MID WEST PORTS

TECHNICAL GUIDELINE

MWPA100 – GENERAL GUIDELINES

Version	Revision Date	Details	Prepared By	Authorised By
Rev 0	10/10/2013	Document Approved for Use	I. McLeod	P. Blundell
Rev 1	11/08/2014	Updated Format	S. Good	I. McLeod

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1 PREFACE

The document set making up the MWPA Technical Guidelines has been developed for the Mid West Ports Authority (MWPA) to provide guidance on the engineering and technical aspects relating to assets and infrastructure owned, operated or under the control of the Mid West Ports Authority. The intended users of the MWPA Technical Guidelines include developers, designers, contractors, maintenance personnel and inspectors undertaking new developments, upgrades, refurbishments, repairs or maintenance activities on land owned or controlled by MWPA. These include areas within the Geraldton Port, Fishing Boat Harbour and adjoining leased land which is owned or controlled by MWPA. These guidelines do not apply at the Oakajee Port or the Useless Loop and Cape Cuvier facilities.

The MWPA Technical Guidelines include methods and guidance on the statutory requirements; standards and codes of practice; MWPA health, safety, environment, quality and operational policies and procedures; local conditions; port assets; and quality assurance requirements applicable to projects undertaken at the Geraldton Port. These guidelines refer to, and draw heavily on, the standards, manuals and codes of practices for design and construction relevant to the discipline covered by each guideline as were considered best practice at the time of writing. The discipline specific guideline should be referred to for more detailed information.

The MWPA Technical Guidelines are to be used as a basis for identifying shortcomings, and ultimately accepting or rejecting, proposed, underway or completed projects in areas owned or controlled by MWPA.

Figure 1: Geraldton Port Past and Present

2 BACKGROUND

2.1 ABOUT THE PORT

The Geraldton Port is a large and complex port infrastructure and marine service provider located 424 kilometres north of Perth, in the Mid West region of Western Australia.

As well as the Geraldton port, the Mid West Ports Authority has responsibility for the Geraldton Fishing Boat Harbour (FBH). Mid West Ports Authority is the relevant authority for the proposed Oakajee Port.

In February 2012, the State Government announced plans to undertake the biggest reform of the State's ports in decades. Under the plan, the seven regional port authorities, together with the 13 commercial ports currently controlled by the Department of Transport (DoT), are in the process of being consolidated into five single port authorities. Namely four adjusted regional Port Authorities; Southern, Mid West, Pilbara and Kimberley; with Fremantle Port Authority to remain separate.

The Mid West Ports Authority has assumed responsibility for the two existing Ports that are listed following. The implementation is occurring in a staged manner and the Cape Cuvier and Useless Loop incorporation is presently a work in progress.

- Geraldton Port Authority, comprising
  - Geraldton port,
  - Geraldton Fishing Boat Harbour (FBH), and
  - Oakajee port.
- Carnarvon Port, comprising
  - The Cape Cuvier facility, and
  - The Useless Loop facility.

Accordingly, Mid West Ports Authority will fall within the areas of four different local governments, namely:

- The City of Greater Geraldton - Geraldton Port.
- The Shire of Chapman Valley - Oakajee Port.
- The Shire of Shark Bay - Cape Cuvier facility.
- The Shire of Carnarvon - Useless Loop facility.

2.2 GERALDTON PORT INFRASTRUCTURE

The Geraldton Port has been the subject of strategic state investment resulting in significant infrastructure enhancements since 2000. This includes the Port Enhancement and Southern Transport Corridor projects, and more recently the Berth 5 Iron Ore Expansion Project. As a result of the Berth 5 Iron Ore Expansion Project, MWPA's facilities include a dedicated iron ore ship loading facility at Berth 5 which handled a record 5.8 million tonnes of iron ore in 2010/11 (5.2 million tonnes in 2011/12).

The Berth 4 and 5 shiploaders are owned by the Mid West Ports Authority and operated under contract. The Berth 4 shiploader has a design capacity of approximately 1,800 tonnes/hour (dependent on cargo density and other characteristics) and the Berth 5 shiploader has a nominal iron ore loading capacity of 5,000 tonnes/hour.

Mid West Ports Authority also owns and manages the common user iron ore train unloading infrastructure. When delivering products to the iron ore storage facility at Berth 5, the train unloader has a design rate of 3,000 tonnes/hour and a limited discharge rate of 1,800 tonnes/hour when delivering to the older storage facilities at Berth 4.

In 2012 Karara Mining commissioned their port infrastructure which involves an additional rail (fourth track) into the port, a dual wagon rotary unloader, 255,000 tonne storage facility, an additional berth (Berth 7) and shiploader, together with all of the associated materials handling infrastructure.

In addition to the traditional trade in grain, iron ore, mineral sand, livestock, fertiliser and fuels, the Port regularly welcomes cruise ships, oil rig tenders, the navy and many different craft. The Mid West Ports Authority also supports Geraldton's marine industries, providing berthing and land facilities, maintenance, waste disposal and security to the local fishing, fish processing and boat building industries operating from the Fishing Boat Harbour.

Refer to the MWPA Development Guideline (**MWPA000**) for further information on the purpose and areas of application of the MWPA guidelines.

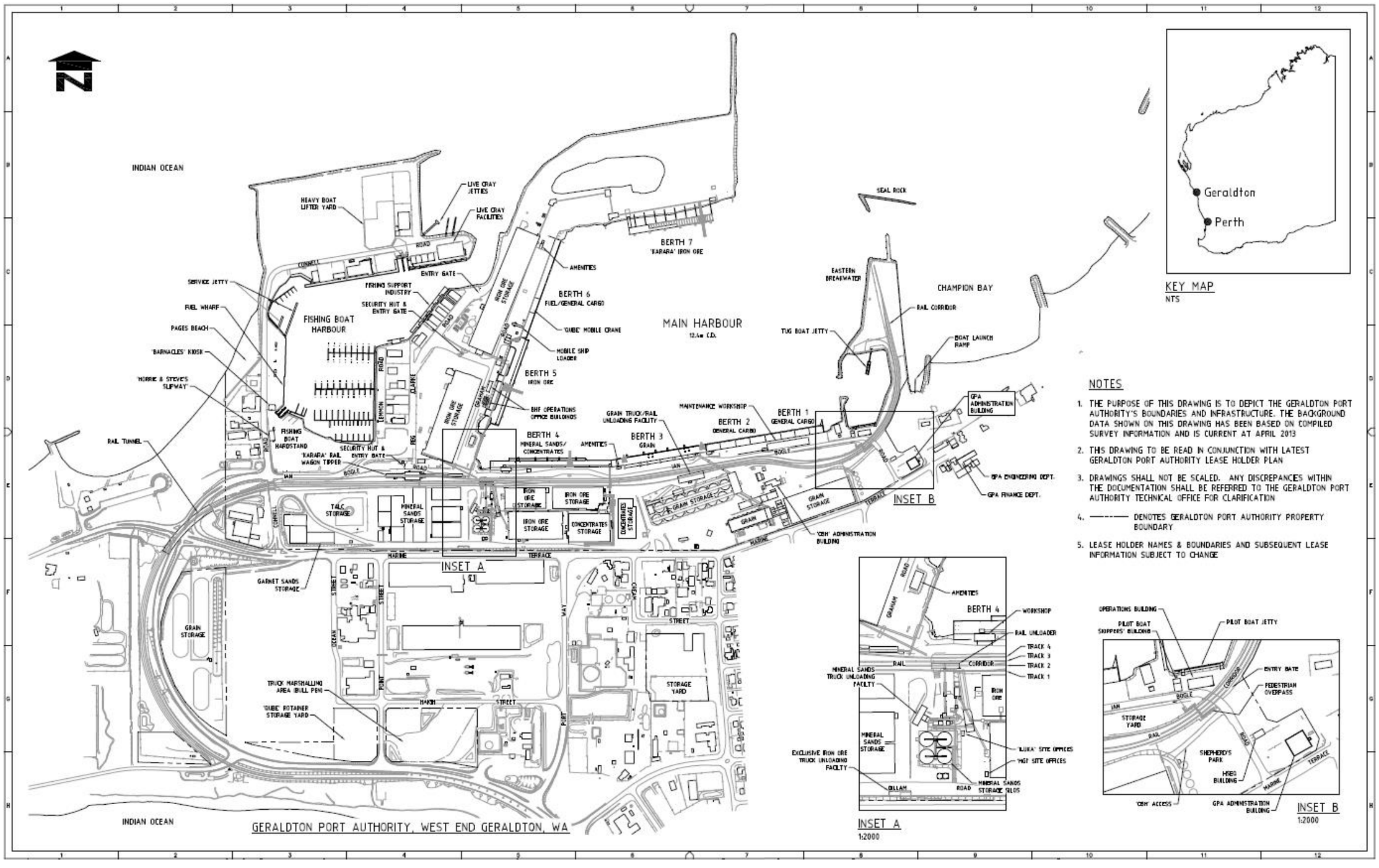


Figure 2: Port Layout Showing Features and Facilities

3 SCOPE

3.1 AIM

The MWPA Technical Guidelines provide design and construction guidelines for various projects undertaken within areas owned or controlled by MWPA, and cover a number of disciplines relating to the assets and infrastructure housed within the port controlled areas.

While the majority of infrastructure within the Port site is MWPA owned and operated, other major regulatory authorities have well-developed standards and codes of practice. Where these are considered best practice and compliant with the applicable legislation, reference is made to these documents in the Technical Guidelines.

Note: Where documents are referred to in this part of the MWPA Technical Guidelines, the reference shall be taken to mean the most recent revision, unless noted otherwise.

The Technical Guidelines list minimum requirements that should be considered. Where features of the standard design offered by the Contractor exceed or do not meet the stated requirements, the Contractor shall bring it to the attention of the Client's Representative for his approval.

This document shall be read in conjunction with the associated scope of work document, project specification and other supporting reference information schedules.

3.2 PRECEDENCE

As a general guide, where particular aspects are not covered in the MWPA Technical Guidelines or where conflict between documents exists, the following precedence for standards applies:

1. Statutory Regulations;
2. Design Codes and Standards;
3. Project Specific Specification;
4. MWPA Technical Guidelines; and
5. Other References (e.g. Recognised Industry Best Practice).

Regardless of the general order of precedence, if there is a conflict between documents the clause presenting the more conservative and pragmatic guidance will govern. If in doubt, or in all cases where noncompliance is anticipated, clarification shall be sought from the MWPA.

3.3 GUIDELINES SUBJECT FIELD

Table 1 provides an outline of the Technical Guideline series of documents. A more detailed list of the individual guideline documents developed, under development, or proposed, is included in Appendix A.

Table 1: Guidelines Master List

MWPA 000 Series	Port Development Guidelines
MWPA 100 Series	Port Technical Guidelines General
MWPA 200 Series	Port Technical Guidelines Drafting & Survey
MWPA 300 Series	Port Technical Guidelines Mechanical Engineering
MWPA 400 Series	Port Technical Guidelines Maritime Structures
MWPA 500 Series	Port Technical Guidelines Civil Engineering
MWPA 600 Series	Port Technical Guidelines Buildings and Structures
MWPA 700 Series	Port Technical Guidelines Electrical and Instrumentation
MWPA 800 Series	Port Technical Guidelines Rail Infrastructure
MWPA 900 Series	Port Technical Guidelines Additional Guidelines

The broad range of titles above address most matters encountered of a technical nature for which guidance is required relating to engineering and maintenance projects undertaken within the Geraldton Port.

3.4 REFERENCES AND LEGISLATION

3.4.1 LEGISLATION

Explanation of the legislation applicable to developments within the Geraldton Port is provided in the Port Development Guideline MWPA000.

In brief, Geraldton Port performs its functions in accordance with the Port Authorities Act (1999), which provides Geraldton Port with the powers necessary to perform its functions, including a responsibility to facilitate trade by implementing safe and efficient operations. Under the Port Authorities Act, MWPA are to control the port business and other activities for the State's economic benefit while protecting and minimising the port's impact on the environment, subject to any direction by the Minister for Transport.

3.4.2 REFERENCES

The following legislative references are provided, some of which are applicable to all areas of the port and others which apply to specific areas only. MWPA HSEQ Policies and Procedures and Guideline MWPA000 are to be referred to for further clarity on areas of influence.

Table 2: Legislative References

Item No.	Reference
1.	Planning and Development Act 2005
2.	Building Act 2012
3.	Environmental Protection Act 1986 (particular reference to Part V)
4.	Occupational Safety and Health Act 1984
5.	Occupational Safety and Health Regulations 1996
6.	Mines Safety and Inspection Act 1994
7.	Mines Safety and Inspection Regulations 1995
8.	Maritime Transport and Offshore Facilities Security Regulations 2003
9.	Rail Safety Act 2010
10.	Rail Safety Regulations 2011

Various national standards, codes of practice, industry specific standards and other best practice references are provided in the guideline documents relating to the specific field covered within each guideline.

Approval from or liaison with the following organisations may be required depending on the nature, size and complexity of the project being undertaken:

Table 3: Agencies and Regulatory Bodies

Item No.	Reference
1.	Water Corporation
2.	MRWA (Main Roads Western Australia)
3.	City of Greater Geraldton
4.	Western Power
5.	DMP (Department of Mines and Petroleum)
6.	DFES (Department of Fire & Emergency Services)
7.	DER (Department of Environment Regulation)

3.5 CONTACT INFORMATION

The following key contacts are provided in relation to activities covered by the MWPA Technical Guidelines. A list of contacts is available on the MWPA website: *www.midwestports.co*

The MWPA can be **contacted** via the following:

Administration Building:	298 Marine Terrace GERALDTON WA 6530
MWPA Postal Address:	PO Box 1856 GERALDTON WA 6531
MWPA Reception Phone:	+61 8 99 64 0520
MWPA Fax:	+61 8 99 64 0555
Email:	mail@mwpa.wa.gov.au
24Hr Emergency No.:	+61 8 9964 0500

Key personnel are listed in the following table.

Table 4: Contact List

Position	Name	Contact Details
Chief Executive Officer	Peter Klein	(08) 9964 0537
General Manager - Landside Operations	Lindsay Morrison	(08) 9964 0570
General Manager – Corporate Services	David Geldart	(08) 99640535
Engineering Manager Geraldton	Paul Blundell	(08) 9964 0593
Operations Manager (Registered Mine Manager)	Barry Underwood	(08) 9964 0527
Commercial Manager	Brad Muir	(08) 9964 0532
HSEQ Manager	Ben Mynott	(08) 9964 0565
Harbour Master	Capt. Martin North	(08) 9964 0547
Duty Pilot		(08) 9964 0505
Duty Wharf Supervisor		(08) 9964 0510
Duty Operations Supervisor		0407 797 311
Rail Operations Supervisor		0407 173 504
Port Security Officer (MSIC)	Harrison Francis	(08) 9964 0562

3.6 GLOSSARY

For the purposes of all parts of the Port Technical Guidelines the following general definitions apply:

Table 5: General Definitions

Term	Definition
Authorisation	Permission to proceed which can only be granted by the Client or the Client's Representative.
Authorities	Any statutory, public, municipal, government or administrative department, commission, authority, agency or entity with jurisdiction in connection with the WUC.
Client	Refers to Mid West Ports Authority or their representative.
Company, Purchaser, Buyer	Refers to the Mid West Ports Authority (MWPA).
Company's Representative, Purchaser's Representative or Buyer's Representative	The person/s so named in the Contract.
Company's Representative's Nominee	Means an individual appointed in writing by the Company's Representative under the Contract.
Contract	The agreement between MWPA (the Owner) and the Contractor.
Contract	The agreement between the Company and the Contractor to which the Scope of Work pertains.
Contractor, Supplier	The person/s and/or organisation/s so named in the Contract.
Design Life	Period of time the structure remains serviceable subject to fair wear and tear. Regular inspections and a reasonable level of periodic and as-needed maintenance will be required to ensure that the structure remains serviceable during its design life.
Designer	Persons or Organisation responsible for the design of a proposed project.
Developer	A person or organisation aiming to put land or infrastructure to profitable use through construction or improvements.
Drawings	Engineering plans and drawings provided by the Designer as part of a proposed project's documentation package.
Engineer	The Engineer is the person or organisation appointed by the MWPA to act in the role as determined by the contract.
Equipment	Means the goods to be supplied by the Supplier.
Execution Date	Means the date on which the Formal Instrument of Agreement is signed by the Company.
Guideline	Means this Guideline.

Term	Definition
Leaseholder	The person who pays the owner of a piece of land or a building in order to be able to use it.
May	Pertains to an act which is optional.
Owner	Means the owner of the project or asset.
Owner's Engineer	A person or organisation deemed to have the authority of MWPA to make project related decisions, give direction, make inspections and request documentation for works determined under the Contract.
Performance Defect	Means a failure of the Equipment or any part to satisfy a Performance Warranty.
Performance Test	Means a test to be carried out to determine whether the equipment or any part complies with a Performance Warranty.
Performance Warranty	A business agreement between the Client and Contractor for the Contractor to perform all of their obligations under the Contract.
Port Site	Geraldton Port.
Port Technical Guidelines	All the parts and appendices of the MWPA Technical Guideline Series of documents.
Project	Works.
Shall	Pertains to an act which is mandatory.
Vendor	A seller of goods or services.
Works	The works performed under the Contract including the supply of equipment.

For the purposes of all parts of the Port Technical Guidelines the following general abbreviations apply:

Table 6: General Abbreviations

Abbreviation	Meaning
AC	Alternating Current
AC	As Constructed
AHD	Australian Height Datum
BHF	Bulk Handling Facility
CBH	Co-Operative Bulk Handling Ltd
CR	Constructability Review
EFCPT	Electric Friction Cone Penetrometer Testing
MWPA	Mid West Ports Authority
IFC	Issued for Construction
ISPS	International Ship and Port Facility Security
ITP	Inspection and Test Plan
KML	Karara Mining Pty Ltd
LAT	Lowest Astronomical Tide
MSIC	Maritime Security Identification Card
NRCD	New RAN Chart Datum
QA	Quality Assurance
RAN	Royal Australian Navy
ROS	Rail Operations Supervisor
SiD	Safety in Design
TOC	Time of Concentration
WPC	Western Power Corporation
WUC	Work Under Contract

4 DEVELOPMENT PROCESS

The following process is applicable to developments within MWPA controlled areas. For more detail on and specific requirements relating to these steps in the process please refer to **MWPA000 - MWPA Port Development Guidelines**.

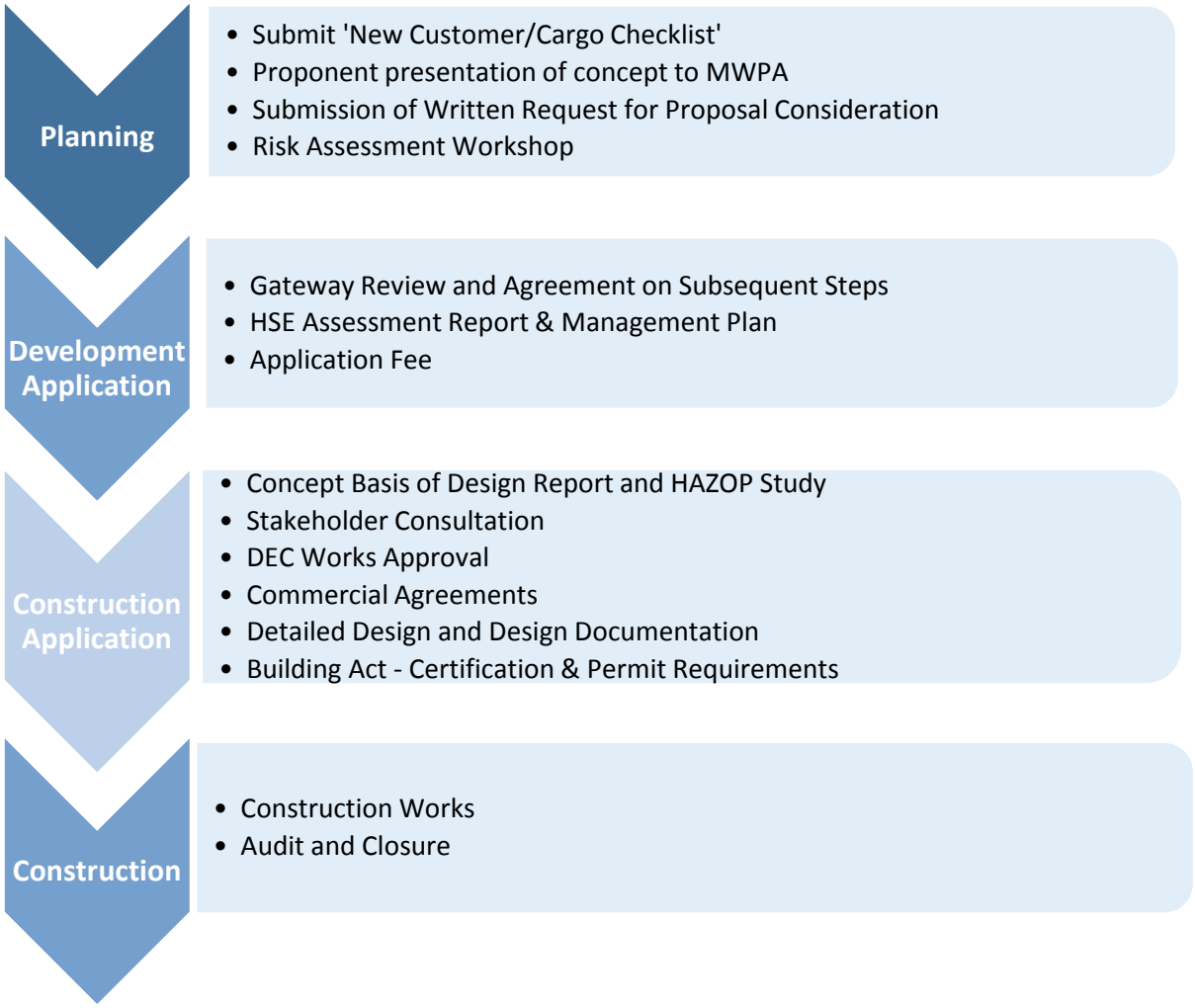


Figure 3: Development Process Flowchart

5 DEVELOPMENT APPROVALS

Section 4 of this Guideline summarises the steps in the approvals process applicable to developments within MWPA controlled areas. These steps are outlined in greater detail in Guideline **MWPA000 - MWPA Port Development Guidelines**. The majority of the approvals associated with the development process steps are outlined in the sections following. Due to the varied nature of projects this guideline could be applied to, there may be approvals requirements which are not covered in this document.

During any part of the process MWPA can inform the proponent that the development application has not been successful and the process will then be at an end. Depending on the nature of the development proposal it is possible, subject to the agreement of the parties, that several of these steps may occur concurrently or in a different sequence.

5.1 PLANNING APPLICATION

MWPA's fundamental planning requirements as outlined in Guideline MWPA000 must be met. As outlined in Guideline MWPA000, MWPA reserves the right to approve or reject the proponent's design consultants.

The steps applicable to the approvals process at the planning stage could include:

- Development Approval Application including:
  - Concept design drawings.
  - The submission of a New Customer/Cargo Checklist.
  - Submission of written Concept Design Proposal addressing fundamental planning requirements for consideration.
  - Concept Presentation by proponent to MWPA.
  - Risk Assessment Workshop.
  - Design Assessment approval.

5.2 DEVELOPMENT APPLICATION

In order to progress the development to the construction approval stage the following development application approval steps apply:

- Gateway Review and Agreement on Subsequent Steps.
- HSE Assessment Report & Management Plan.
- Application Fee.
- Proponents are required to develop the following Management Plans for MWPA approval in accordance with MWPA policies and procedures:
  - Environmental Plan,
  - Health and Safety Plan,
  - Quality Plan,
  - Traffic Management Plan,
  - Construction Execution Plan, and
  - Construction Works Marine Safety Management Plan (if applicable).

5.2.1 HV POWER SUPPLY

Where a HV power supply is required it is likely to take about 12 months to install, if the MWPA has the substation capacity to do so. However if the HV supply to the Port requires upgrading of Western Power Corporation (WPC) infrastructure, a period in excess of 12 months may be applicable. This will depend on WPC approval of the client's HV submission and the client's agreement to WPC terms of supply and costs. (This is the most probable situation for large power users requiring 500kVA or more.)

MWPA will require the client to carry out all electrical works on his lease using a MWPA approved electrical contractor. All work is to meet all relevant AS and BCA requirements. If HV is involved the installation is to meet WPC requirements.

5.3 CONSTRUCTION APPLICATION

The granting by MWPA of permission to proceed with construction does not relieve the proponent of the responsibility to obtain all other statutory or regulatory approvals and permits that may be necessary for the development. Nor does it relieve the proponent from the consequences of not obtaining or of not complying with the conditions of such other approvals and permits.

5.3.1 DESIGN DOCUMENTS APPROVAL

Not less than 45 business days prior to the date of wishing to commence any site works, the proponents must prepare and submit to MWPA for approval Design Documents, such as:

- All design documentation (including specifications, calculations, drawings and reports) in computer readable and written forms which the proponent and its consultants create in respect of the development proposal; comprising at least
  - a set of general arrangement drawings which clearly depict the size and dimensions of the relevant Works on the Site and the basis of design, including all relevant standards and concepts which underlie the design; and
  - if requested by MWPA, more detailed drawings as deemed necessary by MWPA, including where the works associated with the development affect, or are likely to affect, the provision of Port services by MWPA to other users of the Port, including the integration of the electrical and other utility systems for the Works.

In respect of the Design Documentation:

1. MWPA will either approve the Design Documentation or return the same to the proponent with comments or remarks.
2. MWPA and the proponent will consult as to the changes which may be required (if any) by MWPA, following which the proponent will submit revised Design Documentation incorporating agreed changes for approval by MWPA.

MWPA will have no liability to proponents whatsoever for any loss, damage or injury suffered by the proponent or the proponents' personnel or any contractor arising out of or in connection with any approval or direction given by MWPA, MWPA's representative or MWPA's personnel, except to the extent caused as a result of a negligent act or omission of MWPA or MWPA's personnel.

The Design Documentation must not be used for any construction purposes until it is approved by MWPA, and until any other conditions precedent to site construction are met.

5.3.2 PRE-CONSTRUCTION REQUIREMENTS

Prior to gaining approval to commence with construction, the following are required to be in place (where applicable):

- Concept Basis of Design Report and HAZOP Study
- Stakeholder Consultation
- DER Works Approval
- Commercial Agreements
- Detailed Design and Design Documentation
- Building Act - Certification and Permit Requirements

5.3.3 LEASES AND LICENCES

All leases and licences must be executed between proponents and MWPA before lease holder possession of site is possible and before any site works may commence. The MWPA Agreement must occur at Board level. Ministerial approval for Leases is required before document execution by MWPA.

5.3.4 CONSTRUCTION AGREEMENT

Before any construction may commence a Construction Agreement must be executed. The agreement shall cover all relevant Conditions of Contract, particularly in the case of large developments where modifications to port assets outside of lease boundaries are required.

5.4 CONSTRUCTION

Only following the formal granting of permission by MWPA, and all conditions precedent that are set by MWPA, being met may site works begin.

5.4.1 DRAWING REQUIREMENTS

As with conceptual drawings, construction and as-constructed drawings are important when assessing development and construction applications. The proponent must ensure that all drawings submitted to MWPA for approval are in accordance with MWPA's requirements (Refer also **Guideline MWPA200**).

Issued for Construction (IFC) drawings shall be submitted as supporting documentation of a Construction Approval Application and shall capture all information related to the construction issues, so as to facilitate its assessment.

Prior to any electrical work being undertaken on MWPA leases, the proponent will need to obtain MWPA approval for the **complete set of electrical IFC drawings**. On completion of the installation, the MWPA will require a **complete set of electrical As Constructed (AC) Drawings** which are to be updated whenever changes are made to the installation.

5.4.2 CONSTRUCTION PROGRAM

Developers must prepare and submit a Construction Program in respect of each Portion of the Works to MWPA's Representative for approval not less than 15 Business Days prior to commencing any Works in respect of that Portion of the Works, and this Program must detail the Scope of Works and a Works methodology.

For large projects the following minimum requirements will apply:

- Each Construction Program must also include an execution plan (a critical path network) in the form of a time-scaled bar chart in accordance with Australian Institute of Project Management guidelines schedule showing:
  - Key milestone dates and constraints including Commencement Date and Date of Practical Completion.
  - Scheduled delivery of materials and equipment to the Site which may impact on operations at the Port.
  - Details and location of MWPA Works (if any) to be carried out by MWPA during the Construction Program.
  - Details and location of Related Works (if any) notified by MWPA to the developer.
  - Key Hold Points related to the Inspection and Test Plan (ITP).
- Location of all activities on the Site.
- The critical path must be clearly marked.
- The Construction Program must take into account the requirements and program constraints set out in the Design Documentation.

MWPA and the developer shall consult as to the changes which may be required (if any) by MWPA, following which the developer will resubmit a revised Construction Program incorporating agreed changes for approval by MWPA **within five business days** of the date of the review.

Developers must promptly notify MWPA of any actual, proposed or likely departure by the developer from an approved Construction Program for MWPA approval.

5.4.3 CONSTRUCTION WORKS

Requirements of contractors will vary depending on the type of development being undertaken. The various construction requirements are covered elsewhere in this guideline and other discipline specific MWPA Technical Guidelines. Further guidance and requirements can be found in the applicable MWPA Policies and Procedures and National and Western Australian Statutory Authority Regulations, Standards and Codes of Practice pertaining to the undertaking of the works safely and legally.

5.4.4 AUDIT AND CLOSURE

As the construction phase of the development draws to a close various commissioning and testing activities may be undertaken in preparation for handover to operational staff. Refer to Section 12 of this Guideline for general guidance on post-construction requirements.

6 HSEQ

In the interest of ensuring site works are completed to a high standard, the safety of all personnel is ensured and no damage to equipment or property occurs during the undertaking of engineering or maintenance projects within port controlled areas, the following requirements are noted. Some or all of the requirements listed below may be applicable to a particular project and MWPA's HSEQ Policies and Procedures shall be applied to all projects.

6.1 GENERAL HSEQ REQUIREMENTS

The following resources are referenced to assist with location and compliance with MWPA specific HSEQ requirements. The MWPA website *www.midwestports.com.au* is an efficient avenue for accessing the relevant HSEQ documentation:

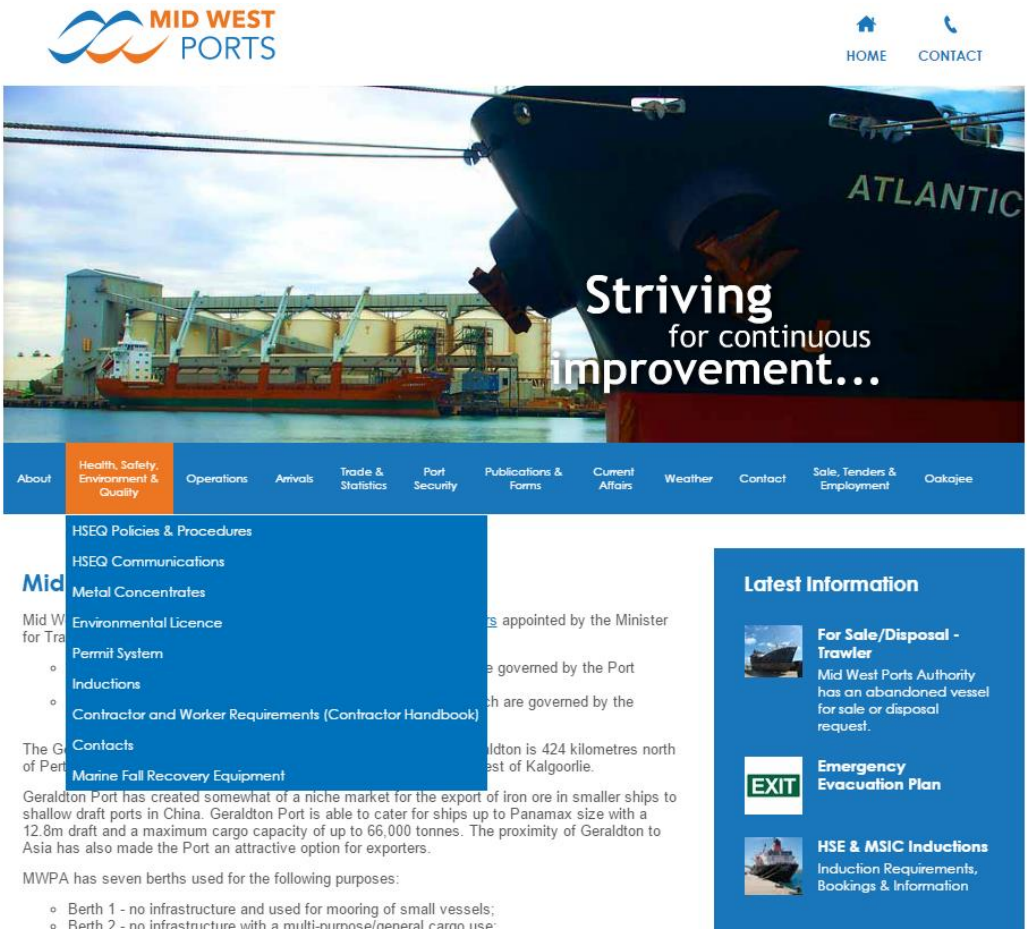


Figure 4: Screenshot - MWPA Website

- The MWPA Contractor Handbook is located on the MWPA website under the HSEQ tab in the Requirements for Contractors section. This is a detailed document that provides a range of information and requirements giving direction to contractors who are working in the port.
- The MWPA HSEQ Policies & Procedures can be found on the MWPA website under the HSEQ tab in HSEQ Policies and Procedures section.

- The MWPA Induction can be conducted online on the MWPA website under the Inductions section.
  - Depending on the location of the works, a BHF Induction may apply. The BHF Induction is completed onsite and takes 2 to 3 hours depending on duration of site walk around.
  - Contact the MWPA Project Coordinator for more information if this is a requirement on your project.
- For requirements for undertaking work within the MSIC Security Boundary, including details on applying for an MSIC Card please refer to the Port Security tab on the MWPA website under the MSIC section.
  Note: MSIC applications can take four to six weeks to approve.

Permit requirements are detailed on the MWPA website under the HSEQ tab in the Permits section. Services drawings and permit templates are also provided in this location. More detail is provided in Section 8 of this Guideline.

Special attention is drawn to the following requirements:

- The Contractor is required to submit all documentation, i.e. Method Statements, Permits, ITP, Pre starts, JSEAs to the MWPA Project Coordinator prior to commencing any work.
  - All JSEAs are to be reviewed and signed by all relevant personnel completing the works and the MWPA Project Coordinator before any work commences.
    Note: All permits are to be submitted at least 48 hours prior to the works starting. Allow more time for complex works.
  - If there is a requirement to undertake Isolation and Tagging in order to safely conduct the works approval must be sought from the MWPA Operations Supervisor (contact details in Section 3).
- If the works are within the rail corridor permission is to be sought from the MWPA Rail Operations Supervisor (contact details in Section 3).
- The Contractor must provide the MWPA Project Coordinator with copies of personnel licences, training and competencies required for the works. For example:
  - Elevated Work Platform (EWP) licence.
  - Working at Heights (WAH) training.
- The contractor is reminded that the works are being undertaken in an operational environment and special attention must be given to operational plant, vessel, rail and trucking movements.

6.2 SAFETY

For all works at the port the contractor shall develop and submit a site specific Safety Management Plan to the MWPA Project Coordinator for approval prior to the commencement of any work. The Safety Management Plan should, wherever possible, incorporate:

- The MWPA's existing HSEQ policies,
- Procedures and relevant safety alerts,
- All risks and hazards associated with performing the work including the planned treatment and response to injuries,
- Safe Work Method Statements (SWMS) or Procedures (SWMP),
- Job Safety Environmental Analysis (JSEA).

The Safety Management Plan should also record the name, contact details and location of the nearest Emergency Response Unit or Medical Practitioner.

6.3 ENVIRONMENT

For all works at the port the contractor shall prepare and submit a site specific Environmental Management Plan (EMP) to the MWPA's Project Coordinator for approval prior to commencement of any work. The EMP should include procedures to:

- Identify all hazardous and imported materials,
- Determine emission control requirements,
- Assess compliance of removal of materials with MWPA's HSEQ requirements,
- Limit or contain emissions and waste materials,
- Ensure the safety of workers and the public.

Emission of hazardous materials to the water or ground water is prohibited. Water samples may be taken to determine the background levels and visible inspection of the integrity of containment and the visible monitoring of emissions to water should be carried out as the primary control. Further water sampling may be carried out if deemed necessary to demonstrate compliance, or to quantify the impact of any suspected or inadequate emissions.

MWPA Procedure 4.3 (Waste Management Procedure) should be referred to as it details requirements for management of waste within MWPA controlled land.

6.4 SECURITY

It is a primary and continuing policy of the MWPA that in the conduct of all its activities it will endeavour to protect the Security of all its property, equipment infrastructure and operations. The MWPA will also endeavour to protect the security of employees, customers and others. It will also endeavour to limit adverse effects on the physical environment in which its activities are carried out, whether directly or indirectly caused by known, unknown or unidentified influences.

The Australian Government has implemented a maritime security regime to help safeguard Australia's maritime transport system and offshore facilities from terrorism and unlawful interference. Under this regime, all security regulated ports, port facilities, port and offshore service providers and ships undertake security risk assessments and implement security plans to address identified risks.

6.4.1 SECURITY ACTS, REGULATIONS AND CODES

The Maritime Transport and Offshore Facilities Security Act 2003 and the Maritime Transport and Offshore Facilities Security Regulations 2003 have been developed to implement the ISPS Code in Australia. Leading up to 1 July 2004, the MWPA was required to upgrade its security and to implement new security arrangements. These have included:

- A security perimeter fence separating the berths and berth activities from the port logistical infrastructure and public accessible areas.
- Limiting the access to the port using one gate providing both access and egress.
- Installing closed circuit television for monitoring purposes.
- Installing a personalised security card access system; and
- Training for certain port personnel in the undertaking of security duties.

The MWPA has a Maritime Security Plan approved by the Department of Infrastructure and Transport (DOIT) and is a security regulated port as specified in the Act.

6.4.2 MARITIME SECURITY IDENTIFICATION CARD (MSIC)

Personnel entering the Port shall at all times conform to the requirements laid down in the Maritime Transport and Offshore Facilities Security Act and Regulations 2003 and any amendments to these documents which may be issued from time to time by the appropriate authority.

The Australian Government requires anyone working within the secure areas of a port, ship or offshore gas facility to display a MSIC. An MSIC is a nationally consistent identification card which is issued to identify a person who has been the subject of a background check. It shows that the holder has met the minimum security requirements and may work unescorted or unmonitored in a maritime security zone.

The MWPA is an authorised issuing body for MSICs. Application forms are available from the MWPA MSIC issuing officer or downloaded from the MWPA website *www.midwestports.com.au*

APPLICATION FOR AN MSIC

Applicants are required to:

- Complete MSIC Application Forms and return to MWPA for lodgement.
- Provide proof of identity to the MWPA interviewing officer.
- Provide proof that they have a requirement to work inside the MWPA secure zone.
- Complete the AusCheck background check form.
- Provide a copy of the MWPA online induction certificate.

ONSITE SECURITY REQUIREMENTS

Personnel must have an MSIC in their possession to gain entry into the Port. All personnel inside the Port Secure Area must have their card displayed correctly at all times. Any person not carrying their card will be escorted from the Port area and may be charged and fined as required under the Act.

VISITORS

Visitors not carrying out operational or construction activities may be brought into the Port Secure Area if escorted by a person who holds a valid MSIC. A visitor must:

- Obtain a visitor's card from MWPA reception or gatehouse.
- Remain at all times under the control of the person granting them access.
- Enter through the main Security Gate.
- Have on their person photographic proof of identity (e.g. Driver's Licence, Passport); and
- Remain within the Port Secure Area for only as long as is required and then must leave via the main Security Gate on Ian Bogle Road.

Visitors who are on site to undertake operational or construction activities will be required to have completed the Online Induction prior to accessing the site. If ongoing access (more than three visits) is required, an MSIC needs to be obtained instead of using a visitor's pass.

6.4.3 ACCESS

Security arrangements have been implemented in accordance with the International Ship and Port Facility Security (ISPS) Code, via the Maritime Transport and Offshore Facilities Security Act 2003 and the Maritime Transport and Offshore Facilities Security Regulations 2003. These arrangements include:

- A Security perimeter fence separating the berths and associated activities from the port logistical infrastructure and areas accessible to the public.
- Limiting port access and egress by use of controlled gates including use of a personalised security card access system; and
- Installing closed circuit television for monitoring purposes.

Figures 5, 6 and 7 on the following pages shows the extent of the restricted zones and locations of the entrance gates into the secure areas.

OTHER ACCESS REQUIREMENTS

The Contractor shall allow MWPA representatives access at any time to plant, equipment, personnel and records, when requested, to enable MWPA to inspect or audit any aspect of the Contractor's operations relevant to quality and occupational safety, health and environment.

Entry onto the Oakajee Port site is via communication and consultation with the MWPA Oakajee Manager. MWPA Procedure 2.23 Oakajee Land Management outlines all access requirements for the Oakajee Port site.

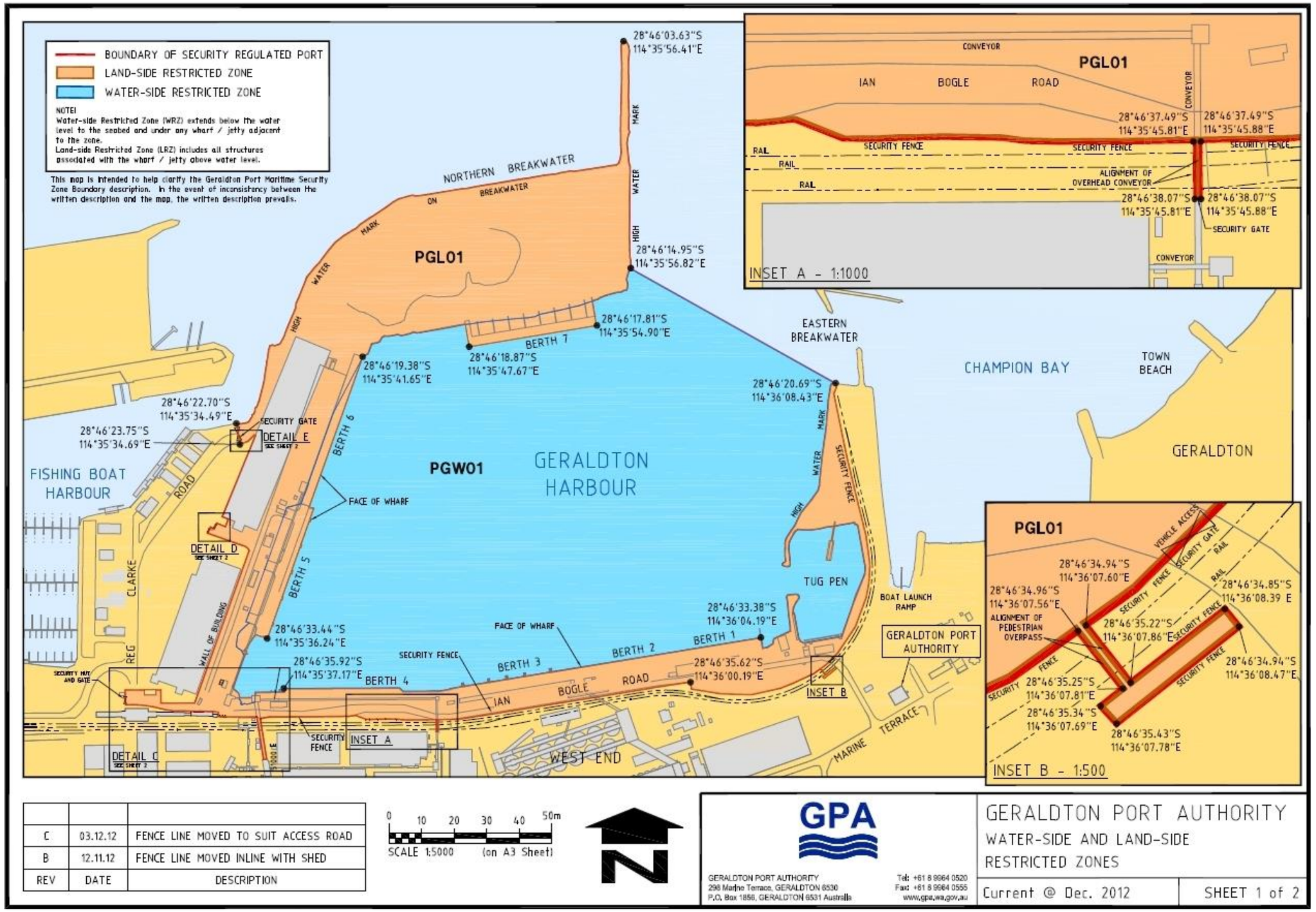


Figure 5: Water and Land Side Restricted Zones (Part 1)

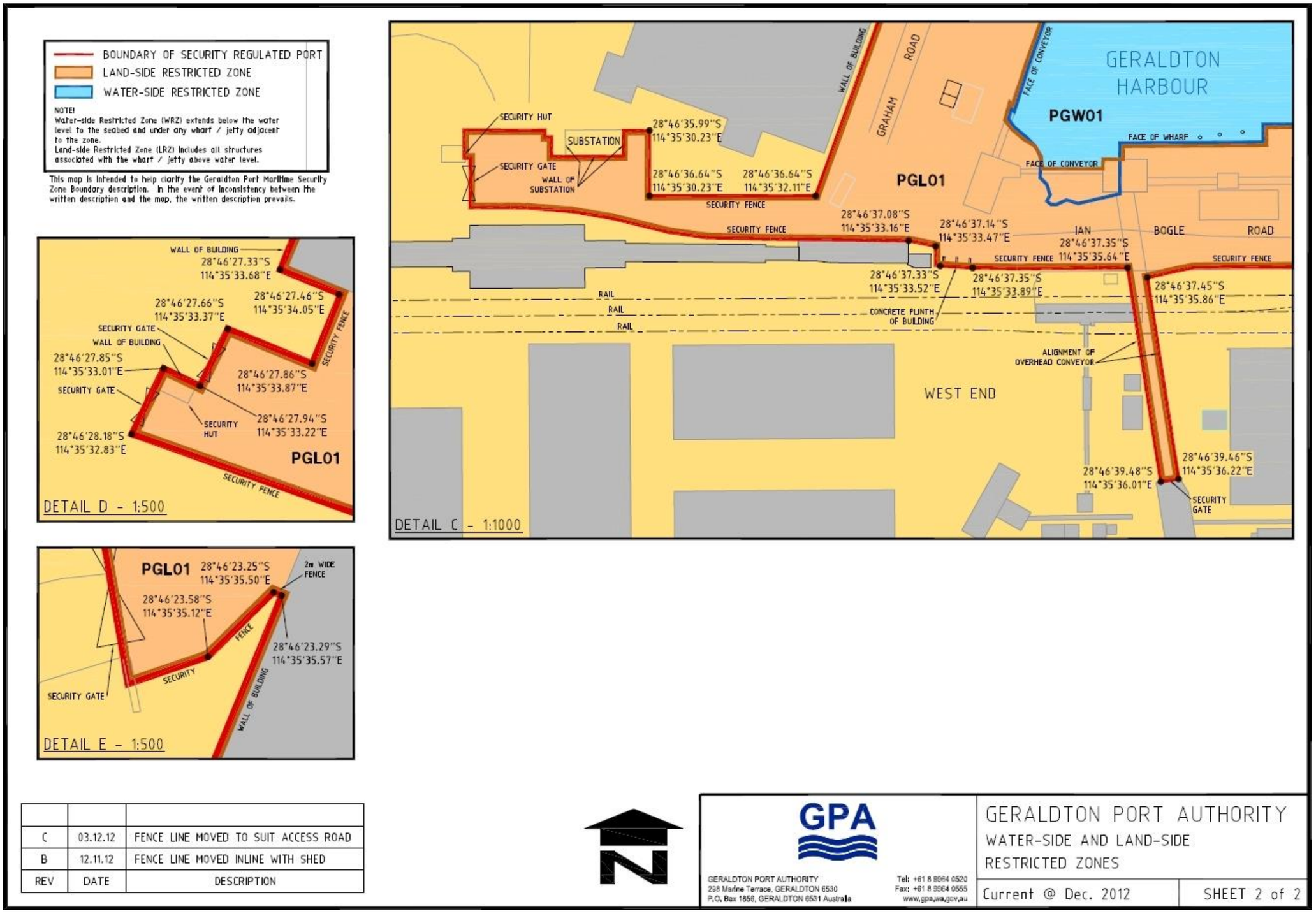


Figure 6: Water and Land Side Restricted Zones (Part 2)

Figure 7: Layout Showing Port Access

6.5 PERSONAL PROTECTIVE EQUIPMENT

6.5.1 MWPA REQUIREMENTS

MWPA's mandatory Personal Protective Equipment (PPE) for work performed in the maritime secure zone, the rail terminal, bulk handling facilities and bulk minerals storage is given in **Table 7.**

Full PPE details can be found in the MWPA Personal Protective Equipment procedure on the MWPA website. When working on or within three metres of the rail corridor, high visibility shirts are to be ORANGE in colour.

Table 7: MWPA Mandatory PPE

Operational Personnel	Working Visitor
High visibility long sleeve shirt with retro-reflective strips (AS 4602:1999 Class N garment)	Long sleeved shirt (high visibility with retro-reflective strips or vest with same that meets Class N garment)
Long pants with retro-reflective strips on the leg (AS 4602:1999 Class N garment)	Long pants
Safety footwear	Safety footwear
Safety glasses	Safety glasses
Helmet (with retro-reflective strips if working in hours of darkness)	Helmet (with retro-reflective strips if working in hours of darkness)

6.6 MAJOR HAZARDS

6.6.1 WORKING NEAR ROCK WALLS

Large areas of Port land are on reclaimed land or modified surfaces where undermining and sink holes can occur. When operating mobile plant such as elevating work platforms (EWP), special care must be taken in close proximity to rock walls, breakwaters or embankments as these areas can be prone to undermining from sea-state, tidal movements and also damage from stormwater runoff.

A minimum three metres must be maintained from the edge of embankment. If for practical reasons this cannot be achieved, approval from MWPA's Engineering Department must be obtained and additional control measures may be imposed. Documented justification and additional technical data may need to be supplied. A mechanical barrier should be used during operations to ensure the exclusion zone is not breached.

6.6.2 WORK AFLOAT OR ABOVE WATER

A personal flotation device (PFD) is to be worn where there is a risk of falling into the water. Where the risks associated with wearing a PFD outweigh the risks of not wearing one, alternate measures can be implemented in lieu of wearing a PFD provided the person is not working alone. This must be approved by the MWPA project coordinator and must be documented, for example in a JSEA.

6.6.3 ISOLATION AND TAGGING

Contractors, their employees and sub-contractors are to ensure isolation and tag-out procedures as per MWPA Procedure - 4.8 Isolation and Tagging are used at all times.

6.6.4 TRAFFIC AND HEAVY MACHINERY

The port is a dynamic environment in which operations require the use of various mobile and fixed plant and equipment. Compliance with MWPA Policies and Procedures is paramount to ensuring the safety of personnel and the integrity of port assets.

PLANT, VEHICLES AND EQUIPMENT

The operator of any vehicle or plant must hold the appropriate licenses and tickets. Plant and vehicles must be licensed. Vehicles, plant and equipment other than required for the work are not permitted on the site or work areas. Exceptions need to be cleared with MWPA.

Cranes are to carry a current copy of the Certification of Inspection for Classified Plant (WorkSafe).

Unless permission from MWPA is obtained, works are not to block any entry, gateway or access so as to prevent the free access of other vehicles, obstruct fire hydrants, hose boxes or other safety equipment or obstruct any berth operations, ship loading or ship discharging.

TRAFFIC MANAGEMENT

A traffic management plan is required where works are undertaken on a roadway or road shoulder where interference with traffic is likely. If works encroach on a laneway, the lane must be diverted around the works if sufficient room. If the laneway must be closed down to one lane and traffic controllers would generally be required alternative routes may be required.

SPEED LIMIT

Due to the dangers imposed by the mixture of light and heavy vehicles, equipment and personnel the port has adopted low speed limits on MWPA controlled roads. Speed limits on MWPA sites are indicated via signage and are zones generally limited to 20 or 40 kilometres per hour.

REVERSED FLOW

Reversed flow traffic conditions exist in parts of the Bulk Handling Facility (BHF) area. One such high risk traffic area is Gillam Rd, which is used by trucks delivering product to storage sheds, maintenance vehicles, operational plant and light personnel vehicles. Due to the volume of heavy vehicles, front end loader operations, restricted areas and local traffic conditions, Gillam Road is considered a high risk traffic area.

6.6.5 HOUSEKEEPING

Throughout the duration of any construction works, the work areas shall be kept clean and tidy with construction materials stored or placed in an orderly manner. Thoroughfares, walkways and pathways must be kept clear. Building waste material and other rubbish must not be left in public areas and are to be placed in the rubbish containers located strategically about the site.

At the completion of the contract all non-MWPA equipment, materials and tools are to be removed from the site. The area is to be left free of scrap, rubbish and other debris prior to handover.

6.6.6 RAIL

The Rail Terminal is managed 24 hours a day by the MWPA Rail Operations Supervisors (ROSs). Special conditions apply to working in the rail corridor including:

- Contacting the duty ROS for permission to access.
- Work is conducted under the jurisdiction of the Rail Safety Act 2010.
- Unless otherwise authorised, pedestrians may only cross the rail corridor at over-line pedestrian footbridges and never climb between wagons.
- When working on or within three metres of the rail corridor, high visibility shirts are to be ORANGE in colour.
- A Works Adjacent to Rail Permit is required when any work is undertaken within three metres of, above, or on a rail.

7 CONTRACTOR REQUIREMENTS

In undertaking the works the Contractor agrees to all National and Western Australian Statutory Authority Regulations, Standards and Codes of Practice pertaining to the undertaking of the works safely and legally.

7.1 PRE COMMENCEMENT REQUIREMENTS

Prior to commencing works on site the Contractor is to:

- Inspect the site to confirm all works and access requirements.
- Confirm availability of power and water supply at the site location with the MWPA Project Coordinator.
  Note*:* If no provisions can be made by MWPA the contractor is to allow for their own power and water requirements.
- Agree and delineate the site or works boundary with the MWPA Project Coordinator. Barricading or temporary fencing may be required with the appropriate safety warning, information signage or traffic management.

7.2 WORKS EXECUTION REQUIREMENTS

In the performing works on MWPA sites the Contractor agrees that they are responsible for:

- The management of sub-contractors and suppliers under their control and employ.
- Mark-up of Vendor and Consultant drawings for inclusion in as-built documentation.
- Provision of progress reports as agreed between the Contractor and the MWPA Project Coordinator.
- The carrying out of the entire incidental works which are necessary whether detailed and described or not, to achieve the intent of this scope of work.

Additionally the following requirements are noted:

- The Contactor shall supply all things necessary to complete the scope of works.
- Material is to be delivered to site and stored in a MWPA approved laydown area.
  Note**:** All material and equipment must be stored in a safe and tidy manner throughout the duration of the works.
- The cost for removal of all waste material and reinstatement of the site is to be included in the Contractor's price.
- Any variation to the scope, price or programme will be subject to approval by the MWPA Project Coordinator.
- Traffic management and associated traffic control devices will be supplied by the contractor if required, in order to ensure operations continue safely and with minimal disruption whilst works are in progress.
- The Contractor will clean up the site and remove any and all waste material from the work area.
- The Contractor shall erect appropriate temporary safety and security fencing in order to safeguard the Site from unauthorised visitors who may not be familiar with the hazards they may be exposed to on the Site.

- The fencing shall be regularly inspected by the Contractor and maintained throughout the duration of the Works.
- The fencing should be fitted with appropriate safety and security information and warning signs.
- If the erection of a fence from suitable materials is not found to be practicable, the Contractor should erect a suitable high-visibility barricade.

7.3 PROJECT CLOSE-OUT REQUIREMENTS

During the close out and handover stage of the project the Contractor will supply all supporting documentation which demonstrates that the works were undertaken to the quality standards (as agreed and applicable), and in accordance with MWPA Policies and Procedures.

This documentation shall include, but is not limited to, the following:

- Tip dockets for material disposed of offsite.
- Documentation certifying that the building, structure or work is compliant with the relevant specifications, drawings, standards and codes.
- Test certificates.
- Defects inspections checklists.
- Operation manuals.
- Maintenance manuals.
- As-constructed drawings and/or surveys.

8 MWPA REGULATORY PROCESSES

8.1 POLICIES AND PROCEDURES

All parties developing, designing, specifying, preparing, applying and inspecting any aspect of a MWPA Project should be aware and abide with MWPA' s policies and procedures. The following list of MWPA policies and procedures may be of relevance to new projects and supporting works. The updated list can be obtained from the MWPA Project Coordinator.

Table 8: Relevant MWPA Policies

Policy No.	Title
5	EEO and Discrimination Policy
7	Environmental Policy
10	OHS Policy
11	Quality Policy
12	Sexual Harassment and Victimisation Policy
14	Smoking in the Workplace Policy
15	Substance Abuse Policy
19	Records Management Policy
24	Energy Management Policy

Table 9: Relevant MWPA Procedures

Procedure No.	Title
1.22	Commissioning of Plant or Process Procedure
1.3	Training and Induction
1.7	Risk Management Procedure
2.11	Manual Handling Procedure
2.16	Fitness for Duty Procedure
2.2	Designated Smoking Areas
2.20	Traffic Management - Geraldton Port
2.21	Transfer Tower 103 (TT103) Isolation of Equipment
2.23	Oakajee Land Management Procedure
2.24	Rail Terminal Procedure
2.27	Asbestos Management
2.3	Incident Reporting and Investigation
2.32	Diving Procedure

Procedure No.	Title
2.33	Working at Heights Procedure
2.34	Respiratory Protective Equipment Procedure
2.35	Wildlife Procedure
2.37	Contaminated Sites Management.doc
2.4	Health Safety and Environmental Responsibilities
2.5	Personal Protective Equipment
2.6	Emergency Preparedness and Response
2.8	Hazardous Substances & Dangerous Goods
3.12	Maritime Security Identification Card (MSIC)
3.13	Geraldton Port Security Zone Access Procedure
3.30	Wharfside Man Overboard Procedure
3.37	Security Fencing - Geraldton Port
4.1	Permit to Work Procedure
4.20	Abrasive Blasting Procedure
4.3	Waste Management Procedure
4.53	Change Management Procedure - Rail
4.6	Working on, over or near water
4.7	High Voltage Switching Practice
4.72	Asset Management Plan Structure
4.74	Port Railway Level Crossing Procedure
4.77	Managing Dust from Port Operations
4.8	Isolation and Tagging Procedure
4.82	Lightning Safety Plan
4.9	Confined Space Entry Procedure
	Environmental Management Plan
	OHS-PLN-001 Occupational Health and Safety Management Plan

Cases may arise where MWPA Procedures intended for internal use by MWPA staff may be brought into play on a particular project. In such cases the MWPA Representative or Project Coordinator should be consulted. Examples of such procedures are included in **Table 10**.

Table 10: Relevant Internal MWPA Procedures

Procedure No.	Title
1.18	Media Liaison
1.2	Quality Manual
1.20	Asset Management Strategy
4.55	Rail Safety Management System Overview
5.16	Tendering for Goods and Services
5.9	Control of Assets

8.2 PERMITS

Many construction-related project activities require a MWPA Permit to be in place in order to ensure that:

- The works are undertaken safely and in accordance with the applicable procedures.
- The Wharf and BHF operations personnel are aware of the works so that the Works can be coordinated with operational activities.
- Operations personnel are made aware of Works completion as part of the permit closure.

Information about the permit procedure and the application for permit to work can be obtained from the MWPA website ***(****www.midwestports.com.au)*. Refer to Procedure 4.1 – Permit to Work Procedure. All approvals are administered by the Wharf Supervisor who can be contacted on (08) 9964 0595 or *permits@mwpa.wa.gov.au*

Table 11: Relevant MWPA Permits

Permit No.	Title
F2.20a	Application for Traffic Management Permit
F4.1c	Application to Excavate / Penetrate Permit
F4.1d	Application for Hot Work Permit
F4.1e	Application for Confined Space Permit
F4.1f	Application for Abrasive Blasting Permit
F4.1g	Application for Land Based Crane Lift Permit
F4.1h	Application to Dive Permit
F4.1k	Application for Works Adjacent to Rail Permit
F4.1l	Work Afloat Permit
F4.1m	BHF Authority to Work Permit (Non-Routine)
F4.1n	Chute Entry Permit - Bulk Handling Facility Berths 4 & 5
F4.21a	Plant Shutdown Notification
F4.7a	HV Electrical Access Permit

9 PORT OPERATIONS

MWPA conducts shipping, ship loading and rail operations on a 24 hour basis. This, coupled with changing weather and sea state conditions, creates a dynamic environment in which safety of personnel is paramount. To this end, it is important to note that port operations will take precedence over construction activities in most instances. Port operations are to be taken into account in both the planning and execution phases by designers and contractors working in areas affected by port operations.

9.1 PORT FACILITIES

The following general specifications and dimensions are provided in relation to operations on the berths at Geraldton Port. In addition to the shiploaders, other bulk handling equipment such as conveyors, transfer towers and other related plant and equipment are in operation in the BHF area.

Table 12: Port Facilities

Berth No.	Length (m)	Depths Alongside Berths Over LAT (As Of January 2013)	Berth Utilisation
Berth 1	50	9.1 m at zero tide	Small Vessels
Berth 2	225	9.7 m at zero tide	Multi-Purpose/Vessel Layup
Berth 3	225	12.9 m at zero tide	Grain, Lay-up outside Grain Season
Berth 4	225	12.8 m at zero tide	Minerals, Fertiliser
Berth 4	225	13.3 m at zero tide	Iron Ore
Berth 6	190	12.4 m at zero tide	General, Livestock, Fertiliser, Minerals, Fuel
Berth 7	250	13.1 m at zero tide	Iron Ore
Harbour Basin Depth 12.4 m at Zero Tide			

The layout provided on the following page (Figure 8) provides an overview of the ports areas and the acts that govern these areas.

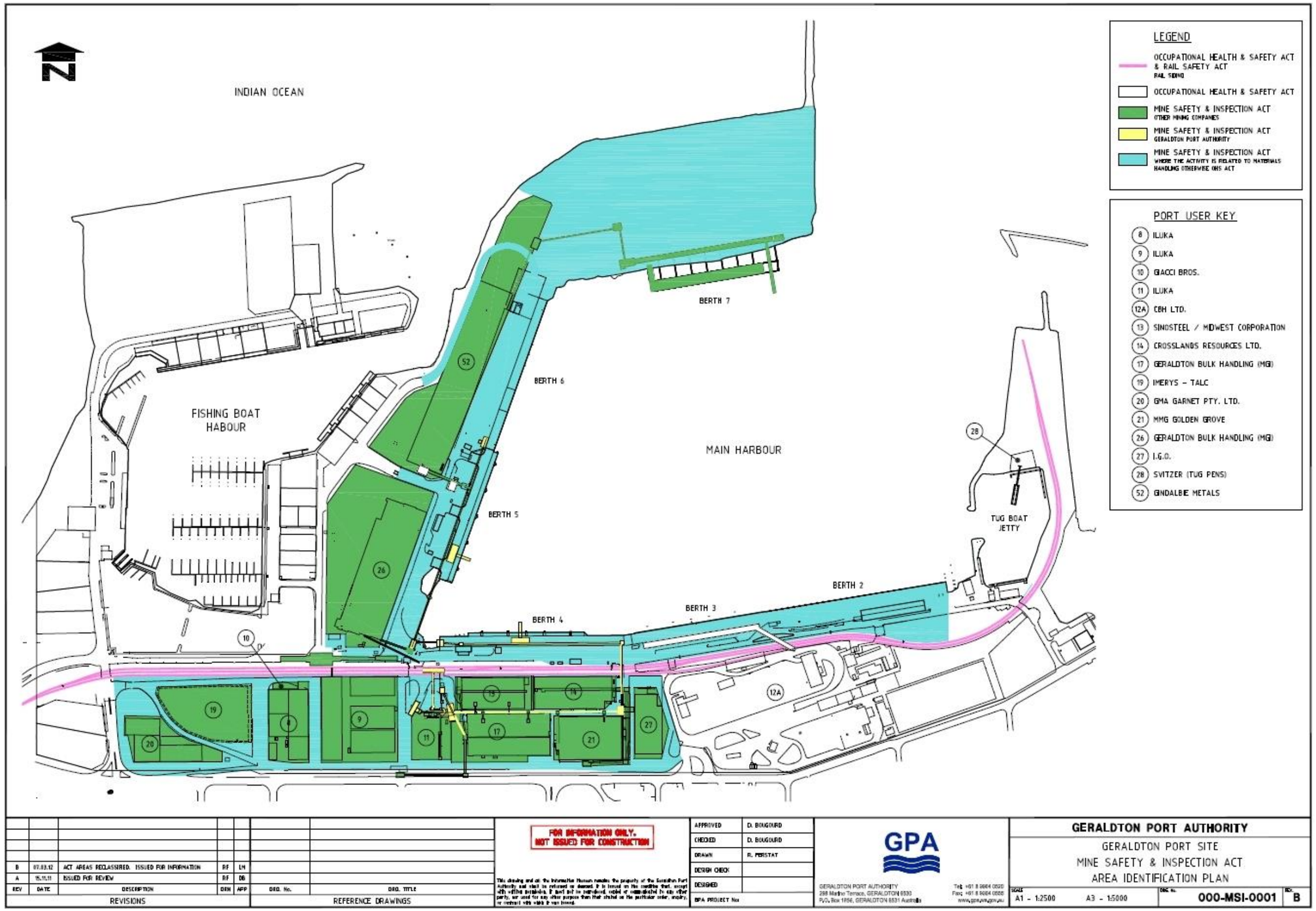


Figure 8: MWPA Mine Safety and Inspection Act Area Identification Plan

9.1.1 GRAIN FACILITIES ON BERTH 3

Grain Handling Services are controlled by Co-operative Bulk Handling Ltd (CBH). Contact Details are as follows:

- Regional Manager: Telephone (08) 9921 9499.

9.1.2 BERTH 4

The following specifications are provided in relation to operations on Berth 4:

- One Wharf Gantry - shiploader capacity 1,800tph
- Air draft - 15m over LAT
- Shiploader dimensions:
  - Boom fully retracted, from fenders to product drop 7.6m
  - Boom fully extended, from fenders to product drop 18.3m
  - Long traverse 180m
- Shiploader attachments available:
  - Articulated Chute
  - Concentrate Slinger
  - Dust Extractor

9.1.3 BERTH 5

The following specifications are provided in relation to operations on Berth 5:

- One Wharf Gantry - 5,000tph
- Air draft - 17m over LAT
- Long traverse 185m
- Chute fully retracted, from fenders to product drop 9.3m
- Chute fully extended, from fenders to product drop 22.1m
- Shiploader attachments available:
  - Iron Ore Chute with Water Sprays

9.1.4 BERTH 6

Berth 6 provides bulk fuel transfer services and heavy load out capability. A Liebherr LHM 280 crane owned by Qube also operates on the berth.

9.1.5 BERTH 7

Berth 7 is owned and operated by Karara Mining Pty Ltd (KML). Contact Details are as follows:

- Regional Operations Manager: Mobile Contact No. 0488 023 205

9.1.6 ELECTRICITY

Ships power is available at all berths (No 4 Berth - west end only). Power supply is three phase, 440 volts AC 50 Hertz and Single Phase, 250 volts AC 50 Hertz

Berth and access lighting is provided throughout the wharf areas.

9.1.7 WATER

Fresh water is available at all berths except Berth 7. Average loading rate is 17tph.

9.2 MARINE OPERATIONS

Shipping has highest priority at all times. Contractors working in the berth areas are required to work to shipping movements and activities. In the event of a vessel movement taking place at a berth, the contractor and their staff will be required to clear the berth until the movement is complete and the 'All Clear' is given. Further information related to work afloat is provided in the MWPA Contractor and Worker Requirements Handbook and relevant Marine Procedures.

9.3 RAIL OPERATIONS

A Rail Terminal forms part of the Port facility. MWPA infrastructure comprises a single run-around track, a rotary twin-cell car dumper track, a bottom discharge ore dumper track and a grain discharge track, together with twelve connecting turnouts to provide for operating flexibility. Karara Mining operate a dual wagon tippler and separate rail line for their operation and CBH similarly have a grain unloading facility.

MWPA has in place 24 hour Rail Operations Supervisors (ROSs) to manage the Rail Terminal. Special conditions apply to working in the rail corridor, the ROS should be contacted for more information on permit and license conditions.

9.4 MINE SITE REQUIREMENTS

A number of areas in the Geraldton Port are used for storing or handling of mining materials. Accordingly these areas are deemed to be 'Mine Sites' and the Mines Safety and Inspection Act 1994 applies. A mine site has a number of specific requirements when compared with the Occupational Health and Safety Act 1984, most notably in regards to electrical installations and equipment.

MWPA has a registered Mine Manager (Operations Manager) who is responsible on a daily basis for the control and supervision of the mine and must, so far as is practicable:

- Manage and control the operation of the mine in accordance with the Mines Safety and Inspection Act 1994 (the Act);
- Ensure that every person who is appointed to perform any duty under the Act understands the nature and scope of that duty; and
- Ensure that every person performs all duties imposed on them under the Act.

9.4.1 MINE SITE ELECTRICAL SAFETY

SWITCHING ON OR CUTTING OFF ELECTRICAL SUPPLY AT MINE SITE

A person must not switch on or off the electricity supply to or at a mine unless the person has been authorised to do so by the Mine Manager and has ensured that it is safe to do so.

ELECTRICAL SUPERVISOR AT MINE SITE

Mine sites must have an Electrical Supervisor appointed by the Mine Manager for the site. The Electrical Supervisor is responsible for ensuring that all work is carried out in accordance with the Mines Safety and Inspection Regulations 1995.

LOG BOOK – ELECTRICAL WORK ON MINE SITE

All electrical installation work on a mine site is to be recorded in the mines electrical log book. The log book must contain up to date details and the location of all:

- High voltage cabling and equipment installed at the mine.
- Main switches provided at the mine; and
- Low voltage and high voltage cables installed in the ground.

Copies of any compliance and test certificates relating to equipment used or installed in hazardous areas must also be recorded in the electrical log book.

HIGH VOLTAGE INSTALLATIONS AT MINE SITES

High voltage operators are appointed to be responsible for high voltage installations at mine sites. The isolation of any high voltage equipment for access, maintenance or repair purposes can only be carried out by a high voltage operator.

9.5 SHUTDOWNS

Works should be scheduled to coincide with quarterly planned shutdowns or otherwise planned so as not to hamper operations (as directed by the MWPA Project Coordinator).

The yearly schedule for planned maintenance shuts for the Bulk Handling Facility rail and berth assets is located on the MWPA website *www.midwestports.com.au*

10 LOCAL CONDITIONS

10.1 REGIONAL SETTING

Geraldton is located on the Mid-West coast of Western Australia, approximately 430 km north of Perth. The Port and city centre face north into Champion Bay, from the northern side of the Point Moore peninsula. Champion Bay is a semi-sheltered embayment protected from ocean wave conditions by shallow reefs systems extending off Point Moore and a deeper shore parallel limestone ridge which runs north towards Drummond Cove. East of the limestone ridge, water depths of approximately 11 metres occur within two kilometres of the coast. To the west of the limestone ridge, water depths rapidly increase to 20 to 30 metres, and then gradually deepen to 50 metres before shallowing again at the Houtman Abrolhos Islands located some 50 km offshore.

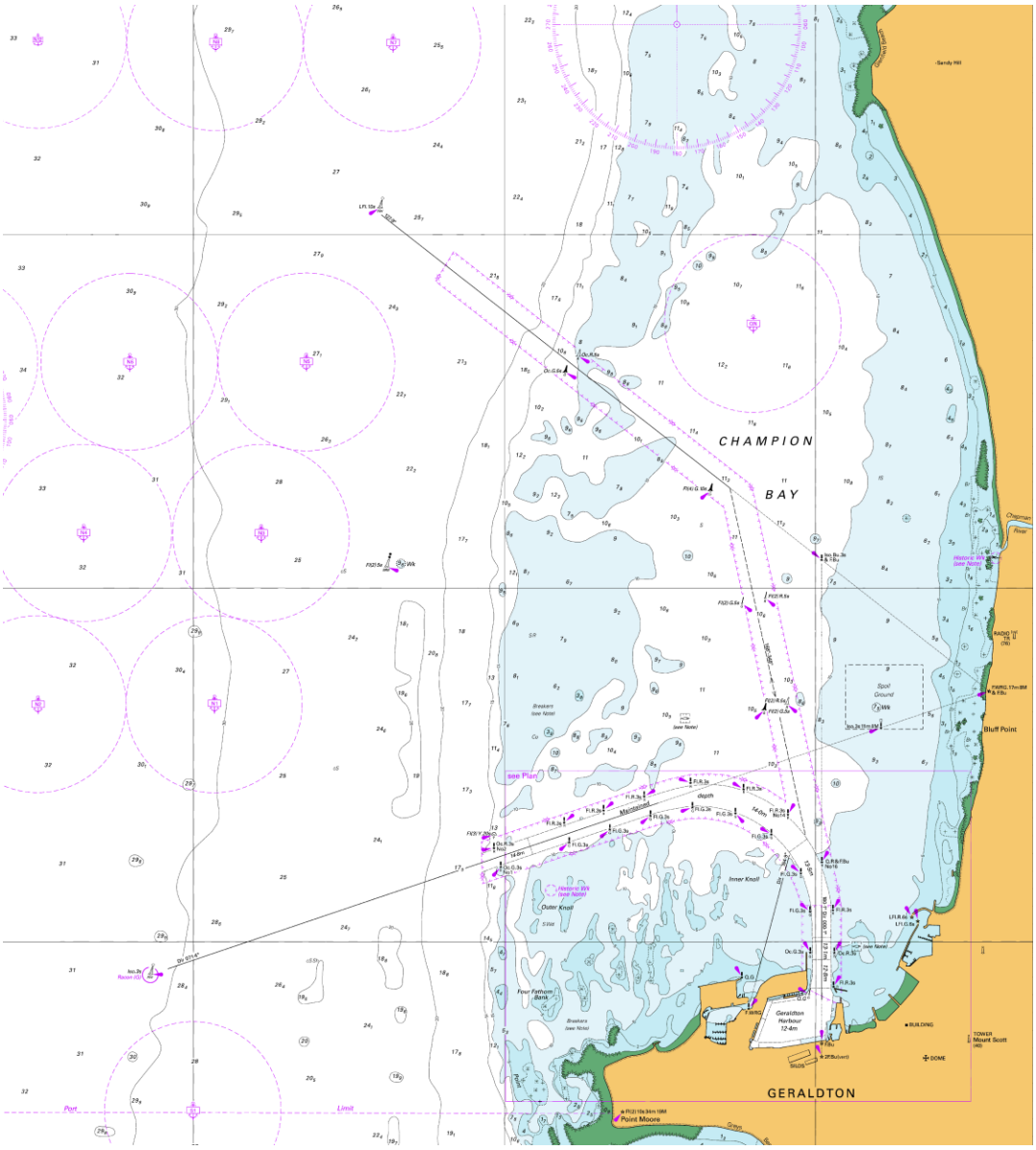


Figure 9: Geraldton Port Location Plan (Source Chart - Department of Transport)

To the north and south of Point Moore, the coast is comprised primarily of sandy beaches generally overlying beach rock. Occasional areas of shallow beach rock and limestone platform are exposed at locations such as at Drummond Cove, Bluff Point, Point Moore and adjacent to the mouth of the Greenough River. The two main rivers discharging into coastal waters in the Geraldton area are the Greenough River (approximately 10 kilometres south of Point Moore), and Chapman River (approximately five kilometres north of Point Moore).

10.2 CLIMATE

Geraldton lies in the transition zone between a Mediterranean and a semi-arid climate. In the winter the temperature is mild, averaging around 20°C, with most of the yearly rainfall falling in this period. This is due to cold fronts from Antarctica moving north and hitting the coast. In the summer months Geraldton averages 31 to 32°C, with some days over 40°C. Daily afternoon sea breezes cool coastal areas and summer temperatures in coastal suburbs are generally cooler than in inland suburbs.

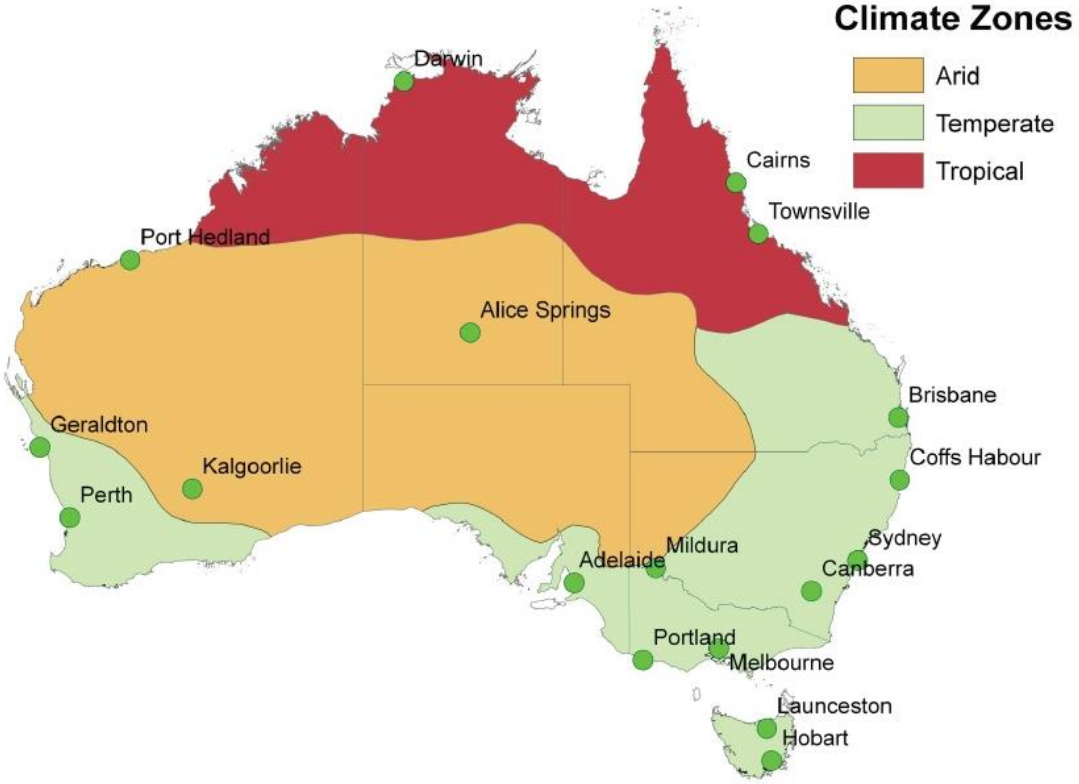


Figure 10: Geraldton Climate Zone
(Source: AS 3600. Based on the Bureau of Meteorology map, Major seasonal rainfall zones of Australia, 2005)

The Exposure Classification for the Geraldton Port, in accordance with AS 3600, ranges from B2 to C2. (See Table 13 extracted from Table 4.3 in AS 3600).

Note: Whilst AS 3600 relates specifically to reinforced concrete, which includes any concrete containing structures or structures that rely on the concrete for protection against environmental degradation, it is a useful indicator of the exposure environment in the port.

Table 13: Exposure Classifications

Classification	Exposure Environment Description
B1	Surfaces of members, located in interior environments in industrial buildings, being subject to repeated wetting and drying. Surfaces of members in above-ground exterior environments that are near-coast (one kilometre to 50 kilometres from coastline) any climatic zone.
B2	Surfaces of members in above-ground exterior environments in areas that are coastal (see Note 1) and any climatic zone. Surfaces of maritime structures permanently submerged in sea water.
C1	Surfaces of maritime structures in sea water spray zone (see Note 2).
C2	Surfaces of maritime structures in sea water tidal/splash zone (see Note 3).

Note:

1. For the purpose of this table, the coastal zone includes locations within one kilometre of the shoreline of large expanses of saltwater. Where there are strong prevailing winds or vigorous surf, the distance should be increased beyond one kilometre and higher levels of protection should be considered.
2. The spray zone is the zone from one metre above wave crest level.
3. The tidal/splash zone is the zone one metre below lowest astronomical tide (LAT) and up to one metre above highest astronomical tide (HAT) on vertical structures, and all exposed soffits of horizontal structures over the sea.

Table 14: Geraldton Climate

STATISTIC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Temperature (°C)													
Mean Max	31.6	32.6	31.0	27.7	24.1	20.9	19.5	20.1	22.1	24.5	27.2	29.6	25.9
Highest recorded	47.7	47.3	45.2	39.4	36.6	29.5	29.0	31.6	36.1	40.7	43.8	46.8	47.7
Mean min	18.3	19.2	17.9	15.4	12.9	11.0	9.4	8.9	9.2	11.0	13.9	16.4	13.6
Lowest recorded	9.4	10.0	8.8	6.1	2.1	0.5	-0.4	1.2	1.2	2.4	3.8	7.7	-0.4
Rainfall (mm)													
Mean	5.8	11.2	16.1	23.4	69.4	98.2	91.3	64.6	31.8	19.6	9.2	5.3	443.5
Highest	63.6	131.4	135.2	100.3	282.2	286.4	243.3	155.4	80.8	109.1	47.4	58.5	843.3
Mean Days ≥ 1mm	0.9	1.2	1.6	3.9	7.5	10.5	11.2	8.9	6.3	4.1	2.1	1.1	59.3
Wind Speed (km/h)													
Mean 9am	21.9	21.9	20.6	18.0	17.1	17.4	16.9	15.5	16.0	18.8	20.7	21.3	18.8
Mean 3pm	31.1	29.6	27.4	23.3	19.5	17.4	16.9	18.0	21.7	26.3	28.9	30.4	24.2
Max Gust	109	108	117	109	128	143	108	102	104	100	93	87	143
Daylight (Hours:minutes)													
Mean/Day	13:44	13:07	12:18	11:25	10:41	10:19	10:27	11:07	11:57	12:50	13:34	13:55	12:00

Source: Australian Government Bureau of Meteorology, Geraldton Airport Climate Statistics (Latitude: 28.80° S, Longitude: 114.70° E, Elevation: 33 m)

Geraldton is not categorised as a located in Wind Region B in accordance with AS 1170.2 (Structural Design Actions, Part 2: Wind Actions). Terrain Categories vary within the port and should be assessed in accordance with the provisions of AS 1170.2.

10.3 WAVE CLIMATE

Offshore coastal waters, west of Champion Bay and Point Moore, experience high wave energy. Measurements undertaken by Steedman (1991) indicate that wave height exceeds 0.5m 99% of the time. The four main elements of the offshore wave climate in Geraldton are:

- Locally generated seas resulting from sea breeze conditions (waves 0.5–1.5m high from the south to south-west);
- Seas generated locally by the passage of cold fronts during winter (waves one to three metres high from the west to south-west);
- Swell waves generated by storms in the southern Indian Ocean (waves one to three metres high from the south-west); and
- Severe waves caused by dissipating tropical cyclones.

The wave climate is moderated slightly within Champion Bay itself due to the protection offered by Point Moore and the offshore reef systems. These natural structures modify the offshore waves by reflection, refraction and diffraction, causing them to break offshore and thereby attenuating their energy.

10.3.1 TIDE

Tidal levels for Geraldton Port are provided in **Table 15**. See also Figure 13, Section 11.

Table 15: Tidal Levels for Geraldton (Australian Hydrographic Service 2011)

	Tide Level (MLAT)	Level (MAHD)
Highest Astronomical Tide (HAT)	+1.2	+0.65
Mean Higher High Water (MHHW)	+1.0	+0.45
Mean Low High Water (MLHW)	+0.8	+0.25
Mean Sea Level (MSL)	+0.6	+0.05
Mean High Low Water (MHLW)	+0.4	-0.15
Mean Low Low Water (MLLW)	+0.2	-0.35
Lowest Astronomical Tide (LAT)	0.0	-0.55

Note: LAT is approximately 0.55m below AHD.

10.3.2 SEA LEVEL RISE

Maritime facilities should be designed to cater for increase in water level due to promulgated sea level rises caused by global warming. AS 4997 states that an allowance of 0.2m should be made for a future sea level rise based on a 50 year design life.

In 2010 the Department of Transport (DoT) released a guidance paper recommending a sea level rise of 0.3m to the year 2060 be used for coastal planning when considering setback of coastal development in Western Australia (refer to Figure 11). Given DoT recommendations, a sea level rise of 0.3m shall be used on projects based on a 50 year design life.

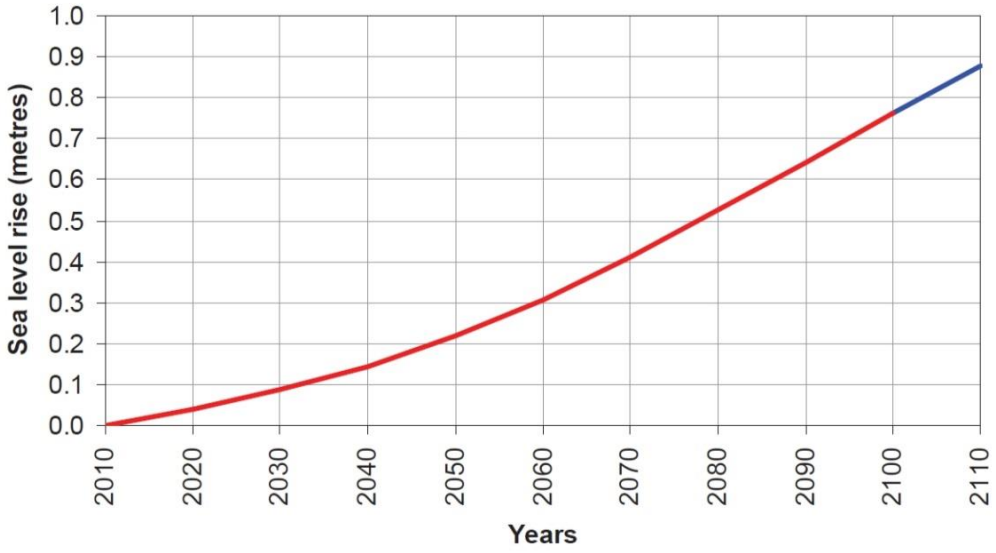


Figure 11: Recommended Sea Level Rise (DoT 2010)

10.4 REGIONAL GEOLOGY

The 1:50,000 geology maps for the region (Geological Survey of Geraldton, Sheet SH 50-1 and Part Sheet SH 49-4, 1971) indicate that the Geraldton Port is located within an area comprising dune and beach sands overlying coastal limestone.

Primary to undertaking any major development within the port the geotechnical condition of the site must be established, either by obtaining and reviewing geotechnical reports already conducted for the area or site being developed or, if no such report exists, by conducting a detailed geotechnical investigation. The information provided below is to be used for general guidance only.

10.4.1 DREDGED FILL

A large portion of port-controlled land comprises of reclaimed land consisting primarily of dredged fill. A variety of geotechnical studies conducted at various locations within the reclaimed areas of the port indicate that there is generally a capping layer comprising of uncontrolled granular fill overlying granular (predominately sand) fill material which overlies recent coastal sand/silty sand sediment.

The recent coastal sediments are a natural marine deposit overlying a hard material, which is likely to be limestone based on the Geraldton geological map.

In some cases site classifications recommended in dredged fill areas of the port of Class 'A' to Class 'S' have been established (based on stipulations and methods specified in AS 2870). It is noted that AS2870 is a residential site classification standard which may, in some instances, be applied to other forms of construction, including light commercial buildings if they are similar to houses in size, loading and superstructure flexibility.

It should be noted that all site classes outlined in AS 2870 (Section 2.4.5) have an allowable bearing capacity of 50kPa or 100kPa depending on the foundation option adopted, and shall not be subject to excessive foundation settlements under building loading (typical tolerance of 25mm assumed).

10.4.2 GROUNDWATER

Results of Electric Friction Cone Penetrometer Testing (EFCPT) carried out in the Fishing Boat Harbour Northern Reclaim area in 2012 indicate that groundwater was intersected at depths ranging between 2.0m and 3.0m below the existing surface level, which corresponds to between RL-0.3m AHD and RL+0.7m AHD.

It is, however, unlikely to be representative of the highest groundwater level, because within the relatively free draining materials encountered the greatest influence on groundwater level should be tidal. Groundwater levels away from edges of the reclamation would be expected to be generally close to, or just above, the mean sea level.

Based on the estimated data provided by consulting coastal engineers, the highest groundwater level is assumed to correspond with the predicted 100 year design still water level (estimation based on projected mean sea and tidal levels) and is located at RL+1.45m AHD.

10.5 SEISMIC DATA

Design Earthquake Loads are to be assessed in accordance with AS 1170.4 and Appendix D of AS 170.0. The following parameters form the basis of design for Geraldton Port infrastructure.

Table 16: Port Seismic Paramaters

Parameter	Notation	Value
Average Recurrence Interval	ARI	500 years
Probability Factor	k_P	1.0
Hazard Factor	Z	0.09
Sub-soil Class	A_e to E_e	TBC by Geotechnical Investigation

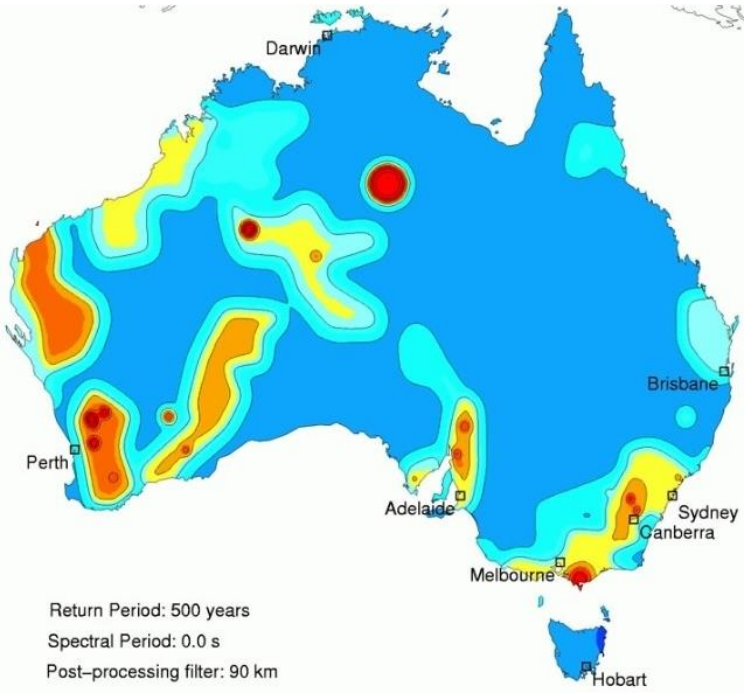


Figure 12: Earthquake Hazard Map of Australia (Geoscience Australia, Australian Government)

11 DESIGN CRITERIA

11.1 DESIGN LIFE

As stated in AS 4997, design life is defined as the period for which a structure or a structural element remains fit for use for its intended purpose with appropriate maintenance. The design life of maritime structures depends on the type of facility and its intended function. This design life will depend on the owner's requirements.

As well as determining loads for a facility, it is necessary to decide on a realistic design life for the structure. This design life should be based on consideration of capital and maintenance expenditure. Durability is to be realized either by a maintenance program, or, in those cases when maintenance cannot (or is not expected to) be carried out, by design such that deterioration will not lead to failure. In the latter case, the initial capital cost is expected to be high.

The Designer should determine an appropriate maintenance regime consistent with the adopted design and materials that will achieve the design life. Particular care should be taken when considering design life and maintenance regimes for inaccessible members. Sections or components of the structure that have limited access or are inaccessible after construction should have a design life (with no maintenance) equal to the design life of the structure.

Design life for MWPA marine structures shall comply with Table 6.1 of AS 4997, or the nominal minimum Design Life listed below, whichever is greater:

Table 17: Design Life Criteria

Structure Type	Design Life (Years)
Berths, wharfs, jetties , pens and similar structures	50
Piles and sheetpiles (onshore/sheltered)	50
Piles (offshore/exposed)	100
Retaining walls (including sheetpiled)	50
Structural Steel Access Structures	50
Access structures: Floor grates, clips and fasteners etc.	15
Ship loaders	50
Bulk materials handling structures: Iron Ore Other Materials	50 30
Mechanical and conveyor systems (including drives and motors)	20
Replaceable mechanical items (e.g. conveyor belting)	7
Mechanical consumables (e.g. bearings, brakes)	5
Roads	30
Maintenance Workshop and Stores Sheds	50

Structure Type		Design Life (Years)
Fixed, permanent buildings (e.g. offices)		100
Power Distribution:	HV Cables HV Switchgear HV Transformers LV Cables LV Switchgear LV Control & Instrumentation	30 10 30 10 10 10
Drainage Infrastructure		50
Breakwaters and Seawalls0		100
Navigation Aids:	Piles (Onshore) Piles (Offshore) Above water structures	50 20 20

Design life is to be determined on a case by case basis. At the end of the design life the structure should have adequate strength to resist ultimate loads and be serviceable, but may have reached a stage where further deterioration will result in inadequate structural capacity.

11.2 VALUE ENGINEERING

MWPA encourages the implementation of Value Engineering (VE) practices. Value Engineering can be defined as a systematic process of review and analysis of a project, during the concept and design phases, by a multidiscipline team of persons not involved in the project, the purpose of which is to provide recommendations for:

- Providing the needed functions safely, reliably, efficiently, and at the lowest overall cost.
- Improving the value and quality of the project.
- Reducing the time to complete the project.

The successful application of the VE process can contribute measurable benefits to the quality of the port improvement projects and to the effective delivery of the new installations. An example of which is the incorporation into the design, appropriate provisions for future operational and maintenance access.

11.3 SAFETY IN DESIGN

MWPA promotes the use of Safety in Design (SiD) to consider options to reduce potential hazards and increase the safety of all stakeholders of the Port. A Safety in Design risk review shall be provided for all projects unless otherwise agreed by the MWPA Representative.

A Safety in Design approach needs to begin early during the design phase and requires consideration of all stages of the life of the asset, not just construction risks.

A Safety in Design review should consider how the assets will be interacted with during:

- Construction
- Normal Operations
- Emergencies
- Maintenance
- Future works on or around the asset
- Decommissioning

By considering the full life of the asset, a designer can anticipate scenarios and modify designs to reduce the hazards, or if mitigation isn't possible, can provide advanced warning that additional policies and procedures will be required.

A basic Safety in Design risk table is provided in Appendix B.

11.4 CONSTRUCTION AND MAINTENANCE

Construction and maintenance actions on port facilities should take into consideration the probable use of cranes and other heavy loads required to construct and maintain the infrastructure.

Note: Construction and maintenance actions on over-water structures can often exceed the service loads of the structure.

11.4.1 MATERIAL SELECTION

Port Structures are generally sited in very aggressive environments for normal structural materials, and the design should include consideration of the requirements to withstand the aggressive environment while the structure remains serviceable. The effect of extreme events on the structure's durability should also be considered.

REINFORCED CONCRETE

Reinforced concrete structures in marine environments require regular condition inspection and maintenance of deteriorated sections. Recent history has shown some maritime concrete structures experiencing significant premature deterioration as a result of an inappropriate selection of materials and insufficient maintenance for the required design life.

STEEL

The structural steel maintenance strategy may allow the reinstatement of a protective coating system before corrosion of the steel begins, or for the deterioration of the steel member until replacement of the protective coating system and/or the member is required. Considerations include the ability to:

- Access the member with working scaffold for inspection and repair.
- Remove and contain waste materials during repair works.
- Prepare and apply protective coatings in situ to achieve required standard.

TIMBER

The service life of timber members may vary significantly depending on application, timber quality (grade), species natural durability and preservative treatment.

The following times to first maintenance can be expected:

- Timber piles exposed to marine organisms: 5 to 10 years.
- Timber piles not exposed to marine organisms: 10 to 30 years.
- Timber decking exposed to weathering: 10 to 25 years.

11.4.2 MAINTENANCE

Infrastructure in a marine environment will deteriorate over time. Early maintenance is generally recommended to prevent more significant damage. Whilst a structure may have a prescribed design life of 25, 50 or 100 years, local marine environments, operational conditions and other factors will dictate maintenance requirements. Regular inspection of the structure will permit early detection allowing the implementation of economic maintenance measures. Maintenance will then be determined by the inspection results. A typical maintenance program will include:

- Regular inspections.
- A program of routine minor maintenance.
- A program of major maintenance.

MAINTENANCE ACCESS

Where access to structures is required for operational, inspection and maintenance personnel, the structures should comply with the requirements of AS 1657.

Upon completion of all major projects MWPA shall be provided with Maintenance Manuals outlining the recommended practical and economic maintenance practices for the newly created asset/s.

11.4.3 CONSTRUCTION

It is imperative that the design is cognisant of the local factors which can impact on the construction phase of the project. In the case of the Geraldton Port, this is especially applicable given the relatively remote regional location. Contractors undertaking construction projects at the Geraldton Port must also make allowance for these factors which include:

- Local environmental conditions and constraints.
- Local availability of materials.
- Local availability of resources.
- Project staging to accommodate shipping and port operations.

CONSTRUCTABILITY

In the book 'Constructability Concepts Practice' (by JA Gambatese, JB Pocock, PS Dunston), constructability is defined as "the integration of construction knowledge and experience in the planning, design, procurement, construction, operation, maintenance, and decommissioning phases of a project consistent with overall project objectives".

Constructability Reviews are an important part of the design phase. Reviews done properly will reveal conflicts that can impact construction time and cost. The best outcomes are achieved when reviews are done independently of the designer and completed well before the tender cycle begins allowing ample time for corrections to be made.

Seasoned construction managers and experienced inspectors are candidates to provide Constructability Reviews (CRs) because of their knowledge of construction, contractors and the bidding process.

Not all documents need be reviewed for constructability, but the plans, specifications, Request for Tender (RFT) and relevant special provisions must be reviewed.

11.5 LEVELS

11.5.1 DATUM

Datum and datum differences stated on key marine structures drawings should be checked prior to any works. MWPA general requirements are as follows:

- Marine components of the Project will be relative to Chart Datum (NRCD).
- All onshore structural construction will be to Australian Height Datum (AHD).
- Key interface levels on drawings will use both NRCD and AHD Datums.
- Horizontal datum Geraldton Coastal Grid 95 coordinates relate to GCG95.
- Refer to Figure 13 – Mid West Ports Authority Vertical Datum Summary

For clarity, Figure 13 shows the relationship between the various datums.

11.5.2 OVERHEAD CLEARANCES

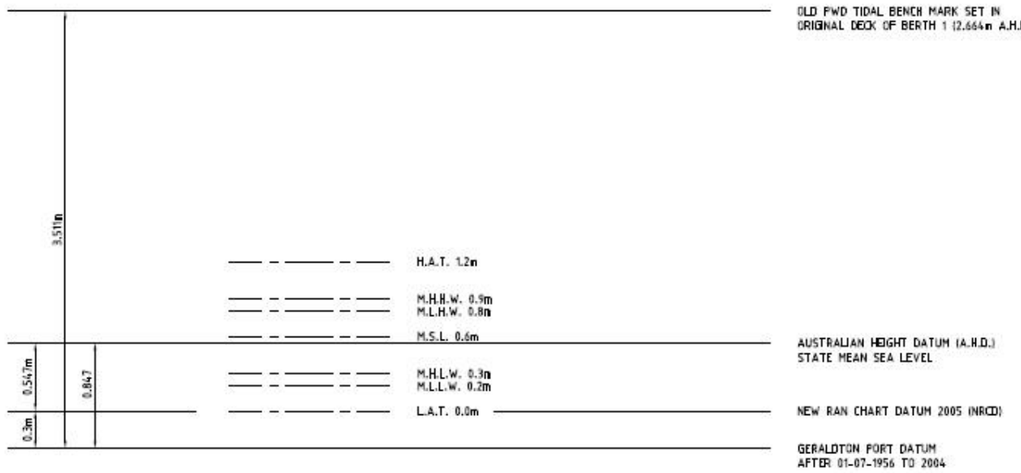
The following minimum overhead clearances shall apply wherever practicable:

Table 18: Minimum Overhead Clearances

Location	Clearance
Major Plant Roads (see Figure 3 MRWA Guide to Design and Operation of High Wide Load Corridors)	10.0m
Over Pumps and Rotating Equipment	2.0m
Over walkways and platforms	2.1m

NOTES

1. ALL MARITIME CONSTRUCTION WILL BE CHART DATUM (NRCD)
2. ALL ONSHORE STRUCTURAL CONSTRUCTION WILL BE AUSTRALIAN HEIGHT DATUM (AHD.)
3. KEY INTERFACE LEVELS ON DRAWING WILL USE BOTH NRCD & AHD DATUMS
4. HORIZONTAL DATUM CO-ORDINATES RELATE TO GDA94
5. THIS DRAWING IS BASED ON INFORMATION SUPPLIED BY DRG No. GPA05-DATUM-01-B (REV B)



LEGEND

H.A.T.	HIGHEST ASTRONOMICAL TIDE
M.H.H.W.	MEAN HIGH HIGH WATER
M.L.H.W.	MEAN LOW HIGH WATER
M.S.L.	MEAN SEA LEVEL
M.H.L.W.	MEAN HIGH LOW WATER
M.L.L.W.	MEAN LOW LOW WATER
L.A.T.	LOWEST ASTRONOMICAL TIDE

REV	DATE	DESCRIPTION	DRN	APP
0	18.10.13	DATA TRANSFERRED FROM DRG 75309495-000409	RF	IH

REVISIONS

DRG. No.	DRG. TITLE

REFERENCE DRAWINGS

APPROVED	GPA
CHECKED	GPA
DRAWN	R. FERSTAT
DESIGN CHECK	
DESIGNED	
GPA PROJECT No	ADM-003

GPA

GERALDTON PORT AUTHORITY
298 Marine Terrace, GERALDTON 6530
P.O. Box 1658, GERALDTON 6531 Australia
Tel: +61 8 9964 0520
Fax: +61 8 9964 0555
www.gpa.wa.gov.au

GERALDTON PORT AUTHORITY

GERALDTON PORT
HARBOUR GENERAL
DATUM SUMMARY - 2007

SCALE		DRG No.	REV.
A1 - 1:20	A3 - 1:40	010-MA-0004	0

Figure 13: MWPA Datum Summary

11.5.3 DRAINAGE

A preferred minimum fall gradient of 1/200, i.e. 5mm/1m shall be provided on all drainage systems wherever feasible. Designers are to make allowance for particles of heavier density due to the product that is handled within the Geraldton Ports Bulk Handling Facility. Consideration must be given in the design of drainage systems to ease of access and maintenance. Silt traps, for example, should have sufficient depth between the inflow and outflow to store trapped material between maintenance events.

Surface water will drain directly into the sea. Where there is a requirement to contain potential pollutants (e.g. hydro-carbons), the appropriate interception and filtration measures should be included in the design. The hydraulic grade line is likely to be influenced by tide levels. The current Mean High High Water (MHHW) level is at +0.45 AHD (Australian Height Datum)

The CGG (City of Greater Geraldton) Stormwater Drainage Asset Management Plan makes the following provision:

> "*A stormwater drainage system that is designed to provide protection for commercial buildings within a new subdivision where the consequences of flooding are severe, may require drainage protection offered through a frequency of 1 in 20 years*".

MWPA generally recommends the following design criteria in commercial and industrial areas:

- Design Average Recurrence Interval (ARI) of 15 years.
- Intensity (I) of 20mm in 20 minutes.
- TOC. (Time of Concentration): 5 minute storm event.
- 100% run off, Impervious Runoff Coefficient (C) of 0.9.

11.6 DESIGN VESSEL SIZES

The design of future facilities or modification of existing facilities shall cater for the following vessel parameters wherever practicable and unless other requirements are provided:

- Minimum: Handymax Class Vessels
  - Typically 35,000 to 50,000 DWT and 150 to 200m long
- Maximum: Panamax Class Vessels
  - Typically 50,000 to 80,000 DWT and limited to 294.13m long and 32.31m wide

A berthing load limitation of 55,000T is applicable and a mooring limitation of 75,000T displacement is also applicable to the main berths.

12 PROJECT CLOSE-OUT

12.1 CLOSE-OUT DOCUMENTATION

12.1.1 QUALITY ASSURANCE DOCUMENTS

During the course of the construction phase of a development or project, numerous QA (Quality Assurance) inspections and tests will have been undertaken by the Developer or Contractor. These may have been conducted on site or in the factory or workshop during fabrication or assemble. Some field tests will require laboratory analysis to be undertaken and the results of the analysis also forms part of the QA data pack.

As part of the project close out activities MWPA shall be provided with a data pack containing all relevant and required QA documentation as proof that the full requirements of the Project Specification and applicable standards have been met, for example test certificates and manufacturer's certificates. Manufacturer's and supplier's certificates shall be such that they enable a clear trace of items from source to the location within the Works.

Quality verification record documentation shall be in a format acceptable to the MWPA Representative.

12.1.2 AS CONSTRUCTED DATA

It is possible that changes and variations to the scope of work would have occurred for a variety of reasons, meaning that the as-constructed or as-built product would differ from what is reflected on the IFC (Issued for Construction) drawings.

The Contractor shall survey, using a suitably qualified person, the completed works and supply to the MWPA a copy of the data in either .dwg or .dxf format. As appropriate, the use of separate drawing layers will be used. This information may be described using a shortened code to be approved by the MWPA. Digital data colours will conform to the requirements of the MWPA Drafting Guidelines and AutoCAD Standards.

MWPA requires a full set of as-constructed drawings detailing deviations from the original scope and attesting to the achievement of the project scope of work. The Contractor may be required to submit as-constructed records to the MWPA Representative at regular intervals during the Contract Period, as agreed with the MWPA Representative.

12.1.3 COMMISSIONING AND TESTING

As the construction phase of the development draws to a close, various commissioning and testing activities may be undertaken in preparation for handover to operational staff. **MWPA Procedure 1.22 Commissioning of Plant or Process Procedure** shall be applied.

During this stage, defects inspection and snagging activities are to be undertaken by the Contractor. The MWPA representative shall be notified upon rectification of defects identified so that a Final Defects Inspection can take place. If no further major defects are identified the MWPA may advise progression to practical completion status.

12.1.4 PRACTICAL COMPLETION

When the Developer or Contractor is confident that the Works are practically complete in accordance with the Scope of Work and all major defects have been rectified, the contractor shall allow MWPA representatives access to plant, equipment, personnel and records, to enable MWPA to inspect or audit the contractor's works or operations in order to evaluate achievement of Practical Completion.

Should defects be identified which prevent the award Practical Completion, these will need to be rectified and a further inspection undertaken. If the MWPA Representative is satisfied that Practical Completion has been achieved, MWPA will provide a Practical Completion Certificate.

Upon award of the Practical Completion Certificate a portion of Security or Retention Monies held is released, if provision for this has been made in the Conditions of Contract.

SECURITY AND RETENTION MONEYS

To ensure that the Contractor performs in accordance with the Contract, MWPA may request a form of guarantee from the Contractor. The most common forms of guarantees are Security and Retention Moneys.

Security relates to the acceptance from the Contractor of an unconditional bank guarantee. Similar forms of security may be considered. The amount is equivalent to the amount stated in the Contract and is held by the Principal should the Contractor default. The amount of security is normally set by assessing financial risk. The MWPA minimum requirement is 10% of the Contract Sum.

The normal practice is for security to be held by the Principal in two equal parts following tender acceptance. Half is normally released at Practical Completion, and the balance when Final Certificate is issued after the Defects Liability Period has finished.

Retention Money relates to a percentage (up to 10%) of the amount due on each progress certificate which is retained until a stated sum is reached. This sum is a safeguarded for the Principal should the Contractor default. It is known as the retention amount. The total retention amount is normally between 5% and 10% of the Contract Sum. Half of the retention is normally released to the Contractor on issuing the notice of Practical Completion, and the balance when the Final Certificate is issued (after the Defects Liability Period has finished).

12.1.5 DEFECTS LIABILITY PERIOD

Award of Practical Completion status signals the commencement of the Defects Liability Period. The duration of the Defects Liability Period will be as agreed in the Conditions of Contract. This is defined as a set period of time after achievement of Practical Completion during which the Contractor is obligated to return to the site to remedy defects. The Contractor must be notified in writing of any defects arising during the Defects Liability Period.

Note: The Warranty Period generally takes effect from the Date of Practical Completion.

12.1.6 FINAL COMPLETION

Upon completion of the Defects Liability Period the MWPA Representative issues a Final Completion Certificate on the basis that the Contractor has rectified all outstanding omissions/defects according to the Contract. This usually involves a final inspection by all parties.

Award of the Final Completion Certificate triggers the release the final portion of Security or Retention Monies held, if provision for this has been made in the Conditions of Contract.

12.1.7 WARRANTY PERIOD

Following the completion of the project, the Contractor as a part of the handover process is required to provide warranties guaranteeing the performance of various elements of the Works for a specified period (Normally two to 10 years).

These warranties extend the protection provided to MWPA as some defects may not become apparent during the Defects Liability Period. The Warranty Period takes effect from the Date of Practical Completion, or for those works completed and accepted after Practical Completion from the date the works were accepted as being completed by the MWPA Representative. At the conclusion of the Defects Liability Period MWPA is able to contact the specified sub-contractor listed on the warranty to inspect and make necessary rectifications.

It is important to note that warranties may be voided if rectification works are undertaken by contractors other than those providing the warranties. Prior to carrying out any works, it is recommended that contractors providing warranties are contacted and advice sought regarding the impact on their warranties.

12.1.8 HANDOVER

The handover of the completed equipment, facility or element thereof to the operator is to be documented in the form of a formal Handover Certificate. MWPA's Project Handover Certificate shall be issued by the MWPA Project Manager or Representative.

The Handover Certificate shall list the technical information and items forming part of the project handover process which are provided in order to safely use the facility or equipment being handed over in a manner which is consistent with Project Scope. The list shall include, but not be limited to, the following:

Table 19: Project Handover Lists

List Item	Examples
Contract Documentation	Practical Completion Certificate Defects Inspection List
Certification	Electrical Test Certificates Emergency Lighting Certificates Smoke Detector Certification
Approvals (Third Party)	Environmental Licence State Mining Engineers Approval
Operation and Maintenance	List of critical spares handed over (and location) Recommended spares list Operation and Maintenance Manuals List of tools handed over (and location) Asset Register and PPM Schedule Current list of isolations Plant maintenance and running log to date
Project Record Information	As Built Drawings List of outstanding Project Handover Information
Commissioning	Commissioning records
Training	Training records
Practicalities	List of keys handed over

As a minimum, there should be a sign-off between the party handing over the equipment or facility and party receiving control.

12.1.9 DEBRIEF

In the interest of continual improvement it is advisable to conduct a Debrief or Close-Out Meeting at the end of the Project. This is a means of establishing the innovations and positives that could be repeated on future similar projects and also identifying areas for improvement to avoid repeating errors made during the course of the project.

Debriefing meetings provide the project team members with the opportunity to give some direct feedback about the project. Aside from being an opportunity to review of what went well and what did not go well, it is an opportunity for project leadership to probe deeper into project issues and to establish the root causes of these issues.

The entire project team should have the opportunity to participate, the more people providing direct verbal feedback to the project leadership the better. Larger projects may require a series of meetings. At the Debriefing Meeting the team members typically discuss project issues in a structured format. A facilitator guides the group in probing deeply into a pre-selected list of issues. Such meetings can also provide team members an opportunity to vent and get closure.

DEBRIEF MEETING AND DOCUMENT STRUCTURE

A Debrief Meeting may be structured to cover the following topics and points of discussion:

- Summary Recommendations:
  - Did the project fulfil its objectives?
  - Is the output meeting its expected targets?
  - Recommendations.
  - Culture.
  - Process.
  - Content.
  - Technical.
- Positives:
  - Heroes.
  - Culture.
  - Process.
  - Content.
  - Technical.
- Areas for Improvement:
  - Editorial/Content issues.
  - People/Resource issues.
  - Communication/Process issues.
  - Site Integrity/User Experience Issues.
  - Technical Build/Systems Integration issues.
  - Policy/Cultural Issues.
  - Business Affairs/Contracting/Legal issues.

- Timeline:
  Revisit Objectives and Deliverables by constructing a timeline under headings such as Tasks, Deliverables and Decisions. The timeline can also be broken down into key project areas:
  - Culture.
  - Process.
  - Content.
  - Technical.
- Performance Figures:
  - KPIs.
  - Success Against Objectives.
  - Project Score Grid (e.g. a summation each individual's score out of 10).

APPENDIX A

DETAILED TECHNICAL GUIDELINES LIST

ITEM A1 – DETAILED TECHNICAL GUIDELINES LIST

No.	Description	Status
MWPA 000 Series	**Port Development Guidelines**	
MWPA 000	Port Development Guideline	Current
MWPA 100 Series	**Port Technical Guidelines – General Guidelines**	
MWPA 100	General Guidelines	Current
MWPA 200 Series	**Port Technical Guidelines – Drafting & Surveying Guidelines**	
MWPA 200	Drafting Guidelines and AutoCAD Standards	Current
MWPA 201	Surveying Guidelines	Proposed
MWPA 300 Series	**Port Technical Guidelines - Mechanical Guidelines**	
MWPA 300	Mechanical Engineering Guidelines - General	Proposed
MWPA 301	Guidelines for Conveyors	Proposed
MWPA 302	Guidelines for Shiploaders	Proposed
MWPA 303	Guidelines for Towers – Transfer and Take-up	Proposed
MWPA 304	Guidelines for Feeders	Proposed
MWPA 305	Guidelines for Dust Extractors/Collectors	Proposed
MWPA 306	Guidelines for Unloaders	Proposed
MWPA 400 Series	**Port Technical Guidelines - Guidelines for Maritime Structures**	
MWPA 400	Maritime Structures Guideline	Current
MWPA 401	Guidelines for Protective Coatings	Current
MWPA 402	Rock Structures Guideline	Current
MWPA 403	Guidelines for HDG Coatings	Draft
MWPA 404	Cathodic Protection Guidelines	Draft
MWPA 500 Series	**Port Technical Guidelines - Civil Engineering Guidelines**	
MWPA 500	Civil Engineering Guidelines	Draft
MWPA 501	Guidelines for Reclaim Fill Placement	Draft
MWPA 502	Guidelines for Buried Services	Current
MWPA 503	Guidelines for Roads & Pavements	Current
MWPA 504	Guidelines for Earthworks & Backfilling	Proposed
MWPA 505	Stormwater Drainage Guidelines	Proposed

No.	Description	Status
MWPA 506	Sewer Systems Guidelines(Gravity & Vacuum)	Proposed
MWPA 507	Guidelines for Fuel Pipelines	Proposed
MWPA 508	Guidelines for Line marking and Signage	Proposed
MWPA 509	Guidelines for Fire Fighting Systems	Proposed
MWPA 600 Series	**Port Technical Guidelines - Buildings and Structures Guidelines**	
MWPA 600	Buildings and Structures Guidelines	Draft
MWPA 601	Reinforced Concrete Guidelines	Draft
MWPA 602	Structural Steelwork Guidelines (includes cladding)	Draft
MWPA 603	Guidelines for Access Structures	Proposed
MWPA 604	Guidelines for Plates Works/Chutes and Hoppers	Proposed
MWPA 700 Series	**Port Technical Guidelines - Electrical and Instrumentation Guidelines**	
MWPA 700	Electrical and Instrumentation Guidelines	Current
MWPA 701	Guidelines for High Voltage Indoor Switchboards	Current
MWPA 702	Guidelines for Supplier Quality Requirements	Current
MWPA 703	Guidelines for Supplier Data instruction	Current
MWPA 704	Guidelines for Low Voltage Switchboards	Current
MWPA 705	Guidelines for High Voltage Ring Main Units	Current
MWPA 706	Guidelines for Electrical Installation	Current
MWPA 707	Guidelines for Distribution Transformers	Current
MWPA 708	Electrical and Instrumentation Installation Guidelines	Current
MWPA 800 Series	**"Port Technical Guidelines - Guidelines for Rail**	
MWPA 800	Guidelines for Rail Infrastructure	Proposed
MWPA 900 Series	**Port Technical Guidelines - Additional Guidelines**	
MWPA 900	Guidelines for Vegetation, Planting & Ground Cover	Current
MWPA 901	Guidelines for Security Systems	Current
MWPA 902	Guidelines for Fire Detection Systems	Proposed
MWPA 903	Guidelines for Communications Systems	Proposed

APPENDIX B

SAMPLE SAFETY IN DESIGN RISK TABLE

ITEM B1 – SAFETY IN DESIGN RISK ASSESSMENT

Design Life Cycle: → Investigation and Design → Setup, Construction and Commissioning → Operation → Maintenance → Disposal

Job Name:	**Job No:**	**Design** (Discipline)**:**	**Date:**

Design Reference	Hazards	Design Life Cycle Stage	Risk	Existing Control Measures	Initial Risk Rating			Potential Control Measures (Consider Hierarchy of Control - Elimination, Substitution, Isolation, Engineering Controls, Administrative Controls, PPE)	Responsibility	By When	Decision / Status	Residual Risk Rating			Comments
					C	L	RR					C	L	RR	
n/a.	Manual handling of materials	Setup, Construction and Commissioning	Muscular-Skeletal injuries to operatives	Minimise weight of individual components. Where possible, design out arrangements, obstacles etc. which potentially make manual handling more difficult.	B	3	Medium	Provide mechanical handling equipment where practical. Train operatives in good manual handling techniques.	Civils Manager, Site Engineer	Before site works commence	To be included in the contractors safety plan	B	2	Low	
n/a.	Striking existing services while excavating for new containment works	Setup, Construction and Commissioning	Electrocution of operative, damage to infrastructure	Full services search & survey undertaken in advance.	E	2	High	Contractor's safety plan in place. "Dial before you dig", Port services plans	Civils Manager, Site Engineer	Before site works commence	To be included in the contractors safety plan	E	1	Medium	

ITEM B2 - RISK ASSESSMENT MATRIX

			CONSEQUENCE				
			MINOR A	MAJOR B	SEVERE C	CRITICAL D	CATASTROPHIC E
LIKELIHOOD	VERY UNLIKELY	1	Low	Low	Medium	Medium	Medium
	UNLIKELY	2	Low	Low	Medium	Medium	High
	POSSIBLE	3	Low	Medium	High	High	High
	LIKELY	4	Medium	Medium	High	High	Extreme
	ALMOST CERTAIN	5	Medium	High	High	Extreme	Extreme

ITEM B3 - CONSEQUENCE AND LIKELIHOOD DESCRIPTORS

CONSEQUENCE DESCRIPTORS

Select the **MOST LIKELY/PROBABLE** consequence descriptor for the information available.

Risk Consequence	Design Consequence Descriptors
E- Catastrophic	Could result in fatality or irreversible severe environmental damage required to be notified under jurisdiction requirements.
D – Critical	Could result in permanent total disability or reversible environmental damage required to be notified under jurisdiction requirements.
C- Severe	Could result in permanent partial disability, injuries or illness that may result in hospitalisation of persons or reversible environmental damage required to be notified under jurisdiction requirements.
B - Major	Could result in injury or illness resulting in one or more lost work day(s) or reversible environmental damage not required to be notified under jurisdiction requirements where restoration activities can be accomplished.
A – Minor	Could result in injury or illness not resulting in a lost work day or minimal environmental damage not required to be notified under jurisdiction requirements.

LIKELIHOOD DESCRIPTORS

Select the best likelihood descriptor for the information available.

Likelihood Descriptor	Design Likelihood Descriptors
5 – Almost Certain	Industry experience suggests design failure is almost certain to occur during the life of the product.
4 – Likely	Industry experience suggests design failure is likely to occur during the life of the product.
3 – Possible	Industry experience suggests design failure is possible at some time during the life of the design.
2 – Unlikely	Industry experience suggests design failure is unlikely to occur in the life of design.
1 – Very Unlikely	Industry experience suggests design failure is very unlikely. It can be assumed failure occurrence may not be experienced,