

PORT OF BRISBANE TECHNICAL STANDARDS

2026

PORT of BRISBANE
Here for the future

Contents

Contents 2
1.0 Background 3
2.0 Planning context 3
3.0 Application 4
4.0 Standards / Guidelines 4
4.1 Environmental Management 4
4.2 Sustainable Development 12
4.3 Environmentally Relevant Activities 23
4.4 Car Parking and Vehicle Movement Design Guideline 28
4.5 Landscaping, Stormwater and Water Sensitive Urban Design Guideline 29
4.6 Signage 37
4.6.1 Advertising Signage Requirements 37
4.6.2 Tenancy Signs 39
4.6.3 Directional Signage 40
5.0 Port Engineering Standards 41
5.1 General Engineering Requirements 41
5.2 Engineering Requirements for Development over Water 48
5.3 Engineering Requirements for Development Over Land 53
6.0 Abbreviations 56
7.0 Appendices 59
Appendix A: Local Grid Transformations 59
Appendix B: Supply of 'As Constructed' deliverables 60
Appendix C: PBPL ADAC Standards 61
Appendix D: PBPL Water Meter Installation and Connection 62
Appendix E: PBPL Electrical Standard LV Switchboards - General Requirements 63
Appendix F: PBPL Standard Crossing Details (Structural Notes, Super B, B-Double Semis, Jointing, PBS Level 3 Vehicle, Super B Double Semi-Layout Drawings) 64-66
Appendix G: PBPL Water and Wastewater Interface Requirements 67

1.0 Background

The Brisbane Port Land Use Plan (LUP) is the primary planning instrument for development on 'Brisbane core port land'.

Under the *Transport Infrastructure Act 1994* ('TIA'), a plan that regulates development is required for Brisbane core port land. As Brisbane core port land is not subject to the planning scheme for the City of Brisbane (*Brisbane City Plan 2014*)), the LUP (gazetted under the TIA) fulfils this role.

These Technical Standards are non-statutory tools that supports the LUP. The Technical Standards:

- outline port-specific information that will assist Proponents in addressing the detailed aspects of developing on port land.
- include both:
    - non-binding **'Guidelines'** that PBPL would, where relevant, encourage or deem preferable specific development outcomes; and
    - mandatory development **'Requirements'** that reflect an accepted industry standard.
- should be addressed ***where relevant*** to a specific development project noting that not all Standards will apply to all projects. PBPL can advise on where degrees of discretion are available.

The Technical Standards should be read in conjunction with the LUP Codes.

This document is regularly updated to ensure the Technical Standards contain the most up-to-date information and requirements that enable PBPL to achieve the highest possible standards of development safety, efficiency, and quality.

2.0 Planning Context

The Technical Standards complement and are ancillary to the LUP. The content of the Technical Standards is informed by, and respond to, the requirements of the LUP (most notably the Codes in Part 4 of the LUP). The Technical Standards provide:

1. General advice about undertaking development and operating on Brisbane core port land; and
2. Information about responding to the requirements of the LUP.

The Technical Standards include advice and information for development Proponents on Brisbane core port land that has been informed by engineering, landscaping, and sustainable development best-practice, site- and port-specific studies and PBPL's experience as a port facilitator, developer, and operator.

The Technical Standards complement rather than override the LUP, accepted Australian Standards or legislation.

The Proponent must always meet all their legislative requirements in relation to matters including but not limited to:

- Work Health and Safety (see: www.worksafe.qld.gov.au and www.safeworkaustralia.gov.au)
- Environment (see: https://www.detsi.qld.gov.au/)
- Planning (see: https://statedevelopment.qld.gov.au/)

- Agriculture and Fisheries (see: https://www.daf.qld.gov.au/)

If there is any inconsistency between the Technical Standards and/or the LUP and the abovementioned legislation, the latter prevails.

3.0 Application

The LUP includes several Codes, either classified as 'Development' or 'Standards' Codes. For the rules on determining compliance with codes, please refer to Part 3, Section 3.2 of the LUP.

These Technical Standards provide development Proponents with information that will assist in their efforts to address the performance criteria and acceptable solutions in several of the LUP's Codes. These Codes include the:

- Environmental Management Code;
- Car Parking and Vehicle Movement Design Code; and
- Landscaping, Stormwater and Water Sensitive Urban Design Code.

The Codes noted above, have a corresponding standard in this document (e.g. the Landscaping, Stormwater and Water Sensitive Urban Design Code in the LUP should be read in conjunction with the Landscaping, Stormwater and Water Sensitive Urban Design Guideline in the Technical Standards). Responses to the performance criteria and acceptable solutions in the LUP should consider the commentary / preferred development outcomes in this document.

These Technical Standards also contain a Port Engineering Standards that will assist engineers and designers with the preparation of plans and designs for development on Brisbane core port land.

Please note, some components of / commentary in these Technical Standards may not be applicable to your development or operations. If you are unsure about the applicability of a specific advice in the Technical Standards, please contact PBPL's planning team on ☎3258 4888.

4.0 Standards / Guidelines

4.1 Environmental Management

These Standards support the Environmental Management Code in the LUP. Please refer to the LUP for the purpose and applicability of the Environmental Management Code.

As part of any development involving works[1] at the Port of Brisbane, PBPL requires a Construction Environmental Management Plan (CEMP) to be prepared and submitted for approval prior to any onsite construction, which has the potential to have a material environmental impact, taking place.

An Operational Environmental Management Plan (OEMP) is required to be prepared and submitted for approval prior to any operational activities associated with an approved use taking place on site based on the environmental impact risk of the operation.

EMP's are expected to be developed using a risk-based approach; that is assessing all potential environmental risks on site and ranking them accordingly. Management measures should be detailed for higher risk environmental aspects. Management measures are not necessarily required for low environmental risks.

[1] Works may be operational, building, or civil works including construction, structural demolition / dismantling, earth works, tidal works, marine plant disturbance / removal, landscaping, services installation, road works etc.

Development Intent	Requirement
4.1I.1 A Construction Environmental Management Plan will address the requirements of the LUP and the Standards in this document. **The CEMP must be site and issue specific.**	**4.1R.1 The Construction Environmental Management Plan contains:** • address and real property description of the site; • description of the construction works, including the types and schedule of works; • details of the developer / contractor, and other key groups or individuals who may be associated with the project; • list of site contacts, including mobile phone numbers; • environmental risk assessment; • summary of key environmental issues based on risk assessment; • key management measures to control environmental risks; • performance criteria to assess management controls; • monitoring, recording, and reporting procedures; • revision of management controls procedures if required; • incident response including reporting protocols; • details of relevant training and competencies; and • site plan of work area.
4.1I.2 An Operational Environmental Management Plan will be prepared by a suitably qualified professional and addresses the requirements of the LUP and the Standards of this document. **The OEMP must be site and issue specific.**	**4.1R.2 The Operational Environmental Management Plan must/provide:** • address and real property description of the site; • a description of the facility and operations; • details of the operator, and other key groups or individuals who may be associated with the operations; • a list of key site contacts; • an environmental risk assessment; • a summary of key environmental issues based on risk assessment; • key management plans to control (actual / potential) environmental issues; • performance criteria to assess management controls; • monitoring, recording, and reporting procedures; • allow for revision of management controls procedures if required; • procedures for environment complaints; • procedures for environmental incidents; • requirements for training / inductions; • define responsibilities of aspects of the OEMP; • Maintenance requirements for equipment where failure could lead to an environmental impact; • audits and reviews of the OEMP; and • a site plan of works area.
4.1I.3 Site design and subsequent construction and operational activities should be managed to minimise erosion and sediment transport from site.	**4.1R.3 Erosion and Sediment Control** Erosion and sediment issues may arise where soils, sands and other earthen materials are left exposed (i.e. following excavations, site clearing, during stockpiling or preloading). Measures must be implemented to ensure that erosion is controlled, and that sediment is contained within the site and not released into the surrounding environment.

Development Intent	Requirement
	To prevent erosion and sediment issues, the Proponent is required to consider the following aspects: • potential sources of sediment / risks of erosion; • impacts from stockpiles; • stormwater discharge points; • existing field and kerb inlets and other stormwater infrastructures (swales, etc.); • overland flow areas; • site access and egress locations; and • nearby sensitive areas. The following management measures should be adopted to minimise erosion and sediment loss: • maintaining natural ground cover as far as practicable; • maintaining landscaping to an appropriate level; • sediment fencing and/or site-bunding; • silt socks at stormwater inlets (within the construction site only); • diversion drains; • sediment basins • rock check dams prior to discharge points; • vehicle rubble grids at site exits; • regular street sweeping where sediment tracking occurs onto roadways; • sheet-flow control for stockpiles and embankments; • slope stabilisation; • rock-lined discharge points; and • weather/storm monitoring and appropriate action. • control the migration of sand or other materials during strong windy conditions.
4.1I.4 Stormwater should be managed to minimise the discharge of contaminants to receiving waters.	**4.1R.4 Stormwater Quality** Stormwater has the potential to convey sediments and contaminants to sensitive environmental areas such as mangrove habitats, tidal areas, waterways, and groundwater, as well as neighbouring properties. Overland flows across site must be managed. It is important to identify potential overland flow locations on site (i.e. high to low areas), and implement controls to slow, contain, and control the release stormwater to prevent potential impacts. Slowing stormwater flows can reduce the volume of sediment and other contaminants being suspended and transported, while containing stormwater for a period of time can allow settling out. The release of water from the site must be controlled to prevent scouring and erosion. Such controls include: • rock check dams; • designated draining areas; • settlement ponds; and / or • rock-lined discharge points. The contractor may also consider opportunities to collect and use stormwater on site, for example, for dust suppression or irrigation.

Development Intent	Requirement
	Rainwater tanks should/must be installed on site to capture discharges from roofed areas for reuse in buildings and for irrigation. The location of activities on site should consider stormwater flows, to prevent suspension of contaminants. Activities that should be managed in this way include: • storage of hazardous materials (e.g. fuels, oils, paints, thinners, etc.); • designated refuelling areas; • washbays and cleaning areas; • waste receptacles (including waste oils and chemicals); and • stockpiling of materials. Operational stormwater management design needs to comply with the *State Planning Policy State interest - Water Quality*. The SPP requires the Proponent to adopt the applicable stormwater management design objectives relevant to the climatic region (outlined in Tables A and B in Appendix 2 of the SPP) or demonstrate current best practice environmental management for development that is for an urban purpose. <u>Option 1 – Design Objectives</u> <u>Table B in Appendix 3 of the SPP requires stormwater to be treated to the following levels:</u>

Total suspended solids (TSS)	**Total phosphorus (TP)**	**Total nitrogen (TN)**	**Gross pollutants >5mm**
80%	60%	45%	90%

Proponents are required to demonstrate through modelling (MUSIC or other) that proposed stormwater treatment methodologies reduce pollutant loads from site by the above percentages. This modelling must meet the requirements of the SPP and PBPL will not accept modelling that only targets a limited range of events. Treatment methodologies can include either hard or soft treatments or a mix of both.

<u>Option 2 – Best Practice (Offsite Stormwater Quality Investment Payment)</u>

As an alternative (or, by negotiation, as a combined) stormwater solution PBPL has developed an offsite stormwater treatment strategy which delivers both significant financial and environmental benefits. In lieu of modelling and installing onsite stormwater treatment infrastructure that specifically targets sediment (for example bio-retention basins), a voluntary payment can be made for offsite stormwater treatment.

The Offsite Stormwater Quality Investment Payment applies of post construction pollutant reduction requirements to total suspended solids (TSS), total phosphorus (TP) and total nitrogen (TN) in accordance with the best practice environmental management definition of the SPP.

Payments for this option are set at $38,000 per hectare (2026) and will be reviewed annually. This figure has been set to provide an appropriate environmental outcome whilst providing an attractive

Development Intent	Requirement
	financial proposition for developers. If the proponent selects this option, an invoice will be issued during the construction phase, please provide details of where an invoice should be sent. Where this option is elected, developers must continue to meet the targets for gross pollutants onsite in accordance with Option 1. This is achieved through the installation of litter baskets in stormwater pits which require scheduled inspection and maintenance in the operational phase. Developers are also encouraged to incorporate stormwater management measures in site design where it is cost effective and practicable to do so (for example directing stormwater flow through landscaping). Developers are also required to continue to ensure sound site environmental management practices to minimise the risk of stormwater pollution in accordance with these Standards. Please note that this option is only available to benign forms of development (for example container terminals and warehousing), to confirm if your development is eligible, please contact a member of the Port of Brisbane Environment Team.
4.1I.5 Groundwater should be managed to minimise risks associated with acid sulfate soils, the discharge of contaminants to the surrounds and optimise general health and safety.	**4.1R.5 Groundwater Quality** Groundwater may be encountered where excavations or other works are undertaken below ground level. The groundwater table at the Port of Brisbane and other Port Land is high and can be variable across sites. Where groundwater is exposed and requires dewatering, it is possible to release Potential or Actual Acid Sulfate Soils (PASS), minerals and other contaminants to either land or waterways. It is also possible to extract too much groundwater, effectively 'pulling' sea / river water from adjacent waterways. Personnel who may come in contact with groundwater should wear appropriate PPE to minimise exposure. Where it is likely that groundwater will be encountered, management approaches may include: • scheduling excavation below the water table level to minimise the volume of groundwater exposed; • undertaking sampling of groundwater prior to excavation works; • ongoing field monitoring (e.g. pH, metals, etc.); • location of discharge areas to recharge groundwater and avoid release to stormwater and / or waterways; and • treatment of exposed groundwater (e.g. liming, filtering, etc.).
4.1I.6 Air quality should be managed to minimise environmental harm and nuisance and optimise general health and safety.	**4.1R.6 Air Quality** Construction works and operational activities may impact neighbouring sites, environmentally sensitive areas, and waterways through the release of, for example, dust, odour, or vehicle / machinery emissions. Such releases must be controlled on site and not leave the site boundaries.

Development Intent	Requirement
	Environmental Management Plans should identify potential sources of air emissions, and how these will be managed, for example through: • use of water for dust suppression; staging of works to minimise exposure of bare earth; • minimisation / avoidance of dust generating activities during dry, windy conditions; • maintenance of machinery, vehicles, and equipment according to the manufacturers standards to minimise exhaust • installation and maintenance of high-quality pavement for regularly trafficked areas • the use of mechanical or manual sweeping for high dust generating activities (i.e. bulk products) • enclosing dusty activities where practicable; and • covering stockpiles to prevent dust generation. The site should be managed to achieve the requirements of the Department of Environment, Tourism, Science, and Innovation (DETSI) *Environmental Protection (Air) Policy 2008* as a minimum.
4.1I.7 Noise should be managed to minimise environmental harm and nuisance and optimise general health and safety.	**4.1R.7 Noise Management** Noise from or associated with works must be controlled to prevent nuisance to surrounding sensitive areas. Environmental Management Plans should identify potential noise generating activities / equipment (e.g. pile driving, excavators, etc.) and how these will be managed. Noisy activities should be controlled through dampeners or enclosures where practicable. While it is recognised that Brisbane core port land is not near sensitive receptors (e.g. residential development), the Proponent must act in accordance with Brisbane City Council's local laws and the *Environmental Protection Act 1994*.
4.1I.8 Potential contamination / contaminants should be managed to minimise environmental harm and nuisance and optimise general health and safety.	**4.1R.8 Preventing Contamination** No works shall result in the contamination of land or waterways, for example through spills of fuels or other chemicals or exposure of Potential/Actual Acid Sulfate Soils (PASS/AASS). The Construction and Operational Environment Management Plans should identify where any existing contamination may be present on the site and any proposed activities that may result in contamination (e.g. storage of fuels, refuelling, importation of fill, etc.). Details of all hazardous substances and materials to be stored and used on site are to be included in the Environmental Management Plan. Spill kits appropriate to these items and the site (e.g. provision of marine booms) should be provided. The contractor should ascertain whether the site is listed on the Environmental Management register (EMR) or Contaminated Land Register (CLR) and any historic or current contamination investigation that will have occurred on the site. Where the potential for contamination is identified, management approaches will be required to prevent exposing contamination through excavations or other works or spreading contamination through the movement of materials off site. In the event disposal off site is required, a disposal permit from the State Government environmental regulator will be required.

Development Intent	Requirement
4.1I.9 PASS should be managed to minimise environmental harm and nuisance and optimise general health and safety.	**4.1R.9 Acid Sulfate Soils Management** Potential and/or actual acid sulfate soils (PASS/AASS) may be encountered during excavation works undertaken on port land. Acid sulfate soils occur naturally in low-lying coastal areas and can cause environmental harm when disturbed and exposed to air. Oxidisation can cause the soil to become acidic (pH<6.5) and release metals such as iron, aluminium, manganese, and other heavy metals, which can enter the environment. Therefore, all excavation, dewatering and other works that interact with sub-surface soils must be managed to prevent the disturbance and/or release of PASS/AASS. Where PASS/AASS are encountered, a number of management approaches must be adopted during the excavation, storage, and disposal, including: Ensuring PASS are not exposed to air (i.e. disposal of Pass under high water mark) minimising the disturbance area where PASS is unavoidable treatment of PASS / AASS material (e.g. liming) disposal of PASS under the high-water mark. The contractor should discuss any works that may encounter PASS/AASS with the port lessee's environment team and refer to the National Acid Sulphate Soils Guidance (June 2018) and Queensland Acid Sulphate Soil Management Guidelines and the Port of Brisbane Acid Sulfate Soils Management Plan.
4.1I.10 Construction and operational wastes / litter should be managed to minimise environmental harm and nuisance and optimise general health and safety.	**4.1R.10 Waste Management** All waste generated (both construction and general waste from onsite facilities) must be stored and disposed of to prevent release to the environment. The contractor should provide waste receptacles of a scale and type appropriate to the works, for example skip bins, 240L general waste bins, 240L recyclable waste bins, and ensure these are serviced regularly. The waste hierarchy (reduce, reuse, recycling) should be employed for both construction and operational wastes. All regulated waste (e.g. waste oils, batteries, etc.) must be stored appropriately on site (e.g. bunded) and disposed of by a licensed contractor. All wastes should be segregated as appropriate, and emphasis should be placed on recycling wastes where practicable.
4.1I.11 EMP's should be developed and implemented to avoid / minimise / mitigate adverse impacts on flora and fauna.	**4.1R.11 Flora and Fauna** The relevant Environmental Management Plan must identify and consider any sensitive environments or flora and fauna present, or likely to be present, on the site or nearby, and identify how these will be managed to minimise impacts. Important flora on site may include marine plants such as mangroves, salt couch or sea grass, for which an approval is required from

Development Intent	Requirement
	Queensland's Department of Agriculture & Fisheries (https://www.daf.qld.gov.au) to disturb. Important fauna may include shore birds, nocturnal animals such as possums and sugar gliders or marine fauna. The disturbance of potential habitat for such fauna may require the presence of a fauna spotter or other management measures during any clearing or disturbance. Disturbance to native vegetation may also require a Natural Assets Local Law approval from Brisbane City Council.
4.1I.12 EMP's should be developed and implemented to address all relevant biosecurity matters and risks at the port.	**4.1R.12 Biosecurity Management** Introduced pest plant and animal species have the potential to significantly impact Queensland's environmental diversity and the commercial viability of many of our primary industries. All persons and organisations in Queensland have a General Biosecurity Obligation (GBO) to manage biosecurity risks. The Port of Brisbane is within Fire Ant Biosecurity Zone 1. This requires that any material being taken from site to an area outside of Fire Ant Biosecurity Zone 1 must be inspected prior to removal. Additionally, any plant and equipment used on site for works involving potential fire ant material must be thoroughly cleaned and inspected prior to leaving site. The relevant Environmental Management Plan must identify any activities that may pose a biosecurity risk (e.g. introducing, transporting, or harbouring weed species or introduced insects like fire ants or mosquitos). The plan must also identify the relevant controls that will be implemented to ensure that these risks are appropriately managed in accordance with the Queensland government's *Biosecurity Act 2014* and *Biosecurity Regulation 2016* to meet the GBO. More information on meeting the GBO is available from Queensland's Department of Agriculture & Fisheries (https://www.daf.qld.gov.au). Construction sites are known to attract fire ant nests. Documented inspections of sites shortly after the commencement of the operational phase should be undertaken to confirm no fire ants have established at the site. If you require assistance identifying potential fire ant nests, please contact the Port environment team for advice.
4.1I.13 EMP's and general development plans should be developed and implemented to optimise water at the port.	**4.1R.13 Water Conservation** The relevant Environmental Management Plan should identify the activities that will involve water use (e.g. dust suppression, pavement compaction and concrete curing), and approximate volumes required. PBPL encourages and can help facilitate the use of alternate sources to potable water such as: • harvested stormwater / rainwater; • imported bore water; • desalinated water; • river water; and • recycled water. **Where wash bays or similar high intensity water use facilities are installed as part of operations, measures should be taken to recycle and reuse water where possible.**

Development Intent	Requirement
4.1I.14 EMP's should include provisions for the management of cultural heritage matters if encountered during works or operations on port land.	**4.1R.14 Cultural heritage (European and / or Indigenous)** Although remote, there is potential for elements of European and / or Indigenous cultural heritage to be encountered during construction works on Brisbane core port land / wet areas. The contractor must comply with their responsibilities regarding their "cultural heritage duty of care" under the *Aboriginal Cultural Heritage Act 2003*, and the *Queensland Heritage Act 1992* regarding non-Indigenous heritage.
4.1I.15 Site Decommissioning Requirements **Prior to vacating a site, the Customer will be required to perform certain functions to minimise the potential for environmental harm from the vacant site and to accurately capture the development / infrastructure servicing status of the site.**	**4.1R.15 Decommissioning** Prior to vacating a site, a Customer / Proponent is required to: • reinstate all boundary fences with PBPL approved fence and barbed wire strands • remove all structures including hardstand from site (as and where agreed with PBPL) • remove all existing services from the site and capped at the boundary (as and where agreed with PBPL). • capture and accurately record all site information as per PBPL ADAC standards (please refer to Appendix C). Prior to decommission works commencing, please contact the Spatial Data Services Team (☎3258 4888) to obtain a service locality plan for the subject site. Any discrepancies to the supplied information, identified during removal, will need to be recorded to the point where both information sources agree. A certified copy of the extent of works is to be provided to PBPL in PDF and CAD formats. • remove all contaminants from the site • ensure all compacted areas are to be ripped to improve soil quality and any bare soil area is to be treated with hydro seeding or similar as approved by PBPL • take measures to minimise any potential contaminated stormwater runoff from the site • ensure compliance with lease conditions via the preparation and submission of a Contaminated Site Investigation (CSI). The scope of the CSI is to be agreed with the PBPL Environment Team prior to this body of work being prepared.

4.2 Sustainable Development

PBPL continues to actively pursue sustainability as a part of its vision *"to be Australia's premier port and logistics hub: here for the future"* and strongly encourages new approaches to industrial and port development.

All port land users and developers of Brisbane Core Port Land are required to consider and where applicable incorporate the following construction and operational Standards relating to:

- Waste
- Energy
- Materials and healthy buildings
- Water
- Transport.

Initiatives in these areas are defined and expanded upon below.

Proponents are encouraged to address these opportunities or alternatively suggest ideas that will deliver similar environmental benefits and/or business savings.

Development Intent	Requirement
4.2I.1 Waste Management	**4.2R.1** The Proponent is to confirm that it will develop and implement an Operational Waste Management Plan that includes, but is not limited to the following: • Information on the reduction and separation of waste streams (recycling, cardboard, containers, general waste, organic waste, paper etc.) with clearly labelled bins. • Dedicated waste segregation and storage area(s) around the building. • Dedicated waste segregation and storage area(s) on site with clear access to collection areas. • Site plan highlighting the relevant areas for waste segregation storage and access. • The site and issue-specific details of this plan should be an addendum to the project's OEMP. All contractors associated with the construction and operation of the project must provide a comprehensive, project-specific waste management plan(s) for the works which addresses the following: • waste minimisation strategies; • waste generation; • waste systems; • performance/reduction targets; • bin quantity and size; • collection frequency; • confirmation of waste contractors' information; • waste management facilities shown on plans; • signage; and • monitoring and reporting of construction waste volumes Such plans should also address the recycling and reuse of all vegetative debris on site (e.g. for topsoil augmentation or composting purposes). If onsite reuse is not feasible, arrangements should be made for green waste to be transported for reuse or disposed of at a fully licensed recycler or repressor. There should be no pit burning of green waste on site or disposal to landfill. Waste tracking processes should be developed to enable Proponents/Tenants to quantify the amount of waste generated by their activities. Waste tracking processes should also enable Proponents/Tenants to determine how much waste from their activities is being reused, recycled, or directed to landfill. Contractors are encouraged to pursue options for the recycling or reuse of all construction and demolition wastes where possible. Contractors should also explore options to use recycled material in construction including the use of recycled aggregates and other similar materials as part of their construction methodology.

Development Intent	Requirement
4.2I.2 Solar	**4.2R.2** The development will incorporate solar panels (and/or other renewable energy technologies) into the design, construction, and operation of the project. The development should consider integration into the Port of Brisbane Virtual Energy Network (VEN) which can provide potential financial and carbon reduction benefits beyond onsite solar. Ongoing inspections and maintenance of systems will be necessary during the operational phase and should be included in onsite O&M processes. The installation of data management systems is encouraged to provide a clear oversight of solar performance.
4.2I.3 Building Energy Efficiency	**4.2R.3.1 Buildings Orientation**: should incorporate appropriate passive solar design and day lighting, while avoiding unwanted heat gain. Further to this requirement, the Proponent must ensure: • all external glazing must comply with NCC Part J2.4 • buildings must include provisions for natural ventilation, such as roof/wall ventilators and operable windows • external shading devices are designed to protect North, East, and West glazed sides of the building; • buildings incorporate glazing with Solar Heat Gain Coefficient of not more than 0.4 to all air-conditioned areas (to reduce summer heat gain) • entrances to all air-conditioned spaces to have either automatic sliding doors with sealed edges or double-door air locks are used • toilets are not located adjacent to air-conditioned spaces • that no exhaust fans are needed in air-conditioned spaces (except for emergency smoke control). **4.2R.3.2 Solar access and shading** should be designed and constructed to: • provide adequate eaves and/or external shading devices to all glazed areas, designed to prevent summer sun, but allow winter sun to enter the building • provide glazing with a low Solar Heat Gain Coefficient to all air-conditioned areas to reduce summer heat gain. Be aware that this may make the space cooler in winter • ensure shade trees are planted on the west and east of all buildings to shade walls and windows from low angle morning and afternoon sun • include shading devices to suit the orientation (East and West elevations require some screening over the sides) face of windows to prevent low angle summer rising and setting sun. The North elevation requires only awnings over because the sun is high in the sky. South elevations may require awnings over with vertical fins on the east and west sides to prevent low angle rising and setting sun from the Southeast and Southwest • ensure glazing size and location to minimise heat gain in summer and heat loss in winter • provide fewer windows on the east and west elevations. Too much unshaded glass on the East and West can cause heat load problems resulting in high air-cooling costs

Development Intent	Requirement
	• provide shade to solid surfaces such as walls, driveways, and car parking areas to minimise the amount of glare and heat reflected or absorbed and re-radiated. Consider planting trees or building shade structures. **4.2R.3.3 Insulation/Colours** should be designed/specified for roofs, ceilings, and external walls: • to included reflective sarking or foil-backed insulation under metal roofs to reflect heat and provide a moisture barrier to condensation forming under the roof • to include air seals to all doors and windows to external/un-air-conditioned spaces to prevent heat gain to interior • considers specialist insulated coatings for roofs to improve the thermal performance of steel sheeting • to include the use of masonry walls such as concrete block or tilt slab walls as a means of improving thermal performance when external insulation is applied. This may be preferred to internal insulation for some workspaces. • external wall insulation has a minimum total R-Value of R1.0 for all non-air-conditioned spaces and R2.0 for all air-conditioned spaces. Metal external wall sheeting is to be insulated from metal studs or frames by a minimum R0.2 thermal break • external wall colours are to be light and have a solar absorbance not more than 0.45 (i.e. avoid excess use of dark colours). Similarly, concrete block or slab external walls must be painted • roof insulation is to be provided with a minimum total R-value of R1.5 • roof colour is to be light and have a solar absorbance of not more than 0.45 (i.e. avoid excess use of dark colours and zincalume) **NB:** Ventilation may conflict with indoor acoustic considerations and may not be appropriate in some noise-affected locations. **4.2R.3.4 Natural and Efficient Lighting** should be adopted wherever possible. In this regard, the Proponent will design buildings to maximise the use of natural light and minimise energy use for artificial lighting, whilst meeting lighting performance standards required for each area. Natural lighting is incorporated into a building, where appropriate, e.g. translucent roof sheeting, atriums, skylights, and clerestory windows. Where adopted, natural lighting strategies must be designed and employed to allow in light without unacceptable increases in heat. Where natural lighting is employed to any part of a building (including near windows), artificial lighting to the same area must be controlled by ambient light sensors to minimise operation when there is sufficient daylight. Occupant sensors switch off room lighting when the space is unoccupied. Daylight sensors prevent artificial lighting from switching on until there is insufficient light. LED or similar energy efficient bulbs will be used for all lighting purposes. Building interiors should be painted in light colours – dark colours absorb light, increasing the amount of lighting required; All internal and external lighting and sky-lighting must comply with the BCA.

Development Intent	Requirement
	4.2R3.5 Energy Efficient Equipment and Appliances should be specified, installed, and properly maintained to maintain design efficiency performance. The Proponent must select equipment and appliances that meet at least a 5 Star rating on the National Minimum Energy Performance Standards (MEPS, refer to: www.energyrating.gov.au). For certain appliances, e.g. fridges, freezers, dishwashers, dryers, and air-conditioners such ratings will be labelled with the MEPS logo – see below. The exception to this requirement is air-conditioning systems. These systems must achieve the minimum efficiency standard as per MEPS (i.e. a > 4 Star rating based on the latest performance requirements). An energy-efficient hot water system must be installed. This may include, but not be limited to: • Solar-hot water system • Heat-pump system. **4.2R.3.6** In relation to **Energy Conservation (Building Materials)**, all building and site layout design will optimise energy conservation via the effective choice, use and maintenance of building material type and mass. The design, selection, fit-out, operation and maintenance of building materials will ensure that energy efficiency is optimised. The Proponent must address the mass of building materials where heavy weight/mass materials store and release heat energy stabilising internal temperatures and function as follows: • *During summer:* Shaded mass materials inside the building absorb heat out of the air and provide cooler indoor temperatures • *During winter:* Mass materials inside the building receiving sunlight absorb the heat and release during the evening maintaining warmer indoor temperatures. The benefits of mass materials are only achievable in internal areas that are exposed to sun during winter. In large commercial buildings these areas can be very limited and using hard floors throughout instead of carpet is often not appropriate for acoustic and aesthetic reasons: • locate mass materials in areas where they will be most effective, e.g. lunchrooms where people relax and congregate • all ground level floors are preferred to be slab-on-ground with minimum area carpeted. **4.2R.3.7** In relation **to Energy Conservation (Air-Conditioning)** all building, and site layout design will optimise energy conservation via the effective choice, use and maintenance of building air-conditioning systems. The efficiency in design, fit-out, operation and maintenance of the proposed building's air-conditioning system is optimised. The Proponent must:

Development Intent	Requirement
	• ensure Heating Ventilation and Air-Conditioning (HVAC) systems are designed to meet the building performance requirements, while minimising energy use • ensure all equipment must be properly maintained to AIRAHDA19 – Level B (good practice), and where possible Level A (best practice) should be adhered to operate efficiently • ensure it only air-conditions those spaces that require heating and cooling • only installs air-conditioners less than 10kWr with minimum cooling Star rating of 4.5 • only installs air-conditioners between 10kWr and 65kWr with Energy Efficiency Ratio (EER) equal to or greater than 3.0 with Coefficient of Performance (COP) equal to or greater than 3.3 (see www.energyrating.gov.au) • ensure insulation and sealing to air-conditioning pipework and ducts complies with BCA Specification J5.2 • ensure air-conditioning systems provide for either 'mixed modal,' 'economy' or 'night flushing' operation • allow for controlling temperature in zones – zones near glazing having different temperatures to internal zones. For example, temperatures set at 21°c heating set point and 25°c cooling set point or 23°c set point with a +/- 2°c operating band • set air-conditioning to a wider temperature range to minimise the cooling energy required • accommodate for the changing of temperature settings in summer and winter to align more closely with outdoor temperatures (warmer in summer and cooler in winter). The Proponent is to confirm that development achieves high levels of thermal comfort. The HVAC system and building façade must meet the requirements outlined in the *Green Star as Built and Design Guidelines.* **4.2R.3.8** In relation to **Energy Conservation (Monitoring & Improving Use)**, Proponents are encouraged to optimise energy conservation via the effective choice, use, maintenance and monitoring of energy usage meters, timers, and sensors. Metering, timers, and sensors for efficient use of all systems. The Proponent will: • specify sensors or timers on lighting to turn off automatically when the room is out of use • locate meters in a highly visible and frequently used area. They need to show current period and previous energy use and associated cost of that use • consider having meters accessible by utility providers to provide remote readings to reduce the need for utility staff to take manual readings. **4.2R.3.9** In regard to **Renewable/Alternative Energy**, Proponents are encouraged to demonstrate the optimal use of renewable energy sources as an alternative to greenhouse intensive non-renewable fuels. Such initiatives could include: • the use of electric or low emissions fuel powered engine equipment,

Development Intent	Requirement
	• the use of higher efficiency petrol, diesel and/or LPG engine forklifts and other vehicles (converted or manufacturer supply); • the use of vehicles that use (either wholly or in part) commercial biofuels, e.g. Biodiesel and Ethanol or LPG; • the use of GreenPowerTM for some or all electricity supply requirements; • opportunities for industrial ecology (where waste streams from production-orientated industries are used as inputs for other industrial activities – either on-site or where synergies exist with neighbouring land uses); and • the use of electric appliances in preference to gas.
4.2I.4 Materials and Healthy Buildings	**4.2R.4.1** Proponents are encouraged to **Reduce Embodied Energy** as part of their development by utilising systems, products and services that capitalise on reduced embodied energy and recycling. Materials are sourced locally where possible to minimise energy consumption from transport where such materials feature a low level of embodied energy including but not limited to the use of: • back-fill aggregate with recycled content • concrete with fly-ash content > 25%, particularly for non-structural components • low carbon asphalts including low temperature asphalt, warm mix asphalt and recycled asphalt • carpet finishes and underlay containing recycled content • recycled materials (e.g. timber, crushed concrete and cleaned bricks). **4.2R.4.2** **Sustainable Timber** should be used by Proponents wherever possible. The Proponent is to confirm that 95% of all timber used in the building and construction works is either: • from a reused source; or • certified by a forest certification scheme Such certification should be independently provided in accordance with the Australian Standards (AS) provided by the Australian Forest Certification Scheme and/or the Forest Stewardship Council's (FSC) certification scheme. Rainforest and old growth timbers are not used. The Proponent is to confirm / certify that building materials are responsibly sourced or have a sustainable supply chain. This can be achieved through: • at least 95% of buildings steel (by mass) is sourced from a Responsible Steel • maker; (Steel maker possesses current certified ISO 14001 (EMS) and is a member of the World Steel Association's (WSA) Climate Action Programme (CAP));

Development Intent	Requirement
	• steel framed buildings, at least 60% of the fabricated structural steelwork is supply by an accredited Environmental Sustainability Charter of the Australian Steel Institute (ASI); or • concrete framed buildings, at least 60% (by mass) of all reinforcing bar and mesh is produced using energy-reducing processed in its manufacture (measured by average mass by steel maker annually). **4.2R.4.3** The Proponent should seek to **Minimising Building Material Toxins**. Materials and products requiring toxic chemicals for manufacturing processes should be avoided where possible. Timber with preservative treatment must be avoided where possible, or low-toxic timber preservative used. Low-toxic or no timber preservative treatments are used; for example, using pine treated with ammoniacal copper quaternary (ACQ) rather than with copper chromium arsenate (CCA). Similarly, the use of products containing Volatile Organic Compounds is to be discouraged. Products with **low or no Volatile Organic Compounds (VOC)** must be specified for floor finishes (e.g. carpet, linoleum) and paint finishes. Materials and products specified for the development enable a high standard of indoor air quality to be achieved and maintained. The Proponent is to confirm that: • 95% of all engineered wood products meet stipulated formaldehyde limits as outlined in the *Green Star Design and As Built Guidelines.* • all internally applied paints, adhesives, sealants, and carpets meet the stipulated 'Total VOC Limits' outlined in section 13 of the Green Star Design and As Built Guidelines. **4.2R.4.4** **Indoor air quality** meets the AS1668 for mechanical ventilation for acceptable indoor air quality, where indoor air quality is maintained by introducing adequate amounts of outside air into the system. Air filters are installed in ventilation systems to remove particulate contamination. The AS3666 for air handling and water systems of buildings Microbial control, is consulted to provide recommendations for control of microbial contamination of air systems, by microbiological agents such as Legionella spp. Further to air quality, development should seek to: • (where possible) to avoid joinery and furniture containing urea formaldehyde glues. Where formaldehyde is used ensure, it is phenol formaldehyde with an emission category not exceeding E1; • Insect and pests are prevented entry to buildings by mechanical means or sealing and caulking rather than chemical means. This includes external doors, hallway doors and points of entry and opening windows; • Avoid insecticide sprays for white ant protection.

Development Intent	Requirement
	• Avoid specification of PVC products such as wastewater pipes, conduit, and cables where possible; • Avoid use of PVC for plumbing drainage pipes and specify High Density Poly Ethylene (HDPE) where possible; • Use physical barriers, visible slab edges and Termimesh; • Educate staff and develop a simple inspection/management plan; • Minimise reliance on synthetic materials made from petrochemical derivatives; and • Establish set limits for toxic emissions from materials, finishes, and furnishings to help guide selection and specification processes.
4.2I.5 Building Services	**4.2R.5** The Proponent is to confirm: • that at least 90% of all permanent formwork, pipes, flooring, blinds, and cables do not contain PVC; or • that PVC products being used are certified as compliant with the GBCA's Best Practice Guidelines for PVC.
4.2I.6 Limit Potable Water Use	**4.2R.6.1** The Proponent is required to: • confirm that no potable water is used for irrigation. • confirm that the development minimises potable water consumption in operations by installing / using: – 6-star WELS rating for taps, urinals, and dishwashers; – 5-star WELS rating for toilets, showers and washing machines; – 3-star WELS rating for showers; – confirm that (where applicable) the development site collects and reuses rainwater on site for applications including but not limited to: – amenities e.g. toilet flushing, washing machine use; – landscape irrigation; – air-conditioning cooling towers; – machinery cooling; – industrial cleaning of equipment, machinery, vehicles, – vessels etc. including washbays; – industrial processing (i.e. re-using water for industrial – processes); – carpet cleaning (or similar applications requiring large – amounts of water); – restoring and maintaining wetlands etc.; and – (where applicable), the Proponent must also confirm that any developed involving a purpose-built wash bay facility will include a wash-water recycling system and provide design specifications for this system. – rainwater collection tank to be sized to allow 10 days' total potable water usage (calculations to be provided, or based on 200L per person per day) – confirm that a minimum of 80% of Fire Protection System test water (including maintenance drain down) is / will be either reused or stored for other reuse on site. – confirm that the development does not use water for heat rejection.

Development Intent	Requirement
	• rain (and potentially grey) water tanks that allow for the capture and reuse of water on-site for landscaping irrigation, domestic use, e.g. toilet flushing and the washing of plant and equipment on site. **4.2R.6.2** Proponents should also consider and, where possible, apply **water pressure limitations** to mains supply to minimise water leakage and associated maintenance issues. NB: Water pressure limiting systems should not hinder fire protection water pressure requirements. **4.2R.6.3** **Harvested stormwater** from roofs and hardstands (and grey-water where appropriate and approved), will be stored, treated, and used on site for applications including: • air-conditioning cooling towers; • machinery cooling; • amenities e.g. toilet flushing, washing machine use etc.; • industrial cleaning of equipment, machinery, vehicles, vessels etc.; • industrial processing (i.e. re-using water for industrial processes); • carpet cleaning (or similar applications requiring large amounts of water); • restoring and maintaining wetlands; and • landscape irrigation. **4.2R.6.4** Any development involving purpose-built wash bay facilities must include a **wash-water recycling** system. All development should demonstrate the capacity to capture, temporarily store and reuse water from all onsite washing and fire protection system tests. In this regard, the Proponent should confirm and illustrate the type and capacity of water storage infrastructure to be provided on site, e.g. above and/or below ground water tanks and its connections. If discharge into the sewerage network is required, a comprehensive analysis of average and maximum volumes (on a litre per second basis) must be provided to determine whether the network can accept the additional load. **4.2R.6.5** Proponents may also consider: a) separating and treating **greywater*** for non-potable uses on-site including: • cleaning • toilet flushing; • machinery washing; • certain industrial; • applications; and • landscaping irrigation. **NB:** Greywater use is subject to BCC/UU standards. b) install rainwater storage capacity beyond their immediate, on-site needs (i.e. providing larger water storage tanks) for the harvesting and use of water throughout the broader Port community.

Development Intent	Requirement
	NB: PBPL may, by negotiation, provide numerous cost incentives for such initiatives. **4.2R.6.6** The site should be designed to provide: • water meters to monitor all water consumption on site; • water use monitors should be linked to a building management system (BMS) to provide a leak detection system; and • porous pavements or design features to allow runoff to drain into a collection, treatment, and re-use system. Alternatively, designs that reduce impervious surfaces should be adopted.
4.2I.7 Water Sensitive Urban Design	**4.2R.7** As per the Environmental Management Standards, developers may elect to either treat stormwater onsite or pursue the Offsite Stormwater Quality Investment Payment. If stormwater is treated onsite, Stormwater Management Water Sensitive Urban Design (WSUD) practices are to be optimised in the design, construction, and operation of the development. The Proponent is required to prepare an integrated and RPEQ certified stormwater plan (integrating landscape design features and treatments) that optimises the use of WSUD technologies and systems[2]. MUSIC modelling, or similar, must be produced to demonstrate the effectiveness of the treatments and a maintenance plan must be produced. If the Offsite Stormwater Quality Investment Payment is adopted, elements of Water Sensitive Urban Design (WSUD) should be incorporated into site design where cost effective and practicable.

[2] Proponent/Tenants may opt to pursue the alternative option of Offsite Stormwater Quality Investment Payments as a complete or partial substitute to accommodating on site WSUD – see: Section 4.1A.4 on p.7).



Solar panels – BMD Office, Port Central, Fisherman Islands

4.3 Environmentally Relevant Activities

In conjunction with the PBPL planning requirements, the Proponent shall ensure all relevant aspects of State environmental legislation are addressed.

In this regard, the Proponent, with PBPL's assistance, is encouraged to consult with DETSI to ensure all relevant environmental approvals are obtained after Planning Consent being issued by PBPL and prior to building works commencing.

Such requirements may include the necessity to obtain approvals for those "Environmentally Relevant Activities" (ERA) detailed in the Environmental Protection Regulation 2019, Schedule 2: see - https://www.legislation.qld.gov.au/view/html/inforce/current/sl-2019-0155#sch.2

Beyond these requirements, PBPL require that other activities with a potential for environmental risk (but that no longer require ERA licensing) are given heightened consideration in any development proposal.

Standards for activities/uses deemed 'High Environmental Risk Activities' are provided below and must be considered.

This Standard has been produced to give Proponents guidance on the types of information required for PBPL to assess applications for the following ***(only)***[3]:

- Asphalt Manufacturing

[3] Where a proposed development does not involve one of the uses here listed, these Standards will not be relevant.

- Abrasive Blasting
- Surface Coating
- Chemical / Fuel Storage
- Motor Vehicle Workshops
- Vehicle Washbays
- Concrete Batching

Development Intent / Type	Requirements
4.3I.1 All developments	**4.3R.1** All applications will require the following documentation: • A site- and issue-specific risk assessment that identifies environmental hazards and appropriate controls. • An updated/augmented Operational Environmental Management Plan that describes how the specific risks of these activities will be managed in the operational phase of the development. • A site plan showing the location of the activity, environmental controls, any nearby sensitive receptors, stormwater flows etc.
4.3I.2 Asphalt Manufacturing	**4.3R.2** Asphalt manufacturing typically involves the storage of hydrocarbons, chemicals, waste generation and has the potential to contaminate stormwater and ground water. The proponent should detail how these issues will be managed. The following control techniques may be considered: • The activity will need to be on an impervious base with bunding large enough to cater for the largest volume of potential spillage. • Operators should consider the local wind conditions when they plan the location of stockpiles and must ensure that there are adequate dust controls in place to minimise dust emissions i.e. windshields. • Operators should use suitable methods of control to suppress dust from unsealed roads and other unsealed parts of the premises. They should promptly clean any spillages of aggregate and should keep traffic areas in good repair. Operators should locate all storage areas and plant requiring access by vehicles close together, to minimise the distance travelled by vehicles on unsealed roads. • Heating of aggregate and bitumen must be undertaken in a manner that minimises air emissions. Operators should maintain bitumen products at the minimum temperature possible. • Operators must ensure that contaminated stormwater is directed to the appropriate surface water treatment system and that treatment systems have adequate capacity. • Operators should implement plant monitoring and maintenance programs to ensure that the volume of contaminated water requiring treatment is kept to a minimum, and that stormwater treatment systems are serviced often enough to prevent build-up of sediment, oil, and other water contaminants. • Accurate monitoring of air emissions and interpretation of results allows the operator to assess the effectiveness of pollution control

Development Intent / Type	Requirements
	equipment and the effect on the environment of activities carried out at a site. • Operators must contain material that is removed during cleaning of equipment and minimise the quantity of waste. Operators should also investigate options for the reuse, recycling or disposal of any wastes produced and should process each waste stream by the most appropriate method. • Water treatment systems should be established to minimise groundwater, surface water and stormwater contamination.
4.3I.3 Abrasive blasting	**4.3R.3** Abrasive blasting can have minimal environmental impact if it is located in an appropriate area and sited, designed and operated properly. Environmental issues such as noise, air and water pollution and waste management will need to be controlled. Control techniques may include: • Facilities should incorporate systems that enable the containment and reuse of water to replace potable supplies for operations such as landscape irrigation, toilet flushing and process water. • All waste products generated during abrasive blasting should be contained and securely stored before disposal to a licensed waste depot. • Operators should seek to minimise or prevent discharges from the premises, by separating clean and dirty waters for on-site treatment and/or reuse. Operators must ensure that any discharges from the premises do not pollute surface waters. • All abrasive blasting must be carried out in a cabinet constructed to contain the emission of particulate matter (generally dust) from the blasting operation. The blast room or cabinet must be totally enclosed and vented to the atmosphere through an effective dust collector, preferably a fabric filter or paper cartridge.
4.3I.4 Surface Coating	**4.3R.4** Surface coating includes works for spray painting and powder coating. This process usually involves noise generation, potential water, and air quality impacts as well as the generation of wastes (paint scrapings, solvents, waste powder and residual coatings). The following control measures must be considered: • Spray painting must be carried out in a confined area where any fugitive paint, solvents etc can be captured by exhaust fans. • To minimise air pollution, it is recommended to include air pollution control devices, including thermal and catalytic incinerators, carbon absorbers and condensers. • Reducing the use of VOC coatings. • Facilities should be incorporate drains, which lead into a dedicated wastewater collection, treatment, and storage and disposal system. • Waste products should be stored in a closed container, appropriately labelled and stored in a roofed, bunded compound.

Development Intent / Type	Requirements
4.3I.5 Chemical/Fuel Storage	**4.3R.5** The storage of chemicals (including fuel products) can potentially cause harm to the environment through, accidental spillage, incorrect storage, and contaminant run-off and air pollution. The proponent should identify how these potential impacts will be managed. Control measures may include: • Storage containers should have overfilled protection and alarms. • All personnel should be trained to ensure spillage incidents are minimised during loading and unloading operations. • Roofed, bunded areas appropriate to the volume of the chemical/fuel storage should be implemented to reduce the risk of water contamination (ground and surface water). • the necessity to store fuel in double-skinned, self-bunding tanks that meet with all relevant Australian Standards. • The necessity to design, develop, operate, and maintain all fuel storage and dispensing facilities in accordance with the relevant Australian Standards and relevant Brisbane City Council policies • Select an appropriate hydrocarbon/ filter system and ensure it is constructed, operated, and maintained in compliance with manufacturer requirements and detailed in the OEMP. Scheduled maintenance activities should be documented. NB: with the exception of appropriately licensed commercial Services Stations, no underground fuel storage will be permitted on Brisbane Core Port Land for the direct refuelling of vehicles and equipment.
4.3I.6 Motor Vehicle Workshop	**4.3R.6** The environmental impacts associated with motor vehicle workshops include water contamination and run off, air pollution (including odours) from the release exhaust, solvents etc. and waste generation. Suggested control measures to minimise these impacts include: • Roofed, bunded compounds should be implemented for the catchment of liquids. • All waste should be stored appropriately and collected by a licensed operator. • All panel beating work is conducted inside the workshop or in an undercover area. • Washing and cleaning of vehicles and equipment must occur within an area that is connected to the sewer (refer to PBPL's Trade Waste Management Plan: https://www.portbris.com.au/documents/d/port-of-brisbane/trade-waste-management-plan-fy26-1-pdf?download=true) or fitted with a water treatment system.
4.3I.7 Vehicle Washbays	**4.3R.7** The environmental / infrastructural impacts associated with vehicle wash bays include water contamination and run off, air pollution (including odours) through overspray and stagnant wastewater, land contamination and waste generation. Suggested control measures to minimise these impacts include:

Development Intent / Type	Requirements
	• Roofed, walled, bunded compounds should be implemented for the catchment of liquids and minimise the potential for overspray. • All waste should be stored correctly and collected by a licensed operator. • Design will need to ensure a significant level of the water used as part of this process is recycled. • On-site water collection/flow discharge-restriction infrastructure will be required as part of the operation process and design, to reduce the pressure to surrounding sewerage system. • All proposed vehicle washbay operations will need to have a flow rate which meets PBPL sewer network capabilities. This will need to be confirmed in writing by an RPEQ. • Washing and cleaning of vehicles and equipment must occur within an area that is connected to the sewer (refer to PBPL's Trade Waste Management Plan: https://www.portbris.com.au/documents/d/port-of-brisbane/trade-waste-management-plan-fy26-1-pdf?download=true) or fitted with a water treatment system. Urban Utilities (UU)-compliant approval for connection to plumbing, drainage and sewerage services (and associated operational works) is required prior to the commencement of the use (if required). • Cleaning chemicals and degreasers should be biodegradable and environmentally friendly where practicable.
4.3I.8 Concrete Batching	**4.3R.8** The proponent should refer the "code of practice for the concrete batching industry" published by the Queensland Government and meet the requirements of the code.

4.4 Car Parking and Vehicle Movement Design Guidelines

This Guideline supports the Car Parking and Vehicle Movement Design Code in the LUP. Please refer to the LUP for the purpose and applicability of the Car Parking and Vehicle Movement Design Code.

Development Intent	Requirements
Transport, Traffic and Access/Egress	
4.4I.1 If deemed necessary by PBPL, a Traffic Impact Assessment may be requested from a suitably qualified professional that addresses the requirements of the LUP and the Standards in this document.	**4.4G.1** Where relevant, a Traffic Impact Assessment should contain the following: • details about vehicle types, size, sweep paths and visitation numbers / frequency (i.e. overall visitation plus details of maximum number of vehicles that will visit the site on a daily basis at the busiest/peak times – NB: peak visitation figures rather than average annual figures of visitation should be provided); • details about operating hours and daily peaks of vehicle movement to and from the site; • process for organising and marshalling vehicles on site; • time taken to facilitate vehicle entry, processing and exit to/from site; • details about traffic management infrastructure, vehicle booking systems and on-site traffic management that will accommodate the maximum number of vehicles that will be visiting the site at the busiest time; • confirmation and verification that the operation will not necessitate vehicle queuing or parking outside the Proponent's leased area; and • confirmation that the traffic generated by the site will not adversely impact the safe and efficient operation of the port or the surrounding road network; plans and engineering drawings that accord with the requirements of the LUP and the advice of this document.

Development Intent	Requirements
Transport, Traffic and Access/Egress	
4.4I.2 The engineering drawings have been certified by a RPEQ (or equivalent) and address the requirements of the LUP and the advice of this document.	**4.4G.2.1** Where relevant, the Proponent will provide RPEQ-certification to the effect that all flexible pavements have been designed for a minimum design life of 15 years. A design life of 10 years may be acceptable in some circumstances. **4.4G.2.2** Where relevant, the Proponent is required to provide a design basis report and drawings for the pavement design. The design basis report must outline the design vehicles, axle loads, number of repetitions, ESAs etc. adopted to achieve the intended design life of the pavement. **4.4G.2.3** Where relevant, the Proponent should provide a minimum bound asphalt pavement to all pavement areas. A two-coat seal may be considered for leased areas accommodating only car storage. **4.4G.2.4** Where relevant, the Proponent is required to provide industrial standard vehicle turning geometry suitable for the largest vehicle that will use the facility (i.e. Super-B-Double, Port Container Vehicle – PBS Level 2B etc) For all development, the Proponent is required to provide vehicle turning geometry for service vehicles including garbage trucks, courier vans, emergency vehicles etc. All drawings must illustrate the car and truck queuing capacity and parking/loading spaces.

4.5 Landscaping, Stormwater and Water Sensitive Urban Design Guidelines

PBPL maintains a commitment to the responsible development of its land. This commitment incorporates the integration of high-quality landscaping and effective stormwater management for all development sites. In this regard, PBPL sees the design, establishment and maintenance of landscaping and stormwater management systems/infrastructure as being complementary and interdependent.

The integration of landscaping and stormwater management should therefore, incorporate the principles of Water Sensitive Urban Design (WSUD) in pursuit of the following objectives:

- The creation of a consistent and visually pleasing environment through the application of consistent design principles on all development sites.
- Ensuring stormwater drains from the site in a manner that avoids erosion, does not compromise public safety, provides an acceptable level of flood immunity, and ensures a quality that does not adversely impact upon receiving waters.
- The incorporation of a landscape design philosophy that:
    - is sensitive to the / prefers the use of indigenous vegetation patterns, native fauna and other natural biological systems of the site and associated locale
    - minimises the effort required to maintain gardens in a high-quality state
    - uses landscaping features/provisions as a means of further treating/improving stormwater quality.
- The reduced use of reticulated town potable supply by:

- compliance with any water restrictions (That may be enforced from time to time, none in Queensland since early 2013)
- using xeriscaping techniques (which relates to a landscape designed around limited water usage). This should limit the requirement for watering via the use of native drought tolerant species and sub-surface drip irrigation systems
- sourcing irrigation water from on-site rainwater harvesting, e.g. on-site water tanks, the use of porous pavements, the use of vegetated swales, retention/detention features and the design of pavements to capture overland stormwater flows as a source of irrigation
- trigger nozzles on all hoses and use of hydro cells when planting.

- The appropriate massing of species to ensure their continual survival and the minimisation of the potential for exotic pests or weeds to establish in landscaped areas.

- The inclusion of landscaping establishment irrigation and maintenance obligations within PBPL leases.

- The reflection of contemporary community expectations regarding the provision of aesthetically pleasing landscape design.

In this context, Proponents should note that Water Sensitive Urban Design (WSUD) refers to the integration of urban water cycle management with the planning and design of landscaping treatments and the infrastructure/systems designed to capture, store, treat and discharge stormwater.

Key elements of this philosophy can be noted to include (but not be limited to) the:

- capture, storage, treatment and (re)use (rather than simple conveyance) of stormwater for washing, domestic and industrial use, and localised landscape irrigation;
- conservation of water use;
- maintenance and enhancement of water quality through filtration and retention;
- reducing of stormwater runoff during peak flow period as a means of reducing the potential for pollution and providing effective flood mitigation;
- use of vegetation and integration with landscape elements for stormwater treatment (complementing or replacing more traditional Stormwater Quality Improvement Devices (SQIDs) such as litter traps, hydrocarbon separators etc.;
- the alternative use of the Port of Brisbane's Offsite Stormwater Treatment Investment Program (see below);
- water conserving landscaping; and
- protecting natural systems in a manner that minimises development costs associated with more traditional hard-engineered solutions.

This Guideline supports the Landscaping, Stormwater and Water Sensitive Urban Design Code in the LUP. Please refer to the LUP for the purpose and applicability of the Landscaping, Stormwater and Water Sensitive Urban Design Code.

Development intent	Requirements
Stormwater	
4.5I.1 A stormwater management plan is prepared and certified by a suitably qualified professional (e.g. an RPEQ) and addresses the requirements of the LUP and the advice of this document.	**4.5R.1.1** The stormwater management plan should contain commentary about the integration of landscaping and stormwater management infrastructure. If this is not possible, the Proponent must provide commentary justifying the proposed design of the facility and the effective management of stormwater. **4.5R.1.2** Pollutants should be removed from stormwater by stormwater quality improvement devises (including but not limited to swales, bio-retention basins, and filter strips) in the operational phase of the development. The following reductions should be achieved by the stormwater quality improvement devises within the site: • 80% reduction in Total Suspended Solids; • 60% reduction in Total Phosphorus; • 45% reduction in Total Nitrogen; and • 90% reduction in Gross Pollutants. MUSIC or a similar program should be used to demonstrate the aforementioned reductions. Alternatively, the development may opt to participate in the PBPL's Offsite Stormwater Treatment investment program. The initiative allows developers to reduce the amount of required on-site stormwater treatment by investing in water quality improvements in the Brisbane River catchment. The requirement to treat Total Suspended Solids, Total Phosphorus and Total Nitrogen will be met via the offsite investment, however gross pollutants must still be treated on site. In return developers are required to pay $38,000 per hectare (2026 rate) of development (excluding landscaping)which is invested by PBPL in catchment management projects throughout Southeast Queensland that scientific investigations have proven to provide net environmental benefits throughout the region. This initiative may also deliver comparative/overall infrastructure cost savings to many developments. For more information, please contact the PBPL's environment team. **4.5R.1.3** The projected sea level rise is a key consideration with the design of a facility or additional land use. For Brisbane core port land: • Site ground level is to be set at least Q100 flood level (3.45 m Port Datum) plus 800mm for potential impacts of sea level rise (4.25m Port Datum). • Finished floor levels are to be set 300mm (minimum) above site ground level (4.55m Port Datum).

4.5I.2 The drawings submitted with the stormwater management plan have been certified by a RPEQ (or equivalent) and clearly illustrate the site's capacity to effectively manage stormwater. These drawings should also be included in the project drawing set.	**4.5R.2.1** The drawings should clearly illustrate the stormwater catchment area, the direction of stormwater runoff and the stormwater hydraulic design calculation sheet and the Q100 flow direction. **4.5R.2.2** The site should be designed to: • Pipe stormwater during a Q10 storm event; and • Direct overland flow to an appropriate location during a Q100 storm event. Please note, the port lessee must consent to the proposed stormwater discharge location(s). **4.5R.2.3** The site should be designed with a grade no steeper than 1 in 100 (a grade no steeper than 1 in 80 may be considered in special circumstances). **4.5R.2.4** The Proponent must ensure that stormwater pipes are designed and constructed to withstand the impacts of the marine environment and the local geotechnical conditions. For example: • the Proponent should use rubber ring jointed pipes; • the Proponent is encouraged to seal the lifting holes in the reinforced concrete pipes. The lifting holes should be sealed with a geofabric patch (approximately 300mm square) prior to backfilling; • the Proponent is not permitted to use flush jointed pipes as they are unlikely to cope with the ground settlement at the port; and • the use of Class 4 marine grade stormwater pipes. • Flexible pipes/fittings (polypropylene/polyethylene with a smooth inside surface and solid or hollow/ribbed/corrugated external surface) may be accepted as an alternative, provided they are rubber ring jointed, a minimum of SN8 initial stiffness, and installed as per manufacturer's recommendations, relevant standards including but not limited to AS5065, AS2566 and other requirements of this specification. **4.5R.2.5** The proponent must ensure pipes are self-flushing during storm events by installing to grades as specified by the products manufacturer.
Landscaping	
Development Intent	**Guidelines**
4.5I.3 A landscaping plan is prepared by a suitably qualified professional and addresses the requirements of the LUP and the advice of this document.	**4.5G.3.1** A landscaping plan should form part of the stormwater management plan. The landscaping plan should demonstrate that landscaping has been effectively used: • to improve the aesthetics of the facility; • to improve the amenity of the site (i.e. recreational areas, car parking areas etc.) or the precinct; and • to minimise heat gain in habitable buildings.

4.5G.3.2 The landscaping plan should contain:

- details about proposed buildings and structures;
- commentary about the existing and proposed operations on the site;
- details about the existing and proposed overhead and underground services;
- details about the proposed landscaping (i.e. layout, species, height, and pot size of the proposed plants);
- details about the stormwater management system; and
- details about the water efficient irrigation system.

4.5G.3.3 Landscape designs/treatments should ensure landscaping:

- is provided for the length of all road frontages to an average width of 3m, except:

- any frontage to Port Drive at Port Gate where an average landscaping strip of 4m in width is required.
- for frontages to Lucinda Drive where an average landscaping strip of 4m in width is required.
- for wharf terminals fronting Port Drive where a landscaping strip of 1m in width is required.
- any frontage to the Brisbane River where PBPL's discretion will apply.

NB: where the operational realities of a site dictate that such landscaping provisions cannot be accommodated within the leased boundaries of a site, PBPL may consider accommodating landscaping treatments outside the fenced boundaries of a site. In such circumstances the Proponent will assume all maintenance responsibilities for such landscaping.

- to be incorporated in site layouts, stormwater, and construction plans (including provisions for ground covers, shrubs, and canopy trees).
- incorporates WSUD practices (wherever possible) during the initial design phase of the site to treat non-operational areas of the development to convey flow of stormwater on the surface of the development. Landscaping and stormwater design are integrated to include measures to reduce traditional stormwater infrastructure, such as pipes, and increase water storage and ground infiltration. Such initiatives may include, but are not limited to, bio-retention basins, filter strips and grass swales where opportunities for on-site water infiltration are maximised through drainage of hardstand towards permeable surfaces.
- (where located close to property boundaries) has appropriate root control systems designed to minimise the spread of roots.
- is designed such that the base area under the tree canopy is either kept clear and unpaved, or devices are introduced to allow adequate watering absorption.

- must include the provision of street trees at 10m intervals along all street frontages to the site at the Proponent's expense.

- that is designed to assist in dust filtration, provide screening from light, and reduce noise levels.

NB: Generally a minimum[4] of 5% of the total site area is to be landscaped with a particular emphasis placed on the aesthetic improvement and presentation of road frontages, areas adjacent to site offices, staff recreation areas, car-parking areas and frontages directly adjoining the Brisbane River and/or Moreton Bay.

4.5G.3.4 Where **car-parking and larger hardstand areas** are located between a frontage and any building, landscaping and the hardstand areas are designed, engineered, and constructed to:

- provide one larger shade tree for every six car parking spaces, with even distribution of the trees (within the broader selection of trees, shrubs and ground covers selected)

- reduce impermeable pavement wherever possible

- direct stormwater flows towards landscaping features

- direct stormwater flows towards treatment devices and collection/harvesting points.

Car parking areas provide for landscaping via diamond-shaped planter boxes and/or landscaped strips/swales separating car parks from each other and/or adjacent built features. Developments use landscaping features to screen uncovered storage areas and loading/unloading areas from general view from frontages. Protective measures, such as kerbing, wheel stops and/or bollards, are used to protect landscaping from being damaged.

4.5G.3.5 **Irrigation systems** comprise subsurface drip-feed technologies (preferably linked to an on-site source of harvested water). Sub-surface watering is programmed for early morning or late afternoon to minimise evaporation. Garden beds should be regularly re-mulched to reduce evaporation. Mowing and weeding of all landscape features and footpaths are regularly conducted to minimise weed infestation and maintain gardens at acceptable standards, with clippings being used as on-site compost.

4.5G.3.6 If no street trees exist, the landscaping plan must also include details about the proposed landscaping in the road corridor. The following should be used as a guide to site street trees:

- Shared property boundary - no closer than 2.0m;
- Kerb and channelling - no closer than 0.45m;
- Driveway - no closer than 3.0m;
- Service inspection pit - no closer than 3.0m;
- Fire hydrant - no closer than 3.0m;
- Water valve - no closer than 3.0m;
- Streetlight or traffic signal - no closer than 15.0m;
- Receding corner - no closer than 10.0m;
- Approach to a corner - no closer than 15.0m; and

[4] A relaxation of the extent of landscaping site coverage (i.e. provision of <5%) may be accommodated where a higher level / quality of landscaping treatment is provided to the site frontage and/or where all other landscaping performance criteria can be met or exceeded). Terminal developments adjacent to working wharfs may be exempt from some of these requirements.

- Departure from a pedestrian crossing - no closer than 5.0m.
- Perimeter fencing – no closer than 2.0m

More generally, plant species are selected and sited to ensure that overhead or underground services are not adversely impacted upon. Landscaping features highlight the main entry into any development site to ensure legibility and ease of access from the street. Mature trees should achieve a minimum clear trunk height of 1.8 metres, where trees are planted near designated vehicle entry points, thoroughfares, driveways, corners, roundabouts, or pedestrian crossings. The designer shall consider vehicle sight lines, maintenance (i.e. mowing) and impacts on any underground services as an element of any street planting plan.

4.5G.3.7 Table 3 below outlines drought tolerant plants that grow well in the local environment and complement the existing landscaping on and adjacent to Brisbane core port land. The landscaping plan should include species noted in Table 3.

Table 3: Trees, shrubs, and ground covers that grow well in the local environment and complement the existing landscaping around Brisbane core port land

(**Key:** I - Invasive 600mm in ground and 200mm out ground / L - Leader/Tap 600mm in ground / F - Fibrous 300mm-400mm in ground / G - Ground Dwelling 100mm in ground/ C – cluster in ground/ S - shallow)

Trees				
Species	**Common Name**	**Height (M)**	**Width (M)**	**Roots**
Acacia aulacocarpa	Hickory Wattle	5-10	5	L
Acacia leiocalya	Black Wattle	4-6	3-4	S/C
Alphitonia excelsa	Red Ash or Soap Tree	10-35	0.6-1.25	L
Angophora leiocarpa	Smooth-Barked Apple	15-20	5	L
Banksia integrifolia	Coastal Banksia	5-25	1-6	I
Banksia serrata	Old man Banksia	15	4	L
Callitris columellaris	Bribie Island Pine	8-20	3-6	L
Casuarina glauca	Swamp Oak	15-20	5-7	L
Casuarina equisetifolia	Coast She-Oak	10-12	6-10	L
Corymbia intermedia	Pink Bloodwood	20-40	1	L
Cupaniopsis anacardioides	Tuckeroo	5-8	5-7	F
Eucalyptus robusta	Swamp Mahogany	25	8-10	L
Eucalyptus signata	Scribbly Gum	20	8-10	L
Eucalyptus tessellaris	Moreton Bay Ash	30	7-9	L
Eucalyptus tereticornis	Forest Redgum	30	8-20	L
Glochidion ferdinandii	Cheese Tree	8-10	0.5-1.5	F
Grevillea banksii or Grevillea Sessilis	Red flowered Silky Oak or White Flowered Silky Oak	7	4	L
Grevillea honeygem	Honey Gem	5	4	L
Hibiscus tiliaceus	Beach Hibiscus	5-7	5-7	F
Hibiscus tillaceus ruba	Purple Cotton Tree	5	4	L
Jagera pseudorhus	Foam Bark	10	4	F

Species	Common Name	Height (M)	Width (M)	Roots
Lophostemon confertus	Queensland Brush Box	10-15	5-8	L
Lophostemon suaveolens	Swamp Box	25	5-7	L
Mallotus claoxyloides	Green Kamala or Odour Bush	11	2-3	C
Melaleuca quinquenervia	Coastal Tea Tree	15-20	5-8	L
Melaleuca bracteata	River Tea Tree	10	6	L
Melaleuca diosmatifolia	Fine Leaf Paperbark	5	4	L
Melaleuca linariifolia	Snow in Summer	5	4	L
Melaleuca leucadendra	Weeping Paperbark	10-30	8	F/C
Melaleuca stypheloides	Prickly Paperbark	5	4	L
Melaleuca seeberil	Honey Paperbark	5	4	L
Callistemon salignus	Weeping Bottlebrush	5-10	3-6	L

Shrubs

Species	Common Name	Height	Width	Roots
Acacia complanata	Flat-stem wattle	5-6	3-4	S
Acacia sophorae	Coastal Wattle	0.5-1	0.5-1	F
Banksia oblongifolia	Fern-leaved Banksia	0.5-2	1-1.5	S
Callistemon formosous	Red Tipped Bottlebrush	4	3	L
Callistemon viminalis	Bottlebrush Rose Opal Wlidfire Hannah Ray Dawson River	4 1.5-2 3-4 4-5 4	3	L
Dodonaea viscosa	Sticky Hop Bush	1.5-4	1-2	F
Dodonaea triquetra	Hopbush	3-5	2-4	L
Goodenia ovata	Hop Goodenia	2	2	G
Grevillea rosmanarifolia	Rosemary Grevillea	0.8-1	0.8-1	G
Leptospermum	Cardwel	1.5-2	1.5-2	G
Leptospermum laevigatium	Coastal Tea Tree	0.3-0.5	1-1.2	F
Melaleuca linariifolia	Claret Tops Honey Myrtle	1-1.2	0.6-1	F/G
Myoporum ellipticum	Upright Costal Myoporum	0.5	2	G
Ozothamnus diosmifolious	Rice Flower	1.5-2	1	G
Metrosideros vitiencensis	Fiji Fire	4	4	F
Sannantha similis	None	2-4	2-4	F
Westringia fruticosa	Wynyabbi Gem Zena	1.5	1.5	L

Ground cover and clumping plants

Species	Common Name	Height	Width	Roots
Carpobrotus glaucescens	Pigface	0.2	2	G
Dianella caerulea 'Breeze'	Dianella Breeze	1	2	F
Dianella tasmanica 'Tasred'	Dianella Tasred	1	2	G
Hardenbergia violacea	Native Sarsaparilla	0.3	1.5	G
Hibbertia scandens	Snake Vine	0.4	4	G
Lomandra hystrix	Green Matrush	1.3	1.3	G
Myoporum acuminatum	Mangrove Boobialla	0.5	4	F
Myoporum elipticum	Creeping Boobialla	1	3	F
Poa labillardierii	Tussock Grass	1	2	F

Species	Common Name	Height	Width	Roots
Pennisetum alopecuroides Nafray	Swamp Foxtail	2	2	F
Scaevola calendulacea or Scaevola Aemula	Purple Fanflower	0.2	0.8	G
Spinifex sericeus	Beach Spinifex	0.5	4	G
Themeda australis 'Mingo'	Dwarf Blue Kangaroo Grass	1	3	F
Goodenia rotundifolia	Star Goodenia	0.2	1.5	S
Sesuvium portulacum	Shoreline Purslane	0.3	1	S
Dianella congesta	Beach Flax Lily	0.5	0.5	G
Dianella brevipedunculata	Blue Flax Lily	0.5	0.5	G
Juncus usitatus	Common Rush	1	0.3	G
Isolepis nodosa	Knobby Club Rush	1	0.8	G
Carex appressa	Tall Sedge	1	1.2	G
Imperata cylindrica	Japanese Bloodgrass	0.5	0.45	F
Lomandra confertifolia	Mat Rush	1	1	G
Myoporum boninense	Coastal Boobialla	0.5	3	G
Microlaena stipoides	Weeping Grass	0.3	0.6	S
Austromyrtus dulcis	Midgen Berry	2	1.4	F
Hibbertia scandens	Guinea Flower	1	3	G

4.6 Signage

These Advertising and Directional Signage Guidelines have been drafted to assist with design and erection of all such signs at the Port of Brisbane.

All advertising signage on Brisbane Core Port Land at PortBris (i.e. Fisherman Islands including Port Central), Port Gate and Port West is managed and assessed by PBPL in accordance with these guidelines and the Development Code requirements of the LUP[5].

Signage at Port North is also reviewed and assessed by PBPL when located on Core Port Lands, however, may trigger assessment by BCC where developed in public road corridors. In such examples, PBPL must first provide their owner's consent to any application for advertising signage being made to BCC.

In considering signage on port land, PBPL will also consider the quality, visual amenity and consistency of signage proposed. Proponents should also note that the Department of Transport and Main Roads (DTMR) also have some jurisdiction over the final approval of all signage along Port Drive upstream of the Captain Bishop Bridge. As is the case with Council-approved signage, applications to DTMR must first be granted owners consent from PBPL where signage is located on port land adjoining Port Drive.

In the context of the following policy requirements:

- Advertising signage specifically relates to signage used primarily for the branding or advertising of a business and/or Tenant located on port land (see overleaf).

- Directional signage relates to more subtle/smaller signage that is primarily used for the interpretive purpose of locating, and directing customers/visitors to, a business or tenancies on Brisbane Core port land (refer to Section 4.6.3).

4.6.1 Advertising Signage

All advertising signage in the aforementioned areas requires approval (solely) from PBPL and should be addressed in the Proponent's development proposal. BCC's Advertising Signage Policy should also be referred to as a further 'guide' for design considerations in these areas. As part of any development application involving the placement of new signage on port land at PortBris, Port Gate or Port West, the

[5] NB: where any proposed signage directly faces an area that is not Brisbane Core Port Land (e.g. the Brisbane River, a Council or State Controlled Road or public park) BCC's and/or DTMR's Local Laws / Policies concerning signage may also apply).

Proponent must submit a signage concept plan and accompanying technical details that confirms and illustrates:

a. how the proposed signage complements existing/proposed building form.

b. the use of complementary colours and designs (in keeping with the port environment).

c. the use of high-quality construction materials.

d. how adverse impacts on the streetscape or impediments to the sight lines of drivers (including

e. adjoining roads are not compromised) or pedestrians are avoided.

f. that signage will not deteriorate in certain weather and environmental conditions.

g. how the proposed signage impacts the ability to maintain surrounding or adjacent infrastructure and landscaping (if applicable).

h. compliance/general consistency with the BCC Local Law Policies as deemed appropriate by PBPL - see: https://www.brisbane.qld.gov.au/laws-permits/laws-permits-businesses/advertising-signs).

i. that signage does not exceed 3 metres in height from the finished ground level when mounted on a free-standing structure or 6m when provided as a pylon sign.

j. that signage is not mounted above the roofline of any building. (**NB:** signage painted onto building rooftops is not considered acceptable on port land).

k. that no free-standing signage has a surface area of more than $6m^2$ when viewed from any direction, exclusive of posts or other support structures.

l. any free-standing signage or signage mounted on fencing must be accompanied by the signed certification of a Registered Professional Engineer of Queensland to the effect that it is structurally sound and incorporates mountings and foundations capable of withstanding the loadings of the sign and the weather conditions (wind loadings) experienced at the location of the signage.

m. that any structure supporting free-standing signage does not (in any way) compromise the structural integrity of any underground services or infrastructure, (e.g. water, sewer, electricity, telecommunications, underground service lines etc). The Proponent will be required to initiate a search for such underground services and confirm that their integrity shall be assured as part of any application for the development of free-standing signage. In addition, please contact the Spatial Data Services Team (☎3258 4888), who may be able to assist with the supply of underground service information.

n. that signage painted or attached on the surface of a building does not exceed 20% of the wall surface area (or 10% of the wall surface for developments in the Port Central Precinct).

o. that banners (including those of construction contractors), bunting, sandwich boards or other promotional material are not permitted (unless specifically sanctioned by PBPL).

p. that all lighting associated with signage does not have an adverse impact on:

- the safe operation of any vehicle circulation either on-site or off-site
- any air or waterway navigation aids or devices
- the amenity value of the streetscape.

Where sign lighting is proposed such lighting should (preferably) be solar powered) and/or be appropriately connected to the Proponent/Tenant's electricity supply (in accordance with Energex requirements).



Example of Advertising of a Business, Port Gate

q. any development has a maximum of one major sign per 100 metres of road frontage. NB: PBPL will generally permit as many minor signs as required for providing access directions and other site non-promotional information.

r. major on-site signage is located as near as possible to the main entry point to the site without adversely affecting safety.

s. customer / tenant branding signage may, with PBPL's prior-approval, be placed on urban art installations / follies with a port-related theme (e.g. shipping containers, retired lifting or maritime equipment) where such elements:
   - do not compromise driver sight lines or the structural / operational integrity of infrastructure services; and
   - are placed on a structurally sound footing.

NB: 'Minor' signage is directional signage that is not primarily for commercial promotion. Such signage is less than 1 metre in height – inclusive of support structure and less than 1m^2 in surface area. All larger signage sporting a business' brand or logo is classed as 'Major' advertising signage. Unless specifically sanctioned by PBPL, no advertising signage profiling the business or products of a third-party will be permitted on port land.

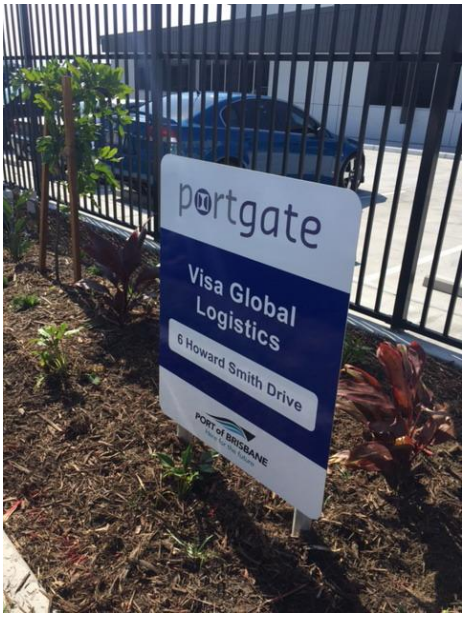
4.6.2 Tenancy Signs

These will be placed by PBPL at the boundary of each tenancy and be reflective of the major series signs. Each new Tenant is to have one of these clearly displayed at the road frontage. The signs may also indicate the main entrance although this is not encouraged.

Each new development should accommodate for the provision of such signage to accurately reflect the occupancy of the site. PBPL will arrange for the provision of such a sign and Proponent's should contact PBPL's Planning Team on ☎3258 4888 to discuss this requirement or any changes required to signs.



Example of Tenancy Signage, PortBris

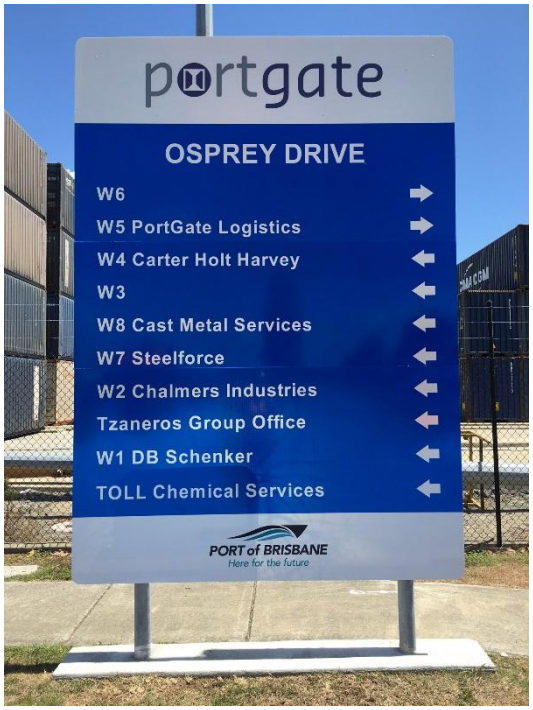


Example of Tenancy Signage, Port Gate

4.6.3 Directional Signage

All directional signs on port land will be provided in accordance with the standards defined for development outside the port in Queensland Transport's Manual of Uniform Traffic Control Devices and/or in accordance with PBPL's interpretive signage policies. As part of any development proposal, the Proponent need only consider the requirements of the Minor Directional Sign and Minor Miscellaneous Sign series requirements (see overleaf).

All other directional signage on port land will be provided by PBPL.



Example of Directional sign, Port Gate



Example of Directional sign, PortBris

5.0 Port Engineering Standards

These Standards support the LUP by outlining the engineering requirements for typical port development. The purpose is to:

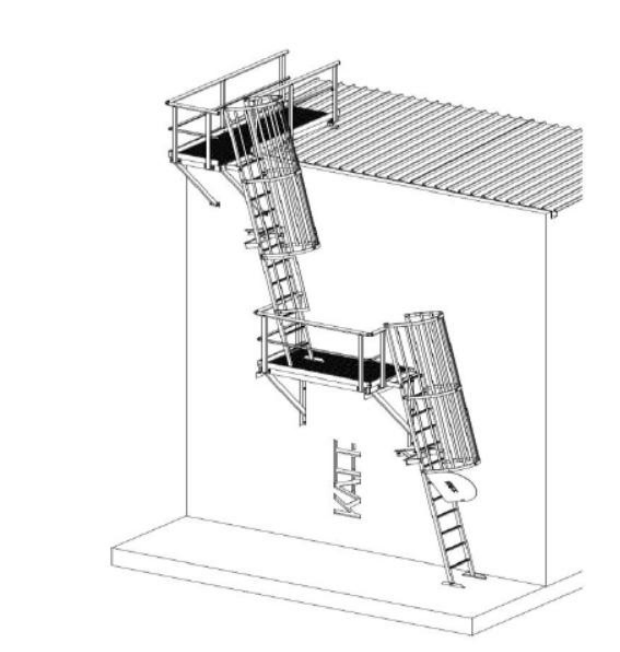
- facilitate good engineering outcomes
- promote development that is appropriate for the local marine and industrial environment
- provide basic direction to engineers and designers that are not familiar with the regulations that are applicable to this area
- outline the port lessee's engineering expectations for development on Brisbane core port land.

5.1 General Engineering Matters

This Guideline supports the Port Development Code in the LUP. Please refer to the LUP for the purpose and applicability of the Port Development Code.

Development Intent	Requirements
Design drawings	
5.1I.1 The location of existing and proposed development is clear	**5.1R.1** Development across all the Port of Brisbane precinct should be illustrated on plans using the Map Grid of Australia Zone 56 (MGA56) and Geocentric Datum of Australia 2020 (GDA2020). All drawings should illustrate development in relation to real property and lease boundaries. For further details about the local survey grids, please contact the port lessee's Spatial Data Services Team (☎3258 4888).
5.1I.2 Engineering details must be clearly noted on the design drawings.	**5.1R.2** The Proponent must ensure that all drawings submitted for approval clearly note the engineering specifications and calculations used to inform the design of the facility. The engineering specifications and calculations used should include: • design life; • design loading and patterns; • vehicle dimensions and details; • vessel dimensions and details; and • for pavements, axle loads, repetitions, and ESAs.
5.1I.3 Development is designed to be structurally sound and fit for its intended use.	**5.1R.3** All design drawings should be certified by a Registered Professional Engineer of Queensland (or equivalent).
5.1I.4 Development drawings prior to construction and after works being completed to be in accordance with Asset Design and As Constructed data (ADAC)	**5.1R.4** All drawings as part of a project, including demolition, for construction and as constructed, shall accord with PBPL "As Constructed" Documentation deliverables and PBPL ADAC standards (see Appendix B & C). Prior to commencing any given project, please contact the Spatial Data Services Team (☎3258 4888).

Development Intent	Requirements
Durability in a marine and industrial environment	
5.1I.5 Materials used must be appropriate for a marine and industrial environment.	**5.1R.5.1** The Proponent is encouraged to use non-corrosive metals (i.e. marine grade aluminium, grade 316 or 316L stainless steel, 2205 duplex stainless steel etc.), hot-dipped galvanised or Colorbond products, in order to achieve the required design life and time to first maintenance. Please note, painted steel sheeting; galvanised sheeting or painted galvanised sheeting is not appropriate. In lieu of a site-specific assessment for exposure classifications, facilities shall be designed to a minimum of a B2 exposure classification for atmospherically exposure elements (excluding maritime structures, which shall be designed to a C1 or C2 classification depending on proximity to the tidal zone).
	5.1R.5.2 All coating systems and metal finishes accord with the advice outlined in AS2312 and AS4312.
	5.1R.5.3 The Proponent is to ensure positive separation of dissimilar metals (the use of neoprene or HDPE spacers, sleaves, washers etc.). The Proponent is encouraged to avoid using dissimilar metals.
Buildings and structures	
5.1I.6 Buildings are designed to endure local weather conditions.	**5.1R.6.1** The Proponent is to ensure that the minimum roof pitch is at least one degree greater than the minimum profile recommended by the manufacturer. **5.1R.6.2** The Proponent is to ensure that roofs, windowsills, doors, and walls are framed and flashed to prevent rain entering the building during intense storm events. **5.1R.6.3** The Proponent is to ensure that all windows are commercial grade and weather proofed. The Proponent is encouraged to use commercial grade hopper style windows. **5.1R.6.4** The Proponent is to ensure that external roller doors are commercial grade and weather proofed. The Proponent is encouraged to construct a graded or recessed step away from the roller door. Perforated or slotted slats are to be protected so that there are no exposed edges.
5.1I.7 Buildings are designed to enable maintenance work to be undertaken safely.	**5.1R.7** The Proponent will ensure that the building and any associated plant can be accessed safely for maintenance and repair work. The proponent is to ensure that all equipment can be easily and safely accessed through purpose-built access / inspection points. Designs should be such that the need for fall arrest/fall prevention systems or access via elevated working platforms are eliminated or reduced. Please refer to the Workplace Health and Safety Queensland 'Managing the Risk of Falls at Workplaces' Code of Practice 2018 for further guidance.

Development Intent	Requirements
5.1I.8 Buildings are designed in regard to machinery and equipment safety.	**5.1R.8** The Proponent must ensure that the design (including plant, machinery, and equipment), built form and operations accord with *Work Health and Safety Act 2011* and AS4024.
5.1I.9 Buildings height access to be provided and maintained in accordance with the relevant requirements of the Building Code of Australia and/or Australian Standards.	**5.1R.9** The Proponent must ensure that Access to, and anchor points on, the roofs of all buildings and structures (including any warehouse, office and water tanks etc) will be provided and maintained in accordance with the relevant requirements of the Building Code of Australia and/or Australian Standards. In this regard, the Proponent is required to submit plans for roofing access for PBPL's assessment and approval. These plans should demonstrate compliance with the design of a Sayfa LD36 Katt Angled Cage Ladder with a midway landing platform or approved equivalent - see attached image below: 

Development Intent	Requirements
Infrastructure, utilities, and services	
5.1I.10 The design and construction of infrastructure, utilities and services must be considerate of the local geotechnical conditions and surrounding uses.	**5.1R.10.1** The Proponent must ensure that the design and construction of infrastructure, utilities and services is considerate of the site-specific geotechnical conditions (including broad scale and differential settlements) and the differential movement caused by the use of surrounding structures. **5.1R.10.2** The Proponent must ensure that stormwater pipes are designed and installed to allow for settlement around manholes. The Proponent is required to install a reinforced concrete pipe stub (length: 600mm) with rubber ring between the manhole and the next pipe. **5.1R.10.3** The Proponent must ensure that stormwater pipes are designed and installed to allow for settlement adjacent to wharves and accommodate the movements of a ship berthing. The Proponent is required to install a reinforced concrete pipe stub (length: 600mm) with rubber ring between the abutment to the wharf and the next pipe.
5.1I.11 Infrastructure, utilities and services are aligned in a structured and orderly manner.	**5.1R.11** The Proponent is required to ensure that all service connections are perpendicular to roads/boundaries/existing services and enter the property as directly as possible. For clarification about the most appropriate alignment, please contact the port lessee's Engineering Team (☎3258 4888).
5.1I.12 Infrastructure, utilities and services must be identifiable.	**5.1R.12** The Proponent is required to provide detectable marker warning tape 300mm above all services (including electrical and communications conduits, PVC pipes etc).
5.1I.13 A drawing that illustrates water and sewer infrastructure has been Designed and certified by a RPEQ and addresses the requirements of the LUP and the advice of this document.	**5.1R.13.1** The Proponent must provide details about the projected water consumption and sewer demands. Excessive water consumption (more than 100L per person per day) or sewer use (more than 100L per person per day) will require special consideration and may necessitate an amendment to the lease. Design assumptions are to be detailed on the RPEQ design drawings. All water use on site (both during construction and operations on completion) shall be recorded and comply with Appendices D and G, and any relevant Queensland Water Commission Water Restrictions and any specifications of Urban Utilities (UU's) that may be in place at any given time.
5.1I.14 Managing Standpipes to Utilities standards	**5.1R.14** PBPL will play a direct role in the assessment of Smart standpipes on Brisbane Core Port Land (unless otherwise informed by PBPL). Accordingly, all such standards should be confirmed with PBPL during pre-lodgement discussions. During construction, water supply is not to be gained from fire main connections (within this or any other site) without the installation of an appropriate temporary or permanent metered standpipe. If the site is directly serviced by UU followed by an appropriate notice, PBPL will

Development Intent	Requirements
	attend to the installation of any water connections to the proposed site boundary. Refer to the PBPL Water and Wasterwater Interface Requirements document in Appendix G for further details.
5.1I.15 A drawing that illustrates emergency response infrastructure has been prepared by a suitably qualified professional and addresses the requirements of the LUP and the advice of this document.	**5.1R.15.1** The Proponent must ensure that the design and installation of all fire suppression services accord with Queensland Fire and Emergency Services' standards and AS2419. **5.1R.15.2** In addition to requirements under the NCC, The Proponent will comply with AS2118 and provide additional fire suppression/sprinkler systems in the design and fit out of any development where it is determined that: • the proposed buildings have a value greater than $20 million and the additional cost of the fire suppression systems is less than 5% of the buildings' cost; or • the proposed buildings are located adjacent to buildings owned by the port lessee where the combined value of the buildings is greater than $20 million, and the additional cost of the fire suppression systems is less than 5% of the Written Down Value of the buildings; or • where a fire in any of the proposed buildings represents a significant business continuity risk to the port lessee.
5.1I.16 A drawing that illustrates electrical, fire detection and telecommunications infrastructure has been certified by a RPEQ and addresses the requirements of the LUP and the advices of this document. **Please refer to Appendix E**	**5.1R.16.1** The Proponent must provide details about the projected power consumption. Excessive power consumption (more than 1000kVA) will require special consideration and may necessitate an amendment to the lease. **5.1R.16.2** The Proponent must ensure that all electrical infrastructure is designed, provided, and maintained in accordance with all relevant standards including, arc flash conditions being met, without limitations: AS3000, AS1670 and Energex's Underground Distribution Construction Manual and standards. **5.1R.16.3** The Proponent must ensure that all electrical conduits are installed by a qualified and competent contractor in accordance with AS3000 and Energex's Underground Distribution Construction Manual and standards **5.1R.16.4** The Proponent must ensure that all telecommunications infrastructure is compliant with the current version of *Telecommunications Act 1997*, Compilation No. 91; *Telecommunications (Low Impact Facilities)* Determination 2018; AS/ACIF S009 Installation Requirements for Customer Cabling and the PBPL lease conditions. **5.1R.16.5** For any works to existing crossovers, or construction of new crossovers, the Proponent must install, or verify the existence of, services for future provision, including but not limited to; 3 x comms conduits, HV Electrical conduits as per Energex requirements installed to two (2) meters wide of either side of a new or modified crossover. Please contact the Portnet Development Manager on ☎3258 4659 for further assistance with conduit requirements. Please refer to PBPL Standard Crossing Details (Appendix F). **5.1R.16.6** The Proponent must ensure that electrical earth stakes are to be grade 316 stainless steel (not copper).

Development Intent	Requirements
	5.1R.16.7 The Proponent must ensure that the design of the load centres and distribution boards are appropriate for a marine and industrial environment (e.g. marine grade aluminium, stainless steel etc). The load centres and distribution boards shall use a Schneider Electric Isobar Type load centre chassis or equivalent. The designer shall address all fault conditions (including Arc flash) by selecting the appropriate switchgear and switchboard configuration. Compliance with the PBPL LV Switchboard Standard and AS/NZS 61439 is mandatory. As per PBPL Electrical Standard Low Voltage Switchboards – General Requirements, Rev B (Appendix E). **5.1R.16.8** The Proponent must ensure that the design of the transformer rectifier units is suitable for a marine and industrial environment. The circuit breaker controls for the transformer rectifier units shall use a Schneider Electric Isobar Type load centre chassis or Equivalent. **5.1R.16.9** The Proponent is required to seal all conduits to protect electrical cables from vermin damage. All conduits to be installed to the correct cover as per relevant standards (AS, Provider, etc). **5.1R.16.10** The Proponent is encouraged to incorporate drainage into electrical and communication pits (particularly in marine terminals).
5.1I.17 Access to infrastructure, utilities and services must be safe and efficient.	**5.1R.17.1** The Proponent will ensure access covers are designed in accordance with the specifications below: All access covers must comply with AS3996 and be marked with service details: **Container wharves and general cargo wharves:** The Proponent will provide Class G access covers. **Bulk products wharves and motor vehicle wharves:** The Proponent will provide Class F access covers. The Proponent is encouraged to provide Class G access covers. **Terminals:** The Proponent will provide Class G access covers. **Port industry:** The Proponent will provide Class F access covers. The Proponent is encouraged to provide Class G access covers. **Motor vehicle storage, processing, and distribution:** The Proponent will provide Class C access covers. The Proponent is encouraged to provide Class D access covers. **Roads:** The Proponent will provide Class E access covers at PortBris, Port Gate and Port West. The Proponent will provide Class D access covers elsewhere. The Proponent is encouraged to provide Class E access covers elsewhere. **Areas adjacent to roads:** The Proponent will provide Class C access covers at PortBris, Port Gate and Port West. The Proponent will provide Class B access covers elsewhere. The Proponent is encouraged to provide Class C access covers elsewhere. **Non-trafficked areas (i.e. garden beds):** The Proponent will provide Class A access covers. **5.1R.17.2** The Proponent is required to locate pits and manholes at: a) substantial changes of direction of conduits; and b) a maximum spacing of 300m; and

Development Intent	Requirements
	c) on all corners of intersections. **5.1R.17.3** The Proponent must ensure that the conduit penetrations are at least 150mm above the floor to the electrical and communication pits. The Proponent must also ensure that bell mouths are installed in the pit walls for conduit penetrations. **5.1R.17.4** The Proponent must ensure pulling eyes and nylon draw ropes are integrated into the design and installation of all electrical and communication pits and infrastructure.
5.1I.18 Concreting for manholes, gully pits and other underground access structures is appropriate.	**5.1R.18** Concreting for manholes, gully pits and other underground access structures must accord with the specifications below: • for development in tidal areas, the Proponent is required to provide a minimum concrete grade of N50; • for everywhere else, the Proponent is required to provide a minimum concrete grade of N40; and • the walls of the structure must be reinforced with SL82 mesh or better. Please note mesh is not used when PBPL install standard BCC manholes. If sandbags have been used as an external framework, they must be removed prior to backfilling.
Wind standards	
5.1I.19 The design wind standard for infrastructure is considerate of the local environment.	**5.1R.19** All development on Brisbane core port land will be designed to accommodate wind speeds in Region B and Terrain Category 2 (as outlined in AS1170.2). The Proponent will ensure: • container cranes and ship loaders are designed to accommodate regional wind speeds not less than 64m/s (ultimate wind speed for limit state design) based on an Importance Level of 4; • consideration for a lower level of importance (please refer to Table 3.2 as part of the AS/NZS 1170 to determine the importance level for building types) may be considered where the proponent can demonstrate via a RPEQ risk based assessment the lower level is appropriate for their equipment and shall not be less than level 2; • container cranes and ship loaders are capable of being operated in wind speeds not less than 20m/s (permissible wind speed for working stress design); and • all other infrastructure and buildings are designed to accommodate regional wind speeds of not less than 57m/s (ultimate wind speed for limit state design) based on an Importance Level of 2.
Lighting	
5.1I.20 Lighting is sufficient to ensure operations that are undertaken at night are safe.	**5.1R.20.1** The Proponent must ensure lighting does not adversely impact adjacent sites or Brisbane Airport. No light should be directed more than 5 degrees above horizontal. **5.1R.20.2** If lighting will result in safer operations at night, the Proponent should provide an average of 50 lux over the site and a minimum of 30 lux at the areas that are least lit. For Outdoor workplaces proponents shall

Development Intent	Requirements
	consider EN12464-2 along with AZ/NZS 1680.5. Detailed RPEQ lighting drawings shall be submitted with the proponent's application.
Gates	
5.1I.21 Gates must not adversely impact public areas.	**5.1R.21** The Proponent is required to ensure that all gates open into leased areas and not onto footpaths in public areas.
Fuel and chemical storage	
5.1I.22 Managing Fuel and chemical storage to the appropriate AS.	**5.1R.22** All fuel and chemical storage must be above ground and accord with all relevant AS and the advice of *Work Health & Safety Act 2011*. The proponent shall ensure that an assessment is undertaken that considers the risks to neighbouring facilities (current or future in the case where no current neighbouring facilities are present), which are introduced by the storage of fuel, chemicals and other potentially hazardous goods (i.e. boundary setbacks, exclusion zones, blast radius). Where applicable, the Proponent must ensure that facilities associated with the storage and handling of fuel / oil, comply with the requirements of the International Safety Guide for Oil Tankers and Terminals (ISGOTT).

5.2 Engineering Requirements for Development over Water[6]

Intent	Advice
Infrastructure and buildings over water	
5.2I.1 The design life of infrastructure and buildings is economical, fit for its intended use and accords with all relevant Australian Standards.	**5.2R.1.1** Major maritime facilities (i.e. wharves) should have a minimum design life of 50 years. Minor maritime facilities (i.e. recreational boating facilities such as pontoons, boat ramps etc.) should have a design life of 25 years or more. **5.2R.1.2** The Proponent must ensure that the design of maritime structures complies with AS4997- Guidelines for the Design of Maritime Structures. **5.2R.1.3** The Proponent must ensure that fendering complies with PIANC - Guidelines for the Design of Fendering Systems: 2002. **5.2R.1.4** The Proponent must ensure that the design of marinas and pontoons complies with AS3962 – Guidelines for the Design of Marinas

[6] These standards only apply to development projects that are on, over or under MHWS.

Intent	Advice
5.2I.2 The design of a wharf is economical, fit for its intended use and accords with all relevant Australia Standards.	**Wharves** **5.2R.2.1** The Proponent will ensure wharves are designed in accordance with the specifications below (as a minimum) and PBPL's guidelines for stormwater management (see 4.5I.1). All vehicle loads must include dynamic effects. **5.2R.2.2 Container Wharves:** The Proponent will provide RPEQ-certification (or equivalent) to the effect that the container wharf will accommodate class 50 loads in accordance with AS4997; 50kPa, multiple 120t axle load from reach stakers and forklifts and 15t straddle wheel load from an eight-wheel straddle. The Proponent is however, encouraged to provide RPEQ certification (or equivalent) to the effect that the container wharf will accommodate class 60 loads in accordance with AS4997; 60kPa, multiple 120t axle load from reach stakers and forklifts and 15t straddle wheel load from an eight-wheel straddle. The container wharf must be designed for SM1600 and HLP400 loads in accordance with the Bridge Design Code AS5100. **5.2R.2.3 General Cargo Wharves and/or Motor Vehicle Wharves:** The Proponent will provide RPEQ-certification (or equivalent) to the effect that the general cargo wharf and/or motor vehicle wharf will accommodate class 40 loads in accordance with AS4997; 40kPa; multiple 110t axle load from reach stakers and forklifts and 13t straddle wheel load from an eight-wheel straddle. The Proponent is however, encouraged to provide RPEQ-certification (or equivalent) to the effect that the general cargo wharf and/or motor vehicle wharf will accommodate class 50 loads in accordance with AS4997; 50kPa; 120t axle load for reach stakers and forklifts, multiple 120t axle loads for MAFI trailers (refer to Abbreviations) and 15t straddle wheel load from an eight wheel straddle. **5.2R.2.4** The general cargo wharf and/or motor vehicle wharf must be designed for SM1600 and HLP400 loads in accordance with the Bridge Design Code AS5100. **5.2R.2.5 Bulk Product Wharves:** The Proponent will provide RPEQ-certification (or equivalent) to the effect that the bulk product wharf will accommodate class 15 loads in accordance with AS4997; 15kPa and multiple 60t axle load from reach stakers and forklifts. The bulk product wharf must be designed for SM1600 and HLP400 loads in accordance with the Bridge Design Code AS5100. The Proponent is however, encouraged to provide RPEQ-certification (or equivalent) to the effect that the bulk product wharf will accommodate class 25 loads in accordance with AS4997; 30kPa and multiple 110t axle load from reach stakers and forklifts. The Proponent is also encouraged to design the bulk product wharf for SM1600 and HLP400 loads in accordance with the Bridge Design Code AS5100. **5.2R2.6 Cruise Wharves:** The Proponent will provide RPEQ-certification (or equivalent) to the effect that the cruise wharf will accommodate class 15 loads in accordance with AS4997; 15kPa and 30t axle load from reach

Intent	Advice
	stakers and forklifts. The cruise wharf must be designed for SM1600 and HLP320 loads in accordance with the Bridge Design Code AS5100. The Proponent is encouraged to provide RPEQ-certification (or equivalent) to the effect that the cruise wharf will accommodate class 25 loads in accordance with AS4997; 30kPa and 45t axle load from reach stakers and forklifts. The Proponent is also encouraged to design the cruise wharf for SM1600 and HLP400 loads in accordance with the Bridge Design Code AS5100.
5.2I.3 The design of a wharf is considerate of the vessels that will berth at the facility and the local weather conditions	**Vessels**
	The Proponent will ensure wharves are designed to accommodate the vessels and movements detailed below (as a minimum): **5.2R.3.1 Container Wharves:** The Proponent will provide RPEQ-certification (or equivalent) to the effect that the container wharf will accommodate a 110,000 DWT post-panamax container vessel berthing at 0.15m/sec (minimum). The Proponent is encouraged to provide RPEQ-certification (or equivalent) to the effect that the container wharf will accommodate a 140,000 DWT neo-panamax container vessel berthing at 0.15m/sec (minimum). **5.2R.3.2 General Cargo Wharves:** The Proponent will provide RPEQ-certification (or equivalent) to the effect that the general cargo wharf will accommodate 50,000 DWT general cargo vessel berthing at 0.15m/sec (minimum). The Proponent is encouraged to provide RPEQ-certification (or equivalent) to the effect that the general cargo wharf will accommodate 60,000 DWT general cargo vessel berthing at 0.15m/sec (minimum). **5.2R.3.3 Car Wharves:** The Proponent will provide RPEQ-certification (or equivalent) to the effect that the motor vehicle wharf will accommodate 35,000 DWT roll on/roll off vessel berthing at 0.15m/sec (minimum). The Proponent is encouraged to provide RPEQ-certification (or equivalent) to the effect that the motor vehicle wharf will accommodate 45,000 DWT roll on/roll off vessel berthing at 0.15m/sec (minimum). **5.2R.3.4 Bulk Wharves:** The Proponent will provide RPEQ-certification (or equivalent) to the effect that the bulk product wharf will accommodate 60,000 DWT handimax bulk carrier vessel berthing at 0.15m/sec (minimum). The Proponent is encouraged to provide RPEQ-certification (or equivalent) to the effect that the bulk product wharf will accommodate 70,000 DWT panamax bulk carrier vessel berthing at 0.15m/sec (minimum). **5.2R.3.5 Cruise Wharves:** The Proponent is encouraged to provide RPEQ-certification (or equivalent) to the effect that the cruise wharf will accommodate a 140,000 GRT cruise liner vessel berthing at 0.15m/sec (minimum). **Please note, the design vessels may be larger, and the berthing speeds may be higher (depending on berthing conditions). The RPEQ (or equivalent) is responsible for designing the wharf for its intended use.**

Intent	Advice
5.2I.4 Piles are durable and fit for their intended use.	**Piles** **5.2R.4.1** The Proponent is encouraged to use steel piles for marine structures. Appropriate consideration must be given to corrosion allowance in accordance with AS4997. An assessment shall also be made to determine the risks of accelerated low water corrosion / microbially influenced corrosion. **5.2R.4.2** The Proponent must confirm the details of the steel pile protection systems, Pile Wrapping (UCC series 2000 HD) are in addition to a paint system and where the layout or type of piles preclude the use of pile wrapping, protective coatings must be used, which are appropriate for a marine environment (splash, spray and tidal zones) and demonstrate compliance with AS2312 and AS4312. This shall include for elements such as fender piles, with coating specification to consider the potential for impact damage or abrasion. Protective coating systems shall be designed to provide a minimum time to first maintenance of 15-years, as defined by AS2312. **5.2R.4.3** The Proponent is required to provide a cathodic protection system (in accordance with AS2832) within the portion of piles permanently immersed in water and in the tidal zone. The wrapping system (i.e. UCC series 2000HD) shall provide protection to the portion of the piles that are not permanently immersed in water and to a depth of 0.5 m below LAT.
Container cranes	
5.2I.5 Container cranes are fit for their intended purpose/design life and accord with all relevant AS.	**5.2R.5.1** The Proponent must ensure that the design wheel loads for container cranes in operating conditions accords with one of the specifications below (maximum allowable wheel loads): • 55 tonnes per wheel for 8-wheel bogies with wheels spaced at 1.5m centres (440 tonnes per crane leg). • 75 tonnes per wheel for 8-wheel bogies with wheels spaced at 1.2m centres (600 tonnes per crane leg). • 60 tonnes per wheel for 10-wheel bogies with wheels spaced at 1.2m centres (600 tonnes per crane leg). **5.2R.5.2** The Proponent must ensure wharves are designed to accommodate the design wheel loads for container cranes in the storm (tie-down) conditions detailed below (as a minimum) and wind standards as described in Section 5.1I.18 • 100 tonnes per wheel for 8-wheel bogies with wheels spaced at 1.5m centres (800 tonnes per crane leg). • 125 tonnes per wheel for 8-wheel bogies with wheels spaced at 1.2m centres (1000 tonnes per crane leg). • 100 tonnes per wheel for 10-wheel bogies with wheels spaced at 1.2m centres (1000 tonnes per crane leg). Uplift load to be assessed for proposed container crane but should not be greater than 195 tonnes per corner (crane leg).

Intent	Advice
Concreting standards for development over water	
5.2I.6 The concrete work associated with the construction of a maritime facility is fit for its intended purpose and design life and accords with all relevant AS.	**5.2R.6.1** The Proponent will ensure the concrete grade accords with the specifications below: **Major maritime facilities:** The Proponent is required to ensure concrete for major maritime facilities incorporates a minimum grade of S50 with the following requirements: • maximum water/cementitious ratio: 0.40 • minimum cementitious content: 450 kg/m^3 • flyash content: 25% by replacement of cement The proponent is encouraged to consider the inclusion of a corrosion inhibitor. This shall typically be anodic corrosion inhibitors (Nitrite) that is admixed to a dosing rate of 15L/m3 for the deck slabs and relieving slabs, and 25L/m3 for crane beams, abutments, and fender panels. **Minor maritime facilities:** The Proponent is required to ensure concrete for minor maritime facilities incorporates a minimum grade of S40 with the following requirements: • maximum water/cementitious ratio: 0.45 • minimum cementitious content: 400 kg/m^3 • flyash content: 20% to a maximum of 25% by replacement of cement **5.2R.6.2** The Proponent must comply with table 6.4 or table 6.5 in AS4997 - Guidelines for the Design of Maritime Structures for concrete cover. The Proponent is encouraged to add 10mm to the minimum concrete cover noted in Table 6.4 or Table 6.5 in AS4997. **5.2R.6.3** The Proponent must ensure that all concrete elements have a minimum of 7 days moist curing or the application of a curing compound that complies with either Class A or Class B curing compounds (depending on application) in accordance with AS3799 (Water Retention Efficiency Index not less than 90%). If curing compounds are used, then Water-based Class B curing compounds are preferred. The Proponent is encouraged to use a moist cure concrete for a minimum of 10 days and use no curing compounds in a marine environment. **5.2R.6.4** The Proponent is required to confirm that all concreting will incorporate carbon steel reinforcement complying with AS4671. Epoxy coating or other enveloping protection systems for reinforcement is not permitted. **5.2R.6.5** Prestressed or post-stressed concrete is not recommended for marine structures. If prestressed or post-stressed concrete is proposed, special consideration and detailing is required.
Recreational and boating infrastructure	
5.2I.7 Recreational and boating infrastructure is effectively designed for its intended use.	**5.2A.7** The Proponent must ensure that the design of recreational boating infrastructure accords with DTMR's requirements.

5.3 Engineering Requirements for Development Over Land

Intent	Advice
Design Life	
5.3I.1 The design life of development on land is economical and fit for its intended use.	**5.3R.1** Development on land should have a design life that is fit for its intended use and/or correlates with the currency period of the relevant lease.
Geotechnical	
5.3I.2 Development and operations must be considerate of the site's geotechnical conditions.	**5.3R.2** The majority of Brisbane core port land has been reclaimed over marine silts and clays. Development on our land needs to be considerate of the site-specific geotechnical conditions (including broad scale and differential settlements). Where ground improvements have been undertaken by PBPL, it is of a broad scale nature and has not considered specific future land use. Proponents are required to contact Head of Infrastructure on 3258 4888 in relation to ground conditions pertaining to any specific site. Should additional ground improvements be required to achieve the desired post construction settlements subject to design loads, then the Proponent is encouraged to design for post construction settlements of 150mm over 20 years for Terminal Areas; and 50mm over 20 years for Warehouses and Buildings (e.g. where buildings are designed for pad footings). Post construction differential settlement shall also be considered in the design. The differential settlement criteria would depend on the type of structure and development. The cost and time implications for any additional ground improvements will need to be taken into consideration by the Proponent.
5.3I.3 Activities that involve importing fill material address the requirements of the LUP and the advice of this document.	**5.3R.3.1** The Proponent is encouraged to cut and level the site to minimise the need for importing fill material. **5.3R.3.2** All fill material must accord with the advice of AS3798. Fill material must have a California Bearing Ratio of 15 or more. **5.3R.3.3** There are statutory requirements associated with importing and exporting fill material. The port lessee's Environmental Team can assist a Proponent's efforts to identify these requirements.
Pavements and concrete slabs on land	
5.3I.4 The supporting information has been certified by a RPEQ (or equivalent) and demonstrates that the pavement areas and concrete slabs (including inside warehouses and sheds) are adequate for their intended use.	**5.3R.4.1** The Proponent will ensure pavement areas and concrete slabs will achieve their intended design life in accordance with the specifications below (as a minimum). All vehicle loads must include dynamic effects: **5.3R.4.2 Container terminals:** The Proponent will provide RPEQ-certification to the effect that all pavements provided for container terminals will accommodate a minimum 50kPa, 120t axle load from reach stackers and forklifts and 15t straddle wheel load from an eight-wheel straddle. The Proponent is encouraged to provide RPEQ-certification to the effect that all pavements provided for container terminals will

Intent	Advice
	accommodate a minimum 60kPa, 120t axle load from reach stackers and forklifts and 15t straddle wheel load from an eight-wheel straddle. Container terminals will be constructed with a minimum concrete grade of N40, with minimum required covers to comply with AS3600. **5.3R.4.3 General cargo terminals:** The Proponent will provide RPEQ-certification to the effect that all pavements provided for general cargo terminals will accommodate a minimum 40kPa, 110t axle load from reach stackers and forklifts and 13t straddle wheel load from an eight-wheel straddle. The Proponent is encouraged to provide RPEQ-certification to the effect that all pavements provided for general cargo terminals will accommodate a minimum 50kPa, 120t axle load from reach stackers and forklifts and 15t straddle wheel load from an eight-wheel straddle. General cargo terminals will be constructed with a minimum concrete grade of N40, with minimum required covers to comply with AS3600. **5.3R.4.4 Empty container parks:** The Proponent will provide RPEQ-certification to the effect that all pavements provided for all empty container parks will accommodate a minimum 15kPa, 60t axle load from reach stackers and forklifts and 11t straddle wheel load from an eight-wheel straddle. The Proponent is encouraged to provide RPEQ-certification to the effect that all pavements provided for all empty container parks will accommodate a minimum 30kPa, 90t axle load from reach stackers and forklifts and 11t straddle wheel load from an eight-wheel straddle. Empty container parks will be constructed with a minimum concrete grade of N32, with minimum required covers to comply with AS3600. **5.3R.4.5 Car storage facilities:** The Proponent will provide RPEQ-certification to the effect that all pavements for car storage facilities will accommodate a minimum 5kPa and 3t axle load. The Proponent is encouraged to provide RPEQ-certification to the effect that all pavements for car storage facilities will accommodate a minimum 10kPa and 7t axle load. Car storage facilities will be constructed with a minimum concrete grade of N32, with minimum required covers to comply with AS3600. **5.3R.4.6 Truck storage facilities:** The Proponent will provide RPEQ-certification to the effect that all pavements for truck storage facilities will accommodate a minimum10kPa and 7t axle load. The Proponent is encouraged to provide RPEQ-certification to the effect that all pavements for truck storage facilities will accommodate a minimum 15kPa and 10t axle load. Truck storage facilities will be constructed with a minimum concrete grade of N40, with minimum required covers to comply with AS3600. **Please note, a truck storage facility is not a machinery storage facility (i.e. a facility that stores agricultural equipment, mining equipment etc.). The pavement design for a machinery storage facility will be determined on a case-by-case basis.** **5.3R.4.7 Loadout Areas for PDI facilities:** The Proponent will provide RPEQ-certification to the effect that all pavements for loadout areas will accommodate a minimum15kPa and 10t axle load. The Proponent is encouraged to provide RPEQ-certification to the effect that all

Intent	Advice
	pavements for loadout areas will accommodate a minimum 20kPa and 15t axle load. Loadout areas will be constructed with a minimum concrete grade of N32, with minimum required covers to comply with AS3600. **5.3R.4.8 Warehouses:** The Proponent will provide RPEQ-certification to the effect that all pavements for warehouses will accommodate a minimum 20kPa, 60t axle load from reach stackers and forklifts and 11t straddle wheel load from an eight-wheel straddle. The Proponent is encouraged to provide RPEQ-certification to the effect that all pavements for warehouses will accommodate a minimum 35kPa, 100t axle load from reach stackers and forklifts and 11t straddle wheel load from an eight-wheel straddle. Warehouses will be constructed with a minimum concrete grade of N32, with minimum required covers to comply with AS3600. **The Proponent is required to provide a design basis report for the pavement design. The design basis report must outline the design vehicles, axle loads, number of repetitions, ESAs etc. adopted for the design.** **Please note, the design loads may be higher (depending on the proposed operations). The RPEQ (or equivalent) is responsible for designing the pavement and/or concrete slabs for their intended use.**
Concreting standards for development over land	
5.3I.5 The concrete work associated with development on land is fit for its intended purpose and design life and accords with all relevant AS.	**5.3A.5** The Proponent must ensure that all concrete elements have a minimum of seven (7) days moist curing or the application of a curing compound that complies with either Class A or Class B curing compounds (depending on application) in accordance with AS3799 (Water Retention Efficiency Index not less than 92%). If curing compounds are used, then Water-based Class B curing compounds are preferred.
Roads	
5.3I.6 The engineering drawings have been certified by a RPEQ (or equivalent) and address the requirements of the LUP and the advice of this document.	**5.3R.6.1** The Proponent will provide RPEQ-certification to the effect that all roads will have a minimum design life of 15 years. The Proponent is encouraged to provide RPEQ-certification to the effect that all pavements will have a minimum design life of 20 years. **5.3R.6.2** The Proponent is required to provide a design basis report for the pavement design. The design basis report must outline the design vehicles, axle loads, number of repetitions, ESAs etc. adopted for the design. **5.3R.6.3** The Proponent must provide a minimum asphalt seal of 50mm for roads. **5.3R.6.4** The Proponent is required to provide industrial standard vehicle turning geometry suitable for the largest vehicle that will use the road (i.e. Super-B-Double, Port Container Vehicle etc.). All drawings must Illustrate the car and truck queuing capacity and parking areas on roads.

Intent	Advice
Dangerous Goods Storage and Handling	
5.3I.7 Facilities deemed to be a Major Hazard Facility (MHF) or Possible MHF (pursuant to the requirements of Queensland's Work Health and Safety Regulations 2013) will only be permitted: - **where detailed via a site and issue-specific risk assessment (provided and certified by a suitably qualified/experienced RPEQ);** - **where assessed and approved by the State; and** - **where deemed compliant with LUP and the advice of this document.**	**5.3R.7.1** The Proponent will provide a site and issue-specific, RPEQ-certified risk assessment for the MHF or possible MHF. This assessment should include details of all potential risks and how same will be avoided, minimised, and/or mitigated. **5.3R.7.2** The Proponent is required to secure PBPL's conditional approval / non-objection to applying for all relevant State approvals for any proposed development of / undertaking of activities associated with a MHF or Possible MHF. **5.3R.7.3** The Proponent must secure the written approval of the State for any MHF or possible MHF. **5.3R.7.4** The Proponent will be required to manage their development / use in accordance with the requirements deemed appropriate by PBPL and/or the State, all relevant State legislation (including environmental and work health and safety requirements) and appropriate Australian Standards.
5.3I.8 The storage of dangerous goods (under the threshold levels for any site being listed as an MHF or possible MHF) may, at PBPL's discretion: - **require the submission and assessment of a site and issue-specific risk assessment (provided and certified by a suitably qualified/experienced RPEQ; and** - **require / involve additional design, construction, and/or site management provisions to reduce the specific risks associated with dangerous goods storage and handling.**	**5.3I.8.1** The Proponent will provide a site and issue-specific, RPEQ-certified risk assessment for any dangerous goods (DG) storage and handling deemed to be of interest by PBPL. This assessment should include details of: • all potential risks and how same will be avoided, minimised, and/or mitigated; • confirmation that the storage and handling of the DGs in question will not structurally compromise any sites' hardstands, driveway crossovers and/or underlying infrastructure / services. Such documentation should also confirm that the proposed DG storage and handling will not exceed the loading capacity of the site's hardstand storage areas; • the DG's being appropriately stored in open or undercover areas; • the DG's being appropriately separated / segregated from combustible materials, other stored DG classes and/or occupied buildings (unless the latter are protected by firewall protection); • the DG's not being stored / stacked in a manner that exacerbates fire risks; and • any additional firefighting systems, emergency response measures, site signage and/or warning systems or alarms associated with DG storage.

6.0 Abbreviations

This section provides the meaning of terms used in the LUP and their application to development and operations on Brisbane core port land. These abbreviations assist with the interpretation of the LUP but do not have a specific land use meaning.

AS means Australian Standards

ADAC means Asset Design and As Constructed data

BCA means Building Code of Australia

BCC means Brisbane City Council.

Brisbane core port land (BCPL) means Brisbane core port land as defined by TIA 1994

CAD means Computer Aided Drafting

Crossover means the area where a site connects to the public roadway.

DETSI means Department of Environment, Tourism, Science, and Innovation

DG means Dangerous Goods

DTMR means Department of Transport and Main Roads

DSDIP means State Development, Infrastructure & Planning

DAF means Department of Agriculture and Fisheries

DWT means deadweight tonnage.

Environmental value means the sum of the desirable elements and factors that comprise the surroundings.

ESA means Equivalent Standard Axle.

Filling or excavation means removal or importation of material to or from a lot that will change the ground level of the land.

Ground level means:

(a) the existing level of the site providing it has not been unlawfully altered; or
(b) where the land has been unlawfully altered the level of land prior to the alteration; or
(c) the 'as-constructed' level of the land in accordance with an approval for filling and excavation.

GRT means Gross Register Tonnage

kWr means kilowatts of refrigerating effect i.e. power consumption of the AC unit

Loadout area means an area for loading and unloading vehicles.

LUP means this Brisbane Port Land Use Plan.

MAFI means **Ma**rtin **Fi**ala whose initials formed the company MAFI in 1957. RoRo system (roll on/ roll off) to carry out efficient and economic loading and unloading of ships.

MHF means Major Hazard Facility

MHWS means Mean High Water Springs

NCC means National Construction Code

PDI means pre-delivery inspection area

Port lessee means an entity declared to be the port lessee under section 289Y of the TIA.

Receiving environment means the environment immediately, or in close proximity to the development and/or its operations.

UU means Urban Utilities

RPEQ means Registered Professional Engineer of Queensland

SQID means Stormwater Quality Improvement Device

TIA means the Transport Infrastructure Act 1994

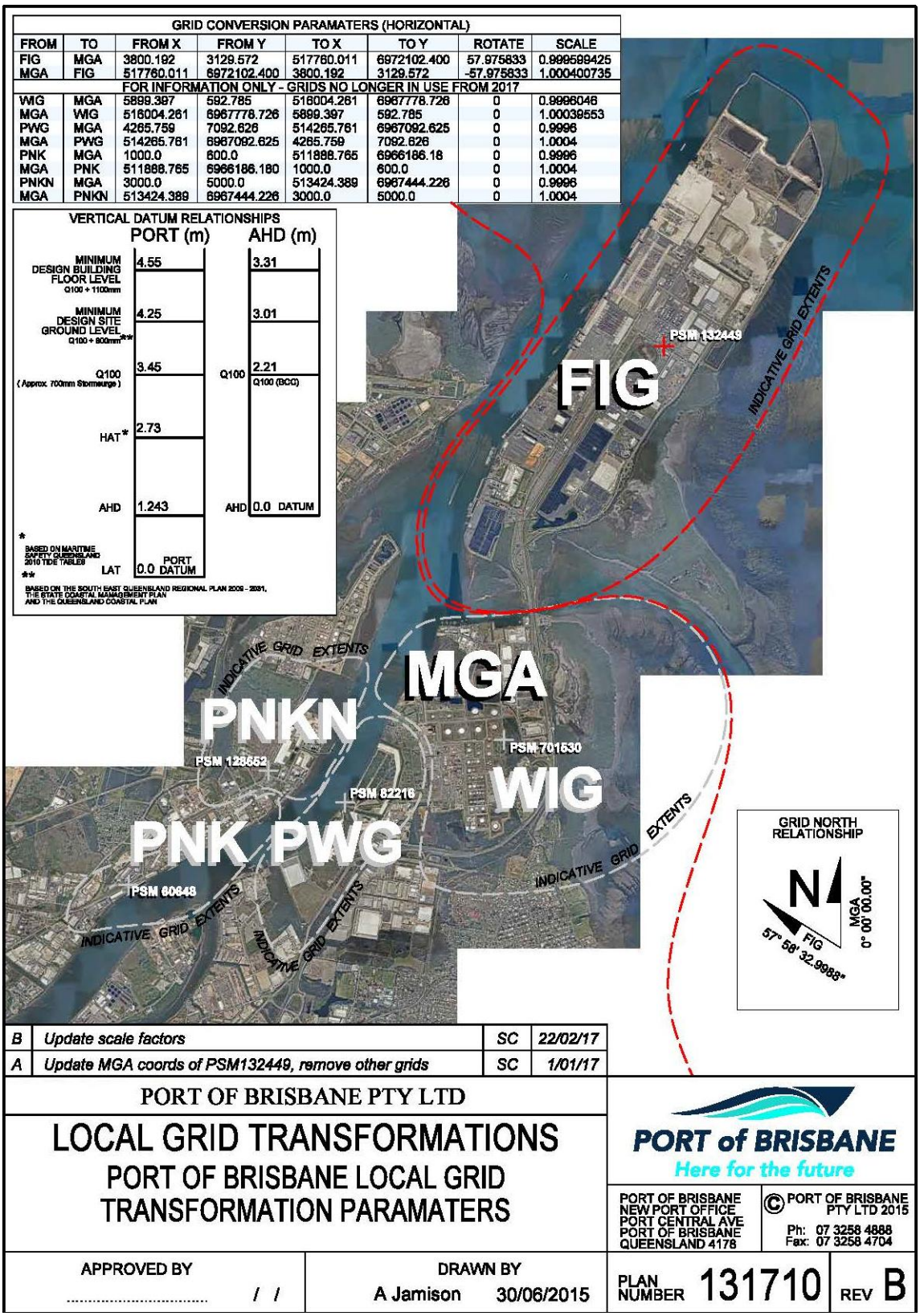
Water Sensitive Urban Design means:

The effective and responsible management of water. Water sensitive urban design promotes the following:

(a) the protection of natural systems;
(b) the protection of water quality;
(c) the integration of stormwater treatment into the landscape; and
(d) the storage and reuse of stormwater.

7.0 Appendices

Appendix A: Local Grid Transformations



Appendix B: Supply of "As Constructed" Deliverables



SUPPLY OF "AS CONSTRUCTED" DELIVERABLES

Edited by: S.Crump *Date: 14/11/2019* *Revision: C*

See: https://www.portbris.com.au/documents/d/port-of-brisbane/supply-of-as-constructed-deliverables-reve-with-attachments-pdf?download=true

Appendix C: PBPL ADAC Standards

PORT of BRISBANE

Here for the future

GUIDELINES FOR CREATION AND SUBMISSION OF ADAC XML FILES

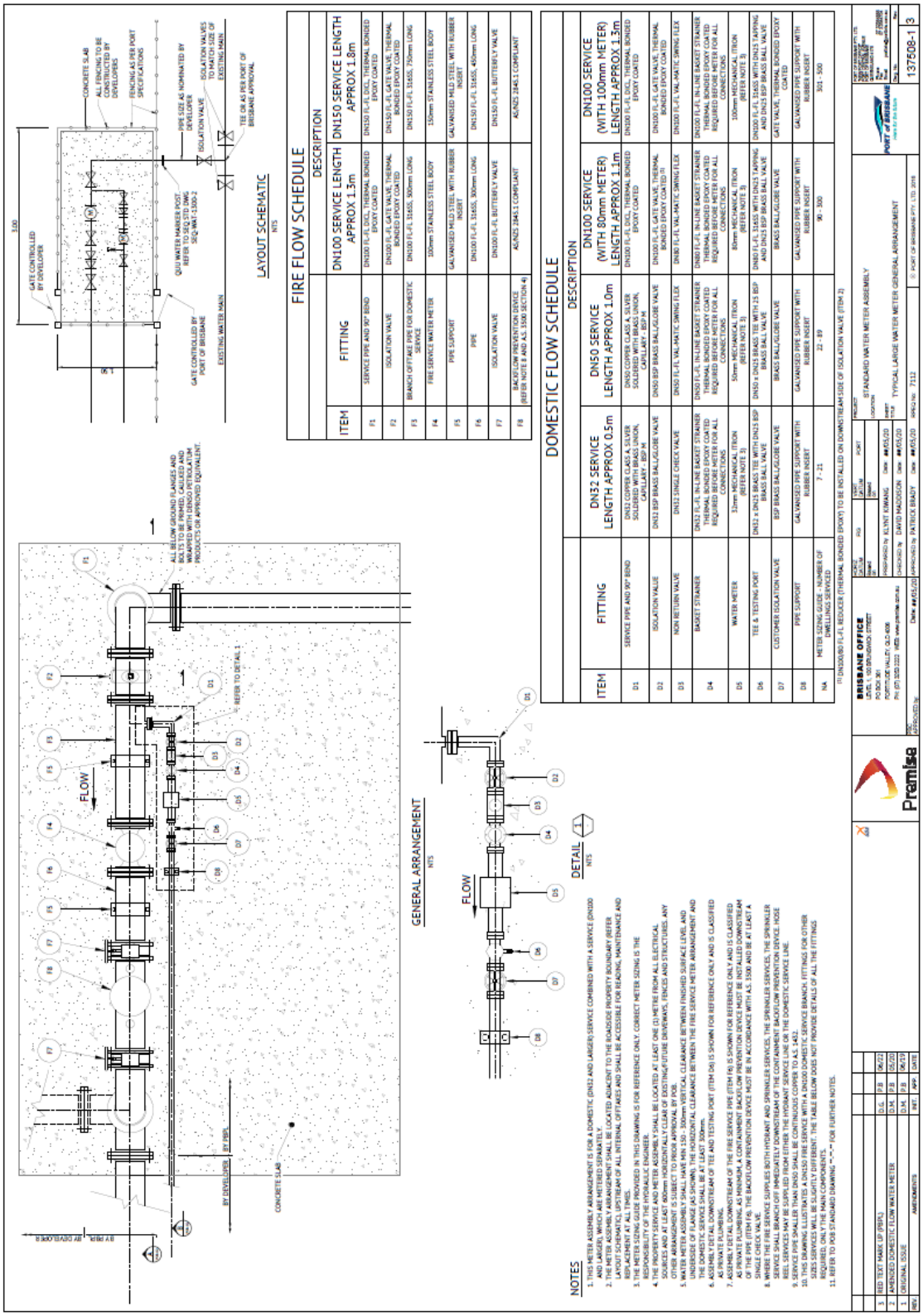
ADAC XML Files to be included as an accompaniment to the "As-Constructed" bundle submitted to Port of Brisbane

---

Version 3.4 FINAL (15th August 2016)

See: https://portofbrisbane.lxc.liferay.com/documents/d/port-of-brisbane/adac-guidelines-version-3-4-pdf?download=true

Appendix D: PBPL Water Meter Installation and Connection



PORT of BRISBANE
Here for the future

PORT OF BRISBANE PTY LTD

Electrical Standard

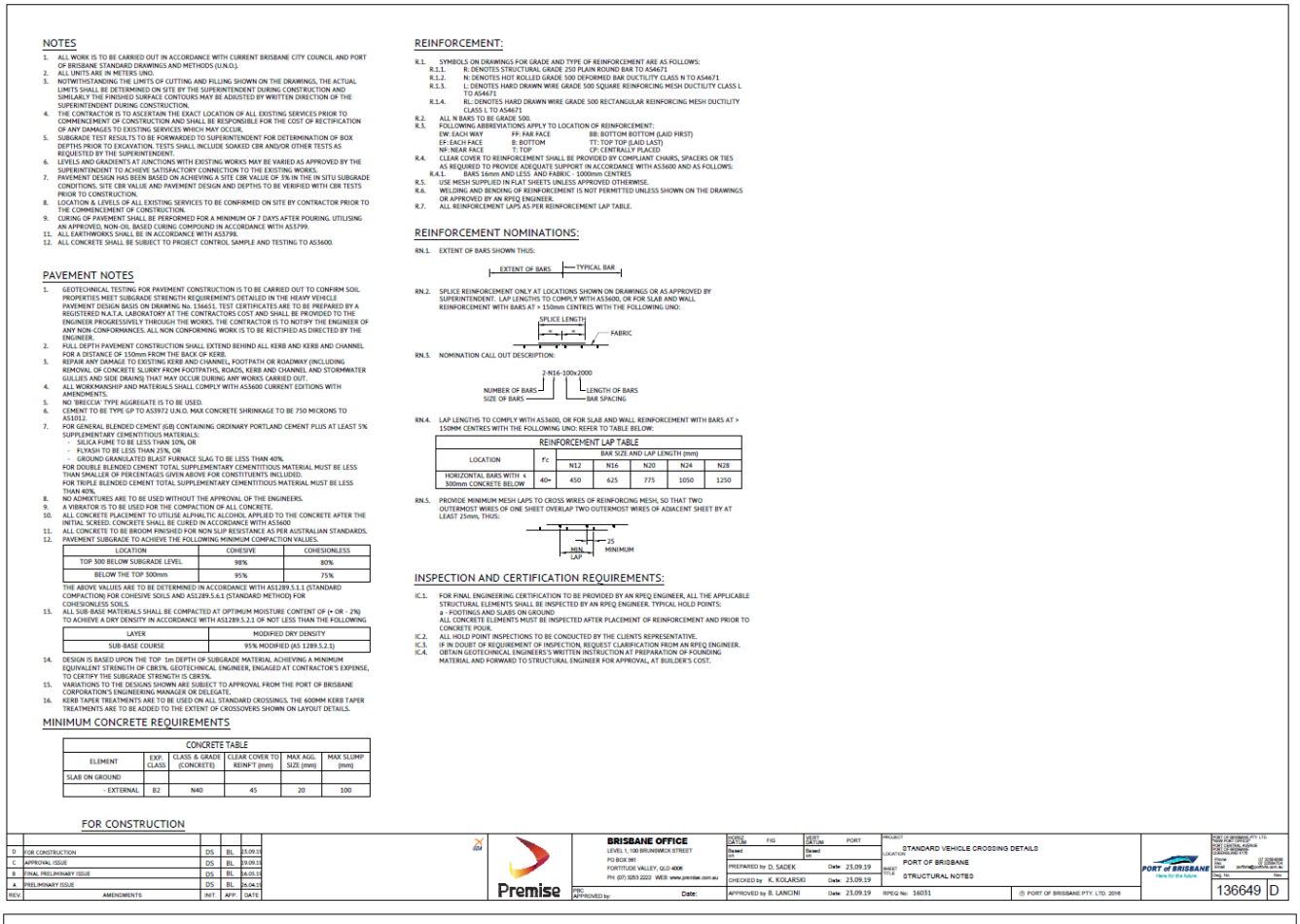
Low Voltage Switchboards - General Requirements

DOCUMENT REFERNECE: A3121545
REVISION: G



See link at: PBPL Electrical Standard - Low Voltage Switchboards - General Requirements
DOCUMENT REFERENCE: A3900560 REVISION G

Appendix F: PBPL Standard Crossing Drawings



NOTES

1. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH CURRENT BRISBANE CITY COUNCIL AND PORT OF BRISBANE STANDARD DRAWINGS AND METHODS (U.N.O.).
2. ALL UNITS ARE IN METERS UNO.
3. NOTWITHSTANDING THE LIMITS OF CUTTING AND FILLING SHOWN ON THE DRAWINGS, THE ACTUAL LIMITS SHALL BE DETERMINED ON SITE BY THE SUPERINTENDENT DURING CONSTRUCTION AND SIMILARLY THE FINISHED SURFACE CONTOURS MAY BE ADJUSTED BY WRITTEN DIRECTION OF THE SUPERINTENDENT DURING CONSTRUCTION.
4. THE CONTRACTOR IS TO ASCERTAIN THE EXACT LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL BE RESPONSIBLE FOR THE COST OF RECTIFICATION OF ANY DAMAGES TO EXISTING SERVICES WHICH MAY OCCUR.
5. SUBGRADE TEST RESULTS TO BE FORWARDED TO SUPERINTENDENT FOR DETERMINATION OF BOX DEPTHS PRIOR TO EXCAVATION. TESTS SHALL INCLUDE SOAKED CBR AND/OR OTHER TESTS AS REQUESTED BY THE SUPERINTENDENT.
6. LEVELS AND GRADIENTS AT JUNCTIONS WITH EXISTING WORKS MAY BE VARIED AS APPROVED BY THE SUPERINTENDENT TO ACHIEVE SATISFACTORY CONNECTION TO THE EXISTING WORKS.
7. PAVEMENT DESIGN HAS BEEN BASED ON ACHIEVING A SITE CBR VALUE OF 3% IN THE IN SITU SUBGRADE CONDITIONS. SITE CBR VALUE AND PAVEMENT DESIGN AND DEPTHS TO BE VERIFIED WITH CBR TESTS PRIOR TO CONSTRUCTION.
8. LOCATION & LEVELS OF ALL EXISTING SERVICES TO BE CONFIRMED ON SITE BY CONTRACTOR PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
9. CURING OF PAVEMENT SHALL BE PERFORMED FOR A MINIMUM OF 7 DAYS AFTER POURING. UTILISING AN APPROVED, NON-OIL BASED CURING COMPOUND IN ACCORDANCE WITH AS3799.
11. ALL EARTHWORKS SHALL BE IN ACCORDANCE WITH AS3798.
12. ALL CONCRETE SHALL BE SUBJECT TO PROJECT CONTROL SAMPLE AND TESTING TO AS3600.

PAVEMENT NOTES

1. GEOTECHNICAL TESTING FOR PAVEMENT CONSTRUCTION IS TO BE CARRIED OUT TO CONFIRM SOIL PROPERTIES MEET SUBGRADE STRENGTH REQUIREMENTS DETAILED IN THE HEAVY VEHICLE PAVEMENT DESIGN BASIS ON DRAWING No. 136651. TEST CERTIFICATES ARE TO BE PREPARED BY A REGISTERED N.A.T.A. LABORATORY AT THE CONTRACTORS COST AND SHALL BE PROVIDED TO THE ENGINEER PROGRESSIVELY THROUGH THE WORKS. THE CONTRACTOR IS TO NOTIFY THE ENGINEER OF ANY NON-CONFORMANCES. ALL NON CONFORMING WORK IS TO BE RECTIFIED AS DIRECTED BY THE ENGINEER.
2. FULL DEPTH PAVEMENT CONSTRUCTION SHALL EXTEND BEHIND ALL KERB AND KERB AND CHANNEL FOR A DISTANCE OF 150mm FROM THE BACK OF KERB.
3. REPAIR ANY DAMAGE TO EXISTING KERB AND CHANNEL, FOOTPATH OR ROADWAY (INCLUDING REMOVAL OF CONCRETE SLURRY FROM FOOTPATHS, ROADS, KERB AND CHANNEL AND STORMWATER GULLIES AND SIDE DRAINS) THAT MAY OCCUR DURING ANY WORKS CARRIED OUT.
4. ALL WORKMANSHIP AND MATERIALS SHALL COMPLY WITH AS3600 CURRENT EDITIONS WITH AMENDMENTS.
5. NO 'BRECCIA' TYPE AGGREGATE IS TO BE USED.
6. CEMENT TO BE TYPE GP TO AS3972 U.N.O. MAX CONCRETE SHRINKAGE TO BE 750 MICRONS TO AS1012.
7. FOR GENERAL BLENDED CEMENT (GB) CONTAINING ORDINARY PORTLAND CEMENT PLUS AT LEAST 5% SUPPLEMENTARY CEMENTITIOUS MATERIALS:
   - SILICA FUME TO BE LESS THAN 10%, OR
   - FLYASH TO BE LESS THAN 25%, OR
   - GROUND GRANULATED BLAST FURNACE SLAG TO BE LESS THAN 40%.

   FOR DOUBLE BLENDED CEMENT TOTAL SUPPLEMENTARY CEMENTITIOUS MATERIAL MUST BE LESS THAN SMALLER OF PERCENTAGES GIVEN ABOVE FOR CONSTITUENTS INCLUDED.
   FOR TRIPLE BLENDED CEMENT TOTAL SUPPLEMENTARY CEMENTITIOUS MATERIAL MUST BE LESS THAN 40%.
8. NO ADMIXTURES ARE TO BE USED WITHOUT THE APPROVAL OF THE ENGINEERS.
9. A VIBRATOR IS TO BE USED FOR THE COMPACTION OF ALL CONCRETE.
10. ALL CONCRETE PLACEMENT TO UTILISE ALPHALTIC ALCOHOL APPLIED TO THE CONCRETE AFTER THE INITIAL SCREED. CONCRETE SHALL BE CURED IN ACCORDANCE WITH AS3600
11. ALL CONCRETE TO BE BROOM FINISHED FOR NON SLIP RESISTANCE AS PER AUSTRALIAN STANDARDS.
12. PAVEMENT SUBGRADE TO ACHIEVE THE FOLLOWING MINIMUM COMPACTION VALUES.

LOCATION	COHESIVE	COHESIONLESS
TOP 300 BELOW SUBGRADE LEVEL	98%	80%
BELOW THE TOP 300mm	95%	75%

THE ABOVE VALUES ARE TO BE DETERMINED IN ACCORDANCE WITH AS1289.5.1.1 (STANDARD COMPACTION) FOR COHESIVE SOILS AND AS1289.5.6.1 (STANDARD METHOD) FOR COHESIONLESS SOILS.

13. ALL SUB-BASE MATERIALS SHALL BE COMPACTED AT OPTIMUM MOISTURE CONTENT OF (+ OR - 2%) TO ACHIEVE A DRY DENSITY IN ACCORDANCE WITH AS1289.5.2.1 OF NOT LESS THAN THE FOLLOWING

LAYER	MODIFIED DRY DENSITY
SUB-BASE COURSE	95% MODIFIED (AS 1289.5.2.1)

14. DESIGN IS BASED UPON THE TOP 1m DEPTH OF SUBGRADE MATERIAL ACHIEVING A MINIMUM EQUIVALENT STRENGTH OF CBR3%. GEOTECHNICAL ENGINEER, ENGAGED AT CONTRACTOR'S EXPENSE, TO CERTIFY THE SUBGRADE STRENGTH IS CBR3%.
15. VARIATIONS TO THE DESIGNS SHOWN ARE SUBJECT TO APPROVAL FROM THE PORT OF BRISBANE CORPORATION'S ENGINEERING MANAGER OR DELEGATE.
16. KERB TAPER TREATMENTS ARE TO BE USED ON ALL STANDARD CROSSINGS. THE 600MM KERB TAPER TREATMENTS ARE TO BE ADDED TO THE EXTENT OF CROSSOVERS SHOWN ON LAYOUT DETAILS.

MINIMUM CONCRETE REQUIREMENTS

CONCRETE TABLE					
ELEMENT	EXP. CLASS	CLASS & GRADE (CONCRETE)	CLEAR COVER TO REINF'T (mm)	MAX AGG. SIZE (mm)	MAX SLUMP (mm)
SLAB ON GROUND					
- EXTERNAL	B2	N40	45	20	100

REINFORCEMENT:

R.1. SYMBOLS ON DRAWINGS FOR GRADE AND TYPE OF REINFORCEMENT ARE AS FOLLOWS:
R.1.1. R: DENOTES STRUCTURAL GRADE 250 PLAIN ROUND BAR TO AS4671
R.1.2. N: DENOTES HOT ROLLED GRADE 500 DEFORMED BAR DUCTILITY CLASS N TO AS4671
R.1.3. L: DENOTES HARD DRAWN WIRE GRADE 500 SQUARE REINFORCING MESH DUCTILITY CLASS L TO AS4671
R.1.4. RL: DENOTES HARD DRAWN WIRE GRADE 500 RECTANGULAR REINFORCING MESH DUCTILITY CLASS L TO AS4671
R.2. ALL N BARS TO BE GRADE 500.
R.3. FOLLOWING ABBREVIATIONS APPLY TO LOCATION OF REINFORCEMENT:
EW: EACH WAY FF: FAR FACE BB: BOTTOM BOTTOM (LAID FIRST)
EF: EACH FACE B: BOTTOM TT: TOP TOP (LAID LAST)
NF: NEAR FACE T: TOP CP: CENTRALLY PLACED
R.4. CLEAR COVER TO REINFORCEMENT SHALL BE PROVIDED BY COMPLIANT CHAIRS, SPACERS OR TIES AS REQUIRED TO PROVIDE ADEQUATE SUPPORT IN ACCORDANCE WITH AS3600 AND AS FOLLOWS:
R.4.1. BARS 16mm AND LESS AND FABRIC - 1000mm CENTRES
R.5. USE MESH SUPPLIED IN FLAT SHEETS UNLESS APPROVED OTHERWISE.
R.6. WELDING AND BENDING OF REINFORCEMENT IS NOT PERMITTED UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY AN RPEQ ENGINEER.
R.7. ALL REINFORCEMENT LAPS AS PER REINFORCEMENT LAP TABLE.

REINFORCEMENT NOMINATIONS:

RN.1. EXTENT OF BARS SHOWN THUS:

EXTENT OF BARS | TYPICAL BAR

RN.2. SPLICE REINFORCEMENT ONLY AT LOCATIONS SHOWN ON DRAWINGS OR AS APPROVED BY SUPERINTENDENT. LAP LENGTHS TO COMPLY WITH AS3600, OR FOR SLAB AND WALL REINFORCEMENT WITH BARS AT > 150mm CENTRES WITH THE FOLLOWING UNO:

SPLICE LENGTH — FABRIC

RN.3. NOMINATION CALL OUT DESCRIPTION:

2-N16-100x2000
NUMBER OF BARS / SIZE OF BARS — LENGTH OF BARS / BAR SPACING

RN.4. LAP LENGTHS TO COMPLY WITH AS3600, OR FOR SLAB AND WALL REINFORCEMENT WITH BARS AT > 150MM CENTRES WITH THE FOLLOWING UNO: REFER TO TABLE BELOW:

REINFORCEMENT LAP TABLE						
LOCATION	f'c	BAR SIZE AND LAP LENGTH (mm)				
		N12	N16	N20	N24	N28
HORIZONTAL BARS WITH ≤ 300mm CONCRETE BELOW	40+	450	625	775	1050	1250

RN.5. PROVIDE MINIMUM MESH LAPS TO CROSS WIRES OF REINFORCING MESH, SO THAT TWO OUTERMOST WIRES OF ONE SHEET OVERLAP TWO OUTERMOST WIRES OF ADJACENT SHEET BY AT LEAST 25mm, THUS:

MIN. LAP — 25 MINIMUM

INSPECTION AND CERTIFICATION REQUIREMENTS:

IC.1. FOR FINAL ENGINEERING CERTIFICATION TO BE PROVIDED BY AN RPEQ ENGINEER, ALL THE APPLICABLE STRUCTURAL ELEMENTS SHALL BE INSPECTED BY AN RPEQ ENGINEER. TYPICAL HOLD POINTS:
a - FOOTINGS AND SLABS ON GROUND
ALL CONCRETE ELEMENTS MUST BE INSPECTED AFTER PLACEMENT OF REINFORCEMENT AND PRIOR TO CONCRETE POUR.
IC.2. ALL HOLD POINT INSPECTIONS TO BE CONDUCTED BY THE CLIENTS REPRESENTATIVE.
IC.3. IF IN DOUBT OF REQUIREMENT OF INSPECTION, REQUEST CLARIFICATION FROM AN RPEQ ENGINEER.
IC.4. OBTAIN GEOTECHNICAL ENGINEER'S WRITTEN INSTRUCTION AT PREPARATION OF FOUNDING MATERIAL AND FORWARD TO STRUCTURAL ENGINEER FOR APPROVAL, AT BUILDER'S COST.

FOR CONSTRUCTION

REV.	AMENDMENTS	INT.	APP.	DATE
D	FOR CONSTRUCTION	DS	BL	23.09.19
C	APPROVAL ISSUE	DS	BL	09.09.19
B	FINAL PRELIMINARY ISSUE	DS	BL	16.05.19
A	PRELIMINARY ISSUE	DS	BL	26.04.19

Premise

BRISBANE OFFICE
LEVEL 1, 100 BRUNSWICK STREET
PO BOX 361
FORTITUDE VALLEY, QLD 4006
PH: (07) 3253 2222 WEB: www.premise.com.au

PREPARED by D. SADEK Date: 23.09.19
CHECKED by K. KOLARSKI Date: 23.09.19
APPROVED by B. LANCINI Date: 23.09.19
RPEQ No: 16051

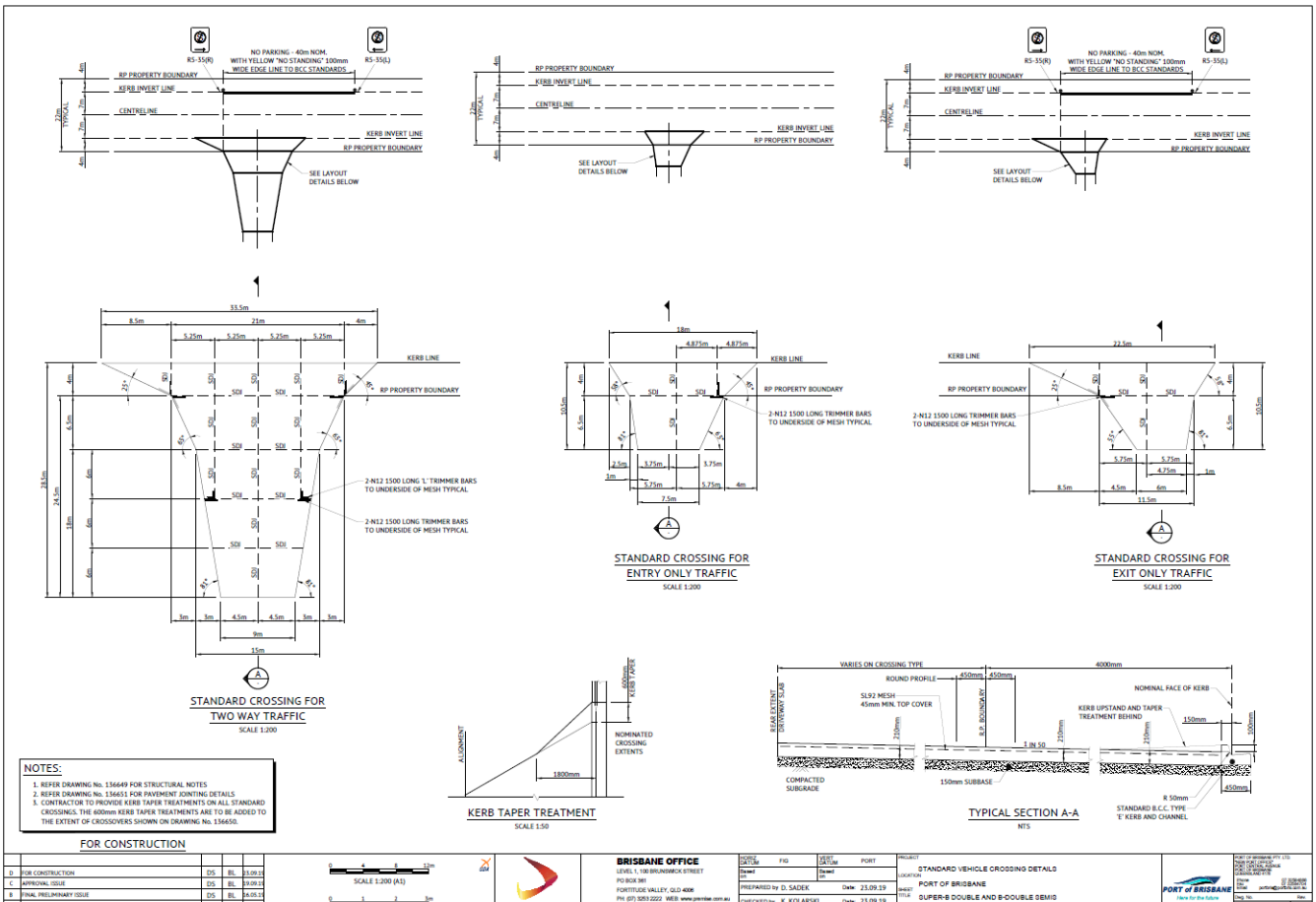
PROJECT: STANDARD VEHICLE CROSSING DETAILS
LOCATION: PORT OF BRISBANE
SHEET TITLE: STRUCTURAL NOTES

© PORT OF BRISBANE PTY. LTD. 2016

PORT of BRISBANE Here for the future

PORT OF BRISBANE PTY. LTD. 'PINKENBA' PORT CENTRAL AVENUE PORT CENTRAL QLD 4178 GPO BOX 1222 BRISBANE QLD 4001
Phone 07 3258 4888
Fax 07 3258 4999
Email portmail@portbris.com.au
Web www.portbris.com.au

Dwg. No. 136649 Rev. D



STANDARD CROSSING FOR TWO WAY TRAFFIC
SCALE 1:200

STANDARD CROSSING FOR ENTRY ONLY TRAFFIC
SCALE 1:200

STANDARD CROSSING FOR EXIT ONLY TRAFFIC
SCALE 1:200

NOTES:

1. REFER DRAWING No. 136649 FOR STRUCTURAL NOTES
2. REFER DRAWING No. 136651 FOR PAVEMENT JOINTING DETAILS
3. CONTRACTOR TO PROVIDE KERB TAPER TREATMENTS ON ALL STANDARD CROSSINGS. THE 600mm KERB TAPER TREATMENTS ARE TO BE ADDED TO THE EXTENT OF CROSSOVERS SHOWN ON DRAWING No. 136650.

KERB TAPER TREATMENT
SCALE 1:50

TYPICAL SECTION A-A
NTS

FOR CONSTRUCTION

REV.	AMENDMENTS	INT.	APP.	DATE
D	FOR CONSTRUCTION	DS	BL	23.09.19
C	APPROVAL ISSUE	DS	BL	09.09.19
B	FINAL PRELIMINARY ISSUE	DS	BL	16.05.19
A	PRELIMINARY ISSUE	DS	BL	26.04.19

SCALE 1:200 (A1)
SCALE 1:50 (A1)

Premise

BRISBANE OFFICE
LEVEL 1, 100 BRUNSWICK STREET
PO BOX 361
FORTITUDE VALLEY, QLD 4006
PH: (07) 3253 2222 WEB: www.premise.com.au

PREPARED by D. SADEK Date: 23.09.19
CHECKED by K. KOLARSKI Date: 23.09.19
APPROVED by B. LANCINI Date: 23.09.19
RPEQ No: 16051

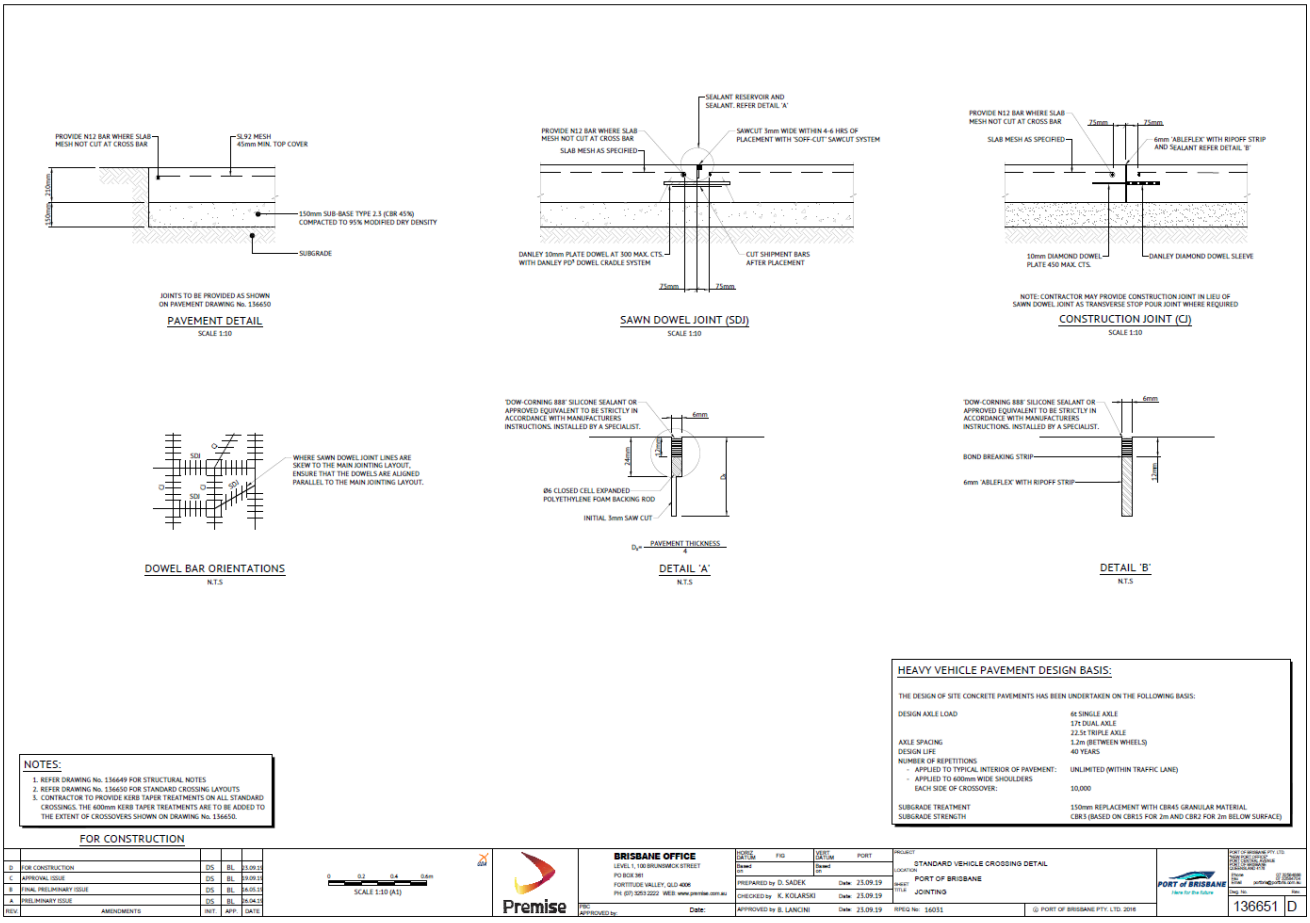
PROJECT: STANDARD VEHICLE CROSSING DETAILS
LOCATION: PORT OF BRISBANE
SHEET TITLE: SUPER-B DOUBLE AND B-DOUBLE SEMIS

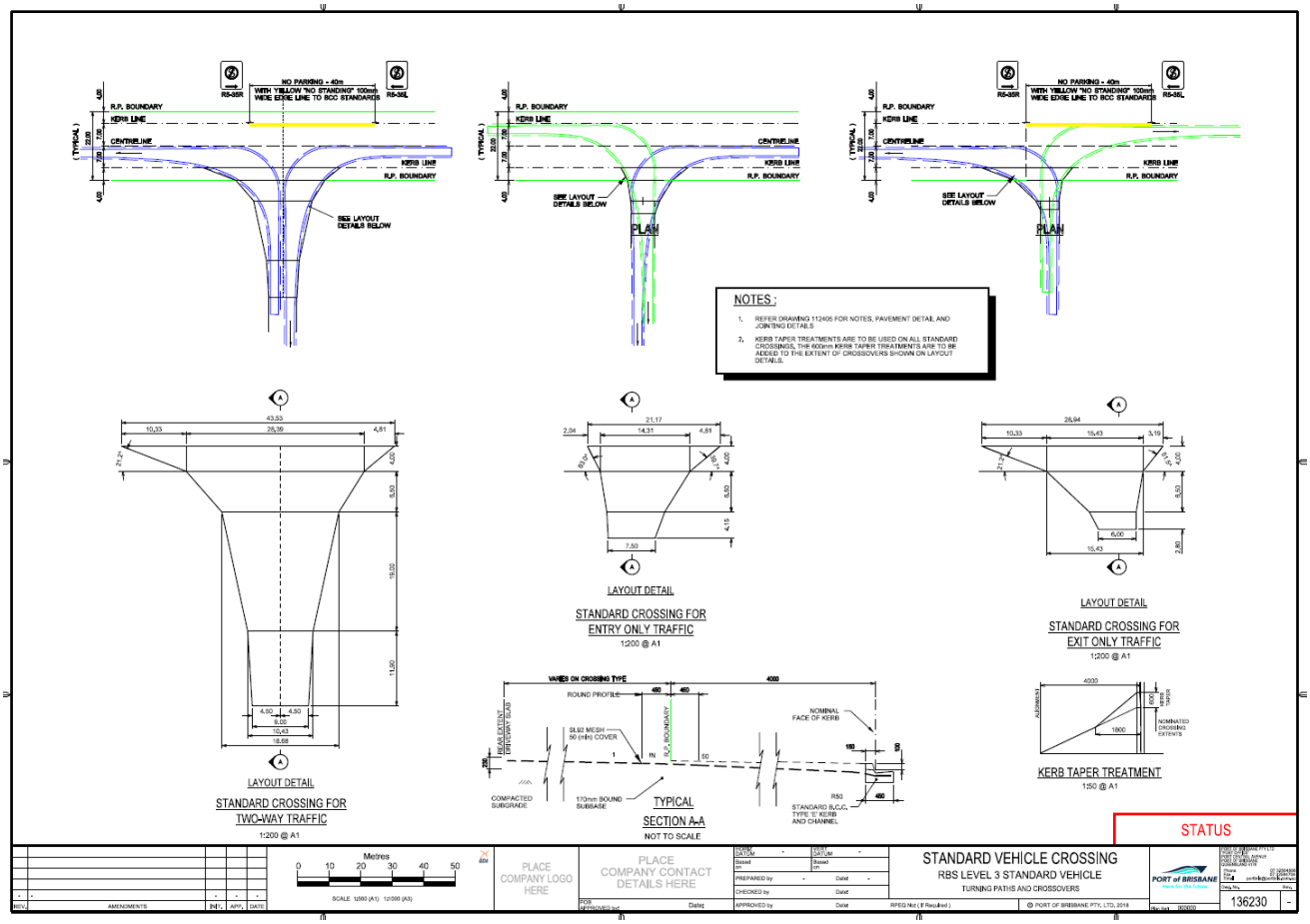
© PORT OF BRISBANE PTY. LTD. 2016

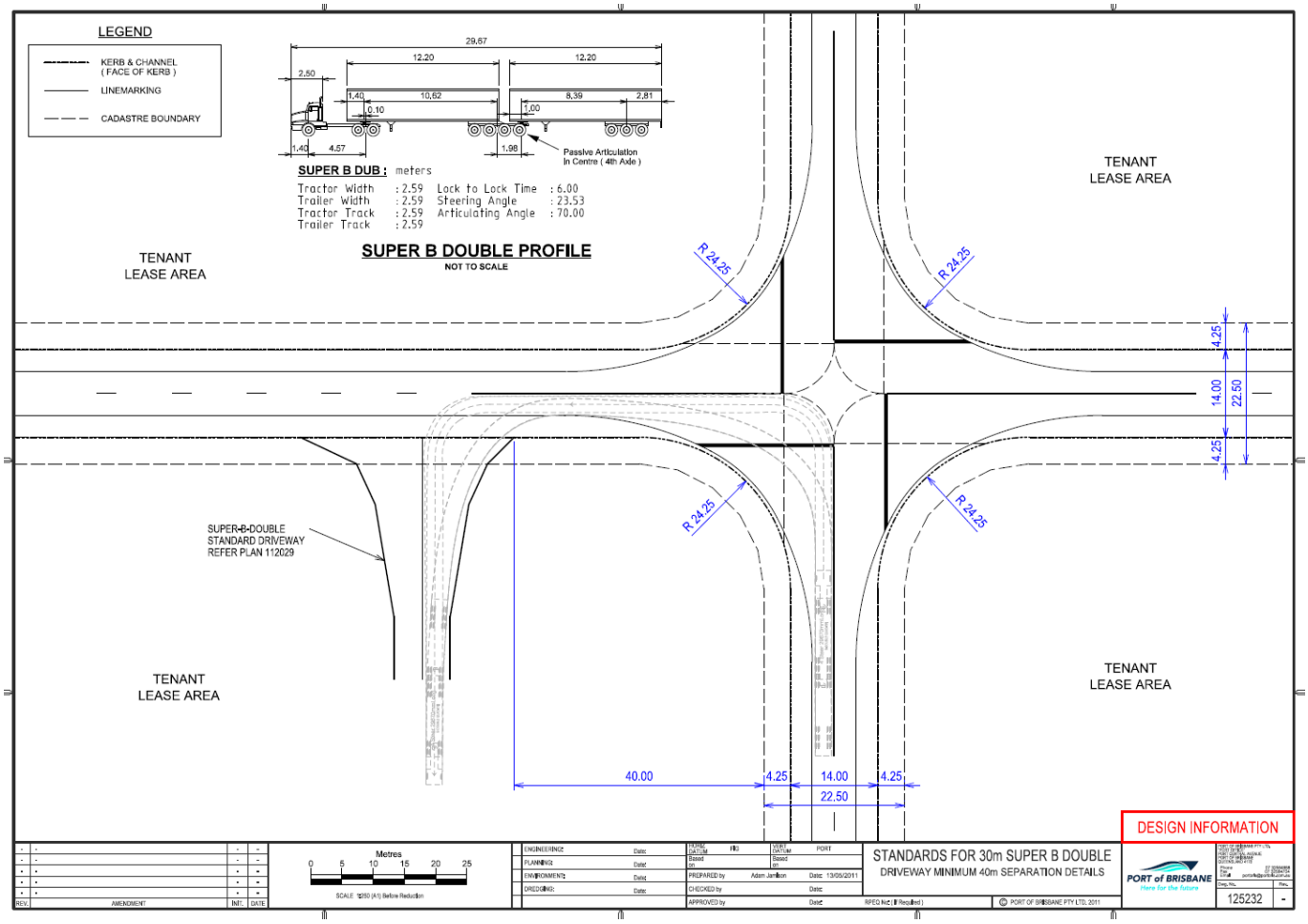
PORT of BRISBANE Here for the future

PORT OF BRISBANE PTY. LTD. 'PINKENBA' PORT CENTRAL AVENUE PORT CENTRAL QLD 4178 GPO BOX 1222 BRISBANE QLD 4001
Phone 07 3258 4888
Fax 07 3258 4999
Email portmail@portbris.com.au
Web www.portbris.com.au

Dwg. No. 136650 Rev. D


PROVIDE N12 BAR WHERE SLAB MESH NOT CUT AT CROSS BAR
SL92 MESH 45mm MIN. TOP COVER
150mm SUB-BASE TYPE 2.1 (CBR 45%) COMPACTED TO 95% MODIFIED DRY DENSITY
SUBGRADE
JOINTS TO BE PROVIDED AS SHOWN ON PAVEMENT DRAWING No. 136650
PAVEMENT DETAIL
SCALE 1:10
SEALANT RESERVOIR AND SEALANT. REFER DETAIL 'A'
SAWCUT 5mm WIDE WITHIN 4-6 HRS OF PLACEMENT WITH 'SOFF-CUT' SAWCUT SYSTEM
SLAB MESH AS SPECIFIED
DANLEY 10mm PLATE DOWEL AT 300 MAX. CTS WITH DANLEY PD² DOWEL CRADLE SYSTEM
CUT SHIPMENT BARS AFTER PLACEMENT
75mm
SAWN DOWEL JOINT (SDJ)
SCALE 1:10
6mm 'ABLEFLEX' WITH RIPOFF STRIP AND SEALANT REFER DETAIL 'B'
10mm DIAMOND DOWEL PLATE 450 MAX. CTS.
DANLEY DIAMOND DOWEL SLEEVE
NOTE: CONTRACTOR MAY PROVIDE CONSTRUCTION JOINT IN LIEU OF SAWN DOWEL JOINT AS TRANSVERSE STOP POUR JOINT WHERE REQUIRED
CONSTRUCTION JOINT (CJ)
SCALE 1:10
WHERE SAWN DOWEL JOINT LINES ARE SKEW TO THE MAIN JOINTING LAYOUT, ENSURE THAT THE DOWELS ARE ALIGNED PARALLEL TO THE MAIN JOINTING LAYOUT.
DOWEL BAR ORIENTATIONS
N.T.S
'DOW-CORNING 888' SILICONE SEALANT OR APPROVED EQUIVALENT TO BE STRICTLY IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. INSTALLED BY A SPECIALIST.
Ø6 CLOSED CELL EXPANDED POLYETHYLENE FOAM BACKING ROD
INITIAL 3mm SAW CUT
PAVEMENT THICKNESS / 4
DETAIL 'A'
N.T.S
BOND BREAKING STRIP
DETAIL 'B'
N.T.S
HEAVY VEHICLE PAVEMENT DESIGN BASIS:
THE DESIGN OF SITE CONCRETE PAVEMENTS HAS BEEN UNDERTAKEN ON THE FOLLOWING BASIS:
DESIGN AXLE LOAD
6t SINGLE AXLE
17t DUAL AXLE
22.5t TRIPLE AXLE
AXLE SPACING
1.2m (BETWEEN WHEELS)
DESIGN LIFE
40 YEARS
NUMBER OF REPETITIONS
- APPLIED TO TYPICAL INTERIOR OF PAVEMENT: UNLIMITED (WITHIN TRAFFIC LANE)
- APPLIED TO 600mm WIDE SHOULDERS EACH SIDE OF CROSSOVER: 10,000
SUBGRADE TREATMENT
150mm REPLACEMENT WITH CBR45 GRANULAR MATERIAL
SUBGRADE STRENGTH
CBR5 (BASED ON CBR15 FOR 2m AND CBR2 FOR 2m BELOW SURFACE)
NOTES:
1. REFER DRAWING No. 136649 FOR STRUCTURAL NOTES
2. REFER DRAWING No. 136650 FOR STANDARD CROSSING LAYOUTS
3. CONTRACTOR TO PROVIDE KERB TAPER TREATMENTS ON ALL STANDARD CROSSINGS. THE 400mm KERB TAPER TREATMENTS ARE TO BE ADDED TO THE EXTENT OF CROSSOVERS SHOWN ON DRAWING No. 136650.
FOR CONSTRUCTION
D FOR CONSTRUCTION DS BL 23.09.19
C APPROVAL ISSUE DS BL 19.09.19
B FINAL PRELIMINARY ISSUE DS BL 16.09.19
A PRELIMINARY ISSUE DS BL 05.04.19
REV AMENDMENTS INIT. APP. DATE
SCALE 1:10 (A1)
Premise
BRISBANE OFFICE
LEVEL 1, 100 BRUNSWICK STREET
PO BOX 391
FORTITUDE VALLEY, QLD 4006
PH (07) 3253 2222 WEB www.premise.com.au
PREPARED by D. SADEK Date 23.09.19
CHECKED by K. KOLARSKI Date 23.09.19
APPROVED by B. LANCINI Date 23.09.19
STANDARD VEHICLE CROSSING DETAIL
PORT OF BRISBANE
JOINTING
RPEQ No 16031
© PORT OF BRISBANE PTY. LTD. 2018
PORT of BRISBANE
Here for the future
136651 D


NO PARKING - 40m
WITH YELLOW 'NO STANDING' 100mm WIDE EDGE LINE TO BCC STANDARDS
R/S-55R
R/S-55L
R.P. BOUNDARY
KERB LINE
CENTRELINE
SEE LAYOUT DETAILS BELOW
PLAN
NOTES :
1. REFER DRAWING 112405 FOR NOTES, PAVEMENT DETAIL AND JOINTING DETAILS
2. KERB TAPER TREATMENTS ARE TO BE USED ON ALL STANDARD CROSSINGS, THE 600mm KERB TAPER TREATMENTS ARE TO BE ADDED TO THE EXTENT OF CROSSOVERS SHOWN ON LAYOUT DETAILS.
LAYOUT DETAIL
STANDARD CROSSING FOR TWO-WAY TRAFFIC
1:200 @ A1
LAYOUT DETAIL
STANDARD CROSSING FOR ENTRY ONLY TRAFFIC
1:200 @ A1
LAYOUT DETAIL
STANDARD CROSSING FOR EXIT ONLY TRAFFIC
1:200 @ A1
VARIES ON CROSSING TYPE
ROUND PROFILE
SL92 MESH 50 (min) COVER
R.P. BOUNDARY
NOMINAL FACE OF KERB
REVEAL EXTENT DRIVEWAY SLAB
COMPACTED SUBGRADE
110mm BOUND SUBBASE
STANDARD R/L.C.G. TYPE 'E' KERB AND CHANNEL
TYPICAL SECTION A-A
NOT TO SCALE
KERB TAPER TREATMENT
1:50 @ A1
STATUS
Metres
SCALE 1:200 (A1) 1:1000 (A3)
PLACE COMPANY LOGO HERE
PLACE COMPANY CONTACT DETAILS HERE
STANDARD VEHICLE CROSSING
RBS LEVEL 3 STANDARD VEHICLE
TURNING PATHS AND CROSSOVERS
PREPARED by - Date -
CHECKED by Date
APPROVED by Date
RPEQ No (If Required)
PORT of BRISBANE
Here for the future
136230 -


LEGEND
KERB & CHANNEL (FACE OF KERB)
LINEMARKING
CADASTRE BOUNDARY
29,67
12,20
12,20
2,50
1,40
10,62
0,10
8,39
2,81
1,00
1,40
4,57
1,98
Passive Articulation In Centre (4th Axle)
SUPER B DUB : meters
Tractor Width : 2.59
Trailer Width : 2.59
Tractor Track : 2.59
Trailer Track : 2.59
Lock to Lock Time : 6.00
Steering Angle : 23.53
Articulating Angle : 70.00
SUPER B DOUBLE PROFILE
NOT TO SCALE
TENANT LEASE AREA
TENANT LEASE AREA
TENANT LEASE AREA
TENANT LEASE AREA
R 24.25
R 24.25
R 24.25
R 24.25
4.25
14.00
22.50
4.25
SUPER-B-DOUBLE STANDARD DRIVEWAY REFER PLAN 112029
40.00
4.25
14.00
4.25
22.50
DESIGN INFORMATION
Metres
0 5 10 15 20 25
ENGINEERING: Date:
PLANNING: Date:
ENVIRONMENT: Date:
DREDGING: Date:
PREPARED by Adam Jamison Date: 13/09/2011
CHECKED by Date:
APPROVED by Date:
STANDARDS FOR 30m SUPER B DOUBLE
DRIVEWAY MINIMUM 40m SEPARATION DETAILS
PORT of BRISBANE
Here for the future
125232

Appendix G: PBPL Water and Wastewater Interface Requirements



See: **https://www.portbris.com.au/documents/d/port-of-brisbane/water-and-wastewater-interface-requirements-aug25-final-pdf?download=true**