Southern Ports

Sustainable Development Guidelines

DOCUMENT CONTROL

Revision Number	Description	Reviewed by	Approved by	Review Date	Issue Date
01	New Document	Manager Projects and Engineering	Chief Executive Officer		16/12/2019

AUDIT

This Guideline shall be reviewed or revised:

- where a Risk Assessment or Audit identifies a need to review
- when legislative changes impact this Guideline
- following a significant incident involving this Guideline
- at least every two years.

DISCLAIMER

Southern Ports makes no statements, representations or warranties about the accuracy, currency or completeness of the information contained in the Sustainable Development Guidelines. The proponent should make its own assessment of all information contained in the Sustainable Development Guidelines to satisfy itself as to the suitability of such information for the proponents own purposes. Any reliance by the proponent, on any information, or any use of any information, in the Sustainable Development Guidelines, is solely at its own risk. Southern Ports does not accept any responsibility for any interpretation, opinion or conclusion that the proponent may form as a result of examining the information and Southern Ports is not liable, and the proponent covenants not to make any claim or commence or pursue any proceedings against Southern Ports, for any loss of any kind arising from an error, inaccuracy, incompleteness or similar defect in the information contained in the Sustainable Development Guidelines.

Contents

Tables

ABBREVIATIONS

Abbreviations used in this Guideline are defined in 1 below.

Table 1: Abbreviations

AHD	Australian Height Datum
ARI	Average Return Interval
AS	Australian Standard
CEMP	Construction Environmental Management Plan
CTMP	Construction Traffic Management Plan
DFES	Department of Fire and Emergency Services
DMIRS	Department of Mines, Industry Regulation and Safety
DPLH	Department of Planning, Lands and Heritage
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
EPS	Environmental Protection Statement
ERMP	Environmental Review and Management Program
HAT	Highest Astronomical Tide
IFC	Issued for Construction
LAT	Lowest Astronomical Tide
MRWA	Main Roads of Western Australia
NCC	National Construction Code
NPER	National Professional Engineers Register
OEMP	Operational Environmental Management Plan
OSMP	Operational Safety Management Plan
OSP	Operational Security Plan
OTMP	Operational Traffic Management Plan
SDS	Safety Data Sheets

1 INTRODUCTION

1.1 General

Southern Ports is a Western Australian Government Trading Enterprise established under the Port Authorities Act 1999 (WA) (the Act) comprising of the ports of Albany, Bunbury and Esperance.

The Southern Ports Sustainable Development Guidelines (this document) provide guidance to Proponents in the development and construction of new infrastructure or modification of existing infrastructure within Southern Ports. The Development Guidelines provide detailed performance criteria and minimum development requirements for both land and marine infrastructure.

The Development Guidelines comprises of 4 sections, as follows:

Section 1: Specifies the expected design criteria and standards for all drawings submitted to Southern Ports by the Proponents.

Section 2: Specifies the expected design criteria and standards for land developments.

Section 3: Specifies the expected design and standards criteria for maritime developments.

Section 4: Specifies the site specific design and standards criteria, and information at the individual ports of Albany, Bunbury and Esperance.

This document forms part of the trade enquiry process. Southern Ports encourages pre-lodgement discussions as early as possible in the trade enquiry process. This allows Southern Ports to outline any issues with the development, information requirements and provide any existing information held by Southern Ports to assist the applicant(s) or Proponents(s) during the process.

For further information on the trade enquiry process please refer to the Southern Ports website (https://www.southernports.com.au/new-trade-enquiries).

1.2 Southern Ports Authority to Approve Port Works and Port Facilities

Under the Act and the Port Authority Regulations 2001(WA) (the Regulations), Southern Ports' approval or authorisation is required for all physical development or works carried out on any port lands, as well as for the use of any port land.

This is in addition to any other approvals that may be required from other authorities or decision-makers, which may include, but are not limited to –

- development approval under the Planning and Development Act 2005 (WA) (the **PD Act**)[1] under either Local Planning Schemes or Region Planning Schemes applicable to the port area;
- demolition and building permits, and occupancy certificates, under the Building Act 2011 (WA), the Health Act 1911 (WA) and the Public Health Act 2016 (WA);
- clearing permits, Works Approvals and Licences under from the Department of Water and Environmental Regulation or the Department of Mines, Industry Regulation and Safety under the Environmental Protection Act 1986 (WA). This includes aspects of a development related to industrial emissions and discharges to the environment; and
- environmental approvals from the Commonwealth Department of Environment and Energy under the Environment Protection and Biodiversity Conservation Act 1999 (Cth).

[1] See section 35(9) of the *Port Authorities Act* 1999 (WA)

Development or use of land that falls within the scope of either "port works" or "port facilities" as defined in the Act[2], generally does not require development approval under Local Planning Schemes or Region Planning Schemes, but still requires approval or authorisation from Southern Ports as referred to above. Also, even if development approval is not required, Southern Ports is nevertheless required under the PD Act to consult with relevant authorities to ensure that any proposed port works or port facilities have regard to the purpose and intent of any Planning Scheme, the requirements of orderly and proper planning, and the preservation of local amenity.

Table 2: Agencies and Regulatory Bodies

Agency or Regulatory Body	Type of Approval
1. Department of Fire and Emergency Services (DFES)	Fire hydrants and other required firefighting resources to be provided in accordance with DFES requirements.
2. Department of Agriculture (DoA)	Formerly the Federal Department of Agriculture, Fisheries and Forestry (DAFF) and Department of Agriculture and Water Resources (DAWR). DoA provides import and export biosecurity inspection and certification services to help retain Australia's highly favourable animal, plant and human health status and wide access to overseas export markets.
3. Department of Mines, Industry Regulation and Safety (DMIRS)	DMIRS provides regulatory and policy oversight of the mineral and energy resources sector by overseeing environmental standards, worker health and safety and dangerous goods legislation. Where a port is deemed to be a mine site, DMIRS has regulatory coverage. Otherwise WorkCover is the regulatory body for those functions except for dangerous goods.
4. Department of Water and Environment Regulation (DWER)	• A land clearing permit may be required under the Environmental Protection (Clearing of Native Vegetation) Regulations 2004. • A Works Approval and Licence Amendment (Part V of the Environmental Protection Act) may be required. The DWER website provides guidelines for clearing permits and exemptions and regulations for clearing native vegetation: www.dwer.wa.gov.au
5. Department of Planning, Lands and Heritage (DPLH)	Approval to relocate or disturb Aboriginal Heritage Sites via Section 18 under the Aboriginal Heritage Act. It is the Proponent's responsibility to arrange for all surveys, liaison and consultation as well as to obtain all necessary approvals associated with the development. The Department of Planning, Lands and Heritage (DPLH) website provides guidelines and advice for developers: www.dplh.wa.gov.au (under Heritage and Culture).
6. Environmental Protection Authority (EPA)	Developments may require referral to the EPA to assess any significant or potential environmental impacts during construction and / or operation of the development. The EPA will determine the level of assessment required for the proposal. Further information concerning referral of proposals and environmental impact assessment can be obtained from the EPA website: www.epa.wa.gov.au (under the "EIA Process Information" link).

2 SUSTAINABILITY

Southern Ports is committed to creating sustainable developments, including not adversely impacting the site ecology or the environment, minimising the whole of life cost and creating a long-term benefit for the wider community and region. Any development and operation within its ports must incorporate sustainable design principles and practices appropriate to the scale of the development or operational activity.

Development proposals are required to integrate best practice sustainable design standards during design, construction, operation and demolition of the proposed development. The main objectives of sustainable design are to reduce, or completely avoid, depletion of critical resources like energy, water, land, and raw materials; prevent environmental degradation caused by facilities and infrastructure throughout their life cycle; minimise the whole of life cost (including, but not limited to, capital, operating, maintenance and demolition costs); and create a work environment that mitigates and reduces adverse impacts on health and wellbeing.

Development proposals must demonstrate a capacity to minimise harm and damage to the environment through sustainable design and by managing the activities which have the potential to adversely impact upon the environment, by avoiding indiscriminate use of natural resources, minimising waste and maximising efficiencies. Features such as sustainable material selection and low water consumption are integral design principles for proposed developments.

Buildings, workshop and storage facilities must be designed employing strategies for minimising energy consumption such as decreasing infiltration and increasing insulation, correctly sizing the heating, roof ventilators, and air-conditioning (HVAC) systems; low emissivity glazing, rain water harvesting and, installation of high efficiency equipment, lighting, and appliances. Passive design measures should be included to prevent overheating and subsequently reduce carbon emissions.

Consideration should be given to the application of renewable energy systems such as - integrated photovoltaic systems that generate electricity, solar thermal systems that produce hot water, and heat pump systems. Renewable energy solutions may include the use of distributed energy sources, including micro grids, turbines, storage batteries, and fuel cells that provide reliability (emergency and mission critical power) and some degree of grid independence, and reduce reliance on the fossil fuel grid power.

Proposals should include design elements for consideration of Infrastructure Sustainability Council of Australia (ISCA) or Green Building accreditation (or other nationally recognised sustainable building standards) incorporating aspects such as indoor environmental quality, energy, transport, water, emissions, innovation and materials.

3 DRAWINGS CRITERIA AND STANDARDS

Conceptual, construction and As-Constructed drawings are important components when assessing development and construction applications. The Proponent must ensure that all drawings submitted to Southern Ports for approval are in accordance with the requirements described below. The level of details shown in the drawings will be dependent upon the complexity of the development.

Southern Ports may assist in this process by providing the Proponent with existing information, such as recent aerial photography for development overlays.

Table 3: Performance Criteria and Applicable Standards

Performance Criteria	Minimum Standard
1) Concept design drawings will be submitted as supporting documentation of a Development Approval Application with all information related to the proposed development, to facilitate its assessment by Southern Ports.	a) Concept design drawings are to contain the following general information, as a minimum: i) Company Name and contact details ii) Drawing number iii) Revision number and revision details iv) Drawing date v) Drawing scale and scale bar vi) North arrow vii) Details of the horizontal and vertical datum, when applicable; and viii) Drawing status (“Concept Only”, “Preliminary Design”)
2) Issued for Construction (IFC) drawings will be submitted as supporting documentation of a Construction Approval Application and will capture all information related to the construction issues, to facilitate its assessment by Southern Ports.	a) IFC drawings are to contain the following general information, as a minimum: i) Company Name and contact details ii) Registered Professional Engineer full name, signature and registration number. iii) Drawing number iv) Revision number and revision details v) Drawing date vi) Drawing scale and scale bar vii) North arrow viii) Details of the horizontal & vertical datum, when applicable; and ix) Drawing status (“Issued for Construction”) b) In addition to the above, IFC drawings will contain specific information, including: i) Site Works: ▪ Earthworks, including cut and fill volumes ▪ Locations and heights of stabilised embankments including gradient ▪ Retaining walls ▪ Existing stormwater drains, culverts, oil/silt removal catch pits ▪ Pavement details and design or other surface finishes including falls and gradients ▪ Identification and size of uses for all areas of the development e.g. storage, loading, trade display, parking.

Performance Criteria	Minimum Standard
	▪ Location and dimensions of areas to be provided for the loading and unloading of vehicles carrying goods or commodities to and from the site ▪ Fencing - type, location and height ▪ Areas of open space, landscaping and screen planting, including materials, plant species, irrigation and irrigation plans ▪ Vegetation to be removed ▪ Buildings and structures to be installed ▪ Any other item or infrastructure that needs to be relocated or removed ii) Road works ▪ Plans and profile ▪ Cross sections and grades ▪ Verge and road features ▪ Streets, locations and names ▪ Pedestrian access ▪ Road compaction tolerances ▪ Subsoil drainage ▪ Trenching plan ▪ Existing Structures ▪ Road signage ▪ Road furniture iii) Electrical and Communications ▪ Location and plan of all existing and future communications pits and conduit galleries ▪ Location plans of electrical and services outlets ▪ Line diagrams; ▪ Trench details iv) Drainage ▪ Drainage plan for site showing catchments areas, directions and volumes of design flow ▪ Culvert sections and design ▪ Sediment and pollution traps ▪ Existing stormwater drains v) Signage and Line marking ▪ Signage plan showing location of traffic, safety, legislative and lease signs ▪ Footing plan and sign heights ▪ Signage layouts for all nonstandard signs (advertising) ▪ Line marking plan for all areas including car parks; ▪ Roadways and turnarounds

Performance Criteria	Minimum Standard
3) Drawings will be prepared in compliance with applicable Australian Standards (AS) and Southern Ports requirements.	a) Drawings must comply with: i) AS 1100 Part 101: Technical Drawing – General Principles ii) AS 1100 Part 401: Technical Drawing - Engineering Survey and Engineering Survey Design Drawing. b) IFC and As-Constructed drawings for developments must be certified by a registered professional engineer. c) At completion of the works and within a timeframe determined by Southern Ports in the development conditions, the developer will provide Southern Ports with a full set of As-Constructed drawings in digital PDF and Auto Cad formats. These drawings will be in a reproducible form, clearly marked: "As-Constructed" and signed by the registered professional engineer. As-Constructed drawings in A1 or A3 sized hard copies may be required; at Southern Ports' discretion. d) Allotment boundary drawings will be certified by a Licensed Surveyor in accordance with Department of Regional Development and Lands and Landgate requirements.
4) A Proof of Engineering Certificate must be prepared by an independent third party and is to be submitted to Southern Ports.	a) Proof of Engineering Certificate must be submitted for Developments in order to ensure compliance with: i) Applicable Australian Standards ii) National Construction Code (NCC); and iii) Development Conditions set by Southern Ports

4 DESIGN CRITERIA AND STANDARDS FOR LAND DEVELOPMENTS

Land developments include, but are not limited to buildings, roads, drainage, laydown areas, fencing and installation of all essential services.

The minimum standards for land developments are stipulated in the following sections. Standards from relevant Australian Standards also apply. Compliance with the minimum standards does not necessarily constitute satisfaction of the performance criteria, which will be determined by reference to each individual development proposal, but provides guidance as to what is typically required in relation to the performance criteria.

Southern Ports may issue dispensations for certain elements of the minimum standards where the Proponent has demonstrated the value or requirement for such dispensation. A dispensation request must be provided in writing. Where a case is demonstrated, and at the discretion of Southern Ports, the proposal may be deemed in compliance, provided there is no compromise of:

1) Other performance criteria
2) The development vision; and
3) The permitted use of the seabed or land.

Respectively, Southern Ports may vary development conditions or extend the time for compliance of any of the condition(s) imposed at its discretion.

Southern Ports encourages pre-lodgement discussions as early as possible in the Development process. This allows Southern Ports to delineate issues with the development, or information requirements, and to impart existing information that Southern Ports holds that may assist the Proponent during the process.

Proponents are also encouraged to adopt safety in design processes during the design, as at this point there is the greatest chance to make changes to the design to arrive at a safe solution.

Information on existing services can be obtained via a Dial Before You Dig enquiry https://www.1100.com.au/.

4.1 Lease Agreement Performance Criteria and Standards

Performance Criteria	Minimum Standard
1) The Proponent is granted tenure for the proposed use of the land by Southern Ports prior to the commencement of any works.	a) Proposed operational activities must be encompassed in the licence, lease, or agreement between the Proponent and Southern Ports for the use of the land. Any new activities that are not covered in the permitted use of the land must be presented to Southern Ports for approval. b) Should Southern Ports approve a new permitted use of the land, a written agreement between Southern Ports and the Proponent must be formalised (i.e. existing lease agreement amended, a new lease or licence be issued). c) For new Port Users and prior to export a Port Access Licence (PAL) must be formalised between Southern Ports and, the Port User/Proponent.
2) The development will be consistent with the Lease / Port Access Licence Agreement.	a) No part of the development such as buildings, fences, depots, car parking and storage facilities is sited outside of the registered boundary. b) The use of the land is in accordance with the permitted use, set out in the Lease / PAL Agreement, unless prior consent from Southern Ports has been obtained. c) Buildings, storage facilities, depots and structures will be maintained in good condition.

4.2 Geotechnical Conditions

Performance Criteria	Minimum Standard
Ground level geotechnical conditions are sufficient to allow for proposed loadings.	a) All ground level pavements, slabs and hardstand areas have been certified by a Registered Professional Engineer to withstand proposed loading of buildings, vehicles, structures and cargo stacking where applicable. b) All geotechnical reports and studies carried out in relation to the proposed development will be submitted to Southern Ports in digital formats.

4.3 Development Levels

Performance Criteria	Minimum Standard
1) The land is developed to minimum levels to avoid the effects of storm surge, hinterland run-off, wave action and predicted sea level rise.	a) Development levels will be calculated based on the following parameters: i) Storm surge using a minimum 100 year return interval plus a further 200mm

Performance Criteria	Minimum Standard
	ii) Taking into consideration surrounding land levels iii) Drainage requirements iv) Ease of access from road v) Predicted sea level rise for the nominated design life. Values for each port based on AS 4997 are included in the relevant Appendices. b) Generally, the finished ground surface level will be at least 0.2 m above the 100 year storm surge level. The finished floor levels of buildings will be 0.3 m above this level. c) The Proponent will satisfy themselves that the elevation of the land developed or leased, is satisfactory with regards to surge tide and flood risk. d) Platforms should be at a level at which the risk of inundation is acceptable to the end user. To minimise the risks associated with future developments, a detailed storm surge study would need to be undertaken with the proposed design of the development taken into consideration.

4.4 Fill Material Brought onto Site

Performance Criteria	Minimum Standard
1) Any fill brought onto Southern Ports land(s) by the Proponent is required to be high quality uncontaminated fill material.	a) The Proponent must obtain Southern Ports' approval two weeks prior to bringing fill material onto site. Notwithstanding, Southern Ports approval, the Proponent will remain responsible for its obligations under the lease agreement, to return the land at the end of the lease in the same condition as it was provided to the Proponent. All risks with placing fill on the land and subsequent activities upon that land will remain the responsibility of the Proponent.
2) Fill materials need to meet the environmental, safety and engineering requirements.	a) As per Section 4.18 of this document, all fill material brought to site must be free of contamination. b) The Proponent will sample and test the material, and provide Southern Ports with a copy of results, to demonstrate compliance with the criteria for clean fill, including that it does not contain any acid sulfate soil or potentially acid sulfate soil. These criteria are indicated in DWER publication *Landfill Waste Classification and Waste Definitions 1996 (as amended),* available as a publication on www.dwer.wa.gov.au. c) The Proponent will submit a risk assessment to Southern Ports for placing the material at the nominated location including monitoring of the fill material. d) Use of clay as fill material is not permitted. Southern Ports may instruct the Proponent to undertake a geotechnical analysis of the material in order to ensure its adequacy for the purpose. e) The Proponent is to maintain records of the source, volume and placement of fill material to the site, and provide such information to Southern Ports as each fill project is completed, or every 6 months, whichever is the lesser. This will include:

Performance Criteria	Minimum Standard
	i) Source of fill (land lot and physical address); ii) Contamination status of this land parcel via cross reference to the Contaminated Sites Register and any other relevant information; iii) Volume of the fill; iv) Brief physical description; and v) Area(s) where fill material is placed.

4.5 Buildings

The following performance criterion is applicable to both temporary and permanent buildings. Southern Ports will specify a period to which a temporary building is permitted to remain upon an approved site, and the requirements for its removal.

Performance Criteria	Minimum Standard
1) Buildings are designed and constructed in accordance with the National Construction Code (NCC), Australian Standards and all applicable authorities' requirements.	a) Buildings of all classes must be designed and constructed so that they comply with and are certified to the provisions as required by the NCC, Australian Standards, and all applicable authorities' requirements.
2) Building structures must function efficiently and safely.	a) The site coverage of all buildings must allow for sufficient: i) Space between buildings ii) Setbacks iii) Landscaping iv) Car parking v) Storage and collection areas for rubbish and waste vi) Vehicle manoeuvring and access vii) Firefighting resources b) The Development Application for any buildings will specify whether the structure is permanent or temporary, the location and design of the structure in relation to surrounding structures, and other physical features and footings or other methods of stabilising the structure.
3) Buildings have an expected floor level that provides expected flood protection.	a) The land is developed to minimum levels to avoid the effects of storm surge, hinterland run-off, wave action and sea level rise.
4) Care must be taken to ensure the durability of the components used in the construction and operation of buildings and structures.	a) Permanent building and structures will have a minimum design life of 25 years, unless agreed otherwise, depending on the type of structure and proposed use. b) Building and structures are designed to comply with the requirements of AS/NZS1170.2:2011 and

Performance Criteria	Minimum Standard
	classified in accordance with the wind classifications allocated in AS4055:2012 c) Structural design must be certified by a registered professional structural engineer d) All components used in every aspect of construction are to be of suitably durable materials, and able to withstand local climatic conditions
5) Site planning of buildings must prevent impacts upon underground services and vehicle circulation.	a) The site layout must avoid building over existing services (potable water supply mains, sewer or stormwater mains, and electrical, telecommunication, and fibre optic cables) and allow for safe and effective manoeuvring of vehicles near and around services b) The development of the site must not adversely impact existing site drainage. If necessary, local on-site drains will be constructed to ensure the site discharges into the perimeter drains. Refer to Stormwater Criteria.
6) Outdoor lighting must be provided for safety and security where required.	a) Landscaping element of the Development will be consistent with local planning requirements, unless dispensation from Southern Ports has been granted. b) Where required, a Landscape Master Plan will include, as a minimum: i) The percentage of the site devoted to landscaping ii) The areas subject to landscaping works iii) Location and species of plants iv) Other materials imported, arranged and/or constructed on the site v) Areas to be irrigated and the systems to be used; and vi) The proposed staging, if any, of works. c) Proposed irrigation will utilise alternative water sources such as captured stormwater or recycled water, wherever possible.

4.6 Fences

Performance Criteria	Minimum Standard
1) Development areas will be appropriately delineated with approved fencing.	Temporary Fences: a) Installation of temporary fences is permitted in construction sites as part of site establishment. Fences will be installed prior to the commencement of construction activities and be included in the development approval for site establishment. b) Temporary construction site fences are to be removed once the construction activities are completed. Permanent Fences: c) Similar specification to existing Southern Ports' fencing, i.e. galvanised chain mesh size 2.5mm to 3mm thick, 1.8 high with 3 barbed wire above vertical d) Perimeter fences must be at least 1.8 m high and should be of chain wire construction. Chain wire fences up to 3m high are acceptable. e) Perimeter fences must be located either within the leased area or on the boundary line. Boundary coordinates must be obtained from Southern Ports by the Proponent prior to the installation of perimeter fences, the Proponent will engage a licensed surveyor to undertake a boundary survey of the property where required. f) Solid Colourbond or similar fences may be used within lease areas for security or privacy. However, Southern Ports approval must be obtained for all fences constructed of solid material. g) Unless there is a legal, security or other requirement to comply with, Southern Ports requests that Proponent leave barbed wire off the fences, to create a more fauna friendly environment. h) All fencing will be designed in accordance with AS 1725: Chain-link fabric security fencing and gates. i) Fence stanchions, rails and footings must be designed to resist wind loads to comply with the requirements of AS/NZS1170.2:2011 and classified in accordance with the wind classifications allocated in AS4055:2012 j) A full site plan is to be submitted, showing the structural details of the fence as well as the height and location of the fence in relation to the property boundaries and existing buildings on the property. Where the building or other infrastructure is already secured against entry by nature of its construction, plans can be submitted showing no fencing.

4.7 Signage

Performance Criteria	Minimum Standard
1) Approved signage is installed within the site.	a) Southern Ports' approval is required for the installation of permanent and temporary signs within the site. Signs to be installed within a building do not require Southern Ports approval. b) Drawings, plans and elevations, showing structural details, height and location of signs in relation to the property boundaries and/or existing buildings on the

Performance Criteria	Minimum Standard
	property, inscription(s) to appear in the sign(s), method of construction and fixing of sign(s) must be submitted to Southern Ports for approval.
2) Permanent and temporary signage is designed compliant with the Australian Standards.	a) Any sign will be in accordance with AS 1744: Forms of Letters and Numerals for Road Signs and Main Roads of Australia, as required.
3) Permanent and temporary signage complies with Australian Standards.	a) A sign will not be erected or maintained that: i) Endangers public safety ii) Obstructs or impedes the sight-lines required for the free and safe movement of traffic into or from any street, vehicle circulation path. iii) Is likely to be confused with or mistaken for an official traffic light or sign or to contravene the *Road Traffic Act 1974 or Main Roads Act 1930* iv) On any building or structure which will detrimentally affect the structural integrity of the building or structure v) Is sited on a road reserve, footpath, drainage reserve, or carriageway, unless approved by Southern Ports vi) Is outside the property boundary vii) Impedes security camera sight lines b) Permanent signs will be securely fixed to the structure by which it is supported. Fixings and support posts will be designed and maintained to comply with the requirements of AS/NZS1170.2:2011 and classified in accordance with the wind classifications allocated in AS4055:2012. Some signage may require appropriate barriers or bollards to minimise the potential for vehicle impact. c) Temporary signs will be securely fixed to the structure by which it is supported and will be removed during storm wind events or constructed to permanent sign standards. d) Construction sites must be appropriately signed. Any such sign will be removed within seven (7) days of completion.
4) Permanent entrance signs will be erected within the site, to Southern Ports' requirements.	a) A lot sign will be placed at the entrance of the site. Sign lettering and numerals will be in accordance with AS 1744. b) The lot sign will be set vertically and located within the lease area at 1.5m from the entrance of the lease area. The lowest part of the lot sign will be a minimum of 1.8m above the ground level or 2.2m if in a pedestrian access. c) Signage stating the minimum safety Personal Protective Equipment (PPE); site induction requirements; visitor directional sign; speed limit; and traffic flow direction; will be placed at the entrance of the site. d) Signage stating the normal operations contact and emergency contact, name and numbers, will be placed at the entrance of the site.

4.8 Car Park

Performance Criteria	Minimum Standard
1) Parking areas are to be provided on site to meet all operational, employee and customer needs in compliance with NCC and applicable AS.	a) Parking areas are to be provided on site to accommodate all vehicles expected to visit and remain on the site during construction and operation phases. b) On-street vehicle parking is not permitted. c) Car park must be suitably sealed in accordance with construction specifications for Commercial or Industrial pavement including drainage. d) The minimum design life for vehicle access and parking areas will be 20 years. e) Design loadings as applicable will be identified for business units' use. f) Delineation of parking bays, signage, kerbing, wheel stops, and aisle width will be completed in accordance with AS 2890.1 and AS 2890.2, with a minimum car park bay dimension of 2.8m wide and 5.8m long. g) The Proponent will ensure the provision and location of car parking bays for the disabled are compliant with the National Construction Code.
2) Car parking facilities will be permanently maintained to the satisfaction of Southern Ports.	a) Car park will be maintained in good condition.

4.9 Road Access and Driveways

Performance Criteria	Minimum Standard
1) On site vehicles access is to be designed in accordance with MRWA requirements	a) Roads, curbs, driveways and pavements must be designed and kept in accordance with Main Roads Western Australia (MRWA) specifications, as applicable b) Entrances directly on to public roads require local planning authority or MRWA approval as applicable. c) Minimum design life for public access, driveways and common road pavements will be 20 years with design loadings as applicable for the road use. d) Driveway width and radius will be designed to allow a double road train in its own lane and triple road train in both lanes. e) The design speed of driveways for semi-trailers is 5 km/hr. f) Clearances must be suitable for a Triple Road Train to enter each site. g) Selected driveways will require a culvert of an appropriate size for water flow and must be capable of supporting the maximum vehicle weight, with a minimum culvert size assessed and designed accordingly, but with a minimum diameter pipe of 300 mm. h) Culvert design, including diameter, headwalls and erosion protection, must be designed by a Registered

Performance Criteria	Minimum Standard
	Professional Engineer. Southern Ports' approval must be obtained for pipe or culvert details and driveway design on all access points.

4.10 Traffic Management

Performance Criteria	Minimum Standard
1) Vehicle circulation and manoeuvring is provided on-site to meet all operational, employee and customer needs.	a) Driveway and, on site road access and egress design will enable the entering of a site without impeding traffic or queuing across footpaths, driveways or intersections. b) External roads. All traffic will be accommodated within property and/or lease boundary. c) An access, circulation, manoeuvring and parking plan will illustrate the following details, as a minimum: i) Estimated traffic volumes ii) Type of vehicles and loadings iii) Dimensions of all pavement and areas iv) Turning circles for the largest vehicle accessing the site v) Pavement design details (in-situ preparation, layer works depths and materials, seal) vi) All gradients of parking, access and circulation areas. d) Appropriate signage, line marking, and lighting are provided for on-site circulation routes. e) Appropriate safety barriers are provided where required. f) Sufficient space is provided on-site to ensure safe and effective manoeuvring of vehicle around the site. g) Access and manoeuvring of emergency service vehicles will be considered in the design and construction of driveways and onsite roadways.
2) Traffic flow generated by the development during both construction and operational phases will be managed in accordance with an approved Construction Traffic Management Plan and Operational Traffic Management Plan.	a) Construction Traffic Management Plan (CTMP) is to be submitted to Southern Ports for approval and will comply with AS 1742: Manual of Uniform Traffic Control Devices Set. The Construction Traffic Management Plan is to be prepared by a suitably qualified person with MRWA accreditation in Advanced Worksite Traffic Management, if traffic flow is affected by the works and the installation of traffic control devices and mechanisms is required. b) If in the opinion of Southern Ports, the CTMP is complex then Southern Ports may require that an engineer with MRWA accreditation as a Road Works Traffic Manager prepare or review the CTMP. This document is to be submitted at least two weeks prior to the commencement of construction works to allow sufficient time for Southern Ports to review and comment. The document must be approved by Southern Ports before construction works commence. c) Operational Traffic Management Plan (OTMP) is to be submitted to Southern Ports for approval and will comply with MRWA and applicable Australian Standards, and is to be prepared by suitably qualified

Performance Criteria	Minimum Standard
	person with MRWA accreditation in Advanced Worksite Traffic Management. d) If in the opinion of Southern Ports, the OTMP is complex then Southern Ports may require that an engineer with MRWA accreditation as a Road Works Traffic Manager prepare or review the OTMP. The Operational Traffic Management Plan is to be submitted at least two weeks prior to the commencement of site operations to allow sufficient time for Southern Ports to review and comment. The document must be approved by Southern Ports before site operations commence. e) Note: Refer to MRWA Website for a Guide to Preparation of Traffic Management Plans.
3) Off-site works complement the road network to safely and efficiently meet the operational requirements.	a) Works required to augment the road network to meet the operational needs of the development are identified on plans. b) Design and construction of off-site road network infrastructure will meet: i) MRWA requirements ii) Local planning authority requirements iii) Southern Ports Traffic Management Plan requirements. iv) A traffic management study may be required, addressing impacts of the development and associated vehicle activity on the road network. These are likely to be projects which will significantly add to, or impact on, traffic volumes in these areas, with a guideline of a 5% increase in peak or total daily traffic counts. However, projects which significantly change the mix of traffic, or have the potential to impact traffic flows (such as laden B-doubles hauling at slow speeds) will be required to submit documentation for Southern Ports to understand and assess the potential impact.

4.11 Services

Performance Criteria	Minimum Standard
1) Land is adequately serviced to appropriate standards that would be required for new developments.	a) Services will be designed and installed in compliance with the service provider's standards. b) Services will be consolidated into services corridors to minimise impact on future land use. c) If required, the development must include provision for additional infrastructure to facilitate future developments. Southern Ports will disclose to the Proponent available information regarding the location of existing services, to ensure that the proposed infrastructure design and layout do not compromise existing services, easements and or planned future land uses. The Proponent is responsible for collecting all the necessary information of location of existing services and easement from various sources (Landgate, service providers, Southern Ports) and for verifying its accuracy. Southern Ports does not guarantee the accuracy of the information provided.

Performance Criteria	Minimum Standard
1. The land is serviced with water to a standard that would be required or expected of new development. Potable Water Service Providers may be: • Water Corporation • Aqwest • Southern Ports	a) Details of water supply and water storage requirements will be submitted to Southern Ports at first, in order to ascertain who the Potable Water Service Provider will be and for approval. b) Development Approval must also be obtained from the Potable Water Service Provider if the water supply is required from existing water pipes, or if the installations of new pipes or water meters are required. All works must be done in accordance with the Potable Water Service Provider's requirements. Early project concept discussions with Southern Ports are encouraged, and applicant(s) or Proponent(s) are reminded that Southern Ports officers can offer support facilitating these discussions c) New water lines required in road reserves will only be laid in defined service corridors with the approval of Southern Ports and the Potable Water Service Provider. Issued for Construction drawings need to be prepared and approved by the Potable Water Service Provider and the approved IFC drawings will be submitted to Southern Ports prior to the commencement of the construction works.
2) The land is serviced with power to a standard that would be required or expected of new development. Electricity infrastructure and service provider may be one or more of the following: • Western Power • Horizon Power • Synergy • Southern Ports	a) Details of electrical power supply requirements will be submitted to Southern Ports at first, in order help ascertain who the electrical service provider will be. b) Power supply cables will be installed underground within the site, unless otherwise approved by Southern Ports. Appropriate warning signage and tape indicating the location of buried cables must be installed. c) New power supplies required in road reserves will only be located in defined service corridors with the approval of Southern Ports and, where applicable, the electricity infrastructure provider. Electrical services installations will be in accordance with all applicable Australian Standards and other regulatory and authorities requirements. d) The proponent must contact the relevant electrical service provider for establishment of a new service or reticulation off existing mains.
3) The land is serviced with telecommunications to a standard required or expected of a new development.	a) Details of telecommunications requirements will be submitted to Southern Ports at first, in order to help ascertain who the telecommunications service provider will be b) New cabling and conduits for communications infrastructure required by the proponent will only be located in defined port service corridors with the approval of Southern Ports. c) Installation of communication services will be in accordance with all applicable Australian Standards and other regulatory and authorities" requirement. Note 1: the telecommunications service provider must be contacted for establishment of a new service. Southern Ports can assist by facilitating discussions with the service providers and/or providing existing

Performance Criteria	Minimum Standard
	available information that Southern Ports has available. Note 2: Once physical communications installation has been completed, the Proponent is responsible for account setup and payments with the service provider.
4) The land is serviced with lighting to current lux standards that are required or expected of new development.	a) Street lighting will be designed in accordance with the Australian Standard series AS1158-2005: Lighting for Road and Public Spaces Set to provide category P4 light on road verges and other access ways for pedestrians. b) Lighting will be required in laydown areas used regularly outside of normal daylight hours. The lighting design should be completed in accordance with the relevant Australian Standards (including AS/NZS 1680.5) and international guidelines. c) Lighting must not interfere with the visibility of existing or planned navigational aids and must not spill onto adjacent areas off-site or cause annoyance to properties outside the port boundary. d) Lighting must not impact on pilotage services or vessel navigation on Southern Ports waters. e) Outdoor lighting must be provided for safety and security particularly where it is intended that a facility will operate at night. f) Site lighting will be appropriate to its intended usage patterns and work areas. Lighting should provide a safe working environment, and the Proponent should outline what lighting on-site is proposed, how this will be managed and what lighting levels it will provide.
5) The land is serviced with firefighting resources to a standard required or expected of new development.	a) Fire hydrants and other required firefighting resources must be provided by the Proponent in accordance with the Department of Fire and Emergency Services of Western Australia (DFES) requirements. b) Southern Ports can assist in this regard by facilitating discussions with DFES and/or providing existing available information that Southern Ports has in its historical records management system. c) Fire services will be installed in accordance with all applicable Australian Standards, the NCC and other regulatory and authorities" requirements. The Proponent will provide written confirmation from the regulator to Southern Ports. d) Applicant(s) or Proponent(s) must take appropriate actions to control possible fires risks within developments, using portable extinguishers or an onsite firewater reticulation system. e) Any building larger than 500m^2 will require a fire water reticulation main in accordance with the National Construction Code. Depending on the size and scale of the development, a “Fire Study” may be required to be completed by the Proponent and submitted to DFES for review. f) Access for fire trucks will be allowed in the design of driveways and roads.

Performance Criteria	Minimum Standard
6) Waste management must comply with relevant regulations and applicable standards.	a) Waste-storage areas will be sized to suit the frequency of waste removal from site and located for ease of access by waste removal vehicles. Bins will be fitted with lids and/or covers to stop windblown litter and access by feral animals. b) All waste materials including fuel, oil, chemicals, hazardous materials and sewage, where relevant, will be adequately bunded to appropriate Australian Standards and meet all regulatory requirements, removed from the site and disposed of in accordance with regulatory requirements and transferred to an authorised disposal site. Burning of waste is not permitted on site. c) The proponent must be able to provide documentary evidence detailing the chain of custody documents for the transport and disposal of contaminated and/or Controlled Waste.
7) The land is serviced with sewerage to a standard required or expected of new development.	a) As there is no standardised or central sewerage scheme for Southern Ports lands, the Proponent may need to install their own self-contained or interconnected systems. The Proponent will provide details of the proposed on-site sewerage system for Southern Ports approval. b) Onsite effluent disposal systems are to comply with the requirements of the *Health (Treatment of Sewerage and Disposal of Effluent and Liquid Waste) Regulations 1974*, for which the local authority is the delegated approval authority c) Southern Ports encourages Proponents to re-use recycled effluent water where possible for landscaping.
8) Use of Non-Potable water is considered as part of the development	a) Southern Ports encourages proponents to consider using non-potable water for relevant aspects of their development, including equipment wash down, flushing toilets and watering gardens. Sources of non-potable water include rain water, bore water, grey water and recycled water. b) The Department of Health provides information relating to the use of non-potable water on their website https://ww2.health.wa.gov.au/Health-for/Environmental-Health-practitioners/Water. c) Various authorities, including the Department of Health, regulate aspects related to the generation, storage and use of non-potable water, including recycled water. Where required, the relevant approval must be obtained from the relevant authority. Copies of the approvals must be submitted to Southern Ports for review. d) Southern Ports must also grant approval for use of non-potable water within the development.

4.12 Drainage and Stormwater Management

Performance Criteria	Minimum Standard
1) Stormwater drainage from the site is at approved locations and of an acceptable quality and volume to prevent harmful impacts on catchment areas and Southern Ports waters.	a) The proponent must make contact with Southern Ports to obtain advice on whether or not a stormwater management plan encompassing the proposed site exists. If a relevant stormwater management plan does exist then the proposed development will comply with it. If not, the following itemised guidelines should be followed. b) A Site-Based Stormwater Management Plan is prepared and must provide for: i) An acceptable level of flood immunity ii) Catchments areas iii) Erosion and sediment control; and iv) On-site drainage, infiltration and emergency overflow if necessary. c) Stormwater and site run-off are to be appropriately treated on site, including the removal of sediment and other pollutants, by using pollutant interceptors and/or retention basins. To be approved by Southern Ports. d) The stormwater management of the site will be in accordance with all regulatory requirements to minimise the export of pollutants from the site. Applicant(s) or Proponent(s) are encouraged to integrate the principals of Water Sensitive Urban Design (WSUD) into their facilities. e) Stormwater discharge points are to be located so that they do not adversely impact on areas of high ecological value, or cause nuisance or damage to adjoining properties. Drain outlets will be appropriately treated to ensure no erosion occurs during design flows. f) Retention basins will be provided at suitable locations to reduce peak flow rates and allow the first 10mm of rainfall to be processed through the traps. g) The amount of stormwater that needs to be treated within the site will be equivalent to 1:3 months Average Return Interval (ARI) calculated as 50% of 1 year ARI. h) Where stormwater run-off flows from construction and/or operational areas to mangrove, tidal and/ or waterway areas, measures must be implemented to minimise, as far as practicable the volume of water entering these areas.

4.13 Storage and Laydown Areas

Performance Criteria	Minimum Standard
1) Storage areas for goods, materials and containers must be configured in a manner that does not negatively affect the environment and safety of the area.	a) All goods, materials or machinery stored on-site must be stored in a safe manner which satisfies all regulatory and legislative requirements. b) Fuelling of vehicles and equipment will comply with the relevant Dangerous Goods (DG) regulations and

Performance Criteria	Minimum Standard
	relevant Australian Standards. This will follow the proponents procedures that would be included within the management plans required by the lease agreement or port access license. c) The use of modified sea containers is permitted within the site for temporary office, workshop, and storage purposes on condition that prior approval from Southern Ports must be obtained. The approval will require a Certified structural design, by a registered professional structural engineer, for the tie down of the sea containers. d) Pavements for container storage areas should be designed and maintained in accordance with PIANC Report No 165, dated 2015, Design and Maintenance of Container
2) Laydown areas are designed and constructed to be safe and effective, and approved by Southern Ports	a) Laydown areas should be adequately sealed, fit for purpose, durable, hard wearing, drained and regularly maintained, including line marking where applicable. The design life of the seal should be 20 years. b) The type and specification of pavement or surface treatment will depend on the proposed use including vehicle type, frequency of movements, cargo/material type and the laydown area surroundings. c) Pavement types proposed for heavy use trafficable areas must be certified by a Registered Professional engineer. Evidence of certification must be submitted to Southern Ports. d) Southern Ports may consider unsealed laydown areas where the proponent can demonstrate sealing of the laydown area would be impractical or unduly expensive and that the unsealed option would serve the same function with appropriate dust suppression measures provided and implemented.
3) All storage and laydown areas must be permanently maintained by the proponent	a) Storage facilities, depots, laydown areas and any other open area must be maintained by the proponent in good condition.

4.14 Dangerous Goods Storage Areas

Performance Criteria	Minimum Standard
1) Storage of hazardous, dangerous or flammable liquids and materials must not pose a safety, environmental or health risk to any adjoining areas or people, and must demonstrate segregation from surrounding land users.	a) Storage of hazardous, dangerous or flammable liquids and materials will be stored, as a minimum, within a bunded and well ventilated area, in compliance with applicable DG Standards and other regulatory and authority requirements (e.g. Dangerous Goods Safety Act 2004 and Regulations). b) Provision must be made for appropriate firefighting and first aid equipment. c) Provisions must be made for potential spills to be bunded and retained on site for removal and disposal by approved means. d) Information about quantities, location and type of dangerous or flammable liquids/materials are to the provided to Southern Ports. e) Safety Data Sheets (SDS) for all substances or dangerous goods to be stored on the site must be

Performance Criteria	Minimum Standard
	submitted to Southern Ports, along with the respective Dangerous Goods Storage Licences, where required. f) Fuel storage on site must be self contained or contained within a sealed bunded areas, comply with the relevant regulations and standards. Precautions must be in place to ensure that any spills do not escape into the groundwater, stormwater adjacent tidal or waterways. g) Fuelling of vehicles and equipment must comply with the relevant regulations and standards. Must be undertaken on impervious surfaces, at locations away from drainage systems, preventative precautions must be in place to ensure spills do not escape and contaminate groundwater, stormwater and/or causeways, waterways. h) Dangerous goods storage facilities must have applicable signage erected i) Copies of the SDS must be available on-site and appropriately sign posted.
2) Storage facilities for hazardous, dangerous or flammable liquids and materials.	a) The Proponent is responsible for obtaining appropriate licenses and approvals for the storage of hazardous, dangerous or flammable liquids and materials. Copies of these licences are to be provided to Southern Ports. b) The Proponent is responsible for ensuring that all bunding on site complies with the conditions on the Dangerous Goods licence and AS 1940, where applicable. c) Where applicable, the Proponent is responsible for ensuring that the requirement under *Schedule 1 of the Environment Protection Regulations 1987* (prescribed premises) is complied with. Southern Ports can assist by facilitating discussions with the respective Departments. d) Where applicable, the Proponent is responsible for reporting the site to the DWER as having a prescribed activity. e) The design of a bund facility to store flammable and combustible liquid or materials will comply with AS 1940, including, but not limited to: f) The bund must be built from impervious and fire resistant materials, to retain and enable recovery of any such spillage; and g) The bund will be designed to withstand the hydrostatic head when full. h) Copy of the correspondence between the Proponent and the DWER / DMIRS regarding the compliance of the above items will be submitted to Southern Ports for review.
3) The Proponent is responsible for ensuring that the product is appropriately licensed, where required, in accordance with *Dangerous Goods Safety Act 2004* and any relevant regulations.	a) Any development relating to the storage, transportation and handling of any dangerous or hazardous goods requires appropriate approvals and permits from the Department of Mines, Industry Regulation and Safety (DMIRS). Relevant examples of hazardous goods include, but are not limited to, the

Performance Criteria	Minimum Standard
	import, export and storage of Ammonium Nitrate, Anhydrous Ammonia and Explosive Material. For further information refer to www.dmirs.wa.gov.au b) Copies of the Dangerous Goods Storage Licences must be submitted to Southern Ports.
4) Dangerous goods storage areas will be permanently maintained to the satisfaction of Southern Ports.	a) Dangerous goods storage areas will be maintained in good conditions to the satisfaction of Southern Ports.

4.15 Washdown Facility

Performance Criteria	Minimum Standard
1) Washdown pads are designed and constructed to an effective standard, to the satisfaction of Southern Ports	a) Washdown facilities must meet all appropriate standards and regulatory requirements. b) Washdown activities can only be undertaken at dedicated wash-down areas approved by Southern Ports. c) Washdown pad must be sealed and bunded to exclude stormwater runoff. d) The washdown pad dimension will be designed to cater for the likely splash area. e) The volume of washdown pads will be designed to contain any anticipated spill and any foreseeable rainfall and hose down events. f) The washdown pad will have sufficient cross and long fall to provide drainage to a collection point for collection and/or treatment. g) Collection point (sump) is to be provided. Applicant(s) or Proponents may choose to include an evaporation pad sized for the usage and volume of the wash bay, with reuse on-site following appropriate treatment of the wastewater to make it fit for purpose. Sumps may be pumped out on a regular basis to avoid runoff and to prevent soil contamination. Sumps may need treatment to preclude breeding of disease vectors, such as mosquitoes, and special treatments adjacent to active wharf areas may be required. Any proposed discharges of waste water will require consideration and approval by the Southern Ports.

4.16 Rail

Performance Criteria	Minimum Standard
Railway Alignment Design Criteria 1) Railway Engineering	Track design is to be undertaken in accordance, and consultation, with: 1) Rail Infrastructure Manager's Code of Practice Track and Civil Infrastructure 2) Rail Infrastructure Operator 3) Rail Infrastructure Owner 4) Office of the National Rail Safety Regulator 5) Southern Ports The design must consider:

Performance Criteria	Minimum Standard
	a) Infrastructure and operating requirements of the standards, rules, code of practice and guidelines issued by the Rail Industry Safety and Standards Board and relevant Australian Standards. b) Temporary (where applicable) and permanent drainage routes. c) Associated signalling and communication equipment including temporary and permanent cable routes and pits. d) Vehicle access for inspection and maintenance of track structure, signalling and communication installation work. e) Ensure alternative vehicle access to the railway is provided. f) Procurement and installation of new railway infrastructure components as required for refurbishment or replacement of existing railway infrastructure components. g) Assess impacts to existing level crossings h) De-stressing methodology i) Transition design between existing and new track structures j) Future duplication to accommodate additional track and associated turnout as necessary k) Passive provision for future utilities/services l) Rail requirements for 3rd party services on corridor land m) Protection of existing services n) Environmental constraints o) Completion of all works required to commission the new Railway; and p) Removal of all redundant infrastructure from the site. q) Must satisfy the requirements of AS 4292.1 Railway Safety Management – General and Interstate Requirements. r) The Proponents must undertake risk assessment of the design for the Railway Related Works in accordance with the requirements of the Rail Safety National Law (WA) Act 2015 and the associated WA Rail Safety Regulations s) The Proponents must include the risk assessment outcomes in the design documentation. The Proponent's risk assessment must include a risk assessment workshop to which Southern Ports Representatives must be invited
2) Route Selection	a) The rail alignment will be designed for effective train performance, constructability and environmental management including whole of life considerations. b) Route selection will be based on minimising reconstruction and minimising shutdown time at tie-ins. c) Tie in staging design will be formulated in conjunction with RIM and to RIM criteria however detail construction scheduling will be determined by the

Performance Criteria	Minimum Standard
	construction contractor at a time when rail operations and the cited contractor are known.
3) Rail Formation Earthworks-Sub Ballast Capping	a) Rail formation and sub ballast capping design criteria will comply with the RIM Code of Practice. Rail embankment capping width will be 6.0m for all mainline tracks. b) Capping thickness will be a minimum of 200mm, subject to track structure design check and compliance with the RIM Code of Practice. Compaction requirements will be detailed in the technical specification and will align with the RIM Code of Practice.
4) Road Crossings	a) Road Crossings will be protected, or grade separated in accordance with the requirements of Main Roads of Western Australia – Railway Crossing Protection in Western Australia. b) Crossing controls will be in accordance with AS 1742.7 -1993 Manual of Uniform Traffic Control Devices - Railway crossings.
5) Level Crossings	a) Locations: Boom gate level crossings and advance warning lights at all sealed public roads. b) Functionality: Autonomous operation
6) Track Signage	a) All signage will comply with the RIM Code of Practice.
7) Signalling and Communications	a) Signalling and communications design and implementation will be carried out in accordance with RIM practices and requirements
8) Rail Bridge Structural Design Criteria	a) The Rail bridges will be designed in accordance with the Australian Bridge Design Code AS5100 (Code), or as modified by the RIM as required. b) All bridges will be designed for a design life of 100 years in accordance with AS5100. c) The design loading will be based on AS5100 250LA (25 tal) axle configuration which will be confirmed with Proponents/ RIM prior to commencement of structural design. d) The rail bridge will be designed with a ballasted deck. The ballast trough will be nominal 4.5m wide and deep enough to accommodate the track structure, together with a nominal depth of 300mm, of ballast under sleeper. e) RIM, PTA and DoT will confirm future TIE IN requirement for either standard gauge or dual gauge track structure and if required ballast trough will be designed to accommodate a wider structure. f) Safe access to the deck and a full length walkway along the deck will be provided with appropriate access. g) If required pedestrian refuges may also be provided at agreed locations along the deck. h) New bridge decks will be provided with agreed service conduits at agreed locations within the cross section for signals and comms.
9) Design Verification and Acceptance	All designs will need to be independently verified by a deemed competent rail consultant and

Performance Criteria	Minimum Standard
	Southern Ports reserves the right to have oversight of independent verifier competency and rail experience. Southern Ports require submission of the following documents for review: i. 15% design drawings and design report ii. 15% independent verifier comments iii. 85% design drawings and design report iv. 85% independent verifier comments v. Southern Ports reserves the right to request 100% design drawings and design report where the 85% is deemed to be insufficient. vi. Final independent verifier comments closed out. a) The design documentation must cover all aspects relating to the constructability, operability and maintainability of the proposed works including, but not limited to, inter-disciplinary interface and associated designs, construction methodology, safety in design, staging, corridor impacts and management of 3rd party services. b) The design drawings submitted must be clear to understand and of sufficient scale to allow detailed review. Southern Ports reserve the right to request additional drawings or documentation for clarification purposes. c) The design program should make sufficient allowance for Southern Ports to review design submissions with not less than a 6 week period to return comments at each review stage. d) The design drawings must be received in pdf format.

4.17 Conveying and Loading Systems

Performance Criteria	Minimum Standard
1) Design Parameters FOR • Civil Works • Structural Works • Mechanical Works	The following AS apply as a minimum: a) AS1170.0 Structural Design Actions: General Principles b) AS1170.1 Structural Design Actions: Permanent, Imposed and other actions c) AS1170.2 Structural Design Actions: Wind Actions d) AS1170.4 Structural Design Actions: Earthquake Actions in Australia e) AS1403 Design of rotating steel shafts f) AS1442 Carbon steel and carbon-manganese steels – Hot rolled bars and semi-finished products g) AS1554.1 Structural Steel Welding – Welding of Steel Structures h) AS1726 Geotechnical Site Investigations i) AS2159 Piling – Design and Installation j) AS4024 Safety of Machinery k) AS4100 Steel Structures l) AS3600 Concrete Structures m) AS5100 Bridge Design As part of the design, consideration should also be given to any relevant vessel movements during loading and unloading.
2) Structural Importance Level	a) Level 1 in accordance with AS1170.0 b) Average Recurrent Interval of 1/500
3) Design Loads	The conveying and loading system will be designed considering all potential loading scenarios. All design loads are to be in accordance with the latest version of AS/NZS 1170 Structural Design Actions and AS5100 Bridge Design Code.
4) Wind Loads	a) Wind Loads in accordance with AS1170.2 and with the following criteria: • Wind region: Region A • Terrain category: Category 1 • Ultimate wind speed: 45m/s • Serviceability wind speed: 37m/s • Working wind speed: 25m/s • Shielding Multiplier 1 • Topographic Multiplier 1
5) Seismic Loads	a) Seismic loading will be based on AS1170.4 and with the following criteria: • Annual probability of exceedance: 1/500 • Hazard factor: 0.09 • Importance factor: 1.0
6) Government Acts and Regulations	All work will be carried out to comply with the requirements of the Statutory Authorities having jurisdiction over the site. These requirements will include, but not be limited to, the following, as applicable:

Performance Criteria	Minimum Standard
	a) Western Australian Occupational Safety and Health Act (1984) and Regulations (1996) b) Safe Work Australia Act (2008) c) Western Australia Health Act (1911) d) Public Health Act (2016) e) Western Australian Mines Safety and Inspection Act (1994) and Regulations (1995) f) Australian Radiation Protection and Nuclear Safety Act (1998) g) Electricity Act (1945) h) Electricity Regulations (1947) i) Environmental Protection Act (1986) and Regulations (1987) j) Poisons Act (1964) k) Clean Air Act (1964) l) Pollution of Waters by Oil and Noxious Substances Act (1987) m) WA Mining Act 1978 and the Mining Regulations (1981) - Amended 2009 n) Dangerous Goods Safety Act (2004) and Regulations (2007) o) Site specific Statutory Requirements and Environmental Guidelines p) All associated standards referenced within the above. In each case, the latest edition or issue and amendments thereto of the relevant Standard, Act, Regulation, Code or Guideline at the start of the project will apply.
7) Noise and Vibration	a) Where noise and vibration are inherent in the plant, the design will endeavour to minimise these effects where possible. b) Where practical noise levels will be kept below 82 dB(A) one metre from the equipment at “ground” level when measured under free field conditions over a reflecting plane in accordance with AS 1269 but as a minimum installation should comply with the Workplace Health and Safety Regulations and AS 1269. c) In some instances, areas may have to be declared hearing protection zones if effective noise reduction and attenuation cannot be achieved. This will be determined on site and appropriate signs displayed. d) Impacts on community and the environment must be considered and impacts minimised to achieve compliance with all relevant Acts and Regulations.
8) Guarding	a) All plant and equipment will be guarded in accordance with statutory requirements. Conveyors will be guarded in accordance with the AS 4024 and MSIR’s.
9) Safety in Design	a) Safety in Design (**SiD**) is based on the understanding that the most significant opportunity to deliver a safe working environment exists during the design phase of a project. At this point designers and engineers have

Performance Criteria	Minimum Standard
	the greatest chance to make changes to a proposed design to arrive at a safe solution. b) Safe design is a process defined as: "The integration of hazard identification and risk assessment methods early in the design process to eliminate or minimise the risks of injury throughout the life of the product being designed. It encompasses all design including facilities, hardware, systems, equipment, products, tooling, materials, energy controls, layout, and configuration". c) Reference: Australian Safety and Compensation Council Guidance of the principles of safe design for work, 2006. d) Any new or modified bulk handling equipment to be installed will include a formalised and documented SiD process. Generally, this will take the form of formalised and documented design reviews at project specific milestones as well as the generation and updating of a live risk register document. e) To obtain maximum benefit from the SiD process it is important that the full spectrum of stakeholders is represented at these design reviews, including Port Engineers, Designers, Operators, Maintenance personnel and any other parties who may have valuable experience to contribute. The process should consider all possible phases of the new equipment delivery, including: • Construction • Normal operations • Emergencies • Maintenance • Future works on or around the asset • Decommissioning
10) Dust Control, Spillage and Washdown.	a) Control of dust emissions and eliminating spillage is of high importance to Southern Ports. All chutes and transfer points will be designed to be integrated into a dust collector. Conveyors and transfer chutes will be designed to minimise dust generation and eliminate spillage. b) Conveyors will be enclosed on all four sides, unless otherwise approved by Southern Ports in writing. Additional dust and spillage controls may be required by Regulatory Agencies. c) Where the conveyor system is required to be frequently washed appropriate drainage and collection points will be designed to facilitate collection and disposal purposes. d) Washdown material will be contained or disposed of and not enter the harbour or any other water bodies, in compliance with all relevant environmental approvals

Performance Criteria	Minimum Standard
11) Access Requirements.	a) Access for all maintenance tasks will be provided in accordance with requirements of AS 4024. b) All platforms, ladders and handrails are to comply with AS 1657 and give adequate means of operation, inspection and overhaul purposes and will be of sufficient strength to support workmen, tools and portions of plant which may be placed on them during overhaul and inspection periods. Particular attention will be given to their rigidity

4.18 Environmental and Heritage Management

Performance Criteria	Minimum Standard
1) All developments must be managed in accordance with an approved Construction Environmental Management Plan and Operational Environmental Management Plan.	a) Construction Environmental Management Plan (CEMP) must be accepted by Southern Ports, prior to the commencement of site works. The CEMP must demonstrate that all potential environmental and heritage impacts resulting from the construction works have been identified and logged in a register. The register will include risks assessed and measures put in place to prevent or mitigate potential harmful impacts. Southern Ports can assist in the preparation of these plans by identifying issues relevant to a site based on previous experience. Southern Ports requires early engagement in this process via a risk workshop to maximise this value of input. b) Operational Environmental Management Plan (OEMP) must be accepted by Southern Ports, prior to the commissioning of the facility. The OEMP must demonstrate that all potential environmental and heritage aspects resulting from the operation of the development have been identified and logged in a register. The register will include risks assessed and measures put in place to prevent or mitigate potential harmful impacts. This may include a baseline environmental survey and report.
2) All practical precautions must be taken to prevent spills of fuel, oil, chemicals and other hazardous materials and wastes to ensure that contamination of the land does not occur.	a) Hardstand, kerbing and channelling of areas dedicated to fuelling and maintenance of vehicles and equipment, storage of fuel and chemicals, with run-off being collected and appropriately treated before disposal or removal. b) Appropriate cleaning agents and emergency equipment should be provided on site. Land-based spills will be reported to Southern Ports or DWER. c) All contamination of land during either the construction or operational phases must be cleaned up in accordance with DWER and other relevant regulations, to the satisfaction of Southern Ports. d) All fill imported and used on site must be free of contamination and comply with the criteria for clean fill as per Section 4.4 of this document. The fill will not be sourced from sites prescribed under the *Contaminated Sites Act, Environmental Protection Act*

Performance Criteria	Minimum Standard
	1994 unless prior approval has been received from the DWER and Southern Ports in writing. e) The Proponents will either organise for a soil sample analysis to be undertaken by an independent party, at the Proponents cost, prior to the development of undisturbed land or prior to entering into a new lease agreement with Southern Ports, or accepts the land as uncontaminated land and thereby assume all responsibility of contamination during the use of the land. Early discussions should be held with Southern Ports to facilitate investigations and identify what data Southern Ports may have available.
3) The proponent will conduct baseline environmental contamination survey and report for the proposed site prior to construction works	a) The Proponents must ensure that all potentially contaminated sites within the area to be developed are identified and approvals obtained from regulatory bodies, where applicable. b) The Proponents must provide a copy of the report to Southern Ports 4 weeks prior to commencing works.
4) The Proponents must ensure that all heritage sites (including Aboriginal and European) within the area to be developed are identified and approvals are obtained from regulatory bodies, where applicable.	a) The Proponent(s) is responsible for identifying all heritage sites located within the area to be developed. The Proponents will act in close consultation with Southern Ports' Environment department. The Proponent will undertake any required archaeological and heritage site surveys and any relevant engagement. All practical attempts to avoid disturbance or impact on heritage artefacts must be made and demonstrated. b) Developments occurring on undisturbed land may require archaeological surveys. Proponents must closely liaise with Southern Ports' Environment Department and consult with representatives from the local Aboriginal groups to identify sites that may be impacted. Approval to relocate or disturb an Aboriginal site may be required via a Section 18 Notice under the Aboriginal Heritage Act. It is the Proponent's responsibility to arrange for all surveys, liaison and consultation as well as to obtain all necessary approvals associated with the development. Any cultural monitoring expense incurred during construction will be borne by the Proponent. The Department of Planning, Lands and Heritage (DPLH) website provides guidelines and advice for developers: www.dplh.wa.gov.au (under Heritage and Culture). Southern Ports may hold information relating to sites within Port lands and may be able to assist this process. Early and thorough engagement with Southern Ports is encouraged on this issue. c) Copies of all heritage reports and archaeological surveys will be provided to Southern Ports for review.
5) The Proponents must ensure that all sensitive environmental areas within the area to be developed	a) The Proponent is responsible for identifying and minimising harm as far as practical to all sensitive environmental areas within the development, maintain

Performance Criteria	Minimum Standard
are identified and approvals are obtained from regulatory bodies, where applicable.	close consultation with Southern Ports' Environment department and undertake any required environmental monitoring, surveys, approvals and reporting. This includes assessment of any emissions that may include, noise, dust and stormwater. b) The Proponent is responsible for obtaining all required permits or approvals from applicable regulatory bodies. This will include permits such as Native Vegetation clearing permits, works approvals and actions required under the Noise Regulations (1997). Copies of any reports and all correspondence between regulatory bodies will be submitted to Southern Ports.
3) Development must not contravene any Australian biosecurity or customs requirements.	a) Development complies with all requirements of the Department of Agriculture, Department of Home Affairs and any other applicable Commonwealth legislation, and any subordinate legislation (contact www.agriculture.gov.au and www.border.gov.au b) The proponent is responsible for ensuring compliance with all relevant First Point of Entry biosecurity requirements.

4.19 Safety and Security Management

Performance Criteria	Minimum Standard
1) All developments must be managed in accordance with an approved Construction Safety Management Plan and Operational Safety Management Plan.	a) Construction Safety Management Plan must be submitted to Southern Ports, at least two (2) weeks prior to the commencement of site works, which demonstrates that all potential safety aspects resulting from the construction works have been identified, risks assessed and measures put in place to prevent or mitigate potential harmful impacts. b) Operational Safety Management Plan must be submitted to Southern Ports, at least two (2) weeks prior to the commissioning of the facility, which demonstrates that all potential safety aspects resulting from the operation of the facility have been identified, risks assessed and measures put in place to prevent or mitigate potential harmful impacts. c) Where the development includes any maritime activities, an Oil Spill Response Management Plan is to be prepared and submitted to Southern Ports for approval.
2) The development must be designed to conform with all relevant legislation relating to workplace safety and hazard management.	a) The development must be designed to conform with all relevant legislation relating to workplace safety and hazard management. Legislation includes: i) Consolidated *Occupational Safety and Health Act 1984* *ii)* Occupational *Safety and Health Regulations 1996* *iii)* Environmental *Protection (Noise) Regulations 1997* *iv)* Environmental *Protection Regulations 1987*

Performance Criteria	Minimum Standard
	v) *Explosives and Dangerous Goods (Explosives and* Dangerous *Goods Handling and Storage) Regulations 1992* vi) *Gas Standards (Gas Fitting and Consumer Gas* Installations*) Regulations 1999* vii) Health *Regulations 1974, (Treatment of Sewerage & Disposal of Effluent & Liquid Waste)* Any other regulatory or authorities' requirements applicable to a specific application.
3) Risks and hazards associated with the storage or transport of hazardous or flammable materials will satisfy all local, state and Commonwealth legislation and/or requirements.	a) For any development storing hazardous or flammable materials, a hazard identification and risk analysis is to be undertaken with the subsequent implementation of a safety or hazard management plan. b) Storage of any hazardous or flammable materials must be appropriately licensed in accordance with: i) *Flammable and Combustible Liquids Regulation 1994* *ii) Dangerous Goods Safety Management Act 2001* *iii) DFES and DMIRS involved in the licensing process.* iv) Storage of any hazardous or flammable materials must not pose a safety, environmental or health risk to any adjoining areas or people and must demonstrate that is appropriately separated from surrounding land users. v) All *infrastructure* and associated buffer zones (inclusive of over pressure zones and radiant heat contours) must be contained within the agreed development area, or as otherwise approved by Southern Ports in writing. c) Safety Data Sheets (SDS) of any dangerous goods to be stored within the site will be submitted to Southern Ports along with the respective Dangerous Goods Storage Licences.
4) The construction site is managed and operated to ensure it is a safe workplace for employees and visitors.	a) The Proponents and its contractors are to ensure that a workplace plan that meets the requirements of *Occupational Safety & Health Act 1984* is developed and implemented during construction.
5) A Security Management Plan that sets out the systems, practices and procedures to govern the surveillance and security of the premises, plant, equipment and infrastructure is implemented.	a) The Proponents will develop a Security Management Plan that sets out the systems, practices and procedures governing the surveillance and security of the premises, plant, equipment and infrastructure and ensure that it is implemented. b) Where the development implies access from and to maritime sites, the Security Management Plan will include the requirements of the *Maritime Transport and Offshore Facilities Security Act 2003*. c) The Proponents Security Management Plan will not conflict with the requirements of Southern Ports Maritime Security Plan. d) Where additional access is required to Southern Ports Maritime Security Zones, the relevant access control and surveillance systems will be installed by the proponent and controlled by Southern Ports.

4.20 Community and Agency Liaison

Performance Criteria	Minimum Standard
1) All reasonable precautions must be taken by the Proponent to reduce and mitigate interferences that may be caused by the development to Southern Ports' facilities, port users and any other stakeholders.	a) The Proponent will notify in writing the proposed development to adjoining owners or leaseholders, Southern Ports, and any other stakeholders as nominated by Southern Ports that may be affected by the development, prior to the commencement of the construction works. The Proponent must address neighbours' concerns and issues, to the satisfaction of Southern Ports. b) Should a development require closure of public or main road or restriction of the traffic flow through such roads, the Proponent must obtain approval from the MRWA. In addition, the Proponent must notify affected parties with, at least, seven (7) days notice, giving further three (3) and one (1) day notices prior to each traffic restriction. Installation of portable signs around the affected area and publication of notices in local newspapers may be required. c) Permits and approvals will be sought for road closures or traffic restrictions within the Port area.
2) Where applicable, referral agency requirements and conditions of approval have been complied with during the design phase of the development.	a) Where applicable, consultation has occurred with relevant referral agencies. b) The Proponents must seek approvals from MRWA for the following: i. Construction of a new crossover onto a MRWA road ii. Increased traffic flows or change in vehicle type on the road network
3) Community groups that may have an interest or could be impacted by the development have been properly notified and consulted prior to the lodgement of the Development Application.	a) Where applicable, community groups that may have an interest in or could be impacted by the development have been properly notified and consulted prior to the lodgement of the Development Application. Southern Ports is to be consulted regarding correspondence with community groups. Southern Ports can assist with relevant contacts, such as the Port Community Consultative Committee.

5 DESIGN CRITERIA AND STANDARDS FOR MARITIME DEVELOPMENTS

Maritime structures include, but are not limited to wharves, mooring structures, breakwaters, jetties, navigation structures, seawalls, barge ramps, floating platforms, reclamation and walkways.

The minimum standards for marine developments are stipulated in the following sections. Compliance with the minimum standards does not necessarily constitute satisfaction of the performance criteria, which will be determined by reference to each individual development proposal, but provides guidance as to what is typically required in relation to the performance criteria.

Southern Ports may issue dispensations for certain elements of the minimum standards where the Proponent has demonstrated the benefit or requirement for such a dispensation. A dispensation request must be provided in writing. Where a case for dispensation is demonstrated, and at the discretion of Southern Ports, the proposal may be deemed to be in compliance, provided that there is no compromise of:

a) Other performance criteria

b) The development vision

c) The permitted use of the seabed or land

Likewise, Southern Ports may vary development conditions or, extend the time for compliance of any condition imposed.

Southern Ports encourages pre-lodgement discussions as early as possible in the development process. This allows Southern Ports to outline any issues with the development, the information requirements and provide any existing information that Southern Ports holds to assist the Proponents during the process.

Proponents are also encouraged to adopt safety in design processes during the design, as at this point there is the greatest chance to make changes to the design to arrive at a safe solution.

5.1 General Considerations

Performance Criteria	Minimum Standard
1) Maritime Structures are designed and constructed consistent with the Australian Standards	a) Design life for all maritime structures will comply with Table 6.1 of AS4997. b) Cope levels of wharves and jetties are to consider the level of storm surge in addition to the rainfall, wave and global warming sea level rise effects. Platform levels are discussed in Section 4.2 Development Levels. c) Minimum design loads for general cargo wharves will be Class 50 as defined in Table 5.1 of AS4997 plus any specific vehicle and equipment loads that the marine structure will be subject to either during construction or in service. d) The design annual probability of exceedance of ultimate environmental and seismic design load events will be as stipulated in Table B1.2b of the National Construction Code (NCC) based on the following Importance Levels: • Marine structures essential to post disaster recovery, associated with hazardous facilities or for which failure will result in significant detrimental economic or Performance Criteria Minimum Standard environmental consequences will be treated as Importance Level 4 structures. • Other marine structures will be treated as Importance Level 2 structures except that structures designed to accommodate a large number of people will be treated as Importance Level 3 structures. e) The design annual probability of exceedance of design wave events will be as stipulated in Table 5.4 of AS4997- 2005 based on Function Category 3 (High property value or high risk to people) except that Function Category 2 can be adopted for minor marine structures. The design Function Category may be lowered only with the prior written approval of Southern Ports. Design wave parameters will be based on available site-specific records and/or appropriate wave climate modelling. f) Adequate navigation and vessel manoeuvring clearances will be provided to Southern Ports' for review and approval.

Performance Criteria	Minimum Standard
	g) Marine structures incorporating piles or columns exposed to currents will be designed to ensure that the critical flow velocity at which flow induced oscillations can commence as stipulated in Clause 38.3 of BS6349-1:2000 always exceeds the maximum design current velocity for the marine structure. h) Access and safety issues will comply with the NCC as appropriate and with Clause 3.4 of AS4997. i) Displacements and settlements of the structure(s) will comply with Clause 4.2.4 of AS4997 and the relevant sections of the applicable material design code (AS1720, AS3600, AS4100, AS5100). In addition, the adopted design allowable displacements and settlements will take in account the requirements of any equipment located on the marine structure and the effects of the displacements or settlements on the marine structure operations. j) Buried tie rods will be protected from loads induced by settlement of the soil using suitable and adequately sized settlement sleeves and will be adequately protected from corrosion.

5.2 Navigation Consideration

Performance Criteria	Minimum Standard
1) Safe navigation of vessels	The configuration of approach channels, channels, aids to navigation, swing basins, berthing pockets and associated infrastructure will be consistent with the PIANC guidelines and to the satisfaction of the relevant Harbour Master.
2) Real-time Vessel Simulation	Real-time Vessel Simulation may be required to provide: a) A detailed, complete representation of the proposed development and its particular physical conditions, specific tugs, smart technologies to aid perception and decision-making factors incorporated into the design. Real-time simulation can assist with providing a more accurate estimates of operating and spatial parameters; b) design and operation conditions of the proposed development; c) Identification of the particular towage requirements; d) Feedback on manoeuvres, both in normal and emergency conditions; and e) Development of manoeuvring strategies and contingency plans which can be enhanced to include human factors. Southern Ports has dynamic models for each of its three ports which can be used for simulation purposes. Southern Ports Marine Pilots will participate in simulations to appraise the design elements and factors including berth and channel geometry, ship dynamics for a range of proposed vessel types, hydraulic interaction and navigation under various meteorological conditions.
Safe Mooring of Ships	A mooring assessment is required to assess the behaviour of ships at berth under the combined action of wind, waves and current. The assessment would

Performance Criteria	Minimum Standard
	consider ship motion (surge, sway, yaw, heave, pitch, roll) to determine the loads transmitted to the fenders and the mooring lines under the combined action of typical environmental factors (tidal levels, currents, waves, wind and passing vessels). The main application of these models is the design and optimisation of mooring layout and equipment.

5.3 Durability Considerations

Performance Criteria	Minimum Standard
1) Maritime Structures are designed and constructed to ensure the durability of their components and functionality.	a) The durability requirements stipulated in Section 6 of AS4997 must be complied with. b) Protective coating systems are to be provided for steel piles and other structural steel components. Design life for the coating systems is to be 15 years to first maintenance. c) Cathodic Protection Systems (either sacrificial anodes or impressed current) will be installed for all permanently immersed steel components. Protective coatings will be suitable for use with the cathodic protection system. d) A suitable corrosion allowance for steel elements forming critical elements and members of the marine structure that are permanently immersed or within the splash zone but will not be less than 2mm for member protected by a cathodic protection system and/or a protective system. e) The use of prestressed concrete elements is discouraged. If justified, for pre-tensioned prestressed concrete elements, the non-prestressed reinforcement must provide at least 40% of the total prestressed plus non-prestressed reinforcement capacity. f) Measures additional to the use of concrete cover will be used to ensure that the required design life is achieved where the design life of the marine structure exceeds 25 years. Such additional measures can include the use of epoxy coated steel, stainless steel or galvanized reinforcement and/or the use of suitable concrete additives or coatings such as organic or inorganic pore blocker concrete admixtures, chemical corrosion inhibitor admixtures, hydrophobic surface sealants (silanes) and/or cathodic protection systems. Adequate supporting documentation confirming that the proposed measures are suitable for the nominated design life will be provided to Southern Ports for review and comment.

5.4 Seismic Design Considerations

Performance Criteria	Minimum Standard
Maritime Structures are designed and constructed consistent with the Australian Standards and PIANC Guidelines.	a) Seismic loads will be determined in accordance with AS1170.4 and PIANC Report 34 ‘Seismic design guidelines for port structures’ dated 2001.

Performance Criteria	Minimum Standard
	b) Hazard Factor (Z) used in determining seismic loads will be in accordance with Section 3.2 of AS1170.4. c) Marine structures will be designed to accommodate: • Ultimate limit state seismic loads based on the annual probability of exceedance stipulated in Table B1.2b of the NCC without catastrophic failure or collapse. • Appropriate serviceability limit state seismic loads adopted based on engineering judgement. d) The probability of design seismic events occurring simultaneously with design ultimate wind, wave and current loads and even maximum applied and operational loads is typically very small. Accordingly, engineering judgement will be used in determining the environmental and applied/operational loads that are taken to act simultaneously with the design seismic loads with the proviso that Southern Ports approval in writing of the proposed simultaneous loads be received prior to proceeding with the design of the marine structure based on these.

5.5 Scour Considerations

Performance Criteria	Minimum Standard
Maritime Structures are designed and constructed consistent with the Australian Standards and PIANC Guidelines.	a) Consideration of scour effects will be in accordance with Clause 4.5 of AS4997 and PIANC Report No 180 'Guidelines for protecting berthing structures from scour caused by ships' dated 2015. b) Adequate scour allowances, but not less than 1.0m, are to be allowed for in the design of maritime structures. c) Batter slopes under open piled wharves and the sea bed in front of solid quay walls and piers will be protected from scour due to waves, current and, propeller or thruster wash, in accordance with relevant standards by using suitable measures, such as rock armour underlain by geotextiles. d) Rock material will comply with the requirements of Clause 57 of BS6349-1:2000 and Clause 4.10.1 of BS6349-7:1991.

5.6 Dredging Requirements

Performance Criteria	Minimum Standard
Dredging works and disposal of the dredged material will be carried out in accordance with a Proponent's regulatory approvals and supplied Dredging and Spoil Management Plan.	a) The Proponent will submit a Development Application for any dredging works to be undertaken within Southern Ports' seabed and to submit the necessary applications to regulatory agencies for approval to conduct dredging works. b) The Proponent will demonstrate the management of the dredged material and forecast of accretion rates to identify the frequency and extent of any ongoing

Performance Criteria	Minimum Standard
	maintenance dredging requirements for the proposed development.
Capital Dredging Approvals	a) Requisite environmental approvals include referral to the WA Department of Water and Environmental Regulation (DWER) under Part IV of the Western Australian EP Act (1986); referral to the federal Department of Environment (DoE) under the Environment Protection, Biodiversity and Conservation Act (1999) and Sea Dumping Act 1981. b) An Environmental Impact Assessment (EIA) will be prepared in accordance with the National Assessment Guidelines for Dredging (2009) that can be submitted to both the state and national regulators. Development of the EIA includes preparation of a Sampling and Analysis Plan (SAP) of the marine sediments to be dredged, consultation and approvals from the appropriate regulators to confirm this meets their requirements. Completion of the SAP determines the recommendations for either containment or disposal of dredge spoil during the works. These recommendations are to be detailed in the final EIA submitted to the federal and state governments. Should an ocean disposal site be the preferred option an application to DoE is required under the federal Sea Dumping Act (1981) to acquire a Sea Dumping Permit. Even if the site identified is the designated spoil ground for each of the three Ports, another application to DoE is required to acquire a Sea Dumping Permit. Any disposal to land must be done in accordance with the Contaminated Sites Act (2003) or the WA Landfill Waste Classification and Waste Definitions 1996 (as amended 2018).

5.7 Fenders and Mooring Systems

Performance Criteria	Minimum Standard
Maritime Structures are designed and constructed consistent with the Australian Standards. Other standards may be used where referenced as a minimum standard.	a) Fenders are to be material and compression tested. All fenders are to be provided with a written rating specification. b) The design contact point during berthing used in determining design berthing energies must be suitable for the fender arrangement. For example, ¼ point berthing may be suitable for the continuous wharf face with fenders spaced to prevent vessels contacting the wharf structure but dolphin type berth arrangements will allow other more severe berthing configurations. c) Factors of safety stipulated in the PIANC Fender Design Guidelines will be applied to the calculated normal berthing energies to allow for abnormal berthing impact cases, except that the factor of safety will not be less than 2.0 for vessels less than 5,000DWT. d) Suitable low friction facings will be used on the contact faces of fender assemblies.

Performance Criteria	Minimum Standard
	e) Fender and fender support structure design will allow for lateral and vertical loads due to friction between the fender and berthing vessel based on the friction factors stipulated in Table 4 of BS6349: Part 4:1994. f) The design of fenders must allow for detrimental effects of overhanging vertical hull angles or slopes (due to bow flare, vessel hull profile and/or listing or heeling of the vessel when berthing) and vessels with low freeboards contacting the fenders or fender frames near the base or only part way up when berthing at low tides. Such detrimental effects include reduction in the energy absorption capacity of the rubber fender and increasing the projection of the vessel hull behind the fender face when the fenders are placed significantly below the marine structure deck level. g) Fenders must be resistant to localised damage due to belting or sponsons on vessels hulls, for smaller vessels less than about 5,000 DWT. h) The fender design must not allow vessel hulls and/or belting, sponsons or other hull projections and mooring lines to catch on top, underneath on the sides of the fender system and will be resistant to damage due to this. Such measures may include ensuring the fender frame covers the anticipated range of hull heights and belting/sponson levels for the different design vessel sizes and tide levels, minimizing the gap between the base of the fender frame and low tide level, using tapered edges to the fender frames and using shear, weight and uplift chains. i) Fenders must be adequate to accommodate forces imposed by moored vessels obtained from a suitable mooring analysis j) The use of alternative mooring systems, similar in type to a “Cavotec” system, is encouraged if this is a viable alternative. k) The effect of the proximity of passing ships is to be considered during design of moorings and fenders

5.8 Bollards and Quick Release Hooks (QRHs)

Performance Criteria	Minimum Standard
Maritime Structures are designed and constructed consistent with the Australian Standards and British Standard 6349.	a) Bollards and QRHs are to be provided with written rating specification and tested if necessary. Suitable corrosion protection must be provided. b) Adequate QRHs will be provided to allow for one mooring line per hook. c) Mooring line loads will be determined in accordance with Oil Companies International Marine Forum (OCIMF) Guidelines and Recommendations for the Safe Mooring of Large Ships at Piers and Sea Islands and AS 4997. In particular: • Required bollard and QRH capacities for mooring arrangements not subject to significant dynamic effects due to waves and current can be

Performance Criteria	Minimum Standard
	determined in accordance with the simplified method stipulated in AS 4997. • The required bollard and QRH capacities for mooring arrangements subject to significant dynamic effects due to wave and current will be determined by suitable dynamic mooring analyses. • In all cases, notwithstanding the conclusions of the mooring analyses, if the bollards or QRHs will be subject to vessel manoeuvring loads the bollard and QRH capacities will not be less than those stipulated in Table C1 of AS4997. Note that AS4997 stipulates that the capacities stipulated in Table C1 are to be increase by 25% for vessels subject tot other than mild conditions. d) The effect of the proximity of passing ships is to be considered during design of moorings and fenders

5.9 Breakwaters and Armoured Slopes

Performance Criteria	Minimum Standard
Maritime Structures are designed and constructed consistent with the Australian Standards and PIANC Guidelines.	a) Breakwaters will provide the wave attenuation required for safe mooring and operations within the basin or harbour protected by the breakwater without creating adverse conditions in the surrounding area. b) Rubble mound breakwater side slopes and armoured slopes will not be steeper than 1:1.5 or shallower than 1:6 (vertical to horizontal). c) Slopes must be stable and not prone to slope stability failures. d) Rock material will comply with the requirements of Clause 57 of BS6349-1:2000 and Clause 4.10.1 of BS6349-7:1991. e) Breakwaters and armoured slopes will be designed to provide protection against initial damage, against an intermediate damage level requiring repair and against failure as defined in the design method for waves with a probability of exceedance during the life of the structure that has the prior approval of Southern Ports. Example probabilities of exceedance are 50% probability of exceedance during the design life for initial damage, 10% of exceedance during the design life for intermediate damage requiring repair and the design wave stipulated in Table 5.4 of AS4997 for the failure. It is anticipated that the adopted design wave sizes will be influenced by: • The availability and cost of rock or armour units of the required sizes. • The difficulty and cost of undertaking repairs. • The magnitude of the detrimental effects that will arise as a consequence of the failure of the breakwater or armoured slope. f) Breakwaters and seawalls will be designed to provide an overtopping rate that is suitable for the activities taking place or structures located in the area at the top of the breakwater or seawall slope as approved by Southern Ports.

6 APPENDICIES

Appendix A - Standards, Guidelines, Codes and Regulatory Requirements.

Appendix B - Developments within Albany Port – Site Specific Information.

Appendix C - Developments within Bunbury Port – Site Specific Information.

Appendix D - Developments within Esperance Port – Site Specific Information.

Appendix E - Sustainable Development Guidelines Checklist.

APPENDIX A - STANDARDS, GUIDELINES, CODES AND REGULATORY REQUIREMENTS

Wherever possible, the design, construction and installation will comply with relevant Australian Codes and Standards. In cases where Australian standards do not provide the necessary guidance, do not exist or cannot be applied, other industry recognised international standards may be used and this will be clearly stated in the design calculations.

Design Codes and Standards that may be required include, but will not be limited to, the following:

Australian Standards	
• AS 1170.0	Structural design actions – General principles.
• AS 1170.1	Structural design actions – Permanent, Imposed and Other Actions.
• AS 1170.2	Structural design actions – Wind actions.
• AS 1170.4	Structural design actions – Earthquake actions in Australia
• AS 1379	Specification and supply of concrete.
• AS 1478	Chemical admixtures for concrete, mortar and grout.
• AS/NZS 1554	Structural steel welding set.
• AS 1657	Fixed Platforms, Walkways, Stairways and Ladders
• AS 1680.5	Interior and Workplace Lighting – Outdoor workplace lighting
• AS 1726	Geotechnical site investigations
• AS 1940	Storage and handling of flammable and combustible liquids
• AS 2073	Methods for the testing of expanding admixtures for concrete, mortar and grout.
• AS 2159	Piling – Design and installation.
• AS 2239	Galvanic (sacrificial) anodes for cathodic protection.
• AS 2419.1	Fire Hydrant Installations System design, installation and Commissioning
• AS/NZS 2312	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings.
• AS 2350	Methods of Testing Portland and Blended Cements
• AS 2441	Installation of fire hose reels
• AS 2832.3	Cathodic protection of metals: Fixed immersed structures.
• AS 3582	Supplementary cementitious materials for use with Portland and blended cement.
• AS 3600	Concrete structures.
• AS 3610	Formwork for Concrete
• AS 3798	Guidelines on earthworks for commercial and residential development.
• AS 3799	Liquid membrane-forming curing compounds for concrete.
• AS 3846	Handling and transport of dangerous cargoes in Port Areas
• AS 3972	Portland and Blended Cement.

• AS 4024 series	Safety of machinery; Conveyors – Mobile and transportable conveyors.
• AS 4100	Steel structures.
• AS 4324.1:2017	Mobile equipment for continuous handling of bulk materials – General requirements for the design of steel structures.
• AS/NZS 4671	Steel reinforcing materials.
• AS/NZS 4680	Hot-dipped galvanised (zinc) coatings on fabricated ferrous articles.
• AS 4997	Guidelines for the design of Maritime Structures.
• AS 5100	Bridge Design Set.
• AS/NZS ISO 9001	Quality management systems – Requirements.
British Standards	
• BS 6349-1	Maritime Structures Part 1: Code of Practice for General Criteria.
• BS 6349-2	Maritime Structures Part 2: Design of quay walls, jetties and dolphins.
• BS 6349-4	Maritime Structures Part 4: Code of Practice for design of fendering and mooring systems.
• BS 6349-7	Maritime Structures Part 7: Guide to the design and construction of breakwaters.
• BS 8081	Ground Anchorages
• BSEN 1537	Execution of special geotechnical work – Ground anchors.
• BSEN 1997-1	Eurocode 7: Geotechnical Design – Part 1 General Rules.
• NA to BSEN 1997-1	UK National Annex to Eurocode 7: Geotechnical Design Part 1 General Rules.
Other Standards and Guidelines	
• ISGOTT 5th Edition International Safety Guide for Oil Tankers and Terminals	
• PIANC Report of WG 33 ‘Guidelines for the Design of Fenders Systems’ dated 2002	
• PIANC Report 34 ‘Seismic design guidelines for port structures’ dated 2001	
• PIANC Report No 165, dated 2015, Design and Maintenance of Container Terminal Pavements	
• PIANC Report No 180 ‘Guidelines for protecting berthing structures from scour caused by ships’ dated 2015	

APPENDIX B - DEVELOPMENTS WITHIN ALBANY PORT – SITE SPECIFIC INFORMATION

Background

For general information on the Port of Albany please refer to the Southern Ports website.

Navigation charts are available on the Department of Transports website (https://www.transport.wa.gov.au/imarine/nautical-charts.asp)

Developments and operations on Berth 1, 2, 3 and 6

Applicant(s) or Proponents(s) will comply with the existing Berth structure design load criteria set out below. A criterion affects the vessels that will utilise the berths, the equipment that will be placed on the wharf and equipment/vehicles that the applicant(s) or Proponents(s) propose to operate on the wharf.

Southern Ports encourages pre-lodgement discussions as early as possible in the Development Application process. This allows Southern Ports to outline any issues with the development, information requirements and provide any existing information held by Southern Ports to assist the Proponents during the process.

Berth 1, 2, 3 and 6

Deck - Applied Loads

a) Refer to Port Information Guide (PoA)

b) Berth 1 and 2 can take all road legal vehicles that don't require RAV permits and has limited ability for forklift access due to the age of the structure. For further information please discuss with Southern Ports.

c) Berth 3 can take all road legal vehicles that don't require RAV permits, has ability for forklift access and potential for Roll on Roll off vessels. For further information please discuss with Southern Ports.

d) Berth 6 is a dolphin type berth structure with limited vehicle access. For further information please discuss with Southern Ports.

Wind Loads

Harbour Masters may vacate the harbour under storm conditions. Mooring infrastructure will be capable of resisting line loads resulting from 1:500 thunderstorm events.

As a guide:

a) During loading operations at the wharves the maximum design wind velocity (operational wind) is specified by the owner of the Ship loader.

b) The wind design parameters and criteria for the design of the permanent structures will be in accordance with AS/NZS 1170.2 and verified by a suitably qualified person, including the Importance level and the terrain category. Parameters adopted for the design will be provided for review by Southern Ports – Albany.

• Importance Level	2
• Average recurrence interval (Ultimate Limit State)	R = 500
• Average recurrence interval (Serviceability Limit State)	R = 25
• Region	A1
• Ultimate 3 sec gust regional wind speed	V_R = 45m/s (87.5 knots)
• Serviceability 3 sec regional gust wind speed	V_R = 37m/s (71.9 knots)

- Terrain Category — TC1.0
- Site wind speed (V_{sitB}) — = V_R x M_d x (M_{zcat} M_s M_t) as per AS1170.2

Climatic Conditions

Climate information for Albany is available on the Australian Government Bureau of Meteorology Website. As a guide to the ambient conditions, the following information is provided (Source: Australian Government Bureau of Meteorology Website, averages for Albany):

- Mean maximum temperature — 19.5 °C
- Highest recorded temperature — 44.8 °C (8 February 1933)
- Mean daily minimum temperature — 11.8 °C
- Lowest recorded temperature — 0.1 °C (25 July 1943)
- Average annual rainfall — 927.1mm
- Highest annual rainfall — 1395.2mm (1955)
- Maximum daily rainfall — 113.6mm (21 November 2008)
- Maximum monthly rainfall — 292.8mm (June 1920)

Stormwater Management

Stormwater run-off flows from the proposed development area to waterway areas may require consideration and approval under the Waterways Conservation Act 1976 by the DWER and/or the Minister for Water.

Oceanographic

Waves

Albany's wharves are located within Princess Royal Harbour resulting in sheltering of the structures from the open ocean. Waves propagate across a short fetch for most wind directions except for a north-westerly which can drive swell into the harbour. Maximum wave heights in the order of 0.2 to 0.5m are assumed under prevailing and storm conditions respectively.

Current

As the Harbour is not connected to a river system, the only prevailing currents are associated with tidal currents. Given the small tidal range and related prism, negligible currents are predicted for the project area.

Tidal Ranges

The tidal range at Albany Harbour is recorded on the submergence curve for Albany (DoT 696-34-02A 16th September 2011). Provided values reference Chart Datum (CD):

Highest Astronomical Tide	(HAT)	1.38m CD
Highest Astronomical Tide	(HAT)	1.38m CD
Mean Higher High Water	(MHHW)	0.99m CD
Mean Lower High water	(MLHW)	0.71m CD
Mean Sea Level	(MSL)	0.66m CD (approx. zero Australian Height Datum)
Mean Higher Low Water	(MHLW)	0.53m CD

Mean Lower Low Water	(MLLW)	0.36m CD
Lowest Astronomical Tide	(LAT)	0.0m CD

In accordance with AS 4997 sea level rise of 0.2m will be considered for a design life of 50 years.

Dredging

In addition to Section 5.6 Dredging Requirements, a separate and subsequent dredging licence is also required under the Waterways Conservations Act of 1976.

APPENDIX C - DEVELOPMENTS WITHIN BUNBURY PORT – SITE SPECIFIC INFORMATION

Background

For general information on the Port of Bunbury please refer to the Southern Ports website.

Navigation charts are availabile on the Department of Transports website (https://www.transport.wa.gov.au/imarine/nautical-charts.asp).

Developments and operations on Berth 1, 2, 3, 5 and 8

Applicant(s) or Proponents(s) will comply with the existing Berth structure design load criteria set out below. A criterion affects the vessels that will utilise the berths, the equipment that will be placed on the wharf and equipment/vehicles that the Proponents propose to operate on the wharf.

Southern Ports encourages pre-lodgement discussions as early as possible in the Development Application process. This allows Southern Ports to outline any issues with the development, information requirements and provide any existing information held by Southern Ports to assist the Proponents during the process.

Berth 1, 2, 3, 5 and 8

Deck - Applied Loads

a) Please refer to the Bunbury Port Information Guide

Wind Loads

Harbour Masters may vacate the harbour under storm conditions. Mooring infrastructure will be capable of resisting line loads resulting from 1:500 thunderstorm events.

As a guide:

a) During loading operations at the wharves the maximum design wind velocity (operational wind) is specified by the owner of the Ship loader.

b) The wind design parameters and criteria for the design of the permanent structures will be in accordance with AS/NZS 1170.2 and verified by a suitably qualified person, including the Importance level and the terrain category. Parameters adopted for the design will be provided for review by Southern Ports – Bunbury.

Importance Level	2
Average recurrence interval (Ultimate Limit State)	R = 500
Average recurrence interval (Serviceability Limit State)	R = 25
Region	A1
Ultimate 3 sec gust regional wind speed	V_R = 45m/s (87.5 knots)
Serviceability 3 sec regional gust wind speed	V_R = 37m/s (71.9 knots)
Terrain Category	TC1.5
Site wind speed (V_{sitB})	= V_R x M_d x (M_{zcat} M_s M_t) as per AS1170.2

Climatic Conditions

Climate information for Bunbury is available on the Australian Government Bureau of Meteorology Website. As a guide to the ambient conditions, the following information is provided (Source: Australian Government Bureau of Meteorology Website, averages for Bunbury):

Mean daily maximum temperature	23.1 °C
Highest recorded temperature	40.8 °C (11 January 2014)

Mean daily minimum temperature	11 °C
Lowest recorded temperature	-3.0 °C (17 June 2006)
Average annual rainfall	726.1mm
Highest annual rainfall	995.6mm (1999)
Maximum daily rainfall	92.0mm (4 July 1999)
Maximum monthly rainfall	263.6mm (July 2000)

Oceanographic

Waves

The Bunbury Inner Harbour is protected by existing sea-walls resulting in sheltering of the Inner Harbour structures. Waves propagate across a short fetch for most wind directions except for a north-westerly which can drive swell into the harbour. Maximum wave heights in the order of 0.2 to 0.75m are assumed under prevailing and storm conditions respectively.

Current

As the Inner Harbour is not currently connected to a river system, the only prevailing currents are associated with tidal currents. Given the small tidal range and relating prism, negligible currents are predicted for the project area.

The inner harbour structure plan shows that in the future it will be connected to a river system.

Tidal Ranges

The tidal range at Bunbury Inner Harbour is similar to the tides at Beacon 3 as published by Southern Ports - Bunbury. Provided values reference Chart Datum (CD):

Highest Astronomical Tide	(HAT)	1.4m CD
Mean Higher High Water	(MHHW)	0.9m CD
Mean Higher High Water	(MHHW)	0.9m CD
Mean Lower High water	(MLHW)	0.6m CD
Mean Sea Level	(MSL)	0.7m CD (Approx. zero Australian Height Datum)
Mean Higher Low Water	(MHLW)	0.7m CD
Mean Lower Low Water	(MLLW)	0.4m CD
Lowest Astronomical Tide	(LAT)	0.1m CD

In accordance with AS 4997 sea level rise of 0.2m will be considered for a design life of 50 years.

Additional Rail Design Criteria

Railway Alignment Design Criteria 1) Design Requirements	a) The Proponent's design must be in accordance with the WestNet Rail Narrow Gauge Mainline Code of Practice Track and Civil Infrastructure AND b) For any issues not covered by the WNRCoP, the Proponent's design must be in accordance with the requirements of the RISSB Code of Practice and notification of any changes to be made in advance to Southern Ports. c) The principles set out in Section 3 (Design and Rating) of the WNRCoP are inherently related to the recommendations in other sections, for example Section 6 (Monitoring and Maintenance). The process used for the design of the Railway infrastructure has a direct bearing on the permissible

	conditions and deterioration rate of that infrastructure and therefore on the way in which it should be monitored.
Railway Alignment Design Criteria 2) Rolling Stock Clearance Envelope	a) Clearance envelopes for Rolling Stock and wayside clearance for structures will be the narrow gauge 1067mm clearance diagram to suit the rolling stock dimensions and operational clearance requirements. b) Should PTA, ARC INFRASTRUCTURE or DoT advise accommodation of standard gauge rail vehicles is required then the ARC INFRASTRUCTURE standard gauge clearance template will be adopted.
Railway Alignment Design Criteria 3) Mainline Geometric Parameters	a) The main parameters for the design of the Railway are as per the Arc Infrastructure Narrow Gauge code of practice, unless otherwise agreed by Southern Ports b) Design Speed 80km/hr (current 40km/hr) Maximum Vertical Grades for Rolling Stock: Loaded 0.500% (current both directions loaded) Compensation per degree of curvature 0.04% c) Vertical Curves – Minimum Radius (Circular): Summit (crest) curve2,000m Sag curve 2,000m d) Horizontal Geometry – Minimum Curve Radius: Desirable Minimum Radius 600m (current) Absolute Minimum Radius 300m (ARC INFRASTRUCTURE NG Code of Practice) Please note existing rail geometry will not be altered and the above criteria will only apply to new rail. e) Horizontal Geometry – Length of Straights between Tangent Points: Desirable Minimum 40m Absolute Minimum 20m f) Horizontal Geometry – Transitions: Transitions - Length: 55m Rate of Change in Applied Cant: (Superelevation) Full Cant to be achieved within transition curve g) Track Spacing Passing tracks - 5.0m. Rail spurs and back tracks 5.0m or as agreed with ARC INFRASTRUCTURE Spacing where road access is required between tracks for inspections - 10.0m
4) Track Lateral Stability	a) Track will be designed according to the Arc Infrastructure Narrow Gauge Mainline Code of Practice to maintain track stability.
5) Rail Formation Geometry	a) Rail formation and sub ballast capping design and construction will comply with the ARC INFRASTRUCTURE NG Code of Practice unless otherwise noted. b) Rail formation width will accommodate sub ballast capping appropriate for final track structure. This will be confirmed by PTA/ARC INFRASTRUCTURE as for NG or DG as appropriate.

<table>
<tr><td></td><td>c) Cutting and embankment slope criteria will not exceed 1 V:2.0 H.</td></tr>
<tr><td>6) Track Structure- Components</td><td>a) The following track structure will be adopted unless otherwise noted in the ARC INFRASTRUCTURE Narrow Gauge Code of Practice. Final gauge selection and design Tal will be confirmed by PTA and ARC INFRASTRUCTURE. Criteria shown pertains to the existing 1067mm narrow gauge
b) RAIL
<table>
<tr><th>Property</th><th>Description</th></tr>
<tr><td>Type</td><td>New Standard Carbon Steel As-rolled rail</td></tr>
<tr><td>Size</td><td>50kg/m</td></tr>
<tr><td>Profile- Supply</td><td>Standard AS1085.1 – 50kg/m rail</td></tr>
<tr><td>Profile - Operating</td><td>Grind to as -rolled Profile</td></tr>
</table>
c) SLEEPERS
<table>
<tr><th>Property</th><th>Description</th></tr>
<tr><td>Type</td><td>Prestressed Concrete</td></tr>
<tr><td>Standard</td><td>AS1085.1 Part 14, Section 1.2 Alternative Design</td></tr>
<tr><td>Load Distribution</td><td>Zimmerman Method</td></tr>
<tr><td>Impact Factor</td><td>Eisenmann Dynamic Load Factor</td></tr>
<tr><td>Sleeper Spacing</td><td>667mm (current)</td></tr>
<tr><td>Gauge</td><td>1067 +2mm -0mm (Sleeper manufacture tolerance)</td></tr>
<tr><td>Axle Loading</td><td>25 tonne</td></tr>
<tr><td>Design speed</td><td>80kph</td></tr>
</table>
d) BALLAST
<table>
<tr><th>Property</th><th>Description</th></tr>
<tr><td>Nominal Size</td><td>50mm</td></tr>
<tr><td>Standard</td><td>AS2758.7 – 1996, Part 7: Railway ballast</td></tr>
<tr><td>Load Distribution</td><td>Zimmerman Method</td></tr>
<tr><td>Ballast Depth (Min)</td><td>300mm below underside of sleeper</td></tr>
<tr><td>Ballast Shoulder</td><td>300mm on ruling grade</td></tr>
</table>
e) FASTENING SYSTEM
Fasteners will be resilient type e.g. Pandrol “E” type or the equivalent to suit the concrete sleepers and rail section.
Rail pad and insulators are to be purpose designed to achieve the desired 1067 +4mm, -0mm target gauge</td></tr>
</table>

<table>
<tr><td></td><td>f) TURNOUTS
<table>
<tr><th>Property</th><th>Description</th></tr>
<tr><td>Turnout Properties</td><td>1:12 turnouts</td></tr>
<tr><td>Application</td><td>All Mainline switches</td></tr>
<tr><td>Geometry Type</td><td>Tangential</td></tr>
<tr><td>Frog</td><td>RBCM r</td></tr>
<tr><td>Detection</td><td>Electrical</td></tr>
<tr><td>Bearers</td><td>Concrete</td></tr>
</table></td></tr>
<tr><td></td><td>g) RAIL WELDING
Rails will be welded in the field to form continuously welded rail. Rail tie-ins will be fully welded.
Aluminothermic welds may be used where approved in accordance with ARC INFRASTRUCTURE NG Code of Practice and testing will be carried out in accordance with the requirements of the Code.
Rail stresses will be adjusted in accordance with the requirements of the ARC INFRASTRUCTURE NG Code of Practice
h) INSULATED RAIL JOINTS
Insulated joints will be provided where required by the signalling designers. Joints will be of the prefabricated plug-in type</td></tr>
</table>

APPENDIX D - DEVELOPMENTS WITHIN ESPERANCE PORT – SITE SPECIFIC INFORMATION.

Background

The Port of Esperance (Port) is located on the north eastern side of Dempster Head and is the deepest port in southern Australia. The Port is sheltered from the south by a 1,200 metre long breakwater and is capable of handling Cape sized vessels up to 200,000 DWT. The port is connected to mining regions to the north by the Leonora-Esperance standard gauge railway line, which intersects the east-west transcontinental railway line at Kalgoorlie.

Iron ore has been exported through the Port since 1995 with exports through Berth 3 reaching about 11.5 million tonnes per year in 2017.

In recent times, Berth 3 has also been used for the export of spodumene product. The Port exports and imports a variety of commodities through Berths 1 and 2. Grain is the main bulk agricultural produce currently exported through Berth 1, along with wheat, barley and small amounts of canola and peas. Berth 2 is primarily used for the export of nickel products and the import of petroleum, fertilisers and containers.

Southern Ports encourages pre-lodgement discussions as early as possible in the Development Application process. This allows Southern Ports to outline any issues with the development, information requirements and provide any existing information held by Southern Ports to assist the Proponents during the process.

For further information please refer to the Southern Ports website.

Developments and operations on Berth 1, 2 and 3

Proponents will comply with the existing Berth structure design load criteria set out below for vessels that will utilise the berths, the equipment that will be placed on the wharf and equipment and vehicles that the Proponents propose to operate on the wharf.

Berth 1, 2 and 3

Deck - Applied Loads

a) Refer to the Esperance Port Information Guide for Ships Masters

Meteorological Conditions Generally

Vessels may be directed to vacate the harbour typically where winds are predicted to exceeds 60 knots or where vessels and loading operations will be adversely affected by long period waves.

Wind Loads

The wind design parameters and criteria for the design of the permanent structures will be in accordance with AS/NZS1170.2.

• Importance Level	2
• Average recurrence interval (Ultimate Limit State)	R = 500
• Average recurrence interval (Serviceability Limit State)	R = 25
• Region	A1
• Ultimate 3 sec gust regional wind speed	VR = 45m/s (87.5 knots)
• Serviceability 3 sec regional gust wind speed	VR = 37m/s (71.9 knots)
• Terrain Category	TC1.5
• Site wind speed (VsitB)	= VR x Md x (Mzcat Ms Mt) as per AS1170.2

Climatic Conditions

Climate information is available on the Australian Government Bureau of Meteorology Website. As a guide to the ambient conditions, the following information is provided (Source: Australian Government Bureau of Meteorology Website, averages for Esperance):

Mean daily maximum temperature	21.9 °C
Highest recorded temperature	46.9 °C (6 January 2010)
Mean daily minimum temperature	12.1 °C
Lowest recorded temperature	1.4 °C (10 July 1997)
Average annual rainfall	618.1 mm
Highest annual rainfall	873.4 mm (1999)
Maximum daily rainfall	153.2 mm (5 January 2007)
Maximum monthly rainfall	223.8 mm (January 1999)

Oceanographic

Waves

Esperance Bay is characterised by a complex bathymetry with the presence of the Recherche Archipelago which consists of numerous offshore islands and reefs. The Esperance Harbour is protected by a breakwater to the southeast and by Dempster Head to the west.

Large surge motions occur along Berth 3 and affects Berths 1 and 2, due to long period wave events that are associated with energetic offshore swell wave conditions.

Current

Currents in Esperance Bay are wind driven ranging from 0.1 to 0.4 knots. The deep water access to the Port and the flushing from the Southern Ocean causes significant water currents circulating adjacent to the foreshore, past Berths 1 and 2 and out along Berth 3 and out to sea.

Tidal Ranges

Esperance has small, semi-diurnal tidal ranges of approximately 0.6m to 1.3 m. Other factors, such as barometric pressure, wind set-up, seiching and other longer-period water level fluctuations can often overwhelm the tidal range.

Tide levels for Esperance based on Department of Transport WA Oceanographic Services 2012 are listed below. Provided values reference Chart Datum (CD):

Highest Astronomical Tide	(HAT)	1.37m CD
Mean Higher High Water	(MHHW)	1.05m CD
Mean Lower High water	(MLHW)	0.84m CD
Mean Sea Level	(MSL)	0.63m CD
Mean Higher Low Water	(MHLW)	0.42m CD
Mean Lower Low Water	(MLLW)	0.21m CD
Lowest Astronomical Tide	(LAT)	0.01m CD

In accordance with AS4997 sea level rise of 0.2m will be considered for a design life of 50 years.

APPENDIX E - SUSTAINABLE DEVELOPMENT GUIDELINES CHECKLIST

Development Application

- ☐ Issued for Construction Drawings
- ☐ Certification(s) by Registered Professional Engineer(s). For example Structural, Civil, Mechanical or Hydraulic Engineers, as applicable
- ☐ Copies of safety in design documentation
- ☐ Copies of development approvals from the relevant Regulator, Authority or service providers
- ☐ Copies of Geotechnical Reports and studies
- ☐ Stormwater Management Plan
- ☐ Copies of Heritage Reports and Archaeological Surveys
- ☐ Security Management Plan
- ☐ Copies of Risk Register developed during the Risk Workshop(s)

Prior to Construction Commencing

- ☐ Evidence of a Lease
- ☐ Evidence of a Port Access Licence
- ☐ Evidence to show fill material is compliant
- ☐ Construction Traffic Management Plan
- ☐ Construction Environmental Management Plan
- ☐ Construction Safety Management Plan
- ☐ Oil Spill Response Management Plan
- ☐ Copies of Safety Data Sheets
- ☐ Copies of Dangerous Goods licenses

Prior to Operation

- ☐ As Constructed Drawings
- ☐ Fill placement records (as per Section 3.4)
- ☐ Operational Traffic Management Plan
- ☐ Operational Environmental Management Plan
- ☐ Operational Safety Management Plan
- ☐ Oil Spill Response Management Plan
- ☐ Copies of Safety Data Sheets
- ☐ Copies of Dangerous Goods licenses