sandbags to be used for bunding of spillages/leaks of oil etc and for use to weigh down absorbent material during pile removal or if oily material is released from the river bed during the proposed Marina removal works. The sandbags will be stored adjacent to the proposed Marina; and
- A boat will be available during the course of the project for emergency response use. The boat will be used for repairing booms and silt curtains, and also will be used to carry divers to areas of concern (where piles are being installed and when large objects are accidentally dropped into the water). The boat will contain emergency absorbent material and sandbags.

A licensed diver will be available as required to inspect boom, silt curtains and river bed during construction of the proposed marina` and when large objects are accidentally dropped into the water. The diver will meet the requirements of Section 8.8 of the *Occupational Health and Safety Regulation, 2001*, which include:

- *“Diving hazards associated with environmental conditions, hyperbaric and physiological factors and the diving site are controlled;*
- *Diving work carried out at depths of 50 metres (at sea level, or equivalent at altitude) or less complies with AS/NZS 2299.1:1999 Occupational Diving Operations Part 1, Standard Operational Practice;*
- *The person diving holds a certificate issued by a medical practitioner certifying that the person is medically fit for the diving work; and*
- *The person diving holds an appropriate certificate issued under the Australian Diver Accreditation Scheme (ADAS) administered by the Department of Industry, Science and Resources of the Commonwealth”.*

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11.3 First Response

Typical first response actions may include:

- Containment of any pollution using booms, silt fences, absorbents, bunding or interception pits;
- Temporary repair or isolation of failed plant/equipment component; and
- Sampling of impacted site media be it sediment, soil, surface water or a mixture of these.

11.4 Follow up Actions

Follow up action shall include the development of a work plan to remediate the impacted site media. The work plan would detail any sampling and analysis requirements to define the nature and extent of impact, methods for the recovery, handling, storage and treatment of impacted material, disposal and/or reuse options for impacted material and personal protective equipment requirements.

11.5 Emergency Procedures

In the event of a serious emergency at the Site, the following procedure shall be followed:

- Stop work.
- All personnel shall leave the work zone via established entry/exit routes. (For off shore works this will be through a designated gate in the silt curtain.
- If the emergency is on a barge, leave the barge by climbing onto a boat.
- If the emergency is on the Marina (during construction) exit via the emergency route to assembly area on the foreshore.
- Await further instructions from the Project Manager.
- Inform NSW Maritime Authority.

No project personnel or visitors are to leave the assembly area unless advised to do so by the Contractor's project manager or Project Manager.

The on-site manager shall notify the relevant service as to the details regarding any emergency:

- Fire Brigade;
- Ambulance;
- Police;
- Environment Protection Authority; and
- NSW Maritime Authority.

Records shall be kept of any incidents, accidents, hazardous situations, unusual events and unsafe health exposures and the corrective action taken. The Contractor or their representative shall investigate the cause of any emergency so that necessary changes in work practices can be made to prevent the incident recurring. Records of any emergency will be forwarded to NSW Maritime Authority.

11.6 Emergency Contacts

The contact names and phone numbers of key project personnel from the Contractor, AECOM and off site emergency services phone numbers are shown below. Emergency procedures and contact telephone numbers shall be displayed in a prominent position within each site working area.

Table 7: Emergency Response Contacts

Organisation	Name	Phone
Construction Project Manager - TLB Engineers Pty Ltd	Howard Bersten	02 9409 3300 0412 618 220
Contractor – Site Manager	TBA	TBA
Principal Environmental Scientist AECOM	Sedat Tasdemir	(02) 8484 8949 0414 447 859
NSW DECC	Pollution Line	131 555
NSW Maritime Authority	TBA	TBA
Emergency Services	Ambulance Police Fire Department	000
General Hospital	Hospital – Concord Repatriation	(02) 9767 5000

Notes: TBA – To be appointed.

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12.0 Site Specific Hazard Identification and Mitigation

The site-specific hazards identified are based on previous investigations/remediation on the former Mortlake Gasworks property and the sediments in the harbour (adjacent to the former Mortlake Gasworks property).

Generally, in managing exposure to hazards at the site, personnel should assess the hazards and risks prior to the commencement of any works. Any concerns with site health and safety, and potential environmental impact should be raised with the Project Manager and AECOM prior to the commencement of any work.

A summary of the likely hazards and prevention and/or management of the hazards identified are provided in the following sections.

12.1 Chemical Hazards and Management

Based on the site history and previous environmental assessments and remediation work at the former Mortlake Gasworks property adjacent to the proposed Marina development area the following substances were identified as potential contaminants derived from various gasworks activities:

- Ammoniacal liquors.
- Waste coal and coke.
- Spent oxide.
- Heavy metal catalysts and corrosion inhibitors.
- Heavy metals;
- Cyanide;
- Sulphate;
- Tar;
- Polycyclic aromatic hydrocarbons (PAHs);
- Phenols; and
- Total petroleum hydrocarbons (TPHs).

Of particular concern during the proposed Marina construction works are known contaminants in nearby sediments, including:

- Heavy metals;
- PAHs; and
- TPHs.

Although the workers are unlikely to come into contact with the above contaminants given the nature of the proposed works (i.e. majority from the above surface of water), the management of exposure to the above contaminants will involve, but would not be limited to, the following safe operating procedures:

- All site personnel whose work tasks may expose them to contaminants or contaminated material during site works will be required to adopt appropriate

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personal protective equipment (PPE). The level of PPE will be determined onsite by the contractor in consultation with AECOM. A minimum level of PPE will be required at all times as described in **Section 10.2**;

- Ensure that any visitors or other site users are not exposed to any potential contaminants or airborne contaminant matter;
- All visitors or other site users personnel should be kept at a safe distance;
- Where dust is a concern, dust suppression measures will be employed to reduce the potential for exposure of personnel to inspirable dust. Dust suppression will as a minimum involve watering down of an area or covering of the source material;
- Any eating, drinking or smoking is prohibited in any working area;
- When handling any material (soil, solid, sediment, sludges etc.) personnel will wear disposable latex or nitrile gloves at a minimum and avoid any dermal contact; and

If the presence of unknown materials is suspected all activity in the vicinity of the area of concern will cease and the Project Manager and/or AECOM will be consulted for direction. Work may resume following identification, removal, and/or disposal of the suspect material and once the work area is deemed to be safe by AECOM.

12.2 Biological Hazards and Prevention

Biological hazards are disease-causing organisms, such as viruses, pathogens, fungal organisms and some bacteria, which may be associated with waste materials. In addition, biological hazards can also be associated with some plants, insects and animals.

Although biological hazards are not expected, AECOM consider that potential biological hazards can be managed by:

- Wearing Appropriate PPE, including;
 - Gloves (latex gloves/nitrile gloves)
 - Long sleeved shirts and long pants
 - Use insect repellents and/or mosquito nets/screens
- Immediate treatment of any cuts, abrasions etc; and
- By rinsing using an appropriate mixture of soap or detergent and water any skin surface that comes in contact with contaminated materials.

If required, the site first aid officer may be consulted for first aid and possibly followed with a visit to the Doctor.

12.3 Other Hazards

Other hazards such as stress, fatigue, etc can be managed by taking appropriate breaks during a given day and not causing any undue stress on the individual. Overall, these hazards are managed by careful project planning and maintaining an awareness of the surrounding environment, including any potential hazards that may be encountered.

Working over open waters presents an additional hazard and risk of drowning. All personnel working on the proposed Marina structure should be provided with life jackets and additional fixed life buoys kept within the site.

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The hazards that the diver could be exposed to are:

- Drowning. The diver will be a licensed and a buddy system will be used.
- Exposure to chemicals released from disturbed sediment. The diver will use a one-piece wet-suit that does not expose any skin. If the diver comes in contact with contaminated material then the decontamination sequence provided in **Section 12.4**, below will apply.

12.4 Decontamination

The personnel decontamination sequence will comprise:

- 1 Wash PPE (or diver suit) of gross contamination;
- 2 Remove outer boots and gloves. The diver will remove goggles, flippers and diving suit;
- 3 Remove respirator;
- 4 Remove inner gloves; and
- 5 Storage and appropriate disposal of used PPE.

12.5 Summary of Hazards

The following points summarise the risks that may be associated with the site:

- Worker exposure to dust, vapour, soil, sediments or water containing contaminants;
- Potential injury caused through operating and working near heavy machinery or general traffic;
- Potential ear or eye injury caused by the site operations;
- Drowning; and
- Traffic.

The potential pathways of exposure posed by the physical, chemical, biological and other hazards that have been identified in the above sections are summarised in **Table 8** below with the general precautions or controls that reduce the overall risk of an incident associated with the hazard.

Table 8: Summary of Hazard Pathway Mitigation Measures

Hazard	Pathway of Exposure	Precautions to Mitigate Exposure
Chemical	Absorption Ingestion Inhalation	Use of PPE and decontamination Decontamination and prohibition of activities Air monitoring for VOCs, dust reduction and use of PPE
Physical	Direct contact	Maintenance of equipment Use of PPE (full body wet suit for divers) Prohibition of activities
Biological	Direct contact	Use of PPE and prohibition of activities

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12.6 Risk Assessment

The table lists potential hazards associated with the project and conducts a risk assessment and details the prevention and control measures.

Table 9: Risk Assessment

Item	Hazard	Risk Assessment (Level of Risk)		Prevention/Control
		Likelihood	Severity	
1	Contaminated soil or sediments coming in contact with skin.	3	2	All site personnel whose work tasks include the potential to come into contact with contaminants or contaminated material during site works will be required to adopt appropriate personal protective equipment (PPE) to protect against exposure. The level of PPE will be determined onsite by the Project Manager and AECOM. A minimum level of PPE will be required at all times as described above in Section 10.2. When handling any material (water, soil, solid, sediment, sludges etc.) personnel will wear disposable latex or nitrile gloves at a minimum and avoid any dermal contact.
2	Underground Services	2	1	Locate services (submerged cables) by reviewing service plans and by the use of a service locator.
3	Heavy Machinery	2	1	Wear safety vest for high visibility. Wear hardhat at all times whilst working on the site. A minimum of 2 metres will be kept between personnel and heavy machinery whilst in operation.
4	Excavation pits and trenches (related on shore work)	3	1	Shoring of all deep excavations. No entry into excavations deeper than 1.5 metres.
5	Site Traffic (Movement of Plant/Equipment)	2	2	An exclusion zone comprising witches hats and/or barricades will be set up surrounding the immediate work area to protect the safety of the workers.
6	Steep Grades (machine overturning)	3	2	Plant and equipment used in a manner to prevent overturning. No work to be carried out by heavy machine on grades greater than 40 degrees.
7	Slippery Surfaces	3	3	If possible site personnel should avoid working in areas with slippery surfaces. Wear rubber sole boots. Use non-slip material to cover the surface, where appropriate.
8	Open Waters (Drowning)	2	1	Personnel should take care. Life jackets to be worn by site personnel on proposed Marina over open waters. Rope and life buoys and resuscitation guide to be kept on site.

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Item	Hazard	Risk Assessment (Level of Risk)		Prevention/Control
		Likelihood	Severity	
9	Heat / sun	2	3	Wear hardhat with rim, long sleeved shirt, long pants and sunscreen. Drink plenty of liquids. Ensure supply of drinking water for all field personnel.
10	Dust	3	3	Where dust is a concern, dust suppression will be employed to reduce the potential for exposure of personnel to inspirable dust. Dust suppression will as a minimum involve watering down of an area or covering of the generating material.
11	Noise	1	2	Use noise attenuation equipment and as necessary provide silencers on noisy equipment. All site personnel will carry earmuffs or plugs for use during excessive noise.
12	Vapours / fumes	2	2	A half-face respirator with organic vapour cartridge will be available for use if organic odours are encountered or background PID (see below) readings exceed 5ppm (TWA for benzene). Monitoring for VOCs will be undertaken of soil samples and the work area by the use of a PID. Should VOC concentrations remain above 5ppm (time weighted exposure limit for benzene) for one minute, then the work at that location will be halted until the appropriate respirators are obtained;
13	Biological Hazards Including: disease-causing organisms, such as viruses, pathogens, fungal organisms and some bacteria, which may be associated with waste materials. In addition, biological hazards can also be associated with some plants, insects and animals. The biological hazards may originate from buried waste areas, including possible surplus medical wastes.	3	2	Wear appropriate PPE, including; Gloves (latex gloves/nitrile gloves) Long sleeved shirts and long pants Use insect repellents and/or mosquito nets/screens Immediate treatment of any cuts, abrasions etc. If any skin surface comes in contact with contaminated materials must be rinsed using a mixture of Decon 90 (or similar) and water.
14	Manual Handling and Lifting	1	2	Heavy loads are not to be lifted alone. If possible use mechanical aids. When handling rough jagged or sharp objects use gloves or hand tools.

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Item	Hazard	Risk Assessment (Level of Risk)		Prevention/Control
		Likelihood	Severity	
16	Work at Heights	3	1	If working at heights is required, provision and maintenance of a stable and securely fenced work platform, with fences and handrails or other barriers to prevent falls. If this is not practicable, other forms of physical restraints will be used (eg harnesses).
17	Stress / Fatigue	2	2	Regular breaks, use equipment where possible to reduce heavy physical labour.

Severity:

Class 1	Death or Permanent Disability
Class 2	Serious Injury / Loss Time
Class 3	Minor Injury / No Loss Time

Likelihood:

Class 1	Very Likely
Class 2	Likely
Class 3	Less Likely

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13.0 Contingency Plans

The purpose of the contingency plan is to identify unexpected situations that could occur during works associated with construction of the proposed Marina and specify procedures that can be implemented to manage such situations and prevent adverse impacts to the environment and human health. The daily site inspection form (in **Appendix B**) will be completed by a representative of the contractor, and any corrective actions required will be noted on this form.

The Contractor will be required to maintain a register of complaints from local residents and waterway users, which will include a record of any action taken with respect to the complaints. The Contractor or a nominated representative of the Contractor will be notified immediately should any incident affecting the environment or the surrounding community, occur. AECOM will be notified upon the occurrence of any incidents effecting the environment.

All incidents and/or complaints will be forwarded to the NSW DECC and NSW Maritime Authority.

Details of the procedures are defined in the following sections.

13.1 Water Protection Measures Fail

In the event that the boom/silt curtain enclosures fail, they will be repaired and/or supplemented immediately.

13.2 Significant Periods of Swell and Wave conditions

In the event that extreme swell and wave conditions, the inspection of the boom silt curtain will be increased to daily inspection. The inspection will be undertaken from the land if the conditions are deemed to be unsafe for use of a boat.

The boom/silt curtain enclosures will be repaired and/or supplemented immediately if it is damaged. However, if conditions are unsafe, the repair or maintenance work will be undertaken once conditions become favourable. In this instance, a diver will also be used to inspect the submerged portions of the boom/silt curtain.

13.3 Material Falling into Kendall Bay

All material that has fallen into the harbour will be contained within the boom/silt curtain enclosure.

If an object falls into the water, the diver will be informed and the location of the fallen object will be inspected by the diver geared with absorbent material and sandbags. If any contamination is observed to be releasing, this will be managed in accordance with **Section 13.4**, below.

The material that has fallen into the harbour will be removed at regular intervals as described in **Section 3.3.1**. All waste material collected will be handled in accordance with the waste management requirements outlined in **Section 3.3.2**.

13.4 Release of Contaminated Material from River bed

In the event that any material (including oil) is released from the river bed due to objects falling into the water or during blanket installation or pile installation, the affected area will be covered with sandbags. A diver will be used to place the sandbags on to the exposed area. The sandbags will be used immediately following identification of release of contamination.

Refer to Emergency Response (**Section 11**) for further details.

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13.5 Uncover Contaminated or Unknown Materials

In the event that any significant unknown type of material (including contaminated) is identified during the works, the material will be inspected by AECOM and sampling and analysis will be undertaken, as required. Any action required will be undertaken by the Project Manager.

13.6 Damage to Underground Services

In the event that any underground services are damaged, all works in that area will be stopped immediately. The Project Manager will be notified. A representative of the Project Manager will assess the situation and inform the Project Manager. The Project Manager will notify the appropriate service provider, and an incident/accident report will be completed.

The works will only proceed if the Project Manager is satisfied that all the actions undertaken are appropriate and additional works will not cause an impact to the environment or health & safety.

13.7 Odour

Should excessive odour (odour that is noticeable at the site boundary by olfactory sensory) be generated during the construction works, the following measures will be considered for use as appropriate:

- Reduce surface area;
- Application of odour suppressant agent;
- Use of covers;
- Modification of the operation of the equipment;
- Use of different equipment that generates less odour; and
- Cease work. Commence work once the Project Manager is satisfied that all odour generating conditions have been controlled.

13.8 Noise and Vibrations

Should nuisance noise or vibrations be generated during the works, the noise will either be monitored and/or the following measures will be considered for use as appropriate:

- Use of noise reducing features or silencers;
- Construction of noise attenuation measures (e.g. stockpile barriers, enclosures);
- Modification of the operation of the equipment;
- Use of different equipment, which generates less noise or vibration; and
- Cease work. Commence work once the Project Manager is satisfied that all noise generating conditions have been controlled

Should noise complaints arise, periodic testing of equipment used on the site will be undertaken to verify compliance within maximum permissible noise levels

13.9 Spills and Leaks

Plant and vehicles used for the construction works will be stored, refuelled and maintained in a designated section of the Site, which will be located on land. Spill response procedures shall be made available to all employees and covered during induction training.

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If spills or leaks of hydraulic fluids, lubricants or fuel from vehicles/plant occur in the work areas, the following measures will be considered for use as appropriate:

- Use of absorbent booms to contain the material;
- Treatment with an absorbent material specifically designed for such situations; and
- Construction of retention basins, diversion drains, if the spill/leak occurs on land.

13.10 Excessive Rain

During major rain events, all the works will cease for safety purposes. The boom/silt curtain and any sediment control measures and bunding will be regularly inspected and maintained. The frequency of the monitoring will be increased during stormy weather conditions.

13.11 Equipment Failure

In the event that any equipment fails, equipment and associated operations will be shutdown until repairs are made. Spare equipment parts or rental options will be made available on site as appropriate.

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Figures

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Environment

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Environment



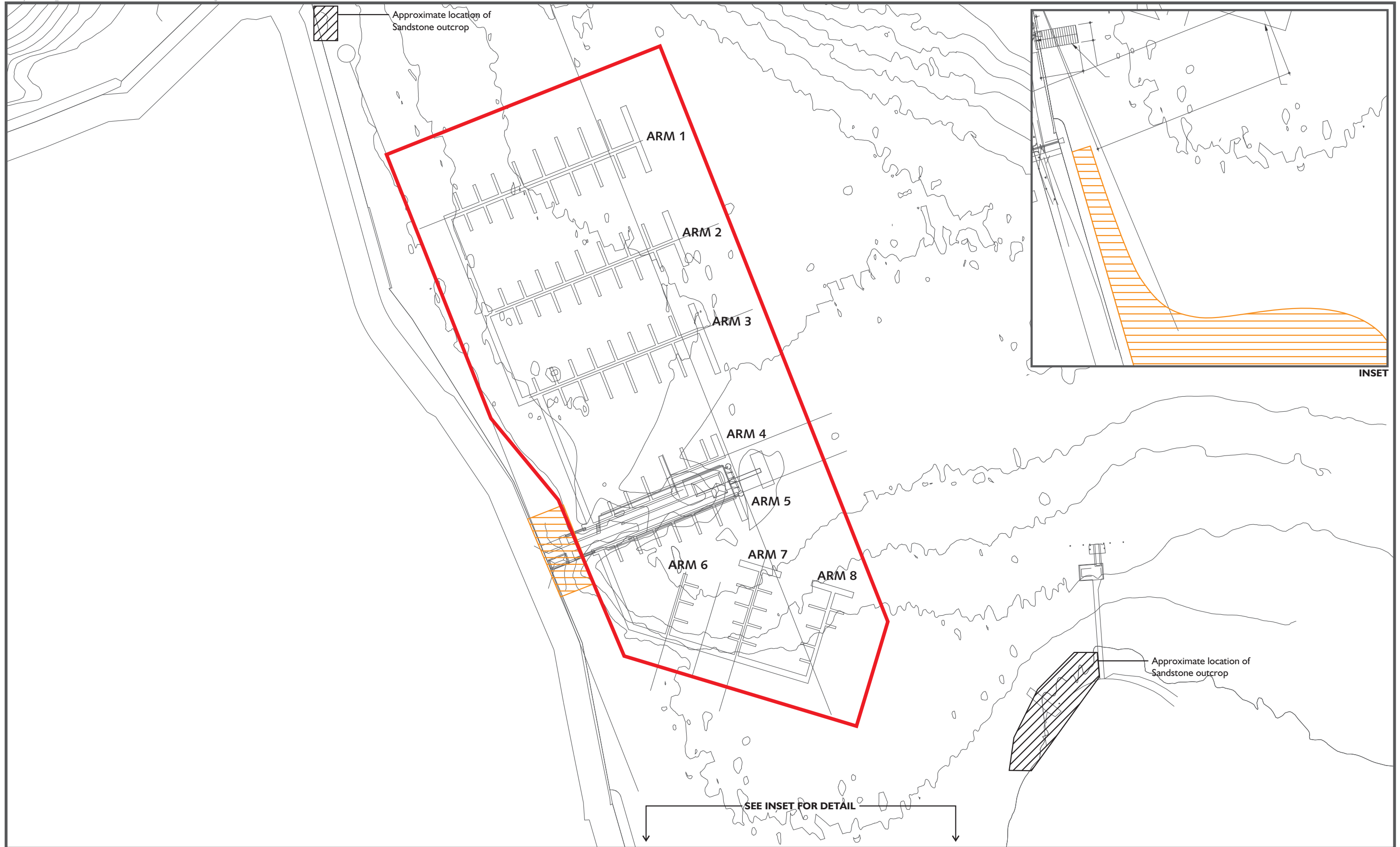
AECOM



Site Location

Breakfast Point Pty Ltd
Construction Environmental
Management Plan
Inner West Marina
Parramatta River, Sydney

Figure
F1



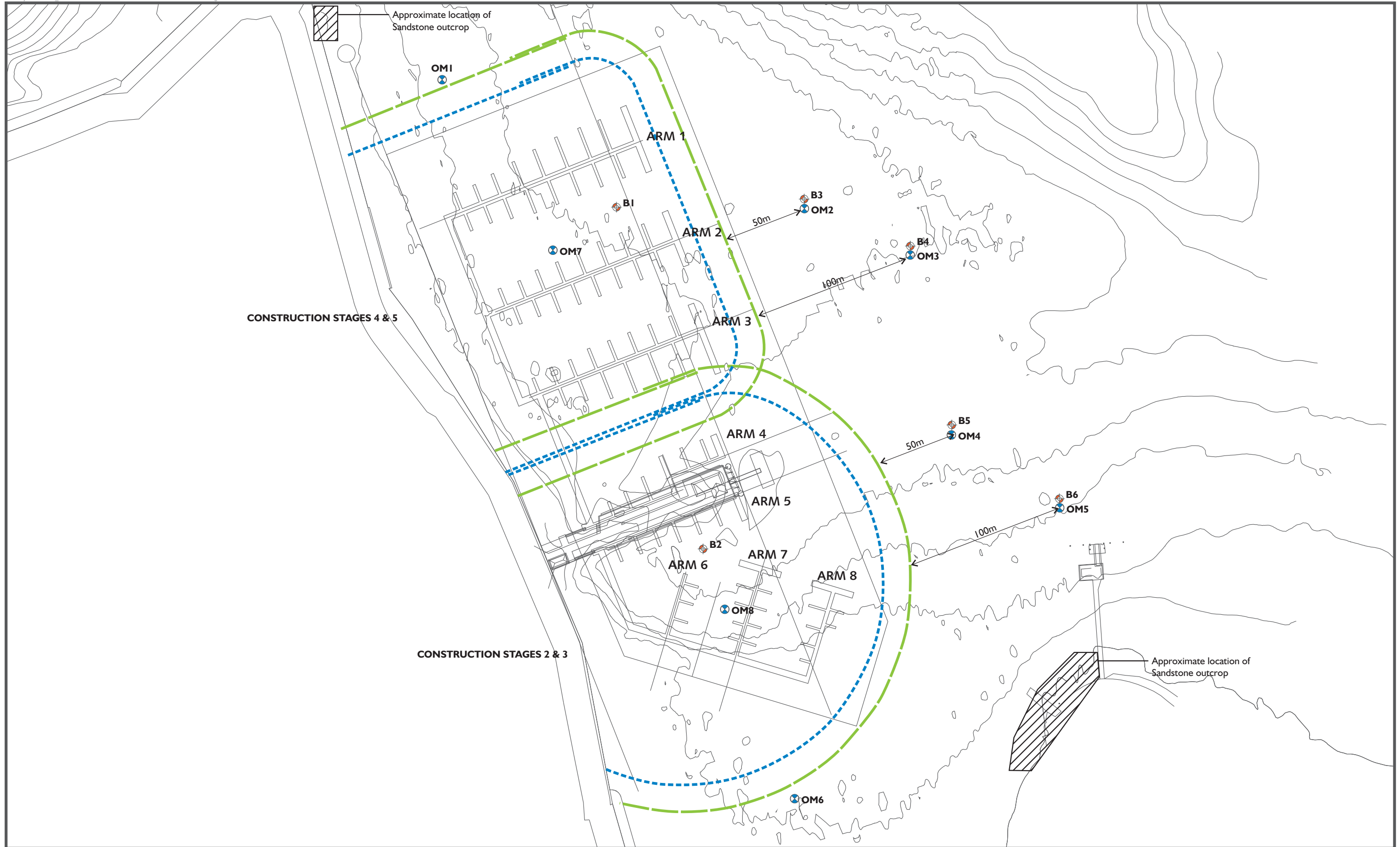
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- Approximate extent of Proposed Remediation Areas (URS, 2008)
- Proposed extent of sediment blanket

Proposed Extent of Sediment Blanket
Breakfast Point Pty Ltd
Construction Environmental Management Plan
 Inner West Marina
 Parramatta River, Sydney

Figure
F2



AECOM



- Floating Boom
- Silt Curtain
- Water quality baseline sample location
- Ongoing water quality monitoring location

Water Quality Monitoring Locations and Silt Curtain Floating Boom Schematic

Breakfast Point Pty Ltd
Construction Environmental Management
Plan
Inner West Marina
Parramatta River, Sydney

**Figure
F3**

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Appendix A

Schematic Drawings Provided by TLB Engineers

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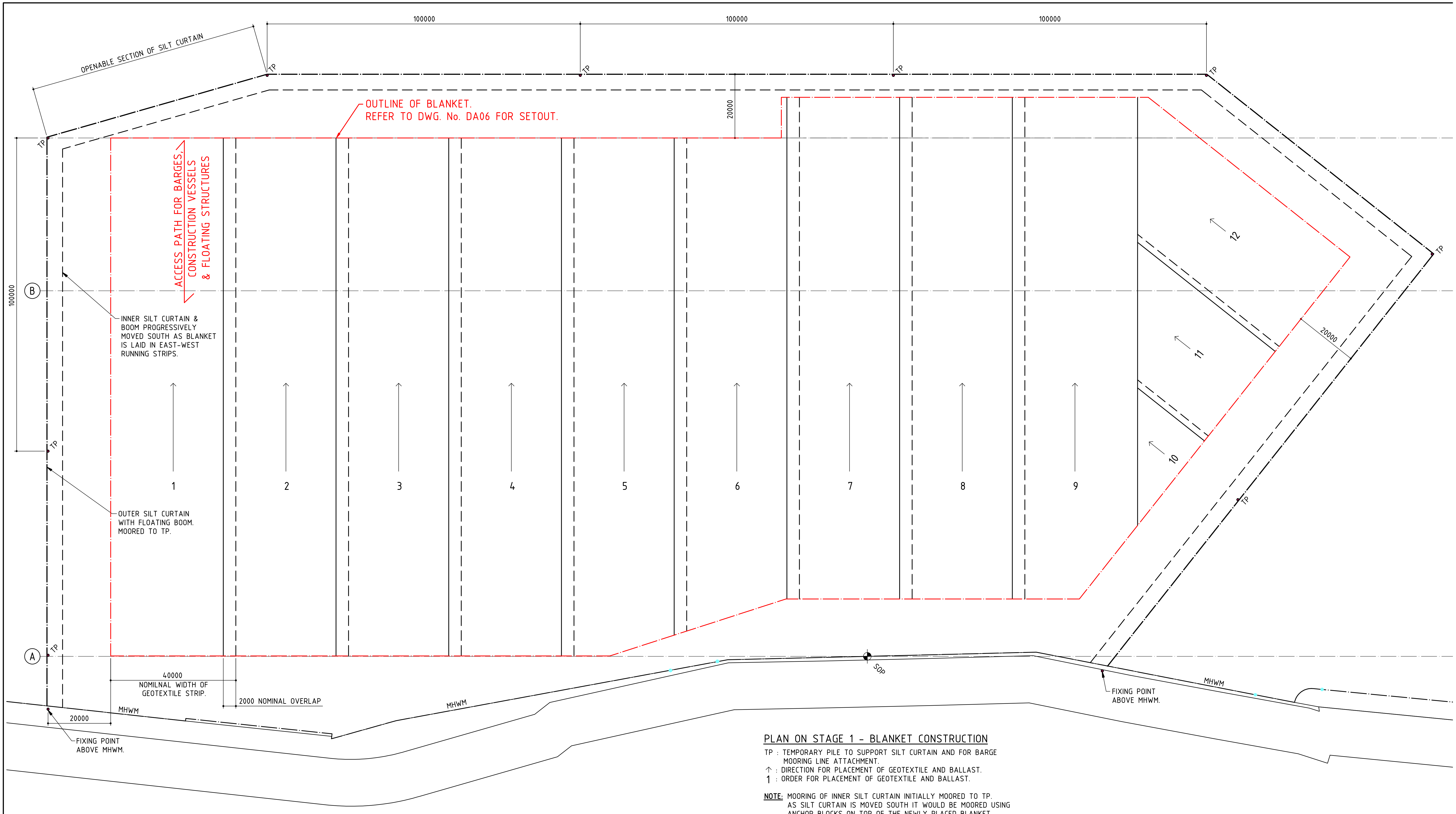
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PLAN

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PLAN ON STAGE 1 - BLANKET CONSTRUCTION

TP : TEMPORARY PILE TO SUPPORT SILT CURTAIN AND FOR BARGE MOORING LINE ATTACHMENT.
↑ : DIRECTION FOR PLACEMENT OF GEOTEXTILE AND BALLAST.
1 : ORDER FOR PLACEMENT OF GEOTEXTILE AND BALLAST.

NOTE: MOORING OF INNER SILT CURTAIN INITIALLY MOORED TO TP. AS SILT CURTAIN IS MOVED SOUTH IT WOULD BE MOORED USING ANCHOR BLOCKS ON TOP OF THE NEWLY PLACED BLANKET.

03 : PROJECT APPLICATION 09.10.09
02 : PROJECT APPLICATION 14.07.09
01 : PROJECT APPLICATION 09.07.09



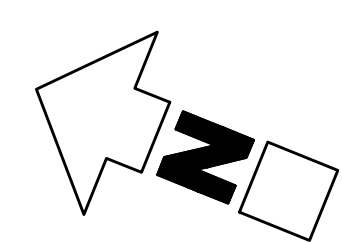
CONSTRUCTION STAGING

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Drawn S.K. Date 29.05.09 Dwg. No. CMP01
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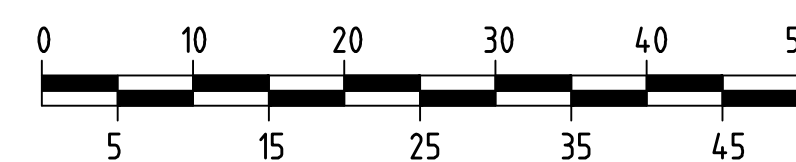
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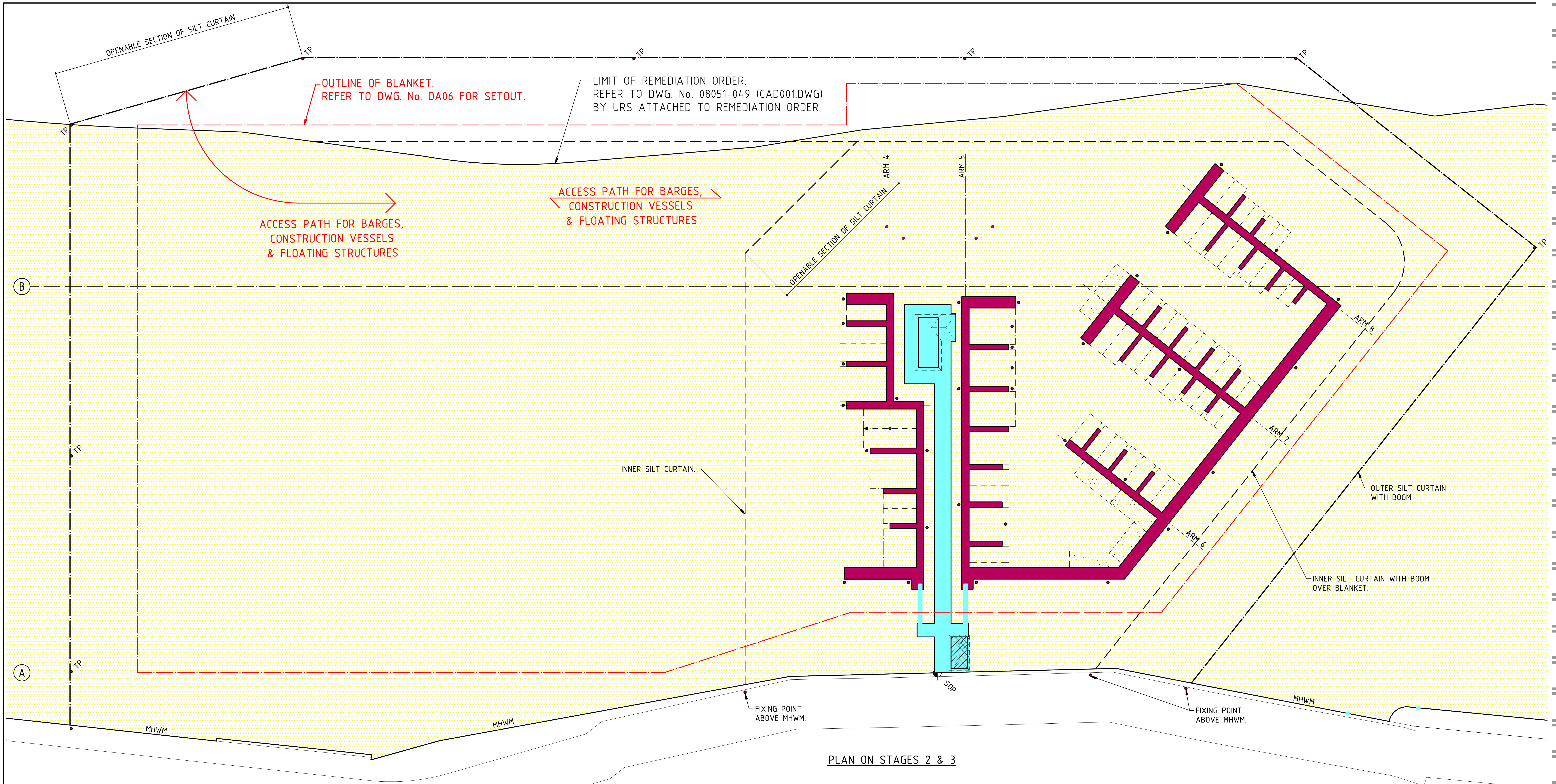
0 20mm 40mm 60mm 80mm 100mm

● TAYLOR LAUDER BERSTEN PTY. LTD. ABN 94 074 717 892 CONSULTING STRUCTURAL, CIVIL & MARITIME ENGINEERS 514 MILLER STREET CAMMERAY (PO BOX 110) NSW 2062 Telephone (02) 9409 3300 Facsimile (02) 9929 6667 EMAIL : tlbeng@tlbengineers.com



SCALE (m)
(1:500)





PLAN ON STAGES 2 & 3

STAGE 1 - CONSTRUCT BLANKET & CARPARKING AREA

STAGE 2 - CONSTRUCT FIXED JETTY

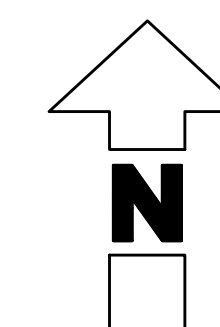
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03 : LIMIT OF REMEDIATION ORDER ADDED	04.09.09
02 : PROJECT APPLICATION	14.07.09
01 : PROJECT APPLICATION	09.07.09



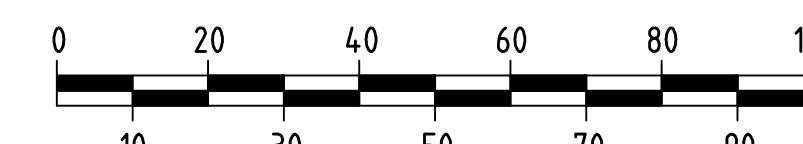
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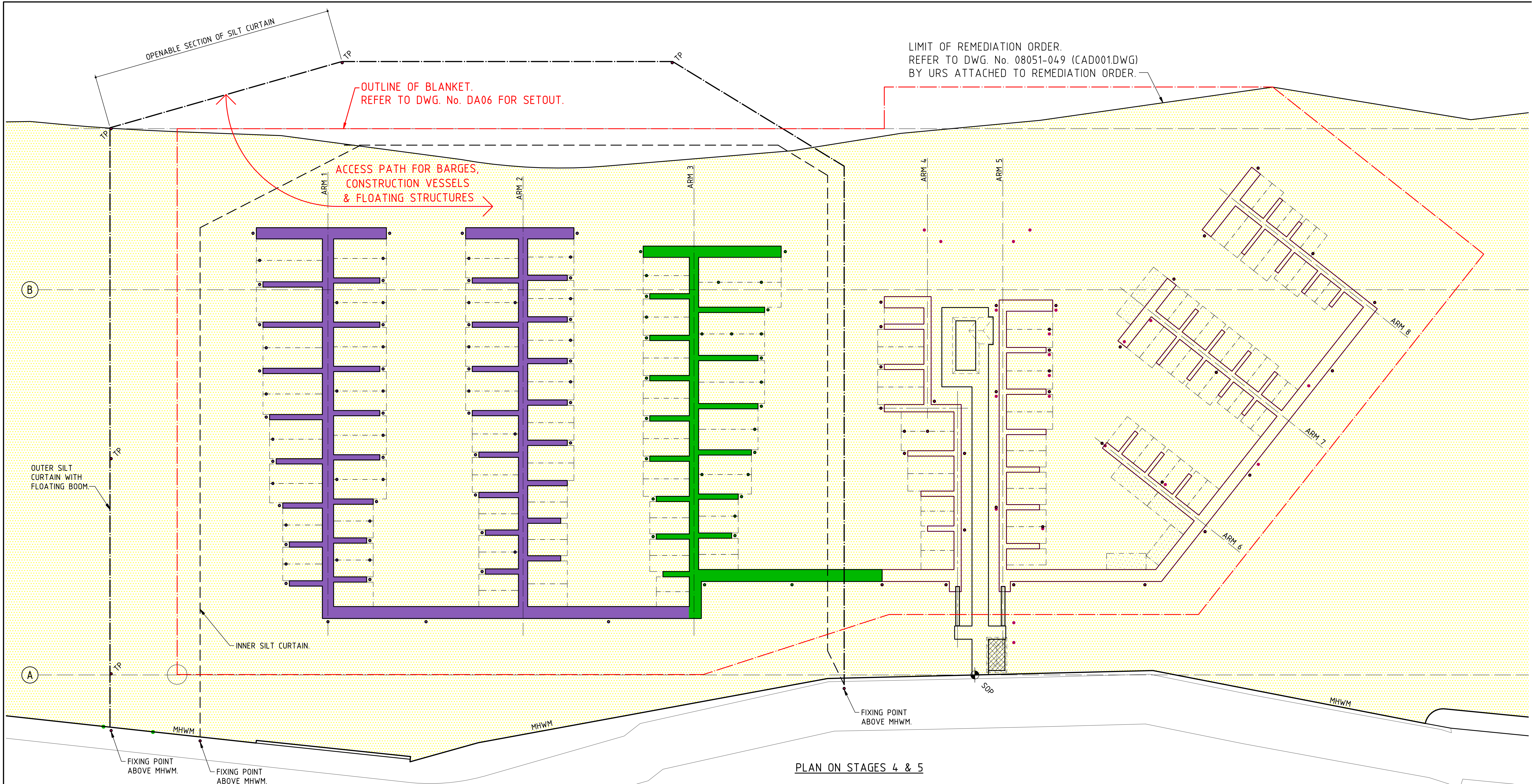
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SCALE (m)
(1:1000)





PLAN ON STAGES 4 & 5

- STAGE 4 - FLOATING STRUCTURE & PILES
- STAGE 5 - FLOATING STRUCTURE & PILES

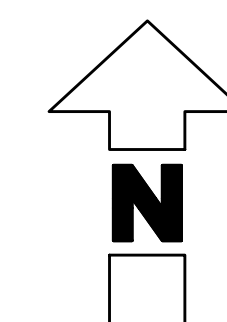
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02 : PROJECT APPLICATION	14.07.09
01 : PROJECT APPLICATION	09.07.09



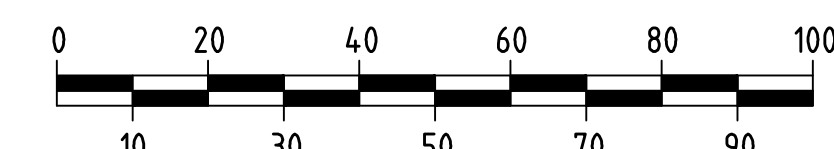
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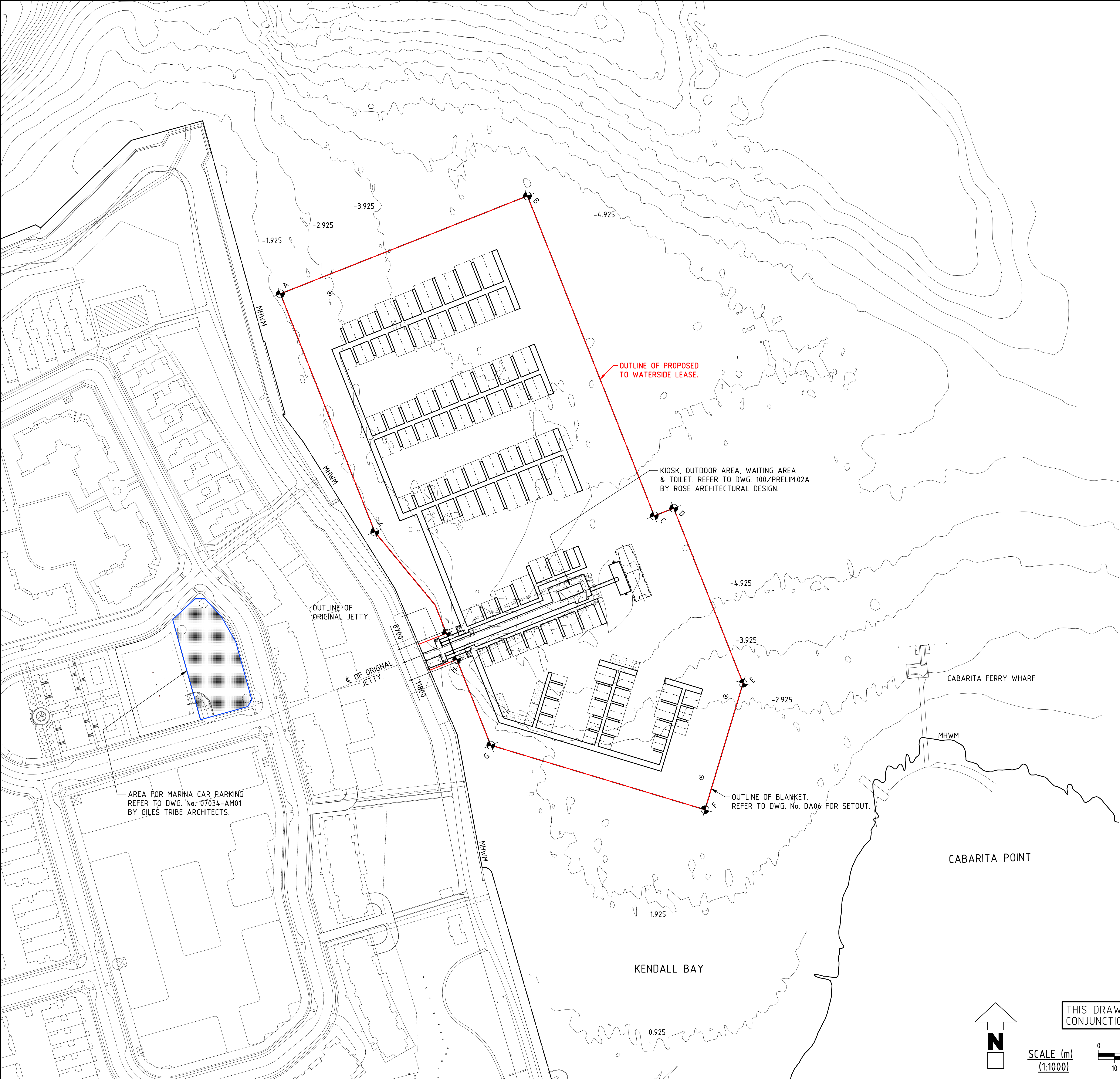
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SCALE (m)
(1:1000)





- NOTES :**
1. DATUM - AUSTRALIAN HEIGHT DATUM (AHD).
 2. THE BED CONTOURS ARE TAKEN FROM A HYDROGRAPHIC SURVEY BY 'HARVEY HYDROGRAPHIC SURVEYS' UNDERTAKEN ON 06.08.01 TO 08.08.01 INCLUSIVE AND A HYDROGRAPHIC SURVEY UNDERTAKEN BY NSW MARITIME IN 2006.

LEGEND :

◆ REFERENCE POINTS : REFER TO MGA94 (ZONE 56) CO-ORDINATES

MARK	MGA94 (ZONE 56) CO-ORDINATES (TO BE USED FOR FINAL SETOUT)	
	EASTING (m)	NORTHING (m)
A	325328.99	6254116.79
B	325482.76	6254177.72
C	325561.68	6253978.56
D	325573.77	6253983.35
E	325616.94	6253874.41
F	325593.26	6253795.71
G	325459.91	6253835.84
H	325438.76	6253889.20
J	325432.32	6253905.44
K	325387.72	6253968.58

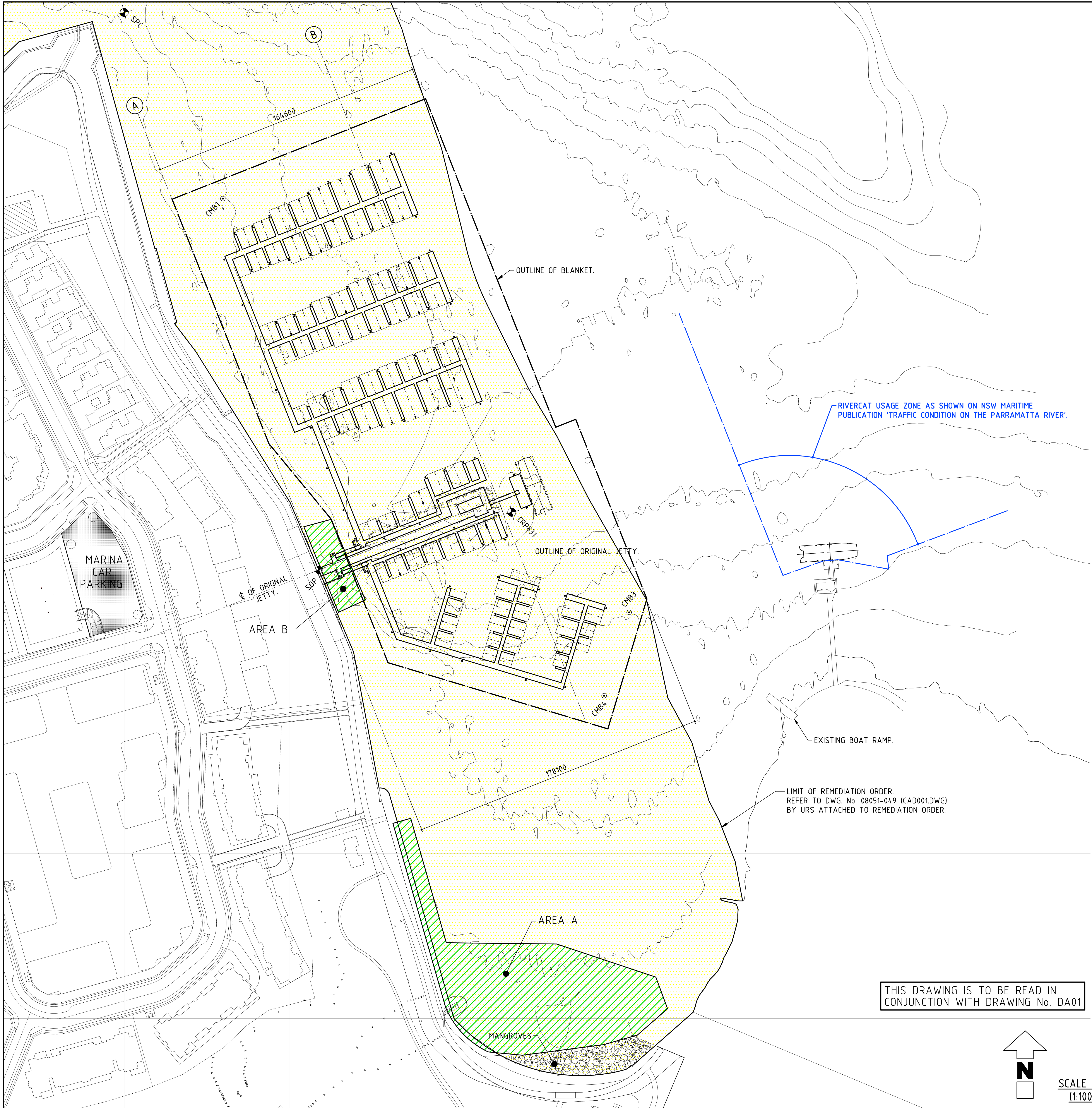
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02 : PROJECT APPLICATION 14.07.09
01 : PROJECT APPLICATION 09.07.09



SITE DIAGRAM

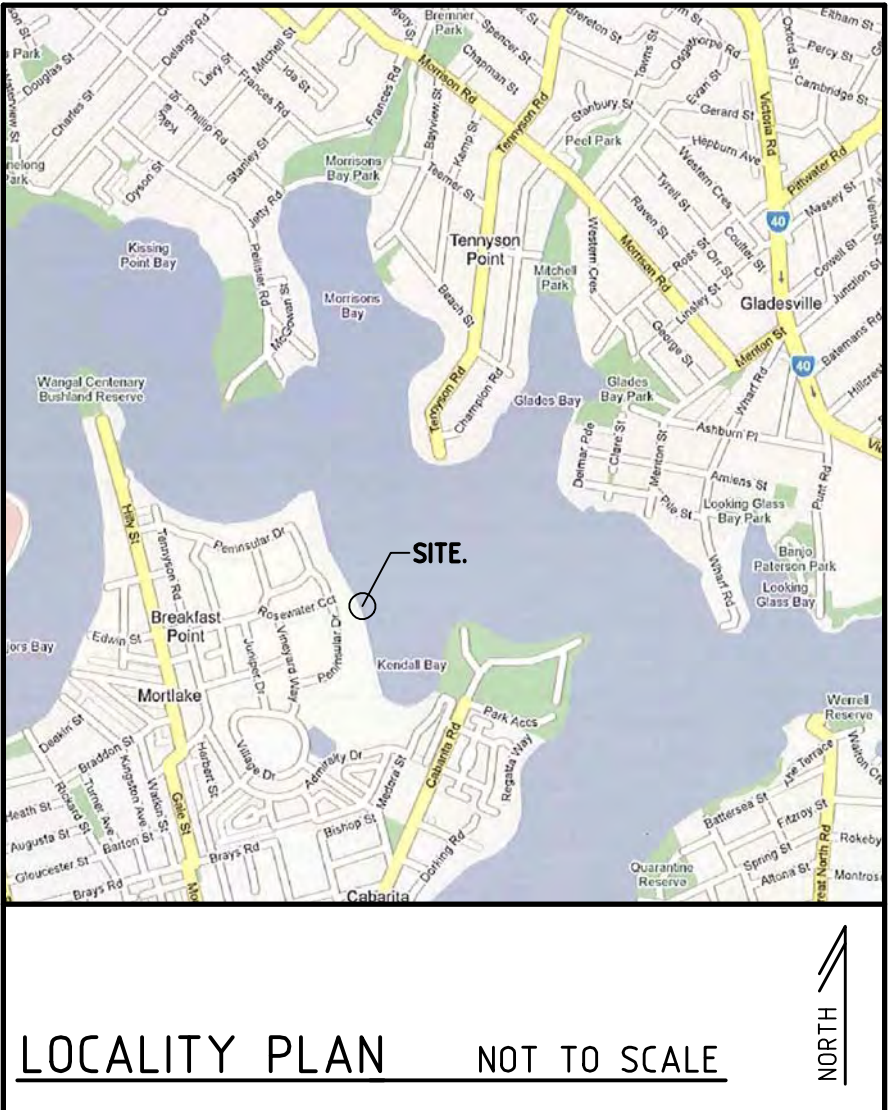
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LEGEND

- AREA PROPOSED TO BE REMEDIATED BY JEMEMA PTY. LTD.
- CMB1 - CMB4 : CHANNEL MARKER BUOY.
- CRP831 : EXISTING MARKER BUOY TO BE REMOVED ON CONSTRUCTION OF MARINA.
- SOP : SET OUT POINT.
- SPC : EXISTING CHANNEL MARKER PILE.



03 : PROJECT APPLICATION	09.10.09
02 : PROJECT APPLICATION	14.07.09
01 : PROJECT APPLICATION	09.07.09



SITE ANALYSIS

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Appendix B

Site Inspection Report

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Site Inspection Report	
Site / Area:	Date:
Reported By (print):	(sign): Time:
Weather Conditions:	Wind Speed:
Item	Comments (Include any immediate corrective actions undertaken)
Have all persons on site received induction and environmental training?	
Are all CEMP control measures in place?	
Is the piling / Proposed Marina construction activities resulting in significant sediment disturbances?	
Are the boom & silt curtain functioning correctly?	
Is the quality of water outside the silt curtain good?	
Are absorbent materials readily available?	
Water quality comments:	
Are dusty conditions observed? If yes, what operations are creating dust?	
Are odorous conditions observed? If yes, what operations are creating odour?	
Dust control comments:	
Are any adverse noise conditions occurring on site?	
Noise Comments:	
Are all fuels and chemicals stored correctly and in appropriately bunded areas?	
Is spill kit adequately stocked?	
Other Issues / General comments:	

Note: If immediate corrective action could not be undertaken to remedy situation, please initiate Non-Conformance and Corrective Action Report.

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Appendix C

Non Conformance and Corrective Actions Report

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Non-Conformance and Corrective Action Report

Date:	
Reporter:	Name: Sign:
Time:	
Site	
Problem:	
Cause:	
Report to:	Project Manager (Name):
Corrective Action:	
Signed by Project Manager upon completion:	
Feedback Response to Prevent Future Occurrences	
Date:	

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Appendix D

Complaints and Environmental Incidents Register

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Complaints and Environmental Incidences Register

[illegible]

Note: Should a complaint or incident identify a non-conformance that is not able to be immediately rectified, please initiate a Non-Conformance and Corrective Action Report

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Appendix E

Training Register

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Environmental Training Register

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Appendix F

CEMP Acknowledgement Record & Project Personnel List

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CEMP Acknowledgment Record & Project Personnel List

Project staff must sign the master copy of this document, indicating they have read and understand it. The employee's signature indicates acceptance and compliance with the requirements of the CEMP. Copies of this document must be made available for their review and readily available at the job Site.

Log of Project Personnel

[illegible]

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APPENDIX 10:
▪ **OPERATIONAL
ENVIRONMENTAL
MANAGEMENT PLAN**

Prepared for:

Breakfast Point Pty Ltd

51 Riley Street

Woolloomooloo NSW 2011



Operational Environmental Management Plan

Proposed Inner West Marina Kendall Bay, Parramatta River, NSW

Final

AECOM

30 September 2009

Document No.: J185612_OEMP_30Sep09.doc

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Distribution

**Operational Environmental Management Plan
Proposed Inner West Marina
Kendall Bay, Parramatta River, NSW**

30 September 2009

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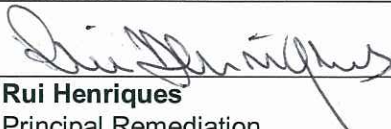
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Sedat Tasdemir

Principal Environmental Scientist

Technical Peer Reviewer:

Date:

	30/09/09
Rui Henriques Principal Remediation	

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Glossary of Terms

General Terms	
ANZECC	Australian and New Zealand Environment and Conservation Council
BTEX	Benzene, Toluene, Ethyl benzene and Xylene
DEC	Department of Environment and Conservation
DECC	Department of Environment and Climate Change
EPA	Environmental Protection Authority
HASP	Health and Safety Plan
ISQG	Interim Sediment Quality Guidelines
LOR	Limit of Reporting
NEHF	National Environmental Health Forum
NEPC	National Environment Protect Council
NEPM	National Environmental Protection Measure
NSW	New South Wales
OH&S	Occupational Health & Safety
OEMP	Operational Environmental Management Plan
POEO	Protection of the Environment Operations Act
PAH	Polycyclic Aromatic Hydrocarbons
SPS	Sediment Protection system
TPH	Total petroleum hydrocarbons
TOC	Total Organic Carbon

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1.0 Introduction

ENSR Australia Pty Ltd (trading as AECOM and hereafter referred to as AECOM) was engaged by Breakfast Point Pty Ltd to develop an Operational Environmental Management Plan (OEMP) for the proposed Inner West Marina (the Marina), Kendall Bay, NSW (the Site).

This OEMP is designed to address the environmental safeguards during the operation of the Marina.

The Site layout is provided in **Appendix A**.

1.1 Objectives of the OEMP

The purpose of the OEMP is to provide guidance on environmental control measures for the operation of the Marina. This OEMP provides an environmental manual for use by management and users of the Marina. It also forms an advisory document for regulatory agencies and stakeholders.

The objectives of the OEMP are to:

- Detail environmental management responsibilities;
- Improve environmental performance;
- Prevent pollution and reduce environmental risks;
- Manage and mitigate the potential for disturbance of the contaminated bed sediments of Kendall Bay;
- Detail auditing requirements; and
- Provide a mechanism to track environmental management activities.

1.2 Site Background Information

Kendall Bay is located immediately east of the former Mortlake Gasworks. During operations of the gas works, a total of three wharves were located along the foreshore area of the former gas works. The wharves were used for coal and oil loading, and one was also an oil/tar pipeline wharf. All three wharves have been removed.

The former gas works site was remediated and now comprises the Breakfast Point residential development.

1.3 NSW DECC Notifications

The NSW Environmental Protection Agency (EPA) [now a part of the Department of Environment and Climate Change (DECC)] has declared the sediments of the bed of Kendall Bay (and the Parramatta River) that fall within two hundred metres of the land based boundary of the former Mortlake Gasworks site, a remediation site under section 21 of the Contaminated Land Management Act 1997. The sediments in this area have been found to be contaminated with polycyclic aromatic hydrocarbons (PAHs) and total petroleum hydrocarbons (TPHs).

Under this DECC declaration, the NSW Maritime Authority (being the landowner) must refrain from carrying out, causing, permitting, or allowing another person to carry out works or activities at the Site which would result in the disturbance or further disturbance of the bed sediments of Kendall Bay and the Parramatta River in the area adjacent to the former Mortlake Gasworks.

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Prior to commencing works which have the potential to disturb bed sediments, the declaration requires that the person proposing to conduct the works must prepare and submit for the DECC's approval, a written plan with specific measures directed at minimising the disturbance and migration of contaminants in the bed sediments of the Site.

1.3.1 Sediment Protection System

A Sediment Protection System (SPS) has been placed above bed sediments to minimise sediment disturbance during the operation of the Marina. The SPS provides erosion protection of the contaminated sediment as well as providing a segregating and covering layer for the sediments. The SPS comprises the following:

- Geotextile: Elcomax 1200R polyester staple fibre geotextile, with a design life of greater than 100 years and polyester is resistant to biological and hydrocarbon attack; and
- Rock armour, consisting of 300 mm of graded basalt rock.

The SPS covers the entire Marina footprint (approximately 57 000 m²), including the floating structures, berths and access fairways and areas of potential sediment disturbance in shallow water between the floating platoons and the mean high water mark. The extent of the SPS is presented on drawings **DA01** and **DA10** in **Appendix A**.

Approximately 160 piles were sunk during the Marina construction. The piles were driven through the SPS. A geotextile collar was installed around the base of the pile on top of the geotextile blanket to ensure that the integrity of the blanket was not compromised by the pile driving. The gravel ballast was then re-instated to the specified thickness by divers.

1.4 Marina Description

The Marina contains up to 172 berths and includes the following facilities:

- A fixed jetty with a kiosk and amenities at the seaward end;
- A managers office, amenities and security gate;
- Public foreshore access along the jetty and marina walkways; and
- An SPS (geotextile and rock ballast) over the bed of the bay.

The layout of the Marina is shown on drawing **DA10** in **Appendix A**.

1.5 Scope of OEMP

The scope of this OEMP is as follows:

- Summarise background environmental information and Site conditions;
- Outline operational measures that will mitigate sediment disturbance and adverse effects on the environment and human health;
- Outline emergency response procedures related to environmental protection for the operation of the Marina;
- Outline the Marina decommissioning process that will mitigate sediment disturbance;
- Outline roles and responsibilities; and
- Outline training requirements.

1.6 Environmental Management Responsibilities

General responsibilities are outlined in **Table 1** below.

Table 1: Roles and Responsibilities

Role	Responsibilities
Site Owner NSW Maritime Authority	• Manage boating activities on NSW waterways and protect marine environment; • Review and approve the OEMP; • Undertake monitoring and inspections of the Marina, as required; and • Maintain records and documents produced as a result of this AOEMP.
Marina Owner/Operator Breakfast Point Pty Ltd	• Ensure the latest version of the OEMP is available; • Review and update the OEMP, as required; • Maintain records and documents produced as a result of this AOEMP; • Oversee overall implementation of the OEMP; • Ensure adequate training of all employees through a site induction, and as required on an ongoing basis whilst working at the Marina; • Ensure all staff and contractors working on the Marina comply with the requirements of the OEMP, together with regulatory requirements; • Ensure that operations are carried out in a safe and environmentally responsible manner in accordance with the OEMP on a day to day basis; • Monitor to ensure that the environmental protection measures put in place by contractor working on the Marina are appropriate and functioning correctly; • Ensure monitoring and inspections of the Marina are conducted, as required; • Undertake regular monitoring of the SPS integrity; • Undertake visual monitoring of surface water in and around the Marina for floating debris and oil; • Ensure incident reports and complaint reports are completed and followed up as required; • Ensure non-conformance and corrective action reports are completed, and follow up corrective actions are undertaken, as required; • Ensure corrective actions are undertaken in response to requests made by independent auditors or regulatory authorities regarding specific environmental or safety issues; • Ensure all necessary registers, databases, and records are completed as required in the OEMP; • Ensure audits of the Marina operations are undertaken in

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Role	Responsibilities
	accordance with the requirements of the OEMP; • Encourage the use of oil-absorbent products on vessel with inboard motors; and • Liaise with relevant agencies; • Actively discourage vessels from discharging oil-contaminated bilge waters within the Marina site.
Vessel Owner (Marina user)	• Review and understand the requirements of the OEMP; • Ensure oil-absorbent products are available if the vessel has inboard motor; and • Ensure that all vessel operations whilst accessing, egressing and moored in the Marina are carried out in an environmentally responsible manner in accordance with the OEMP.
Contractors (maintenance/service working on Marina) The Contractors will report to the Marina Owner/Operator	• Ensure that all OH&S regulatory requirements are met; • Prepare, maintain, implement and administer a Health and Safety Plan, ensuring that all OH&S regulatory requirements are met; • Ensure implementation of the OEMP during works on Marina; • Ensure that all site operations are carried out in an environmentally responsible manner on a day to day basis; • Ensure that all site operations are carried out in a safe and responsible manner on a day to day basis; • Ensure that all environmental protection measures (including silt curtain and protective boom) are in place and are functioning correctly; • Ensure daily site inspections (OH&S and environmental) are undertaken and recorded and reported as appropriate; • Undertake continual visual monitoring of surface water within the area of the Marina if works are being conducted over water. • Ensure adequate training of all employees and sub-contractors through a site induction, and as required on an ongoing basis during the works; • Ensure all works comply with relevant regulatory requirements; and • Ensure all sub-contractors comply with statutory and licence requirements and conditions of the OEMP.

1.7 Application of the OEMP

This OEMP applies to the Inner West Marina, including the underlying Sediment Protection System (SPS).

The guidance and requirements presented in this OEMP are specific to the operation of the Marina and the associated SPS in the context of protecting the immediate environment.

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They are to be adopted in addition to any specific environmental controls and safety procedures that are to be implemented by the Marina users or contractors as part of any licences prevailing regulatory requirements of the day.

1.8 Applicable Documents

In preparing this OEMP, AECOM has referred to the following documents/publications:

- Breakfast Point Master Plan 2002;
- *Environmental Management Systems Guidelines, NSW Department of Public Works and Services, November 1998;*
- *Guideline on Protection of Health and the Environment during the Assessment of Site Contamination (Assessment of Site Contamination) Measure. National Environment Protection Council. 1999;*
- Remediation Order 23022 Declaration number 21055 for area 3335 dated 22/6/2007;
- ANZECC Australian Transport Council. *Best Practice Guidelines for Waste Reception Facilities at Ports, Marinas and Boat Harbours in Australia and New Zealand.*
- DECC. 2007. *Environmental Action for Marinas, Boatsheds and Slipways.* June 2007.
- EPA. 1999. *Environmental Guidelines: Best Management Practice for Marinas and Boat Repair Facilities.* June 1999.
- WorleyParsons. 2009. *Inner West Marina, Statutory Planning Report.* Draft, July 2009.

1.9 Document Revision

This OEMP may be reviewed and updated as necessary. Therefore it is the responsibility of the reader of this document to ensure they have the current version of the OEMP. The master document, with the up to date version of the OEMP will be available from the Marina operator or AECOM.

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2.0 Environmental Compliance

The Protection of the Environment Operations Act, 1997 (POEO Act) is the main piece of NSW environmental legislation covering water, land air and noise pollution and waste management. Everyone involved with the Marina needs to be aware of environmental laws that apply to the operations. Individuals are required to minimise the risk of an environmental incident by implementing precautionary and control measures.

In order to meet environmental compliance the following needs to be addressed:

- Providing environmental management measures, as required;
- Detailing staff training and supervision requirements; and
- Completion of self-assessment or independent audits.

The environmental management, training, and auditing requirements are provided in this OEMP.

The following presently applicable environmental regulatory requirements need to be complied with by Marina operator and users:

- Contaminated Land Management Act, 1997;
- Catchment Management Authorities Act 2003;
- Canada Bay Local Environmental Plan 2008;
- Concord Local Environmental Plan. No.117;
- Electricity Supply Act 1995;
- Electricity Supply (General) Regulation 2001;
- Environmentally Hazardous Chemicals Act, 1985;
- Environmental Planning and Assessment Act 1979;
- Environmental Planning and Assessment Act, 1979 (State Environmental Planning Policy No 55 – Remediation of Land);
- Environmental Planning and Assessment Regulation 2000;
- Environmental Offences and Penalties Act, 1989; Repealed by the Protection of the Environment Operations Act 1997;
- Fisheries Management Act, 1994;
- Land and Environment Court Act 1979;
- Local Government Act 1993;
- Local Government (General) Regulation 2005
- Maritime Services Act 1935;
- Occupational Health and Safety Act 2000;
- Occupational Health and Safety Regulation 2001;
- Protection of the Environment Operations (General) Regulation 1998 No. 720;

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- Protection of the Environment Operations (General) Regulation 2009 No. 211;
- Public Health Act 1991;
- Sydney Harbour Foreshores and Waterways Area Development Control Plan 2005;
- Water Management Act 2000;
- Waste Recycling and Processing Corporation Act, 2001; and
- Waste Avoidance and Resource Recovery Act, 2001.

Compliance with other relevant DECC guidelines including:

- DECC. 2008. *Waste Classification Guidelines: Part 1: Classifying Waste*. NSW Department of Environment & Climate Change. April, 2008;
- ANZECC/ARMCANZ. 2000. *Australia and New Zealand Guidelines for Fresh and Marine Water Quality, National Water Quality Management Strategy, Australia and New Zealand Environment Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand*; and
- NEPC. 1999. *National Environmental Protection Measure (Assessment of Site Contamination)*. National Environment Protection Council. December, 1999.

Additionally, the actions required by the Remediation Order (Number 23022, Declaration 21055) under section 23 of the Contaminated Land Management Act 1997 also apply to the Marina. Any other regulatory requirements applicable from time to time will also need to be complied with.

3.0 Managing Marina Operations

3.1 The Key Environmental Issues for the Marina

The key environmental issues for the Marina are:

- Pollution of the water by allowing material other than rainwater to enter waterways;
- Air pollution and land contamination caused by releasing:
 - volatile organic compounds (VOCs) into the environment due to solvent or paint use;
 - dust, including particles that may contain organic compounds, metals and metal complexes, due to sanding and blasting.
- Handling and disposing of dangerous goods such as solvents, fuel and paint wastes;
- Waste management, including reuse, recycling and disposal;
- Disturbance of contaminated sediments or damage to the SPS;
- Noise affecting the amenity of the surrounding community;
- Water use; and
- Greenhouse gas emissions from energy use.

3.2 Marina Environmental Policy

The Inner West Marina Environmental Policy has been developed to provide commitment to protect the environment, comply with regulations and improve practices. A copy of the policy is provided in **Appendix B**.

3.3 Environmental Risk Management

Everyone using, visiting or working at the Marina will need to comply with the environmental conditions provided below to ensure that the environmental risks are properly managed. In general, best practice procedures will be adopted to protect the environment within and around the Marina. These procedures address:

- Water pollution;
- Air pollution;
- Land pollution;
- Hazardous materials and waste;
- Offensive noise; and
- Waste.

The above are discussed further in the following sections.

3.4 Water Pollution

It is illegal to pollute or cause or permit pollution of waters (under section 120 of the POEO Act).

Under the Act, 'water pollution' includes introducing anything, including litter, sediment, fuel, oil, grease, wash water, debris, detergent, paint, etc. into waters or placing such material where it is likely to be washed or blown into waters or the stormwater system or percolate into groundwater.

All practicable steps will be taken to ensure that unforeseen events, such as spills or leaks, do not result in polluted water entering the harbour. This means keeping chemicals in a properly maintained and operated in bunded and covered storage area, having adequately stocked spill kits on hand and making sure operational staff know how to use them. Under no circumstances will chemical spills be hosed down off the Marina into the harbour.

The following measures will apply to the Marina to reduce the potential of polluting the waterways:

- The operation staff will be trained to ensure they are aware that chemicals including paint, solvents or other toxic substances must not be poured on the ground, into stormwater drains or waterways;
- Use biodegradable soaps and cleaning products, and minimise use of solvents;
- Avoid working over water (if possible). The installation of floating booms shall be considered around the work area, if working over water;
- Implement measures to stop malfunctioning of Marina sewage pump switch;
- Keep outdoor surfaces free of debris. Regularly clean and maintain work areas;
- Use tarpaulins to catch falling particles;
- All Marina users are to observed navigation rules and use the pre-determined access and egress routes; and
- Anchors, or any other types of anchoring devices shall not be used within the Marina or areas immediately surrounding of the Marina.

3.5 Air Pollution

Air pollution means emitting any impurities into the air, including odours, volatile organic compounds (VOCs), smoke, dust, gases, fumes and solid particles of any kind.

Equipment must be maintained and operated, and materials must be dealt with in a proper and efficient manner to prevent air pollution at all times (under the POEO Act, sections 124-126).

All activities conducted at the Marina will be controlled such that all equipment used is designed and operated to control the emission of odours, smoke, fumes, vapour and dust into the atmosphere. Control measures may include:

- Maintenance of equipment so that exhaust emissions comply with the Clean Air Regulations issued under the Protection of the Environment Operations Act;
- Use of water sprays or covers over surfaces, which are generating unacceptable amounts of dust;
- Application of odour suppressant agent or use of covers;
- Modification of the operation of the equipment;
- Use of different equipment that generates less odour or dust;

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- Maintenance of all odour and dust control measures to ensure good operating condition; and
- Cease work. Commence work once the Marina operator is satisfied that all odour or dust generating conditions have been controlled.

All practicable measures will be taken to help ensure that fugitive emissions emanating from the Marina are minimised so that associated odours do not constitute a nuisance and that the ambient air quality is not adversely impacted. Ensure odours that are generated are not detectable beyond the Marina boundary.

The odour performance criteria specified in NSW DECC (2005) *Approved Methods and Guidance: for the Modelling and Assessment of Air Pollutants in New South Wales* will be used during any odour assessment. The odour performance criteria for a population of affected community of 2 000 people (urban setting) is 2 OU/m³ (odour units per cubic unit). The criterion is based on the 99th percentile highest odour concentration, and is a function of the population in the affected area.

3.6 Land Pollution

It is an offence to pollute land (under section 142 of the POEO Act). Additionally, section 116 of the POEO Act makes it an offence to wilfully or negligently cause any substance to leak, spill or otherwise escape in a manner that harms or is likely to harm the environment.

The following measures will apply to the Marina to reduce the potential of polluting the land:

- The operation staff will be trained to ensure they are aware that chemicals including paint, solvents or other toxic substances must not be poured on the ground or into stormwater drains; and
- Appropriate disposal of waste.

3.7 Hazardous Materials and Waste

Hazardous waste is waste that poses a substantial or potential threat to public health or the environment. They can be dangerous goods, ozone depleting substances, hazardous chemicals or wastes, and may include the following (but not limited to):

- Toxic;
- Corrosive;
- Explosive; and
- Radioactive.

If handling hazardous materials and waste, it is an offence to cause any substance to leak, spill or otherwise escape in a manner that harms or is likely to harm the environment (POEO Act section 116). It should also be aware of the legal requirements before using, storing, transporting and disposing of hazardous materials (e.g. dangerous goods and chemicals).

The most effective way of dealing with hazardous materials is to:

- Avoid using them, or by replacing them with less toxic materials; and
- Use work practices that minimise their use.

Legal requirements for the handling, storing, treating, processing or reprocessing of any organotin wastes, including but not limited to tributyltin wastes, are prescribed in the *Environmentally Hazardous Chemicals Act* (EHC Act) 1985.

If hazardous liquids, such as paints and solvents are to be stored for use at the Marina, they will be stored in a properly maintained and operated bunded area with a roof that excludes rain.

Anti-fouling paints containing tributyltin oxide (TBT) are no longer registered in Australia and their use is now illegal.

Up-to-date Material Safety Data Sheets (MSDS) for chemicals/materials stored in the Marina and for those brought to the Marina will be kept in a central location and readily accessible. These will be referred to by Marina users as required. All chemicals/materials will be clearly labelled and kept on a register. All Marina staff shall be aware of the potential hazards of the chemicals/materials at the Marina.

3.8 Waste Management and Minimisation

It is an offence to disposing of waste unlawfully. The owners of waste (as well as the transporters and receivers) have a responsibility to ensure their waste is managed, transported and disposed of appropriately.

The *Waste Avoidance and Resource Recovery Act 2001* encourages the most efficient use of resources, to reduce environmental harm and to provide for an ongoing reduction in waste generation.

Waste minimising and recycling practices and programmes will be employed to meet the requirements of DECC. The following hierarchy for managing waste will be implemented:

1. Avoid generating waste;
2. Minimise products used;
3. Maximise the use of recycled materials, maximise recycling (paper, PET, glass, plastics etc.); and
4. Reduce waste generation (litter/garbage). Dispose of the material safely and lawfully.

Waste management strategies that will be utilised are:

- Waste bins for domestic waste and recyclable waste will be readily available. Other waste bins may be included for disposal of hazardous substances, fish waste, waste oil, oily mixture, scrap metal and wastewater (including bilge water);
- Solid waste bins (domestic waste and recyclable waste) will be placed at the street entrance to the property for pick-up on a weekly basis; and
- Return empty containers to suppliers, where possible.

3.9 Offensive Noise

An 'offensive noise' means that by reason of its level, nature, character, quality or the time at which it is made, or any other circumstance, the noise is harmful or interferes unreasonably with the comfort of people who are outside your premises.

Offensive noise must not be generated from premises as a result of the failure to maintain or operate machinery or deal with materials in a proper and efficient manner (under the POEO Act, sections 139 and 140).

The noise associated with the Marina operations will be controlled by the following means:

- Ensure that no vehicles, vessels, machinery or equipment generate noise levels beyond applicable guidelines, and use of quieter equipment and acoustical enclosures;
- Use of noise reducing features or silencers;
- Implementation of noise attenuation measures (e.g. barriers, enclosures);
- Use of equipment, which generates less noise;
- Restricting activities generating high noise levels to normal working hours (7:00am-5.30pm Monday to Friday, 7:00am-1:00pm on Saturday, with no work on Sunday and public holidays); and
- Hydraulic hammers will not be used before 9:00am on Saturdays.

All practicable measures will be taken to minimise the generation of noise so that it remains within acceptable levels. In the event that short-term noisy operations are necessary, and where these are likely to affect residences, notifications will be provided to the Council and the residents, specifying the expected duration of the noisy work.

As a general rule, the noise level from operations must not exceed the existing background noise levels by more than 5 dB(A) at any affected residence.

Should noise complaints arise, periodic testing of equipment used at the Marina will be undertaken to verify compliance within maximum permissible noise levels

3.10 Vessel Access and Navigation

All vessel access to the Marina is from the north. Vessels shall travel along the main channel of the Parramatta River and approach the Marina on a path between 100 m and 190 m east of the foreshore mean high water mark. The vessels shall enter through the 50 m wide predetermined area to north east of the Marina, identified by navigational markers. This is 60 m clear of the ferry access path.

Vessels shall egress the Marina area through the navigational markers along the deep channel perpendicular to the shore to mitigate disturbance of sediments outside the Marina area.

The vessel access to/from the Marina is shown on drawing **DA10** and **N01** in **Appendix A**.

The navigation control measures will include:

- Navigational markers showing access and egress areas;
- A restricted vessel speed on approach to the Marina and within the Marina area; and
- Advice to the Sydney Ferries controller of ferry movements concerning Marina activities which may affect Sydney Ferries.

3.11 Vessel Cleaning and Maintenance at the Marina

3.11.1 Cleaning Boats and Motors

All practicable measures will be taken to prevent pollutants discharging into the water when cleaning boats and motors. Control measures to be implemented are:

- Boat decks will be rinsed with water only (where possible);
- If detergents are used they will be of low phosphate content. Wash water (sudsy water) will not be mopped up and collected into a bucket and emptied onto a landscaped area, or into the vessels wastewater system; and
- Oil, fuel and dirt will be wiped off from motor before rinsing.

No in-water bottom cleaning, hull scraping or any underwater process that could remove antifouling paint from the boat hull will be undertaken at the Marina.

3.11.2 In-Water Mechanical Repairs

All practicable measures will be taken to prevent pollutants discharging into the water when conducting in-water mechanical repairs. Control measures to be implemented are:

- Care to be taken when moving fluids and parts to and from the boat. All fluids are to be in sealed secure containers. Dirty oil filters to be transported in buckets with a sealed lid.
- Spare parts, oil filters, etc to be placed in drip trays.
- Appropriate disposal of waste generated during repairs. Oil filters are not to be disposed of in normal waste bins.

3.11.3 Managing Sewage from Vessels

NSW regulations prohibit the discharge of untreated sewage from vessels in all NSW waters and there are also 'no discharge zones' for treated sewage. It is an offence if untreated sewage is discharged to a receptor other than to an approved facility.

The Marina provides a pump-out facility to ensure sewage from vessels is not discharged into the environment.

3.11.4 Bilge Water

Contaminated bilge water shall not be discharged into the waterway. The Marina and vessel owners and operators are responsible for making sure that contaminated bilge water is not discharged to the environment.

Oil absorbent products will be available for use to deal with discharge from the bilge. The Marina operator shall encourage vessel owners using the Marina to use oil-absorbent products on vessels with inboard motors.

3.12 Marina Deck and Building Maintenance

All practicable measures will be taken to prevent pollutants discharging into the water when maintenance works are being conducted on the Marina deck or the building. Control measures to be implemented are:

- Training of operation staff to ensure they are aware that chemicals including paint, solvents or other toxic substances must not be poured on the ground, into stormwater drains or waterways;

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- Implement measures to stop paint flakes from entering the environment by placing drop sheets below work areas;
- Use biodegradable soaps and cleaning products, and minimise use of solvents;
- Keep outdoor surfaces free of debris. Regularly clean and maintain work areas; and
- Use tarpaulins to catch falling particles.

3.13 Damage to SPS

Measures will be implemented to reduce the potential of damaging to the SPS. Control measures to be implemented include:

- Provide training to operation staff to ensure they are aware of the SPS and its purpose and that the SPS is not to be disturbed unless approval is provided by the DECC;
- Restrict deep hull vessels from entering shallow water;
- Anchors or any other type of bottom anchoring devices are not to be used;
- Advise DECC if damage is observed during routine inspection of the SPS (as described in **Section 4.0**); and

Marina users are to be made aware of anchoring restrictions and access and egress routes.

In the event that the integrity of SPS is compromised a diver will be engaged to repair the exposed area. Geotextile material will be available to use, as required.

3.14 Resource Efficiency

Measures will be implemented to reduce the use of resources (raw materials, water and energy) and lowering the volume and toxicity of waste and other emissions. The resource efficiency opportunities that will be considered, include:

- Reduce the use of energy, water and raw materials;
- Avoid waste and reusing and recycling materials;
- Minimise waste volumes and reducing waste toxicity to lower the cost of treatment and disposal;
- Use biodegradable soaps and cleaning products, and minimise use of solvents;
- Switch off lighting when not required and install energy-efficient lighting on Marina walkways and areas that need permanent lighting; and
- Reduce the use of hazardous and dangerous materials to minimise dangerous goods storage and environmental and OH&S liability risks.

3.15 Marina Decommissioning

In the event that the sediment beneath the Marina needs to be remediated, the following process shall be followed as required by the Remediation Order:

- Preparation of an EMP;
- EMP to be reviewed by a Site Auditor accredited under the Contaminated Land Management Act 1997 for its suitability;

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- EMP to be reviewed and approved by DECC; and
- Carry out works in accordance with the approved EMP.

Given the construction of the SPS and Matrina, AECOM considers that minimum disturbance of the sediment would occur during removal if the works are conducted in accordance with an approved EMP.

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4.0 Inspection and Maintenance

4.1 General Inspection

The Marina operator will carry out quarterly inspections of the Marina operations to ensure that the requirements of this OEMP are adhered to and responsibilities are met. The inspection findings will be recorded / documented in the Site diary.

The Site Inspection Report (or similar) as shown in **Appendix C** will be completed, and performance reviewed against the requirements of this OEMP.

4.2 Monitoring of SPS Condition

The SPS will be inspected on a yearly basis by divers for the first five years of its use and the inspection frequency will be re-assessed at the end of this period. This inspection will be conducted to observe the condition of the SPS. The inspection findings will be recorded / documented in the Site diary and take note of the following:

- Condition of ballast and any deterioration;
- Foreign objects that may potentially damage any components of the SPS;
- General conditions of the geotextile material including perceived deterioration;
- Integrity and condition of SPS around piles; and
- Any areas of perceived contamination, potentially low visibility.

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5.0 Occupational Health and Safety

Listed below are some general OH&S requirements of the Occupational Health and Safety Regulation 2001 under the Occupational Health and Safety Act 2000:

- Evaluation of onsite hazards and risks associated with these hazards;
- Particular risk control measures (including provisions regarding lighting, noise, atmosphere, electricity, confined spaces, manual handling, working near water and diving);
- Definition of personal protection standards;
- Classification of onsite personnel and work zones;
- Details on work practices and restrictions, assessment of anticipated protection levels and controls on access to work zones;
- Supervision of work practices and medical surveillance;
- The notification of accidents and other matters;
- Environmental monitoring protocols;
- Emergency information; and
- Risk assessment methods.

5.1 Site Induction

All workers and contractors will be required to attend a site specific health and safety induction before conducting works. The following items would be presented in the site induction:

- General overview of the work to be conducted;
- Hazard identification and prevention;
- Personal protective equipment;
- Occupational monitoring; and
- Emergency response procedures

5.2 Potential Hazards and Prevention

The hazards at the Marina can be managed by maintaining an awareness of the surrounding environment, including any potential hazards that may be identified by operational staff, contractors or users.

Hazard	Prevention
Drowning	Working over open waters presents a risk of drowning. All personnel working on the Marina structure should be aware of the location of life jackets the fixed life buoys. Do not enter the water at all, if a hazard is present
Vapour inhalation	Conduct occupational air monitoring and upgrade PPE as needed based on results

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Hazard	Prevention
Dust inhalation	Wear dust masks. Dust to be suppressed by spraying or covering.
Slippery Surfaces	If possible personnel should avoid working in areas with slippery surfaces. Wear rubber sole boots. Non-slip material will be used to cover the surface, where appropriate. Warning signs will be installed on/adjacent to all access points.
Heat	Hardhats with rims, long sleeved shirts, long pants and sunscreen will be used. Plenty of liquids will be available for all field personnel.
Noise	Noise attenuation equipment will be used as necessary. All personnel will carry earmuffs or plugs for use during excessive noise.
Hot Work	Hot work will only be undertaken once a hot work permit is received.
Confined Spaces	All confined space entry will be undertaken by appropriately trained personnel, if required.
Manual Handling and Lifting	Heavy loads are not to be lifted alone. Mechanical aids will be used. Gloves or hand tools will be used when handling rough jagged or sharp objects.
Hazardous Substances	Appropriate storage. MSDS's should be available for all hazardous substances. Appropriate handling of hazardous substances must be carried out in accordance with details on the MSDS.
Work at Heights	Provision and maintenance of a stable and securely fenced work platform, with fences and handrails or other barriers to prevent falls. If this is not practicable, other forms of physical restraints will be used (eg harnesses).
Fatigue	Regular breaks will be taken and equipment will be used, where possible, to reduce heavy physical labour.
Strike by boats while diving	Experienced qualified drivers will only be engaged. Area to be condoned off during diving operation and spotter will be used on land to provide emergency supports.

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6.0 Emergency Plan

6.1 Priority Actions

In the event of any environmental incident, the first priority shall be the safety of all personnel and the community in the immediate vicinity of the Marina. Following this, all practical steps shall be taken as soon as possible after the event to minimise the risk of further environmental damage. The situation should be stabilised with regard for the appropriate incident management procedures. The appropriate staff should be notified and emergency procedures enacted.

6.2 Emergency Response Equipment and Personnel

The following emergency response equipment and material will be maintained at the Marina at all times for immediate use:

- Clear signs will be on display outlining spill clean-up procedures and emergency contact numbers;
- Fire fighting equipment to be appropriately placed within the Marina; and
- Spill kits to be appropriate for the operation and kept stock with relevant absorbent and clean-up materials.

6.3 Emergency Response

In the event of an emergency at the Marina, the following procedure shall be followed:

- Containment of any pollution by eliminating the source. For water related spills, use absorbent materials, and for land based spills use absorbent materials or bunding.
- Temporary repair or isolation of failed plant/equipment component.
- If the emergency is on a vessel, leave the vessel by climbing onto the Marina.
- If the emergency is on the Marina, exit via the emergency route to assembly area on the foreshore.
- Await further instructions from the Marina operator.
- Inform NSW Maritime Authority.

For major spills, call **fire brigade** on **000**. If a spill occurs that threatens or harms the environment, the DECC (pollution line: **131 555**) or the council must be contacted immediately.

The Marina operator shall notify the relevant service as to the details regarding any emergency:

- Fire Brigade;
- Ambulance;
- Police;
- DECC; and
- NSW Maritime Authority.

Records will be kept of any incidents, accidents, hazardous situations, unusual events and unsafe health exposures and the corrective action taken. The Marina operator or their representative will

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investigate the cause of any emergency so that necessary changes in work practices can be made to prevent the incident recurring. Records of any emergency will be forwarded to NSW Maritime Authority.

Other potential emergency situations are provided in the following sections:

6.3.1 Spills and Leaks

Spill response procedures will be made available to all personnel involved with the Marina, including users and vessel owners. If spills or leaks of hydraulic fluids, lubricants or fuel from vessels or Marina occur, the following measures will be considered for use as appropriate:

- Use of absorbent booms to contain the material;
- Treatment with an absorbent material specifically designed for such situations; and
- Construction of retention basins, diversion drains, if the spill/leak occurs on land.

The waste generated from a spill/leak will be stored in a sealed vessel and in a bunded and covered area. The waste will be disposed to an appropriately licensed facility by a contractor who is licensed transport such waste.

6.4 Damage to SPS

Damage to SPS will be repaired immediately. The damaged area will be initially inspected by the diver to assess extent of damage and the appropriate action required. The following measures will be considered for use as appropriate:

- Re-instate geofabric in the damaged area;
- Place ballast over the newly laid geofabric;
- Record damage details and repair works in Marina diary; and
- Locate the damaged area using a GPS for future inspections.

It is noted that geofabric material will be stored on the Marina for use during emergencies.

6.4.1 Material Falling into Kendall Bay

If material falls into the harbour, an appropriately licensed diver or mechanical lifting equipment will be used to retrieve the material.

All waste material collected will be handled in accordance with the waste management requirements outlined in **Section 3.7**.

Depending in the size and weight of the item, consideration shall be given to any impact on the integrity of the SPS and the SPS inspected, if deemed that an inspection is required.

6.5 Follow up Actions

Follow up action shall include the development of a work plan or modification of this OEMP to ensure the incident does not occur again.

Any changes to the practices at the Marina will be communicated to staff, Marina users and vessel owners.

6.6 Emergency Contacts

The contact names and phone numbers of key project personnel and off site emergency services phone numbers are shown below. Emergency procedures and contact telephone numbers will be displayed in a prominent position within each site working area.

Table 2: Emergency Response Contacts

Organisation	Name	Phone
NSW DECC	Pollution Line	131 555
NSW Maritime Authority	-	9563 8511
Divers	TBA	TBA
Emergency Services	Ambulance Police Fire Department	000
General Hospital	Hospital – Concord Repatriation	(02) 9767 5000

Notes: TBA – To be appointed.

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7.0 Reporting

7.1 Non Conformance and Corrective Action Reports

All non-conformances will be reported to the Marina operator, and recorded in a Non-Conformance and Corrective Action Report (**Appendix C**), or similar. Details of the non-conformance, including any immediate corrective actions undertaken, are to be recorded by the Marina operator. The Marina operator may also initiate a Non-Conformance Report.

It is the responsibility of the Marina operator to immediately initiate corrective actions, if required. Once completed, the Marina operator will provide details of the actions undertaken on the Non-conformance Report, sign, date and file the report. The Marina operator will monitor feedback and response to prevent future occurrences. A copy of the report is to be forwarded to the NSW Maritime Authority and NSW DECC, as required.

7.2 Complaints and Incident Reports

The Marina operator will maintain a register of complaints from local residents, or other parties, which will include a record of any action taken with respect to the complaints. Details of the complaint are to be documented by the Marina's Complaints Register (**Appendix D**), or similar. The Marina operator shall be notified immediately should any incident affecting the environment or the surrounding community, occur. In accordance with the requirements of the *Contaminated Land Management Act, 1997*, the DECC shall be notified as soon as practicable in the event of any incident potentially impacting the site environment.

If a complaint is related to a non-conformance, a Non-Conformance and Corrective Action report is to be initiated.

Records will be kept of any environmental incidents, accidents, hazardous situations, unusual events and unsafe health exposures and the corrective action taken. A representative of the Marina operator will investigate the cause of any emergency so that necessary changes in work practices can be made to prevent the incident from recurring.

Copies of incident and complaint reports will be provided to the NSW Maritime Authority.

7.3 Record Keeping

The Marina operator will ensure that records are kept on site of all documentation arising from implementation of this OEMP. Records shall include:

- Approvals, licences and permits;
- Site Inspection Reports;
- SPS Monitoring Reports;
- Audit Results;
- Non-Conformance and Corrective Action Reports;
- Training Register;
- Complaints Register;
- MSDS Register;

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- Chemicals Database;
- Waste Register;
- Environmental correspondence; and
- Miscellaneous items.

All records will be kept on the site and maintained in a legible state. All records will be made available to authorised officers of the NSW DECC, NSW Maritime Authority, Council and other government agencies, as required. All records will be retained by the Marina operator.

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8.0 OEMP Audit and Review

The Marina operator or a representative of the Marina operator will conduct an audit of the OEMP and operation activities on a quarterly basis to ensure that the OEMP is being properly implemented and followed.

Additionally, the NSW Maritime Authority may require independent audits of the Marina and associated activities.

Audits outside of the regular audit program may be conducted where:

- Major amendments occur to applicable legislation, policy or standards;
- Environmental feedback or complaints identify a major system non-conformance; and
- Significant risk to due diligence is identified.

The Marina operator shall review the OEMP to ensure its continuing suitability, adequacy and effectiveness.

Copies of all Audits should also be forwarded to NSW Maritime Authority.

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Appendix A

Site Plans

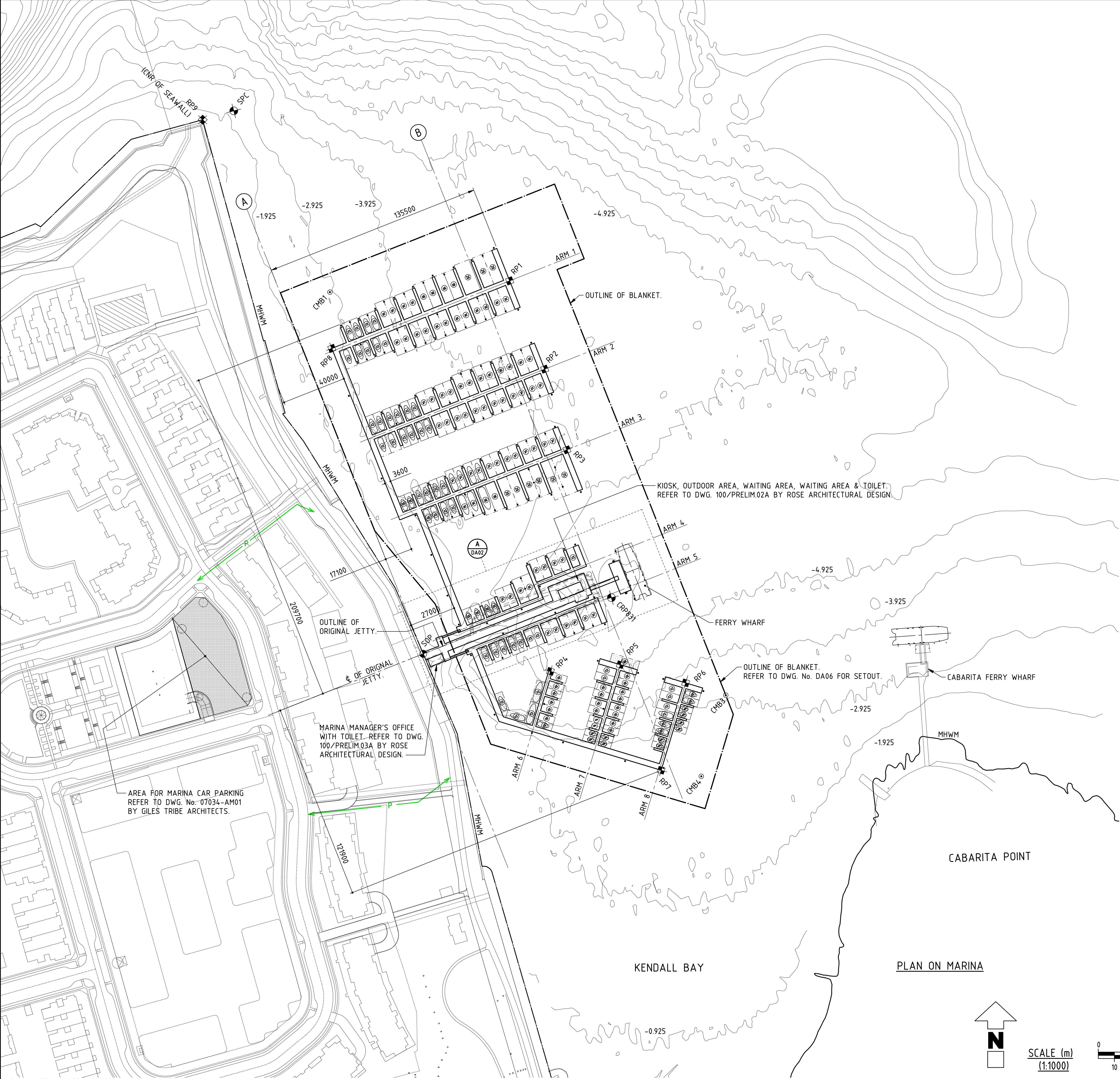
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Environment



- NOTES :
- 1. DATUM - AUSTRALIAN HEIGHT DATUM (AHD).
 - 2. THE BED CONTOURS ARE TAKEN FROM A HYDROGRAPHIC SURVEY BY 'HARVEY HYDROGRAPHIC SURVEYS' UNDERTAKEN ON 06.08.01 TO 08.08.01 INCLUSIVE AND A HYDROGRAPHIC SURVEY UNDERTAKEN BY NSW MARITIME IN 2006.
 - 3. WHERE VESSEL IS SHOWN IN BERTH ON PLAN '11', BERTH IS TO BE USED FOR MOTOR VESSELS ONLY.
 - 4. REFER TO DWG. No. DA03 FOR VESSEL SCHEDULE.

- LEGEND :
- CMB1, 3 & 4 : CHANNEL MARKER BUOY.
 - ◆ CRP831 : EXISTING MARKER BUOY.
 - ◆ SPC : EXISTING CHANNEL MARKER PILE.
 - ◆ SOP : SET OUT POINT.
 - ⑩ : VESSEL LENGTH.
 - ← P → : PEDESTRIAN PUBLIC ACCESS.
 - : DESTINATION (DAY TRIPPER) BERTHS - CASUAL BERTHING.
 - ✱ REFERENCE POINTS : REFER TO MGA94 (ZONE 56) CO-ORDINATES

MARK	MGA94 (ZONE 56) CO-ORDINATES (TO BE USED FOR FINAL SETOUT)	
	EASTING (m)	NORTHING (m)
CRP831	325535.00	6253927.00
SPC	325300.00	6254230.00
SOP	325417.91	6253892.06
RP1	325471.70	6254124.19
RP2	325493.48	6254069.24
RP3	325507.36	6254019.02
RP4	325497.08	6253881.15
RP5	325540.54	6253885.30
RP6	325581.20	6253873.97
RP7	325565.99	6253819.58
RP8	325361.01	6254082.15
RP9	325280.63	6254224.47

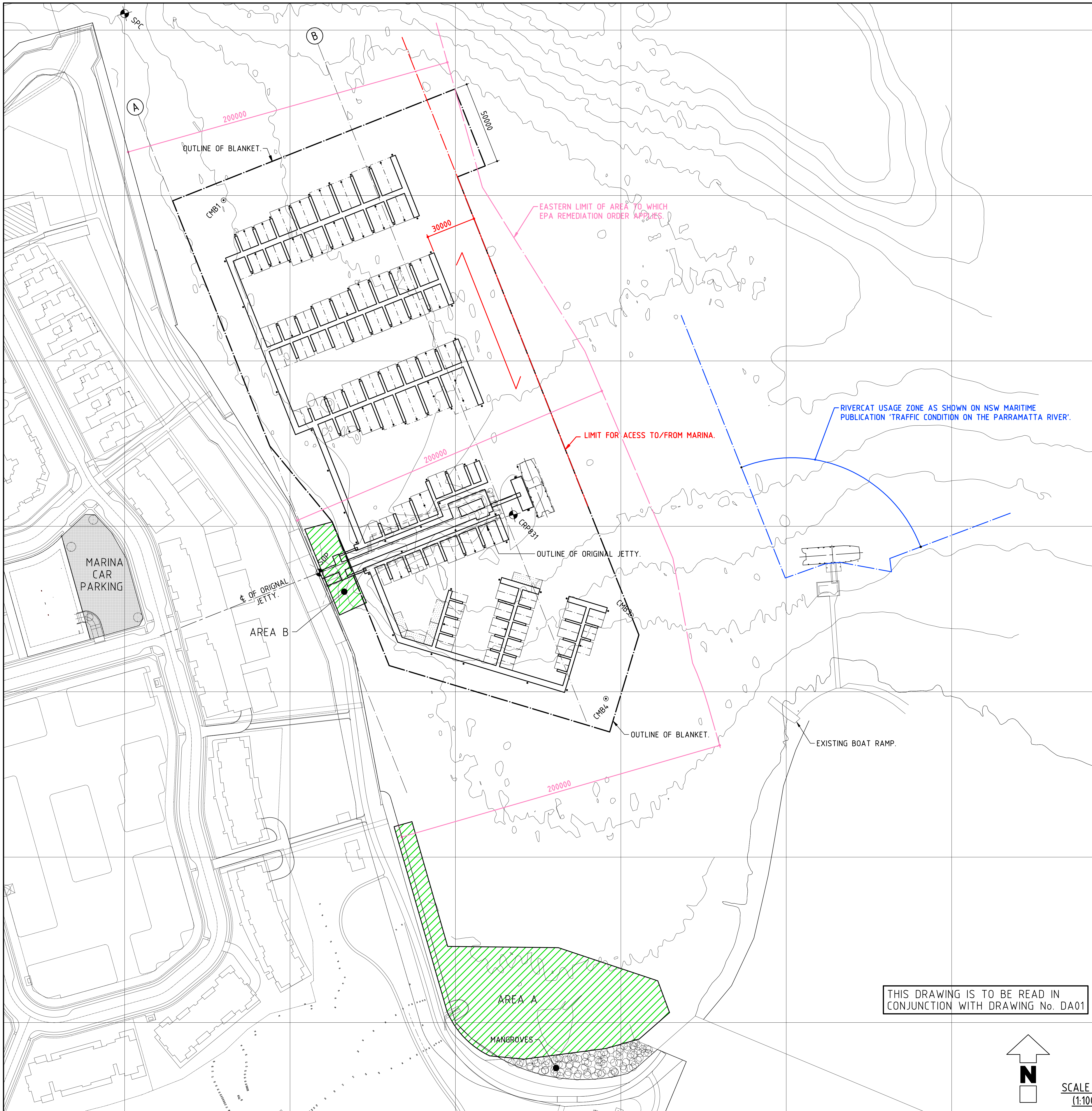
02 : PROJECT APPLICATION 14.07.09
01 : PROJECT APPLICATION 09.07.09



GENERAL ARRANGEMENT

Design H.B. Scales 1:1000 Job No. 01013
Drawn S.K. Date 26.03.09 Dwg. No. DA01
App'd. Sheet Size B1 Rev. No. 02

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- LEGEND**
- [Green hatched area] : AREA PROPOSED TO BE REMEDIATED BY JEMEMA PTY. LTD.
 - [Circle with dot] CMB1 - CMB4 : CHANNEL MARKER BUOY.
 - [Cross symbol] CRP831 : EXISTING MARKER BUOY TO BE REMOVED ON CONSTRUCTION OF MARINA.
 - [Star symbol] SPC : EXISTING CHANNEL MARKER PILE.
 - [Red arrow] : VESSEL ACCESS TO/FROM MARINA.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING No. DA01



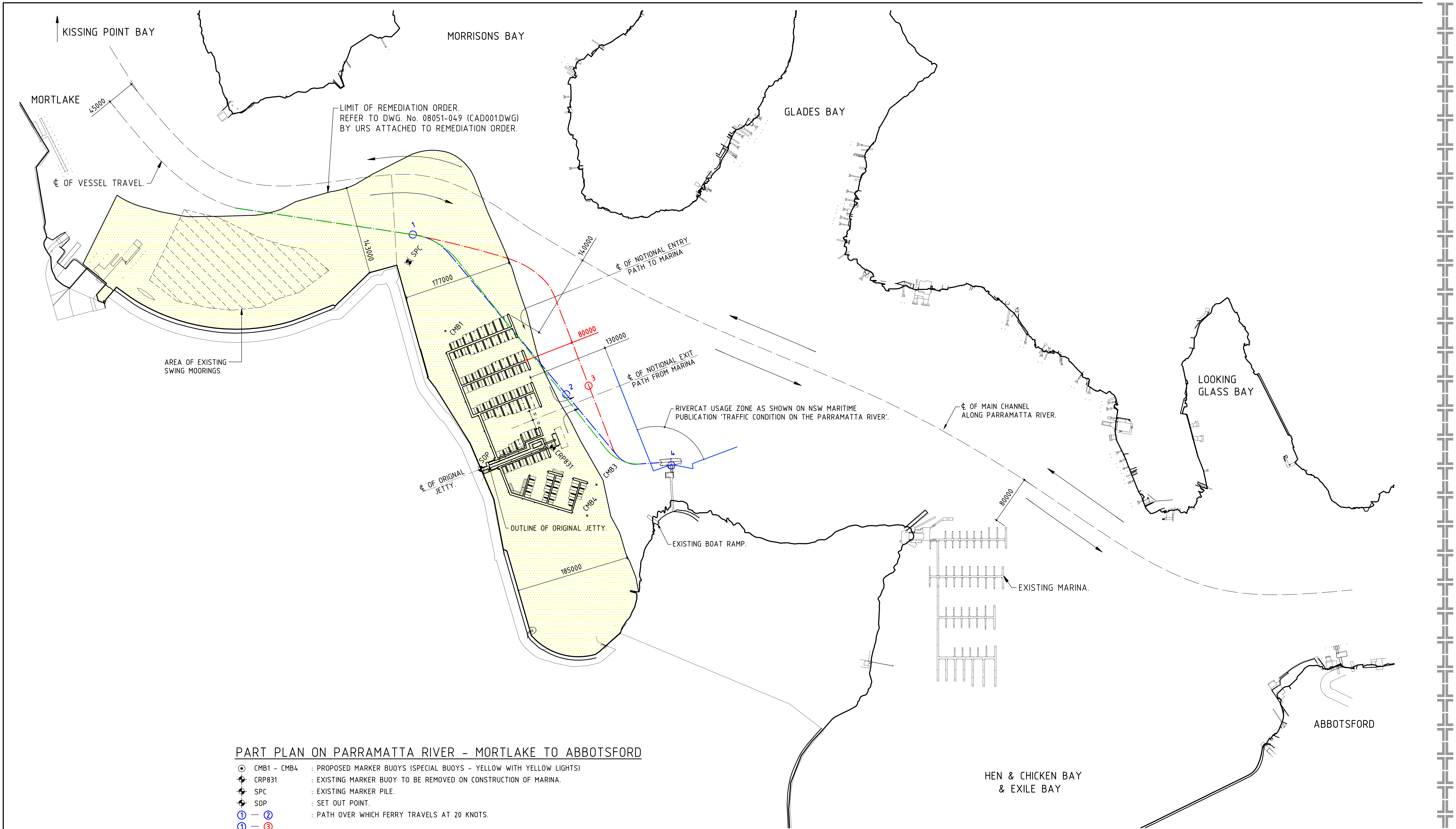
02 : PROJECT APPLICATION 14.07.09
01 : PROJECT APPLICATION 09.07.09



SITE ANALYSIS

Design	H.B.	Scales	1:1000	Job No.	01013
Drawn	S.K.	Date	26.03.09	Dwg. No.	DA10
App'd.		Sheet Size	B1	Rev. No.	02

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PART PLAN ON PARRAMATTA RIVER - MORTLAKE TO ABBOTSFORD

- CMB1 - CMB4 : PROPOSED MARKER BUOYS (SPECIAL BUOYS - YELLOW WITH YELLOW LIGHTS)
- ⊕ CRP831 : EXISTING MARKER BUOY TO BE REMOVED ON CONSTRUCTION OF MARINA.
- ⊕ SPC : EXISTING MARKER PILE.
- ⊕ SOP : SET OUT POINT.
- ① - ② : PATH OVER WHICH FERRY TRAVELS AT 20 KNOTS.
- ① - ③ : PATH OVER WHICH FERRY SLOWS TO BERTH AT WHARF & PATH OVER WHICH FERRY BUILDS UP SPEED WHEN DEPARTING WHARF HEADING UP RIVER.
- ② - ④ : PATH OVER WHICH FERRY SLOWS TO BERTH AT WHARF & PATH OVER WHICH FERRY BUILDS UP SPEED WHEN DEPARTING WHARF HEADING UP RIVER.
- ③ - ④ : PATH OVER WHICH FERRY SLOWS TO BERTH AT WHARF & PATH OVER WHICH FERRY BUILDS UP SPEED WHEN DEPARTING WHARF HEADING UP RIVER.
- Area of which remediation order applies.
- Proposed travel path (Rivercat & Supercat)
- Current optimum travel path (Rivercat)
- Current optimum travel path (Supercat)



NAVIGATION

Design	H.B.	Scales	1:2500	Job No.	01013
Drawn	S.K.	Date	10.07.09	Dwg. No.	N01
App'd.		Sheet Size	B1	Rev. No.	03

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- 03 : LIMIT OF REMEDIATION ORDER AMENDED 04.09.09
- 02 : EXISTING MOORING FIELD AT NORTHERN
END OF BREAKFAST POINT & SYDNEY
FERRIES VESSEL TRAVEL PATHS ADDED 20.08.09
- 01 : PROJECT APPLICATION 20.07.09

Appendix B

Inner West Marina Environmental Policy

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Environment

Inner West Marina Environmental Policy

The management and staff of Inner West Marina are committed to preserving and protecting the quality of the environment. A clean environment is important for the success of our business and to ensure that future generations can also enjoy these precious resources.

In support of this commitment, we strive to conduct clean boating and marina practices at our marina and will educate our staff, customers and guests on sound practices. Our overall goal is to be the leader in protecting the environment. We will achieve this goal by using a team-oriented management approach to help ensure responsible use of our air, land and water resources.

We will endeavour to continually improve our environmental performance and to prevent pollution before it is produced. We also endeavour to meet or go beyond compliance with all applicable national, state and local environmental rules and regulations. All our marina employees are expected to support our environmental goals while providing clean, affordable boating services that help keep boating a good clean recreational activity.

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We believe that the Kendall Bay and Parramatta River are one of our community's greatest natural resources, contribute significantly to our quality of life, and substantially benefit our businesses and local economy. We recognize that we, as businesses and individuals, may have adverse impacts on our waterways and environment, and thus, we have an obligation to mitigate those impacts. In addition, we understand that we have a personal responsibility to operate our businesses and to make personal choices that will not knowingly harm the Bay and River.

We ask that all customers and contractors working on our property read, understand, and follow these guidelines in order to support our efforts:

1. Anyone working on a vessel must report to our office the type and amount of paints used for all jobs done while at the Marina.
2. No spray painting is to be conducted outside of an enclosure.
3. Areas around the vessel must be kept clean at all times. Please pay particular attention to dust and paint chips.
4. No discharge of bilge, tankage or hazardous waste is allowed except into approved containers or drums. Owners and their agents are responsible for proper environmental waste disposal.
5. All waste to be appropriately disposed, including oil and fuel, batteries, paints, thinners, solvents, flares, bilge switches, etc.
6. The cleaning and scraping of hull bottoms including removing barnacles from running gear while vessels are in the water is strictly prohibited.

I have received, read and understood the Inner West Marina Environmental Policy, Operational Environmental Management Plan and the above guidelines, and agree to abide by them while using the Inner West Marina services and facilities.

Signature: _____

Printed Name: _____

Date: _____

Appendix C

Site Inspection Report

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Environment

Site Inspection Report	
Site / Area:	Date:
Reported By (print):	(sign): Time:
Weather Conditions:	Wind Speed:
Item	Comments (Include any immediate corrective actions undertaken)
Are all operational staff aware of the environmental commitments of the Inner West Marina?	
Are site users (operational staff, vessel owners, visitors, contractors) aware of the environmental commitments of the Inner West Marina?	
Are all OEMP control measures in place?	
Are there adequate waste bins (including recycle bins) with lids?	
Are staff, customers, contractors, visitors and operational staff encouraged to use waste facilities correctly?	
Water quality comments:	
Are dusty conditions observed? If yes, what operations are creating dust?	
Are odorous conditions observed? If yes, what operations are creating odour?	
Dust control comments:	
Are any adverse noise conditions occurring on site?	
Noise Comments:	
Are all fuels and chemicals stored correctly and in appropriately bunded areas?	
Are material Safety Data Sheets (MSDSs) available?	
Is spill kit (absorbent material) adequately stocked?	
Other Issues / General comments:	

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Note: If immediate corrective action could not be undertaken to remedy situation, please initiate Non-Conformance and Corrective Action Report.

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Environment

Appendix D

Non Conformance and Corrective Actions Report

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Environment

Non-Conformance and Corrective Action Report

Date:	
Reporter:	Name: Sign:
Time:	
Site	
Problem:	
Cause:	
Report to:	Marina Operator (Name):
Corrective Action:	
Signed by Marina Operator upon completion:	
Feedback Response to Prevent Future Occurrences	
Date:	

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Appendix E

Complaints and Environmental Incidents Register

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Environment

Complaints and Environmental Incidences Register

[illegible]

Note: Should a complaint or incident identify a non-conformance that is not able to be immediately rectified, please initiate a Non-Conformance and Corrective Action Report

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Appendix F

Training Register

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Environment

Environmental Training Register

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Environment

Appendix G

OEMP Acknowledgement Record & Project Personnel List

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Environment

OEMP Acknowledgment Record & Project Personnel List

Marina staff must sign the master copy of this document, indicating they have read and understand it. The employee's signature indicates acceptance and compliance with the requirements of the OEMP. Copies of this document must be made available for their review and readily available at the Marina.

Log of Project Personnel

[illegible]

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