

Procedure for the Assessment of Public Ferry Wharf Safety



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PROCEDURE FOR THE ASSESSMENT OF PUBLIC FERRY WHARF SAFETY

1. Background

One of the recommendations of the Independent Transport Safety and Reliability Regulator (ITSRR) following investigations into public transport was that a system for the safety and inspection of public ferry wharfs should be introduced. This recommendation was implemented by amendment to the Marine Safety Act 1998 to insert new provisions in Part 8 - Division 5 - Prohibition and improvement notices relating to public ferry wharves. The new provisions came into force on 20 November 2004.

For the purpose of this Act, a public ferry wharf is defined in the legislation as “*a wharf or associated facilities used for the purpose of public passenger services provided by ferries*”. A *ferry* is defined as any vessel which seats more than 8 adult persons and includes a fare or other consideration. As such a public ferry wharf includes wharves used by typical commuter scheduled ferries; charter vessels; and other hire vessel such as dive vessels which fit the definition of a “ferry” vessel.

There are approximately 90 wharves in Sydney Harbour and another 170 wharves throughout the state that are captured by this definition. These public ferry wharves are primarily owned by Councils, State government agencies and some commercial marina operators.

This Procedure has been prepared to assist public ferry wharf owners in defining key criteria for safety at public ferry wharves including consideration of structural integrity and risk management (*public liability*). NSW Maritime will use this Procedure when inspecting public ferry wharves for compliance with public ferry wharf safety. NSW Maritime will progressively inspect public ferry wharves with priority given to commuter scheduled services and high use wharves.

While NSW Maritime now has responsibilities for inspection and monitoring of safety of public ferry wharves, it should be noted that the owners of public ferry wharves have always had a responsibility for safety under existing legislation such as OH&S legislation and relevant building codes and standards.

2. Purpose of Procedure

The aim of this Procedure is to provide a general methodology to assist owners with the assessment of the safety of their public ferry wharf. The Procedure identifies checklists and guidelines for the preparation of maintenance and safety inspection reports including consideration of structural integrity and risk management (*liability*) items. It has been prepared with input from owners and designers of wharf assets and NSW Maritime with reference to the relevant Australian Standards.

This Procedure will assist in identifying appropriate criteria and standards for public wharf safety; outline appropriate inspections and maintenance requirements; and establish an appropriate methodology for the ongoing compliance of public ferry wharves.

The Procedure also explains the role of NSW Maritime to inspect public ferry wharves under the Marine Safety Act and the responsibility of wharf owners to ensure the safety and maintenance of public ferry wharves.

3. Amendments to The Marine Safety Act 1998

NSW Maritime has a statutory responsibility to ensure the safe operation of commercial and recreational vessels throughout the State and the new provisions (*commenced 20 November 2004*) impose associated responsibilities on NSW Maritime (*formerly known as the Waterways Authority*) in relation to inspecting public ferry wharves.

Should a risk be identified, authorised NSW Maritime officers now have the power to:

- (a) issue the owner of a public ferry wharf, or the person responsible for its maintenance, with an Improvement Notice requiring remedial safety work to be undertaken; and/or
- (b) issue a Prohibition Notice to the owner of a public ferry wharf barring any activity at that wharf that may involve a risk to the health or safety of persons using, or operating, public passenger services provided by ferries.

Where the risk or non-compliance with these guidelines is deemed to be minor, NSW Maritime may as a first step issue a Defect Advisory Notice requiring the owner of public ferry wharf to provide a timetable and strategy for repairs. Should the owner fail to comply with the Defect Advisory Notice, NSW Maritime would then issue a formal Improvement Notice or Prohibition Notice.

Penalties of up to \$27,500 for an individual and up to \$55,000 for a Corporation can be imposed for a failure to comply with a Improvement or Prohibition Notice.

The role of NSW Maritime under the Marine Safety Act and the responsibility of wharf owners is summarised in **Figure 1**.

MARINE SAFETY ACT – PUBLIC FERRY WHARVES ROLES AND RESPONSIBILITIES

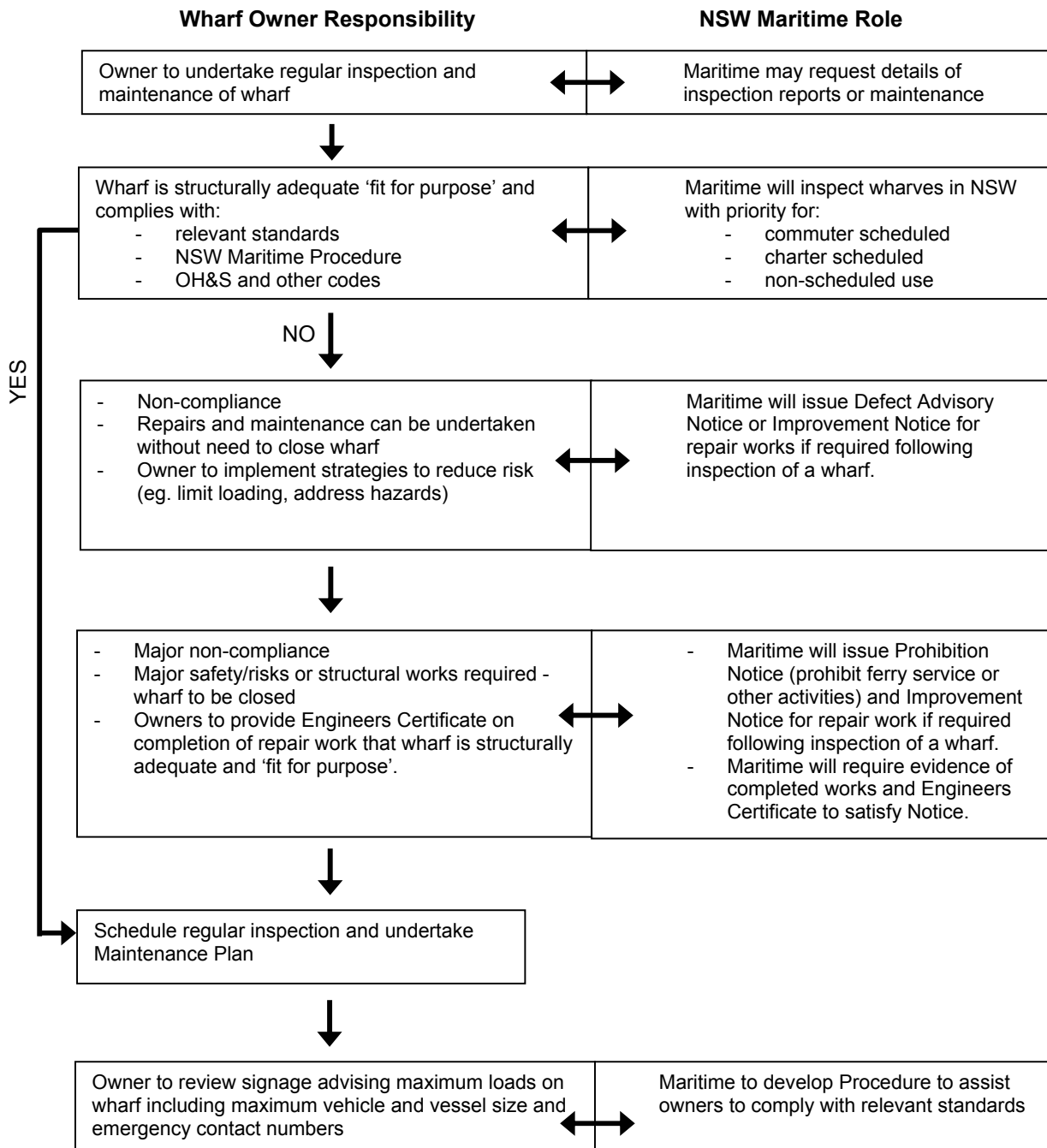


Figure 1: The role of NSW Maritime under the Marine Safety Act and the responsibility of the wharf owner.

4. Relevant Reference Information

The following key documents have been used to establish the criteria for this Procedure:

- AS 3962-2001: Guidelines for design of marinas;
- AS 4997-2005: Guidelines for design of maritime structures;
- NSW Waterways Authority: Engineering standards and guidelines for maritime structures (*April, 2005*); and
- Former NSW Public Works: Design Guidelines for Wharves and Jetties (*August 1990*).

5. Safety Inspection and Assessment Procedure

The steps involved in the safety inspection and assessment of each public ferry wharf are shown in **Figure 2**.

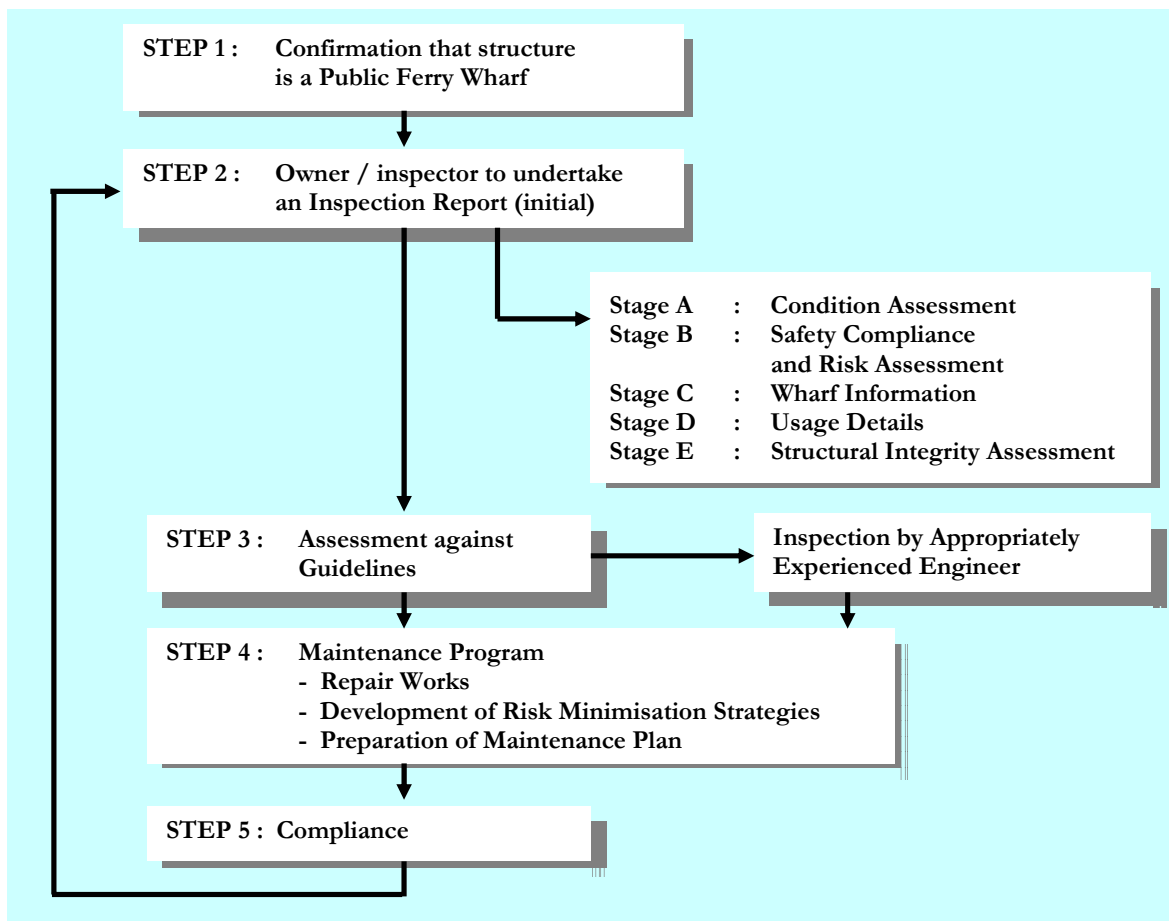


Figure 2: Steps involved in the safety assessment of public ferry wharf

5.1 Step 1: Confirmation Structure is a Public Ferry Wharf

Determine whether the structure is a public ferry wharf as defined in the Marine Safety Act 1998, that is:

“a wharf or associated facilities used for the purpose of public passenger services provided by ferries”. A ferry is defined as any vessel which seats more than 8 adult persons and includes a fare or other consideration. This includes:- typical commuter scheduled ferries; charter vessels; and, dive vessels.

If the structure does fall under this definition for a public ferry wharf, then legislative compliance under the Marine Safety Act 1998 does not apply. However wharf owners may wish to apply relevant sections of the Procedure in monitoring and maintaining all wharves.

5.2 Step 2: Inspection Report

To assist in the safety assessment process, the owner/operator is strongly encouraged to undertake the regular inspections of the structure in conjunction with completing an inspection report.

A recommended pro-forma for an Inspection Report and Wharf Records is contained in **Appendix A**. This pro-forma allows the operator/owner to record details of the structure (*e.g. condition, provision of items etc.*) and compare them against accepted guidelines, codes or standards for compliance in terms of structural integrity and safety. It will identify any actions required to bring the structure up to acceptable public safety standards. A shortened version for inspection only is contained in **Appendix B**. The methodology that should be used for completing the Inspection Report is contained in **Appendix E**.

It is recommended that unless a wharf/jetty structure is relatively new (*i.e. constructed less than 5 years ago*) an appropriately qualified and experienced engineer specialising in maritime structures should generally undertake the initial inspection and prepare the initial Inspection Report.

Thereafter, unless specific problems/issues are identified, a knowledgeable owner/operator who has a fundamental understanding of wharves/jetties should be able to complete the Inspection Report with specialist input on an as-required basis. However, it is recommended that a condition assessment should be undertaken by an appropriately qualified and experienced engineer specialising in maritime structures at intervals not exceeding 5 yearly under any circumstances.

5.3 Step 3: Assessment against Procedure

- Identify areas of non-compliance/risk.
- Identify risk minimisation strategies (e.g. limit loading, signage).
- Identify repairs to structure.

5.4 Step 4: Maintenance Program

- Implement repair works and risk minimisation strategies and prepare long term maintenance plan.
- Under the Marine Safety Act 1998, NSW Maritime (*or other suitable party*) may conduct an inspection of each structure. NSW Maritime will progressively inspect public ferry wharves with priority given to commuter schedule services and high use wharves. The inspection (*and audit*) may review the owner's Inspection Reports and will determine if further inspection of the wharf or improvement works are required.

5.5 Step 5: On-going Compliance

- The owner/operator should undertake regular safety and structural integrity assessments of their structure. These assessments will assist the owner/operator in identifying actions required to ensure the structure is compliant.
- Ongoing inspections (*and audits*) by NSW Maritime (*or other suitable party*) may be undertaken to confirm compliance.

The wharf owner is responsible for regular public safety and structural integrity assessment of the structure. The frequency of public safety checks will vary dependent on usage, however, it could involve regular inspections for a high usage structure to review:

- visual inspection and condition;
- lights;
- cleaning; and
- safe access (*tripping/ hand rail etc*).

Structural integrity checks should be undertaken every year (*approximately*), however, this will vary dependent on age of structure, usage and condition.

The owner would be responsible for:

- inspection and maintenance record;
- maintenance plan based on structural inspections; and
- maintenance in accordance with maintenance plan.

**APPENDIX A: PRO-FORMA INSPECTION REPORT AND
WHARF DETAILS**

PUBLIC FERRY WHARVES INSPECTION REPORT

INSPECTION DETAILS

1: Wharf Name <input style="width: 95%; height: 20px;" type="text"/>	4: Date of Inspection (dd/mm/yyyy) <input style="width: 95%; height: 20px;" type="text"/>	7: Structure Type(s) <input type="checkbox"/> Fixed Wharf <input type="checkbox"/> Other (please specify) <input type="checkbox"/> Floating Pontoon <input type="checkbox"/> Access Ramp
2: Street Address <input style="width: 95%; height: 20px;" type="text"/>	5: Date of Last Inspection (dd/mm/yyyy) <input style="width: 95%; height: 20px;" type="text"/>	
3: Owner / Operator <input style="width: 95%; height: 20px;" type="text"/>	6: Name(s) of Assessor(s) <input style="width: 95%; height: 20px;" type="text"/>	

STAGE A - CONDITION ASSESSMENT

Item	Condition	Main Element						Connections			Risk/ Priority			Comments	Action
		1 ACCESS POINT													
1.1	Deck – trip hazard														
1.2	Girders														
1.3	Headstocks														
1.4	Piles														
1.5	Safety Fencing*														
1.6	Lighting*														
1.7	Edge Marking*														
1.8	Tactile Indicators														
1.9	Bracing – timber members														
2 MAIN WALKWAY															
2.1	Deck – trip hazard														
2.2	Girders														
2.3	Headstocks														
2.4	Piles														
2.5	Safety Fencing*														
2.6	Lighting*														
2.7	Edge Marking*														

PUBLIC FERRY WHARVES INSPECTION REPORT

STAGE A - CONDITION ASSESSMENT

cont'd

Item	Condition						Risk/ Priority			Comments	Action	
	Main Element			Connections			H	M	L			
	G	F	P	G	F	P						
2	MAIN WALKWAY (cont'd)											
2.8	Tactile Indicators*											
2.9	Bracing – cross and horizontal bracing											
2.10	Land Tie Assembly (if visible)											
3	BOARDING / BERTHING AREA											
3.1	Fender Piles											
3.2	Rubbing Strips											
3.3	Rubber Fenders											
3.4	Stairs											
3.5	Low Level Landings											
3.6	Mooring Cleats / Bollards											
3.7	Access Ladders											
3.8	Safety Fencing*											
3.9	Lighting*											
3.10	Edge Marking*											
3.11	Tactile Indicators											
3.12	Gates											
4	FLOATING PONTOON											
4.1	Waling											
4.2	Rubber Fendering											
4.3	Aperture Plates											
4.4	Aperture Protection											
4.5	Bollards											
4.6	Access Ladders											

PUBLIC FERRY WHARVES INSPECTION REPORT

STAGE A - CONDITION ASSESSMENT

cont'd

Item	Condition						Risk/ Priority			Comments	Action	
	Main Element			Connections			H	M	L			
	G	F	P	G	F	P						
4	FLOATING PONTOON (cont'd)											
4.7	Manhole Covers											
4.8	Hydraulic Supports											
5	GANGWAYS											
5.1	Gangway connection											
5.2	Gangway											
6	SEATING / SHELTER AREA											
6.1	Roofing											
6.2	Seating											
6.3	Walls											
7	SERVICES											
7.1	Fuel											
7.2	Water											
7.3	Power Cables											
7.4	Sewerage											
7.5	Telecommunications											
8	OTHER											
8.1	Corrosion Protection System											
8.2	Distress Measuring Device											
8.3	Security Fence / Gates											
8.4											
8.5											

*Note: these items should also be assessed for compliance (refer Stage B – Safety Compliance and Risk Assessment).

G = Good F = Fair P = Poor N/A = Not Applicable H = High M = Medium L = Low

PUBLIC FERRY WHARVES INSPECTION REPORT

STAGE B – SAFETY COMPLIANCE AND RISK ASSESSMENT

	Provision Item	Required? (refer Charts*)		Condition			Compliance? (refer Charts*)		Risk/ Priority			Comments	Action
		Yes	No	G	F	P	Yes	No	H	M	L		
		1	SAFETY ITEMS										
1.1	Safety Fencing												
1.2	Lighting												
1.3	Access Ladder(s)												
1.4	Markings												
1.5	Anti-skid Treatment (ramps)												
1.6	Anti-skid Treatment (stairs)												
1.7	Anti-skid Treatment (low level landings)												
2	VEHICULAR ACCESS BARRIERS												
2.1	Non-mountable Kerbs												
2.2	Vehicular Barriers												
3	EMERGENCY PROVISIONS												
3.1	Fire Hose Reels, Hydrants and Extinguishers (provide service date)												
3.2	Lifebuys – Spacing & Type												
3.3	Accessways / Exits Clear of Obstructions												
4	SIGNAGE												
4.1	Load Limitations												

PUBLIC FERRY WHARVES INSPECTION REPORT

STAGE B – SAFETY COMPLIANCE AND RISK ASSESSMENT

	Provision Item	Provided?		Condition			Risk/ Priority			Comments	Action	
		Yes	No	G	F	P	H	M	L			
5	CONSIDERATIONS (refer Charts*)											
5.1	First Aid											
5.2	Emergency Response Plan/Procedure											
5.3	Overall Accessibility to Disabled											
5.4	Tactile Indicators											
5.5	Signage - Warnings on Usage											
5.6	Signage - Emergency Response (plans visible)											
5.7	Signage – Owner’s Name and Contact Nos											
5.8	Booms for Oil/Petrol or Chemical Spillage											
6	OTHER / ADDITIONAL COMMENTS											

*Note: Refer to Appendix C – Safety Compliance and Risk Assessment Flow Charts

G = Good F = Fair P = Poor
H = High M = Medium L = Low

PUBLIC FERRY WHARVES INSPECTION REPORT

STAGE C – WHARF INFORMATION

1 Description of Structure

1.1 General Dimensions

1.2 Materials *(provide details)*

2 Historical Information of Structure

2.1 Age *(orig.)*

- 0-5 yrs
- 5-15 yrs
- 15-30 yrs
- > 30 yrs

2.2 Design Documentation

- Available
- Unavailable

2.3 Records of Damage *(provide details)*

2.4 Maintenance Undertaken *(provide details)*

2.5 Improvements Undertaken *(provide details)*

3 Surrounding Land Uses *(provide details)*

4 Site Conditions

(Area topography, bathymetry, water level variation, foundation condition, exposure to wind, waves and currents, services, area of approach for vessels)

5 Access

5.1 Land Access Details

5.2 Water Access Details

PUBLIC FERRY WHARVES INSPECTION REPORT

STAGE D – USAGE DETAILS

1 User Details

1.1 Vessels using Wharf

Vessel Type	No.

1.2 Frequency of Use

<input type="checkbox"/> More than once a day	<input type="checkbox"/> Weekly
<input type="checkbox"/> Daily	<input type="checkbox"/> Other (<i>please specify</i>)
<input type="checkbox"/> More than once a week

1.3 Operating Times and Conditions (*provide details*)

1.4 Main Users (*can select more than 1 option*)

<input type="checkbox"/> General Public (public transport)
<input type="checkbox"/> Charter Groups
<input type="checkbox"/> Water Taxis
<input type="checkbox"/> Other (<i>please specify</i>)

1.5 Vehicular Access

<input type="checkbox"/> Provided
<input type="checkbox"/> Not Provided => Item 4 not applicable

2. Usage Limitations

2.1 Loading Limitations (*formal/informal*)

<input type="checkbox"/> Vessel Tonnes/kPa
<input type="checkbox"/> Vehicle..... Tonnes/kPa
<input type="checkbox"/> Other (<i>please specify</i>) Tonnes/kPa

2.2 Disabled Access

<input type="checkbox"/> Formal Access Provided	<input type="checkbox"/> Assisted
<input type="checkbox"/> Informal Access Provided	<input type="checkbox"/> Unassisted
<input type="checkbox"/> No Access Provided	

3 Details of Largest Vessel

3.1 Type

--

3.2 Dimensions

--

3.3 Tonnage / Displacement

--

3.4 Berthing Velocity (*refer Table D.1*)

m/sec

4 Details of Vehicles Accessing Structure

4.1 Type

4.2 Dimensions

4.3 Mass – Loaded / Unloaded (for heaviest vehicle)

Loaded :	Tonnes
Unloaded:	Tonnes

4.4 Turning Circle (*for longest vehicle*)

--

5 Information Services (*tick appropriate boxes*)

<input type="checkbox"/> Timetables (Ferries)
<input type="checkbox"/> Timetables (Buses/Trains)
<input type="checkbox"/> Arrival/Location Information
<input type="checkbox"/> Destinations Served
<input type="checkbox"/> Other (<i>please specify</i>)

PUBLIC FERRY WHARVES INSPECTION REPORT

STAGE E – STRUCTURAL INTEGRITY ASSESSMENT

1 Load Classification

1.1 Vertical Loading (refer Table E.1 and Item 3.4 of Stage D)

<input type="checkbox"/> Class 5a	<input type="checkbox"/> Class 10
<input type="checkbox"/> Class 5b	<input type="checkbox"/> Class 15
<input type="checkbox"/> Class 5c	

1.2 Horizontal Loading

1.2.1 Vessel Impacts (refer Table E.2 and Item 3.3 of Stage D)

--

1.2.2 Other

--

1.2.3 Total (1.2.1 + 1.2.2)

--

2. Structural Dimensions

2.1 Fixed Wharf Structures

Note: Assessment includes low level landings and stairs

2.1.1 Decking

material(s)
Dimensions (min)
width 'A'
depth 'B'
maxi girder to girder span 'C'
max cantilever 'D'

For grade F17 hardwood decking, dimensions can be checked against the Guideline for Structural Adequacy of Decking Timbers as shown in Table E.3 in Appendix F.

2.1.2 Girders

material(s)
Dimensions (min)
width 'E'
depth 'F'
max support to support span 'G'
max cantilever 'H'

2.1.3 Headstocks

materials (s)
member type (single headstock, single capwale or twin capwale)
Dimensions (min)
width 'J'
depth 'K'
max support to support span 'L'
max cantilever 'M'

2.1.4 Piles

Piles material(s)
Sea bed material(s)
Dimensions (min)
pile Φ at top (timber or solid piles) 'N'
pile Φ at water line (timber or solid piles) 'N'
height from sea bed to top of pile 'Q'
outside pile Φ (steel or hollow piles) 'N'
wall thickness (steel or hollow piles) 'P'
geotechnical foundation conditions

2.1.5 Fendering

- a) Freestanding fender pile OR
 b) Fender pile into rubber fender

a) Freestanding fender pile

Piles material(s)
Sea bed material(s)

PUBLIC FERRY WHARVES INSPECTION REPORT

STAGE E – STRUCTURAL INTEGRITY ASSESSMENT

(cont'd)

2.2 Floating pontoons

material(s)		
Dimensions (min)		
width (s) of overall pontoon arrangement		
length(s) of overall pontoon arrangement		
free board(s) of overall pontoon arrangement		
draught(s) of overall pontoon arrangement		
width(s) of individual pontoon units		
length (s) of individual pontoon units		

2.2.4 Guide piles and roller/block

material(s)		
Layout / Dimensions (min)		

2.2.5 Site wall (if different from side wall)

Dimensions (min)		

2.2.2 Deck surface and applied treatments

material(s)		
Dimensions (min)		

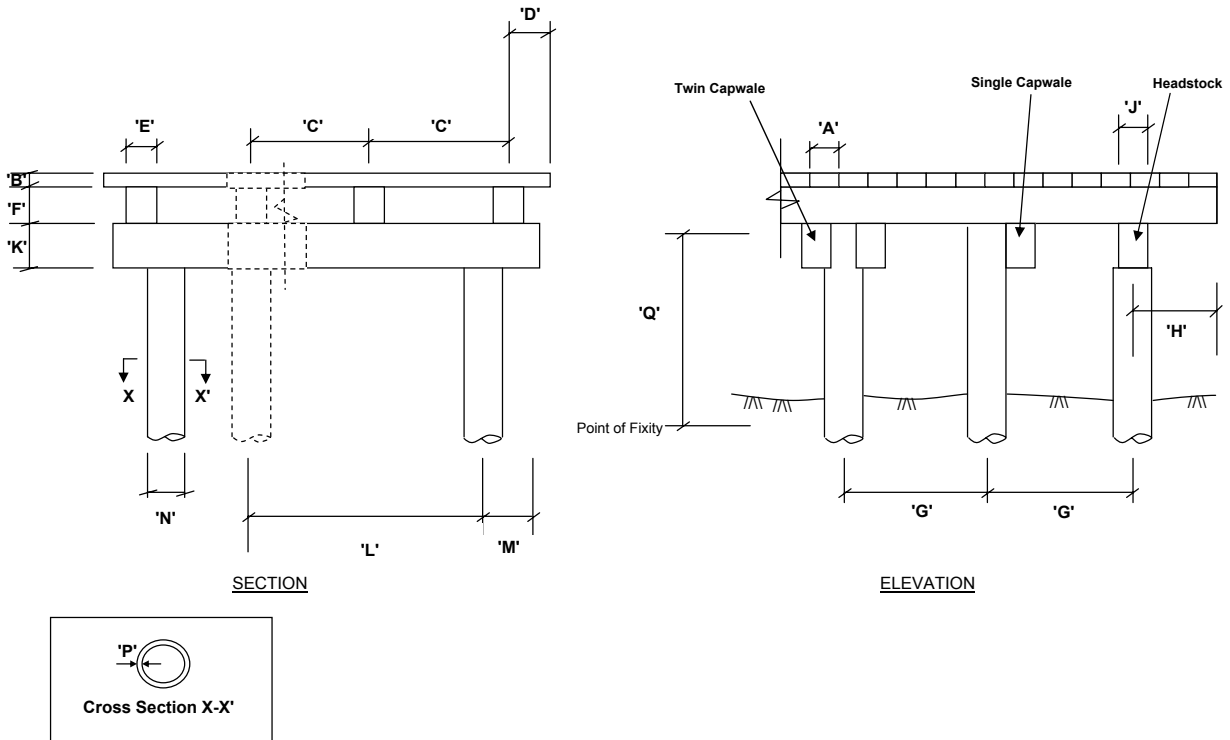
2.2.3 Side wall

material(s)		
Dimensions (min)		

PUBLIC FERRY WHARVES INSPECTION REPORT

STAGE E - STRUCTURAL INTEGRITY ASSESSMENT

SITE DETAILS / MEASUREMENTS



**APPENDIX B: PRO-FORMA INSPECTION REPORT –
SHORT VERSION**

PUBLIC FERRY WHARF INSPECTION REPORT

SAFETY COMPLIANCE AND CONDITION ASSESSMENT - SUMMARY CHECKLIST

Wharf Name:	Wharf Use:	Date:
Owner:	Assessor:	Time/Tide:
Construction	Inspection No:	
Pile:	Sub-structure:	Deck:

Provision Item	Condition			Comply (refer Chart)		Risk / Priority			Comments / Action
	G	F	P	Yes	No	H	M	L	

COMPLIANCE

1 SAFETY ITEMS									
1.1	Transition Plates								
1.2	Deck – trip hazard								
1.3	Safety Handrails								
1.4	Lighting								
1.5	Access Ladder(s)								
1.6	Edge Markings								
1.7	Anti-skid Treatment (low level landings)								
1.8	Pile / roller protection								
2 VEHICLE ACCESS BARRIERS									
2.1	Non-Mountable Kerbs								
2.2	Vehicle Barriers								
3 EMERGENCY PROVISIONS									
3.1	Fire Hose, Hydrants and Extinguishers (service date)								
3.2	Lifebuoys – Spacing & Type								
3.3	Accessways / Exits Clear of Obstructions								
4 SIGNAGE									
4.1	Load Limitations								

OTHER CONSIDERATIONS (refer Charts*)

5.1	Overall Accessibility to Disabled								
5.2	Tactile Indicators								
5.3	Signage - Warnings on Usage – no diving / fishing								
5.4	Signage -Owners name /contact								
5.4	Signage - Emergency Response (plans visible)								

CONDITION ASSESSMENT

6 FIXED STRUCTURE									
6.1	Deck								
6.2	Girders								
6.3	Headstocks								
6.4	Piles								
6.5	Berthing Piles								
6.6	Rubbing Strips								
6.7	Rubber Fenders								
6.8	Mooring cleats / Bollards								
6.9	Connections /tie rods /corrosion								
6.10	Stairs								
6.11	Other -								
6.12	Engineering Assessment required:								
7 PONTOON									
7.1	Waling								
7.2	Rubber Fenders								
7.3	Berthing Piles / Strips								
7.4	Aperture plates								
7.5	Aperture Protection								
7.6	Gangway connections, sliding plates, hangers								
7.8	Gangway safety chains								
7.9	Mooring cleats / Bollards								
7.10	Hatch covers								
7.11	Other -								
8 SEATING / SHELTER AREA									
8.1	Seating / Walls								
8.2	Roofing								
9 OTHER									
9.1	Water / Sewage / Fuel								
9.2	Power cables								
9.3	Hydraulic Ramp Operation								
9.4	Gates								

*Refer to Appendix C for Flow Charts

G = Good F = Fair P = Poor
H = High M = Medium L = Low

APPENDIX C: SAFETY COMPLIANCE CRITERIA – FLOW CHARTS

STAGE B SAFETY COMPLIANCE AND RISK ASSESSMENT

FLOW CHARTS

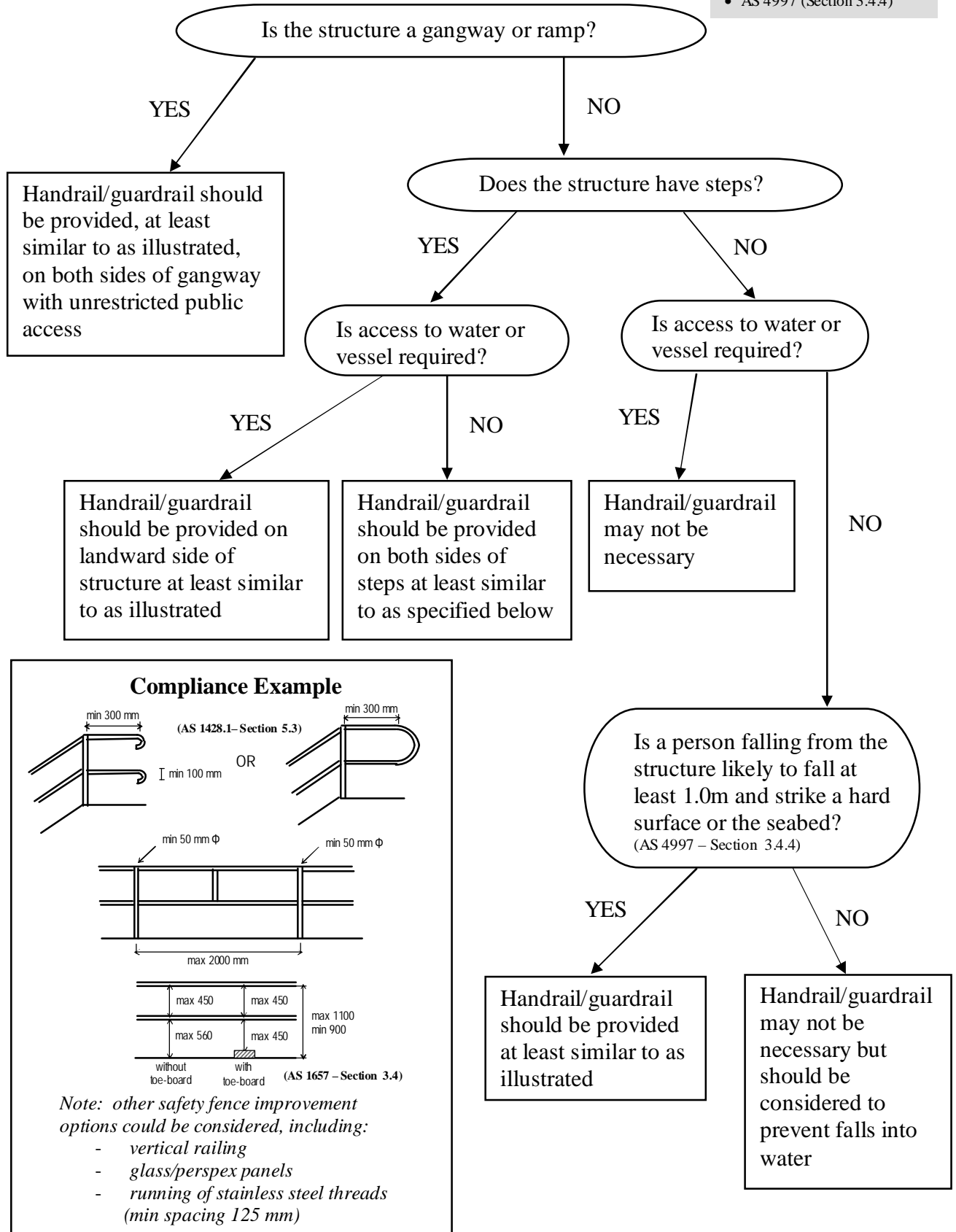
References:

AS/NZS 1158.3.1 - 2005	Light for Roads and Public Spaces Part 3.1: Pedestrian Area (Category P) Lighting – Performance and Design Requirements
AS 1170.1 - 2002	Structural Design Actions - Permanent, Imposed and Other Actions
AS/NZS 1221 - 1997	Fire Hose Reels
AS 1428.1 - 2001	Design for Access and Mobility - General Requirements for Access - New Building Work
AS 1428.2 - 1992	Design for Access and Mobility - Enhanced and additional requirements - Buildings and Facilities
AS 1428.4 - 1992	Design for Access and Mobility - Tactile Indicators
AS 1657 - 1992	Fixed Platforms, Walkways, Stairways and Ladders - Design, Construction and Installation
AS 1851 - 2005	Maintenance of Fire Protection Systems and Equipment
AS 3962 – 2001	Guidelines for the Design of Marinas
AS 4997 - 2005	Guidelines for the Design of Maritime Structures
NSW Public Works	Design Guidelines for Wharves and Jetties August 1990
NSW Maritime Authority (2004)	Engineering Standards and Guidelines for Maritime Structures
Commonwealth Government (2002)	Disability Standards for Accessible Public Transport

SAFETY FENCING

Relevant References

- AS 1170.1 (Section 3.6)
- AS 1428.1 (Section 5.3)
- AS 1657 (Section 3.4)
- AS 3962 (Section 3.6.3)
- AS 4997 (Section 3.4.4)



Compliance Example

(AS 1428.1 – Section 5.3)

min 300 mm

min 100 mm

OR

min 50 mm Φ

min 50 mm Φ

max 2000 mm

max 450

max 450

max 560

max 450

max 1100

min 900

without toe-board

with toe-board

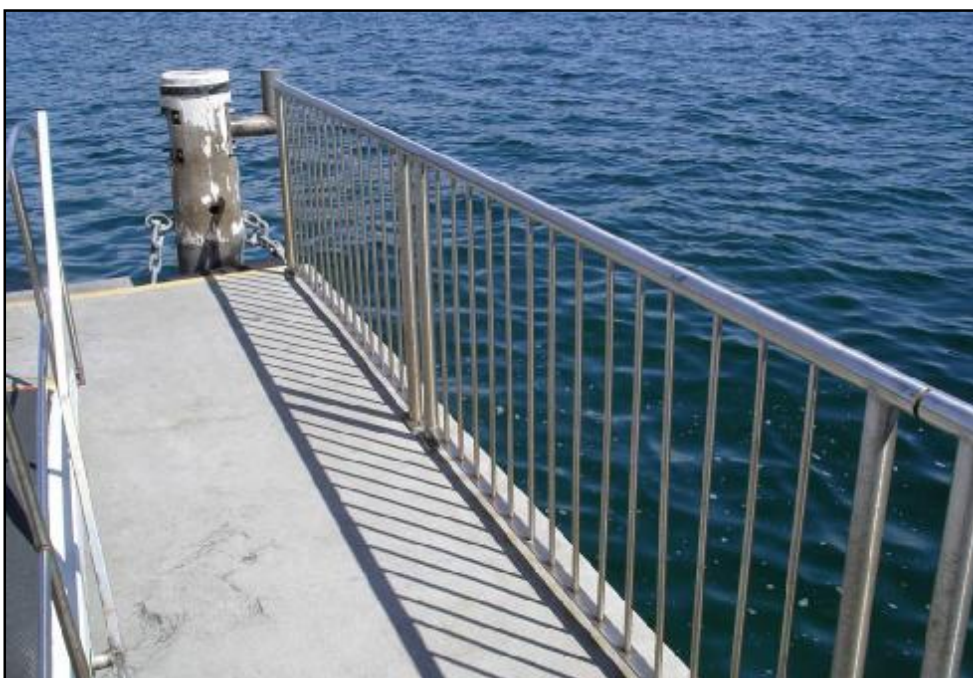
(AS 1657 – Section 3.4)

Note: other safety fence improvement options could be considered, including:

- vertical railing
- glass/perspex panels
- running of stainless steel threads (min spacing 125 mm)



Example of horizontal railing safety fence



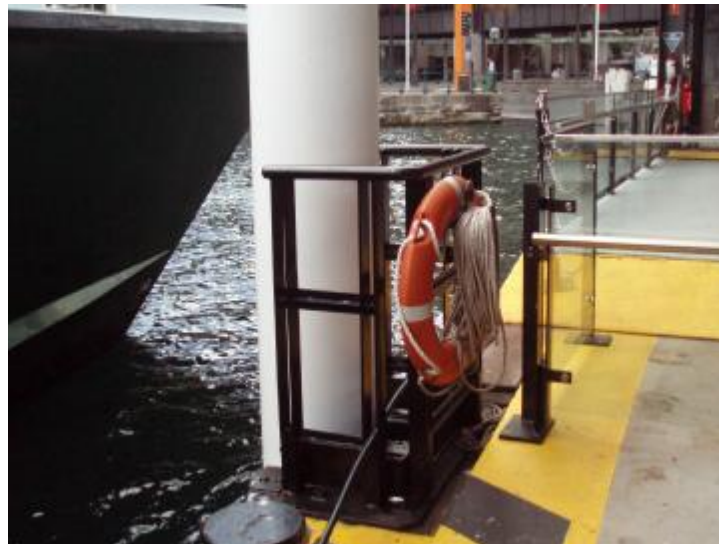
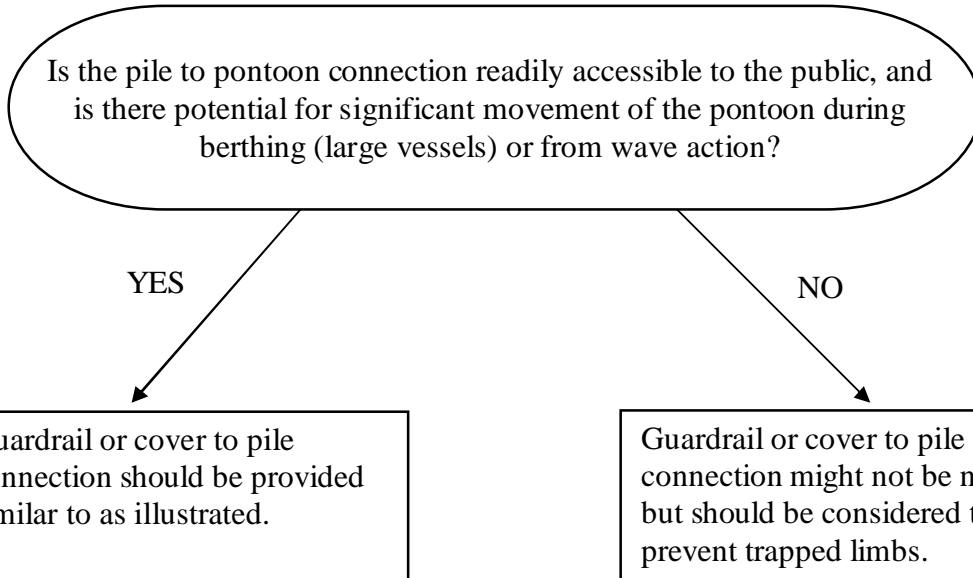
Example of vertical railing safety fence

PONTOON/PILE CONNECTION

Relevant References

- NSW Maritime's Engineering Standings and Guidelines for Maritime Structures (Section 3.12 & 3.13)
- AS 4997 (Section 3.4)

Compliance



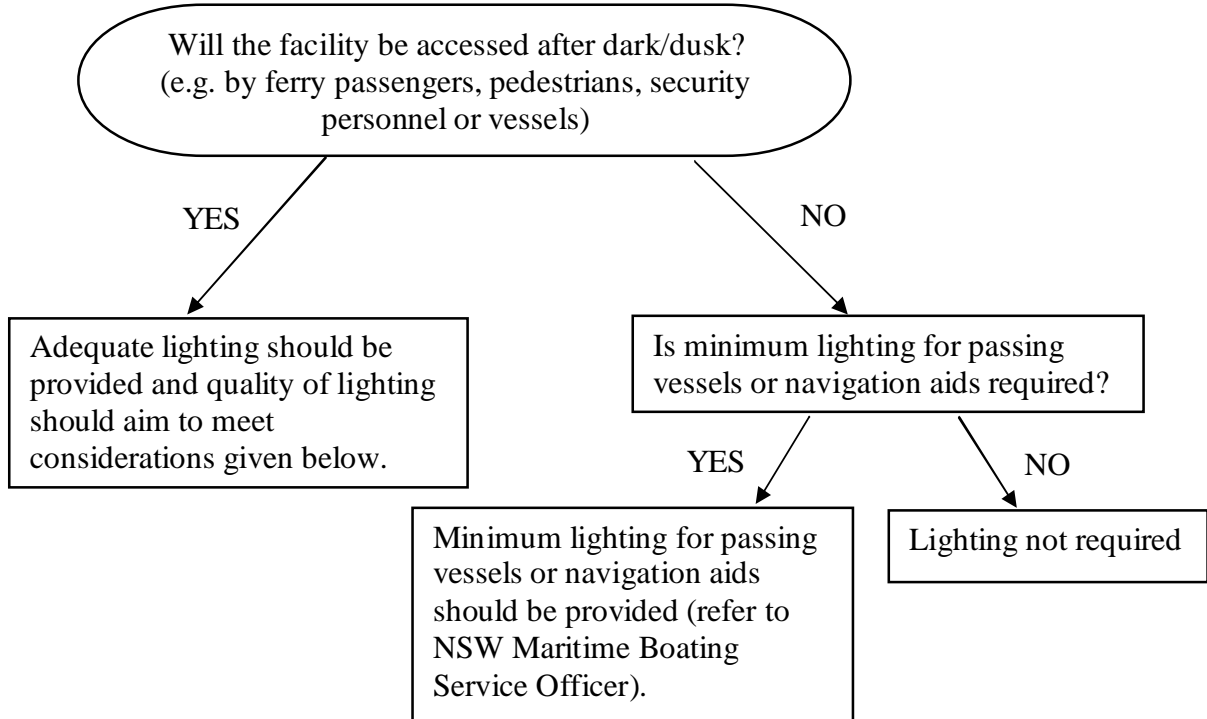
Example of pile roller protection

LIGHTING

Relevant References

- AS/NZS 1158 (Section 3.1)
- AS 3962 (Section 6.5)

Compliance



Considerations

Targets for Illuminance at Wharves (AS/NZS 1158.3.1:2005 Table 2.3 and Table 2.7)

<i>Location</i>	<i>Average Illuminance During Ferry Operating Times (Average Horizontal Illuminance)</i>
High Use Wharf	21 lux
Medium Use Wharf	14 lux
Low Use Wharf	7 lux

Connecting Element

For connecting elements, such as ramps and stairs, the lighting category is the same as the highest lighting category that abuts the connecting element.

Steps

For steps, the requirements assume that the noses of the treads are clearly delineated by a contrasting strip or other equally effective means. If such means are not provided, the illuminance should be at least twice the value specified.

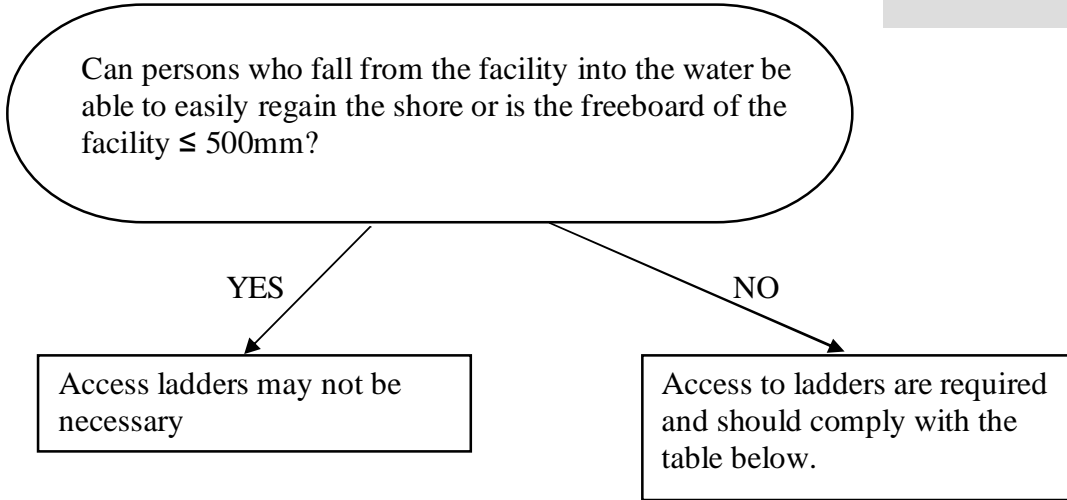
Positioning of Lighting

Lighting should be strategically positioned to ensure there is adequate coverage of the facility, particularly at critical areas such as steps/ramps, shadow areas and changes of grade. Lighting should be designed and positioned to minimise glare for vessels navigating in the vicinity.

ACCESS LADDERS

- Relevant References
- AS 1657
 - AS 3962 (Section 5.1.2)
 - AS 4997 (Section 3.4.5)
 - NSW Maritime Engineering Standards and Guidelines for Maritime Structures (Section 5.12)

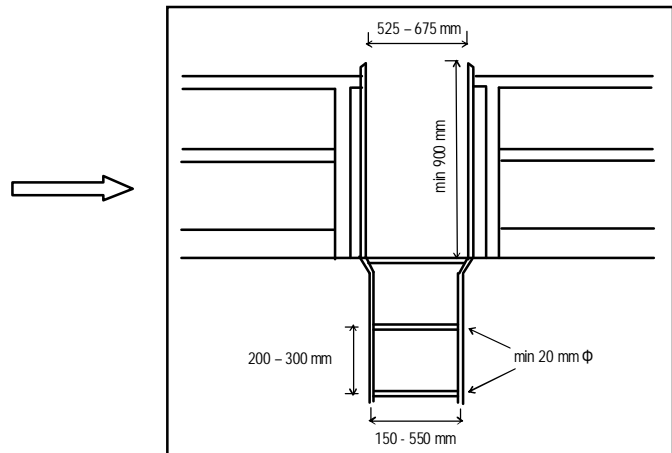
Compliance



Requirement	Compliance			Comments
	Yes	No	N/A	
Ladder of durable material (AS 4997 – Section 3.2.5)				
Ladder extends from deck level down to below low water level (bottom rung is at approx. 300mm below LAT) (AS 4997 – Section 3.2.5)				
Ladders are located at maximum 60m intervals (AS 4997 – Section 3.2.5)				
Buffer rails at least 250 mm proud at each side of the ladder are provided (AS 4997 – Section 3.2.5)				

Considerations

- Rung diameter ≥ 20mm (AS 1657 – Section 5.6.6.1)
- Spacing of rungs are between 200mm and 300mm (AS 1657 – Section 5.6.6.2)
- Clear width of the tread of each rung is between 150mm and 550mm (AS 1657 – Section 5.7)
- Clear openings at top of ladder is between 525mm and 675mm (AS 1657 – Section 5.6.3)
- Stiles extend more than 900 mm (AS 1657 – Section 5.6.3)



MARKINGS

Relevant References

- No standard or code exists for this item

Compliance

NSW Maritime recommends that adequate painted or coloured tape markings be provided along any edges of the structure (waters edge, steps/stairs and other edges) and around no-go zones (e.g. fuel pumps) in the absence of other safety edge indicators for public ferry wharves that are serviced by regular scheduled ferry services.

Yellow or white line markings are generally considered appropriate. Consideration should be given to the type of material the lines will be painted on eg. yellow lines may be more appropriate on a concrete wharf edge as white lines may not stand out.

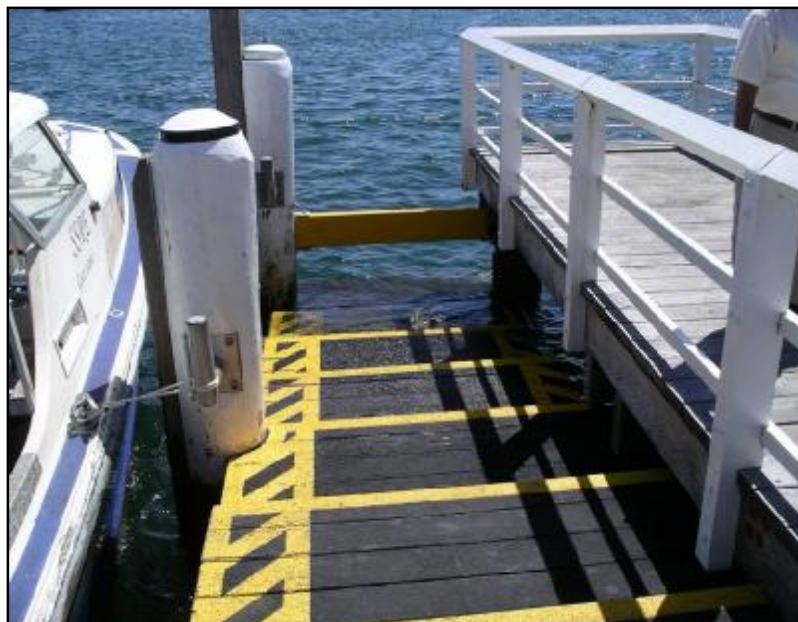
Considerations

Line Marking Dimensions Guide

Location	Line Type	Typical Dimensions
- wharf/pontoon edge - transition plate - no-go zone	hatching	
- wharf/pontoon edge (alternative) - step edge	single line	

Condition

Have any markings faded?

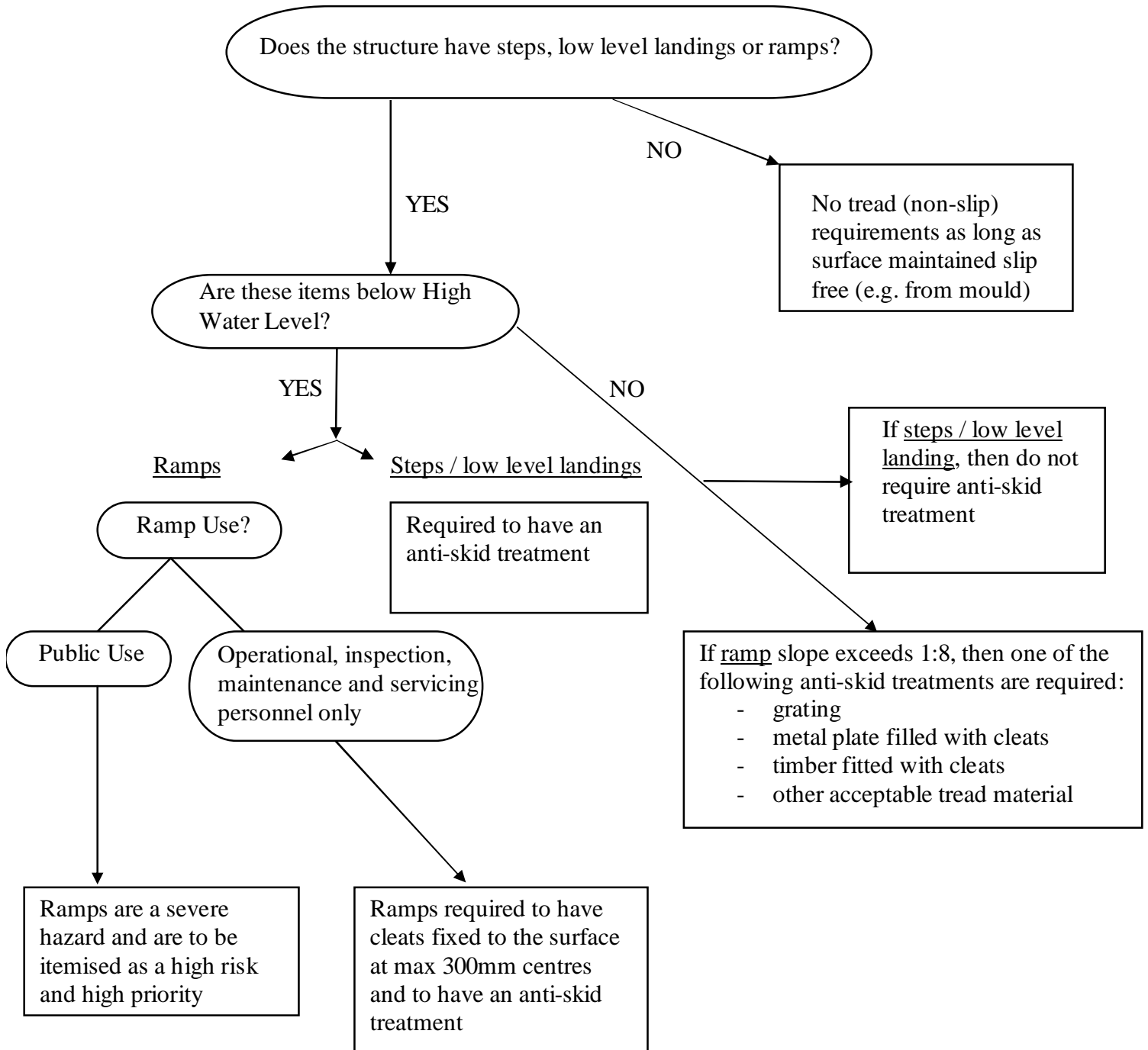


Example of paint markings along critical edges (steps, waters edge)

ANTI-SKID TREATMENT

- Relevant References
- AS 4997 (Section 3.4.2)
 - NSW Maritime – Engineering Standards and Guidelines for Maritime Structures (Section 5.18)
 - NSW Public Works – Design Guidelines for Wharves and Jetties (Section 5.2.3)

Compliance



Condition

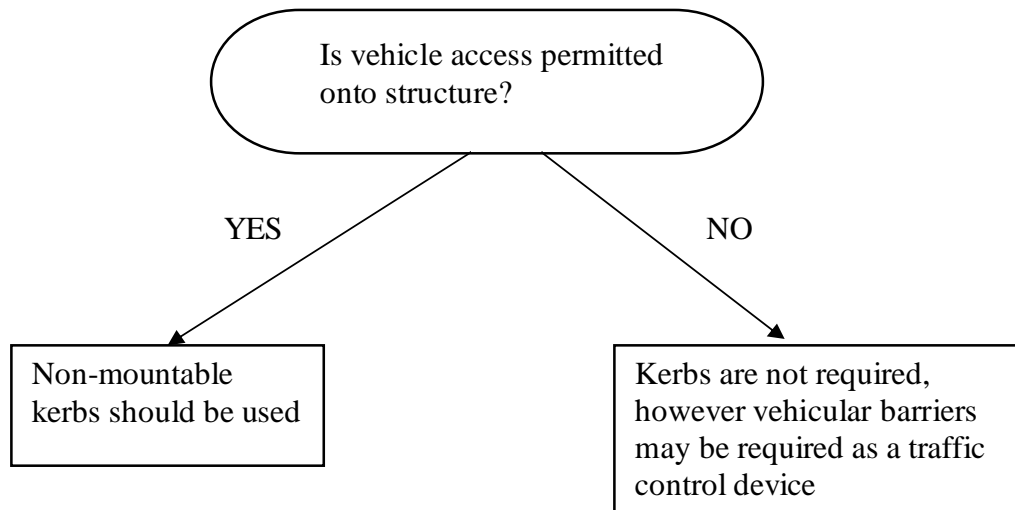
What condition is the anti-skid treatment in?

VEHICULAR ACCESS PROVISIONS

Relevant References

- AS 4997 (Section 3.4.4)

Compliance



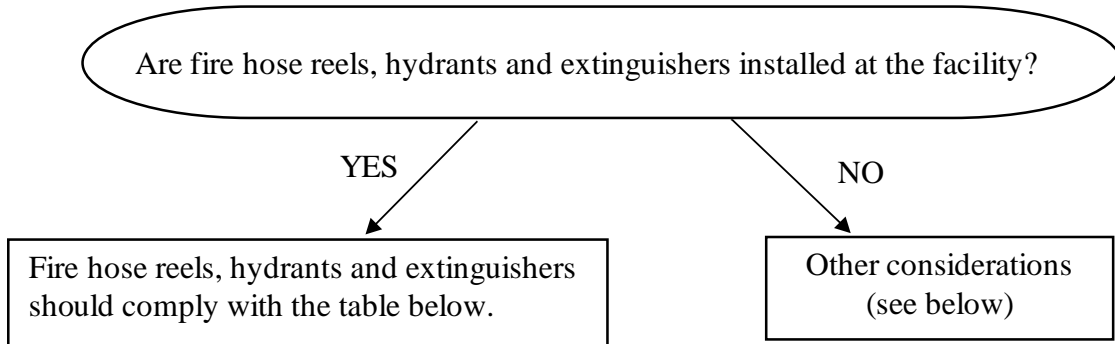
4. Signage

FIRE HOSE REELS, HYDRANTS AND EXTINGUISHERS

Relevant References:

- AS/NZ 1221
- AS 1851
- AS 3962 Section 6.2

Compliance



Requirement	Compliance		
	Yes	No	Comments
Maximum distance between any two hose reels is 30m (AS 3962 Section 6.2)			
Length of hose is at least 36m (AS 3962 Section 6.2)			
All parts of the facility can be reached by the end of the hose reel (AS 3962 Section 6.2)			
Fire hydrants are provided adjacent to the head of each gangway (AS 3962 Section 6.2)			
The maintenance record tag/labels for the fire hose reels, fire hydrants and fire extinguishers are marked with previous inspections (AS 1815)			
The frequency of inspections for the fire hose reels, fire hydrants and fire extinguishers are six-monthly, yearly or 5-yearly as applicable for the test (AS 1815)			

Considerations

- § Are there activities at the wharf that may indicate a need for fire fighting facilities such as permanent mooring of vessels, cooking facilities or flammable goods?
- § Can the NSW Fire Brigade or NSW Rural Fire Service access the facility?
- § Is the closest fire hydrant near enough to provide adequate service to the facility?

Where further assessment is required, the owner should seek advice from the NSW Fire Brigade or a Fire Safety consultant regarding the provision of fire hose reels, hydrants and extinguishers.

Condition (AS 1851)

Hydrant:

- Provide last service date (refer maintenance record tag).
- Has the hydrant been serviced within the last year? If 'NO' then condition is poor.
- Does the hydrant appear in an adequate condition?

Hose Reel:

- Provide last service date (refer maintenance record tag).
- Has the hose been serviced within the last six months? If 'NO' then condition is poor.
- Does the hose reel appear in an adequate condition?

Extinguisher:

- Provide last service date (refer maintenance record tag).
- Has the extinguisher been serviced within the last six months? If 'NO' then condition is poor.
- Does the extinguisher appear in an adequate position?



Example of a hose reel

LIFEBUOYS

Relevant References

- NSW Maritime Engineering Standards and Guidelines for marine Structures (Section 5.19)

Compliance

- Life buoys should be provided on all regularly-serviced public facilities and should comply with the following:

Requirement	Compliance		
	Yes	No	Comments
Located in order to cover the water distance of a minimum of 10m in plan around the perimeter of the facility			

Considerations

Lifebuoys shall generally comply with the Australian Maritime Safety Authorities Marine Orders Part 25 Appendix 1.1 which includes:

- § having an outer diameter of not more than 800 mm;
- § having an inner diameter of not less than 400 mm;
- § being fitted with grablines secured at four equidistant points around the circumference of the buoy to form four equal loops; and
- § being fitted with retro-reflective tape not less than 50 mm wide at 4 locations.

Each lifebuoy is fitted with a buoyant lifeline which complies with the Australian Maritime Safety Authorities Marine Orders Part 25 Appendix 1.4 which includes:

- § being non-kinking; and
- § having a diameter of not less than 8 mm.



Example of a lifebuoy

Condition

What condition is the lifebuoy and lifeline in (i.e. is it ripped, worn etc)?

EXITS CLEAR OF OBSTRUCTIONS

Relevant References

- NSW Maritime Engineering Standards and Guidelines for marine Structures (Section 5.5 & 5.18)
- NSW Public Works – Design Guidelines for Wharves and Jetties August 1990 (Section 5.2.2)
- AS 1428.1 (Section 5.1)
- AS 3962 (Section 3.6.1)
- Commonwealth Government – Disability Standards for Accessible Public Transport Guidelines 2001' Part 2

Compliance

The requirements specified below is for new structures and should also be implemented where practicable for existing structures:

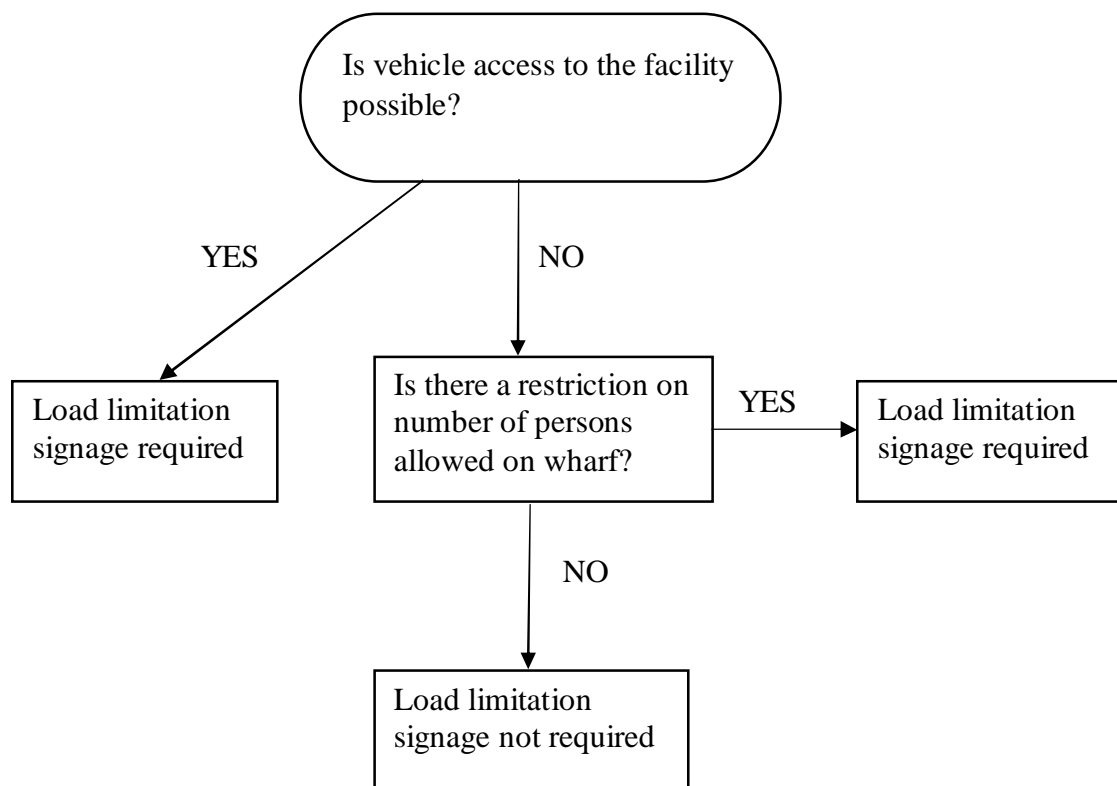
Requirements/Considerations	Compliance			
	Yes	No	N/A	Comments
Steps have a minimum clear width of 1.8m (NSW Maritime – Section 5.18)				
Stairs have a minimum clear width of 1.2m (NSW Maritime – Section 5.18)				
Egress pathway has a minimum 2.0m height clearance (AS 1428 Section 5)				
Gangways have a minimum clear width of 1.2m (AS 1428 Section 5, NSW Maritime - Section 5.5, Disability Standards for Accessible Public Transport Guidelines 2001)				
Jetties/walkways/accessways have a minimum clear width of 2.0m for light pedestrian traffic and 2.5m for moderate pedestrian traffic (NSW Public Works – Section 5.2.2)				
Consideration should be given to removing any obstructions that might present a hazards and obscure line of sight.				

LOAD LIMITATIONS

Relevant References

- No standard or code exists for this item

Compliance



The following OH&S provisions are not required to be provided by any standards or codes at this stage. However, the owner/operator should consider implementing these provisions with the aim to improve public safety.

FIRST AID KIT

Relevant References

- No standard or code exists for this item

Consideration

No Australian Standards exist for this item, however, provision of an appropriate first aid kit may be warranted dependant on passenger numbers and security at the structure.

Condition

Ensure the first aid kit(s) are sufficiently stocked with the necessary items.

EMERGENCY RESPONSE PLAN/PROCEDURE

Relevant References

- No standard or code exists for this item

Consideration

An adequate management plan/procedure for evacuation of the facility in the event of an emergency (e.g. fire, chemical spill etc.) may be required from the wharf owner (e.g. Council) or other agency, and tested regularly.

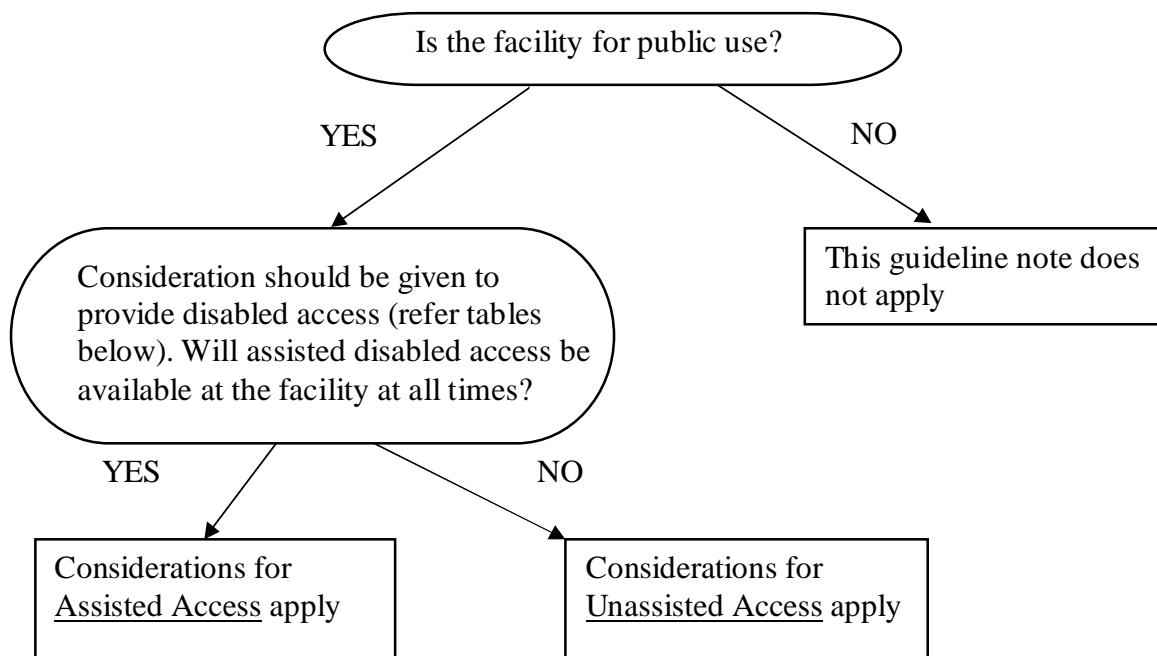
OVERALL ACCESSABILITY TO DISABLED

Relevant References

- AS 1428.1
- AS 3962 (Section 3.6)
- Disability Standards for Accessible Public

Consideration

The following disabled access considerations generally apply to new structures or the renovation of existing structures. However, if the facility does not comply with any of the requirements, the owner/operator may need to make adjustments to the facility in accordance with timetable requirements listed in the document, *Disability Standards for Accessible Public Transport (Commonwealth Government, 2002)*.



HINGED RAMPS TO PONTOON

	Considerations
	There is a continuous path of travel to/from the ferry wharf that has no steps, lips at joints > 5mm or hazards with less than 2m height clearance (AS 1428.1)
	All ramps/gangways have minimum clear width of 1.2m
Assisted disabled access	All ramps (exceeding 1520mm in length), gangways (including access ways from car park/street) have slopes flatter than 1:8 for more than 80% of the time (tide) (AS 3962 Section 3.6)
Unassisted disabled access	As for <u>assisted disabled access</u> except minimum slope is 1:14 for more than 80% of the tide (time) (AS 1428.1 Section 5)

FIXED RAMPS

	Considerations
Unassisted disabled access	All fixed ramps/gangways have landings (min 1.2m in length) at 9m intervals (max) for ramp gradients of 1:20 (linear interpolation for ramp gradients between 1:14 and 1:20) (AS 1428)

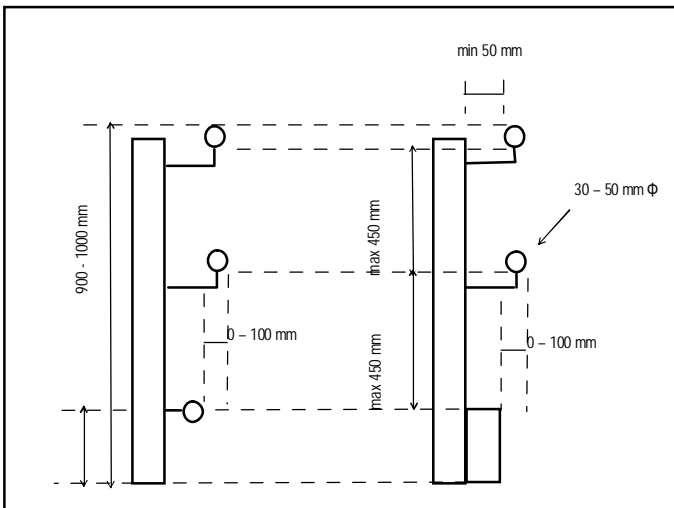
WALKWAYS

- Any accessory with a gradient flatter than 1:20

	Considerations
Unassisted disabled access	All walkways have a gradient flatter than 1:20
Unassisted disabled access	All walkways have landings (min 1.2m in length) at 15m intervals (max) for walkway gradients of 1:20, and 25m intervals (max) for walkway gradients of 1:33

HANDRAILS

- Unassisted disability access requirements for handrails are shown on the figure below:



Example of handrailing

TACTILE INDICATORS

Relevant References
 • AS/NZS 1428.4

Consideration

The following provisions should be considered in accordance with timetable requirements listed in the document, *Disability Standards for Accessible Public Transport (Commonwealth Government, 2002)*.

Requirement	Compliance			
	Yes	No	N/A	Comments
Where hazards exist, (such as change of surface gradient with no continuous handrail; or edge of wharf with no handrail; or low clearance < 2m) tactile indicators are required (such as warning tactile ground surface indicators (TGSIs), and handrail domed indicator buttons)				
Where directional assistance is required to determine the path of travel or to designate a route to avoid a hazard and no other sufficient tactile directional cues are provided directional TGSIs are provided				
Warning TGSIs are set back 600mm to 900mm from edge of wharf and 300mm from other hazards such as change of surface gradient for the full length of				
Warning TGSIs are placed across the direction of travel and are 600mm to 800mm wide (in direction of travel)				
Directional TGSIs are placed along the direction of travel and are 300mm in width (perpendicular to direction of travel)				
TGSI are of adequate luminance contrast with the ground surface				



Example of tactile markers near the waters edge

Condition

Have tactile indicators been lost, cracked or loosened?

SIGNAGE - WARNINGS ON USAGE

Relevant References

- No AS exist for this item

Consideration

Are any of the following warnings of usage of the facility required?

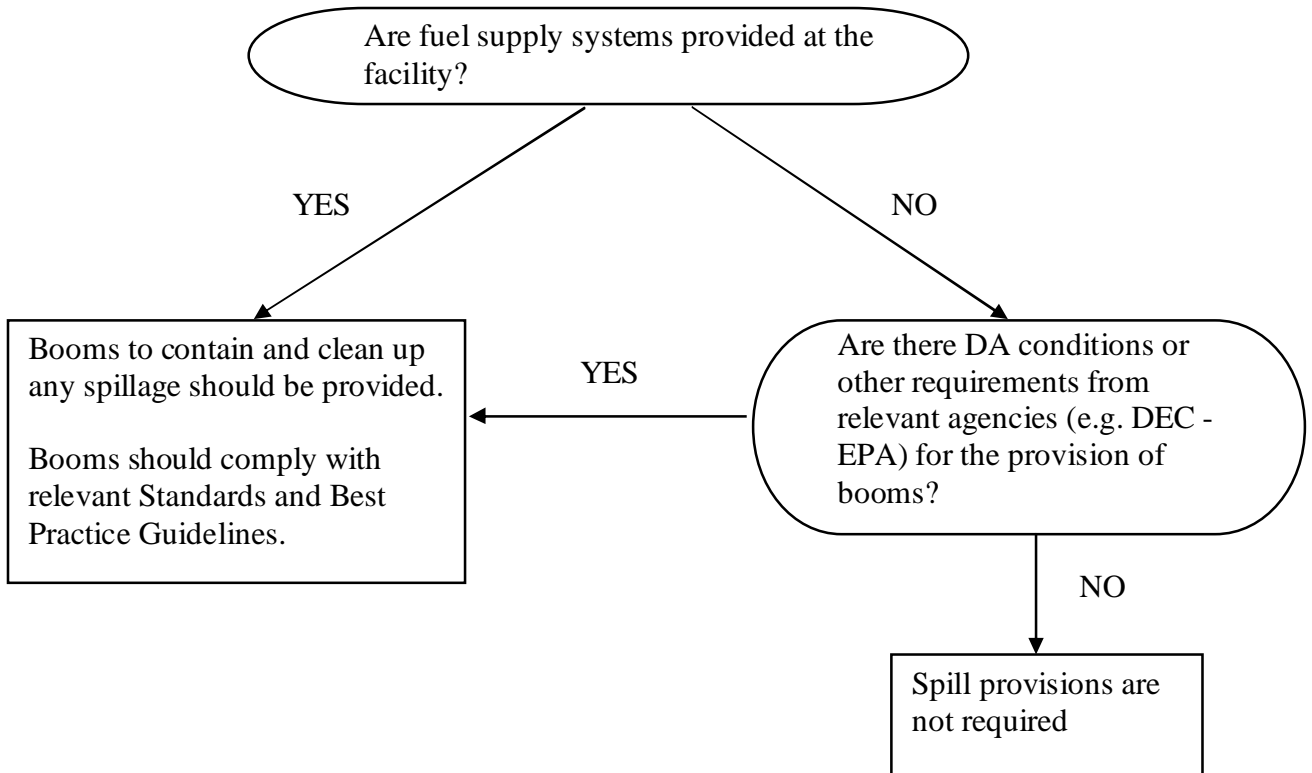
Warnings	Yes	No	Comments
No Diving			
No Swimming			
Beware of Berthing Ferry			
Electrical/Fuel Indicators			
No Fishing from Wharf			
Submarine Cables in Vicinity			
Slippery Surface			
Owners Name and Contact Nos			
Emergency Response Signage			

BOOMS FOR OIL/PETROL OF CHEMICAL SPILLAGE

Relevant References

- AS 3962 (Section 6.9)
- Relevant Standards and Best Practice Guidelines

Consideration



Example of spill provisions

**APPENDIX D: CONDITION ASSESSMENT
CHECKLIST/COMMENTARY**

INTRODUCTION

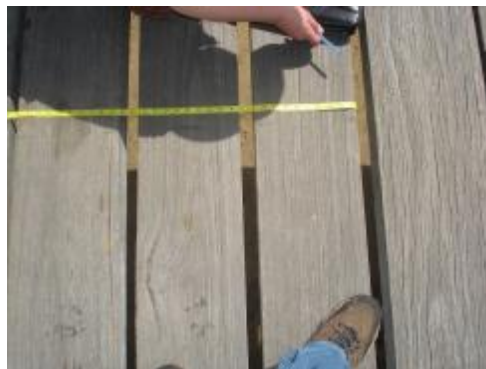
The commentary / checklist below is a guide only and is not exhaustive. Every wharf, pontoon or structure is different, however the common points to look for have been listed below.

1. ACCESS POINT AND MAIN WALKWAY

1.1 Deck – Trip Hazard

Timber Deck

- § inspect deck planks for splits, rotting and holes;
- § check gaps between deck planks are not be greater than 10mm, and vertical rise/fall between planks should not be greater than ± 5 mm so as not to create a trip hazard.;
- § check no deck spikes (connections to girders below) protrude above deck level; and
- § check deck planks bear evenly on girders below.



Gaps greater than 10mm may create a trip hazard

Concrete Deck

- § inspect concrete deck above and below for cracking and sagging of the deck and exposure of steel reinforcement;
- § check for concrete delaminating and creating a trip hazard; and
- § check for joints in the concrete deck that may allow wetting of the supporting timber below.

Steel Connections

- § inspect holding down rods and U connectors for corrosion, damage and whether any are missing;
- § check tie rods between piles;
- § check bolt connections to see if they have become loose or are missing a nut; and
- § check the extent of corrosion. Bolts should be replaced where they are delaminating significantly (steel/rust peeling from the bolt) or where about one third of the original cross-section of the bolt is lost.



Loss of cross-section evident from this corroded pile/headstock connection



Bolts beginning to delaminate



Delaminating bolt connection

Timber Girders/Headstocks

- § check members have even bearing. Uneven bearing can cause extra stresses in members and reduce design life. Packing with HDPE strips is often an effective solution;
- § inspect for splitting, rotting and holes;
- § check timber member is not hollow by hitting the member with a hammer and listening for a hollow sound;
- § check alignment, deformation, sagging and cracking of members; and
- § inspect for termite infestation with signs of wood damage and mud leads (mud-like tubes that usually run horizontally). Refer photograph. Where termites are suspected, termite presence should be confirmed by a pest inspector.



Girder bearing unevenly on headstock



Headstock bearing unevenly on pile



Horizontal mud leads evident of termite presence

Concrete Girders/Headstocks

- § check for rust stains providing evidence of reinforcement corrosion;
- § inspect for cracking, spalling and flaking of concrete surfaces;
- § check for areas of exposed reinforcement;
- § inspect for the alignment, straightness and deformation of girders and headstocks;
and
- § inspect construction and expansion/contraction joints for separation, accumulation of rubbish/debris and breakdown of expansion/contraction material.

Bracing

- § check timber cross-bracing for splitting, rotting and holes; and
- § inspect connections for corrosion, damage and whether any are missing.

1.2 Piles – Vertical and Raker Piles

Timber piles

Visual inspection of piles from the deck and from a boat:

- § Inspect piles at low tide for signs of necking (hour-glass shape of pile with the diameter reduced in the intertidal zone.) If piles have lost greater than 15-20% of their original diameter (eg. 300mm diameter reduced to approximately 250mm), then an appropriately qualified and experienced engineer specialising in maritime structures should be engaged to advise on the structural adequacy of the deteriorated pile;
- § check piles for holes, splits and rotting;
- § inspect headstock connections;
- § check alignment of pile;
- § check for breakdown/deterioration of pile sleeves/splice; and
- § pile tops – inspect for decay, rot or splits.

Underwater diver inspections of piles should be undertaken every three years by an experienced diver.



Examples of piles and necking (hour-glass shape)



Splits in the top of a pile allows water to infiltrate and often cigarette butts get inserted into the splits which could create a safety hazard.

Steel piles

- § inspect for deterioration of pile;
- § check condition of protective coating;
- § check gusset plates, chafing bars and stiffeners for signs of buckling, cracking, separation or corrosion;
- § check welds for cracking or other signs of distress; and
- § Inspect the surface of metal for corrosion. Where corrosion appears significant, ultrasonic thickness testing may be required to determine the amount of steel remaining. Painting / protection may be required or piles replacement.



Steel pile with some corrosion

Previously Repaired Piles

- § inspect piles that have been wrapped with an impermeable membrane for slippage of jacket, seal placement and performance, jacket overlap, marine growth, new borer/worm activity;
- § inspect epoxy encapsulated piles for headstock connection, steel sleeve condition, pile position, epoxy performance on top surface of sleeve, pile condition worm activity;
- § check concrete encapsulated piles for concrete erosion, and condition, headstock condition, pile condition above encasement; and
- § check steel jack-up piles protective coating, weld at inner and outer steel tube connection, steel stub condition and position, and epoxy performance at bearing to existing pile stump.

Handrails

- § inspect connections at base and secure joints;
- § inspect corrosion of metal handrails particularly handrails installed on low level platforms subject to splash and immersion. Handrails should be replaced or repaired where there are holes in the handrails and / or stanchions; and
- § inspect the sturdiness of the handrail – displacement should be minimal.



Corroded connections at the base of the handrail.

2. BOARDING /BERTHING AREA

Berthing Piles

- § check that berthing piles impact on rubber fenders (where installed);
- § check piles are not loose; and
- § inspect paint on top section of timber fender piles.

Rubbing Strips

- § check length of rubbing strips extend from -0.5m CD to +3.5m CD to allow for berthing vessels at extreme tides with waves.
- § check steel connections do not protrude from timber – this could damage a vessel;
- § check timber rubbing strips for splitting or rotting.

Rubber Fenders

- § check that rubber fenders completely bear on the wale / fender pile;
- § check the rubber for cracking, laminar separation (the rubber splitting into parallel layers), perishing, loss of pliability, and surface crazing (myriad of small cracks on the surface of the rubber);
- § check for corrosion, loss of section and wearing of fender chains and rods.



Rubber fender not fully bearing on wharf wale and fender chain corroded.

Stairs

- § check chocks (packer blocks under step planks) are not rotting; and
- § check adequate painted or coloured tape markings are provided along the edges of the stairs and if they have faded.

Low level landings or steps

- § check for loose planks or timber members;
- § check anti-skid treatment covers all landings or steps that are in the intertidal and splash zone; and
- § check adequate painted or coloured tape markings are provided along the edges of the steps and if they have faded.
- § check for marine growth



Stairs with patchy antiskid treatment and some marine growth.

Mooring Cleats/Bollards

- § inspect for corrosion of holding bolts to cleats/bollards (potential to fail under berthing line load, see steel connections). The possibility of the cleat/bollard being thrown onto vessel with damage to vessel and injury to persons should increase the risk/priority rating selected; and
- § inspect wear and corrosion on cleat/bollard, especially where mooring ropes are applied.



Corroded mooring cleat and bollard.

3. FLOATING PONTOON

Waling

- § inspect waling for splitting and rotting;
- § inspect connections; and
- § inspect there are no trip hazards such as a gap greater than 10mm between the wale and the pontoon deck.

Rubber Fendering

As per 'Rubber Fenders' in BOARDING / BERTHING AREA Section.

Aperture Plates

- § check for corrosion of aperture plates;
- § check connections; and
- § check even bearing.

Aperture Protection

- § check for corrosion and stability, similar to steel handrailing.

Access Ladders

- § check for build up of marine growth; and
- § check for compliance – refer **Appendix C - Stage B Safety Risk Assessment Flow Charts**.

Manhole Covers

- § check that the cover does not create trip hazard;
- § check for corrosion, damage, stability; and
- § check that the cover does not have holes or ingress points for water.

Hydraulic Supports

- § inspect for corrosion.



Example of hydraulic supports

4. GANGWAYS

For all gangways:

- § inspect the connection of the gangways to the abutment;
- § inspect safety chains to the gangway; and
- § inspect transition plates from gangway to pontoon and from land to gangway – check no trip hazards are present, and for wear of rubbing strip underneath.

Steel Gangways

- § check corrosion of bottom section exposed to sea spray or likely to collect water in hollow sections.



Corroded sections of bottom steel member of gangway

Aluminium Gangways

- § check all sections for signs of damage, cracks, failure of the welds.

5. SEATING/SHELTER AREA

Roofing

- § check roof sheeting for corrosion and holes; and
- § inspect connections for corrosion, damage or whether any are loose or missing.

Seating

- § check the base connections to the deck.

6. SERVICES

For all services:

- § inspect for continuity of service conduit / pipe;
- § check connections for damage, tightness, whether any are missing; and
- § inspect positioning of service is high up within the structure and fixed to element of the structure (not sagging down freely towards the tidal zone).

Fuel

- § check for leaks.

Water

- § check for leaks.

Sewerage

- § check for leaks.

Power Cables

- § inspect conduits and connections for damage, corrosion and wear; and
- § check no exposure of live wires.

Telecommunications

- § inspect corrosion of conduits, connections and exposure of live wires.



Exposed wires are unsafe

7. OTHER

Inspect all other structure specific elements, checking for wear, damage, corrosion, infestation, adequate connections, and the adequate operation of any moving parts.

**APPENDIX E: METHODOLOGY FOR COMPLETION OF
INSPECTION REPORT**

INTRODUCTION

This section of the Procedure provides some assistance to the owner/operator of the public ferry wharf when completing the forms comprising the Inspection Report for each of the five stages (*Stage A to Stage E inclusive*).

The methodology described below should be adopted as much as possible.

INSPECTION DETAILS

Indicate the wharf name, street address and classify the structure into one of the following categories:

- | | |
|-------------------|---|
| Fixed wharf: | a structure fixed to and parallel to the foreshore (<i>or jetty</i>) alongside which vessels may lie to load or unload cargo, passengers etc. |
| Floating pontoon: | a stable, floating platform restrained by guide piles or anchors which can be accessed via a gangway. |
| Access ramp: | a structure which provides pedestrian access between a walkway or shore and a floating structure or vessel. |

Examples of each type of structure are shown below:



Example of a Fixed Wharf structure



Example of a Floating Pontoon structure



Example of an Access Ramp (*gangway*)

If the structure does not fit into the types provided above, provide a general description of the structure.

Also indicate the date of inspection, the date of the last inspection conducted on the structure, the name(s) of the person(s) conducting the inspection and corresponding designation(s), and the company or operating body responsible for the structure.

STAGE A – CONDITION ASSESSMENT

The purpose of this stage of the Inspection Report is to assess the condition of each element and associated connections of the structure.

Where it is determined that the condition of these items are unacceptable then this means the element could be at risk of failure or a safety hazard and the owner/operator is alerted that action is required to remedy this.

For each item, fill out the corresponding fields. Note that items including Safety Fencing, Lighting, Edge Marking and Tactile Marking should also be assessed for compliance within **Stage B – Safety Compliance and Risk Assessment**.

Condition

For each of the items listed, indicate whether the main elements (*e.g. deck planks*) and the associated connections (*e.g. deck spikes connecting the deck to the girder*) are in a *good, fair or poor* condition (*or not applicable*). See below for a guide in classifying the condition of the item:

Good:	no visible damage or wear and tear
Fair:	some wear and tear but otherwise in an acceptable condition
Poor:	unacceptable damage or wear and tear

Risk/ Priority

Indicate the level of risk to health and safety associated with the provision of the item and its condition if provided. The priority, or level of urgency, for the action to be carried out is directly related to the level of risk.

Risk can be defined as a combination of the probability of a hazard occurring and the magnitude of the consequences of the occurrence. The consequence relates to the adverse impacts or harm resulting from the hazard identified.

The hazard could include a failure of the item (*e.g. handrailing collapsing*) which has the potential to lead to an adverse health and safety incident (*e.g. a person falling off the structure into the water*).

The probability ranking ranges from almost certain that an adverse incident will occur to practically impossible that the incident will occur.

The consequences ranking ranges from a small impact (*e.g. minor inconvenience*) to a very large impact (*e.g. fatality*).

The following Risk Matrix can be used to assess the risk/priority associated with each item:

Risk Matrix					
Consequences of Occurrence					
	Severe (fatality or permanent illness/ injury)	High (long term or serious illness/ injury)	Moderate (Medical attention needed)	Low (first aid needed)	
Likelihood of Occurrence	Very likely	1	1	2	2
Likely	1	1	2	3	
Unlikely	2	2	2	3	
Very Unlikely	2	3	3	3	

1 – **High** risk
2 – **Medium** risk
3 – **Low** risk

EXAMPLE 1: The seating provided at a particular fixed wharf is in a fair condition (*some wear and tear*). It could be considered that it is unlikely that there would be an adverse health and safety incident (*e.g. seat collapsing*) as a result of this wear and the consequences would be low.

For this scenario the risk associated with this item would be Low (3).

EXAMPLE 2: The berthing piles located at the boarding/berthing area of a floating pontoon are in a poor condition as they are extensively covered with marine life (*e.g. barnacles, oysters etc*). It could be considered that it is likely that someone will come into contact with the piles while boarding a vessel. The consequences of coming into contact with the piles have the potential to be moderate (*severe cuts to hands/body, possibility of infection*).

For this scenario the risk associated with this item would be Medium (2).

Comments

This column provides the opportunity to record comments on condition of the item.

Action

Detail any required action identified after the inspection of the item to bring the level of risk to health and safety to an acceptable level. This might include repairing, replacing or - if the item is not provided - installing the health and safety provision. It might also mean making alterations to the item to ensure it is compliant with the relevant standards, codes or guides.

STAGE B – SAFETY COMPLIANCE AND RISK ASSESSMENT

The purpose of this stage of the Inspection Report is to identify the provisions associated with the structure that are related to health and safety minimisation, and to provide an assessment of the adequacy of these provisions in managing risk.

For each item, fill out the corresponding fields:

Required?

Indicate if the specified item is required or not based on the **Flow Charts** provided for each item (*refer Appendix C*).

Condition

If the item is provided at the structure, indicate whether it is in a *good, fair* or *poor* condition. See below for a guide in classifying the condition of the item:

Good:	no visible damage or wear and tear
Fair:	some wear and tear but otherwise in an acceptable condition
Poor:	unacceptable damage or wear and tear

Compliance?

Indicate whether the item is compliant or not, based on the requirements described on the **Flow Charts** for each item (*refer Appendix C*). If one or more of the requirements of the item is not satisfied, then the entire item is not compliant.

Risk/Priority

Indicate the level of risk to health and safety associated with the provision of the item and its condition if provided. The priority, or level of urgency, for the action to be carried out is directly related to the level of risk.

Risk can be defined as a combination of the probability of a hazard occurring and the magnitude of the consequences of the occurrence. The consequence relates to the adverse impacts or harm resulting from the hazard identified.

The hazard could include a failure of the item (*e.g. handrailing collapsing*) which has the potential to lead to an adverse health and safety incident (*e.g. a person falling off the structure into the water*).

The probability ranking ranges from almost certain that an adverse incident will occur to practically impossible that the incident will occur.

The consequences ranking ranges from a small impact (*e.g. minor inconvenience*) to a very large impact (*e.g. fatality*).

The following Risk Matrix can be used to assess the risk/priority associated with each item:

Risk Matrix

		Consequences of Occurrence			
		Severe (fatality or permanent illness/ injury)	High (long term or serious illness/ injury)	Moderate (Medical attention needed)	Low (first aid needed)
Likelihood of Occurrence	Very likely	1	1	2	2
	Likely	1	1	2	3
	Unlikely	2	2	2	3
	Very Unlikely	2	3	3	3

1 – **High** risk
2 – **Medium** risk
3 – **Low** risk

EXAMPLE: A review of the Safety Fencing flow chart indicates that appropriate handrailing is required on either side of a gangway to a pontoon that requires disabled access. The gangway is located 3-4 m over a shallow mud flat that is often exposed at low tides. The risk here is that a user of the structure might fall off the gangway onto the mud flat below.

Scenario 1 - No handrailing provided along the gangway.
It could be considered likely (or even very likely) that someone would fall off the gangway in this case. The consequences of falling off the gangway could be considered high (or even severe) as you would expect that a fall of 3-4 m onto the solid mud flat would result in a serious injury or even death (for example, if the person landed on their head).

For this scenario the risk associated with this item would be High (1).

Scenario 2 - Handrailing provided, however it is lower than the recommended standard.
Although the handrailing is not to standard, it is at least provided in this case and so it could be considered unlikely that someone would fall off the gangway. Again, the consequences of falling off would be high.

For this scenario the risk associated with this item would be Medium (2).

Where an item is not provided for, the level of risk should be assigned as *high*.

Comments

This column provides the opportunity to record comments on condition of the item.

Action

Detail any required action identified after the inspection of the item to bring the level of risk to health and safety to an acceptable level. This might include repairing, replacing or - if the

item is not provided - installing the health and safety provision. It might also mean making alterations to the item to ensure it is compliant with the relevant standards, codes or guides.

NOTE:

The safety provisions under **Section B5** are not required to be provided by any standards or codes at this stage. However, the owner/operator should consider implementing these provisions with the aim to improve public safety.

STAGE C – WHARF INFORMATION

1. Description of Structure

1.1

Provide general dimensions for the footprint (*length and width*) and the deck level of the structure in metres relative to Australian Height Datum (*AHD*).

1.2

Describe the material/s used for each of the main elements of the structure (*e.g. wood, concrete, steel etc*).

2. Historical Information of Structure

2.1

Classify the structure into the relevant age category for when it was originally constructed.

2.2

Indicate if the design/construction drawings and associated documentation for the structure is readily available.

2.3

Provide details of any recorded incidents of damage to the structure since its construction. This should include (*if known*) the date of when the damage occurred, how the damage occurred, the degree of damage, and the resulting action taken (*i.e. repairs undertaken*).

2.4

Provide details of all maintenance undertaken on the structure since its construction. This should include (*if known*) the date of each maintenance event and other relevant details.

2.5

Provide details of any improvements undertaken of the structure since its construction. This should include (*if known*) the date on which each improvement was undertaken and the type and scale of the improvement.

3. Surrounding Land Uses

Provide details of the land uses adjacent and within the vicinity of the structure. This might include the designated land zoneage (*e.g. residential, commercial, industrial, open recreational space etc*), the ownership of the land (*freehold, government, crown land*), the density of nearby buildings/structures (*if applicable*) and any noticeable feature (*e.g. utility, train/bus station etc*).

4. Site Conditions

Provide brief details on the site conditions in the vicinity of the structure, including the features described below. Any supporting drawings or data that are available can be attached to the report and referred to on the Inspection Report form.

Area Topography

Describe the general nature of the existing ground level landwards of the structure (*e.g. flat, hilly etc.*).

Bathymetry

Describe the general nature of the bathymetry surrounding and beyond the structure (*e.g. depth of water at seaward end of structure, bed gradient etc.*).

Water Level Variation

Provide astronomical tidal planes for the location related to Australian Height Datum (AHD). Also include the predicted water level at the location during a 1 in 50 year storm event taking into account barometric effects, wind setup and wave setup.

Foundation Conditions

Provide details of the condition of the material that the structure is founded upon. This might include a classification of the overlying soil, and the depth to stiff clay or rock.

Exposure to Wind, Waves and Currents

Describe the degree of exposure the structure normally experiences to wind, waves and currents.

Services

Describe the services present in the vicinity of the structure. Types of services might include water, power, sewerage, fuel and telecommunications.

Area of Approach for Vessels

Comment on the area available for vessels to berth at the structure including size, shape and any obstacles that need to be maneuvered around.

5. Access

A5.1 – A5.2

Provide details of all access points from the land (*transition to structure*) and water (*berthing features*).

STAGE D – USAGE DETAILS

1. User Details

1.1

List the types of vessels and indicate the total number of each vessel type using the structure on a regular basis.

1.2

Indicate how often the structure is usually utilised by vessels.

1.3

Provide details (*if applicable*) on the operating times (*and dates*) associated with regular ferry services conducted from the structure. Also note any conditions on ferry services (*e.g. passenger limits etc.*).

1.4

Indicate the main types of users of the structure (*e.g. general public – e.g. Sydney Ferries, charter groups*). If the structure services more than one type of user, select multiple options.

1.5

Indicate whether or not the structure caters for vehicular access onto the structure. If it does not, **Item 4** is not applicable.

2. Usage Limitations

2.1

If the structure has any formal or informal loading limitations, indicate these limits for vessels, vehicles or other (*specify*) in tonnes or kPa.

Formal loading limitations might be in the form of conditions placed on the structure during the approvals phase or as ordered after construction by a regulatory authority. Loading limitations might also have been stipulated within the design drawings or documentation. Informal loading limitations might be in the form of temporary signage advising of recent damage/problems.

2.2

Indicate whether or not disabled access to the structure has been provided or not. If formal disabled access is provided, indicate whether this is assisted or unassisted access.

3. Details of Largest Vessel

3.1

Indicate the type of the largest vessel that uses the structure.

3.2

Indicate the dimensions (*length, width, height and draft*) of the largest vessel that uses the structure in metres.

3.3

Indicate the weight/displacement of the largest vessel that uses the structure in tonnes.

3.4

Indicate the maximum approach velocity likely to be associated with the largest vessel to berth at the structure.

This velocity can be estimated by referring to **Table D.1** of the Inspection Report taking into account the vessel class, tonnage range and exposure conditions within the berthing zone.

4. Details of Vehicles Accessing Structure

4.1

Indicate the types of vehicles that access the structure (*e.g. cars, buses, trucks, cranes, or other*).

4.2

Indicate the dimensions (*length, width and height*) of the heaviest vehicle that accesses the structure in metres. Also include the number axles as well as the wheel and axle spacing.

4.3

Indicate the weight of the heaviest vehicle that accesses the structure in tonnes in its loaded and unloaded condition.

4.4

Indicate the turning circle for the longest vehicle accessing the structure in metres.

5. Information Services

Indicate, where appropriate, any information services that are provided at the structure as part of the ferry services.

STAGE E– STRUCTURAL INTEGRITY ASSESSMENT

The purpose of this stage of the Inspection Report is for the assessor (*or an appropriately qualified and experienced engineer specialising in maritime structures*) to obtain the minimum and overall dimensions of each element of the structure, in order that they can be assessed for structural integrity by an appropriately qualified and experienced engineer specialising in maritime structures.

1. Load Classification

1.1

Classify the structure in terms of its expected maximum vertical loading.

The appropriate loading Class can be determined by referring to **Table E.1** in **Appendix G** and taking into account the expected maximum vertical load (*uniformly distributed load or concentrated load, whichever is larger*). This load can be estimated from information on the anticipated load conditions and the application/usage of the structure (*refer Item 3.4 of Stage D*).

1.2

Indicate the maximum horizontal loading that is expected at the structure.

The expected maximum horizontal load due to vessel impacts (*bollard capacity*) can be determined from **Table E.2** in **Appendix F** taking into account the displacement (*tonnage*) of the largest vessel accessing the structure (*refer Item 3.3 of Stage D*). .

The total maximum horizontal loading for the structure is a combination of the loading from vessel impacts and any other horizontal forces identified.

2. Structural Dimensions

2.1 – 2.3

Complete the section that is appropriate for the type of structure being assessed, that is:

2.1: Fixed Wharf Structures **OR**

2.2: Floating pontoons **OR**

2.3: Access Ramps

For each of the structural elements comprising the structure (*2.1, 2.2 or 2.3*), undertake the following:

1. Indicate the minimum dimensions in millimetres necessary for the appropriately qualified and experienced engineer specialising in maritime structures to assess the element against loading standards. The typical dimensions to be recorded are listed in the Stage E form.

For grade F17 hardwood decking, dimensions can be checked against the Guideline for Structural Adequacy of Decking Timbers as shown in **Table E.3** in **Appendix F**.

2. Provide any element specific information that the assessor considers might be relevant, in the additional blank lines on the Stage E form. Such information could relate to any cracks, splits, holes, notches, damage, rot, pest infestation, etc. present in each element. The completed form should provide full details including a brief description, full dimensions and preferably a sketch and/ or photographs.

Where it is determined that the dimensions of the element are unacceptable then this means the element could be at risk of failure or a safety hazard and the owner/operator is alerted that action is required to remedy this.

**APPENDIX F: WHARF LOADING CRITERIA
AND GUIDELINES**

TABLE D.1
BERTHING VELOCITIES – VESSELS < 1000 TONNES

Vessel Class	Tonnage Range	Exposure Conditions	V_n (m / sec)
Private Vessels	Up to 10 tonnes	Mild ¹	0.20
		Moderate ²	0.25
		Severe ³	0.30
Private Vessels	Over 10 tonnes	Mild	0.15
		Moderate	0.20
		Severe	0.25
Commercial charter / cruise vessel	Up to 1000 tonnes	Mild	0.20
		Moderate	0.25
		Severe	0.30
Ferries	Up to 100 tonnes	Mild	0.30
		Moderate	0.35
		Severe	0.40
Ferries	Over 100 tonnes	Mild	0.25
		Moderate	0.30
		Severe	0.35

1. 'Mild' exposure has current speeds less than 0.5 knots; fair weather prevailing wind speeds less than 10 knots; and wave height less than 10% of the moulded draft of the design vessel.
2. 'Moderate' exposure has current speeds between 0.5 knots and 1.0 knot; or fair weather wind speeds between 10 knots and 15 knots; or fair weather wave heights between 10% and 20% of moulded depth of vessel.
3. 'Severe' exposure is when the environmental conditions exceed any of the current wind or wave conditions for a moderate exposure.

TABLE E.1: VERTICAL LOADING CLASSIFICATIONS

Class	Uniformly Distributed Load (Q)	Concentrated Load (Area mm)	Anticipated Load Conditions	Application
Cl. 5a	5.0 kPa	2.0 kN	Light pedestrian traffic areas	Private and public boardwalks. Passenger jetties. Marine approach jetties.
Cl. 5b		4.5 kN	Pedestrian loading only	
Cl. 5c		20.0 kN (150x150) $s = 1.8$	Pedestrian crowd load and light motor vehicles up to 3 tonne tare	
Cl. 10	10.0 kPa	45.0 kN (300x150) $s = 1.8$	Small emergency (fire tender) vehicles.	Public boardwalks and promenades with access for emergency vehicle and service vehicles.
Cl. 15	15.0 kPa	200.0 kN (400x700) $s = 4.0$	Bridge design code (excl heavy lift platforms). Small mobile crane up to 20 tonne SWL.	Light duty wharf and jetty for fishing industry, charter boat industry, ferry wharfs, light commercial activities.

Source: DR 02536 – Guidelines for design of maritime structures (*Draft*)

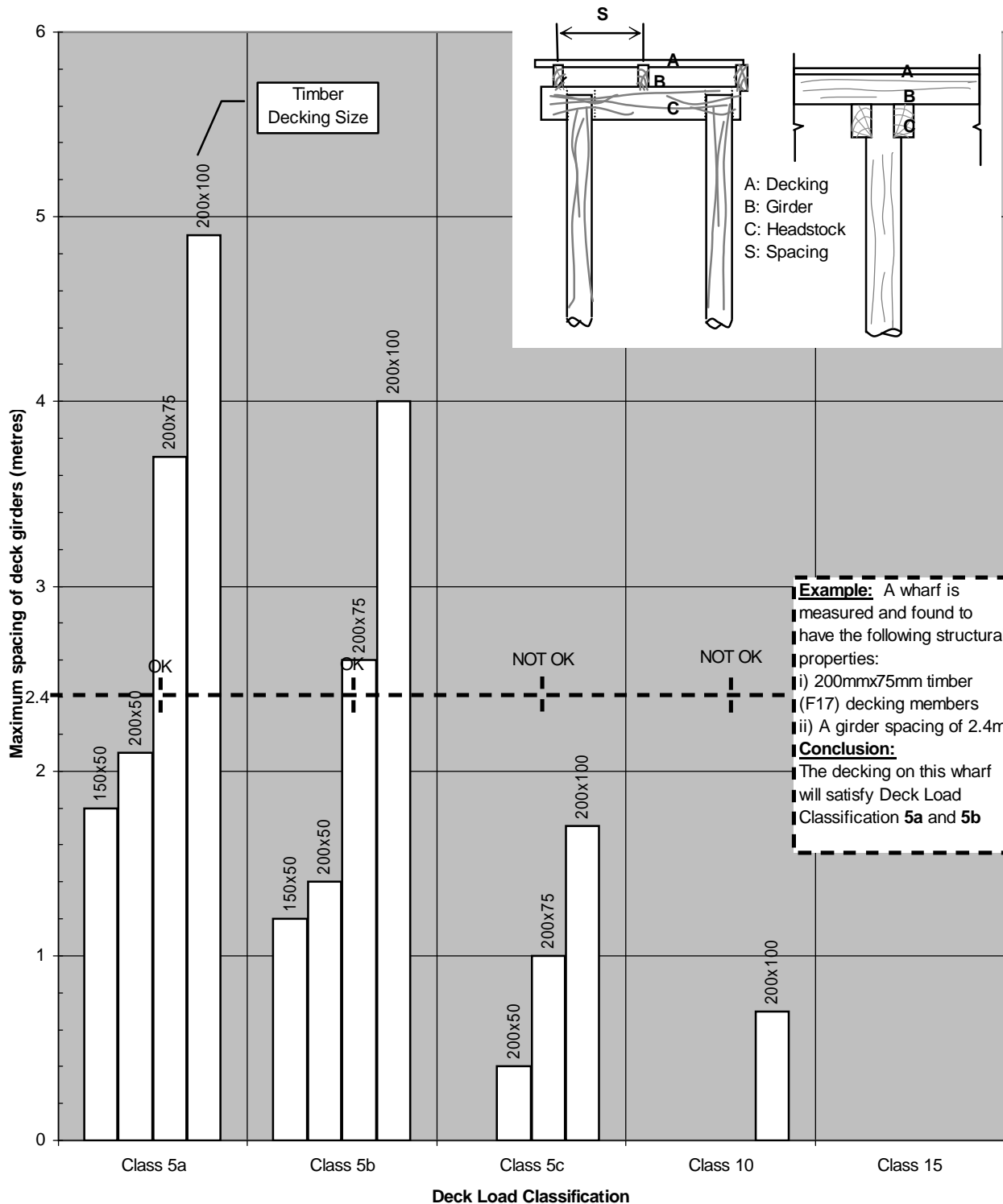
Notes:

1. s = spacing (metres) in any direction between concentrated loads, or between concentrated loads and the edge of uniformly distributed loads. Concentrated loads and uniformly distributed loads should not be superimposed.
2. These loads do not include any component for dynamic effect (rolling 'impact', or heavy landings of cargo loads).

**TABLE E.2
MOORING FORCES FOR SHELTERED CONDITIONS**

Vessel Displacement (Tonnes)	Bollard Capacity KN
Up to 50	50
50 to 200	100
200 to 1000	200
1000 to 10,000	300

Table E.3 - Guideline for Structural Adequacy of Decking Timbers (Grade F17)



Notes:

- 1) Maximum girder spacing for Class 5a and 5b are determined by deflection limits
- 2) Maximum girder spacing for Class 5c, 10 and 15 are determined by strength limits
- 3) These guidelines were produced using the following assumptions:
 - a) Deck members are F17 hardwood
 - b) Applied design loads are of 5 minutes duration