

Vessel Management Plan

Causeway Link Alliance

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Control Page

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1. INTRODUCTION

1.1 Purpose and Intent

The Vessel Management Plan (VMP) outlines the requirements for establishing, implementing, and managing vessel traffic management for the Causeway Pedestrian and Cyclist Bridge Project across the Swan River in Perth, Western Australia.

The Vessel Management Plan has been established to communicate the key processes, strategies and policies required to facilitate the development and implementation of the vessels traffic management and logistics services required on the Swan River during the project.

The implementation of these initiatives provides for an effective project management system, whilst ensuring that the work satisfies the requirements of the Contract documents, statutory requirements and applicable standards and codes.

The Alliance's vessels and logistics scope includes for:

- Management of vessels and the impact on traffic flow and movements on the river network.
- Clear communication plan with vessels and mariners.
- Transport and installation of bridge components (foundations, supports, piles, piers, and deck modules). Further information is contained within this Vessel Management Plan.
- Transport and craneage of equipment and materials from shore on to vessels and barges.

1.2 Distribution and Authorisation

1.2.1 Plan Distribution:

The Alliance Construction Manager is responsible for the distribution of the VMP. It will be introduced to all relevant staff as required. The controlled copy of this document will be maintained in the project document control system.

1.2.2 Plan Authorisation:

The implementation of the VMP is under the authority of the Alliance Construction Manager. All relevant personnel employed on the Project will perform their duties in accordance with the requirements of the VMP, supporting management plans and related procedures.

1.2.3 Further Development:

The VMP is a live document and maybe further developed and revised during its use on the project to address:

- Any changes in the project execution process.
- Comments and feedback by MRWA and DoT.
- Changes in technology, vessels, equipment and work methods to improve processes.
- Changes identified by continuous improvement.

1.3 Safety

The Alliance will ensure that environment, safety, and health guidelines are established in accordance with the VMP. The Alliance will ensure that all operations performed by any vessel mand equipment providers are in strict compliance with Project safety requirements, procedures, and standards.

The VMP will form part of the overall OSH Plan and shall comply with the requirements of MRWA Specification 203 Occupational Safety and Health.

1.4 Subcontract/Supply Management

All vessel and equipment suppliers/subcontractors subcontracted to the Alliance will be managed by the Alliance Construction Manager or nominee once a subcontract has been executed. Regular inspections by the Alliance will be completed and the supplier/subcontractor will be required to provide regular progress reports to the Alliance. Reporting requirements and frequency will be detailed within the subcontract document.

All Alliance directives to suppliers/subcontractors shall be officially communicated via Civmec Document Control. Suppliers/subcontractors shall acknowledge receipt of the transmitted document and reply accordingly. This process will assist in eliminating any misunderstandings related to instructions and contractual obligations.

All vessel and equipment providers shall, at all times be in radio communication. Updating the Alliance on progress/ delays on, a daily basis.

All subcontractors working onsite will be managed by an Alliance representative on, a daily basis.

On a monthly basis suppliers/subcontractors' performance shall be briefly summarised in the Monthly project reports by the Project Manager.

2. PROJECT OVERVIEW

The Causeway Pedestrian and Cyclist Bridge Project is an opportunity to deliver a landmark pedestrian and cyclist connection across the Swan River that responds to the unique cultural and historic significance of the area, integrates with existing landscape and urban design, and provides an attractive link for both tourists and the wider community.

The existing causeway bridge is one of only four pedestrian and cyclist crossings of the Swan River, being one of the busiest carrying approximately 1,400 cyclists and 1,900 pedestrians per day, with peak hour volumes of over 150 cyclists and 200 pedestrians. The need to improve this connection has been identified for some time, with concerns about existing shared path width, surface condition and mix of user groups generally causing safety concerns.

The new bridge will have a 3.5m wide cycle path and a 2.5m wide pedestrian walkway provided for separated and safer access across the Swan River for both cyclists and pedestrians independent of the road traffic. Located 80-90m downstream of the existing Causeway, this alignment was considered appropriate in terms of its ability to improve pedestrian/cyclist amenity, maintain directness, and minimise impacts on flora and fauna, as well as the Swan River itself. Consisting of two cable stay bridges, the proposed option limits the number of river piers to just three, acknowledging the spiritual and cultural importance of the Swan River (Derbarl Yerrigan) to Perth's first nations peoples.

The historical and cultural significance of the areas is of prime importance. Both Heirisson Island and the Swan River hold significant Aboriginal cultural values, while the existing Causeway Bridges remains with high historical heritage value. The Department of Transport commenced early engagement with key stakeholders in 2019 and the Main Roads project team continue to engage until the Alliance is formed. This includes establishment of and, engagement with an Elders Advisory Group, as well as consultation with other key stakeholders such as the City of Perth, Town of Victoria Park, and other key government agencies.



Figure 1: Concept Image of the Causeway Pedestrian and Cyclist Bridge

3. DEFINITIONS

Term	Definitions
MRWA	Main Roads of Western Australia.
Alliance	MRWA, Civmec Construction & Engineering Pty Ltd, Seymour Whyte, WSP.
Contract	Document detailing the binding agreement between the MRWA and the Alliance NOP's for completion of the Project.
DoT	Department of Transport.
Subcontractor	A successful service supplier to whom the Alliance has issued a subcontract to complete engineering and design portion of the Project's Scope of Work.
NOP/Alliance/Proponent	Non-Owner Participant.
Project	Causeway Pedestrian and Cyclist Bridge Project.

4. ABBREVIATIONS

Term	Definitions
AS/NZS	Australian Standard/New Zealand Standard.
ALARP	As least as reasonably possible.
BDC	Basis of Design and Construction.
CEMP	Construction and Environmental Management Plan
D&A	Drug and Alcohol.

Term	Definitions
DFES	Department of Fire and Emergency Services.
DoT	Department of Transport.
HAT	Highest Astronomical Tide.
Hazard	A potential source of harm to life, health, environment, the community, or property.
HSE	Health Safety Environment.
IAMA	International Association of Marine Aids to Navigation and Lighthouse Authorities.
IMP	Interface and Communication Management Plan.
JHA	Job Hazard Analysis – (Risk Assessment).
Knts	Knots.
PFD	Personnel Flotation Device.
Risk	The combination of the potential consequences of an unwanted event and the likelihood of the occurrence.
SIMOPS	Simultaneous Operations.
SOW	Scope of Work.
Spotter Vessel	Vessel used solely for the purpose of vessel traffic management.
STOP	Safe Transfer of Personnel.
TBC	To Be Confirmed.
VOC	Verification of Competency.
VMP	Vessel Management Plan (this document).
WARWSA	Western Australian Recreational Water Sports Association.
WAPWSA	Western Australian Powered Water Sports Area.
Works	Activities being undertaken by the Alliance in relation to the Contract.

5. REFERENCES/ASSOCIATED DOCUMENTS

Document Number	Document Title (Source Location)
AS/NZS 4602	High visibility safety garments.
AS 1742.3	Traffic Management for Works on Roads Code of Practice, Australian Standard, the Occupational Safety and Health Act 1984.
	Occupational Safety and Health Regulations 1996.
MRWA Specification 203	Occupational Safety and Health.
Department of Transport	Marine Incident Form.

6. VESSEL SCOPE OF WORK

The VMP contains all information to manage vessel and waterway operational requirements for the Swan River area to the Causeway Pedestrian and Cyclist Bridge Project construction site installation locations.

The VMP outlines the requirements for establishing, implementing, and managing vessel traffic management on the Swan River during construction of the bridge at the nominated site location.

The VMP also outlines proposed vessel traffic management schemes detailing the impact on traffic flow and movements on the Swan River network. The Alliance shall ensure that the river navigation systems continue to operate efficiently and any disruption to river users are minimised, with the intent to maintain the movement of vessels at all times in accordance with the BDC.

The Alliance shall be responsible for providing vessels and signage to manage the Swan River waterways operations near, around and through the Causeway bridge site locations during the project works. To ensure vessels, and other marine operations, are operated without compromising the safety of personnel, nearby structures and other vessels or adversely impacting the marine environment.

The Alliance shall be responsible for all vessel and work activities including, but not limited to:

- Planning, management and coordination for all vessel and work activities.
- Appointing a river vessels management professional subcontractor:
- Provision of all work vessels, barges, craneage and other plant and equipment required during the works in the Contract.
- Providing a detailed logistics plan for all items.
- Onsite and river personnel movement.
- Mobilisation and demobilisation of temporary facilities including jetties, offices, crib rooms and stores.

6.1 Site Constraints/Impacts

- There is a currently designated navigation channel to the west of Heirisson Island used by recreational and commercial vessel operators.
- The area to the east of Heirisson Island is designated for power boats and water sports (WAPWSA).
- The WAPWSA is not a gazetted navigation channel and is not suitable for non water sports vessels.
- Also, within the WAPWSA is a designated disabled water ski area with its own access ramp.

For the safety of all waterway users the WAPWSA area south of the Causeway should be closed to all vessels (other than construction vessels) for the duration of the works. During the works it will be necessary to reduce vessel speeds when working within or adjacent to vessel channels. It may also be required to restrict access to powered vessels to using the WAPWSA. The area is closed at all times to all vessels (including paddle craft) unless approved by the Department of Transport.

Existing moorings within the project area are located at the commercial operations at "On the Point", the Department of Water & Environmental Regulation/Department of Primary Industries & Regional Development (DWER/DPIRD) Victoria Park facility, and the adjacent kayak hire business.

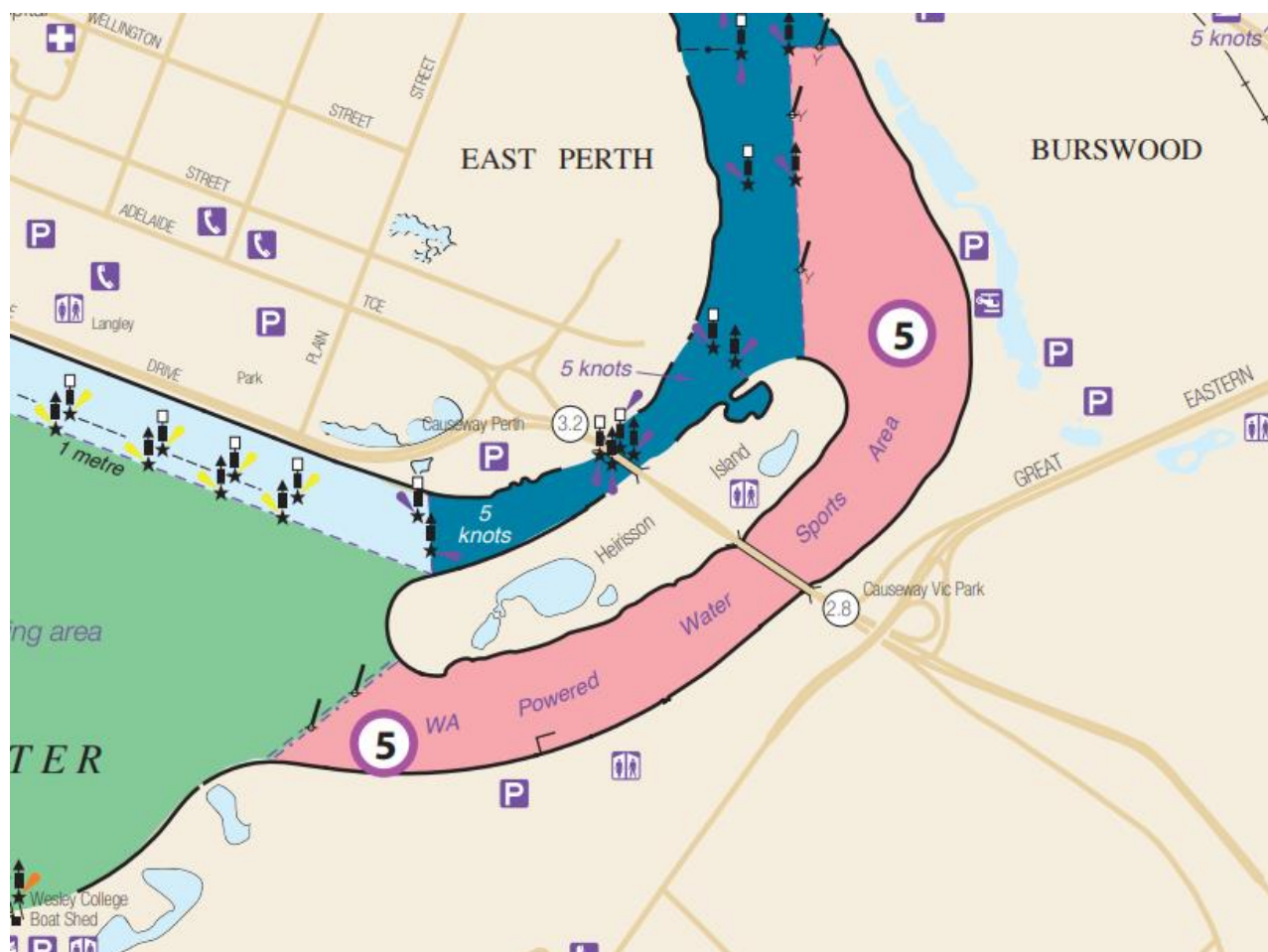


Figure 2 – DoT Demarcation of Restricted Waters Around Site

6.1.1 Tide Height Restrictions

Height restrictions apply to vessels (including construction vessels) traversing under the adjacent Causeway bridges. Information on the Causeway Traffic Bridge navigation span vertical clearances are provided on the, Department of Transport Chart WA 898 (April 2014 Edition 7).

For the Causeway – Perth side 3.2m and Victoria Park side 2.8m from HAT.

All commercial and public vessels shall be managed by the marine traffic control spotter vessels. Traffic control vessel coxswains shall be suitably trained and shall have responsibility for the safety of the waterway with the Works area. Coxswain shall always consider tidal and vertical clearance constraints for vessels within the worksite

6.1.2 Pest Management – Vessels

The vessels directly engaged by the Alliance for the works (barges, spotter vessels etc) will need to comply with the state authorities (DPIRD, DBCA) in terms of biofouling and pest management. Refer to details in the CEMP, that include ensuring the vessels are clean of weed / pest / pathogen materials when mobilised to site.

6.2 Objectives and Strategies

The objectives of the Vessel Management Plan are to ensure:

- A safe environment for all waterway users during the works.

- To protect workers, visitors, agents of MRWA and the general public from vessel hazards that may arise as a result of the Works.
- Minimal disruption, congestion, and delays to all waterway users during the Works.

To meet these objectives the Vessel Management Plan will incorporate the following strategies:

- Ensure whenever possible, that the minimum number of channels are closed to complete the Works while minimising disruption.
- Ensure that delays and vessel congestion are kept to a minimum.
- Ensure that appropriate/sufficient warning and information signs are installed, and that adequate guidance is provided to delineate the channels and guide vessels around the work fronts.

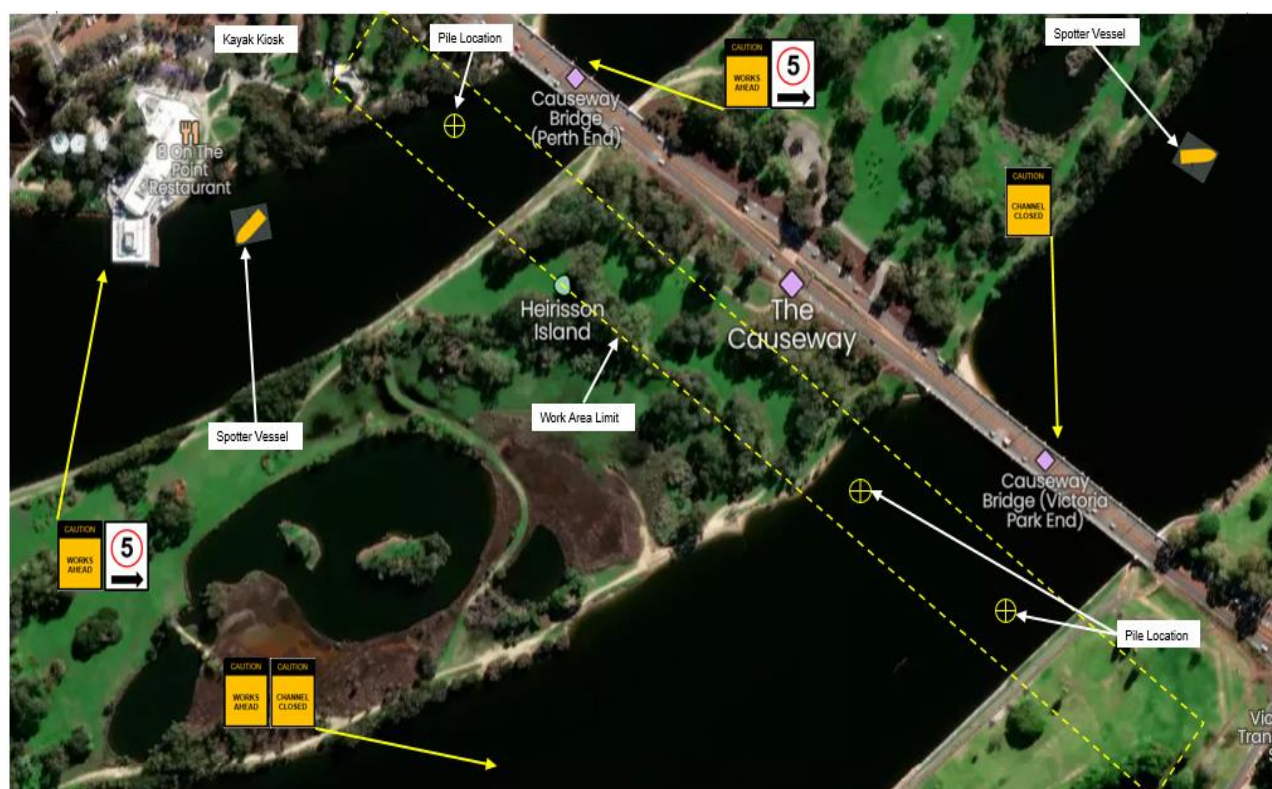


Figure 3 – Proposed Vessel Management Diagram

6.3 Project Representatives

The Alliance will take the utmost care to prevent the risk of injury and/or property damage to employees, subcontractors, other parties, waterway users and members of the public.

Work will not commence or continue at any location until all appropriate signage and devices are in place and in accordance with the requirements of the approved VMP. All necessary signs and vessel control devices will be installed at the work site to direct and regulate vessel movements around the work activity and ensure that adverse impacts associated with the Works are avoided.

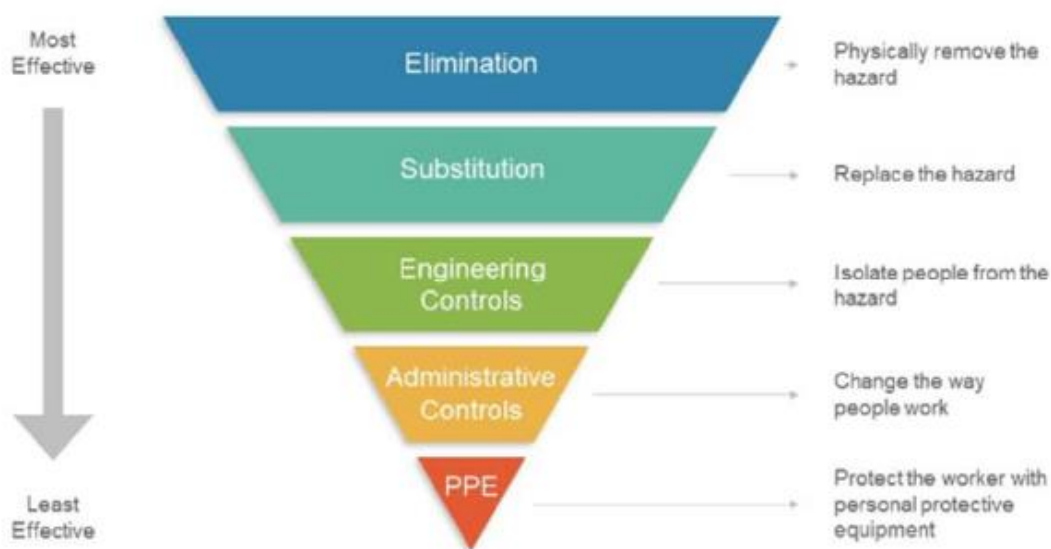
To assist in meeting these objectives the VMP provides information on:

- The Scope of Works.
- Site Conditions.
- Permissible working times.
- Procedures and Responsibilities.

- The Vessel Control Diagrams (VCDs).
- 24hr, 7 day a week Contractor contact details for issues relating to the Works.

7. RISK ASSESSMENT

The following details the preliminary assessment of site hazards likely to be encountered, the level of risk associated with each and the control proposed. Note that the risk level is the level of assessed risk without the controls in place. The controls listed have been determined as being appropriate in reducing the risk to a level that is acceptable. The hierarchy of control has been utilised to ensure that the highest practicable level of protection and safety is selected:



In evaluating the options, a key consideration is whether the option takes traffic around, through or past the worksite.

7.1 Risk Classification Tables

QUALITATIVE MEASURES OF CONSEQUENCE OR IMPACT		
Level	Consequence	Description
1	Insignificant	<ul style="list-style-type: none"> Hourly vessel traffic flow is equal to or less than normal usage. No impact to the performance of the river network. No property or vessel damage.
2	Minor	<ul style="list-style-type: none"> Hourly vessel traffic flow is equal to normal usage. No impact to the performance of the river network. Minor property damage.
3	Moderate	<ul style="list-style-type: none"> Hourly vessel traffic flow is equal to or greater than normal usage. Moderate impact to the performance and congestion of the river network. Moderate property or vessel damage.
4	Major	<ul style="list-style-type: none"> Hourly vessel traffic flow exceeds normal usage. Major impact and congestion of the river network. Major property or vessel damage.
5	Catastrophic	<ul style="list-style-type: none"> Hourly vessel traffic flow is excessive.

QUALITATIVE MEASURES OF CONSEQUENCE OR IMPACT		
Level	Consequence	Description
		<ul style="list-style-type: none"> Unacceptable impact to the performance of the river network. Total property or vessel damage.

QUALITATIVE MEASURES OF CONSEQUENCE OR IMPACT		
Level	Consequence	Description
1	Insignificant	No treatment required
2	Minor	First aid treatment required
3	Moderate	Medical treatment required or Lost Time Injury
4	Major	Single fatality or major injuries or severe permanent disability
5	Catastrophic	Multiple fatalities

OSH QUALITATIVE MEASURES OF LIKELIHOOD

Level	Likelihood	Description
A	Almost certain	The event or hazard: <ul style="list-style-type: none"> Is expected to occur in most circumstances, will probably occur with a frequency in excess of 10 times per year.
B	Likely	The event or hazard: <ul style="list-style-type: none"> Will probably occur in most circumstances, will probably occur with a frequency of between 1 and 10 times per year.
C	Possible	The event or hazard: <ul style="list-style-type: none"> Might occur at some time, will probably occur with a frequency of 0.1 to 1 time per year (i.e. once in 1 to 10 years).
D	Unlikely	The event or hazard: <ul style="list-style-type: none"> Could occur at some time, will probably occur with a frequency of 0.02 to 0.1 times per year (i.e., once in 10 to 50 years).
E	Rare	The event or hazard: <ul style="list-style-type: none"> May occur only in exceptional circumstances, will probably occur with a frequency of less than 0.02 times per year (i.e., less than once in 50 years).

IMPORTANT NOTE: The likelihood of an event or hazard occurring shall first be assessed over the duration of the activity (i.e. "period of exposure"). For risk assessment purposes the assessed likelihood shall then be proportioned for a "period of exposure" of one year.

Example: An activity has a duration of 6 weeks (i.e. "period of exposure" = 6 weeks). The event or hazard being considered is assessed as likely to occur once every 20 times the activity occurs (i.e. likelihood or frequency = 1 event/20 times activity occurs = 0.05 times per activity). Assessed annual likelihood or frequency = 0.05 times per activity x 52 weeks/6 weeks = 0.4 times per year. Assessed likelihood = Possible.

VESSEL MANAGEMENT PLAN

7.2 Risk Register

Item	Risk Event	Consequence	Pre-Treatment Risk			Treatment	Residual Risk		
			L	C	RR		L	C	RR
1	Construction vessel entering navigation channel may result in conflict with other vessels causing collision and injury.	Injury to worker and other personnel.	C	3	M (9)	Advanced warning signage to be installed on all approaches to the work area. Spotter vessel is to be present to alert worker to approaching vessel. Traffic arrangements to be evaluated for effectiveness following initial opening to traffic.	D	2	L (4)
2	Poor weather conditions resulting in decreased visibility for river users resulting in collision and injury.	Injury to worker and other personnel.	D	2	L (4)	Vessel Master to ensure signs are lit and vessel light turned on. If visibility is still poor work is to cease until it is safe to continue.	E	2	L (2)
3	Injury to personnel transferring to and from shore to vessels.	Injury to worker.	C	3	M (9)	Ensure vessel is securely moored and gang plank safe to use and installed correctly.	E	2	L (2)
4	Impact from public or other river users to construction equipment or structures.	Damage to vessels. Damage to structure.	C	4	H (12)	Implementation of this vessel management plan including spotters Protection of temporary piers particularly at risk of impact.	E	2	L (2)

7.3 Risk Rating Matrix

Likelihood	A - Almost certain	Greater than 75%	Moderate A1	High A2	High A3	Critical A4	Critical A5
	B - Likely	50% to 75%	Moderate B1	Moderate B2	High B3	High B4	Critical B5
	C - Possible	25% to 50%	Low C1	Moderate C2	Moderate C3	High C4	Critical C5
	D - Unlikely	10% to 25%	Low D1	Low D2	Moderate D3	High D4	High D5
	E - Rare	Less than 10%	Low E1	Low E2	Moderate E3	Moderate E4	High E5
	Probability	1	2	3	4	5	
		1 - Minor	2 - Medium	3 - Serious	4 - Major	5 - Catastrophic	
Consequence							

7.4 Hazard Identification and Risk Management

Vessel hazard identification and risk assessment shall be carried out as part of the overall project risk identification and assessment process. A separate risk register shall be developed to reduce risks identified to ALARP.

7.5 Existing Traffic and Speed Environment

There is one channel permitting vessel movement through the site. The maximum existing posted speed limit

8. VESSEL MANAGEMENT PLANNING AND ASSESSMENT

8.1 Legislative and Other Provisions

The VMP has been developed and shall be implemented with due consideration and in accordance with the following legislative, environment and industry standards:

- Navigable Waters Regulations 1958.

The Alliance shall ensure that the requirements of these documents and other relevant information will be monitored and the VMP adjusted to meet changing requirements where necessary. The Project Manager and DoT (Marine Safety) to be notified of any amendments to the VMP.

8.1.1 Temporary Speed Zones

The existing speed limit of 5knts will be maintained during the construction works.

8.1.2 Existing Vessel Signage and signals

Existing traffic signs will be covered or removed during the construction works in the areas affected.

8.1.3 Temporary Traffic Signage and signals

Temporary signage and signals will be placed strategically on the waterways during construction. These will include:

- Additional speed limits signs.
- Work Ahead signs.
- Channel Closed signs.
- Temporary signals to identify construction hazards.

8.2 Vessel Assessment and Analyses

8.2.1 Volume and composition

Perth water and the surrounding waterways carry a significant volume of commercial and pleasure craft. It is envisaged that the work will be undertaken during peak periods of vessel traffic. This may include site occupation during special events.

8.2.2 Existing and Proposed Speed Zones

The maximum existing posted speed limit within the navigation channel is 5knts. The proposed speed limit for the duration of the project around the working area will be 5knts. The WAPWSA area speed limits may vary subject to WAPWSA events and prevailing site conditions. As the WAPWSA is closed to all other vessels other than the members that operate out of there, there is no speed restriction within that area.

8.2.3 Existing Mooring Facilities

There are existing mooring facilities at :

- On The Point (306 Riverside Drive East Perth) reserved for private commercial operators.
- The adjacent kayak hire business at The Point.
- The operations of the DWER/DPIRD Victoria Park facility.

Access to these facilities must be kept clear of obstructions and equipment, at all times.

Work vessels when not securely moored at the worksite may be moored at an alternate location approved by MRWA and DoT.

8.2.4 Heavy and Oversized Vessels and Loads

No direct interface is expected between these vessels and the work front.

8.2.5 Commercial Vessels

Commercial vessels transit through the site between Perth Water and the upper reaches of the Swan River. Due to the Causeway Bridge height restrictions these vessels are typically low height clearance and shallow draft. By carefully planning the location of work vessels minimal disruption is anticipated to commercial vessels during bridge temporary piling and deck installation works. A separate Interface and Communication Management Plan shall be developed detailing the project communication with other vessels and Project Stakeholders.

8.2.6 Special Events and Other Works

Special events include:

- Events at Optus Stadium which may include provision of charter vessels.
- City of Perth's Australia Day Skyworks.
- WARWSA Events.
- Boat club regattas.

Should the need for work methods to be modified because of special events they will be addressed at a separate stakeholder meeting if required. School and community groups use the waterways for boating activities and will be guided by the direction of the Spotter Vessel through the work zone.

8.2.7 Management of Private Vessels

The flow of private vessels through the work site shall be managed as per this VMP and the Interface and Communication Management Plan.

8.3 Non-Motorised Waterway Users

8.3.1 Sail Vessels and Human Propelled Vessels

Sail vessels shall be controlled in the same manner as motorised vessels. Human propelled vessels (kayaks) shall be directed by the Spotter Vessel to keep vessels clear of work areas.

8.4 Works Programming

8.4.1 Works Sequence

The works will be progressed in the following sequence:

Premobilisation

Confirm all statutory requirements and approvals have been received for the works to proceed.

Site Mobilisation

The establishment of project wide traffic control, warning signs and Shared Path closures/detours. Establishment of the contractor's laydown area and hoarding/fencing of the compound in accordance with LGA requirements.

A spotter vessel will be mobilised and onsite once the works on or above the river are starting. Its first take will be to set-up the marine traffic control devices.

McCallum Park Western River Works

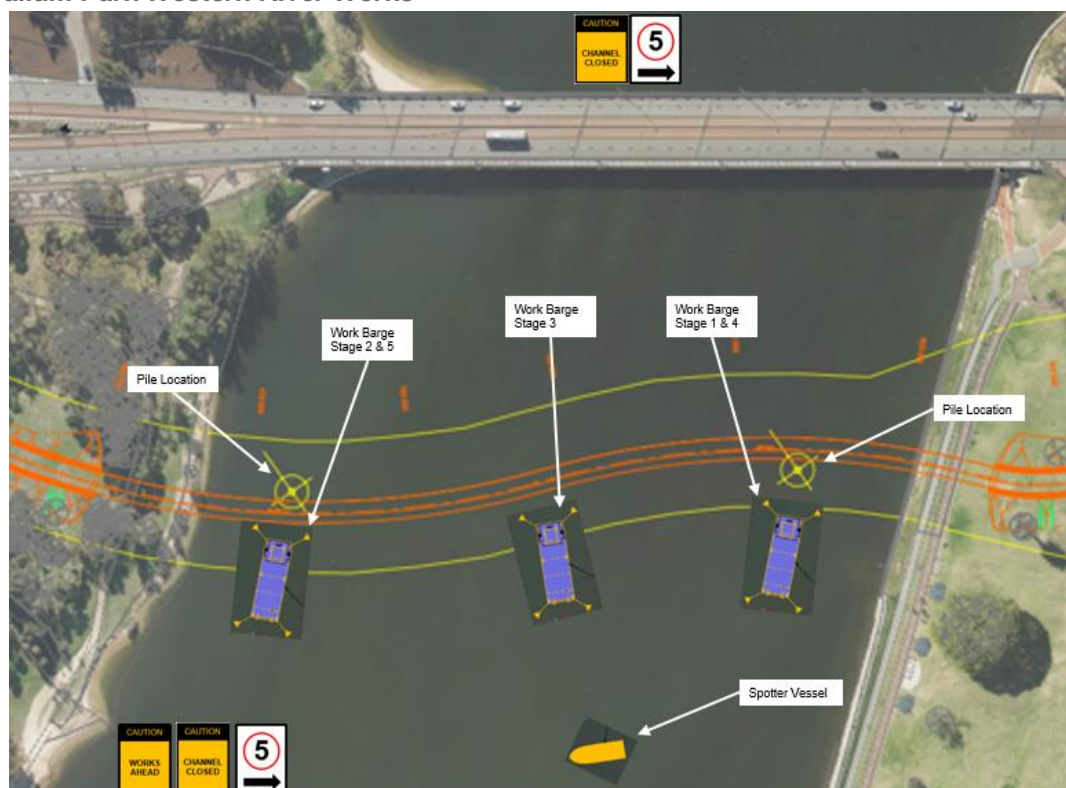


Figure 4 – Proposed Vessel Control Diagram – McCallum Park Bridge River Works

- Stage 1 – McCallum Park Bridge – Pier 2 (McCallum Park side) - mobilise and position barge using spud piles or stingray/4-point anchors on the riverbed to complete the:
 - Pier pile installation, support and guidance works.
 - Pier cap installation and welding works (use of divers may be required to assist).
 - Temporary support piles/piers installation works.
- Stage 2 – McCallum Park Bridge – Pier 1 (Heirisson Island side) - mobilise and position barge using spud piles or stingray/4-point anchors on the riverbed to complete the:
 - Pier pile installation, support and guidance works.
 - Pier cap installation and welding works (use of divers may be required to assist).
 - Temporary support piles/piers installation works.
- Stage 3 – McCallum Park Bridge temporary pier mobilise and position barge using spud piles or stingray anchors on the riverbed to complete the:
 - Temporary mid-section river support pile installation works.

Use of crane on barge – typical barge 120ft long – 12m x 36m with multicat/workboat to tow. Securing with spud piles or stingray/4-point anchors on the riverbed.

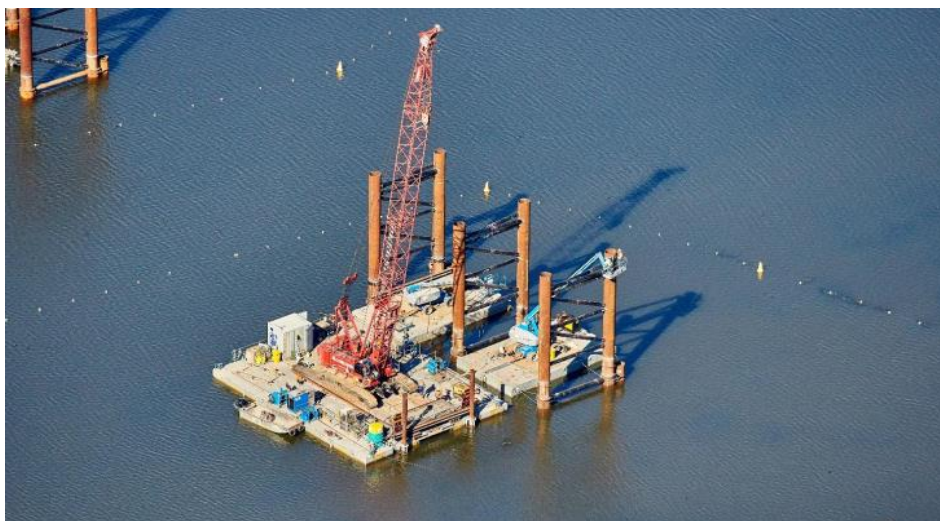


Figure 6 - Example of crane on barge driving pile / installing temporary headstock

- Stage 4 – McCallum Park Bridge - mobilise and position barge using spud piles or stingray anchors on the riverbed to complete the:
 - Installation of deck segments lifted over water with crane on shore.
 - Installation of deck segments (segments 3, 4 and 5) supported on barge and jacked-up into position for load transfer to temporary piles.

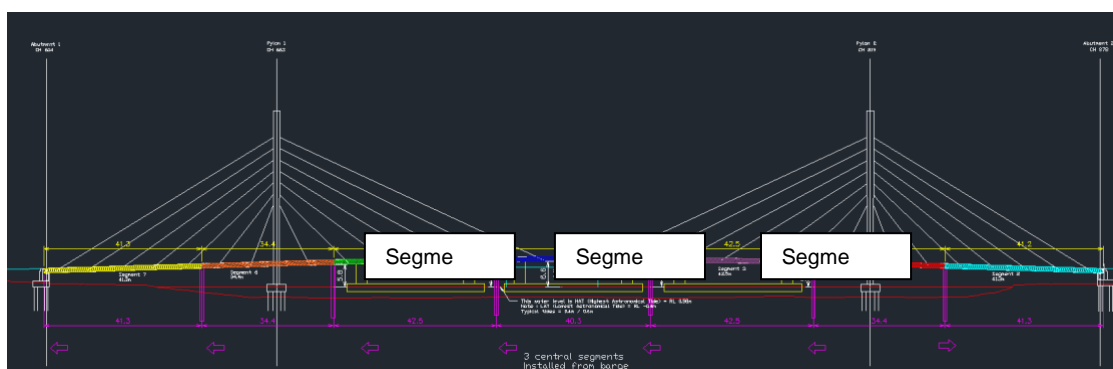


Figure 7 - McCallum Park Bridge – Deck segments 3, 4, 5 to be installed by barge

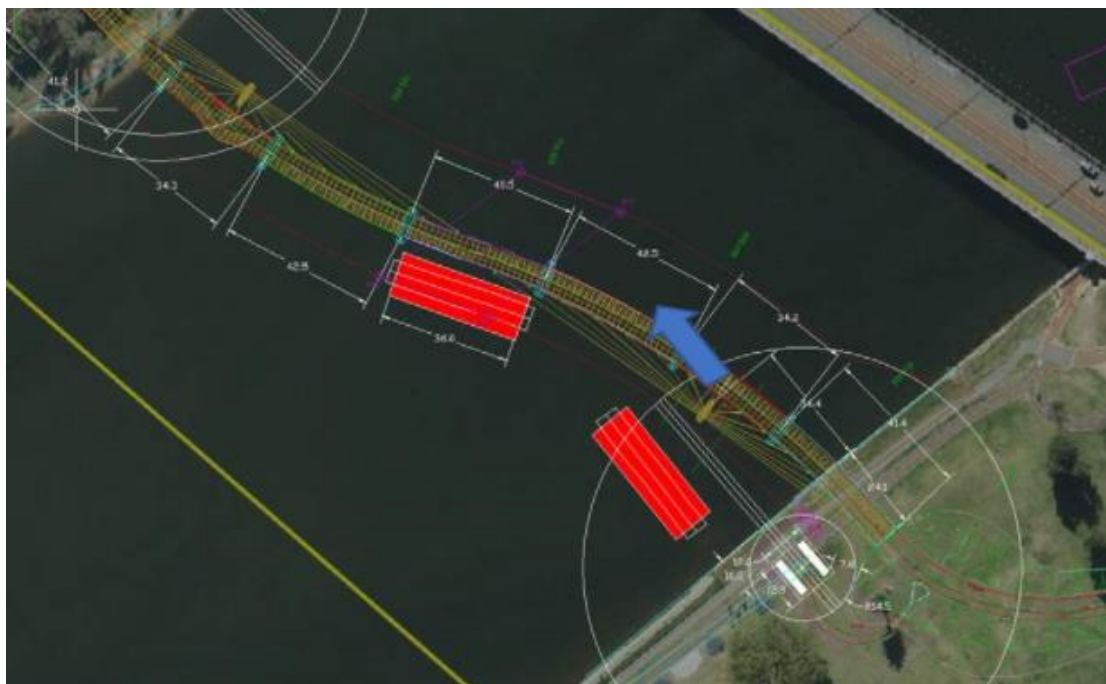


Figure 8 - McCallum Park Bridge - Barge movement for installation of deck segment 4

- Stage 5 – McCallum Park Bridge:
 - Use of small pontoons (with EWP) and workboats to assist with the installation of bridge stays.
- Stage 6 – McCallum Park Bridge:
 - Removal of temporary support piles/piers in the river.

Use of crane on barge – typical barge 120ft long – 12m x 36m with multicat/workboat to tow. Securing with spud piles or stingray/4-point anchors on the riverbed.

Use of diving crew may be required to assist with the extraction/cutting-off the piles.

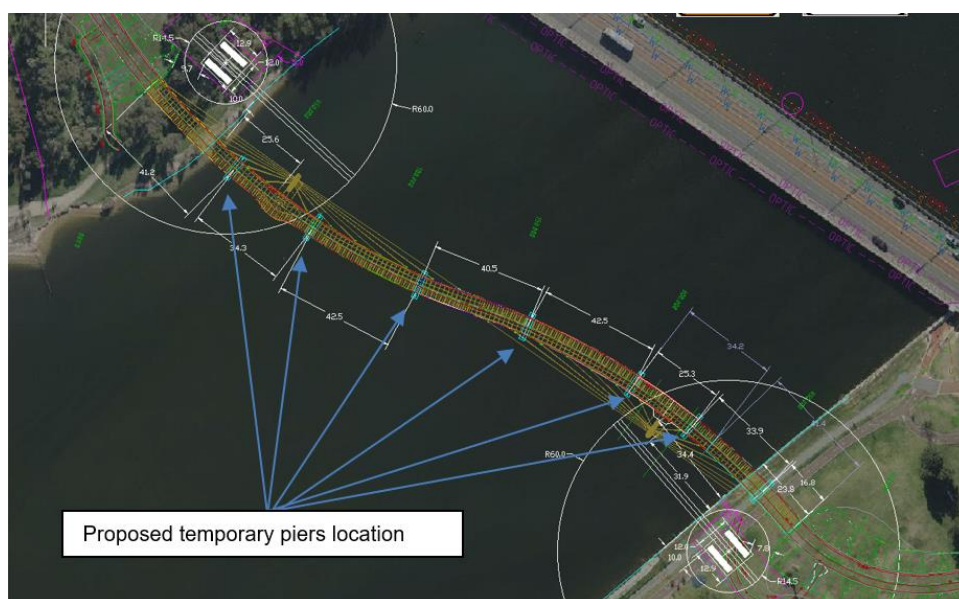


Figure 9 - McCallum Park Bridge – Temporary piers location

Point Fraser Eastern River Works

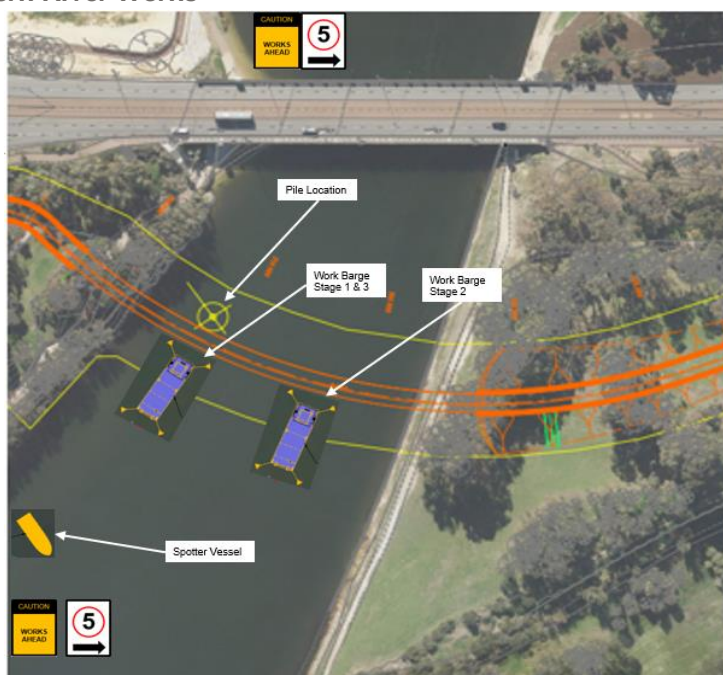


Figure 10 – Proposed Vessel Control Diagram – Point Fraser Bridge River Works

- Stage 1 – Point Fraser Bridge temporary pier mobilise and position barge using spud piles or stingray anchors on the riverbed to complete the:
 - Temporary river support pile installation works.

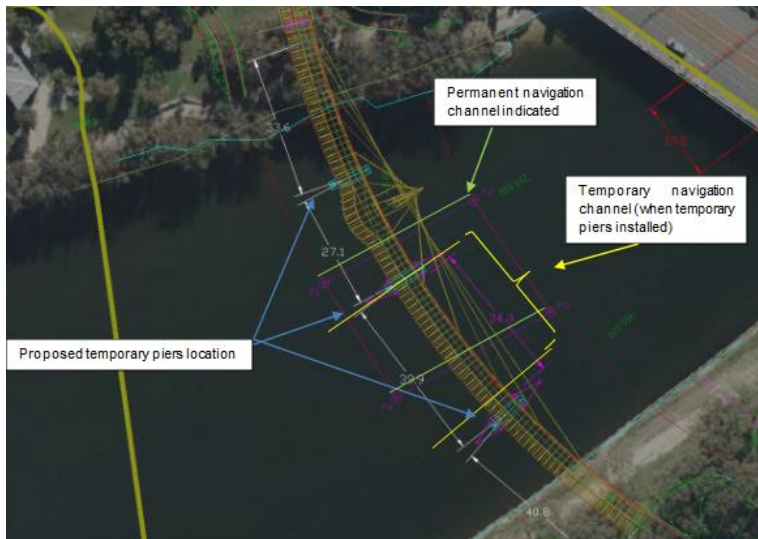


Figure 11 – Pt Fraser Bridge – Temporary piers location

- Stage 2 – Point Fraser Bridge pier mobilise and position barge using spud piles or stingray anchors on the riverbed to complete the:
 - Pier pile installation, support and guidance works.
 - Pier cap installation and welding works.
 - Temporary support pile installation works.

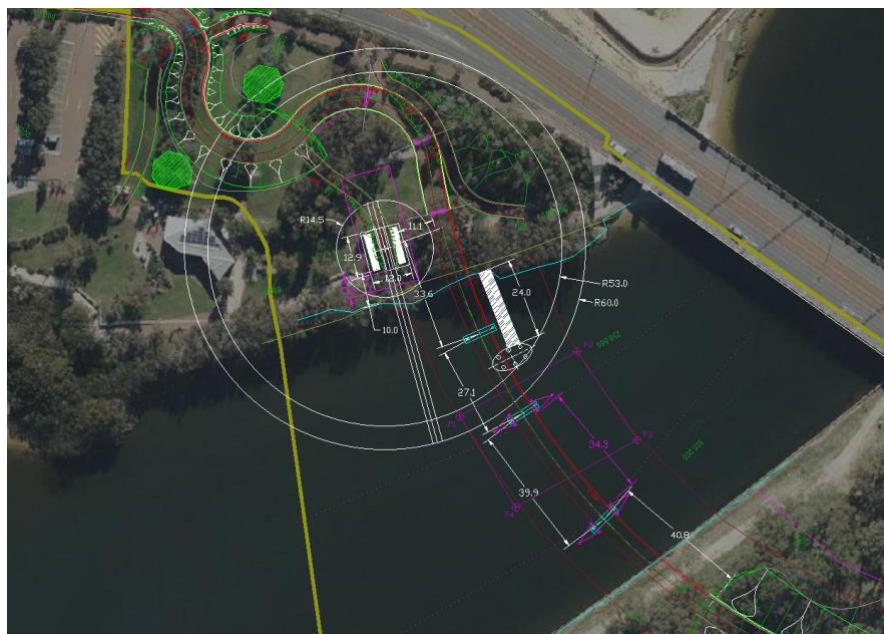


Figure 12 - Typical set-up during Pt Fraser pier / pylon installation (access to pile cap via floating deck)

- Stage 3 – Point Fraser Bridge:
 - Deck segments installation (use of cranes on shore).
- Stage 4 – Point Fraser Bridge:
 - Use of small pontoons (with EWP) and workboats to assist with the installation of bridge stays.
- Stage 5 – Point Fraser Bridge:
 - Removal of temporary support piles/piers in the river.

Use of crane on barge – typical barge 120ft long – 12m x 36m with multicat/workboat to tow. Securing with spud piles or stingray/4-point anchors on the riverbed.

Use of diving crew may be required to assist with the extraction/cutting-off the piles.

Site Demobilisation

Removal of project wide traffic control, warning signs and devices. Removal of plant and equipment.

8.4.2 Emergency Planning

Project personnel will be informed of emergency procedures and contacts during inductions.

Relevant emergency telephone numbers and radios channels will be posted on noticeboards and kept current by Vessel Masters.

- **Emergency Services:**
 - Emergency services shall be notified via DFES (phone 9323 9300) of the proposed works nature, location, date, and times as well as contact details for the site supervisor.
- **Dangerous Goods:**
 - Refer DFES contact details above.

8.5 Consultation and Communication

8.5.1 Approvals

Approvals for the implementation of this VMP shall be obtained from the following parties:

- Main Roads WA.
- Department of Transport (Maritime)*.
- Other relevant parties identified within the Contract.

**In accordance with the BDC, prior to commencing construction of the footbridges, the Contractor must meet with Transport (Marine Safety) to determine requirements for navigation clearances and vessel speed restrictions during construction.*

8.5.2 Public Notification

The public shall be notified of the works through issuing a 'Notice to Mariners'.

8.5.3 Notification of Other Agencies

Formal correspondence will be issued to all impacted commercial operations impacted by the Works. Copies of formal correspondence will be issued for approval of MRWA prior to distribution.

8.5.4 Communication Between Contractors

Proponent to prepare a separate Interface and Communication Management Plan for the works.

8.6 Managing Traffic within the Work Zone

Vessel traffic management within the work site shall be the responsibility of the Vessel Traffic Management Coxswains.

The DoT shall have the authority to close navigation and non-navigation channels for closures to facilitate the works, an assessment of the site:

- Weather Conditions.
- Physical Site Conditions.
- Volume of water traffic.
- Vessel Activity.

The safe passage of vessels shall be continually monitored, and the implementation of isolated closures reassessed as, a result of a change to any site conditions.

9. SITE ASSESSMENT

9.1 Access to Adjoining Properties

Access to adjoining properties will be maintained. DWER/DPIRD, Disabled Water Ski Club, On the Point moorings and the Kayak Hire business's access to the foreshore will be maintained downstream of the works area. A site-specific communications plan will outline how project works will be communicated on, a daily basis to these businesses to avoid disruption.

9.2 Environmental Conditions

9.2.1 Adverse Weather/River Conditions

(Rain, Fog, River Conditions, Storm Conditions – Wind, Lightning, Sun Glare)

The Alliance Project Manager and Vessel Masters shall monitor weather forecasts and assess weather/marine conditions prior to commencing work for the day. Pre-Start briefings involving all

project personnel onsite will be used to determine possible restrictions on marine transfers and work activities.

If adverse river state or weather conditions constitutes an unacceptable risk, hazards associated with all or part of the work activities will be assessed and may be closed down until conditions are deemed safe.

Hazard and warning signs shall be reflective and designed such that they are visible through rain and fog. Consideration will also be given to the effect of sun glare on the visibility of signage.

9.2.2 Existing Signage

A preliminary assessment will be conducted to ascertain if the project activities may obstruct any existing signage. The existing signage will be assessed and where appropriate covered up or removed should it conflict with project signage. Existing signage – any amendments to existing signage must be endorsed by DoT prior to covering up.

10. SAFETY PLAN

10.1 Occupational Health and Safety

All persons and organisation's undertaking the Causeway Pedestrian and Cyclist Bridge Project works or using the site have a duty of care under statute and common law to themselves, their employees, and all site users, lawfully using the site, to take all reasonable measures to prevent accident or injury.

This VMP forms part of the overall project Safety Management Plan and provides details on how all Swan River waterway users considered likely to pass through, past, or around the worksite will be safely and efficiently managed for the full duration of the site occupancy and works.

10.2 Responsibility

The Alliance Project Manager has the ultimate responsibility to ensure the VMP is implemented for the prevention of injury and property damage to employees, contractors, subcontractors, river system, vessel and boat users and all members of the public.

The Alliance Project manager will ensure all site personnel are fully aware of their responsibilities, and that vessel spotters are appropriately trained and accredited and that sufficient controllers are available to ensure appropriate breaks are taken.

The Alliance Project manager will ensure accurate training records, both electronic and hard copies are maintained, reviewed for currency, and updated by the HR department regularly and are accessible via the HR online database, Success Factors. The project-specific Skills Register is updated regularly during the project to ensure training records are current.

All personnel must comply with the Fitness for Work policy and procedure. Guidelines as minimum requirements are as follows:

- No alcohol must be on board any vessel at any time. The Vessel Master is responsible to manage this policy.
- The Vessel Master must report any instance of crew insobriety to the Project HSE Manager immediately upon discovery or suspicion.
- It is the Vessel Master's responsibility to ensure that all crewmembers are fit for duty.
- If the Vessel Master observes that a crewmember's performance appears to be impaired for any reason, then he/she should be suspended from duty pending further investigation.
- Random D&A testing of workers and subcontractors may be undertaken during the works.

All personnel selected for employment on any task of the Works must as a minimum have completed the following:

- Pre-employment medical and D&A screening.
- All personnel shall be required to hold a Safety and Awareness (White Card) before commencing work onsite.
- Any project/vessel specific induction.
- Competency based training and assessment for any equipment to be operated.
- All high-risk workers / trades personnel shall be VOC'd by an assessor holding the agreed qualifications.
- Training shall be undertaken to ensure that the relevant personnel understand their responsibilities and the requirements for environmental and safety management.

The operators of all sea going vessels must ensure manning requirements are met. The Masters, Mates and Engineers must all have valid Certificates of Competency for the class of vessel that they are operating and comply with Marine Order 505 of the Marine Safety (Domestic Commercial Vessel) National Law Act 2012:

- Certificate of competency; or
- Certificate of recognition; or
- Restricted certificate of recognition; or
- Certificate of proficiency (integrated rating); or
- Certificate of rating; or
- Certificate of safety training; or
- STCW Endorsement; or
- Document of endorsement issued by the Project Manager.

10.3 Personal Protective Equipment

In addition to their standard PPE required for work on the construction site, all personnel working on or around the waterways shall wear personal floatation devices (PFD'S) when travelling on floating vessels or transferring to and from vessels.

10.4 Plant and Equipment

All vessels at the workplace shall meet statutory requirements and have the required registration, licences or certification where required. Maintenance records shall also be available for inspection. All Vessel Masters shall consider all conditions which may affect their vessels when operating in areas where marine hazards are present.

As a minimum the following shall be complied with:

- Inductions to be carried out for new personnel and visitors.
- Regular inspections to be carried out to ensure compliance.
- Report any unsafe acts or conditions.
- Comply with this document.
- Communicate information i.e. Updated schedules, HSE notices.
- Ensure housekeeping standards are met.

In addition to the standard survey and certifications requirements, ensure vessels carry the following:

- First Aid kits of a suitable size and content for all potential incidents and injuries to enable stabilisation and transfer of an injured person.
- Specific PPE and safety equipment for all safe transfer of personnel to and from marine craft and work areas.
- Sufficient lifesaving equipment including PFD's, flares, air horns, smoke indicators, retrieval rings and ropes, for all personnel (including potential visitors) on the vessel.
- PFDs shall be stored as per manufacturer's specifications.

All workers will be made aware of the safe work practice at the time of the site induction.

10.5 Incident/Accident Procedures

In the event of an incident or accident whether, or not involving vessels or other waterway users, all work shall cease, and vessels shall be stopped as necessary to avoid further deterioration of the situation. First Aid shall be administered as necessary, and medical assistance shall be called for if required.

- For life threatening injuries an ambulance shall be called on telephone number 000.
- The Police shall also be called on 000 for vessel crashes where life threatening injuries are apparent.
- Any vessel crash resulting in non-life-threatening injury shall immediately be reported to the WA Water Police Service on 94422 8600.

Broken down vessels and vessels involved in minor non-injury crashes shall be temporarily moved beyond the work front as soon as possible after details of the crash locations have been gathered and noted. Where necessary to maintain vessel flows, vessels shall be temporarily moved to mooring ashore, providing there is no risk to vessels and their occupants or workers. Suitable recovery systems shall be used to facilitate prompt removal of vessels unable to move from the work site under their own power. Assistance shall be rendered to ensure the impact of the incident through the work site is minimised.

Details of all incidents and accidents involving vessel shall be reported to the Alliance Project Manager using the incident investigation report form, and The Department of Transport's Marine Safety Marine Incident Report Form located at:

http://www.transport.wa.gov.au/mediafiles/marine/MAC_F_marineincidentreport.pdf

(if required under Western Australian Marine Act 1982 — 64 (3) (c), 64 (5)).

11. IMPLEMENTATION

11.1 Marking Underwater Hazards

Hazards are to be marked with a polyform buoy of sufficient size to readily be sighted, orange in colour and marked with reflective tape. The buoy is to be secured to the hazard or a clump weight using rope in such a way that the buoy "watches" at the highest expected tide. The buoy should be yellow and if left overnight lit with yellow light in accordance with IALA

The length of the mooring line shall be such so, as to reduce the "watch radius" of the buoy to a minimum.

11.2 Emergency Exercise and Drills

All personnel working on marine operations must be familiar with and participate in emergency exercises and drills. All drills and emergency rehearsals will be recorded in an emergency drill register. The drills must cover the following (where applicable):

- Person overboard and retrieval procedure.
- Person at height retrieval procedure (over water, etc.), for high and low water situations.
- Fire and explosion (refuelling, etc.).
- Vessel recovery (broken mooring lines, loss of power, etc.).
- Injured party management and transfer.
- Muster point.

11.3 Vessel Lighting

Whilst working at night will not be permitted, there will be the requirement for safety and navigational lighting. Additionally, provision is required for early starts, late finishes and or breakdown / emergency situations were working during hours of darkness may be required. Lighting of barges and work vessels in accordance with Prevention of Collision at Sea Regulations.

When considering the need for lighting and environmental responsibilities, consideration of the following will occur:

- Outside artificial lighting on vessels will be kept to a minimum (i.e., navigational lights and where safety dictates necessary deck lighting). Lighting will be switched off when not in use and/or automatic timers/sensors installed where possible.
- Where practicable, lighting will be mounted as low as practical and aimed low to minimise horizon glow.
- Lighting of vessels shall be in accordance with the International Regulations for Preventing Collisions at Sea 1972 (COLREGs) requirements for construction vessels. Anchors to be marked by yellow buoys and fitted with a yellow flashing light. All efforts should be made to avoid any anchor lines protruding into the channel.
- If spuds used barge to be marked appropriately in accordance with IALA.
- Work areas should be marked by lit yellow buoys (use of temporary lit lateral markers may be considered in consultation with DoT).

11.4 Environment

Personnel responsible for manoeuvring vessels shall be trained and understand their responsibilities and the requirements of Benthic Habitats, which includes:

- Knowledge of fauna and their behavioural characteristics within the conservation zone and the ability to recognise various species so that numbers can be reported.
- Maintain personnel at the worksite who have undertaken formal training in Marine Fauna Observation.
- Compliance with defined speed limits required to be adhered to within worksite limits.
- 24hr operational look ahead to be coordinated by the Vessel Master.
- Securing equipment on board vessels to prevent solid objects from falling overboard.
- Ensure a visual lookout for marine fauna while manoeuvring vessels, slowing speed and avoidance measures where fauna is in vicinity so that potential injury from propeller, hull or entanglement is minimised. Vessels are not to approach fauna unless authorised to do so.
- Maintaining a "Dropped Object Register" so that if objects dropped overboard cannot be retrieved immediately, its location is logged so that retrieval by divers at later date is facilitated.
- Communicating risks and hazards through pre-start meetings, toolbox meetings.

11.5 Vessel Control Devices

Work will not commence or continue until all signs and devices are in place and operational in accordance with the requirements of the VMP. Devices no longer required shall be promptly and completely removed from the waterway user's line of sight.

Vessel control devices shall be erected in accordance with the locations (TBC) such that:

- They are properly displayed and securely mounted.
- They are within the vessel operator's line of sight.
- They cannot be obscured from view.
- They do not obscure other devices from the vessel operator's line of sight.
- They do not become a possible hazard to workers or vessels.
- They do not deflect vessels into an undesirable path.

11.5.1 Signs

All signs shall be in accordance with AS 1319 – 1994. Prior to the installation all signs shall be checked for damage and cleanliness and repaired, replaced, or cleaned, as necessary.

As the SEP is within the illumination zone of bridge lighting, the reflective warning signs on the barge and moored buoys will be visible during hours of darkness.

Signage required:

- Advanced Warning signage of the Works to be provided where possible.
- Posted speed limit signage (5knts).

11.5.2 Buoys

Buoys may be used as a method of directing vessel traffic during construction. Approval for positioning and type must sought by DoT prior to installation. Generally, buoys will not be deployed as they are considered a risk to vessels utilising the waterway.

11.5.3 Variable Message Signs

All variable message signs shall be in accordance with AS 4852.2 – 2009. Prior to the installation all variable message signs shall be checked for damage and cleanliness and repaired, replaced, or cleaned, as necessary. Remote operable electronic Variable Message Sign should be considered during the works (if required).

11.6 Emergency Arrangements

The Vessel Master shall assist emergency vessels entering and/or travelling through the worksite.

Vessel breakdown and/or crashes outside of the works area can cause considerable delay and congestion. The Proponent will also render assistance where possible to ensure the impact of crashes and breakdown on the waterway is minimised.

11.7 Site Access

Access to the work site shall be by workboat via the Proponent's laydown area. Access will be coordinated with the Vessel Master.

11.8 Communicating VMP Requirements

The requirements of the VMP will be communicated to all personnel entering the site through the site induction program. The Barge/spotter vessel shall monitor VHF Ch16 and 9 during site operations.

Communication and coordination generally shall include:

- The Alliance shall liaise with Maritime - DoT to co-ordinate works in the (Navigation) western side channel. The channel shall remain open at, all times but can be altered with approval of DoT Marine Safety.
- Closure of navigable channel must be approved by Maritime - DoT prior to and in accordance with legislative provisions under Western Australian Marine Act.
- Works to be staged so as, to provide the largest possible clearance between bore holes and associated barge and provide the widest possible navigation channel at any one time.
- Consultation with WAPWSA will be required to minimise disruption to events. This will include the requirement to reduce speed, wake, and wash around the works area.
- Consultation with commercial operators should be conducted for works to the west of Heirisson Island to ensure safe navigation is possible during works period. It is recommended that arrangements be made for ferries to notify works vessels when approaching works area.
- Consultation with commercial kayak operator and Trinity college to be undertaken prior to works so as to raise awareness on works and no-go areas as they are not equipped with marine radios.
- Speed limit of western side is currently 5 knots. This is lowest speed to maintain steerage of vessel and cannot be reduced.
- An exemption will be required for works vessels to enter the closed waters WAPWSA area (eastern side). An exemption can be obtained by contacting Maritime - DoT.

12. MONITORING AND MEASUREMENT

12.1 Site Inspections and Record Keeping

Prior to works commencing the Alliance Project Manager shall undertake to communicate the Vessel Management Plan to all key stakeholders and affected parties.

The Vessel Management Contractor shall ensure that all temporary signs, devices, and controls are maintained at, all times. To achieve this, procedures in line with the requirements outlined will be instituted. The monitoring program shall incorporate inspections:

- Before the start of work activities onsite.
- During the hours of work.
- Closing down at the end of the shift period.
- After hours.

A daily record of the inspections shall be kept indicating:

- When traffic controls were erected.
- When changes to controls occurred and why the changes were undertaken.
- Any significant incidents or observations associated with the vessel controls and their impacts on other users or adjacent properties.

The Vessel Management Contractor shall ensure that personnel are assigned to monitor the vessel control scheme. Inspections shall at least satisfy the following requirements.

12.1.1 Before Work Starts

- Confirm VMP is suitable for the day's activities.

- Inspect all signs and devices to ensure they are undamaged, clean and comply with requirements.
- All lamps checked and cleaned as necessary.
- Confirm Vessel Management Plan for the day's activities.
- After any adjustments have been made to the signs and devices, conduct a drive through inspections to confirm effectiveness.

12.1.2 During Work Hours

- Designate and ensure that appropriate work personnel inspect all signs and devices and ensure they are undamaged and comply with the requirements.
- Attend to minor problems as they occur.
- Conduct on the spot maintenance/repairs as required.
- When vessel spotters are on the Job, ensure they remain in place at, all times. Relieve spotters as necessary to ensure attentiveness is retained.
- Reposition signs or required by work processes throughout the day and keep records of any changes.

12.1.3 Closing-Down Each Day

- Conduct a pre-close down inspection, allowing time for any appropriate maintenance works.
- Remove any unnecessary signage.
- Install barriers and lights where required.
- Check and confirm all signs and devices are operating correctly.
- Record details of inspection and any changes made to layout.

12.2 VMP Auditing and Inspections

One compliance audit may be conducted following setting up of the vessel management and prior to commencement of the works.

Audit findings, recommendations and actions taken shall be documented and copies forwarded to the Alliance Project Manager and the MRWA Representative.

12.3 Public Feedback

The Proponent will implement a procedure that ensures comments and complaints received from the public are registered. The Supervisor shall be responsible for the monitoring of the Register on a daily basis. Refer to the Interface and Communication Management Plan for further details.

13. MANAGEMENT REVIEW

13.1 VMP Review and Improvement

The Alliance Project Manager will undertake a review of the effectiveness of this VMP. Any improvements shall be noted to determine if a VMP review is needed.

13.2 Variations

Onsite variations, if required, shall generally only be made following approval by the MRWA Representative, and recorded in the daily diary. In emergency situations, on-site variations shall be made and recorded in the daily diary, and the MRWA Representative notified as soon as practicable.

13.3 Approvals

Approvals for the implementation of this VMP shall be obtained in accordance with the MRWA and DoT from the relevant Body of Authority responsible for the Swan River area affected.