

REPORT

new Sydney Fish Market Concept and Stage 1 Early Works

Navigation Impact Assessment

Client: Infrastructure NSW

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1 Introduction and Overview

1.1 Background

Sydney Fish Market is the largest of its kind in the Southern Hemisphere and among the three largest seafood markets in terms of variety in the world. The market sources product both nationally and internationally and trades approximately 14,500 tonnes of seafood annually with up to one hundred sustainable seafood species traded every day and approximately 500 species traded annually. The site attracts over 3 million visits each year. In November 2016 the NSW Premier announced a new fish market would be built at the head of Blackwattle Bay, adjacent to the existing Fish Market. In June 2017 the Premier of NSW announced the appointment of Danish architects 3XN to lead the design team that includes Sydney firms BVN and Aspect Studios. They have been working with key stakeholders, including Infrastructure NSW and Sydney Fish Market Pty Ltd (SFM), to develop the design for the new Sydney Fish Market. As announced by the NSW Premier, works are planned to commence in 2019.

1.2 Site and context

The site is located at the head of Blackwattle Bay between the Pyrmont Peninsula and the foreshore of Glebe, situated less than 2km west of Sydney's CBD and is partially within the City of Sydney Local Government Area.

The land to which the development application relates comprises Lots 3 - 5 in DP 1064339 part of lot 107 in DP 1076596 and part Lot 1 in DP835794. Works to connect to the existing waterfront promenade to the west of the site are located on Lot 3 in DP1018801. The development footprint is irregular in shape and has an area of approximately 36,800m². The site is partly on land above mean high water mark and partly on water below mean high water mark.

The site has a frontage to Bridge Road to the south and Blackwattle Bay to the north. Pyrmont Bridge Road is an arterial road that links to the Anzac Bridge to the north west of the site. Sydney Secondary College Blackwattle Bay Campus is immediately south west of the site and the existing Fish Market immediately north east. Located directly opposite the site to the south is Wentworth Park, separated by Bridge Road.

Located approximately 400m walking distance from the site are the existing Fish Market, Wentworth Park, and Glebe Light Rail stops which are serviced by the Dulwich Hill Line which is a 23 stop, 12.8-kilometre route running from Dulwich Hill to Central station via Pyrmont.

The site contains one heritage item being the heritage stormwater culvert. The site is also near a number of heritage items.

The site's current uses include a concrete batching plant at the Western end and concrete hardstand and wharf area at the Eastern end, which is currently vacant. The site includes wharves and land-based structures. Part of the site is the water of Blackwattle Bay. Works will be undertaken on Bridge Road and its intersections with Wattle Street and Wentworth Park Road.

1.3 Approval strategy

Pursuant to the provisions of the *Environmental Planning and Assessment Act 1979* and *State Environmental Planning Policy (State and Regional Development) 2011* ("SEPP SRD") the new Sydney

Fish Market development is State Significant Development and the Minister for Planning is the consent authority.

To deliver the new Sydney Fish Market, the following applications will be lodged:

1. A concept development application seeking approval for concept proposals for the new Sydney Fish Market. This is to meet the requirements for a master plan contained in clause 40 of SREP26. This concept development application will also set out details of the first stage of the development being the demolition of land and water-based structures on the site including removal of marine piles and any resulting repairs to the existing sea wall;
2. A development application for the construction of the new Sydney Fish Market;
3. An application to amend the planning controls applying to the site to enable the proposed development to be a permissible use on all of the site. This is to be achieved by an amendment to *Sydney Regional Environmental Plan No 26—City West* ("SREP26").

These applications are lodged concurrently.

1.4 Summary of the development

The proposal is to build a new fish market with a contemporary urban design, provide unique experiences for visitors and world-class auction and wholesale facilities. The new facility will be set within an improved public domain including the creation of a waterfront promenade with improved access to Blackwattle Bay and linking to surrounding areas and to public transport.

The development will expand and improve the functions of the existing in a new setting designed to achieve design excellence, functional performance and environmental sustainability.

The new Sydney Fish Market will include retail and food and beverage premises, wholesale facilities and auction rooms, offices and commercial space, Sydney Seafood Schools, back-of-house facilities and car, truck and coach parking spaces. The new facility is to include a new foreshore promenade and wharves. The new Sydney Fish Market will be purpose built and will be supported by a state of the art back-of-house plant and recycling/waste management facilities.

1.4.1 Concept development application

The Concept development application seeks approval for:

1. the use of the site for the new Sydney Fish Market including waterfront commercial and tourist facilities and ancillary uses and the distribution of uses;
2. a gross floor area of up to 30,000m² contained within a defined building envelope;
3. waterfront structures such as wharves;
4. concepts for improvements to the public domain including promenades, access to Blackwattle Bay and landscaping;
5. pedestrian cycle and road access and circulation principles;
6. principles for infrastructure provision and waste management.

This concept development application will also set out details of the first stage of the development being the demolition of land and water-based structures on the site including removal of marine piles and any resulting repairs to the existing sea wall, and related services relocations.

1.4.2 Main Works development application

The Main Works development application seeks approval for:

1. the construction of a new Sydney Fish Market including land and water-based structures.
2. the use of the site for the new Sydney Fish Market including waterfront commercial and tourist facilities and ancillary uses and the distribution of uses;
3. a gross floor area of approximately 26,000m² as calculated according to the definition of GFA under SREP 26 (approximately 25,600m² as calculated according to the definition of GFA under the Standard Instrument).
4. public domain works including promenades access to Blackwattle Bay and landscaping;
5. pedestrian, cycle and road access and circulation;
6. infrastructure provision and waste management;
7. associated works as required.

The proposed uses comprise:

Below Ground Level

- Parking for service and delivery, and private vehicles up to approximately 417 vehicles;
- Plant and storage;
- Waste Management facilities; and
- End of journey facilities.

Ground Level - Outside of Building Envelope

- Up to three operational wharves for fishing fleet servicing and product unloading/loading, multi-purpose wharf space, private-operated ferry stop, recreational vehicles and the like;
- Vehicular access driveways; and
- Publicly accessible promenade.

Ground Level - Within Building Envelope

- Wholesale services space including product storage and processing; and
- Auction floor and associated refrigeration and handling space.
- Loading dock including time-limited delivery and service vehicle parking area;
- Waste management facilities;
- Office space including buyers room;
- Staff amenities, plant and storage.

Upper Ground Level (L1)

- Retail premises including fresh food retail, food and drink premises including harbourside dining;
- External/shared dining space;
- Ancillary back of house space and staff amenities; and
- Circulation areas.

Upper Level 2 (Mezzanine)

- Catering space;
- The Sydney Seafood School;
- Tenant and subtenant office space; and
- Plant and storage space.

1.5 Purpose of this Report

The purpose of this report is to address the Secretary's Environmental Assessment Requirements (SEARs) which state that a Navigation Impact Assessment (NIA) is required "to address the impacts of the development and wharves on the navigation of bulk carriers, cruise ships, ferries and commercial/recreational and other maritime vessels".

Infrastructure NSW has engaged Royal HaskoningDHV (RHDHV) to undertake a Navigation Impact Assessment for the proposed relocation of the existing Fish Market. The scope of this study involves:

- establish existing waterway navigation and usage;
- review and description of proposed development based on drawings and information detailing existing and future proposed operations provided by Infrastructure NSW;
- assessment of potential navigation impacts and proposed mitigation measures during construction and operation of the proposed development; and,
- preparation of Navigation Impact Assessment reports.

The subject of this report is the site of the proposed new Sydney Fish Market at the head of Blackwattle Bay. However, consideration has also been given to waterway use in adjacent areas such as Rozelle Bay as this interacts with vessel activity in Blackwattle Bay, and boating traffic from both areas utilises a common navigation channel beneath the Glebe Island Bridge to access Sydney Harbour.

This report addresses navigation impacts associated with the design concept and future operation of the new Sydney Fish Market and construction impacts during Stage 1 Early Works. A separate report will be prepared to address construction impacts during the Main Works.

Appendix A contains maps displaying relevant spatial data and comprises:

- Map 1 – Existing Bathymetric Levels
- Map 2 – Maritime and Navigation Features
- Map 3 – Proposed Sydney Fish Market Plan

Appendix B contains NSW Boating Information.

Appendix C contains a concept drawing for the proposed New Sydney Fish Market.

UrbanGrowth NSW Development Corporation (UrbanGrowth NSW) was abolished on 1 July 2019 with all functions transferred to Infrastructure NSW. Any reference to UrbanGrowth NSW throughout the report is interchangeable with Infrastructure NSW.

2 Existing Waterway Navigation and Usage

2.1 Tidal Water Levels

Tidal water levels in Sydney Harbour are represented by tidal planes at the Fort Denison tide gauge, and are summarised in **Table 1**.

Table 1: Sydney Harbour Tidal Planes (MHL, 2012)

Tidal Plane	Chart Datum (metres)	Australian Height Datum (metres)
Highest Astronomical Tide, HAT	2.1	1.18
Mean High Water Springs, MHWS	1.57	0.65
Mean High Water, MHW	1.45	0.53
Mean High Water Neaps, MHWN	1.33	0.41
Mean Sea Level, MSL	0.95	0.03
Mean Low Water Neaps, MLWN	0.56	-0.37
Mean Low Water, MLW	0.44	-0.49
Mean Low Water Springs, MLWS	0.32	-0.61
Lowest Astronomical Tide, LAT	0	-0.93

2.2 Water Depths

Water depths on navigation charts are typically displayed as depths below Chart Datum, which approximates the Lowest Astronomical Tide (LAT). Water depth information (relative to Chart Datum, CD) has been sourced from the RMS Infrastructure and Geospatial Services division and is displayed on **Map 1** (refer **Appendix A**).

Water depths within Blackwattle Bay are deepest in the middle of the Bay, where depths of up to 7m are found. Water depths adjacent to existing wharf, marina and jetty structures are generally between 2m to 6m.

The shallowest water depths of 0m occur at the shoreline along the eastern side of the Bay and generally deepen to 2m within 10m to 50m of the shoreline. Water depths are around 2m along the shoreline at the head of the Bay and deepen to 4m within 10m of the shoreline. Water depths along the western shoreline of the Bay are generally 2m, with water depths of 3m at the pontoon facilities used by Glebe Rowing Club and Sydney University Boat Club. An anchorage zone exists within the embayment between Sydney University Boat Club and the headland at Bellevue House and has water depths of 2m to 4m.

The maximum water depths in the adjacent area of Rozelle Bay are located along the northern side of the Bay where depths of 6m to 7m are enjoyed by marina facilities including Roads and Maritime Services, Sydney Superyacht Marina and Sydney Boathouse. Water depths at the head of the Bay are shallower and range from 0m along the shoreline to 2m to 4m at the Seawind Catamaran marina facility. Along the southern shoreline water depths are shallower than the northern side of the Bay and range between 2m and 4m in the anchorage zones in the embayments between Bellevue House and Glebe Point and adjacent to Bicentennial Park. A notable shallow water area exists offshore of the entrance to Johnstons Creek, where water depths of less than 2m extending some 150m offshore are indicated by a north cardinal mark.

Water depths within the marked navigation channel beneath Anzac Bridge are between 6m and 8m, and are around 7m within the navigation channel through the Glebe Island Bridge. Beyond the Glebe Island Bridge water depths increase to 12m on the approach to Darling Harbour through Johnstons Bay and similar water depths exist within White Bay.

In summary, the relatively deep water depths within Blackwattle Bay are favourable for a wide range of boating activities. These water depths are also generally available in neighbouring bays (Rozelle Bay, Johnstons Bay and White Bay). This deep water in combination with sheltering from swell and wind waves found elsewhere in the outer Sydney Harbour, and the availability of flat waterfront land makes the Bays Precinct attractive for siting of industrial, commercial and recreational boating facilities and also the use of passive recreational craft.

2.3 Navigation Widths

A relatively wide navigation area exists within Blackwattle Bay for transit of commercial and recreational vessels. At the entry to the Bay, a 250m width exists between the headland at Blackwattle Bay Park and the foreshore beneath the Anzac Bridge and adjacent to Bank Street. Further into the Bay, special marks delineate the anchorage zone on the western side and a 250m wide navigation area exists to the eastern shoreline. The narrowest width for passage of boats of around 180m exists between the rowing club facilities on the western shoreline and the marinas on the eastern shoreline owned by Blackwattle Bay Marine Operatives and the existing Fish Market.

Beneath the Anzac Bridge the waterway width is around 250m between the facilities at Sydney City Marine and the opposing foreshore. However, port and starboard markers delineating the navigation channel beneath the bridge indicate that a width of 140m is available for navigation.

The navigation width narrows significantly to 18.8m through the eastern portal of the Glebe Island Bridge. It is noted that the western portal (18.7m clearance) of the Glebe Island Bridge has restricted water access due its proximity to the commercial shipping berths at Glebe Island (Berths 1 & 2) (SMEC, 2016). Beyond this point the waterway width opens out to a maximum of 300m within Johnstons Bay and ranges between 220m to 280m on the approach to Darling Harbour.

2.4 Navigation Rules

The Roads and Maritime Services (RMS) Boating Handbook (RMS, 2016) provides boating information for operating on NSW waters including water traffic rules. The “Safety on the Water” section from the RMS Boating Handbook is provided within **Appendix B** to this report and includes the following sub-sections:

- Know the Rules;
- Navigation Marks and Signs;
- Night Safety;
- Special Areas;
- Big Ships and Small Boats; and,
- Go Easy on the Drink.

The water traffic rules include guidelines on preventing collision and the interaction of vessels, and reference is made to the requirement to comply with the International Regulations for Preventing Collisions at Sea.

The Boating Handbook states the following in relation to Sydney Harbour:

Sydney Harbour is a unique waterway that is used extensively by a diverse range of recreational and commercial boats including large ships, ferries, charter boats, cruisers, yachts, runabouts, sailing skiffs, dinghies, sailboards, rowing shells, kayaks and dragon boats.

The Harbour is an extremely busy waterway that requires you to be aware of your responsibilities and to take care when boating, especially in busy navigational channels, and make allowances for commercial activity.

There is a need to consider paddlers, rowers and sailors as well as accommodating the needs of commercial operators and those wishing to cruise, ski and fish on the Harbour.

The number of vessels on the Harbour is increasing each year, providing a greater challenge in managing the potential for additional conflict and incidents to ensure safety on the waterway.

There is a continuing need for an understanding and commitment to water safety by all people using the Harbour. The different types of boating may not always be compatible and can lead to potential conflicts: for example, people sailing in organised events and commercial vessels operating to timetables.

RMS has launched a safety awareness initiative, aimed at the boating community, called 'You're the Skipper. You're Responsible'. The campaign is designed to encourage all recreational operators to take responsibility for their actions on the water highlighting that boat operators, or skippers, are responsible for the safety of their vessel and the people onboard, and that they should keep a proper lookout for other boats, non-powered vessels (including kayaks and dinghies) and swimmers. The information booklet produced for this campaign is included within **Appendix B**.

The clear message from RMS is that the responsibility for safety rests with the boat users themselves.

2.5 Paddle Safety on Sydney Harbour

In addition to promoting safe operation of motorised vessels, RMS has also launched a safety campaign for passive craft targeted at the use of canoes and kayaks. The Paddle Smart safety campaign (refer brochure in **Appendix B**) outlines requirements for paddle safety on Sydney Harbour, which include:

- paddling on the outside (starboard or right-hand side) of channels or rivers where possible, not in the centre;
- keeping a proper lookout at all times;
- keeping clear of larger vessels and being aware of their wash;
- crossing behind motorised vessels, not in front;
- wearing a lifejacket when more than 100m from shore on enclosed waters or at all times on open waters, with a strong recommendation that a lifejacket is worn at all times in Sydney Harbour;
- a minimum requirement to carry a torch between sunset and sunrise, and a strong recommendation that craft have an all-round white light visible in every direction

A map of Sydney Harbour was included in the campaign brochure. This shows that the central main channel of Sydney Harbour, including the adjacent areas of Darling Harbour, Walsh Bay, White Bay and Johnstons Bay are considered heavy traffic areas that are not recommended for paddlers. Rozelle Bay and Blackwattle Bay were not considered to be heavy or busy traffic areas or areas prohibited to paddlers (e.g. Sydney Cove) on the map.

In addition to the above safety requirements, Rowing NSW has published their own Code of Conduct (effective 19 February 2008) for Rowing and Sculling Shells, which is available on their website. This document outlines additional light requirements (over and above Rule 25 of the Regulations for Preventing Collisions at Sea, adopted in NSW through the Navigation (Collision) Regulations 1983) for rowing and sculling shells over 4m in length. The Code of Conduct states that in restricted visibility conditions and between sunset and sunrise, vessels greater than 4m in length should exhibit:

- two all-round white lights, one attached to the vessel at or near the forward end, and one attached to the vessel at or near the aft end;
- a continuous white light is considered acceptable if it is visible in clear conditions from a distance of 1km;
- a flashing white light is considered acceptable if it flashes at least once per second and is visible in clear conditions from a distance of 1km;
- notwithstanding the above, it is considered acceptable for a light to be masked so as not to interfere with the vision of the vessel's occupants, provided at least one light is visible from any direction.

2.6 Navigation Restrictions

Navigation restrictions are shown on RMS Boating Map 9G – Port Jackson Western Area, Lower Parramatta and Lane Cove Rivers (dated April 2016), which is reproduced below on **Figure 1**. Navigation restrictions are also shown on **Map 2** (refer **Appendix A**).

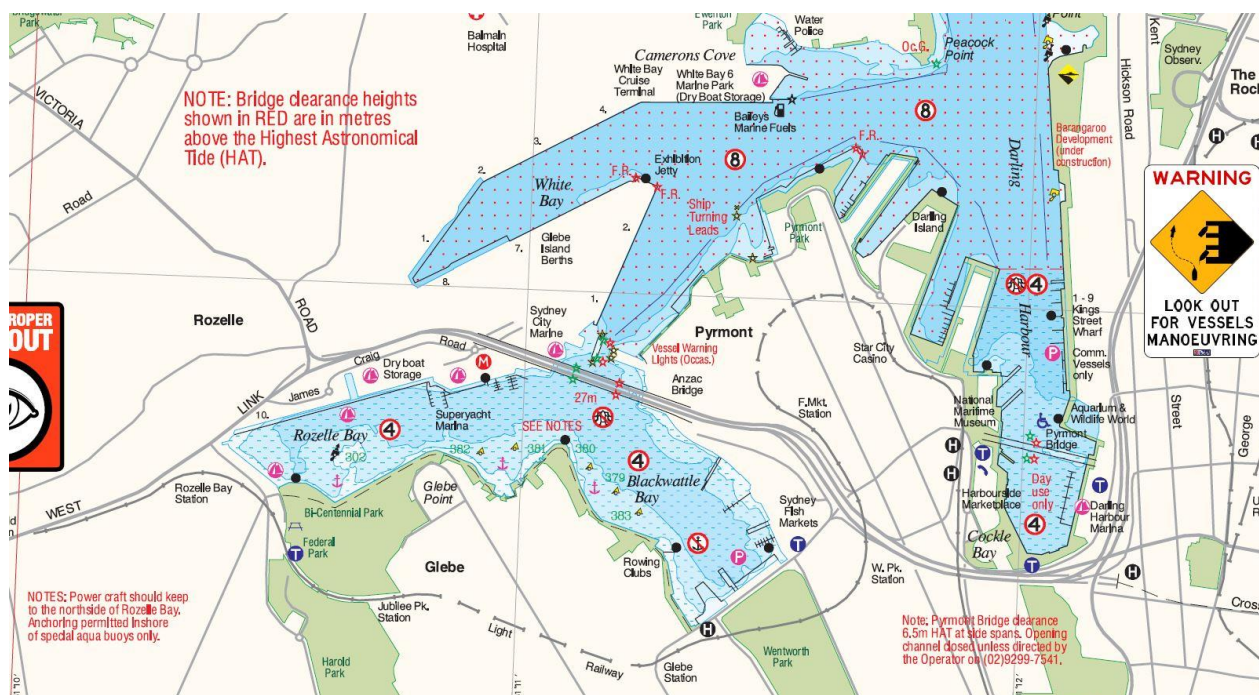


Figure 1: Extract from RMS Boating Map 9G

Navigation restrictions include:

- 4 knot zones within Rozelle Bay and Blackwattle Bay.
Restriction noted by Transport for NSW (2014) to be introduced due to high volume of traffic and interactions between commercial and recreational vessels, including large powered vessels and dragon boats and rowing boats;

- 8 knot zone in Johnstons Bay and White Bay.
Restriction noted by Transport for NSW (2014) to be introduced due to high traffic volume and vessel interactions;
- No wash zone in Blackwattle Bay.
Restriction noted by Transport for NSW (2014) to be introduced due to existence of slipways and commercial vessel operations; and,
- No anchorage zone near the existing Fish Market
Restriction noted by Transport for NSW (2014) to be introduced due to high traffic area.

It is noted that Rowing NSW successfully applied for an exemption to the 4 knot speed limit introduced in Rozelle Bay and Blackwattle Bay while rowing supervision is being conducted (i.e. rowing boats accompanied by a tinnie escort to facilitate on-water coaching). This is documented in NSW Maritime letter correspondence dated 9 January 2008 and included within **Appendix B**.

Special marks delineate preferred anchorage zones at the following locations:

- on the southern shoreline of Rozelle Bay adjacent to Bicentennial Park;
- on the southern shoreline of Rozelle Bay in the embayment formed between Glebe Point and the headland adjacent to Bellevue House; and,
- on the western shoreline of Blackwattle Bay in the embayment between the headland at Blackwattle Bay Park and the rowing club facilities.

Navigation aids installed to guide vessels within the waterway include:

- north cardinal mark to indicate shallow water offshore of the entrance to Johnstons Creek;
- lit port and starboard beacons to delineate the navigation channel beneath Anzac Bridge;
- lit port and starboard beacons to delineate the navigation channel through the eastern portal of the Glebe Island Bridge;
- lit special mark beacons to indicate the ends of the Glebe Island Bridge (normally rests in open position); and,
- lit special mark beacons to indicate the end of the eastern (Pymont) road approach to the Glebe Island Bridge.

Notes on the RMS Boating Map advise that power craft should keep on the northside of Rozelle Bay.

Bridge clearances (refer **Figure 2**) relative to Chart Datum are reported by Port Authority of NSW (2015) to be 4.9m (inner end) to 6.8m (outer end) for the swing-span of the Glebe Island Bridge (6m under the side spans) and 29.1m for the Anzac Bridge (and noted on the RMS Boating Map as 27m relative to Highest Astronomical Tide). Further navigation requirements for the Glebe Island Bridge were noted in Acil Allen (2013) and SMEC (2016) to include:

- vessels must give way to outbound traffic;
- vessels must navigate through the Eastern Channel (eastern portal), unless directed otherwise by the Harbour Master (the western channel is closed);
- the Harbour Master periodically issues directions to maritime vessels in the vicinity of Glebe Island Bridge, such as altering the navigation channel if bridge maintenance is occurring; and,
- vessels must give way to traffic lights installed on the bridge when in operation. These traffic lights are controlled by Harbour Control (Vessel Traffic Services) when a large vessel needs to navigate through the channel. Operators of large vessels can inform Harbour Control of their intended transit and RMS also has a secondary control unit.

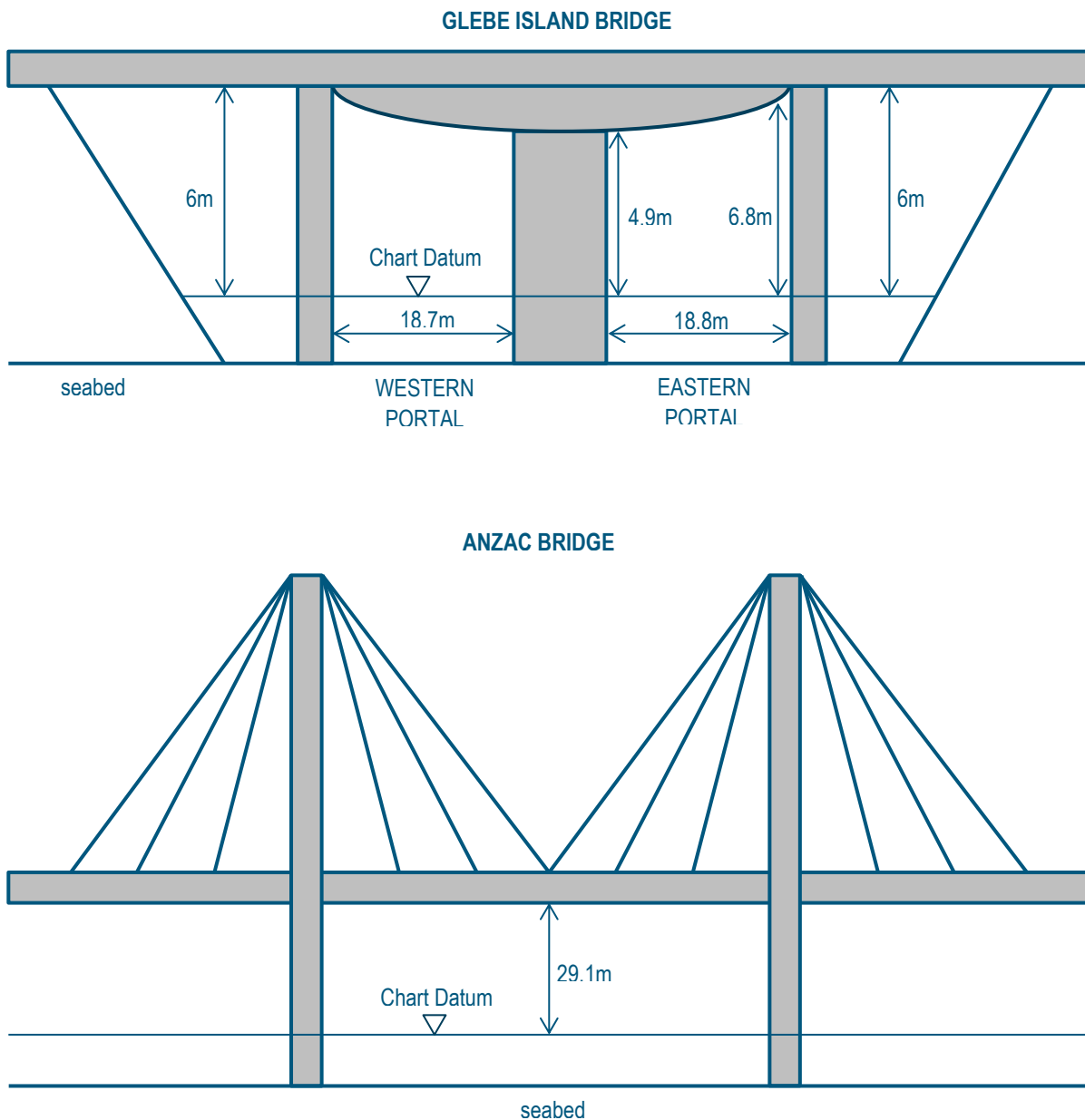


Figure 2: Bridge clearances at Glebe Island Bridge and Anzac Bridge

2.7 Existing Vessel Use

2.7.1 Recreational Power Boats

Recreational power boats are serviced by a number of berthing and boat storage facilities within Rozelle Bay and Blackwattle Bay.

Berthing and boat storage facilities within Rozelle Bay include:

- Sydney City Marine;
- Sydney Superyacht Marina;

- Sydney Boathouse; and,
- Seawind Catamaran Marina.

Berthing facilities within Blackwattle Bay include:

- Blackwattle Bay Marine Operatives; and,
- existing Fish Market (northern mooring jetty);

In addition to permanent berths, there are also public wharves available for temporary mooring of visiting recreational vessels. These facilities comprise:

- Rozelle Bay Public Pontoon at Bicentennial Park (refer **Figure 3**) – signage indicates the pontoon is for casual mooring only (pick up and drop off, vessels attended at all times), maximum vessel length of 10m, and maximum draught at low tide of 1.4m;
- Blackwattle Bay Public Pontoon at the headland adjacent to Bellevue House (refer **Figure 4**) – signage indicates the pontoon is for casual mooring only (pick up and drop off, vessels attended at all times), maximum vessel length of 10m, and maximum draught at low tide of 2.4m;
- Glebe Rowing Club pontoon in Blackwattle Bay (refer **Figure 18**) – low freeboard pontoon designed primarily for rowing boat access; and,
- existing Fish Market public pontoon in Blackwattle Bay (refer **Figure 5**) – provides a drop off/pick up facility for visitors to the existing Fish Market, accommodates vessels of up to 6m in length, 1.2m water depth is available at low tide.

These facilities cater for a range of motorised vessel sizes including trailable recreational boats (runabouts, motor cruisers), motor yachts, super yachts and larger sized recreational boats less than 11m in length (dry storage at Sydney Boathouse).



Figure 3: Rozelle Bay Public Pontoon



Figure 4: Blackwattle Bay Public Pontoon



Figure 5: Existing Fish Market Public Pontoon

2.7.2 Sailing Yachts

Facilities that cater for sailing yachts are located in Rozelle Bay and include:

- Sydney City Marine (refer **Figure 6**) – boat repair and refitting of sailing yachts;
- Sydney Heritage Fleet (refer **Figure 7**) – restoration of heritage boats including sailing skiffs; and,
- Seawind Catamaran Marina (**Figure 8**) – marina offering berths specifically for service, repair, chartering and boat management of large ocean going catamarans and tri-marans (only dedicated multihull marina in Sydney), some motor yachts and cruisers are also berthed.



Figure 6: View across Rozelle Bay towards Sydney City Marine repair facility



Figure 7: View across Rozelle Bay towards Sydney Heritage Fleet



Figure 8: Seawind Catamaran marina

2.7.3 Commercial Vessels

Commercial vessels use the waterway to access berths and repair facilities located at a number of waterfront premises occupied by marine contractors. Commercial vessels used by these contractors include tugs, workboats and barges. Marine contractors are primarily located along the northern shoreline of Rozelle Bay (refer **Figure 9**) and include:

- Clement Marine;
- Australian Wharf and Barge;
- Polaris Marine; and,
- Waterway Constructions.



Figure 9: View of marine contractors along northern shoreline of Rozelle Bay

RMS operational vessels are berthed outside the RMS Head Office (Maritime Division) on the northern shoreline of Rozelle Bay, adjacent to the Anzac Bridge (refer **Figure 10**).



Figure 10: View across Rozelle Bay of RMS Head Office and adjacent operational vessel berths

Within Blackwattle Bay, a number of marina berths are provided for charter boat operators. These include:

- Blackwattle Bay Marina (refer **Figure 11**) – previously provided 18 berths with vessels including All Occasions Cruises vessels and 12 other charter operators, this marina facility is now vacant and the vessels have been relocated elsewhere;
- existing Fish Market (refer **Figure 12**) – the end berths of the northern mooring jetty are used by Manly Fast Ferries and Fusion Cruises; and,
- Blackwattle Bay Marine Operatives (refer **Figure 13**) – provides up to 22 informal berths for use by charter operators, no public access to adjacent foreshore (privately owned Hymix concrete batching plant).



Figure 11: View of Blackwattle Bay Marina looking west across Blackwattle Bay



Figure 12: Existing Fish Market northern jetty end berths occupied by charter boats



Figure 13: Blackwattle Bay Marine Operatives

Fishing trawlers also access Blackwattle Bay to berth at the existing Fish Market facilities, which include:

- dedicated fishing trawler berths at the inner berths of the northern timber mooring jetty (refer **Figure 14**); and,
- main concrete jetty with hardstand area (trawler wharf, refer **Figure 15**) is used for unloading, reprovisioning, refuelling and maintenance of fishing vessels.



Figure 14: Existing Fish Market northern jetty inner berths occupied by fishing boats



Figure 15: Existing Fish Market main concrete jetty

The south-western corner of Blackwattle Bay is currently occupied by Hanson Australia (refer **Figure 16**). On the eastern side of the Hanson Australia concrete batching plant, a small marina exists for mooring of workboats and barges owned by HDSA Group (refer **Figure 17**) who offer marine construction and commercial diving services.



Figure 16: Hanson Australia concrete batching plant in Blackwattle Bay



Figure 17: Small marina facility adjacent to Hanson Australia concrete batching plant

2.7.4 Rowing Boats

Rowing is a popular activity in the Bays Precinct with boat houses for rowing clubs occupying waterfront land within Blackwattle Bay and use of the waterway on a regular basis for training purposes. Existing facilities providing waterway access for rowers include:

- beach launching area within Bicentennial Park (Rozelle Bay, refer **Figure 28**);
- Glebe Rowing Club (GRC) boathouse and pontoon (Blackwattle Bay, refer **Figure 18**);
- Sydney University Boat Club (SUBC) boathouse and pontoon (Blackwattle Bay, refer **Figure 19**);
- Dragon Boat ramp at Bank Street, Pyrmont (Blackwattle Bay, refer **Figure 23**); and,
- foreshore access steps adjacent to Sydney Secondary College (Blackwattle Bay Campus).



Figure 18: Glebe Rowing Club Pontoon



Figure 19: Sydney University Boat Club boathouse and pontoon

A voluntary rowing guide has been developed by RMS in consultation with local rowing groups (including Dragon Boating Clubs) and details a recommended rowing course throughout Rozelle and Blackwattle Bays. This rowing course is shown on **Figure 21** and **Map 2** (refer **Appendix A**) and, based on observations during a Saturday morning site visit, is generally adhered to by rowing clubs during training

activities. The course runs in an anti-clockwise direction around the perimeter of both Rozelle and Blackwattle Bay with row boats staying on the starboard side and keeping a distance off of 25m to 40m from berthing structures and moored vessels.

The Glebe Rowing Club (GRC) website notes that training can comprise 2 to 5 laps of the course and the best water conditions for rowing are early morning or late afternoon. The GRC Club Handbook includes a Rowing Map (refer **Figure 22**) that also indicates an extended rowing course through Johnstons Bay and into White Bay. However, it is noted on the GRC website that rowing in White Bay is undertaken on the weekend if water conditions are good and that a tinnie escort (refer **Figure 20**) is required for rowing beyond White Bay.



Figure 20: Row boat with tinnie escort in Blackwattle Bay

From review of information on the GRC and SUBC websites, rowing training occurs on most mornings during the week and over the weekend. Learn to row programs are also held by the clubs and are typically scheduled on Saturday or Sunday mornings at 9am-11am following early morning rowing training.

Sydney Secondary College (Blackwattle Bay Campus) is located on the western shoreline of Blackwattle Bay and offers rowing, kayaking and dragon boating as part of its school sports curriculum.

A J.B. Sharp Series rowing regatta was also held in 2016 with a racing course being set out within Rozelle Bay and Blackwattle Bay. This was attended by a number of Sydney rowing clubs and multiple rowing boat access points were utilised to launch boats onto the water for the event.

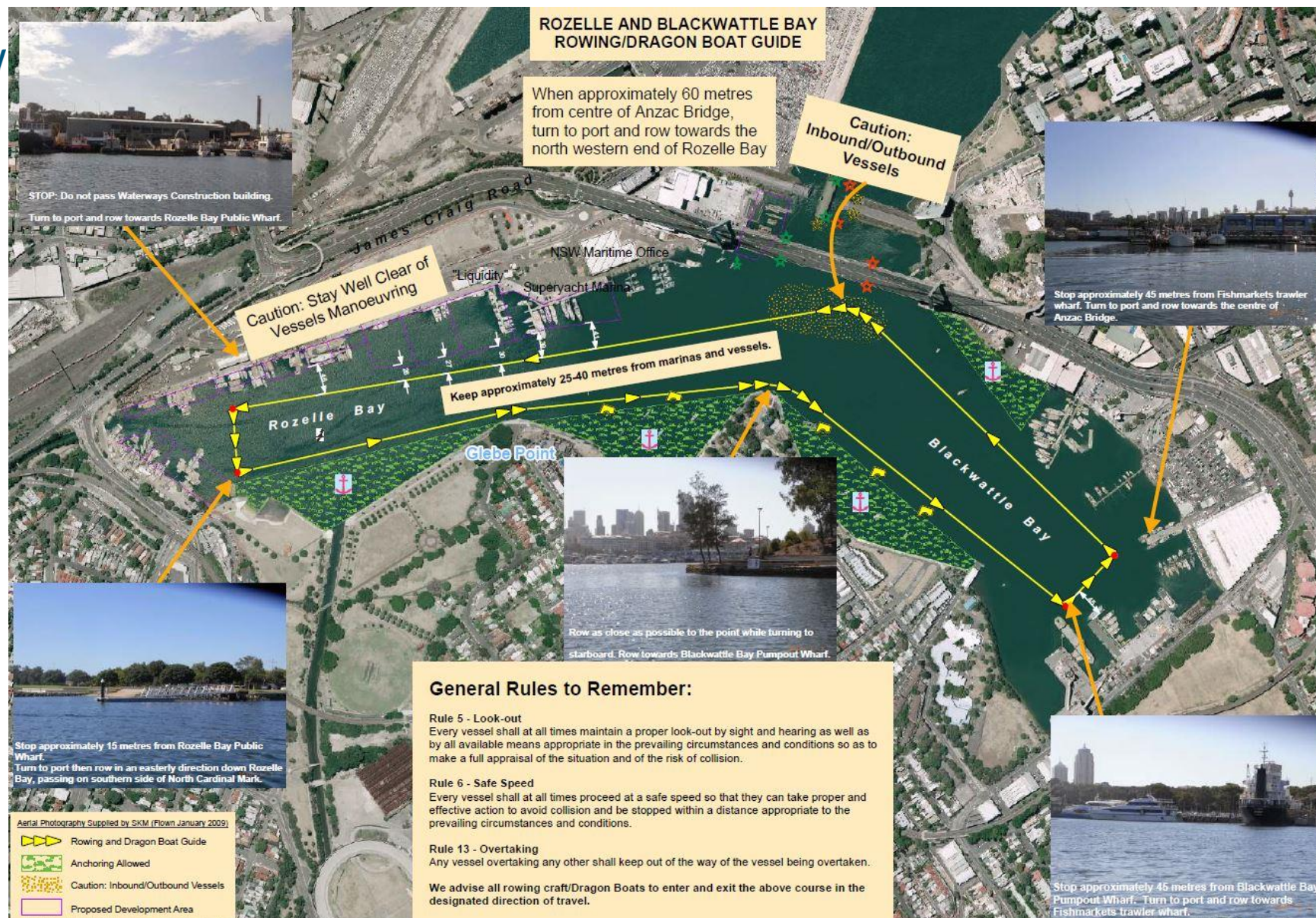
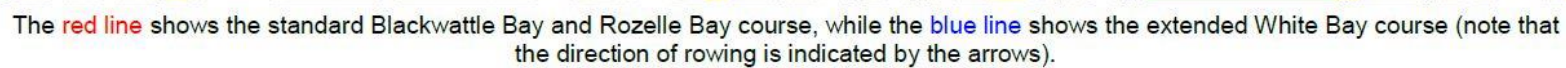


Figure 21: Recommended Rowing Course in Rozelle Bay and Blackwattle Bay (SSM, 2017)



20 September 2019

2.7.5 Dragon Boats

Dragon boating is another popular passive recreation activity enjoyed on the waterway. Dragon Boats NSW Inc. occupy waterfront land used for dragon boat storage and have a dedicated ramp launching facility (including lighting) at Bank Street, Pyrmont (refer **Figure 23** and **Figure 24**). According to the Dragon Boats NSW (DBNSW) website, 15 dragon boating clubs use the Pyrmont facility on a regular basis for training ahead of dragon boating regattas held in regional NSW, interstate and in the Sydney metropolitan area. The Bank Street site is also used as an unsealed parking area for dragon boat club members and is surrounded by a chain wire security fence.



Figure 23: Dragon boat launching ramp at Bank Street, Pyrmont



Figure 24: Onshore dragon boat storage racks and parking area at Bank Street, Pyrmont

The dragon boating clubs follow the same training route around Rozelle Bay and Blackwattle Bay as described above for rowing clubs. This was confirmed by observations during a Saturday morning site visit. It was also observed that dragon boats can row two abreast (refer **Figure 25**) and that dragon boat clubs also use the Blackwattle Bay Public Pontoon as a marshalling area for crew changes (refer **Figure 26**).



Figure 25: Dragon boats rowing two abreast



Figure 26: Dragon boat clubs using Blackwattle Bay Public Pontoon

Dragon boat club training is generally held in the evenings during weekdays (most popular on Tuesday and Thursday evenings) and on Saturday and Sunday mornings. A summary of the training schedules collated from review of dragon boat club websites is provided in **Table 2**.

DBNSW have advised that additional training by corporate groups takes place from November to January and is scheduled Monday to Friday between 5.30pm and 8.30pm. State crew training is also undertaken from January to March by 6 boats between 1pm and 4pm on Sundays. National crew training is also undertaken during early morning periods.

Table 2: Schedule of Dragon Boat Club Training at Bank Street, Pyrmont

Club	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Blackwattle Bay Dragon Boat Club	6.30pm-8pm		6.30pm-8pm				8.45am-11am
Naga Spirit Dragon Boat Club						9am-11am	
Pacific Dragons Dragon Boat & Outrigger Canoe Club	6.45pm	6.45pm	6.45pm	6.45pm	Morning	8am	8am
ACCA Dragon Boat Racing Team		6.45pm-8.30pm		6.45pm-8.30pm		8.30am-10.30am	
Bluefins Dragon Boat Racing Team							8.45am
Mavericks Dragon Boat Club		6.30pm-8pm		6.30pm-8pm		8.30am-10.30am	
Chinese Youth League Dragon Boat Club		6.30pm-8.30pm		6.30pm-8.30pm		9.30am-11.30am	
City Dragons Dragon Boat Club							9am-11am
Different Strokes Dragon Boat Club		6.30pm-8pm		6.30pm-8pm		7am-9am	
Dragons Abreast Sydney		6.30pm-8pm		6.30pm-8pm		7.30am-9am	
FFB Dragon Boat Club	6.30pm-8pm		6.30pm-8pm			7.30am-9.30am	
Flying Dragons			7pm				9am
Sydney Tsunami Dragon Boat Club		6.30pm-8pm				8.30am-10.30am	
Sydney Zodiacs		5pm-6.30pm		5pm-6.30pm		7.30am-9am	
The Sloths Dragon Boating Club	6.45pm-8.30pm		6.45pm-8.30pm			7.45am-10am	

AM Training	
AM Peak Day	
PM Training	
PM Peak Day	

2.7.6 Canoes and Kayaks

Rozelle Bay and Blackwattle Bay are highly regarded waterway areas for calm water kayaking and are listed as top destinations for kayaking within Sydney Harbour on websites of kayak tour operators, travel blogs and passive recreation groups. In addition to the sheltered waters, other attractions of the area for

kayaking visitors include paddling beneath the iconic Glebe Island Bridge and Anzac Bridge, extensive foreshore park areas for picnicking, the Glebe Foreshore Walk including canoe storage racks (refer **Figure 27**), surrounding industrial and commercial activities, and dining options at the existing Fish Market and The Boathouse (Blackwattle Bay).



Figure 27: Canoe storage racks adjacent to Sydney Secondary College, Blackwattle Bay

A dedicated kayak launching area is also provided at Bicentennial Park on the southern foreshore of Rozelle Bay (refer **Figure 28**). This comprises steps leading down to a 20m wide shallow beach area that has been recessed into the shoreline. A low freeboard pontoon is also provided at the adjacent public wharf (refer **Figure 3**).

Several sets of water access steps (refer **Figure 29**) are provided as part of the Glebe Foreshore Walk along the western shoreline of Blackwattle Bay (two sets of steps) and the southern shoreline of Rozelle Bay (three sets of steps). These steps provide water access from the elevated promenade level and could be used for launching of passive craft.



Figure 28: Steps leading to beach launching area for passive craft at Bicentennial Park, Rozelle Bay



Figure 29: Water access steps along the western shoreline of Blackwattle Bay

Annandale Boat Hire is located at the head of Rozelle Bay (behind Seawind Catamaran marina) and offers hiring of kayaks and stand-up paddleboards.

A range of passive craft were observed on the water during a Saturday morning site visit. These included fishing kayaks, outrigger canoes (refer **Figure 30**) and sea kayaks (refer **Figure 31**).



Figure 30: Outrigger canoe in Blackwattle Bay



Figure 31: Sea kayaks in Rozelle Bay

2.8 Glebe Island Bridge Boat Traffic

An indicator of the level of boating traffic in the area is provided by estimates of the number of vessel movements per day through the Glebe Island Bridge (refer **Figure 32**).

A report assessing options for Glebe Island Bridge (Acil Allen, 2013) contains estimates of 200 to 300 movements per day based on consultation with maritime businesses and RMS. The same report notes that 78% of trips were believed to be business related rather than for leisure. It was estimated that vessel movements were likely to grow by 2 per cent per annum. **Table 3** summarises the estimates of vessel movements obtained from consultation with maritime businesses undertaken by Urbis (2012).

Table 3: Estimated Glebe Island Bridge Vessel Movements (Urbis, 2012)

Business Operator	No. of Vessel Movements
Sydney Superyacht Marina	10-15 per day
Sydney Boathouse	up to 20 per day (excludes dry stack storage traffic)
Seawind Catamarans	4-20 per day depending on low/peak season
Sydney City Marine	up to 10 per day
All Occasion Cruises	10-30 per day depending on low/peak season
Blackwattle Bay Marine Operatives	8-14 per day depending on low/peak season
Sydney Fish Market Pty Ltd	20-30 per day

Further consultation was undertaken by SMEC (2016) and estimates of vessel movements contained within this report are summarised in **Table 4**. The report also concluded that several vessel types using the waterway would be limited by the available air draught of 4.9m (above Chart Datum) beneath the Glebe Island Bridge in its closed position. This is demonstrated by the typical dimensions of vessels accessing the Bays Precinct, which were summarised in SMEC (2016) and are reproduced in **Table 5**. It should be noted that the common vessel types accessing or departing Blackwattle Bay would include:

- Charter boats;
- Fishing trawlers;
- Recreational boats (runabouts, motor cruisers); and,
- Passive vessels (rowing/dragon boats).



Figure 32: View of Glebe Island Bridge looking towards Johnstons Bay

Table 4: Estimated Glebe Island Bridge Vessel Movements (SMEC, 2016)

Business Operator	Type of Vessel	No. of Vessel Movements
Sydney City Marine	sailing yachts, charter boats, superyachts, recreational vessels	10 per day
Sydney Superyacht Marina	superyachts	5-15 per day
Sydney Superyacht Marina	smaller motor yachts	5-15 per day
Sydney Boathouse	motor yachts and power boats	10-30 per day
Sydney Boathouse	dry stacked power boat (less than 11m)	120 per day
Seawind Catamarans	multihull vessels	4-24 per day
Blackwattle Bay Marine Operatives	charter boats	8-14 per day
Blackwattle Bay Marina	charter boats	10-30 per day
Sydney Fish Market Pty Ltd	charter boats	3-10 per day
Sydney Fish Market Pty Ltd	fishing trawlers	3-10 per day
Sydney Heritage Fleet	large heritage boat (John Oxley)	less than 1 per year
Sydney Heritage Fleet	small heritage boats (rowing boats, motor boats, sailing skiffs and historic replica boats)	3-10 per day
RMS Head Office (Maritime Division)	RMS operational vessels	highly variable
Marine Contractors (Rozelle Bay)	tugs, workboats and barges	highly variable

Table 5: Typical Dimensions of Vessels in the Bays Precinct (SMEC, 2016)

Vessel Type	Length (m)	Beam (m)	Draught (m)	Air Draught (m)	Approx. No.
Charter Boat (largest)	42	14	2.4	8.9	41
Fishing Trawler (largest)	17	5	-	10	9
Heritage Fleet – John Oxley (largest vessel)	51	9.8	3.4	22.7	8
Barge (max.) with crane	56	18	3.7	24	18
Tug (max.)	29	9	3.6	15	4
Workboat (max.)	13	5.1	1.4	4	4
RMS Operations vessel	7 to 16	7 max.	2.3	< 5	23
Sailing Yacht – largest that fits under Sydney Harbour Bridge	38	9	4	50	occasional, only to SCM
Superyacht (motor)	24 to 73	7 to 10	2 to 3	10 to 22	24
Yacht (motor)	< 24	< 7	< 2	< 10	56
Boat LOA<11m (dry storage)	11	3.7	0.9	< 5	570
Seawind Catamaran	12.5	6.8	1.2	20	16
Passive vessels (rowing/dragon boat) - maximum	9	1.5	0.5	< 5	-

3 Proposed Development

3.1 Concept Design

The concept design for the proposed new Sydney Fish Market is documented on the drawing provided within **Appendix C**. The development covers a footprint extending from Bridge Road at the head of Blackwattle Bay to approximately the existing quay line of the concrete batching plant. The new Sydney Fish Market comprises an enclosed building with several levels, including basement level, ground level, upper ground level and mezzanine level, and is surrounded by a perimeter promenade. On the northern (seaward) side of the development several wharfs are proposed, which cater for fishing industry operations, recreational craft access and a ferry service. These wharf facilities include:

- fixed loading & unloading wharf; and,
- recreational floating wharf, with gangway access to a t-shaped pontoon with berths on each side for use by recreational craft and a ferry pick up and drop off berth at the head of the pontoon.

3.2 Stage 1 Early Works

Stage 1 of the development comprises the following construction activities:

- site mobilisation and establishment (including installing environmental controls);
- demolition of existing infrastructure including the concrete batching plant, timber wharf and other marine structures;
- services verification, relocations and installation of selected temporary services;
- localised remediation works; and,
- selected early civil works (temporary works, drainage and other inground services).

The extent of demolition to be completed as part of Stage 1 Early Works is shown on **Figure 33**.

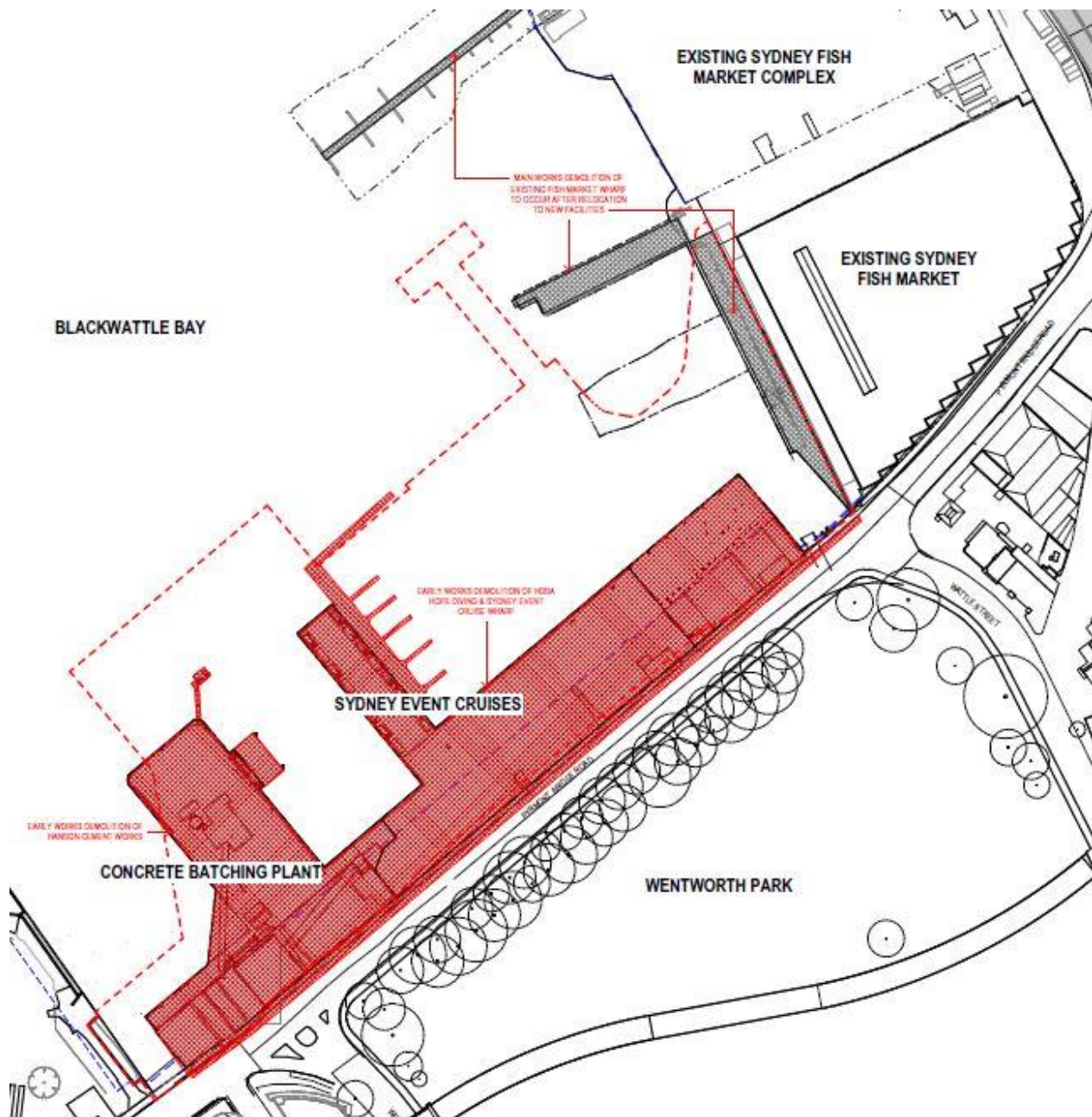


Figure 33: Proposed extent of Stage 1 Early Works demolition

4 Assessment of Impacts and Mitigation Measures

4.1 Wave Climate

Guidelines for acceptable wave climate within marinas are provided within AS3962-2001 and are based on consideration of the 50 year ARI¹ and 1 year ARI wave climate and the direction of incident waves relative to the alignment of berthed vessels. AS3962-2001 states that for vessels of less than 20m in length, the most severe wave climate should satisfy 'moderate' conditions. For vessels larger than 20m in length, the wave climate may be more severe.

Due to the 4 knot speed limit and no wash zone applied within Blackwattle Bay, and its inner harbour location, the wave climate at the site of the new Sydney Fish Market would be predominantly influenced by locally generated wind waves. The site is subject to the longest wind fetches from the WNW-NNW sector across Blackwattle Bay.

The incident 50 year ARI and 1 year ARI wave climates for WNW-NNW fetch directions have been calculated using the procedures for wind wave hindcasting within the Coastal Engineering Manual (USACE, 2006) with input wind data from AS 1170.2 – 2011 Structural Design Actions – Part 2 Wind Action. The resulting incident wave climates are summarised in **Table 6** and **Table 7**.

The wave climate at the proposed location of operational and recreational wharves proposed as part of the new Sydney Fish Market will generally satisfy the 'moderate' conditions specified within AS3962-2001 for oblique seas. Oblique seas would generally be expected for vessels berthed alongside in the same orientation as the alignment of wharf structures.

Beam seas may be possible if vessels are proposed to be berthed perpendicular to the alignment of wharf structures. In this case the 50 year ARI and 1 year ARI beam seas would need to be less than 0.31m and 0.38m respectively to satisfy the 'moderate' conditions specified within AS3962-2001. As such, the 50 year ARI wave heights would need to be attenuated to 60% of their incident wave height to meet this criteria. This is readily achievable with the wave attenuation performance provided by a typical 2.4m floating pontoon, which could be installed at the end of the wharf to provide wave protection. Alternatively, intermediate mooring piles can be provided in between each berth to facilitate roughwater tie-up arrangements.

Table 6: 50 year ARI Wave Climate at new Sydney Fish Market Site

Direction	Seas	Fetch	Incident Wave Height	Wave Period	'Moderate' Criteria
		(m)	(m)	(secs)	(m)
WNW	Oblique	920	0.51	1.50	0.50*
NW	Oblique	750	0.47	1.41	0.50*
NNW	Oblique	780	0.48	1.43	0.50*

* Criteria for seas greater than 2 seconds applied, no AS3962-2001 requirement for seas less than 2 seconds.

¹ Average Recurrence Interval.

Table 7: 1 year ARI Wave Climate at new Sydney Fish Market Site

Direction	Seas	Fetch	Incident Wave Height	Wave Period	'Moderate' Criteria
		(m)	(m)	(secs)	(m)
WNW	Oblique	920	0.37	1.35	0.38
NW	Oblique	750	0.34	1.26	0.38
NNW	Oblique	780	0.34	1.28	0.38

4.2 Water Depths

The required water depths for permanent vessel berthing and fairway access are specified within AS3962-2001 Guidelines for design of marinas and RMS Guidance Note 03 Depths in Berths and Fairways. These documents specify that the water depths available at berths under 0m CD water level conditions shall not be less than the sum of the following:

- draught of the largest vessel to be accommodated;
- half the incident 50 year ARI significant wave height; and,
- a clearance of 0.3m where the seabed consists of soft material and 0.5m for rock.

The addition of the same components is applied to a Mean Low Water Springs water level condition for fairway access.

Based on the above requirements, **Table 8** summarises the water depth requirements for the types of vessels that are likely to be accommodated at the new Sydney Fish Market wharves. The maximum incident wave height of $H_s=0.51\text{m}$ generated across the 920m WNW fetch into Rozelle Bay has been adopted as the 50 year ARI design condition.

Seabed levels in the vicinity of the proposed wharf structures range from -4m CD to -7m CD with seabed levels on the approach to the head of Blackwattle Bay being generally deeper than -6m CD. Comparison of the required seabed levels for berthing and fairway access and the existing seabed levels available (refer **Table 8** and **Map 1**) demonstrates that existing water depths satisfy the requirements of AS3962-2001. As such, dredging is not required to provide additional water depth at the new Sydney Fish Market wharves.

It should also be noted that although sailing yachts do not currently access the existing Fish Market wharf facilities, the available water depths at the new Sydney Fish Market wharves could accommodate sailing yachts up to the maximum size that would fit under the Sydney Harbour Bridge (38m length, 4m draught, 50m air draught, refer **Table 5**).

Table 8: Water Depth Requirements at new Sydney Fish Market Wharves

Vessel Type	Length (m)	Draught (m)	$\frac{1}{2} \times H_s$ (50 year ARI)	Clearance (soft bottom)	Depth Required	Required Seabed Level (berth, m CD)	Required Seabed Level (fairway, m CD)
Recreational Powerboat	8	0.9*	0.26	0.3	1.5	-1.5	-1.2
Recreational Powerboat	12	1.0*	0.26	0.3	1.6	-1.6	-1.3
Recreational Powerboat	15	1.2*	0.26	0.3	1.8	-1.8	-1.5
Charter Boat	20	1.5*	0.26	0.3	2.1	-2.1	-1.8
Charter Boat	25	1.8*	0.26	0.3	2.4	-2.4	-2.1
Charter Boat	30	1.9*	0.26	0.3	2.5	-2.5	-2.2
Charter Boat	35	2.1*	0.26	0.3	2.7	-2.7	-2.4
Charter Boat	40	2.3*	0.26	0.3	2.9	-2.9	-2.6
Ferry (Emerald Class)	35	2.0	0.26	0.3	2.6	-2.6	-2.3
Fishing Boat (Trawler)	20	4.0	0.26	0.3	4.6	-4.6	-4.3
Fishing Boat (Tuna Boat)	20	4.0	0.26	0.3	4.6	-4.6	-4.3
Fishing Boat (Trapper)	15	2.0	0.26	0.3	2.6	-2.6	-2.3

* Assumed draught from AS3962-2001 Table 3.1.

4.3 Waterway Encroachment

The proposed footprint of the new Sydney Fish Market building and perimeter promenade extends out to the approximate quay line of existing structures, such as the concrete batching plant and Blackwattle Bay Marina. The proposed wharf structures extend a further 30 metres (Fixed Loading and Unloading Wharf) and 65 metres (Recreational Floating Wharf) into Blackwattle Bay.

The waterway encroachment of the proposed development is not considered to impact on existing boating access from other surrounding wharf structures or foreshores. Embayments have been maintained to the west and east of the development, which maintain the existing foreshores. The nearest existing boating access structure to the development is the Glebe Rowing Club pontoon, which will not be impacted by the proposal as it is approximately 70m away from closest proposed wharf.

As shown on **Map 3**, the proposed wharf structures encroach over the existing alignment of the rowing route. As such, the rowing route would need to be modified to accommodate the new Sydney Fish Market. It is recommended that the rowing route is shortened to provide a minimum distance of 45m to the proposed wharf structures as per the current offsets applied in the existing rowing route from the Blackwattle Bay Marina² and existing Fish Market main concrete jetty (refer **Figure 21**). This would improve waterway safety by reducing interaction between powered and non-powered craft in the vicinity of the proposed wharves and relocate the end of the rowing route to a convenient position opposite the Glebe Rowing Club pontoon. It is not considered that this rowing route modification would have any adverse impact on the safety of non-powered craft as the existing available waterway width across

² It should be noted that the 45m buffer distance to the rowing route was originally applied to the end of the Blackwattle Bay Pumpout Wharf, which had the footprint shown in the linework on Map 2. However, subsequent installation of floating pontoons has reduced this buffer distance to 20m, which is further reduced when vessels are berthed alongside the pontoons.

Blackwattle Bay would be maintained and only the length of the Blackwattle Bay leg of the rowing route would be reduced by 45-50 metres. Further discussion on vessel interaction is provided in **Section 4.5**.

4.4 Vessel Approach and Manoeuvring

As noted previously (refer **Section 4.2**), water depths on the approach to the new Sydney Fish Market wharves are more than sufficient to accommodate the expected range of vessels at the facility. The width of the waterway available for navigation is also adequate with the narrowest width being 180 metres.

The available waterway area in the vicinity of the proposed wharves can be generally assessed based on the type of vessels expected at each wharf.

At the Fixed Loading & Unloading Wharf (western wharf), fishing vessels of 15 metre (Trapper vessels) and 20 metre (Trawler and Tuna Boat vessels) length would be expected. The 15 metre vessels are proposed to be berthed perpendicular to the wharf alignment on the western side. If a minimum fairway width of $1.5L$ (where L is the vessel length) is applied in accordance with AS3962-2001, a distance of 37.5m would be required off the western face of the wharf. This may be limited by available water depth (subject to the draught of larger vessels) in which case the berthing arrangement could be modified to include larger vessels moored parallel to the wharf alignment. The 20 metre vessels are proposed to be berthed within a number of pens orientated perpendicular to the perimeter promenade. Turning manoeuvres would be performed off the end of the wharf if the 20m vessels are berthed stern-to. Depending on the manoeuvrability of vessels, the turning circle diameter could be 1.5 to 1.8 times the vessel length, or a 30m to 36m diameter for a 20m length vessel. Adequate waterway area is available for vessels to perform this manoeuvre.

The Recreational Floating Wharf (eastern wharf) is expected to accommodate 8m and 12m length recreational boats and water taxis (8m length) on the western side, 15m length boats on the eastern side, and ferry berthing for passenger loading/unloading at the t-shaped head of the pontoon. Adequate waterway area is available (with the proposed demolition of the existing Sydney Fish Market wharves) for manoeuvring of ferries alongside the berthing pontoon and for smaller recreational boats to access the berths on each side of the wharf.

4.5 Vessel Interaction

The new Sydney Fish Market development involves the relocation of existing vessel operations from the existing northern mooring jetty, main concrete jetty and public pontoon in the south-eastern corner of Blackwater Bay to the immediately adjacent waterway area at the head of the Bay. The existing number of daily vessels movements for charter boats and fishing trawlers using the existing Fish Market wharves is relatively low at 3-10 vessels per day. As such, the impact of the relocation of existing operations to the new site with respect to interaction with other motorised craft is minimal. It should also be noted that although the current public pontoon is a modest structure, a much longer pontoon with a number of berthing pens previously existed at the site (circa 2016, outline shown on **Map 2**) to service recreational boating access to the existing Fish Market.

However, as noted above (refer **Section 4.3**) the proposed wharves encroach over the existing rowing route alignment. It is proposed that the rowing route is modified to provide a sufficient buffer distance from the head of the wharves to minimise vessel interaction with non-powered craft (e.g. rowing boats, dragon boats and outrigger canoes). The introduction of a ferry service to the new Sydney Fish Market would introduce additional vessel traffic into Blackwattle Bay and, subject to timetabling, is expected to increase the likelihood of vessel interactions with non-powered craft. The modification of the rowing route alignment would assist in this matter by moving non-powered craft away from the ferry manoeuvring area

and the heads of wharves where turning manoeuvres are likely to be completed if vessels are berthing stern-to (refer **Section 4.4**).

The head of the Bay is an area where non-powered craft (particularly rowing boats) would typically muster before realigning themselves for the return leg along the eastern side of the Bay. Operators of non-powered craft would need to maintain their awareness of vessel movements at this location, particularly if ferry movements are relatively frequent. They would currently need to do this when mustering adjacent to the existing Blackwattle Bay Marina and when passing alongside other existing marinas and wharves within Blackwattle Bay.

Approaching and departing vessels using the new Sydney Fish Market wharves would need to keep a proper lookout at all times and vessels other than ferries should give way to passive recreational crafts. These navigation requirements should be written into the 'berthing rules' and/or a Plan of Management and included as part of the berthing agreement and planning documentation for use of the wharf facilities. This approach has been taken by the Sydney Superyacht Marina who have a similar potential for vessel interaction due to the rowing course passing alongside marina berths on the northern side of Rozelle Bay. Safe navigation requirements should also be reinforced and made clearly visible to regular wharf users, visiting seasonal vessels and recreational vessels by installing signage in prominent locations throughout the wharf facilities to outline the following:

- 4 knot speed limit and no wash zone;
- no anchoring at the head of Blackwattle Bay;
- keeping a proper lookout for non-powered craft at all times;
- notification of peak times for passive recreation (e.g. dawn and dusk); and,
- giving way to passive recreational craft including rowing boats, dragon boats and outrigger canoes.

Notwithstanding the above measures, it is also recommended that a Vessel Traffic Management Plan (VTMP) is developed for the new Sydney Fish Market to provide guidance to enhance marine safety and navigation for all vessels using the wharf facilities and the surrounding waterway area. The VTMP would be prepared in consultation with all stakeholders including Infrastructure NSW, Roads and Maritime Services, Port Authority of NSW, ferry operators, new Sydney Fish Market wharf user group representatives, and rowing and dragon boat club representatives. The VTMP would be reviewed periodically based on feedback received from stakeholders on its implementation and performance.

4.6 Stage 1 Early Works Construction Impacts

Stage 1 Early Works construction activities will be undertaken by a combination of floating and land-based plant and equipment. Demolition of water-based structures such as piles and jetties would require mobilisation of floating plant and waterway occupation around the perimeter of the existing structures. Floating plant would also be required to install floating silt curtains around the perimeter of the work area, to complete maintenance on the silt curtains and to undertake environmental monitoring activities (e.g. water quality). It is not proposed that barges would transport any demolition material off the site via Sydney Harbour. Demolition materials would be transferred onshore to a dedicated waste storage area in close proximity to the demolition activity for processing into various waste streams for disposal, recycling or reuse.

Mobilisation and demobilisation of floating plant to the site would require navigation through the surrounding areas of Johnstons Bay, and Blackwattle Bay and Sydney Harbour subject to the location of available plant and equipment. This would be a 'one-off' activity completed at the start and end of the works and is not considered to pose any significant navigation risks. A staging area is proposed to be established within White Bay for barge related works. The transit of barge-mounted equipment, tugs and

workboats throughout the Harbour is a relatively common activity, and is particularly prevalent in Rozelle Bay and Blackwattle Bay due to the presence of several waterfront premises occupied by marine contractors (refer **Section 2.7.3**). The transit of floating plant to site would need to account for the navigation restrictions imposed at the Glebe Island Bridge and Anzac Bridge (e.g. channel width and bridge clearances).

The required work area around the perimeter of the demolition areas (refer **Figure 33**) would need to be clearly delineated. The required work area would be confirmed in the Contractors detailed work method plan for all water-based activities, which would form the basis for detailed consultation between Infrastructure NSW, Roads and Maritime Services, Port Authority of NSW, Harbour Master and other appropriate Authorities. The perimeter of the work area would typically be defined by a floating boom and silt curtain. The boom would typically be continuously floating along its entire length, brightly coloured and would be tethered to temporary buoys anchored to the seabed to retain the silt curtain in position. This feature would clearly delineate the construction work area for vessels navigating within the surrounding waterway. In particular, this would clearly define 'no-go' areas for non-powered craft that use the waterway for recreation and training activities (e.g. rowing, dragon boating). The existing rowing route within Blackwattle Bay would need to be modified to accommodate the construction work area at the head of the Bay. This would require shortening of the route so that it does not extend as far into Blackwattle Bay. It is not considered that this would have any adverse impact on the safety of non-powered craft as the available waterway width across Blackwattle Bay would generally be maintained and only the length of the Blackwattle Bay leg of the rowing route would be reduced.

The extent of the construction work area is not expected to significantly impact on boating access to existing wharf structures as the Glebe Rowing Club pontoon, Sydney University Boat Club pontoon, existing Fish Market northern mooring jetty and Blackwattle Bay Marine Operatives marina are at a sufficient distance away from the site.

In accordance with Clause 67ZN of the *Ports and Maritime Administration Regulation 2012*, works involving disturbance of the port bed shall be subject to the written permission of the relevant Harbour Master and shall be completed in accordance with the conditions attached to such permission. Port Authority of NSW have advised that they would provide their approval for the works through their Harbour Master Approval process. This requires submission of all final documentation detailing the proposed works (assessment reports and plans) for review together with a completed Harbour Master Approval Application Form (available on the Port Authority of NSW website). The Harbour Master may impose conditions on any approval to disturb the seabed.

As noted above, a detailed work method plan for all water-based activities should be prepared by the Contractor in consultation with Infrastructure NSW, Roads and Maritime Services, Port Authority of NSW, Harbour Master and other appropriate Authorities. This plan would form the basis for a 'Marine Notice' which would be issued in coordination with Roads and Maritime Services to advise the boating community of the extent, nature and duration of the construction activities. Several Marine Notices may need to be issued to cover different phases of the proposed works.

Notwithstanding the issue of Marine Notices, an appropriate program of consultation and information should be developed to ensure that stakeholders (e.g. rowing clubs, dragon boating clubs, marina facilities, marine contractors) and the general public are fully notified of proposed construction activities and associated exclusion zones.

4.7 Glebe Island Development

Proposed future development in the Glebe Island area comprises the following two projects:

- Glebe Island Multi-User Facility; and,
- Glebe Island Concrete Batching Plant (SSD Application 8544).

The Glebe Island Multi-User Facility has been proposed by Port Authority of NSW and involves the construction and operation of a multi-user facility for the import, storage and distribution of dry bulk materials (e.g. sand and aggregates) at the existing Glebe Island Berths 1 and 2, located on the eastern side of Glebe Island. The proposed facility would facilitate ship off-loading and include radial electrical stackers and an enclosed storage building designed to enable feeding material from the stackers through building slot/s into the storage bays. The building slot/s would be closed when there is no ship-offloading. It would also feature internal truck receipt and delivery facilities to reduce noise emissions. It should be noted that the existing Glebe Island Berths 1 and 2 are currently operating as a multi-user facility for the unloading/loading of dry goods, as well as other occasional ad hoc port-related uses and laying-up of vessels. The project proposal has been documented in a Review of Environmental Factors, which has been put on public exhibition. Port Authority of NSW are currently preparing a Response to Submissions report prior to undertaking further consultation.

The Glebe Island Concrete Batching Plant has been proposed by Hanson Construction Materials Pty Ltd to facilitate relocation of their current concrete batching plant operations from Blackwattle Bay in order to make way for the new Sydney Fish Market. A new aggregate handling facility and concrete batching plant is proposed adjacent to Glebe Island Berth 1 and is considered to be complimentary to the proposed dry bulk material handling facilities at Glebe Island Berth 1 and 2 (i.e. the Glebe Island Multi-User Facility). The proponent is currently reviewing submissions received from the SSD application and EIS.

Cumulative impacts can occur when two or more projects are carried out concurrently and in close proximity to each other. The impacts can be caused by both construction and operational activities.

The construction schedule of all projects has not been determined. However, the new Sydney Fish Market works are located at the head of Blackwattle Bay and are considered to be at a sufficient distance away from the Glebe Island Berths such that cumulative impacts from conflicting navigation and operation of floating construction plant would not occur. Furthermore, the Glebe Island projects comprise predominantly land-based construction works undertaken on the hardstand area behind the existing berth face. As such, occupation of the waterway by floating construction plant in the vicinity of the Glebe Island berths would be limited to periodic delivery of plant, equipment and supplied by barge (e.g. delivery of aggregate silo modules for proposed Hanson facilities).

The distance between the proposed new Sydney Fish Market and the Glebe Island Berths is considered to be sufficient to mitigate any navigation impacts during the operational phase. The Glebe Island Berths are currently operating as a multi-user facility for the unloading/loading of dry goods and this shipping is therefore an existing use of this port area. Similarly, the new Sydney Fish Market is relocation of pre-existing boating access facilities, which have operated in conjunction with shipping activities at Glebe Island and White Bay for a long period of time. The relocation of the Hanson concrete batching plant operations to Glebe Island is considered to provide an improvement in navigation conditions within Blackwattle Bay. Furthermore, any interaction of boating traffic associated with the new Sydney Fish Market and Glebe Island shipping would occur in Johnstons Bay, where a broader waterway area is available to accommodate vessel passing and manoeuvring. It is expected that vessel navigation would be managed using existing operational protocols established for interaction of shipping with other recreational and commercial vessels in the Bays Precinct, and that no cumulative impact on navigation would occur.

4.8 Summary of Mitigation Measures

Based on the above assessment, the following measures are considered to minimise and mitigate potential navigation impacts from the proposed development:

- wave climate experienced at the marina site complies with guidance for acceptable conditions within AS3962-2001, provided that floating pontoons are located at the end of wharves to offer wave protection for any berthing in beam seas;
- comparison of the required seabed levels for berthing and fairway access with existing seabed levels demonstrates that existing water depths satisfy the requirements of AS3962-2001 and dredging is not required to provide additional water depth;
- existing 4 knot speed limit and no wash zone within Blackwattle Bay / Rozelle Bay;
- shortening of the rowing route at the head of Blackwattle Bay to provide a minimum distance of 45m to the proposed wharf structures and to maintain a buffer for vessel turning and ferry manoeuvring at the head of wharves;
- Approaching and departing vessels using the new Sydney Fish Market wharves would need to keep a proper lookout at all times and vessels other than ferries should give way to passive recreational crafts. These navigation requirements should be written into the 'berthing rules' and/or a Plan of Management and included as part of the berthing agreement and planning documentation for use of the wharf facilities.
- Safe navigation requirements should also be reinforced and made clearly visible to regular wharf users, visiting seasonal vessels and recreational vessels by installing signage in prominent locations throughout the wharf facilities to outline the following:
 - 4 knot speed limit and no wash zone;
 - no anchoring at the head of Blackwattle Bay;
 - keeping a proper lookout for non-powered craft at all times;
 - notification of peak times for passive recreation (e.g. dawn and dusk); and,
 - giving way to passive recreational craft including rowing boats, dragon boats and outrigger canoes.
- Preparation of a Vessel Traffic Management Plan (VTMP) for the new Sydney Fish Market to provide guidance to enhance marine safety and navigation for all vessels using the wharf facilities and the surrounding waterway area.
- Ongoing consultation with rowing stakeholders and the Sydney Fish Market to discuss vessel interactions and mitigation measures for potential impacts on rowers.

The following measures are considered to minimise and mitigate potential navigation impacts during the Stage 1 Early Works construction phase:

- Delineation of construction work areas and exclusion zones with a floating boom and silt curtain;
- Modification (shortening) of the existing rowing route to accommodate the construction work area at the head of the Bay;
- Port Authority of NSW approval for disturbance of the port bed under Clause 67ZN of the *Ports and Maritime Administration Regulation 2012* shall be provided through their Harbour Master Approval process. This requires submission of all final documentation detailing the proposed works (assessment reports and plans) for review together with a completed Harbour Master Approval Application Form (available on the Port Authority of NSW website). The Harbour Master may impose conditions on any approval to disturb the seabed.

- Issue of a 'Marine Notice' in coordination with Roads and Maritime Services to advise the boating community of the extent, nature and duration of the construction activities;
- an appropriate program of consultation and information should be developed to ensure that stakeholders (e.g. rowing clubs, dragon boating clubs, marina facilities, marine contractors) and the general public are fully notified of proposed construction activities and associated exclusion zones.

5 References

Acil Allen Consulting (2013), *Options for Glebe Island Bridge: Cost Benefit Analysis of Various Options for Glebe Island Bridge*, draft report to Transport for NSW, September.

Manly Hydraulic Laboratory [MHL] (2012), *OEH NSW Tidal Planes Analysis: 1990-2010 Harmonic Analysis*, Report MHL2053, prepared for NSW Office of Environment and Heritage, October.

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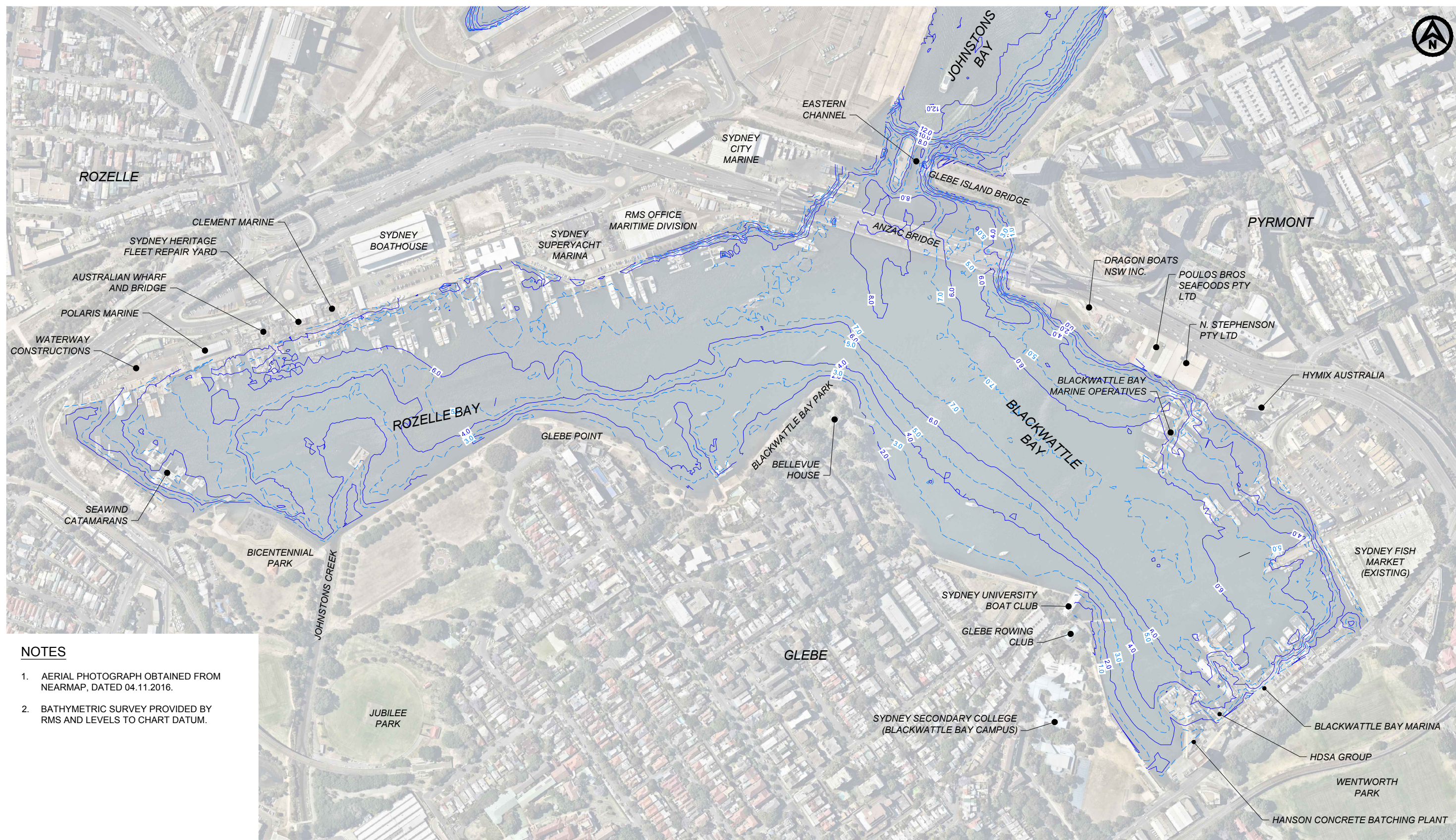
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Urbis (2012), *Glebe Island Bridge and Key Maritime Businesses in Blackwattle and Rozelle Bay – Stakeholder Consultation Report*, prepared for NSW Roads and Maritime Services.

Appendix A: Maps

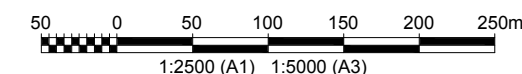
NEW SYDNEY FISH MARKET
NAVIGATION IMPACT ASSESMENT
EXISTING BATHYMETRIC LEVELS
MAP 1

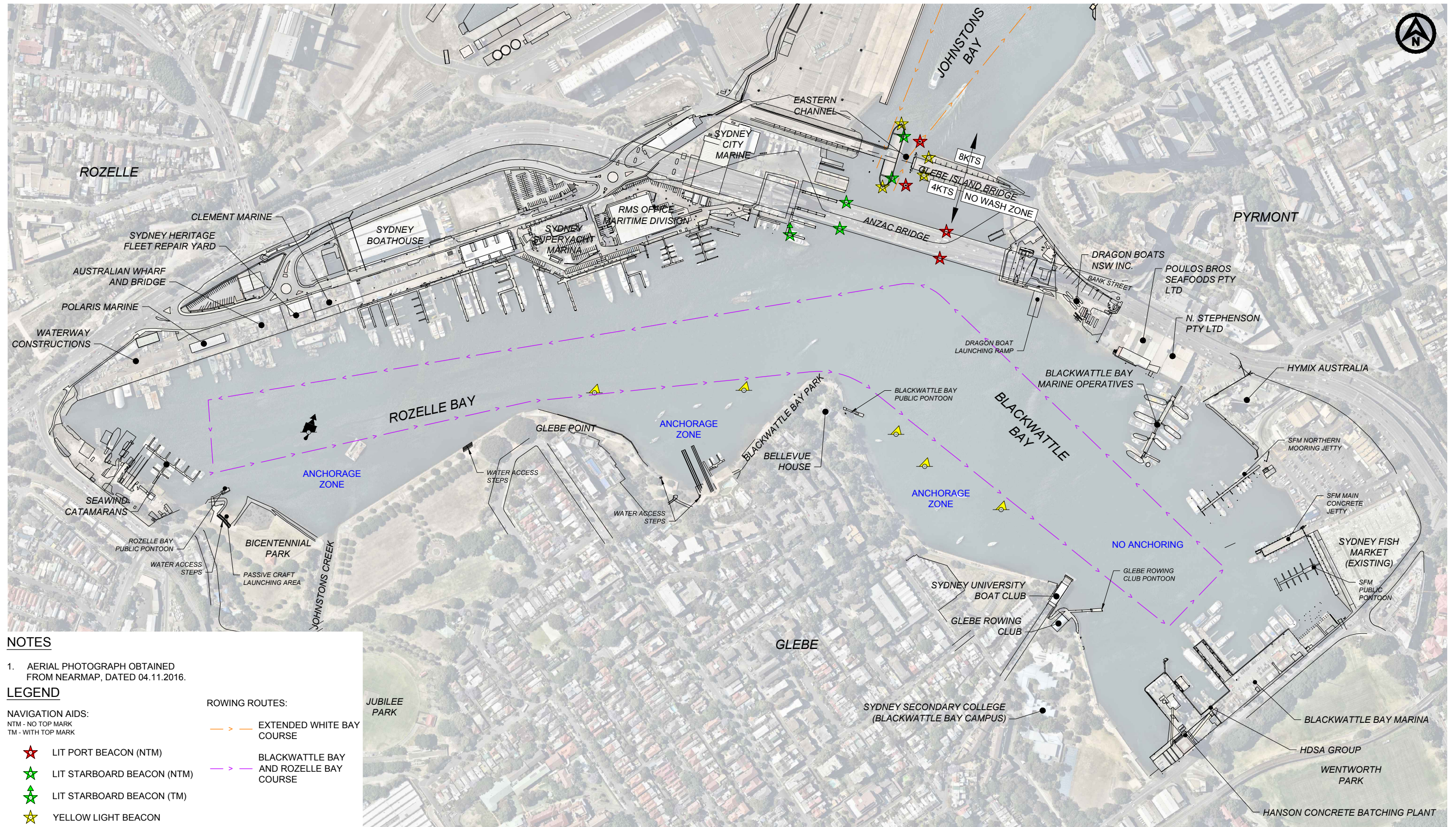


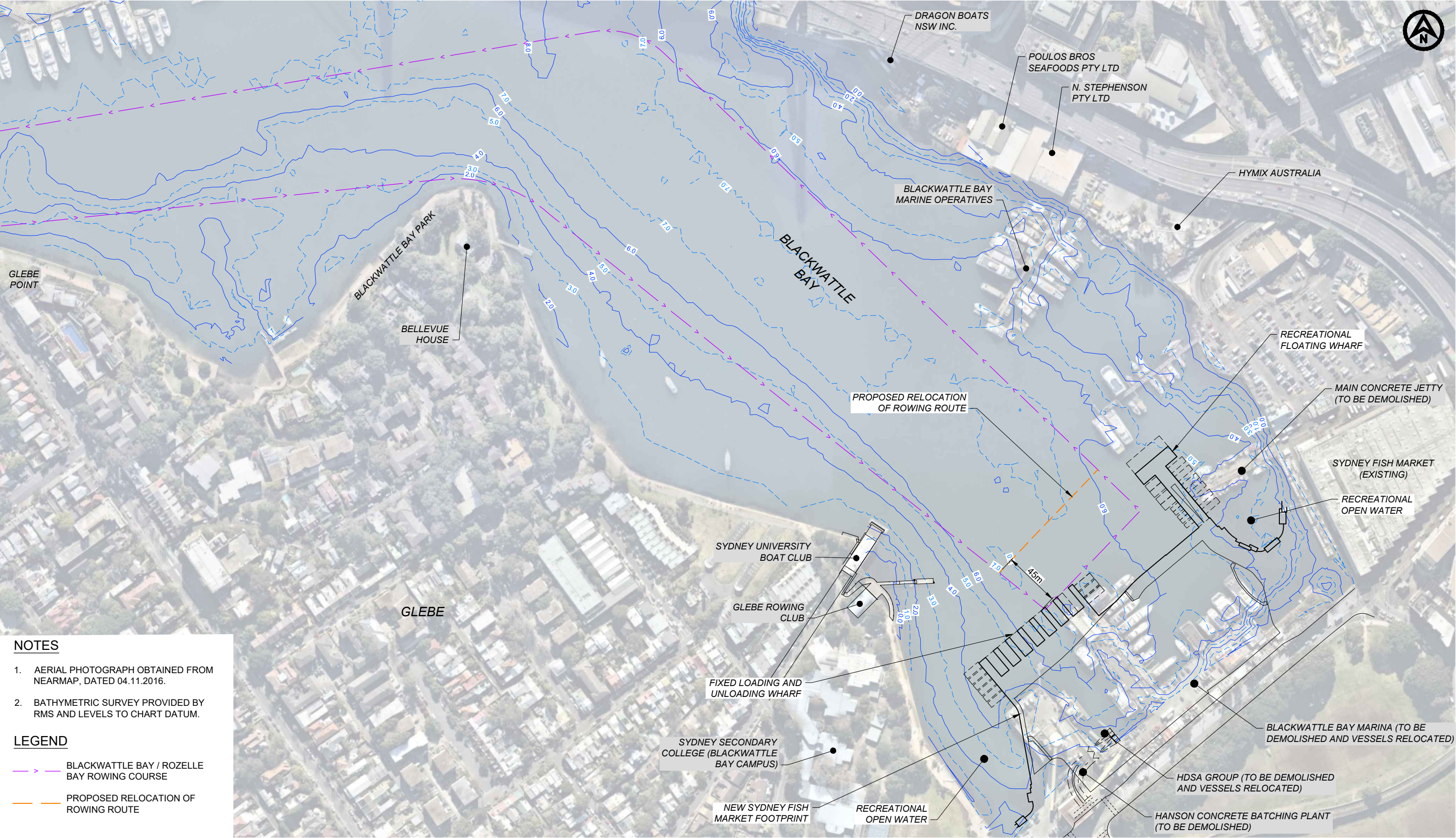
NOTES

1. AERIAL PHOTOGRAPH OBTAINED FROM NEARMAP, DATED 04.11.2016.
2. BATHYMETRIC SURVEY PROVIDED BY RMS AND LEVELS TO CHART DATUM.

CHART DATUM







- NOTES**
1. AERIAL PHOTOGRAPH OBTAINED FROM NEARMAP, DATED 04.11.2016.
 2. BATHYMETRIC SURVEY PROVIDED BY RMS AND LEVELS TO CHART DATUM.

- LEGEND**
- BLACKWATTLE BAY / ROZELLE BAY ROWING COURSE
 - PROPOSED RELOCATION OF ROWING ROUTE

CHART DATUM

Appendix B: NSW Boating Information



**Safety on
the water**



46 Know the rules

- Safe speed
- Proper lookout
- Bow riding
- Giving way
- Safe distance and speed
- Mooring areas
- Diving activities
- Dredges
- Vehicular ferries
- Commercial fishing vessels

57 Navigation marks and signs

64 Night safety

- Navigation lights checklist

70 Special areas

- Open waters
- Bar crossings
- Inland waterways
- Alpine waters
- Sydney Harbour

78 Big ships and small boats

79 Go easy on the drink

KNOW THE RULES

All masters must be aware of the International Regulations for Preventing Collisions at Sea which are adopted in NSW and modified through the *Marine Safety Regulation 2016* and available on the Roads and Maritime website at rms.nsw.gov.au/maritime. A summary of these rules is given in this section.

SAFE SPEED

All vessels must travel at a safe speed at all times.

A safe speed cannot be expressed as a maximum or minimum number of knots because it varies with circumstances and conditions. The master (skipper) must continually assess the safety of the vessel's speed.

A safe speed is one at which the vessel can be stopped in time to avoid any danger which arises suddenly. In judging a safe speed the master must consider a number of issues including:

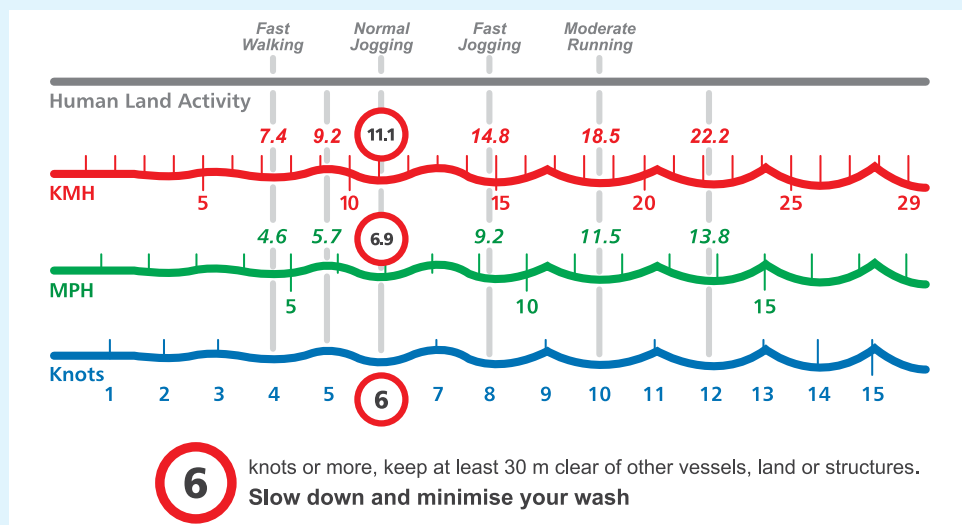
- **Visibility** – Drive slowly in rain, fog, mist, smoke or glare
- **Night** – Special caution is required between sunset and sunrise because many potential hazards may not be lit or may not be easily seen. Background shore lighting may confuse you

- **Other vessels** – Slow down on busy waterways and when near moored or anchored vessels, working vessels showing special signals and large vessels which have difficulties in manoeuvring
- **Navigation hazards** – Slow down in shallow areas or in unfamiliar waterways. Water depth can vary and change frequently. Not all hazards may be marked or lit and signs, buoys, marks or lights may have shifted or been vandalised
- **Wind, waves and currents** – May adversely affect the manoeuvrability of a vessel
- **Manoeuvrability of the vessel** – Stopping and turning ability depends on the speed travelled, wind and current and the boat's design, such as hull shape, engine and propeller type and number.

If your vessel does not have a speedometer, you must be able to determine if you are exceeding a local speed limit. For example, if your boat is planing in a restricted speed zone it is likely that you are exceeding the speed limit, so slow down.

WASH

Wash refers to the waves and turbulence created by a boat as it moves through the water. The size of a boat's wash and the effects it might have depend on how the boat is driven, its hull shape and how much load it is carrying.



PROPER LOOKOUT

The master is responsible at all times for keeping a lookout for dangers. A good lookout must be kept by sight and hearing.

The master must be fully aware of the boating environment, especially in bad weather, restricted visibility or darkness. Don't forget to look all around, even behind you.

Special care should be taken when operating your boat in areas where high speed vessels operate, such as Sydney Harbour. The situation can become dangerous very quickly due to rapid closing speeds, even if your vessel is travelling slowly.

For example a vessel going at 20 knots will cover more than 100 metres in less than 10 seconds and the speed of your boat may further decrease your time to react to avoid a collision.

Don't confuse the lookout duties of the master with those of the observer when the boat is towing a person on skis, tubes etc.

See page 82 for information on towing responsibilities.



BOW RIDING IS ILLEGAL

Bow riding means:

- Extending any part of your body outside the perimeter of a power-driven vessel that is making way, or
- Being on the bow in a position that increases the risk of falling overboard.



IMPORTANT NOTE

The offence relating to bow riding applies to both the operator of the vessel and the offending person. Fines apply.



Safety on the water



'Bow riding' on a moving powerboat includes being on the bow in a position increasing the risk of falling overboard, or sitting or leaning out over any edge of the vessel.

GIVING WAY

The master must continuously assess the risk of collision with other vessels. Power vessels must give way to:

- Sailing vessels
- Vessels approaching head on, by altering course to starboard
- Vessels approaching from the right (starboard) hand side, ie crossing
- Vessels displaying the special lights and signals shown in this chapter
- Large vessels restricted in their manoeuvrability
- Any vessel being overtaken
- Vessels engaged in fishing activities and showing appropriate signals.

A vessel drifting is deemed to be underway and has no special right of way. It is required to comply with the International Regulations for Preventing Collisions at Sea.

Do not create a dangerous situation by forcing your right of way. Always keep a safe distance from other vessels so the vessel can be stopped or manoeuvred to avoid any sudden danger.

The faster the speed, the greater the safe distance must be.

When altering course make your intentions clear to others as early as possible.



IMPORTANT NOTE

In a collision, all masters involved can be held responsible even if the give-way vessel does not give way, because all masters are required to exercise caution and take avoiding action if the other vessel does not.

SOUND SIGNALS

Special sound signals exist for powered vessels to indicate their manoeuvring intentions when they are in sight of one another.

1 short blast

I am altering course to starboard (the right).

2 short blasts

I am altering course to port (the left).

3 short blasts

I am operating engines astern (stopping/slowing or reversing).

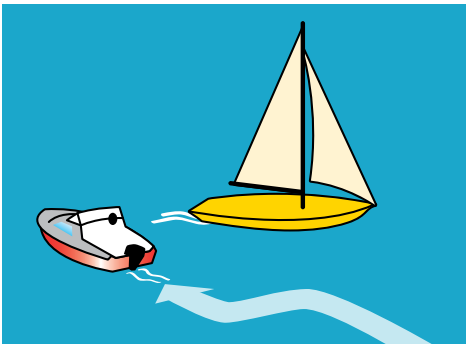
5 short blasts

I am unsure of your intentions and I doubt whether you are taking sufficient action to avoid collision.



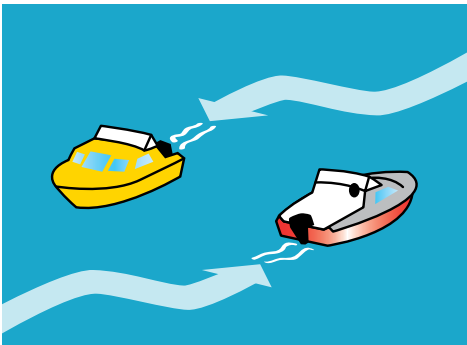
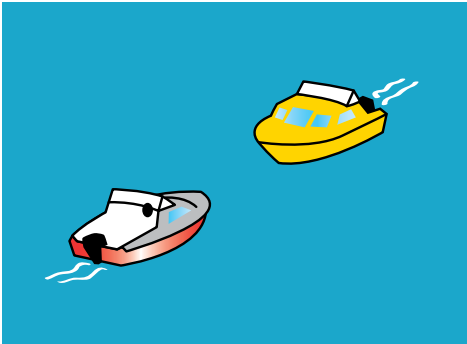
POWER GIVES WAY TO SAIL

A power driven vessel must give way to a sailing vessel unless the sailing vessel is in the process of overtaking it.



POWER DRIVEN VESSELS MEETING HEAD ON

When two power driven vessels meet head on, each must alter course to starboard (to the right) and pass at a safe distance.



ACTION TO AVOID COLLISION

The give-way vessel must avoid a collision by changing course substantially, by slowing down, or stopping and allowing the vessel which has right of way to pass clear ahead. This must be done as early as possible.



IMPORTANT NOTE

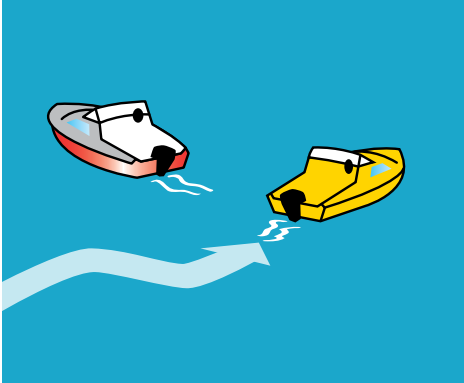
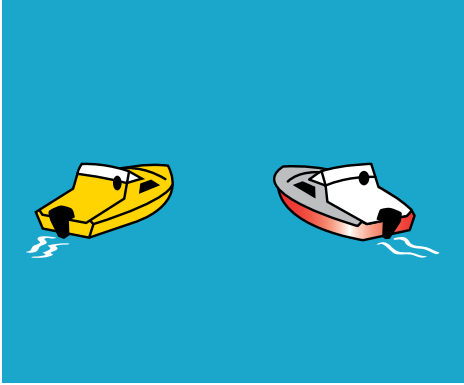
The master of the vessel which has right of way must maintain a lookout, maintain course and speed and be prepared to take action to avoid a collision if necessary.



Safety on the water

POWER DRIVEN VESSELS CROSSING

In crossing situations, give way to the right.



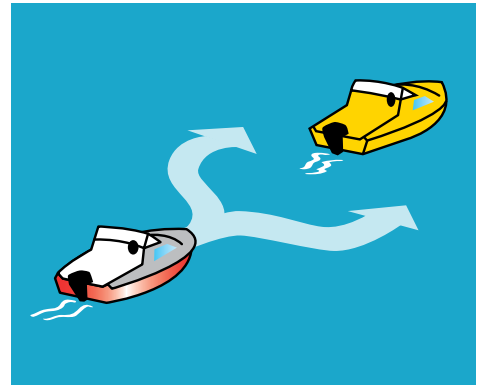
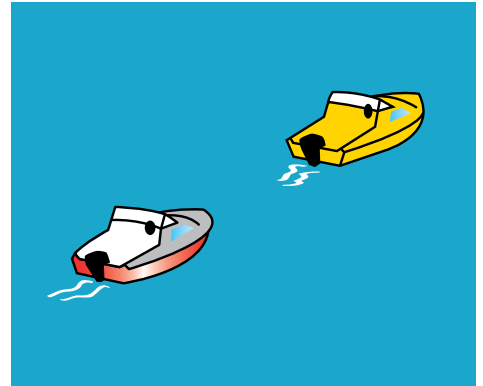
VESSELS OVERTAKING

Any vessel (including a sailing boat) which is overtaking another vessel must keep well clear of the vessel being overtaken.

You can overtake another vessel on either side but only when it is safe and you must stay well clear.

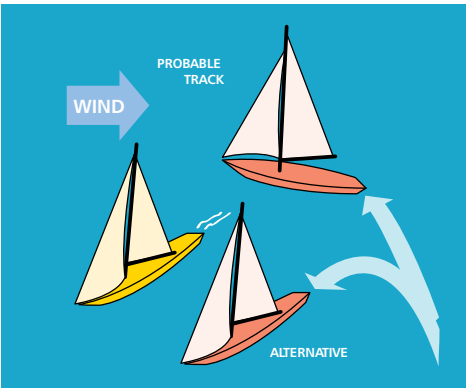
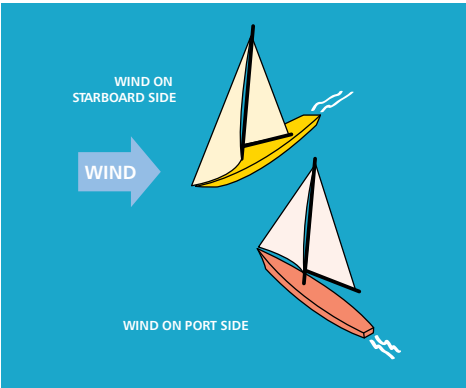
In narrow channels you must be particularly careful when overtaking.

In all instances, make sure you do not cut in front of the vessel you have overtaken.

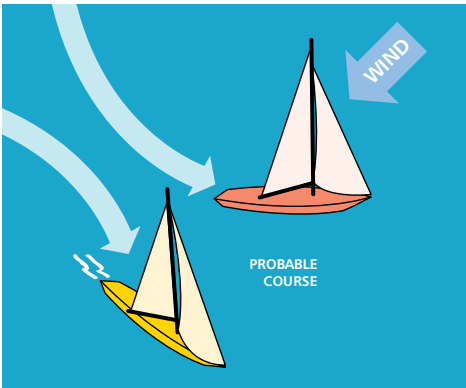
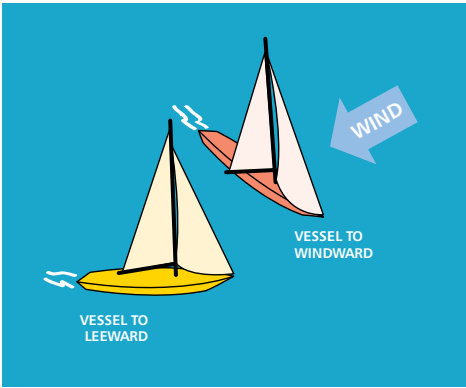


SAILING VESSELS AND SAILBOARDS

When two sailing vessels have wind on different sides, the vessel with wind on the port side gives way. In the following scenarios, the red vessel gives way.



When both craft have wind on the same side, the vessel which is to windward shall keep out of the way of the vessel which is to leeward.



IMPORTANT NOTE

If a collision appears inevitable, the skipper of each vessel must take proper action to avoid the collision.



Safety on the water

SAFE DISTANCE AND SPEED

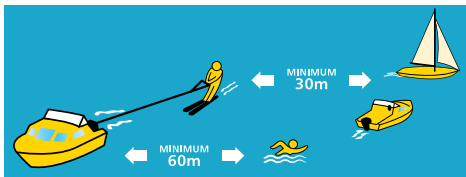
A **safe distance and speed** between a vessel and a person or thing (including another vessel) is a distance and speed that will ensure that the vessel will not cause danger or injury to the person or damage to the thing, having regard to all relevant safety factors including weather conditions at the time, visibility, speed of the vessel and obstructions to navigation that are present.

Changes have been made to the safe distance requirements (also known as 'distance off') from July 2016 by the introduction of the *Marine Safety Regulation 2016*. The revised rules are explained below.

When driving any vessel (including when towing a person or people) you must keep the vessel, any towing equipment and anyone being towed, a minimum distance of:

- **60 metres** from people in the water or if that is not possible, a safe distance and speed
- **60 metres** from a dive flag on the surface of the water or if that is not possible, a safe distance and speed.

Exceptions are when you are supporting swimmers or divers in the water; or your vessel is human-powered, eg a canoe, kayak, surf ski or rowboat; or it is a sailing vessel under 5.5 metres long without an auxiliary engine; or you are launching or removing it from the water taking care to avoid injuring people or damaging property.



When driving a power-driven vessel at a speed of six knots or more (including when towing a person or people) you must keep the vessel, any towing equipment and anyone being towed, a minimum distance of:

- **30 metres** from any other vessel, land, structures (including jetties, bridges and navigation markers), moored or anchored vessels, or if that it is not possible, a safe distance and safe speed.



Parasailing vessels, any towing equipment and anyone being towed, must maintain a distance of at least **200 metres** from any other vessel, bridge, cable, wire, pipeline or structure.

DESIGNATED SWIMMING AREAS

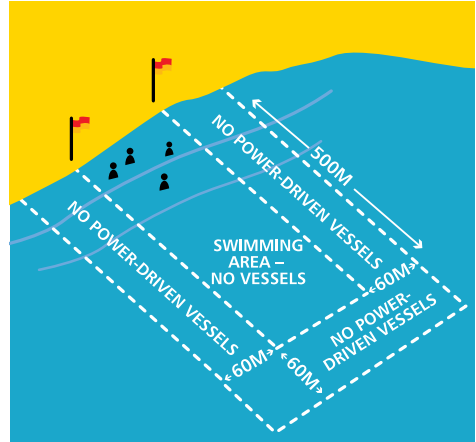
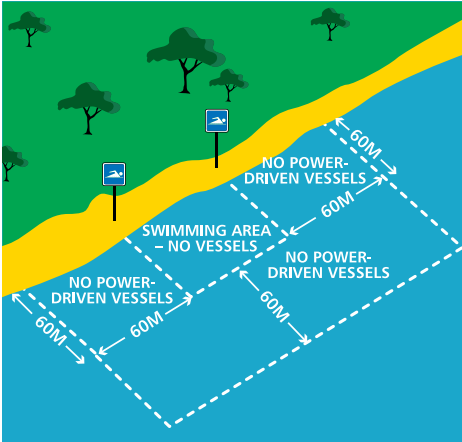
Vessels must not be operated in a swimming area, unless permitted to do so by signage.

A designated swimming area in a surf zone is defined as the area extending 500 metres out from shore between surf patrol flags or signs.

In all other areas a swimming area is defined as the area extending 60 metres out from shore between signs for swimmers.

Power-driven vessels must not be operated within 60 metres of a swimming area and the flags or signs marking such zones, unless they are a vessel operated by Surf Life Saving NSW or Council lifeguards or unless permitted to do so by a sign.

Remember the same rules apply for PWC as other vessels operating near surf zones/ swimming areas.



All vessels must stay outside swimming areas and power-driven vessels must not come within 60 metres, unless permitted by signage.

MOORING AREAS

On many waterways in NSW, areas are set aside for the mooring of vessels. These vessels are not required to be lit at night and the masters of other vessels must be aware of the location of such moorings.

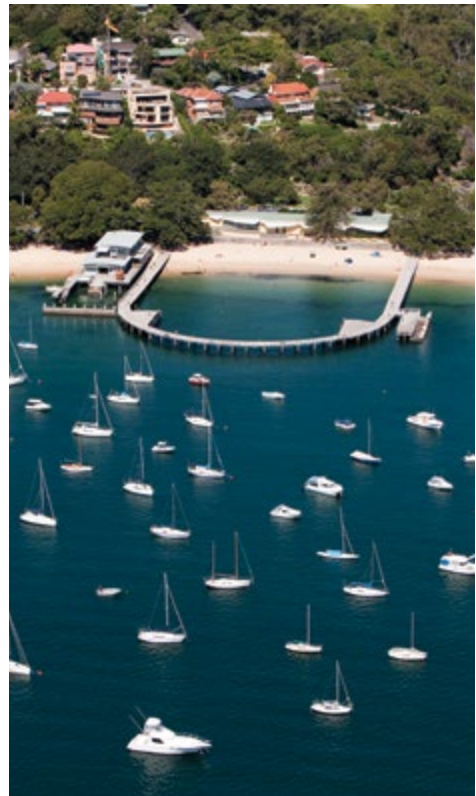
Check local maps or charts, or contact your local Roads and Maritime centre for details of mooring areas.



REMEMBER

When navigating near, in or through a mooring area:

- Drive slowly and keep wash to a minimum
- Keep a lookout for people in the water, small dinghies, and trailing ropes
- When travelling at 6 knots or more in a power-driven vessel, you must stay at least 30 metres from any moored vessel.



Special rules apply when navigating through and near mooring areas.



DIVING ACTIVITIES

Always keep a good lookout for people in the water, including divers, snorkellers, spearfishers and swimmers. Keep an eye out for the 'Alpha' flag, which means divers, snorkellers or spearfishers are in the water nearby.

Divers may be present in a variety of areas: Headlands, rocky reefs, bomboras and sheltered coves. Check your local boating map for likely areas before going out on the water.

Navigate with caution whenever within 200 metres of the shore where divers may be present. Be particularly careful when visibility is poor, such as in fog, glare, low light and surface chop.

The blue and white Alpha flag must be displayed whenever divers, spearfishers or snorkellers are operating from the vessel. It should measure at least 40 centimetres x 40 centimetres in size, be rigid, and be flown in a vertical position at least one metre above the vessel's superstructure and visible through 360 degrees. In addition, it is a good idea to attach a high visibility fluorescent yellow/green flag to draw attention to the Alpha flag, whether it is displayed from a vessel, buoy or personal float.



Alternatively the Alpha flag can be flown off a nearby float/buoy, in which case it must be at least two metres above the water level. It is also strongly recommended that a personal float and an Alpha flag be towed by snorkellers or spearfishers who venture more than 60 metres away from their vessel or who are operating from shore. For even greater visibility, it is a good idea to use a float that displays the high visibility colours.

If you see any Alpha flags, brightly coloured flags or brightly coloured floats, slow down and keep well clear. Remember, you must stay at least 60 metres away from anyone in the water, or a safe distance and speed if that is not practicable.



Divers can be up to 100 metres from their float/flag. You must stay at least 60 metres away from anyone in the water.



Fluorescent floats and/or flags are recommended to draw attention to the Alpha flag.

If you suddenly find yourself close to divers' flags and/or floats, cut the engine immediately, look around and match people to floats before slowly motoring clear. Remember that spearfishers may be up to 100 metres from their float and flag.

Avoid passing between a diving vessel and the shore, pass well clear to the seaward side. Be aware that spearfishing and snorkelling vessels

are not always at anchor, and often move about picking up and dropping off divers.

If picking up or dropping off snorkellers or divers, always be prop aware. For more information on propeller strikes, see page 92. Preferably switch off the engine first and always choose a safe position well clear of rocks or breaking waves so you don't have to rush.

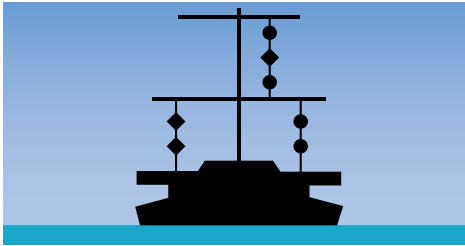


The blue and white 'Alpha' flag means divers, snorkellers or spearfishers are in the water nearby.



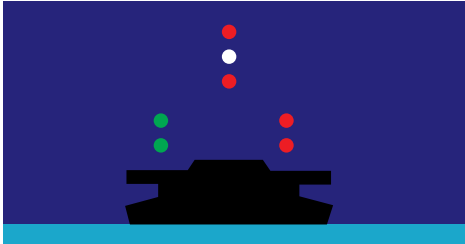
DREDGES

When driving your vessel you must not create wash that may damage or unreasonably impact on a dredge or work barge.



**Safe side to pass
(Diamonds)**

**Obstruction this side
(Balls)**



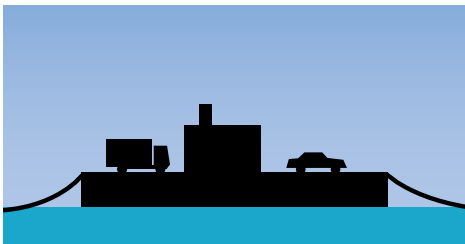
**Safe side to pass
(Green – Go)**

**Obstruction this side
(Red – Danger)**

VEHICULAR FERRIES

In some areas vehicular ferries drag themselves across channels using wires or chains. Because these wires/chains are often below the water you may not see the danger.

You must slow down to four knots or less when within 100 metres of the wires or chains of a vehicular ferry when it is underway and disengage power when crossing the wires or chains.



Always pass astern of the ferry. Preferably wait until it has reached the shore to avoid becoming entangled in the wires.

A vehicular ferry underway will display an all-round flashing light. You should give way, as it is significantly restricted in its ability to manoeuvre.

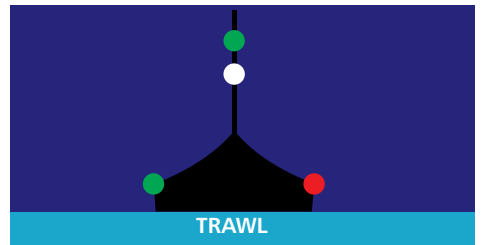


COMMERCIAL FISHING VESSELS

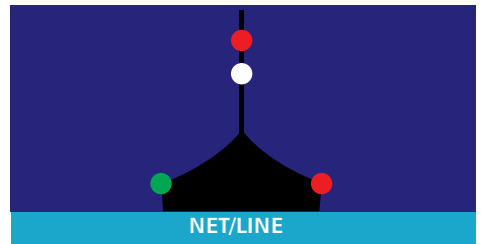
Licensed fishing vessels (LFB) display special shapes and lights when their manoeuvrability is restricted by their fishing apparatus.

You should keep clear of these vessels when you see such shapes or lights or notice they are working with nets and lines.

Contact your local NSW Department of Primary Industries (NSW DPI) Fisheries office for more details about the rights of commercial fishing vessels.



TRAWL



NET/LINE

NAVIGATION MARKS AND SIGNS

A system of buoys, poles and lights is used to assist safe navigation. Each type of mark has a unique combination of colour, shape, topmark and light. You must be able to identify these marks and pass them safely on the correct side.

An interactive guide to safe navigation, including marks and signs as well as vessel lights, is available online at rms.nsw.gov.au/maritime.

LATERAL MARKS

Port and starboard marks are referred to as lateral marks.

Port hand markers

Port markers are red and have a can shaped topmark or buoy.

If lit, a port hand mark shows a flashing red light.

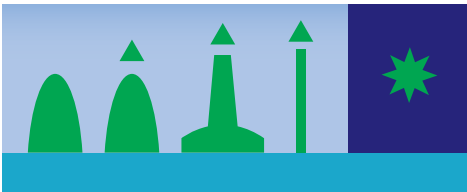
Port markers may be any of the shapes shown below.



Starboard hand markers

Starboard markers are green and have a cone shaped topmark or buoy. If lit, a starboard hand mark shows a flashing green light.

Starboard markers may be any of the shapes shown below.



Safety on the water



IMPORTANT NOTE

When port and starboard marks are placed near each other, you travel between the two.

Single lateral marks

Often lateral marks are not placed in pairs, so you will need to decide on the safe side to pass.

The safe side to pass a lateral navigation marker is determined by your direction of travel to or from the sea.

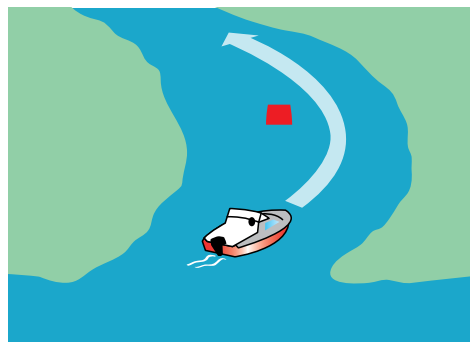


IMPORTANT NOTE

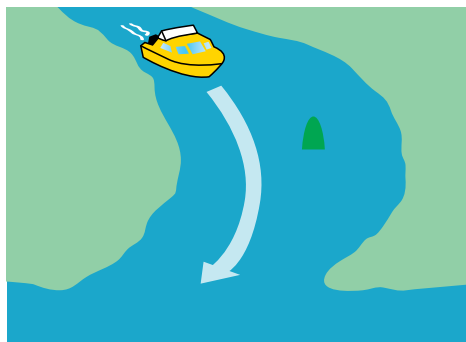
Heading upstream means in a direction away from the sea. Heading downstream means in a direction towards the sea.



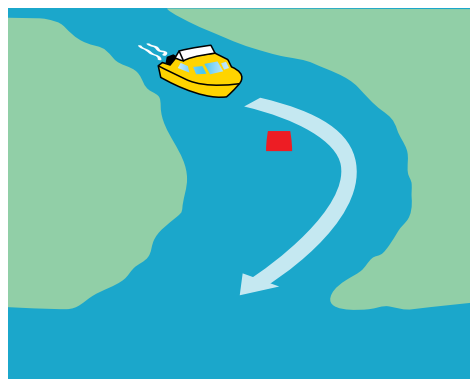
Keep **green** (starboard hand marks) on your **right hand side** (to starboard) when going upstream.



Keep **red** (port hand marks) on your **left hand side** (to port) when going upstream.



Keep **green** (starboard hand marks) on your **left hand side** (to port) when going downstream.



Keep **red** (port hand marks) on your **right hand side** (to starboard) when going downstream.



GREEN to GREEN
when going upstream



GREEN to RED
when seas are ahead

CHANNELS AND RIVERS

In NSW, the term 'channel' means an area of navigable waters that, whether or not indicated by navigation marks, provides a passage for vessels. This means that the term channel extends to bays and sounds as well as the more traditional marked channels, fairways, passages and rivers. Generally speaking, best practice is to keep to starboard (right hand side) in all waterways. However, in narrow channels a vessel **must** keep to starboard.

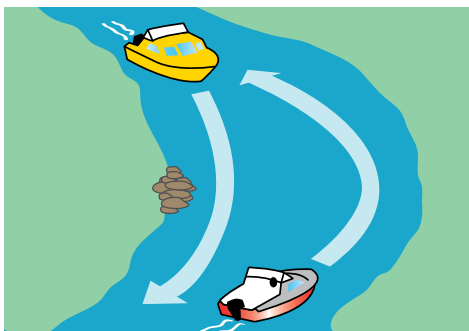
When driving a boat on rivers and estuaries, extreme caution should be exercised because not all shallow areas and navigation hazards may be marked and shallow areas may shift.

Be careful at bends. Keep a good lookout for boats coming the opposite way.

Do not cut corners.

In channels or narrow stretches of water all regulations for avoiding collision apply. Remember:

- Keep to the starboard side (right-hand side) of the channel
- Do not get in the way of larger vessels operating in the channel and watch for unexpected alterations of course as they try to follow the deepest water route
- Do not anchor or fish in channels where you may obstruct other vessels.

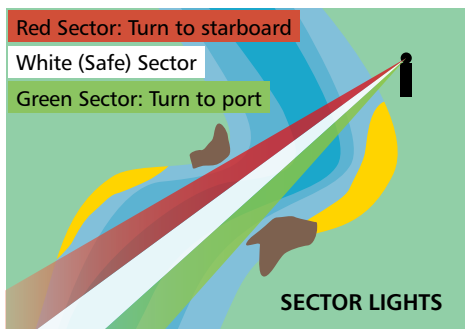
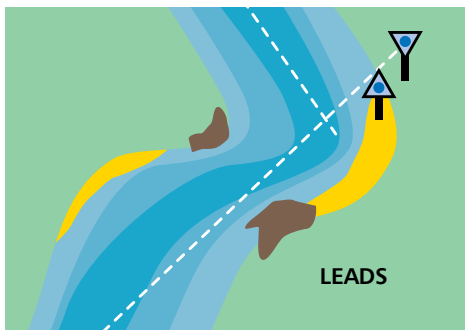


LEADS AND SECTOR LIGHTS

Leads are often used to guide vessels into a port or through sections of a waterway. By moving your vessel to a position so that both leads are lined up, the course should be a safe one.

At night, major leads are lit. Move your vessel to ensure that the lights are vertically above each other. All leads are shown on maps and charts, so it is essential to consult your chart for relevant leads and other navigation aids before entering unfamiliar waters.

The leads at major ports are usually highly visible blue triangular or vertical lights mounted on bright orange or red triangular boards.



Sector lights vary from port to port and a chart should be referred to before using them. Where sector lights mark the entrance to a port, be aware that the white sector is the shipping channel. Do not impede the passage of seagoing ships. See page 78 for more information on large vessels.



CARDINAL MARKS

Cardinal marks are used to indicate that deeper water lies in a compass direction away from a danger such as a reef, shallow areas, etc. They are painted in combinations of yellow and black as shown.



REMEMBER

Think of a clock face when remembering the lights on cardinal marks.

Three flashes = East.

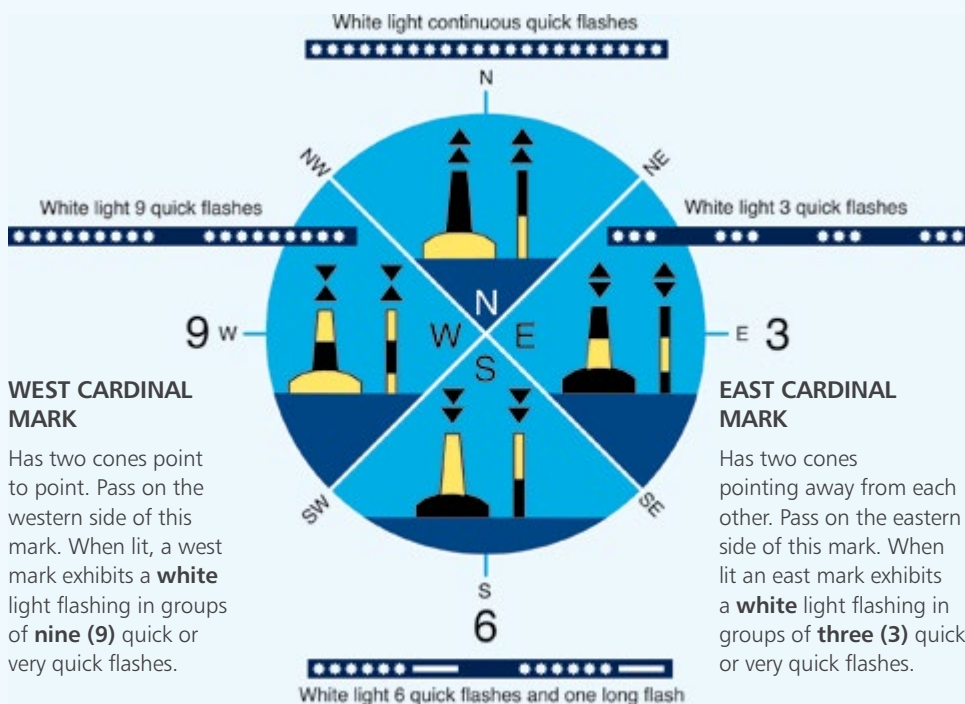
Six flashes and one long flash = South.

Nine flashes = West.

Continuous flashes = North.

NORTH CARDINAL MARK

Has two cones pointing up. Pass on the northern side of this mark. When lit, a north marker exhibits a **continuous** (very) quick **flashing white** light.



WEST CARDINAL MARK

Has two cones point to point. Pass on the western side of this mark. When lit, a west mark exhibits a **white** light flashing in groups of **nine (9)** quick or very quick flashes.

EAST CARDINAL MARK

Has two cones pointing away from each other. Pass on the eastern side of this mark. When lit an east mark exhibits a **white** light flashing in groups of **three (3)** quick or very quick flashes.

SOUTH CARDINAL MARK

Has two cones both pointing down. Pass on the southern side of this mark. When lit a south mark exhibits a **white** light flashing in groups of **six (6)** quick or very quick flashes followed by a long flash

SPEED SIGNS

In some areas, speed restriction signs are used for safety reasons in NSW. These usually show four or eight knots, but can also show six, 10 and 15 knots. Penalties apply for travelling in excess of the speed restriction.



4 knots

About 7 km/h or
a fast walking speed



6 knots

About 11 km/h
or a jogging speed



15 knots

About 28 km/h or a fast
running speed. Used in
the Sydney Harbour Transit
Zone. See page 76 for
additional details.

WASH

The operator of a vessel must not cause wash that damages or impacts unreasonably on:

- Any dredge or floating plant
- Any construction or other works in progress
- Any bank, shore or waterside structure
- Any other vessel, including a vessel that is moored.

‘Wash’ is the wave effect created by a vessel moving through the water. ‘No Wash’ and ‘Reduce Wash’ signs are placed in some areas where the wash from a vessel is likely to cause damage to the foreshore or vessels, or injury or annoyance to people.



Be aware that vessel wash can travel for hundreds of metres, and you can be held legally responsible for damage caused by wash from your vessel.

Travel at a speed which creates minimal wash when you see this sign and when near moored or anchored vessels. Look behind occasionally to see if your boat is creating wash that affects other boats or the shore. Adjust your speed if necessary.

Regardless of signs, you should not navigate your vessel in such a way as to produce wash that damages other vessels or impacts unreasonably. This is an offence.



IMPORTANT NOTE

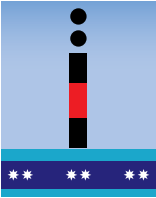
On the spot fines are issued for creating excessive wash.

Travelling at the speed shown on a speed restriction sign does not guarantee you are not creating excessive wash.



OTHER BUOYS AND SIGNS

Isolated danger



Indicates specific dangers with generally safe waters all around (eg a wreck). You can pass them on any side but do not pass too close. If lit, it shows a white light flashing in groups of two.

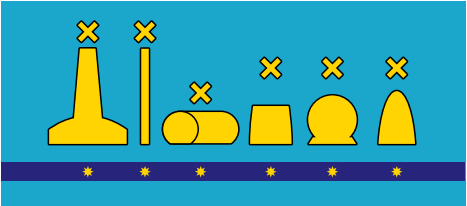
Special marks

Indicates special features or areas such as:

- Tide poles
- Spoil grounds
- Underwater pipes.

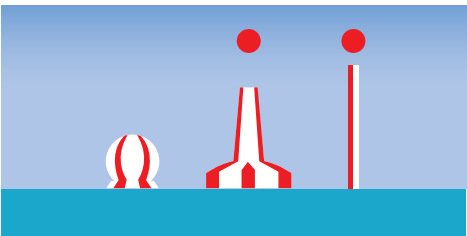
They can be utilised as lateral marks by using can or conical shaped buoys. If so they must be passed as lateral marks: can (port hand) or conical (starboard hand). See page 57 for more information.

These marks, if lit, show a yellow light at night which may flash in any rhythm.



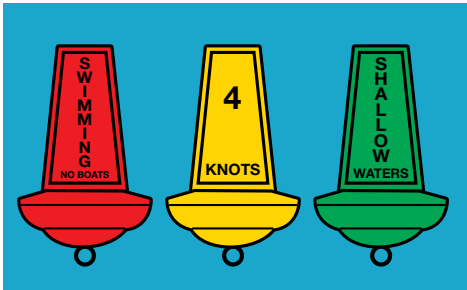
Safe water marks

These are not common in NSW. They may be used to mark the division of large shipping channels. They may show a white flashing light at night. Where the mark is used to identify a turning point or centre line it should be kept on your left hand (port) side.



Aquamark minibuoy

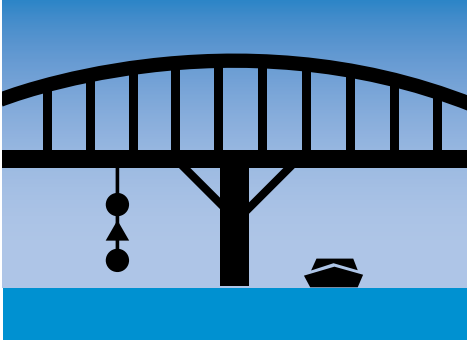
Used in some areas as alternatives to conventional buoyage. They often have advisory messages on them and penalties may apply for breaching the requirement displayed.



Channel blocked/closed

These signals mean vessels should not navigate in that part of the channel.

- Bridge span blocked
- Channel is blocked
- Port closed.



Submarine cables

Submarine cables carry electrical power or telecommunication signals under the water. Anchoring is prohibited within 200 metres of a submarine cable. If your anchor becomes snagged in this area, it should not be retrieved. Cut the anchor line as close as you can to the anchor.

Overhead power lines

As clearance height can vary according to water levels, it is most important that masters know the heights of their masts and understand the height level given on any sign.

Most of the existing signs on the water give the clearance of the power lines as the clearance above Mean High Water Springs or the average of very high tides. It is important to know that this clearance height may be reduced during king tides or floods.

A new crossings signage system is progressively being introduced on NSW waterways. The new

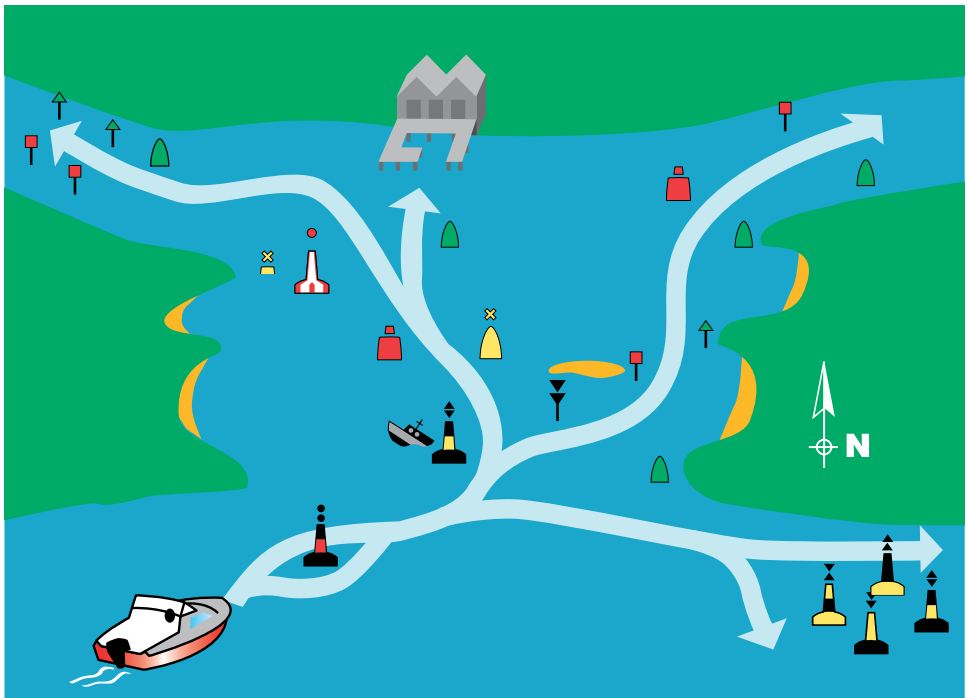
signage advises the maximum vessel height which can be navigated under an overhead crossing. It is important to note that clearances may be reduced during floods.

Roads and Maritime offers a free sticker which you can use to help remember the height of your vessel above the water line. You are encouraged to place the sticker close to the steering position of your vessel.

Extra caution is required during the changeover period from the old to the new system and when launching/retrieving vessels with a mast on shore. Always keep a lookout for overhead power lines.

Bridges

Bridge heights on maps are measured at the Mean High Water mark, so you should allow for higher than average tides at certain times of the year. Also consider your vessel may require more room when unloaded.



Understanding the system of navigation buoys, poles and lights is an essential element of safe boating.



NIGHT SAFETY

BE BRIGHT – BE SAFE AT NIGHT

When night falls it is a completely different world on the water and so vessels that operate from sunset to sunrise, whether at anchor or underway, must carry and exhibit the correct lights.



IMPORTANT NOTE

Boating at Night

Go slow, be seen, keep a lookout and be bright.

GO SLOW

When fog, glare, smoke or darkness restricts your visibility, you must slow down to a safe speed. A safe speed is one at which you can stop and avoid a collision, considering the circumstances and conditions at the time.

You wouldn't drive fast on a dark road without headlights, the same applies on dark waterways. Be bright!

Remember, the faster you go, the faster you approach hazards and the less time you have to react. Hitting a hazard at speed can have a greater impact on you, your passengers and your boat.



Check all your navigation lights are working before heading out on the water, switch them on and slow down to a safe speed when night falls.

BE SEEN

You may be able to see others but can they see you? At night, every type of craft on the water needs lights in order to be seen. Whether you are paddling, rowing, sailing or motoring, everyone needs to be able to recognise where you are and what you are doing.

Make sure you have the correct lights for your craft and that they work properly. Use them as soon as the sun goes down or when visibility is poor. Your lights should be mounted in a position that gives you optimum night vision and allow others to see you from every direction.

You must carry a working waterproof floating torch. It may help others see you if you shine your torch on your sails or superstructure.

Make sure you don't adversely affect your night vision or the vision of other boat skippers.



Vessels at anchor displaying all round white lights. Photo courtesy of City of Sydney.

NAVIGATION LIGHTS CHECKLIST

Check your lights before heading out. When boating at night or in times of restricted visibility:

- Check switches are on
- Check navigation lights are on and working
- Physically check each light is on
- Turn off cabin lights as they may reduce your ability to see
- If the vessel has a flybridge and weather permits, it is generally preferable to drive from there as you will have a better all round view
- If you anchor at night, show an all round white light clearly visible through an arc of 360 degrees, where it can best be seen.

KEEP A LOOKOUT

Navigating at night requires special care, it can be like looking into a black hole. Look and listen at all times, as a number of hazards such as logs, moored boats or sandbanks are unlit.

Navigation lights may not be as bright as other lights and background lights may hide something that is closer. If it is a large ship, the lights might be high and you may not realise that you are looking at the sides of a black hull.

If you have the slightest doubt, stop, ensure you are lit and have a good look around you.

KNOW YOUR WATERWAY

Navigation markers can aid you in safe passage of a waterway. These aids to navigation can indicate where prominent hazards are, but should be coupled with reference to a map or chart and use of local knowledge of the area, particularly in the dark.

DIFFERENT LIGHTS

All round white light: A white light showing an unbroken light over an arc of the horizon of 360 degrees.

Masthead light: A white light placed over the fore and aft centreline of a vessel, showing an unbroken light over an arc of the horizon of 225 degrees and fixed to show from anywhere ahead, to just behind the beams of the vessel.

Sidelights: A green light on the starboard (right) side, and a red light on the port (left) side of a vessel. Each shows an unbroken light over an arc of the horizon of 112.5 degrees, and is fixed to show from ahead to just behind the beam of the vessel on its respective side.

On a vessel of less than 20 metres in length, the sidelights may be combined in one light unit, carried on the fore and aft centreline of the vessel.

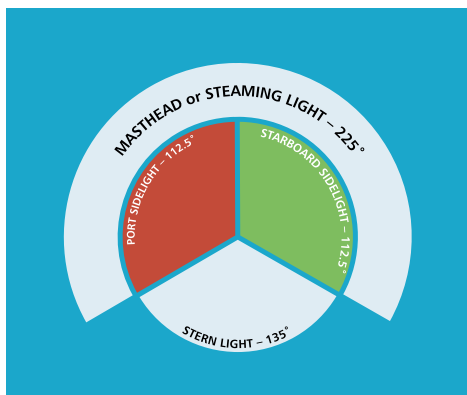
Sternlight: A white light placed near the stern, showing an unbroken light over an arc of the horizon of 135 degrees, fixed to show from behind the vessel.



REMEMBER

Look out at night

- Is that a vessel(s)?
- How big is it?
- What direction is it travelling in?
- How fast is it moving?
- How far away is it?
- Does it have priority?
- What is our relative position?



RANGE OF VISIBILITY

Vessels under 12 metres

- Masthead light – 2 nautical miles (nm)
- Sidelight – 1nm
- Stern light – 2nm
- All round lights – 2nm.

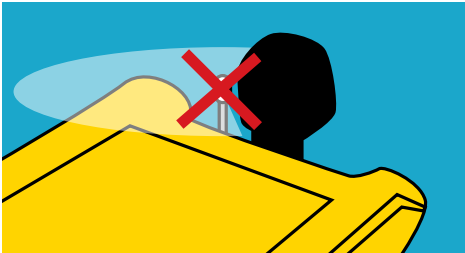
Vessels 12 metres to 20 metres

- Masthead light – 3nm
- Sidelight and stern light – 2nm
- All round lights – 2nm.

PLACEMENT OF LIGHTS

Incorrectly installed navigation lights

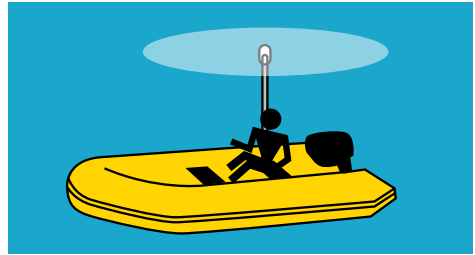
Navigation lights should be installed correctly so they show the appropriate arc of light and are not obscured by the vessel's superstructure as shown in the diagram below, or interfered with by deck lights. This reduces the vessel's visibility and is dangerous.



The diagram above shows incorrectly installed sidelights. Don't install them so they point only forward or straight up. They need to point out across the water as described and illustrated on the opposite page.

Masthead

The masthead and/or all round white light must be fitted (if practical) on the centreline (bow to stern) of the vessel.



POWER VESSELS UNDERWAY

Power vessels under seven metres and less than seven knots

Powered vessels of less than seven metres in length, capable of a maximum speed of seven knots or less, shall exhibit a white light visible all round and if possible, separate and/or combined sidelights.

All other power vessels under 12 metres

Shall exhibit one of the following:

- Separate or combined sidelights; a masthead light and a stern light
- Separate or combined sidelights and an all round white light.

The masthead or white all round light shall be carried at least one metre above the sidelights.

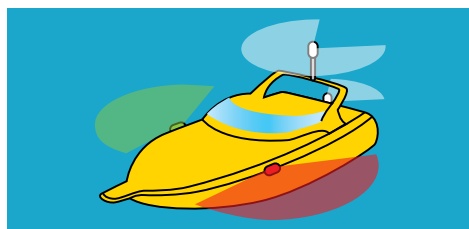


Power vessels 12 metres to 20 metres

Shall exhibit one of the following:

- A masthead light, separate sidelights and stern light
- A masthead light, combined sidelights and stern light.

The masthead light shall be carried at least 2.5 metres above the gunwale. Combined sidelights shall be carried at least one metre below the masthead light.



SAILING VESSELS UNDERWAY

Sailing vessels while underway (being motor driven) under power shall exhibit navigation lights applicable to power driven vessels.

Sailing vessels under seven metres

Sailing vessels of less than seven metres in length, or vessels being rowed, should if practicable exhibit the lights required for sailing vessels over seven metres.

If not they should have ready use of a torch or lantern showing a white light which shall be exhibited in sufficient time to prevent collision.



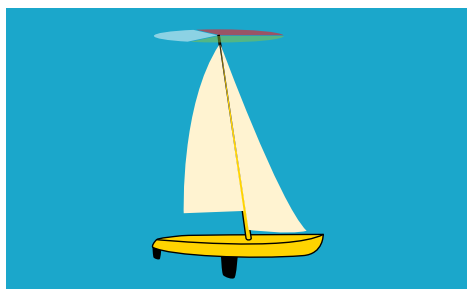
IMPORTANT NOTE

The use of tricoloured lights alone in areas affected by backlighting is not recommended eg Sydney Harbour. In these cases it is recommended to use deck level navigation lights to make your vessel as visible as possible.

Sailing vessels seven metres to 20 metres

Shall exhibit one of the following:

- A combined lantern, that is at or near the top of the mast and incorporates sidelights and stern light
- Separate sidelights and stern light.



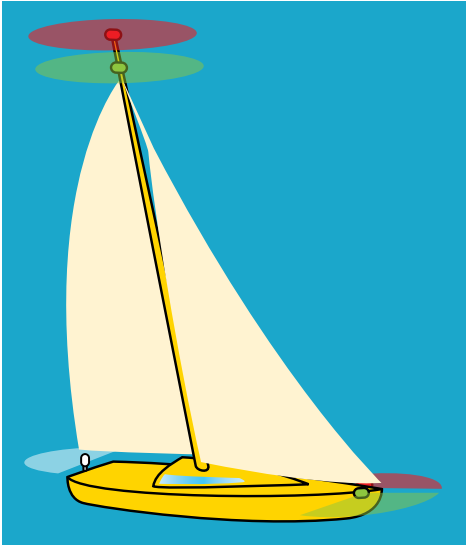
Sailing vessels over 20 metres

Must exhibit sidelights and stern light and may carry the optional red and green all round lights. However, these vessels may not carry a combined lantern.



Optional lights for sailing vessels

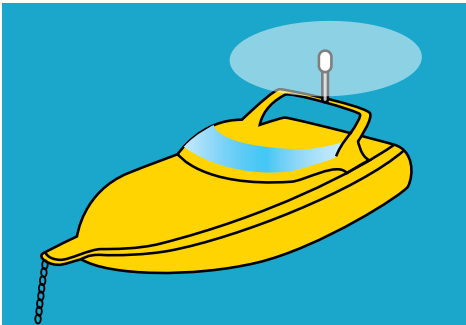
A sailing vessel of any length which is fitted with sidelights and a stern light (but not a combined lantern) may, in addition, carry two all round lights in a vertical line at or near the top of the mast. The upper light shall be red and the lower green.



Power and sailing vessels at anchor

Vessels less than 50 metres in length at anchor shall exhibit an all round white light, placed where it may be well seen.

Anchor lights must always be shown from sunset to sunrise. If you are at anchor in a busy area, then show additional lights such as deck lights or cabin lights to ensure you are seen and keep a good watch.



ROWING/PADDLE VESSELS

Such craft must have a torch or lantern ready to display in time to prevent a collision. Craft that are more than four metres long should exhibit two all-round lights, either continuous or a combination of continuous and flashing white lights, positioned at either end, in accordance with the Code of Conduct for Rowing.



IMPORTANT NOTE

There are many other combinations of lights used on vessels. The lights shown relate to the activity the vessel is engaged in, ie fishing, dredging, not under command.

A simple rule of thumb for a small power boat is to stay clear of any vessels exhibiting additional lights.



SPECIAL AREAS

OPEN WATERS

Handling a vessel at sea

The way a boat handles at sea will depend on:

- Its hull design and strength
- The amount of power used to propel it
- Wave direction
- The way the boat is steered
- The distribution of weight on board.

Bomboras

When boating along the coastline, particularly when close to a shoreline, be aware of bomboras. Bomboras are shallow areas such as those created by rocks or reefs that cause waves to break.

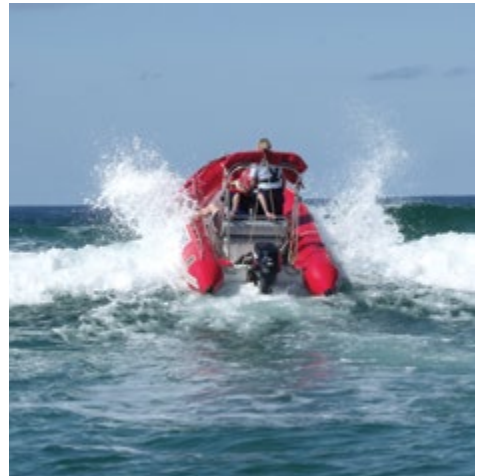
It is advisable to check maps and charts, talk to experienced locals and be aware of the existence of bomboras. The danger posed by these formations can be higher in good weather, as a bombora may not be identifiable because it may not always have breaking waves.

Boaters need to be cautious anywhere bomboras may exist.

Head seas

Generally, the best way to tackle bigger waves is to take them bow on or up to about 30 degrees off each bow.

Too much power will result in the boat leaping over the crests and crashing down into troughs. This slamming action is not good for either the boat or the people on board.



Too little power may mean that the waves break onto or over the vessel.

Control the speed and direction steered to achieve the most comfortable and safest ride.

Beam seas

The danger from travelling beam on to waves is that rolling is increased. The amount of rolling can be reduced by varying the angle to the seas.

The bow is the strongest part for taking on waves and is typically designed to take the initial impact of chop and waves. Vessel design however is extremely varied and it is essential you know the limits of your boat's capability.

Watch out for waves that are larger than others and consider changing course or speed to ride over or with it.



Following seas

Travelling with a following sea has the greatest potential for disaster, with broaching sideways and swamping/capsize a real possibility. Steering power is reduced by following seas and judicious use of the throttle controls is critical.

As in crossing a bar (see page 72), you should attempt to maintain a position on the back of waves, using throttle to keep ahead of waves breaking behind the boat.

Remember when conditions worsen

- Ensure all persons are wearing lifejackets
- Ensure the boat is as watertight as possible
- Use throttle control and steering to reduce the impact of waves
- The bow of a boat is the strongest part for taking on waves
- If caught in rough weather, report your situation to rescue authorities
- Secure all moveable items in the boat so that they do not become missiles
- Ensure all people are holding on firmly
- Have an EPIRB ready for use in case of capsize
- Stay with the capsized boat unless you are very close to shore.

Handling a vessel in rough weather/hazards

Like other hazards on the water, rough weather can generally be avoided by obtaining a weather forecast prior to setting out.

A sudden unpredicted squall, however, can catch even the most careful boater, so you should always prepare and plan for the worst and keep a good lookout for tell-tale clouds and white cap waves.

IMPORTANT NOTE

If you doubt your chances of safely running back to harbour you may prefer to ride out the initial onslaught by keeping your bow into the wind and waves.

If you are close enough, run for the shore, a safe harbour or the lee of an island, where the wind cannot generate large waves.

Sudden squalls usually only last for a short period and sometimes precede a change in wind direction, usually blowing at much stronger speeds than the wind that will follow.

The main thing is to keep a speed sufficient to allow you to steer the vessel, but no faster. Without power to maintain steerage, a vessel will drift side on or beam on to the sea and be vulnerable to capsize.

A sea anchor or a strong bucket tied to the bows will help to keep you pointing into the waves should your engine fail.



IMPORTANT NOTE

Always wear your lifejacket at times of heightened risk.

SEAPLANES

When on the water, seaplanes are just like any other vessel. They are subject to all the restrictions and privileges of other boats and must conduct their operations accordingly.

Don't be alarmed if a small seaplane alights or takes off in the waterways near you. Seaplane pilots are specially trained and qualified to operate upon the water. Like other boat operators, they hold marine boating licences to operate a vessel at speeds in excess of 10 knots.

Avoid making sudden changes of direction which might confuse the pilot or obstruct the seaplane's path.





Check the conditions before you cross ... this skipper made it, just!

BAR CROSSINGS

Shallow sand bars which can form at the point where rivers, creeks, lakes or harbours meet the sea are locations for experienced vessel drivers only. Any channel through such bars can change frequently. Even in apparently calm conditions vessels can be swamped, damaged or wrecked on bars and lives have been lost.

Avoid crossing a bar on a run-out tide as this is when dangerous waves are most likely to occur.

Knowledge and experience

If in doubt, don't go out.

Do not attempt to cross any bar without experience and local knowledge. You should:

- Spend considerable time watching the bar conditions in all combinations of weather and tide
- Cross the bar with other experienced skippers before trying it yourself
- Obtain and read a copy of the bar crossing brochure from Roads and Maritime.

Preparation and planning

Prior to crossing any bar it is recommended that the following checks should be made.

- Know the times of the tide and obtain an up to-date weather forecast, especially expected wind and sea conditions

- Observe the bar conditions, either in person or via the online network of web cameras, and be prepared to cancel or delay the crossing
- If unfamiliar with the bar, obtain advice from experienced locals, eg from the local Marine Rescue NSW unit
- Check the vessel, especially steering and throttle controls, watertight hatches and drains. The vessel must be seaworthy, suitable for the conditions and able to take some impact from waves
- Ensure that all loose items can be stowed away in lockers or tied down to prevent movement
- Check that all watertight hatches can be closed and sealed properly, drain holes are free and bilge pumps work.

On the water prior to crossing

- Secure all loose gear and equipment
- Brief your passengers/crew about the dangers
- Make sure all people onboard have their Level 100+ lifejacket on
- Check all watertight hatches are closed and secured but not locked
- Assess the bar conditions, have they changed since your last inspection?
- When crossing coastal bars, you should not lose your nerve in the white water. Once committed, keep going
- Trying to turn around in the middle of a bar entrance can be disastrous. Try to take waves as close to head on as possible.

Going out

The outgoing vessel must meet the incoming wave energy. Do not hit waves at high speed as an airborne vessel is out of control and can cause damage and injury. Do not allow waves to break onto your vessel.

As a guide:

- Idle towards the breaking waves watching for any lulls
- If a flat spot occurs speed up and run through it
- If the waves keep rolling in, motor to the break zone
- Gently accelerate over the first part of broken water
- Apply more power and run to the next wave, heading for the lowest part (the saddle) if possible because this is the last part to break
- Back off the power just before meeting the next swell
- Pass slowly through the wave and accelerate again to the next wave
- Repeat the process until through the break zone.

Coming in

Be aware the conditions may have changed.

If dangerous, consider alternatives:

- Wait for conditions to abate
- Wait for change of tide
- Seek alternate safe harbour.

The vessel should travel at the same speed as the waves. The aim is to travel in on the back of a swell, staying ahead of waves breaking behind the vessel.

You should:

- Approach the break zone and try to pick the spot with the least activity
- Keep any leads in transit as breakers may obscure your vision of the entrance
- Choose a set of waves suitable for your entry
- Position the vessel on the back of a swell and maintain speed, ensuring that:
 - You do not overtake the wave and run down its face
 - You stay ahead of any wave behind you



- When the wave ahead of you has broken, accelerate through the white water
- Beware of steep pressure waves bouncing back off the entrance or shore
- Adjust speed to counter any pressure waves or any outgoing current.

Roads and Maritime has a number of initiatives on bar crossings including the brochure *Bars 'n' Boats – A Safety Guide*, a list of coastal bars and a bar crossing safety checklist sticker.

Roads and Maritime also has a network of web cameras to assist in trip preparation. Check the Roads and Maritime website for up-to-date information and live vision of 19 locations along the NSW coast and in the alpine area.



INLAND WATERWAYS

Boating on inland waterways such as rivers, creeks and dams demands special care. Many of these areas present issues not encountered in coastal waters, including submerged trees and other snags.

Inland waterways are often murky and constantly changing; if you don't have a depth finder play it safe and reduce speed.

Familiarise yourself with the area using maps and wherever you can, talk to local operators. They can often provide valuable knowledge such as how the current runs after rain and water depth following drought.

Keep a good lookout for objects ahead or above you, such as overhead powerlines and low level bridges.

Strong currents in major rivers and creeks can flow at fast rates and affect the manoeuvrability of vessels. Never underestimate the power of even a moderate current, which can exert a strong force that may trap vessels such as canoes

against rocks. Extra caution is required following heavy rain or flooding.

Be careful in dams subject to water releases and stay well clear of spillways. These can be extremely dangerous due to turbulence as the water flows through spillway gates. Boats can easily become caught in the turbulence and trapped.

Also remember that during release periods the foreshore can become soft, trapping vehicles during launch and retrieval.

Rivers and dams may look peaceful, but low water temperature and remote locations could prove risky should trouble occur.

Remember not to overload your vessel.

Wind and waves

The surface of the water in shallow dams and storage areas can become extremely rough in windy conditions. Waves are generally short and steep, and can be as high as those encountered in coastal areas.



Submerged trees and other snags can pose danger on inland waterways.

Always get a wind/weather report before boating and once out on the water, keep a constant lookout for signs of:

- Changing weather
- White caps/disturbance on the water
- Cloud development.

If the conditions deteriorate, put on your lifejacket and head for shore. Remember it is better to be on the shore a long way from home, than a long way from shore in such conditions.

Communication

If you are going to go boating in remote locations, have a good reporting plan in place. Always tell someone where you will be launching from and going, how many people are with you and when you intend to return.

Phone or radio coverage is not always possible, making assistance difficult if problems occur.

ALPINE WATERS

Alpine waters refers to:

- Lake Burrinjuck
- Lake Eucumbene
- Lake Jindabyne
- Khancoban Pondage
- Swampy Plains River
- Mannus Lake
- Googong Reservoir
- Blowering Reservoir
- Pejar Dam
- Yass River
- Lake Oberon
- All navigable waters within the boundaries of Kosciuszko National Park.

Alpine waters present their own unique boating challenges. As with other inland waters, many hazards are not marked and as water levels fluctuate, more hazards may develop just under the surface.

The most common vessel operated in these areas is the small open runabout which is reasonably inexpensive to buy, easy to tow

and used as a fishing platform. The majority of these vessels, however, are designed for calm water conditions only.

Wearing a lifejacket is compulsory in most situations on alpine waters. For full details refer to pages 22-23.

Alpine weather

Alpine lakes are often subject to very cold and windy weather. Many of these lakes commonly experience snow in winter. The higher altitude means weather often changes quickly, so proper trip preparation and continuous monitoring of the weather when you are out are essential. Watch for any warnings and be prepared to change your plans if necessary.

When boating in alpine waters check the weather with the Bureau of Meteorology's graphical forecasts **bom.gov.au/australia/meteye/** and zoom into your location. You can also use **m.bom.gov.au** on your mobile device and type in the nearest location.

Cold water

Winter brings a greater risk of hypothermia to boaters exposed to the elements. Capsizing in cold water can also be life-threatening. 'Cold shock' can incapacitate almost instantly. So plan and prepare to avoid cold shock and hypothermia.

- Minimise your capsize risk
- Check the weather. If in doubt, don't go out
- Wear warm and wet weather gear
- Wear a lifejacket
- In the water, don't swim unless extremely close to the shore. Remain with your craft in the 'HELP' or 'Huddle' position
- Remember, alcohol increases the body's heat loss.

See page 94 for more information.



SYDNEY HARBOUR

Sydney Harbour is a unique waterway that is used extensively by a diverse range of recreational and commercial boats including large ships, ferries, charter boats, cruisers, yachts, runabouts, sailing skiffs, dinghies, sailboards, rowing shells, kayaks and dragon boats.

The harbour is an extremely busy waterway that requires you to be aware of your responsibilities and to take care when boating, especially in busy navigational channels, and make allowances for commercial activity.

There is a need to consider paddlers, rowers and sailors as well as accommodating the needs of commercial operators and those wishing to cruise, ski and fish on the Harbour.

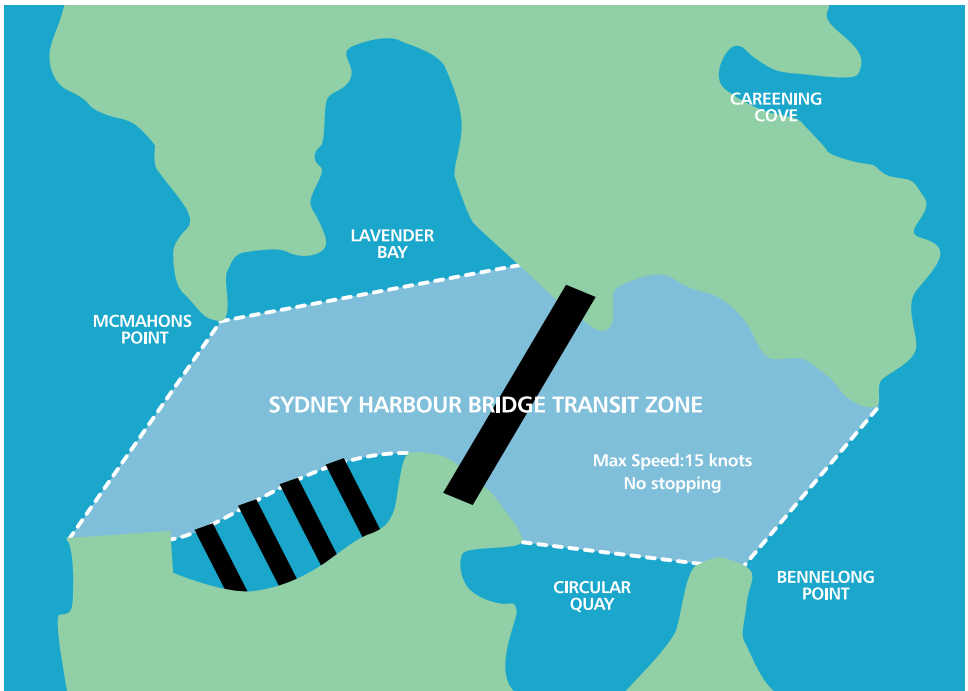
The number of vessels on the Harbour is increasing each year, providing a greater challenge in managing the potential for additional conflict and incidents to ensure safety on the waterway.

There is a continuing need for an understanding and commitment to water safety by all people using the harbour. The different types of boating may not always be compatible and can lead to potential conflicts eg people sailing in organised events and commercial vessels operating to timetables.

Sydney Harbour Bridge Transit Zone

Roads and Maritime has established the Sydney Harbour Bridge Transit Zone. The transit zone has a 15 knot maximum speed limit in the vicinity of the Harbour Bridge, between a line drawn between Bennelong Point and Kirribilli Point to Millers Point and Blues Point, but does not include Walsh Bay, Sydney Cove or Lavender Bay north of a line between Blues Point and the southern extremity of Milsons Point ferry wharf.

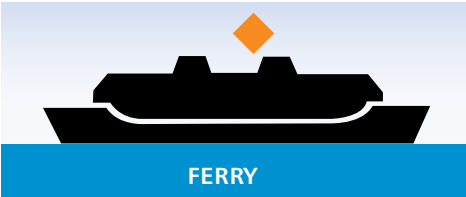
Within this zone, anchoring or drifting are prohibited other than in an emergency. This means that vessels may only travel through this area to reach an area alongside or outside of the transit zone.



Priority over sail

Some ferries on Sydney Harbour display an orange diamond shape. The shape is called the priority over sail signal. This shape removes the usual 'power gives way to sail' rule - meaning a sailing vessel is required to keep out of the way of any ferry displaying an orange diamond. The only exception is if the ferry is overtaking the sailing vessel.

For general safety and courtesy, skippers of sailing vessels should stay at least 200 metres from the bow, and at least 30 metres from the sides or stern of a ferry displaying the priority over sail signal.

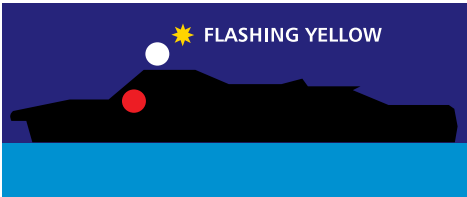


IMPORTANT NOTE

The use of a PWC is prohibited in Sydney Harbour, including all tributaries such as Parramatta River.

High speed ferries (on Sydney Harbour)

These craft carry the normal lights for a power driven vessel underway and, in addition, they exhibit an all-round flashing yellow light when they are travelling at speed.



Safety on the water



Look for the BIA member symbol

Businesses throughout all segments of recreational boating can be found as members of the Boating Industry Association.

These businesses have pledged to abide by the association's Code of Practice.

Consider dealing with a BIA member first

Look for the BIA member logo or visit our website

www.bia.org.au



MyBoatingLife

[.com.au](http://MyBoatingLife.com.au)

MyBoatingLife.com.au covers just about everything there is to know about recreational boating in Australia.



Make it your homeport
Create your own dashboard.

MyBoatingLife.com.au



Sydney Harbour Control

Channel 16/13 (24 hours). Details of large vessel movements, navigation warnings and meteorological forecasts are broadcast on VHF Channel 13 from approximately 1.05am, every second hour. Unless otherwise directed, sailing vessels and motor vessels are not to impede the passage of commercial shipping/naval vessels inside the shipping channels. See pages 78-79 for more information.

BIG SHIPS AND SMALL BOATS

Large vessels are restricted to particular channels and cannot deviate from their set course. These vessels are restricted in their ability to alter their course due to their size and need a large area to turn and stop. Their stern swings out wide when negotiating a turn and they lose steerage if they travel too slowly.

The main safety tips for small boats around shipping and ferry channels are:

- Recreational boats, both power and sail, should keep well clear of large vessels and ferries
- Do not cross ahead of large vessels or ferries unless well clear. Even when hundreds of metres away, your boat may disappear from the ship master's view from the bridge

- Remember, large vessels tend to travel much faster than they appear to be. Give yourself plenty of room
- Do not cross close astern of a large vessel or ferry
- Always keep to the starboard side of a channel
- Do not cross a channel if you are going to impede a vessel which has to use the channel
- Roads and Maritime provides more information regarding big ships and small boats on its website, including map sections within the local boating map showing the shipping channels. Visit rms.nsw.gov.au/maritime.

Active radar reflectors (ARR)

Active radio reflectors emit a signal to nearby radar receivers. The signal is amplified and returned to the transmitting vessel.

This makes vessels more visible on radar receivers from greater distances and may reduce the chance of being involved in an incident. It may also assist rescue operations in the event of an incident.

ARR need to be mounted high enough on a vessel to be effective (eg up the mast) and they require a power source. Consequently they may not be suitable for some smaller vessels.

While ARR are not mandatory on NSW navigable waters, they may be a good inclusion to improve your visibility to other vessel operators.



Large vessels are restricted in their ability to alter course and cannot stop quickly. Always keep well clear of them.

Recreational boat users beware

- Always keep a proper lookout for big ships and steer clear of them
- Make your intentions clear to an approaching vessel well in advance. For the master of a large ship who is unclear of your intentions, you should indicate that you are getting out of the way of a large vessel at least one kilometre in advance of that vessel
- Do not anchor in a navigation channel
- Ensure you can be seen clearly at all times. Dull aluminium tinnies can be difficult to see, especially in overcast and poor conditions. Wear bright clothing and be seen
- After sunset and in restricted visibility, ensure you have the correct navigation lights fitted and they are in proper working order. Your lights must be bright and must be visible for a distance of kilometres. Lights not only tell the other vessel what sort of vessel you have, but also what you are doing and where you are going. Make sure that if someone 'interprets' your lights, they are getting the right message.



Do not risk crossing ahead of large vessels unless well clear.

GO EASY ON THE DRINK

When afloat, your coordination, judgement, vision, balance and reaction time can decline up to three times faster after consuming alcohol. The boating environment with the waves, motion, vibration, engine noise, weather, wind and spray multiply the effects of alcohol. Driving under the influence of alcohol or drugs is an offence.

Everyone aboard needs to take care. Studies have shown that boat passengers are just as likely as operators to be involved in incidents such as capsizing the vessel or falling overboard as a result of drinking alcohol.

Operators of vessels that are underway may be subject to random breath testing and subject to heavy penalties if found to be over the limit. The 'operator' of a vessel includes anyone steering or exercising control over its course or direction and includes the observer in a vessel which is towing people, as well as anyone being towed.

See page 107 for further information about drug and alcohol offences and random breath/drug testing.



WEATHER

Always check the weather before and during boating. If it looks dicey, don't go out. If it starts to turn bad, head straight for shelter. A marine radio helps you keep in touch with weather updates. Learn to understand and read weather patterns, the wind, waves and the limits of your craft.

GOING OFFSHORE

A good skipper will always treat the ocean with respect, so it's essential to plan and prepare when going offshore. Check the weather forecast and your safety gear.

Plan for any change of conditions by anticipating wind, waves, tides and safe havens.

You must have a marine radio and a 406 MHz EPIRB distress beacon when more than two (2) miles offshore. And, always let someone know where you're going and when you plan to return.



BE PROP AWARE

Boat propellers pose a risk that is easily ignored because they are under the water, 'out of sight and out of mind.' But a strike from a spinning propeller can cause serious injury or even death.

- Ensure the prop area is all clear before starting the engine
- Keep all arms and legs inside the boat
- Keep a proper lookout, especially when near swimmers, observe 'distance off' rules and stay out of designated swimming areas
- Wear a kill-switch lanyard when boating alone.

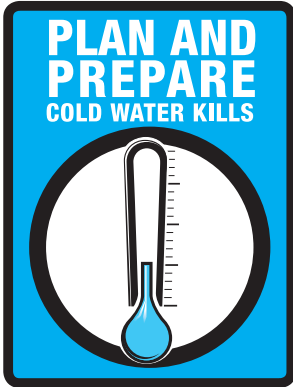


HYPOTHERMIA

Boating in cooler weather increases the risk of developing hypothermia from wind-chill, capsize, and damp and wet clothes.

Hypothermia is the effect of heat loss from the body. Immersion in cold water causes the body to lose heat up to 25 times faster than normal and the shock of sudden immersion in cold water can be a serious threat to survivors of accidents.

- Plan and prepare to avoid hypothermia. Minimise the risk of capsize or swamping, keep an eye on the weather and if in doubt, don't go out
- Wear warm thermal clothing, including a beanie and add wet weather gear over your warm clothes to provide wind proofing. Foul weather gear or waders may help keep you warm but are extremely difficult to swim in. So, if you wear this sort of gear in a boat – put on a lifejacket
- Wear a lifejacket at all times of heightened risk
- In the water, don't swim. Remain with your craft in the "huddle" position
- If hypothermia is suspected, try to reduce any further heat loss and commence rewarming slowly.



NAVIGATION LIGHTS

When night falls, it is a completely different world on the water. Vessels that operate from sunset to sunrise, whether at anchor or underway, must carry and exhibit the correct lights. When boating at night – go slow, be seen, keep a lookout and be bright. Make sure you have the right lights for your craft, they are working properly and mounted in a position that gives you optimum night vision and allows others to see you from every direction.

Carry a working waterproof torch. It may help others see you if you shine your torch on your sails or superstructure. Make sure you don't affect your night vision, or the vision of other boat skippers.

If you anchor at night, show an all-round white light where it can best be seen.

Navigating at night requires special care – look and listen at all times, as a number of hazards are unlit such as logs, moored boats or sandbanks.

If you have the slightest doubt, stop, ensure you are lit and have a good look around you.



For more information, visit www.maritime.nsw.gov.au or call the info line 13 12 56.

Maritime is a division of Roads and Maritime Services.

**YOU'RE THE SKIPPER
YOU'RE RESPONSIBLE!**

Printed on recycled stock

**YOU'RE THE SKIPPER
YOU'RE RESPONSIBLE**



MAR0303/UC02/12





SAFE AND RESPONSIBLE BOATING

The skipper of every boat is responsible for the safety of their vessel and the people on board.

While that responsibility presents some challenges, a seaworthy and well-prepared vessel in good hands can provide an immense amount of enjoyment for you, your friends and your family.

Preparation and awareness are two of the most important elements of safe and responsible boating.

As skipper, take time to ensure the boat is ready and also spend time to consider the safety issues highlighted in this brochure.

More information on these and other boating safety issues is available at www.maritime.nsw.gov.au

LIFEJACKET – WEAR IT

Lif jackets save lives. But a lifejacket will not save your life if you are not wearing it.

You must carry a lifejacket for every person on board. But don't just have lifejackets on board, make sure you and your passengers wear them.

New rules apply in NSW and you must wear a lifejacket in situations including if you are:

- Under 12 years of age
- In a small vessel up to 4.8m long when boating alone, at night, on open (ocean) waters and on alpine waters
- On a PWC
- Being towed
- When wearing waders on alpine waters
- Instructed to by the skipper.

For more information, visit www.lifejacketwearit.com.au or call the info line **13 12 56**.



GO EASY ON THE DRINK

The blood alcohol limit on the water is the same as on land, 0.05, but that's where the similarities end. Drinking on the water isn't the same as drinking on land. Wind, waves and the sun can increase the effects of alcohol on your body. You are more likely to get drunk quicker and get disorientated, increasing the chance of a boating accident or drowning.

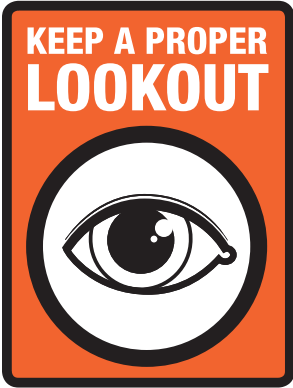
Be aware that random breath testing applies to the skipper of any vessel while underway.



KEEP A PROPER LOOKOUT

It may seem obvious, but you must keep an eye on what's going on around you. The skipper must be in a good lookout position at all times to watch and listen carefully, especially in bad weather, restricted visibility or darkness.

- Don't forget to look all around – even behind you
- Take special care in areas where higher speed vessels operate
- Keep watch for smaller vessels that can be difficult to see, especially kayaks and dinghies
- Watch for swimmers, floating debris and whitewater that may indicate submerged reefs and rocks
- Even when you have an observer while towing a person on skis or tubes, the skipper is always responsible for keeping a proper lookout
- Keep safe, keep to the right, especially when entering a narrow passage or on a sharp bend.



CARBON MONOXIDE

Carbon monoxide is a colourless and odourless gas produced when carbon-based fuel burns. Exposure to this gas can cause death or serious injury.

Carbon monoxide is normally at the back of the boat when engines and generators are running. If you have a headache, feel nauseous, dizzy or drowsy, move to fresh air.

To keep these gas levels under control and prevent poisoning, regular boat and engine maintenance and proper operation are important.

SPEEDING

Speeding on the water is the same as speeding on the road. It can kill. A skipper is responsible for taking a number of things into account.

CONDITIONS

Conditions on the water can change in the blink of an eye. The wind might pick up, wave size might increase and the current may change. The skipper is responsible for making sure a boat travels at a safe speed. If in doubt, slow down to suit the conditions.

VISIBILITY

You must slow down in heavy rain, thick fog, dense mist and intense glare when you're on the water. If you are travelling at night you are responsible for displaying navigation lights. Not all hazards are lit, so special caution is needed at night.

OTHER VESSELS

You must not speed close to other vessels. Slow down and take care in busy waterways and when you're near moored or anchored vessels and smaller craft. Extra caution is needed around working vessels or large boats that find it hard to manoeuvre.

NAVIGATION HAZARDS

Waterways are filled with hazards. Keep an eye on your speed in shallow or unfamiliar waters. Not all hazards are marked or lit, signs and buoys can be damaged, and lights can be out of action. You can report damage to nav markers to the info line **13 12 56**.

YOUR VESSEL

All boats are different. The size of your hull, engine and propeller type can affect your manoeuvrability. You are responsible for knowing your vessel's limitations. How quickly can you stop and turn?

CHILDREN

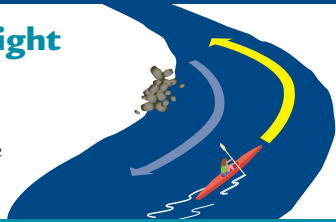
Children need to be carefully watched. Be especially careful not to allow children to be on the bow or to sit with legs dangling over the side while under power.

Paddle Smart

When Paddling You MUST

Keep safe, stay right

- Where possible paddle outside the channel
- Don't paddle in the centre of the channel or river



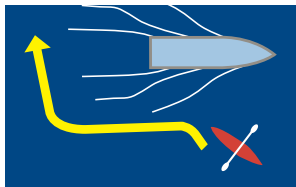
Keep a proper lookout

- Use your eyes and ears to keep a good lookout
- Take care when entering or crossing channels



Keep clear of larger vessels

- Cross behind, not in front
- Remember powerboat wash can capsize small craft



Wear a lifejacket

- When more than 100m from shore or on open (ocean) or alpine waters

ALL REGULATIONS FOR AVOIDING COLLISIONS APPLY. SHOW REQUIRED LIGHTS AT NIGHT.



Info line **13 12 56**
www.maritime.nsw.gov.au

WAT0879_7/11

Sydney Harbour with its connected bays and tributaries is one of the world's premier waterways, providing unmatched opportunities for all forms of boating, from powerboats and yachts to canoes and kayaks.

It is also one of the world's busiest harbours, with canoes and kayaks sharing the water with large commercial ships and ferries.

An understanding of the safe boating rules that apply to all vessels, as well as the specific rules for canoes and kayaks, will help paddlers to enjoy their sport in safety.

Lifejacket wear requirements

Lifejackets must be worn when paddling more than 100 metres from the nearest shore on enclosed waters, and at all times on open waters. It is strongly recommended that you wear an approved lifejacket at all times when enjoying Sydney Harbour.

Navigation lights

Between sunset and sunrise a torch is a minimum requirement, but it is strongly recommended that the craft has an all-round white light visible in every direction.

General safety and traffic flow

Conflict between canoes and kayaks and larger craft can occur in confined waterways which are often busy with powerboat traffic, as is the case around Sydney Cove, Walsh Bay and Darling Harbour. When using these areas, paddlers need to be alert and keep a good lookout at all times, as the areas listed are all very busy with commercial traffic.

To alleviate potential conflict when paddling in these areas, it is recommended that you stay on the northern shore of Sydney Harbour. This will reduce the possibility of further conflict with larger vessels, while also raising general awareness of paddlers operating along the northern shore.



The map of Sydney Harbour in this brochure shows orange shaded areas which are prohibited to paddlers. The yellow and pink shaded areas are commercial and high traffic shipping channels, where paddlers must operate with extreme caution. The blue shaded areas should be entered only for the purpose of crossing from one side of the shipping channel to the other. When crossing these channels, paddle as nearly as practicable at right angles to the general direction of the traffic flow.

It is important to be clearly visible while on the water. Suggested precautions are to:

- Dress brightly
- Paddle in tight formation
- Keep a proper lookout
- Paddle during daylight hours or adhere to the night lighting requirements for canoes and kayaks
- Stay close to the shore line
- Keep to the starboard (right-hand) side of the channel.

Conduct a safety check before heading out:

- Check the latest weather and wave report, and plan your trip accordingly
- Check your equipment is in working order
- Advise friends or family of your time of departure, return and proposed route
- Carry a mobile phone in a waterproof pouch
- Carry sufficient drinking water and sun protection
- Dress appropriately for the conditions
- Use a paddle or leg leash in windy conditions
- Find out as much information as possible about the area you are going to paddle.

To learn more about the boating rules and lifejacket requirements, and for links to paddling organisations, visit www.maritime.nsw.gov.au www.boatforlife.com.au and www.paddleNSW.org.au

SAFETY PARTNER



PADDLE SAFETY ON SYDNEY HARBOUR

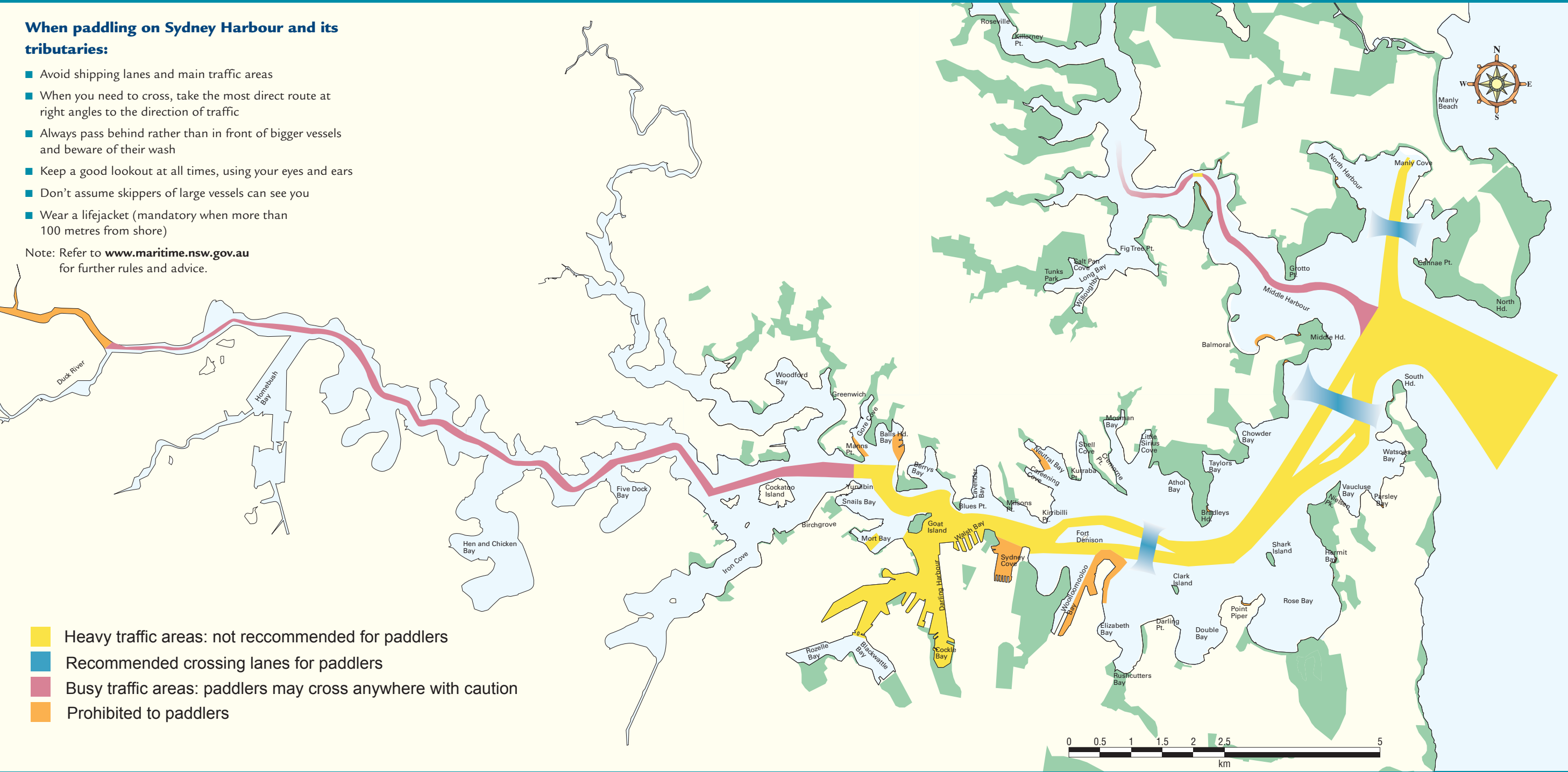


PADDLE SAFETY ON SYDNEY HARBOUR

When paddling on Sydney Harbour and its tributaries:

- Avoid shipping lanes and main traffic areas
- When you need to cross, take the most direct route at right angles to the direction of traffic
- Always pass behind rather than in front of bigger vessels and beware of their wash
- Keep a good lookout at all times, using your eyes and ears
- Don't assume skippers of large vessels can see you
- Wear a lifejacket (mandatory when more than 100 metres from shore)

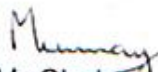
Note: Refer to www.maritime.nsw.gov.au for further rules and advice.



09 JAN 2008

Mr Murray Clarke
22 Murray Street
RUSSELL LEA NSW 2046

W01/00528
CEC07/868


Dear Mr Clarke


I refer to your correspondence of 24 October 2007 regarding the conditions of approval for the dry boat store in Rozelle Bay.

The issue of Development Application conditions for the dry boat storage facility is a matter for the Minister for Planning as the consent authority.

In relation to rowing coach vessels, when the 4 knot speed limit is introduced in Rozelle and Blackwattle Bays, I have approved NSW Rowing Association's request for an exemption from the 4 knot speed limit while rowing supervision is being conducted. At all other times, the 4 knot speed limit must be observed. An aquatic licence for the purpose of rowing training will not be required.

If you require any further information please do not hesitate to contact NSW Maritime's General Manager Recreational Boating, Mr Brett Moore on 9563 8660.

Yours sincerely

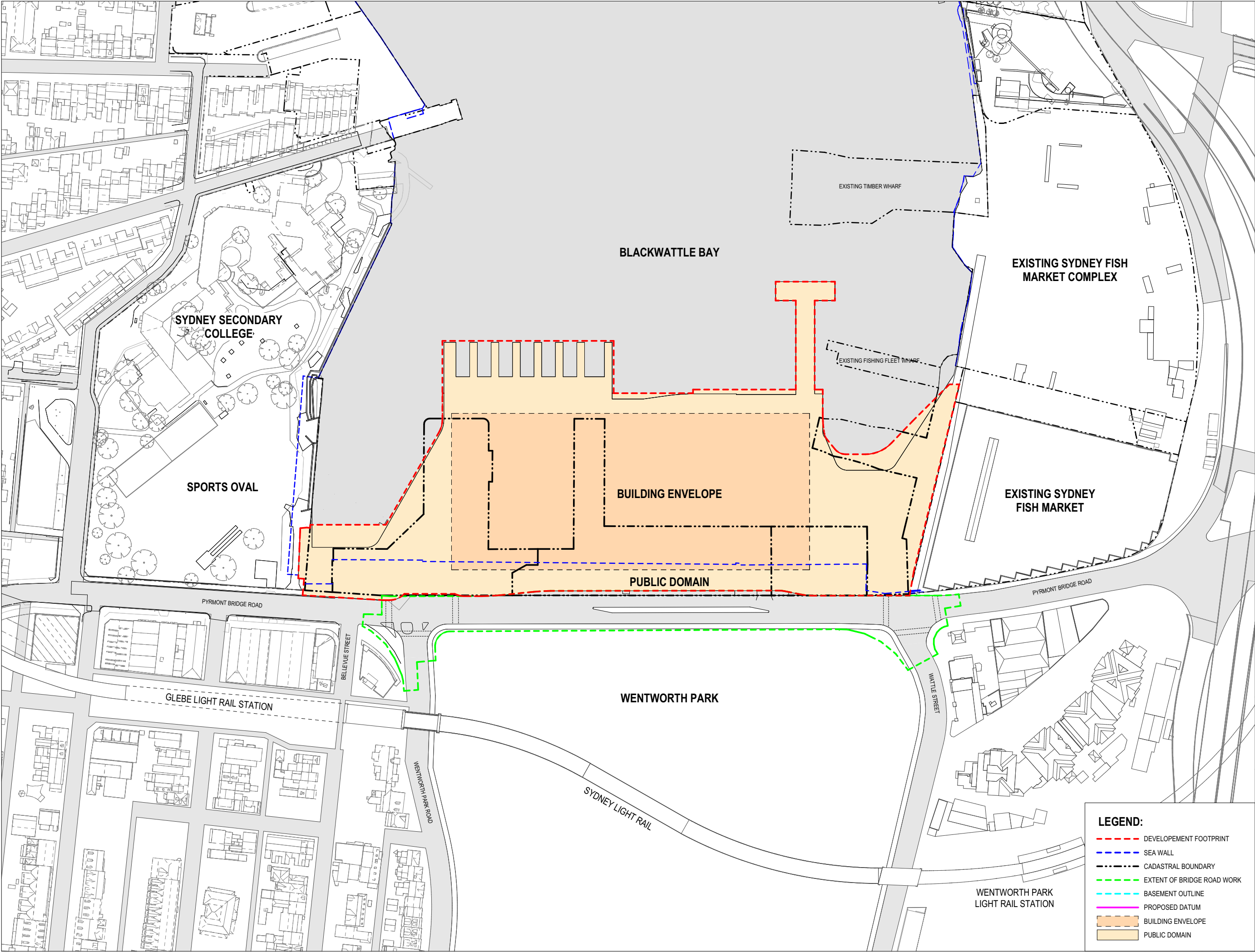

Chris Oxenbould AO
Chief Executive

NSW MARITIME

James Craig Road Rozelle NSW 2039
Locked Bag 5100 Camperdown NSW 1450

T 02 9563 8511 F 02 9563 8530 www.maritime.nsw.gov.au

Appendix C: new Sydney Fish Market Concept Drawing



ISSUE	DATE	FOR
A	12/09/18	ISSUE FOR SSD-DA
B	12/11/19	ISSUE FOR SSD-DA
C	22/03/19	ISSUE FOR SSD-DA
D	15/04/19	ISSUE FOR SSD-DA
E	27/08/19	ISSUED FOR REVIEW
F	18/09/19	ISSUE FOR SSDA

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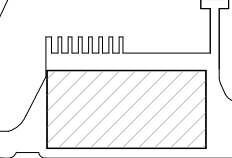
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NEW SYDNEY FISH MARKET
18 BRIDGE RD, GLEBE NSW
BvN PROJECT NUMBER

1611013

DRAWING KEY



TRUE NORTH PROJECT NORTH

GRAPHIC SCALE
0 20000 50000
SCALE

1 : 1000@A1
STATUS

DRAWING

SITE PLAN

AR-S1-A20 AAA-03 F