City Pacific Limited

Townsville Ocean Terminal Temporary Bridge (Ross Creek) Preliminary Scoping Report

Wednesday, 6 September 2007

Report no: QL00704-TBR-R01

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1 Introduction

1.1 Purpose

The purpose of this report is to provide comment on the indicative concept design of a proposed temporary construction haul route bridge to be constructed over Ross Creek between The Strand on it's the northern creek embankment to Ross Street on the southern embankment. This temporary bridge is proposed to enable haulage of sand, rock and material for engineered fill to the site of the proposed Townsville Ocean Terminal (TOT) project.

The temporary bridge is proposed to be decommissioned in some three years of construction commencing, that is at the completion of the major earthworks reclamation phase of the project.

This report is provided to demonstrate the appearance and proposed operation of the bridge. The bridge will have an opening section to enable safe navigable access of Ross Creek by existing and potential future marine vessels utilising the upstream portion of Ross Creek.

The report also provides comment on the proposed approval and statutory approval licences required to enable the construction of the bridge to proceed.

1.2 Background

1.2.1 TOT Project

The TOT project will involve development of a cruise ship terminal and associated facilities (TOT Precinct) and an integrated residential waterfront development (Breakwater Cove Precinct). These precincts will be constructed on land to be reclaimed within Cleveland Bay in the site identified as the "Future Development Area" under the *Breakwater Island and Casino Agreement Amendment Act 2006*.

The TOT project was declared by the Coordinator General to be a project of State significance pursuant to Section 26 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act). An Environmental Impact Statement (EIS) will therefore be prepared in accordance with Part 4 of the SDPWO Act to identify the potential impacts on the social, economic and ecological environments associated with the project.

In order to establish building platforms for construction of the TOT project, it will be necessary to source fill material from locations external to the site. The EIS will therefore include assessment of the methods of delivery of fill materials to the project site.

1.2.2 Existing Roads

Flinders Highway, Bruce Highway, Abbot Street, Saunders Street, Dean Street, Ross River Road, Woolcock Street and Boundary Street are identified as State-controlled roads under the jurisdiction of the Department of Main Roads. The Townsville City Plan identifies The Strand, Sir Leslie Thiess Drive, Ross Street and Archer Streets are identified as sub-arterial roads. These roads are under the control of Townsville City Council.

The Townsville City Plan Policy 3 identifies the following local government roads as being within the Breakwater Road Network.

- McIlwraith Street
- Perkins Street
- The Strand
- Sir Leslie Thiess Drive

This Policy also identifies a future 4-lane "Bascule" bridge across Ross Creek as part of the proposed upgrades to the Breakwater Road Network. This bridge will extend from Ross Street on the southern creek bank to the Strand on the northern creek bank.

It is proposed that a temporary bridge will be constructed within the corridor of this future Bascule bridge to enable haulage of construction materials to the TOT project site for a period of three years.

1.3 Planning Framework and Approvals

It is anticipated that relevant *Integrated Planning Act 1997* (IPA) approvals pursuant to the Integrated Development Assessment System (IDAS) process will be obtained as required for each element of the project which constitutes assessable development under IPA.

The consultation process associated with the various approval processes is primarily undertaken as part of the EIS process for the TOT project.

The EIS will describe in detail the relevant statutory requirements in relation to the TOT project and associated temporary construction site areas, such as, the temporary bridge over Ross Creek and associated roadworks. In particular, the EIS will describe the potential impacts and those controlled actions under the Commonwealth Legislation relating to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC). In this regard the Commonwealth has accredited the Queensland State Government EIS process for the purpose of the Commonwealth assessment under Part 8 of the EPBC.

A number of development approvals will be required for construction of the temporary bridge across Ross Creek. A description of the approvals that

will be sought by the proponent prior to commencement of construction is provided in Table 1.

Table 1: Development approvals required for construction of proposed temporary bridge.

Legislation	Administering Authority	Type of Approval
Commonwealth Legislation		
Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)	Commonwealth Department of the Environment and Water Resources	Environment Protection and Biodiversity Conservation Act amongst other matters provides for the protection of the environment especially those aspects of the environment that are matters of national environmental significance. The TOT Project has been listed as a Controlled Action The TOT project must be assessed for its impacts on matters of national environmental significance. These aspects are dealt with in the EIS.
Aboriginal And Torres Strait Islander Heritage Protection Act 1984 (Cwlth)	Commonwealth Department of the Environment and Water Resources	The Aboriginal And Torres Strait Islander Heritage Protection Act provides for the preservation and protection of areas and objects that are of particular significance to Aboriginals in accordance with Aboriginal tradition. Provided these aspects are dealt with in the TOT Project EIS it is not envisaged there will be further assessments required. There will need to be appropriate Cultural Heritage Duty of Care through the construction phase.
Native Title Act 1993 (Cwlth)	Attorney-General's Department; and Department of Families, Community Services and Indigenous Affairs	The Native Title Act (Cwlth) provides the mechanisms for the recognition and protection of native title. These aspects are dealt with in the TOT Project EIS, it is not envisaged there will be further assessments required.
Queensland Legislation		
State Development and Public Works Organisation Act 1997 (SDPWO Act)	Department of Infrastructure	The TOT Project has been identified as a Significant Project. The EIS process being undertaken is controlled by the SDPWO Act. Details of this process are included in the EIS. The temporary construction bridge forms part of the TOT project works.
Breakwater Island and Casino Agreement Amendment Act 2006	Treasury Department	Application for approval of FDA Scheme. The temporary construction bridge is located outside the land influenced by the BICA Act. Therefore this legislation is not applicable. Moya to confirm
Integrated Planning Act 1997	Department of Infrastructure	Building Work – Building works associated with the proposed temporary bridge will be self assessable refer to IPA - Schedule 8, Part 2, Table 1, Item 1. All building work will be self assessable in accordance with the Standard Building Regulations and the Building Act.

Integrated Planning Act 1997	Townsville City Council	Operational Work and/or Building Work – A development Permit for Operational works assessable against the planning scheme will be required for the roadworks, earthworks, landscaping, and stormwater drainage and associated electrical and lighting works.
Integrated Planning Act 1997	Queensland Transport	Strategic Portland – The IPA and the Transport Infrastructure Act deal with Strategic Port Land. The Proposed temporary bridge is located near the perimeter of the Townsville Port Land and navigation waterways. There are on going discussions with the Townsville Port Authority in relation to the approvals processes. If and where necessary an application will be made with respect to Strategic Port Land.
Integrated Planning Act 1997	Department of Natural Resources and Water	Clearing Native Vegetation - The Integrated Planning Act - in Schedule 8, Part 1, Table 4 item 1A,1D,1E,1F,1G provides for operational work that is the clearing of native vegetation on: freehold land and indigenous land, a road, trust land, unallocated State land, and land that is subject to a licence or permit is assessable development unless certain exceptions apply. If the vegetation is a remnant not of concern or the vegetation is not remnant. If these exceptions are not applicable then an application may then be required to be made to clear native vegetation pursuant to the Vegetation Management Act. Indications are the site does not contain vegetation that is remnant of concern. Any approvals if required would be obtained from the Department of Natural Resources and Water.
Integrated Planning Act 1997	Townsville City Council	Operational Works in Tidal Areas and in a Coastal Management District – The Coastal Protection and Management Act has jurisdiction over coastal lands and coastal waters within coastal management districts. The TOT site does not fall within a mapped coastal management district presently but consideration of the State Coastal Management Policy must be undertaken. The structure will be built in, on and over tidal water. This will require the issue of a Development Permit for 'Tidal Works' that is Prescribed Tidal Works – for operational works that are tidal works in,on, or above land under tidal water would be a code assessable application with EPA the concurrence agency.
Integrated Planning Act 1997	Environmental Protection Agency	Contaminated Land - Application for removal of contaminated soils from sites listed in Environmental Management Register or Contaminated Land Register. Reference is made to the Integrated Planning Act Schedule 8, Part 1, Table 2, Item 5. If it is required an application will be made in the future where required.

Integrated Planning Act 1997	Department of Primary and Fisheries	Disturbance of Marine Plants - Application for operational work that is the removal, destruction or damage to marine plants as defined. Reference is made to Schedule 8, Part 1, Table 4, Item 8 of the Integrated Planning Act.
Environmental Protection Act 1994	Environmental Protection Agency	ERA 19 Dredging material Dredging material from the bed of any waters (other than by dredging by a port authority of material for which a royalty or similar charge is not payable) using plant or equipment having a design capacity of: (a) not more that 5,000t per year; or (b) 5,000t or more, but less 100,000t per year; or (c) 100,000t or more per year. This will only apply if there is any detailed trimming of the bed and banks of the Ross Creek. The initial indications are it will not be necessary – the approval required is listed for completeness – in case it may be required. If it is required application will be made.
Environmental Protection Act 1994	Environmental Protection Agency	Application for removal of contaminated soils from sites listed in EMR or CLR.
Coastal Protection and Management Act 1995	Environmental Protection Agency	Application for operational work that is tidal works in, or above land under tidal waters
Nature Conservation Act 1992	Environmental Protection Agency	Application for operational work that is the taking, using, keeping or interfering with a protected animal or plant.
Fisheries Act 1994	Department of Primary Industry and Fisheries	Application for operational work that is the removal, destruction or damage to marine plants as defined. This is also incorporated in the Integrated Planning Act.
Queensland Heritage Act 1992	Environmental Protection Agency	
Aboriginal Cultural Heritage Act 2003	Department of Natural Resources and Water	The main purpose of this Cultural Heritage (CH) Act is to provide effective recognition, protection and conservation of Aboriginal Cultural Heritage. The temporary construction bridge forms part of the TOT project works. Where these matters are to be assessed as part of the TOT Project EIS process, it is not envisaged additional assessments will be necessary. Appropriate Cultural Heritage Duty of Care in compliance with the CH Act will be required through the construction

		phase.
Native Title (Queensland) Act 1993	Department of Natural Resources and Water	The Native Title (Queensland) Act 1993 provides for those matters relating to native title "to ensure that Queensland law is consistent with standards set by the Commonwealth Native Title Act for future dealings affecting native title". These aspects are dealt with in the TOT Project EIS it is not envisaged there will be further assessments required.
Vegetation Management Act 1999	Department Natural Resources and Water	The Integrated Planning Act - in Schedule 8, Part 1, Table 4 item 1A,1D,1E,1F,1G provides for operational work that is the clearing of native vegetation on: freehold land and indigenous land, a road, trust land, unallocated State land, and land that is subject to a licence or permit is assessable development unless certain exceptions apply. If these exceptions are not applicable then an application may then be required to be made to clear native vegetation pursuant to the Vegetation Management Act. Indications are the site does not contain vegetation that is remnant of concern. Any approvals if required would be obtained from the Department of Natural Resources and Water.
Land Act 1994 (Queensland)	Department Natural Resources and Water	The Land Act applies to all land, including land below high – water mark. Section 9 (1) of the Land Act identifies "All land below high – water mark, including the bed and banks of tidal navigation rivers – (a) is the property of the State, unless the land is inundated land or a registered interest in the land is held by someone else; and (b) may be dealt with as unallocated State land. Part 3 section 28 (1) states "Any action taken under this Act must be taken in a way not inconsistent with the Native Title Act 1993 (Cwlth) and the Native Title (Queensland) Act 1993. The Chief Executive may issue a permit to occupy unallocated State land, a reserve or a road. It will be necessary to obtain such a permit for a designated period to undertake the proposed works on unallocated state land, and the road reserve. Pursuant to Section 3.2.1 of IPA it will be necessary to obtain the written support of the chief executive for a resource allocation or entitlement for the application under the IDAS to be made -- at least a temporary period while the bridge is being constructed, operated and decommissioned
Local Government Act 1993 (Queensland)	Department of Local Government,	Where necessary temporary road closures will be sought under the provisions of the Local

	Planning, Sport and Recreation	Government Act and the Land Titles Act.
Transport Infrastructure Act	Department of Transport (Harbour Master)	This Act provides the mechanisms for the establishment of a ports system and how ports can be administered in accordance with the *Government Owned Corporations Act 1993.* The Transport Infrastructure Act also provides mechanisms to ensure use of the waterways for transport purposes is effectively and efficiently managed. It will be necessary to have the Harbour Master review the proposal and provide any conditions to ensure the safety of the waterways.
Transport Operations (Marine Safety) Act 1994	Department of Transport (Harbour Master)	This Act is to provide a system that achieves a balance between regulating the maritime industry to ensure marine safety and enabling the effectiveness and efficiency of the Queensland maritime industry to be further developed. An application is to be made to the Harbour Master to consider the structure and its potential impact on marine safety and so the Harbour Master may set conditions of construct signage to aid navigation and may be a light, or signal be erected to aid navigation.
Local Government Legislation		
Local Laws	Townsville City Council	An ongoing review of the Local Laws will be undertaken with Townsville City Council in relation to road closures.

2 Project Preferred Haul Route and Alternatives

2.1 Preferred Construction Haulage Route

It is proposed that fill material will be delivered from Roseneath, Pinnacle and Marathon Quarries via Boundary Street to a temporary bridge to be constructed across Ross Creek and then to the project site during Construction Stages 1, 2 and 3 as described below.

Delivery from Pinnacle Quarry to City Limits

Trucks delivering material from Pinnacle Quarry will use the haul route along Gumlow Road turning east on Hervey Range Road then continuing along Ross River Road. Trucks will then turn left onto Nathan Street (Bruce Highway) and then right onto Woolcock Street. (Refer to Haul Route Maps – Drawing K424-QL00704-01 Pinnacle Quarry).

Delivery from Roseneath and Marathon Quarries to City Limits

Trucks will use the northern haul route from Roseneath and Marathon Quarry along Flinders Highway then turn right onto the Bruce Highway. Trucks will then turn left onto Abbot Street and continue north onto Railway Avenue. (Refer to Haul Route Maps – Drawing K417-QL00704-01 Marathon Quarry and Drawing K426-QL00704-01 Roseneath Quarry).

Delivery from City Limits to Temporary Bridge at Ross Creek

Trucks from Roseneath and Marathon Quarries will turn right at Boundary Street then left onto Archer Street and continue on to Ross Street. Trucks from Pinnacle Quarry will continue west from Woolcock Street onto Boundary Street then left onto Archer Street and continue on to Ross Street.

Trucks from all quarries will then turn left from Ross Street into the present Curtin Brothers Marine site continuing over temporary haulage roads and bridge (the proposed bridge will be openable for marine traffic). Once over the temporary bridge, trucks will proceed west along the Strand then turn right onto Sir Leslie Thiess Drive to the project site. Trucks will return to the quarries via the same route. The proposed frequency of material deliveries for this option is provided in Table 2.

Table 2: Preferred option haul route material delivery frequencies

Option 1 Stage	Material Volumes	Delivery Times	Vehicle Frequency / Delivery	Total Movements
Stage 1	580,439 tonne of rock	Ten hours/day six days/week	5.79 vehicle movements per hour	17,475 over 12 months
Stage 2	621,125 tonne of rock, sand and engineered fill	Ten hours/day six days/week	6.94 vehicle movements per hour	20,960 over 12 months
Stage 3	446,984 tonne of rock and engineered fill	Ten hours/day six days/week	4.19 vehicle movements per hour	12,653 over 12 months

2.2 Bridge Construction Programme

A proposed programme for design, approval and construction of the proposed temporary bridge over Ross Creek is provided in Table 3.

Table 3: Temporary bridge construction programme

Programme Element	Estimated Timeframe
Design to lodgement of Operational Works application based upon the below being provided including: ▪ Full site survey ▪ Full detailed assessments ▪ Concept design sign-off ▪ Final geotechnical investigations	9 weeks (2 months)
Cold start – design to lodgement of operational works application.	12 weeks (3 months)
Operational Works approval	8 weeks (2 months) estimated
Construction	22 weeks (5 months)

2.3 Advantages of the Proposed Temporary Bridge Haul Route

This haulage route utilises existing major truck routes and does not require haulage of materials through the CBD or the recreational part of The Strand. The proposed route is less visible to members of the public and will result in less pedestrian conflicts and fewer noise and air quality impacts associated with heavy vehicle movements.

It could also negate the need for barging of material via Ross River and across Port of Townsville navigational channels. This route reduces the potential impacts of adverse weather and tidal movements associated with barge transport to the project site.

A further advantage is that it could be used for construction traffic associated with other Breakwater developments.

2.4 Haul Route Alternatives

Three alternative haulage routes have been considered in the selection of the preferred method for delivery of materials to the project site. These include:

- Delivery of material from Roseneath Quarry via Flinders Highway, Bruce Highway, Abbot Street / Railway Avenue / Saunders Street / Dean Street, Denham Street, Oxley Street,The Strand, Sir Leslie Thiess Drive and Entertainment Drive directly to the project site during Construction Stage 1 and from Roseneath, Pinnacle and Marathon Quarries via Boundary Street to a Barge Point site then transport by barge via the Ross River to the project site during Construction Stages 2 and 3.
- Delivery of material from Roseneath Quarry via Flinders Highway, Bruce Highway, Abbot Street / Railway Avenue, Boundary Street / Woolcock Street, Hugh Street / Percy Street / Bundock Street / Warburton Street / Eyre Street / Oxley Street, Oxley Street, The Strand, Sir Leslie Thiess Drive, Entertainment Drive directly to the project site during Construction Stage 1 and from Roseneath, Pinnacle and Marathon Quarries via Boundary Street to a Barge Point site then by barge to the project site during Construction Stages 2 and 3.
- A fourth alternative was also considered that would involve haulage of quarry materials along an existing unsealed road located within the Townsville State Development Area to the south of the Ross River. However, due to considerable ecological and hydraulic constraints given the location of the road within extensive flood-prone coastal vegetation areas this haul route has also been discounted. This route

would also require construction of a barge landing point and possible dredging of Ross River.

3 Proposed Ross Creek Crossing Temporary Bridge Works

3.1 Temporary Bridge

3.1.1 Site Location

The location for alignment of the proposed temporary bridge is within the corridor of the future Bascule bridge proposed as part of the future upgrade of the Breakwater Road Network. The location is indicated on Sketch K050-QL00704-01 in Attachment 1 and on the Bridge Layout and Long Sections Drawings K051-QL00704-01, K052-QL00704-01, K055-QL00704-01, K056-QL00704-01, K057-QL00704-01, K058-QL00704-01 and K059-QL00704-01 contained in Attachment 3.

3.1.2 Land Tenure

Preliminary investigations indicate the bridge and approaches are positioned on land controlled by three agencies. There are ongoing discussions with the three respective parties in relation to the land tenure:

1. Townsville City Council and Department of Natural Resources and Water – the Strand works, within a road reserve.
2. Queensland Government, Department of Natural Resources and Water – Ross Creek and revetments, unallocated State land.
3. Townsville Port Authority – Curtin Brothers site and Ross Street this involves leased land and Port land.

Further consenting authorities will be applicable as defined in Section 1.3 Planning Framework and Approvals.

3.1.3 Concept Bridge Design

Design Options

There are three options for design of the temporary bridge structure. These include:

- Option A – A steel girder bridge with pre-cast biscuits (permanent formwork planks 50mm), an in-situ concrete deck and pre-cast driven piles. Steel girders act compositely with the concrete deck and therefore the deck must be in-situ concrete.

- Option B – A pre-cast concrete girder bridge with pre-cast biscuits, an in-situ concrete deck and pre-cast driven piles. This option will minimise in-situ concrete deck and includes asphaltic concrete wearing surface.
- Option C – A steel truss bridge with steel cross beams, precast biscuits, an insitu deck, steel caisson piles socketted into rock and steel headstocks.

The bridge will be a one-way trafficable bridge with a four metre clear width to allow for wide vehicle loading. The bridge will have no allowance for pedestrian traffic.

The Bascule span and drop-in span will be located on the centreline of the navigation channels. Spans will generally be 27 metres along the length of the bridge.

Pile lengths may be up to 15 metres long or greater.

The Bascule span will be a 25 metre span and is proposed to be a design and construct item based on a hinge arrangement with retractable hydraulic rams for lowering and raising the steel trussed structure as indicatively shown on Sketch No K053-QL00704-01 and K054-QL00704-01 contained in Attachment 4.

The drop-in section will be a 15 metre span to be primarily steel framed with steel plating and secondary members to keep the mass down in lieu of an in-situ concrete deck. Possible mass could be in the order of 40 tonnes.

Options A and B will be the most cost effective construction options and will be the easiest to erect. These options use standard bridge elements often employed in bridges in Queensland. The steel girders proposed for Option A will weigh less than the concrete girders in Option B and will therefore be easier to erect over water and could be launched from each other.

Design Loads

Design loads will be in compliance with the requirements of the Department of Main Roads for a permanent bridge to support standard axle loads permitted on highways. Heavy loading greater than the Department Main Roads requirements will not be permitted without a design check and approval and with a certification from a suitably qualified structural engineer. There will be no limit on the number of haulage trucks crossing the bridge at any one time provided the load on the bridge meets the requirements of public highway loading.

Ground conditions assumed for this concept design are those provided in the McConnell Geotechnical report for “Ross Creek- Bascule Bridge” dated 3rd August, 2003. Further detailed geotechnical analysis will be undertaken once the final design option for the bridge is confirmed.

3.1.4 Construction Methodology

For the bridge design options A & B above the construction methodology will be as follows.

Option A – Steel Girders

1. Work site will be defined and appropriate working compounds site and associated construction site fencing will be constructed. This will include temporary road closure for the immediate area adjacent to the Strand/Ross Creek abutment.

2. Precast octagonal piles will be driven from a barge mounted piling rig (this option of driven rather than steel caissons being jetted to bear into existing rock layer) will be end bearing piles set into the existing rock layer to refusal and terminated at headstock level.

3. Precast concrete headstocks will be lifted via a barge mounted crane to bear and connect to driven piles.

4. Steel girders will be lifted progressively from a barge mounted crane to bear and be positioned against the precast concrete headstocks.

5. Precast biscuits permanent formwork decking planks 50mm will be progressively lifted from a land based crane operating from both the northern and southern embankments. This will enable 220mm overall cast insitu concrete decking to be placed. Due to the removable spans later sections of the bridge will require lifting works to be conducted from a barge mounted crane.

6. For non openable sections of the bridge a cast insitu upstand kerb will be constructed and a proprietary safety barrier/guardrail will be connected from the working bridge deck.

Operable Sections

7. Bascule section – a prefabricated steel trussed and webbed lightweight decking section (25m span) will be hinged from the bridge working deck via a land based crane operation. This operable section will be hydraulically raised and lowered.

8. Removable Span – a prefabricated steel trussed and webbed lightweight decking section (15m span) will be placed and secured via a land based crane operation.

Civil Road and Traffic Works

9. A new industrial cross over and driveway incorporating appropriate security gates and signage will be constructed adjacent to Ross Street.

10. Resumption of 5 car spaces and introduction of traffic control devices and line marking will be undertaken to the Strand temporary bridge abutment and the intersection with Sir Leslie Thiess Drive. Appropriate signage and security gates will be constructed adjacent to the Strand Bridge abutment.

Navigational aids and lighting

11. Temporary and safety lighting will be introduced to both bridge land abutments and security gates. Navigational channel marks will be installed complete with minimal clearance indicators.

    Signage for bridge operation times and contacts will be installed. All markers and signs will be illuminated for safety.

12. Temporary holding/mooring buoys will be introduced adjacent to the Ross Creek navigational channel to provide secure hold points for vessels awaiting bridge opening.

Option B – Precast Girders

This option will involve the previously described steps 1-12 with the substitution of precast girders in lieu of steel girders in step 4.

3.1.5 Temporary Bridge Operation

The proposed temporary bridge will be openable to enable masted and larger vessels to pass through. It will have a 25m clear opening. It is proposed that the bridge will be opened nightly from 7.00pm to 7.00am the following morning. It will also open for a short period at the following fixed times.

- Monday to Saturday (excluding Wednesday) - 8.00 am, 11.00am, 2.00pm and 5.00pm.
- Wednesday - 8.00 am, 11.00am, 2.00pm and 3.00pm onwards
- Sunday - All day

Should there be no vessels waiting or in close proximity to the bridge, it will not open at these fixed times. Floating pontoons will be provided at both upstream and downstream sides of the bridge to allow temporary mooring of vessels waiting for the bridge to open.

The bridge will open on demand for emergency, Queensland Transport or police vessels. A mobile number will be displayed on both sides of the bridge for these adhoc opening requests.

The bridge will be patrolled while closed and will be properly marked with illuminated navigational beacons, to be erected to the requirements of the Harbour Master and Queensland Transport.

3.1.6 Decommissioning

A demolition permit will be required prior to decommissioning works.

1. A land based crane will be utillised to firstly remove the bascule section. This section could be relocated for use on another site or broken down into reusable elements.
2. The guard/safety rails will similarly be removed and relocated for another use off site.
3. The bridge decking will be cut and broken up for transportation and dumping or use as recycled reconstituted fill off site. Girders will be removed a bay at a time to allow all works to be conducted from on top of the bridge. Girders may be reutilised on another project.
4. Step 3 will be repeated for each span to avoid conducting works for each span to avoid conducting works via a barge mounted crane.
5. Headstocks will be removed via barge mounted crane and transported off site for reuse on another project.
6. Piles will be required to be entirely removed or consent from DNR will be required to cut off at river bed level and as constructed survey conducted to identify the locations and levels of the remaining pile sections. These piles are to the end bearing nature are to be relatively easily removed by water jetting and rocking piles via a barge mounted crane. Piles will be transported from site and broken down for reuse as recycled reconstituted fill.

3.2 Floating Bridge (Option)

3.2.1 Site Location

The location for alignment of the proposed temporary bridge is within the corridor of the future Bascule bridge proposed as part of the future upgrade of the Breakwater Road Network. The location is indicated on the Bridge Layout and Long Sections drawings contained in Attachment 6.

3.2.2 Land Tenure

Preliminary investigations indicate the bridge and approaches are positioned on land controlled by three agencies. There are ongoing discussions with the three respective parties in relation to the land tenure:

1. Townsville City Council and Department of Natural Resources and Water – the Strand works, within a road reserve.

2. Queensland Government, Department of Natural Resources and Water – Ross Creek and revetments, unallocated State land.

3. Townsville Port Authority – Curtin Brothers site and Ross Street this involves leased land a Port land.

Further consenting authorities will be applicable as defined in Section 1.3 Planning Framework and Approvals.

3.2.3 Floating Bridge Concept

Another option for crossing Ross Creek with the temporary haul route is to utilise a barge (self propelled 65m stern landing vessel with a drive through arrangement). This will require landing pontoons and ramps to accommodate vehicular access at maximum grades of 1:6 throughout the l tidal range (with allowance for astronomical tides). This option is proposed to be a design and construct (D & C) item. Indicative Ross Creek sections are indicated on seatransport's Floating Bridge Proposal drawing contained in Attachment 6.

3.2.4 Construction Methodology

The basic construction methodology for the temporary barge will follow these steps:

1. Landing zones on both the northern and southern embankments will require multiple services relocations to avoid the area of influence imposed by the embankment cut outs to allow for the Ross Creek tidal influences and the resultant vehicular access at a maximum grade of 1:6.

2. Anchoring abutment beams/footings will need to be excavated and poured to allow a hinge point for loading ramps. These ramps will need to be supported by conventional high density pontoons held in horizontal alignment by driven piles (similar to conventional marina systems).

3. A land based crane will lift lightweight steel web/framed ramps into position.

4. The barge complete with bow and stern hydraulic loading ramps will osolate between the embankment loading ramps.

5. A new industrial cross over and driveway complete with appropriate security gates, gate control room and signage will need to be constructed adjacent to Ross Street.

6. Resumption of 5 car spaces and introduction of traffic control devices and line marking will be undertaken to the Strand temporary bridge abutment and the intersection with Sir Leslie Thiess Drive.

Appropriate signage and security gates will be constructed adjacent to the Strand Bridge abutment.

3.2.5 Decommissioning

Landing ramps and pontoons will be removed by land based crane and materials recycled for use on other projects off site.

Embankment cutouts are to be refilled and restored to their original condition.

Barge to be relocated to other projects.

4 Key Environmental Values and Management of Impacts

4.1 Noise

There are two multi-storey residential buildings at the end of The Strand and Sir Leslie Thiess Drive which will potentially be affected by noise from heavy vehicles travelling on the temporary bridge. The nearest building façade is 10m from the temporary bridge.

The Department of Main Roads (DMR) "*Road Traffic Noise Management: Code of Practice (CoP)*" recommends that road traffic noise levels at potentially affected residences within the 10-year period following construction of the new roads should not exceed the following objectives:

- 63dB(A) $L_{A10,18hr}$ AND more than 3dB(A) above the pre-construction level, where existing noise level is greater than 55dB(A) $L_{A10,18hr}$; and
- 60dB(A) $L_{A10,18hr}$ AND more than 6dB(A) above the pre-construction level, where existing level is 55dB(A) $L_{A10,18hr}$ or lower.

The CoP normally applies to operational noise from road infrastructure projects. At present, there are no noise assessment guidelines in Queensland for temporary roads used during construction. Nevertheless, for assessment purposes, DMR CoP may be used as a guide.

4.1.1 Predicted Construction Traffic Noise

Table 4 presents a summary of the predicted construction traffic noise levels at the nearest residential building façades from the temporary bridge.

These noise predictions are based on the UK Department of Environment Calculation of Road Traffic Noise (CORTN) Method and take account of distance variation and façade correction (adjusted for Australian conditions). It was assumed that average vehicle speed on the temporary bridge would be 50km/hr or lower.

Table 4: Predicted $L_{A10,18hr}$ Construction Traffic Noise Level, dB(A)

Construction Stage	Predicted $L_{A10,18hr}$ Construction Traffic Noise Level
Stage 1 (1st Year)	58 dB(A)
Stage 2 (2nd Year)	59 dB(A)
Stage 3 (3rd Year)	57 dB(A)

4.1.2 Assessment and Conclusion

The predicted noise levels from construction traffic associated with the temporary bridge over Ross Creek comply the noise assessment objective of 60dB(A) $L_{A10,18hr}$ at the nearest residential buildings located at the end of The Strand and Sir Leslie Thiess Drive.

4.2 Air Quality

4.2.1 Potential Impacts

Air quality impacts may result from loss of particulate matter during haulage of sand, rock and engineering fill to the project site. However, it is proposed that all haulage vehicles and activities will be operated in accordance with the Traffic Management Plan contained in Attachment 5 and the Project EMP – Construction Phase.

4.2.2 Mitigation Measures

Air quality control measures to be implemented during haulage operations will include:

- covering of all truck loads that are subject to loss by wind suspension;
- directing all haulage vehicles leaving the site through a truck 'shake down' or 'wheel wash' for removal of loose soil and other material;
- restriction of construction vehicles to designated access roads and maintaining a speed limit of 20km/hour within the project site;
- watering of access roads within the project site as required to prevent dust generation; and
- ensuring appropriate maintenance of all haulage vehicles to prevent impacts from air emissions.

4.3 Marine Plants

A number of mangroves exist on the banks of Ross Creek within the corridor of the proposed temporary bridge. Mangroves, seagrasses, saltcouch, algae and samphire are classified as marine plants and are protected under the *Fisheries Act 1994*.

Marine plants have value as fish habitat and any development that may damage or destroy marine plants will require an approval under Section 51 of the *Fisheries Act 1994*. An application will be made to the Department of Primary Industries and Fisheries and approval obtained prior to the

commencement of works. Further studies will be required to determine the extent of marine plants requiring removal for construction of the temporary bridge.

4.4 Geotechnical Considerations

A preliminary geotechnical investigation was undertaken to determine geotechnical constraints for construction of a future four-lane Bascule road bridge over Ross Creek. This investigation consisted of drilling of five boreholes in the location of bridge abutment structures on the northern and southern creek banks and at locations within the creek channel. The geotechnical conditions that were encountered during drilling are summarised in Table 5.

The assessment of these initial geotechnical conditions found that for the loads required for the future bridge structure, some form of piling would be required for bridge abutments and for over water piers.

Table 5: Geotechnical conditions encountered in the location of the proposed Bascule bridge over Ross Creek.

Depth of Bore (BH1)	Southern Abutment Area	Depth of Bore (BH4 & BH5)	Northern Abutment Area	Depth of Bore (BH2 & BH3)	Mid-stream Pier Bents Area
Ground level to 6m	Boulder, cobble and gravel fill in a clayey sand matrix.	Ground level to 4.8/5.4m	Mostly loose to medium dense sand fill with a surficial pavement layer.	Streambed level to 0.8/2.6m	Very ("extremely") soft organic clay "ooze".
Below 6m	High to very high strength fractured pink granite.	4.8/5.4m to 7.5m	Natural alluvium comprised of a mixture of soft and firm sandy clay and loose and medium dense clayey sand.	0.8/2.6m to 4.0/4.5m	Interbedded bands of sand, gravel and gravelly sand, medium dense at first becoming very dense at depth.
		7.5m to 9.7/11m	Decomposed and very low strength granite in the form of hard sandy clay and medium dense to very dense clayey sand (grades into clayey rock at depth in BB-05).	Below 4.0/4.5m	In BB-02, very high strength fractured pink granite. In BB-03, low-to-medium strength fractured granodiorite (possible intrusion).
		Below 9.7/11m	High strength fractured pink granite.		

4.5 Traffic Impact Assessment

An assessment of the potential traffic impacts associated with haulage of construction materials along the proposed temporary bridge haul route has been undertaken by Holland Traffic Consulting (HTC). The Traffic Impact Assessment Report is summarised below.

4.5.1 Existing Road Network

The State-controlled Road System:

Flinders Highway, Bruce Highway, Abbott Street and Railway Avenue are all constructed roadways and are already heavily used as major roads.

The Strand

The whole length of The Strand has recently been reconstructed with a series of traffic calming devices such as speed humps, pedestrian crossings and roundabouts. Angle parking spaces have been provided along significant sections of the route.

Sir Leslie Thiess Drive

Sir Leslie Thiess Drive is a 4-lane 2-way road with an additional lane for right turning vehicles at major access points. It terminates at The Strand via a channelised but unsignalised T-junction.

Sir Leslie Thiess Drive is subject to very high traffic demands during major events at the Townsville Entertainment and Convention Centre (TECC). At the conclusion of such events, continuous queues form at the intersection of Flinders Street East and Denham Street and extend back along Flinders Street East, King Street and Sir Leslie Thiess Drive reaching back into the car parks serving the TECC and Jupiter's Casino. This is primarily due to the inability of the Flinders Street East and Denham Street intersection to cope with the intensive traffic demands experienced at such times.

Traffic surveys were conducted in Sir Leslie Thiess Drive between 3 December 2006 and 16 December 2006. Traffic during this period included average weekday and weekend traffic flows as well as major event traffic flows during basketball games held on 8 December 2006 and 16 December 2006. On an average weekday, total traffic flows along Sir Leslie Thiess Drive were 6000 vehicles per day. The results of these surveys are summarised in Tables 6 and 7 below.

Table 6: Peak weekday traffic flows in Sir Leslie Thiess Drive

Weekday traffic	Average Weekday	With Basketball
Peak northbound flows	400 vehicles / hour (morning peak conditions)	1068 vehicles / hour (7pm to 8pm Friday)
Peak southbound flows	600 vehicles / hour (evening peak conditions)	1,483 vehicles / hour (10pm to 11pm Friday)

Table 7: Peak weekend traffic flows in Sir Leslie Thiess Drive

Weekend traffic	Average Weekend	With Basketball
Peak northbound flows	362 vehicles / hour (7pm to 8pm Saturday)	994 vehicles / hour (7pm to 8pm Saturday)
Peak southbound flows	283 vehicles / hour (3pm to 4pm Sunday)	1,474 vehicles / hour (10pm to 11pm Saturday)

The 4-lane Sir Leslie Thiess Drive carriageway has capacity to handle traffic flows well in excess of those observed outside basketball games: the capacity of a single traffic lane in urban conditions such as those that prevail in Sir Leslie Thiess Drive are about 1200 vehicles per hour, so the 4-lane Sir Leslie Thiess Drive carriageway has a nominal capacity of about 2400 vehicles per hour (one-way) and could accommodate two-way daily flows of up to 40 000 vehicles per day.

Traffic Control during Major Events

Severe congestion in the area at the conclusion of major events at the Entertainment Centre could be significantly improved by use of trained police control in Flinders Street East, and particularly at the Flinders Street East and Denham Street intersection.

4.5.2 Potential Traffic Impacts

The State-controlled Road System:

In general, Flinders Highway, Bruce Highway, Abbott Street and Railway Avenue are all constructed roadways and are already heavily used as major roads. No particular issue is perceived in relation to usage of those

roads, particularly taking into account advice from Main Roads' officers. (need to state what this was)

Local Roads

The analysis of Boundary Street generally, and of the intersection of Boundary Street - Railway Avenue - Saunders Street demonstrates that the impact of truck movements on the road system relied upon for access to the temporary bridge is acceptable.

The availability of Archer Street to accommodate B-doubles remains uncertain. However, traffic flows in both Archer Street and Ross Street are currently so low that there are no possible traffic-related issues in that regard.

Sir Leslie Thiess Drive:

In view of the prevailing low traffic flows on Sir Leslie Thiess Drive, the introduction of up to 10 trucks per hour in each direction will have a negligible effect on traffic operations and safety in Sir Leslie Thiess Drive.

4.5.3 Traffic Impact Mitigation Measures

A Draft Traffic Management Plan (TMP) has been prepared to mitigate impacts that may arise as a result of increased heavy vehicle traffic on proposed haul routes for delivery of materials to the project site. This TMP will be implemented during the construction phase of development and is contained in Attachment 5.

4.6 Vehicle Types and ESA Loading

Detailed design loadings have been calculated in accordance with DMR suggested criteria. Refer Attachment 7 ESA Loadings Table.

4.7 Navigational Access, Signage and Lighting

Preliminary discussions have identified these requirements to be provided (statutory requirements):

A. Provide port and starboard identification markers to the up and downstream sides for the piles adjacent to the navigational channel of Ross Creek. These markers will be illuminated via photo electric cell switching controlling hinged bracket mounted 70W metal halcide lights affixed to bridge deck upstands. (refer sketch – VOS

Hastill Pty Ltd and Areaflood 7 product specification sheet contained in Attachment 8).

B. Provide minimum clearance height markers to each bridge bay on both up and downstream approaches. Illuminated via photo electric cell switching controlling sealed compact fluorescent lights mounted to side of bridge girders.

C. Provide standard 7.5m/1.5m outreach, 70W high pressure sodium streetlight adjacent to the Strand/bridge abutment to illuminate safety signage and security gate access control. (Refer Energex standard design sheet 4927-A4-E contained in Attachment 8).

D. It is viewed that the hydraulic bascule bridge motor will require single phase power supply only. New metered supply adjacent to the Strand abutment will be required.

E. Due to the openable sections of the bridge two alternatives are presented.

    1. Metered supply from both embankments (preferred option).

    2. Metered supply from the Strand only and submerged cable supply to opposite bank via preferred option 1 above a rapidly commissioned and decommissioned power connection system will be utilised for the removable bridge section adjacent to the slip way. (Refer clipsal switch gear information sheet contained in Attachment 8).

4.8 Safety and Security

The purpose of the temporary bridge is for access of the TOT project construction traffic only. As such, it is proposed the bridge will be controlled by the following elements:

- Security and traffic control personnel to be positioned at all times when the bridge is operational “open to construction traffic”.
- Security gates that can be locked to prevent vehicular access.
- Gates and signage that can be erected to prevent pedestrian access.
- A protocol established through the traffic management plan for the safe access onto the bridge as it will be ‘one way only’.
- A protocol established with emergency services agencies, Harbour Master, Queensland Transport and the Townsville City Council for emergency access via land or waterway.

- A protocol established to enable the safe navigation of Ross Creek and the opening of the bridge for large ship passage.
- On site personnel to be positioned during the non construction use of the bridge to ensure the bridge is functional for navigation purposes.
- A protocol will be established with the haulage contractors and users of the road bridge to ensure the operations of the bridge are known and adopted for safe use.

5 Further Detailed Design Assessments

As part of the detailed design phase for the temporary construction haulage bridge there will be further detailed on site assessments undertaken to ensure the design of the bridge is fit for its intended purpose. The future assessments will ensure that appropriate management plans are developed to minimise environmental impacts of the bridge.

These detailed assessments and designs will include:

- Detailed site level and features survey.
- Contaminated Land Analysis;
- Acid Sulfate Soils Analysis;
- Geotechnical Engineering Analysis including bank stability, ground and creek subsurface and bathymetry;
- Hydraulic Engineering Analysis for flood conveyance and tidal movements;
- Civil Engineering for stormwater drainage, earthworks, utility services relocation, roadworks and energy supply;
- Electrical Engineering for lighting and navigation lighting;
- Maritime Safety Analysis for navigation markers, stand by mooring piers/piles;
- Traffic Engineering for vehicle movement control;
- Formulation of the Navigation Protocols with the Harbour Master;
- Formulation of the Traffic Management Plan with Townsville City Council. Particularly with respect to traffic control, security of access gates, and haulage timetable;
- A Dilapidation Analysis would need to be undertaken of roadways and some selected adjacent buildings; and
- Detailed marine plant assessment.

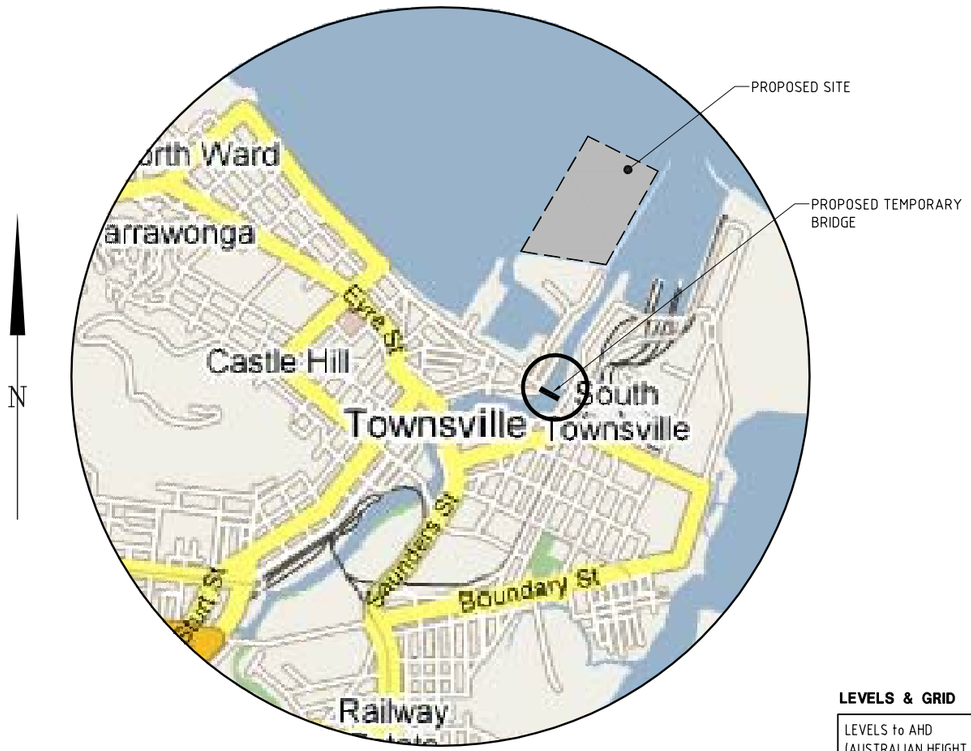
ATTACHMENT 1: LOCALITY SKETCH

TOWNSVILLE OCEAN TEMINAL
ROSS RIVER TEMPORARY BRIDGE

CIVIL ENGINEERING WORKS
FOR : CITY PACIFIC LIMITED

DRAWING SCHEDULE

DWG. No.	DESCRIPTION
K050-QL00704	DRAWING SCHEDULE AND LOCALITY PLAN
K051-QL00704	ROSS RIVER TEMPORARY BRIDGE LAYOUT
K052-QL00704	ROSS RIVER TEMPORARY BRIDGE LAYOUT AND LONG SECTION
K053-QL00704	ROSS RIVER TEMPORARY BRIDGE GENERAL ARRANGEMENT CONCEPT PLAN
K054-QL00704	ROSS RIVER TEMPORARY BRIDGE SECTIONS AND DETAILS
K055-QL00704	ROSS RIVER TEMPORARY BRIDGE LINEMARKING LAYOUT PLAN- THE STRAND
K056-QL00704	ROSS RIVER TEMPORARY BRIDGE SIGNAGE LAYOUT PLAN- THE STRAND
K057-QL00704	ROSS RIVER TEMPORARY BRIDGE LINEMARKING AND SIGNAGE LAYOUT PLAN- ROSS STREET
K058-QL00704	ROSS RIVER TEMPORARY BRIDGE TURNING CIRCLE - OFF BRIDGE- RIGHT LEFT-TOWARDS BRIDGE
K059-QL00704	ROSS RIVER TEMPORARY BRIDGE TURNING CIRCLE - OFF BRIDGE- RIGHT LEFT-ONTO BRIDGE



LOCALITY PLAN
SCALE NTS

LEVELS & GRID

LEVELS to AHD
(AUSTRALIAN HEIGHT DATUM)
GRID to GDA94
(GEOCENTRIC DATUM OF AUSTRALIA 1994)

Issue	Description	Date

100mm on Original

Scale (Plan)

Scale (Sections)

Surveyor: BRAZIER MOTTI

Architect: BUCHAN GROUP

Filename: K050-QL00704-DWG SHEDULE AND LOCALTIY PLAN.DWG

Client: Townsville Ocean Terminal

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Approved

R.E.P.Q No :

Scales	NTS	Current Issue Signatures	
		Author JH	
Original Size	A1	Designer RM	
Height Datum		Reviewer RM	
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Project: TOWNSVILLE OCEAN TERMINAL PROJECT

Title: DRAWING SCHEDULE AND LOCALITY PLAN

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Drawing No.	Project No.	Issue
K050	— QL00704	— 01

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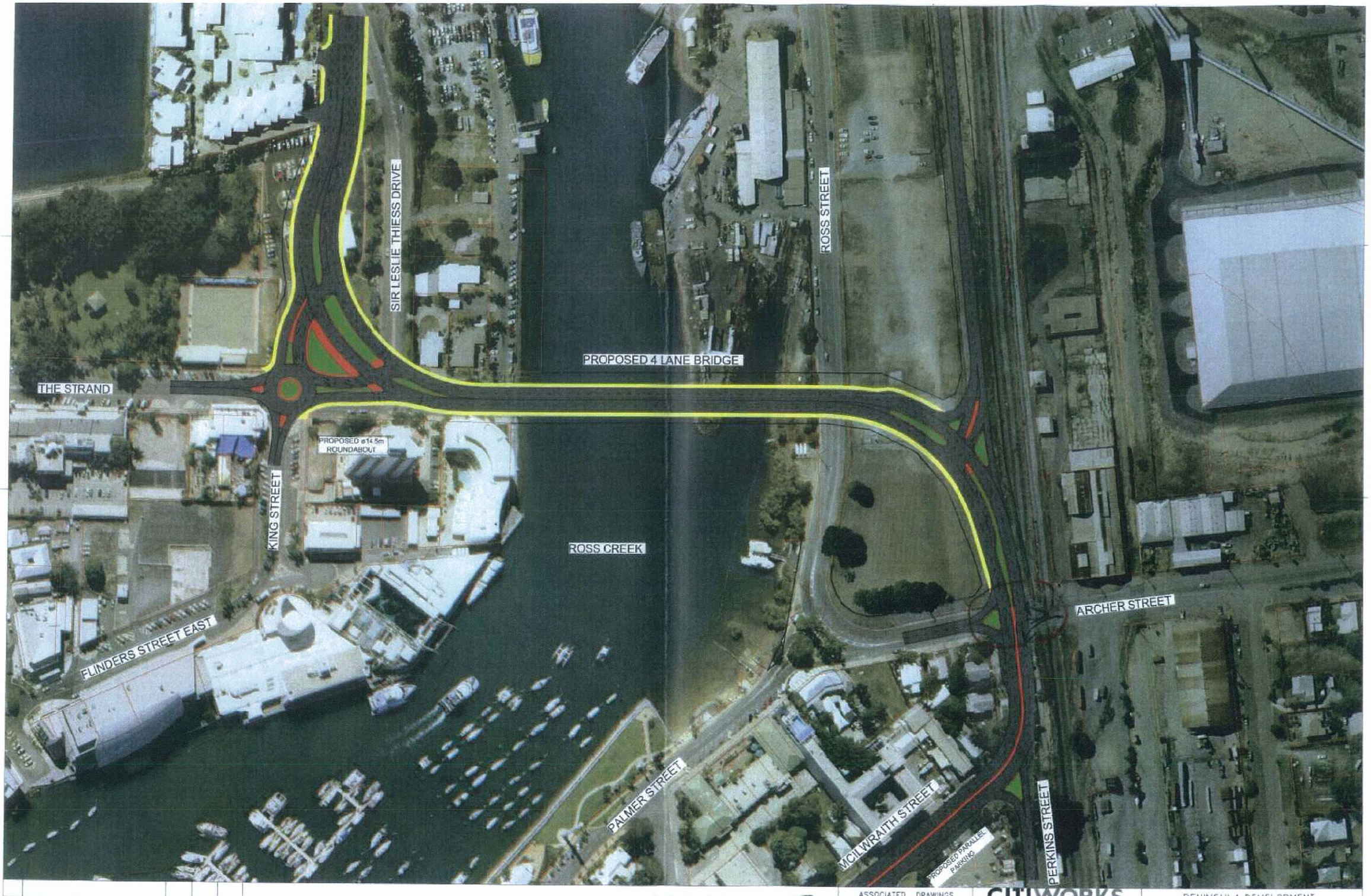
ATTACHMENT 2: CITIWORKS PROPOSED 4-LANE BRIDGE



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Surface Sealed Gradient.

REF	REVISIONS	BY	CKD	DATE

City of Townsville

ASSOCIATED DRAWINGS	
LEVEL DATUM	SURVEY INDEX NO.
AHD	
SERVICE LOCATIONS	DESIGN INDEX NO.
	CW196

CITIWORKS TOWNSVILLE

APPROVED	DES.	CH
	DRN.	
MANAGER – CITIWORKS	CHK.	
	SD.	
OPERATIONS ENGINEER	ENG.	

PENINSULA DEVELOPMENT
SIR LESLIE THIESS DVE TO DEAN ST
CONCEPT PROPOSAL
OPTION 01

SHEET 1 OF 2

DATE	SCALE	DRAWING NO.	
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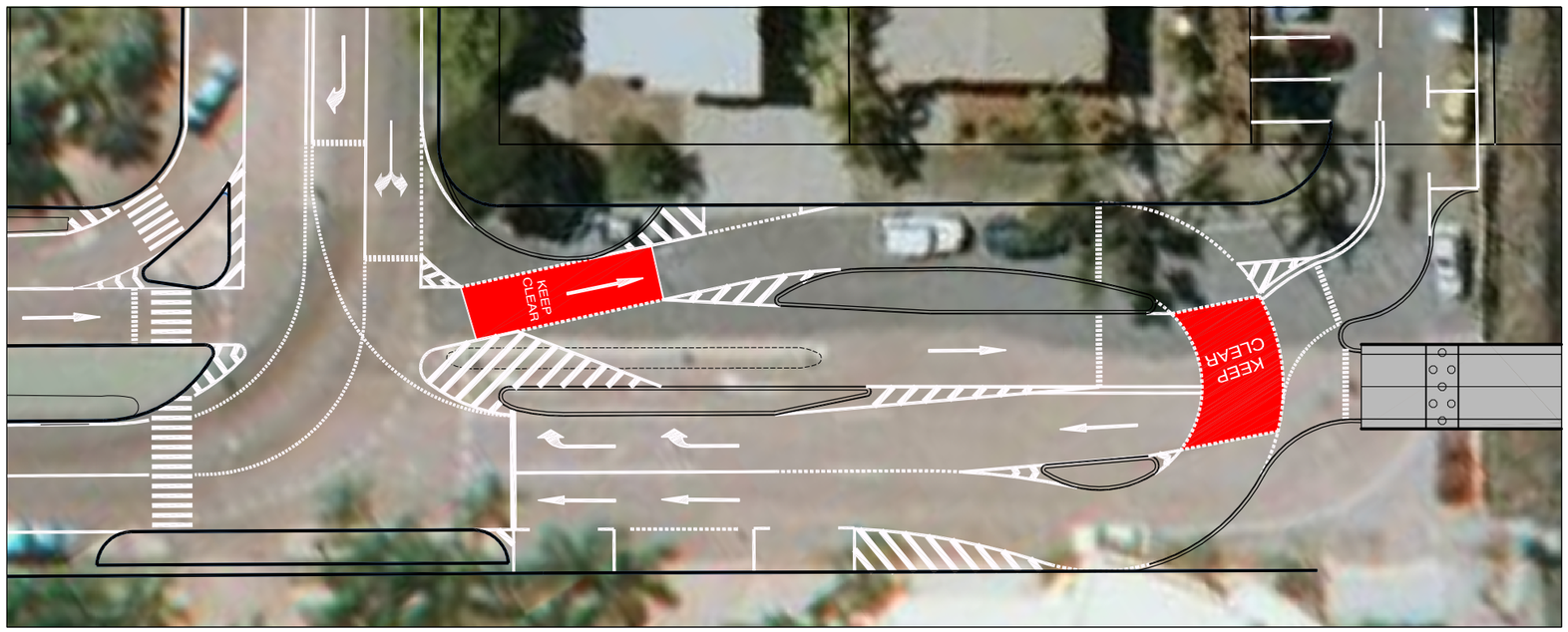
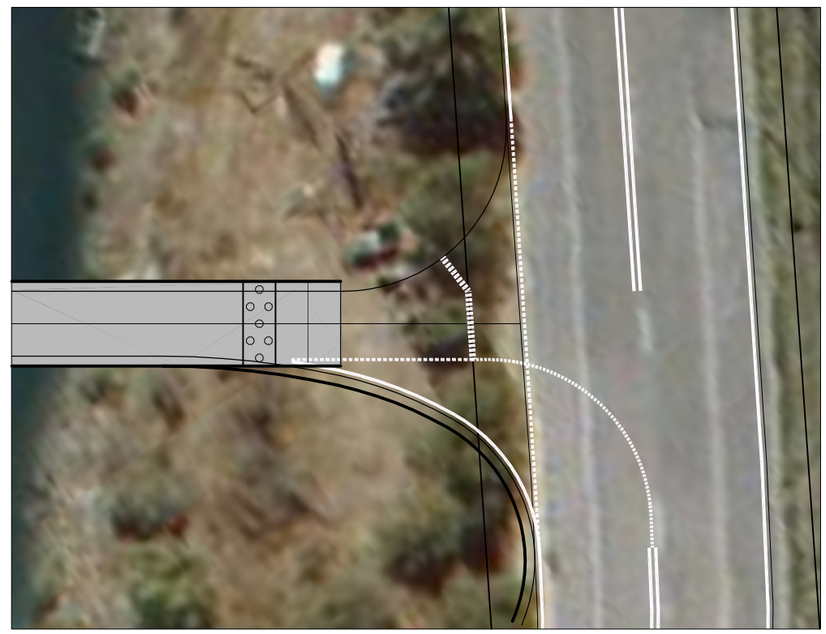
ATTACHMENT 3: PROPOSED TEMPORARY BRIDGE LAYOUT AND LONG SECTIONS





Issue	Description	Date
01	ORIGINAL ISSUE	07.09.2007

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Scale (Plan): NOT TO SCALE

Scale (Sections):

Surveyor: BRAZIER MOTTI

Architect: BUCHAN GROUP

Filename: K051.DWG

Client: Townsville Ocean Terminal

Status: **PRELIMINARY**
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Scales	NTS	Current Issue Signatures	
		Author P.S.M	
Original Size	A1	Designer I.G	
Height Datum		Reviewer R.M	
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Project: TOWNSVILLE OCEAN TERMINAL PROJECT

Title: ROSS RIVER TEMPORARY BRIDGE LAYOUT

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K051	QL00704	01

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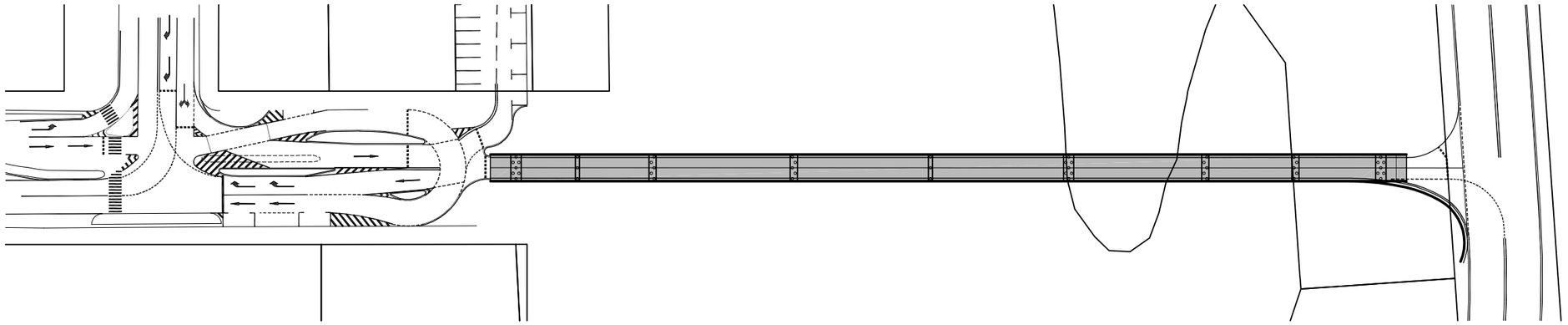

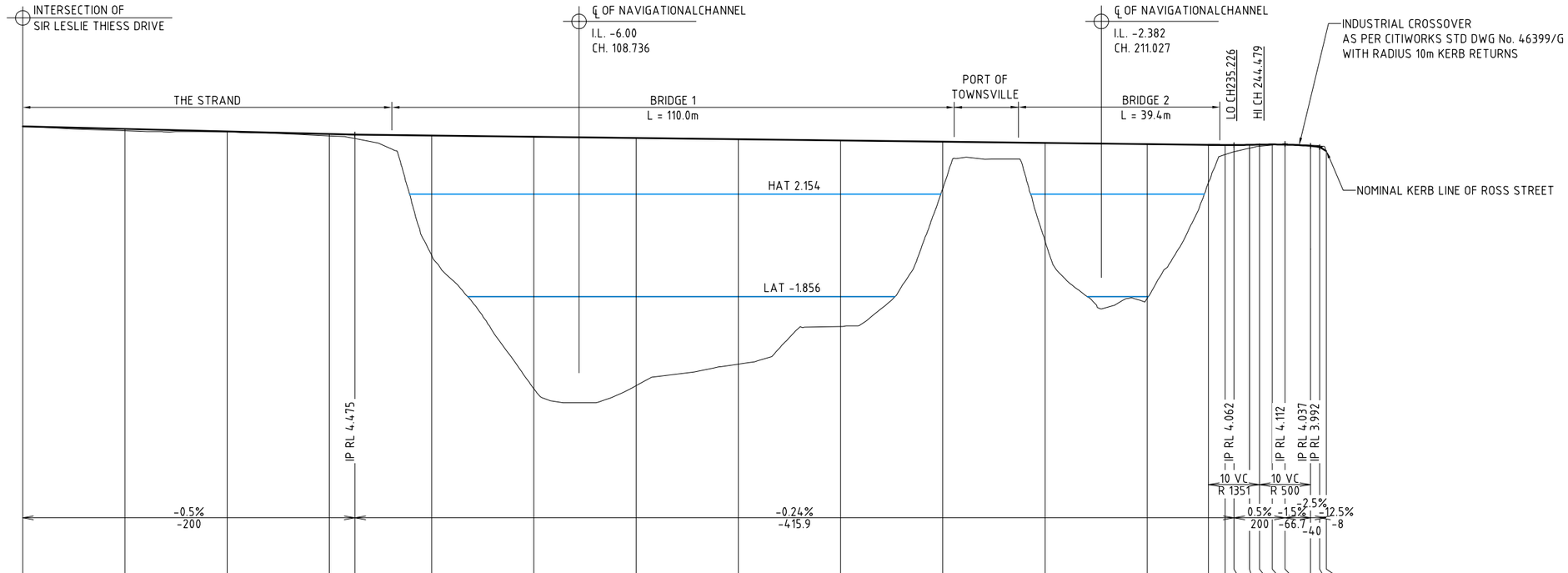

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CUT / FILL DEPTH	0.000	0.070	0.004	0.072	0.151	4.682	9.844	9.677	8.786	7.271	1.832	3.821	6.023	1.464	0.374	0.263	0.133	0.060	0.020	-0.002	-0.029	-0.047		
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PEGGED CHAINAGE	0.000	20.000	40.000	60.000	65.000	80.000	100.000	120.000	140.000	160.000	180.000	200.000	220.000	231.979	235.226	236.979	240.000	241.979	244.479	246.979	251.979	253.756	255.044	

TEMPORARY ROAD & BRIDGE LONGITUDINAL SECTION

Issue	Description	Date
01	ORIGINAL ISSUE	09.07.2007

100mm on Original

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Scale (Sections): HORZ 0 5 10 20 30 40 50m — 1 : 500; VERT 0 1 2 4 6 8 10m — 1:100

Surveyor: BRAZIER MOTTI

Architect: BUCHAN GROUP

Filename: K052.DWG

Client: Townsville Ocean Terminal

Status: **PRELIMINARY** — NOT TO BE USED FOR CONSTRUCTION

Approved

R.E.P.Q No :

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Original Size: A1

Height Datum

Grid

Current Issue Signatures: Author P.S.M; Designer I.G; Reviewer R.M

Project: TOWNSVILLE OCEAN TERMINAL PROJECT

Title: ROSS RIVER TEMPORARY BRIDGE LAYOUT AND LONGSECTION

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Drawing No. K052 — Project No. QL00704 — Issue 01

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SIR LESLIE THIESS DRIVE

EXISTING KERB & CHANNEL

REMOVE EXISTING PARKING & LINEMARKING ALONG THIS SECTION

REMOVE EXISTING ISLAND & RELOCATE EXISTING TREES IN THIS AREA TO FACILITATE AN EXIT FROM THE PROPOSED ROUNDABOUT / TUNRING AREA

90° PARKING

PARALLEL PARKING

PROPERTY ACCESS

EXISTING ISLAND

EXISTING ISLAND

KEEP CLEAR

EXISTING ISLAND TO BE REMOVED

KEEP CLEAR

PROPOSED TEMPORARY BRIDGE

POSSIBLE PARKING

POSSIBLE PARKING

POSSIBLE LOCATION OF PEDESTRIAN CROSSING

EXISTING KERB & CHANNEL AND KERB TO TRAFFIC ISLAND TO REMAIN

THE STRAND

PROPERTY ACCESS

PROPERTY ACCESS

EXISTING KERB/CHANNEL

NOTES

1. ALL LINEMARKING TO BE REFLECTORISED WHITE, UNLESS STATED OTHERWISE.
2. FINAL SIGN LOCATIONS TO BE DETERMINED ON SITE BY THE SUPERINTENDENT.
3. EXISTING LINEMARKING SUPERSEDED BY NEW LINEMARKING IS TO BE REMOVED BY ROUTING OR OTHER METHOD APPROVED BY QUEENSLAND TRANSPORT.
4. COLOUR OF ALL REFLECTORISED PAVEMENT MARKERS TO BE WHITE EXCEPT AT EDGE LINES TO ONE WAY PAVEMENTS, WHICH SHALL BE AS FOLLOWS:
   RIGHT EDGE - WHITE
   LEFT EDGE - RED
5. ALL TRAFFIC SIGNS TO BE SIZE 'A' UNLESS NOTED OTHERWISE.
6. FOR TRAFFIC SIGN SUPPORT DETAILS, REFER QUEENSLAND DEPARTMENT OF MAINROADS STANDARD DRAWING No.'s 1360 & 1362.
7. ALL SIGN MATERIAL TO BE CLASS 1.
8. DIRECTION SIGNS ARE SHOWN INDICATIVE ONLY. DETAILED DESIGNS ARE TO BE USED FOR ORDERING.
9. ALL SIGNAGE, LINEMARKING & RRPMs ARE TO BE PREPARED IN ACCORDANCE WITH THE CURRENT QUEENSLAND DEPARTMENT OF MAINROADS 'MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES' (MUTCD).

LEGEND

1000 3000 — 200 CONTINUITY LINE (CL).

24000 — 100 EDGE LINE (EL). REFER NOTE 4.

600 600 — 300 HOLDING LINE (HL).

300 STOP LINE (SL).

3000 9000 3000 9000 3000 — 100 LANE LINE (LL).

600 600 — 100 TURNING LINE (TL).

1000 300 1000 — 150 PEDESTRIAN LINE (PL).

100 100 CHEVRON 100 100 — 1200 1000

KEEP CLEAR — KEEP CLEAR AREA
NOTE: WHITE LETTERING ON RED SURFACE

PROPERTY ACCESS

APPLY CHEVRON MARKING
REFER LEGEND OPPOSITE

TEMPORARY KERB (TK)

EXISTING KERB/CHANNEL

Issue	Description	Date
01	ORIGINAL ISSUE	07.09.2007

100mm on Original

Scale (Plan): 0 2.5 5 7.5 10 12.5m — 1 : 125 @ A1

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Surveyor: BRAZIER MOTTI

Architect: BUCHAN GROUP

Filename: K055.DWG

Client: Townsville Ocean Terminal

Status: **PRELIMINARY** NOT TO BE USED FOR CONSTRUCTION

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Grid

Current Issue Signatures: Author I.G; Designer C.W; Reviewer R.M

Project: TOWNSVILLE OCEAN TERMINAL PROJECT

Title: ROSS RIVER TEMPORARY BRIDGE LINEMARKING LAYOUT PLAN

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Drawing No.	Project No.	Issue
K055	QL00704	01

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NOTES

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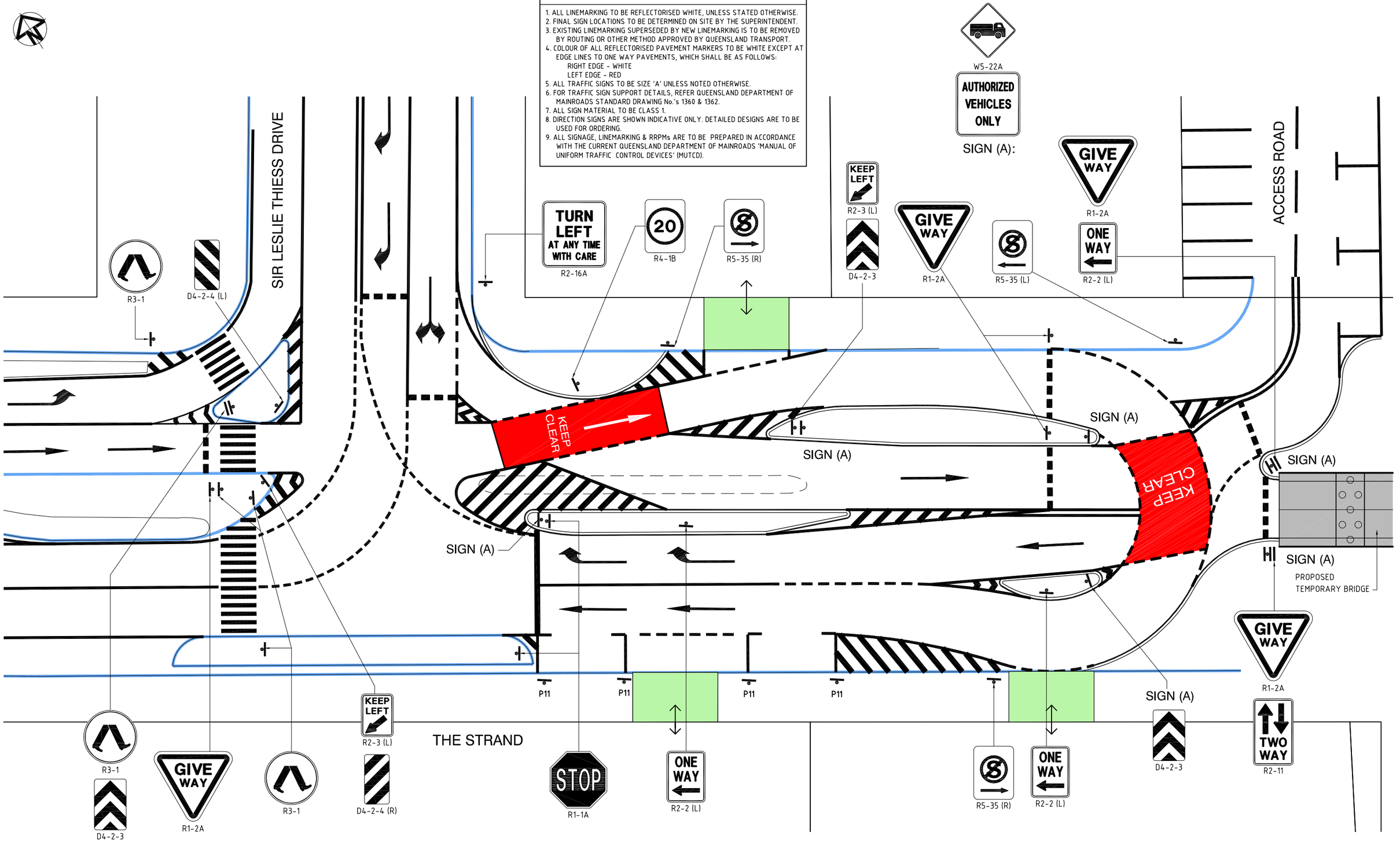
3. EXISTING LINEMARKING SUPERSEDED BY NEW LINEMARKING IS TO BE REMOVED BY ROUTING OR OTHER METHOD APPROVED BY QUEENSLAND TRANSPORT.
4. COLOUR OF ALL REFLECTORISED PAVEMENT MARKERS TO BE WHITE EXCEPT AT EDGE LINES TO ONE WAY PAVEMENTS, WHICH SHALL BE AS FOLLOWS:
   RIGHT EDGE - WHITE
   LEFT EDGE - RED
5. ALL TRAFFIC SIGNS TO BE SIZE 'A' UNLESS NOTED OTHERWISE.
6. FOR TRAFFIC SIGN SUPPORT DETAILS, REFER QUEENSLAND DEPARTMENT OF MAINROADS STANDARD DRAWING No.'s 1360 & 1362.
7. ALL SIGN MATERIAL TO BE CLASS 1.
8. DIRECTION SIGNS ARE SHOWN INDICATIVE ONLY. DETAILED DESIGNS ARE TO BE USED FOR ORDERING.
9. ALL SIGNAGE, LINEMARKING & RRPMs ARE TO BE PREPARED IN ACCORDANCE WITH THE CURRENT QUEENSLAND DEPARTMENT OF MAINROADS 'MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES' (MUTCD).



01	ORIGINAL ISSUE	06.09.2007	Scale (Plan) 1 : 125 @ A1	Surveyor BRAZIER MOTTI	Client Townsville Ocean Terminal	Status PRELIMINARY NOT TO BE USED FOR CONSTRUCTION	Project TOWNSVILLE OCEAN TERMINAL PROJECT
Issue	Description	Date	Scale (Sections)	Architect BUCHAN GROUP		Approved / R.E.P.Q. No:	Title ROSS RIVER TEMPORARY BRIDGE SIGNAGE LAYOUT PLAN
				Filename: K056.DWG		Scales 1:125 @ A1, 1:250 @ A3 — Current Issue Signatures	
						Original Size A1 — Author I.G; Designer C.W; Reviewer R.M	
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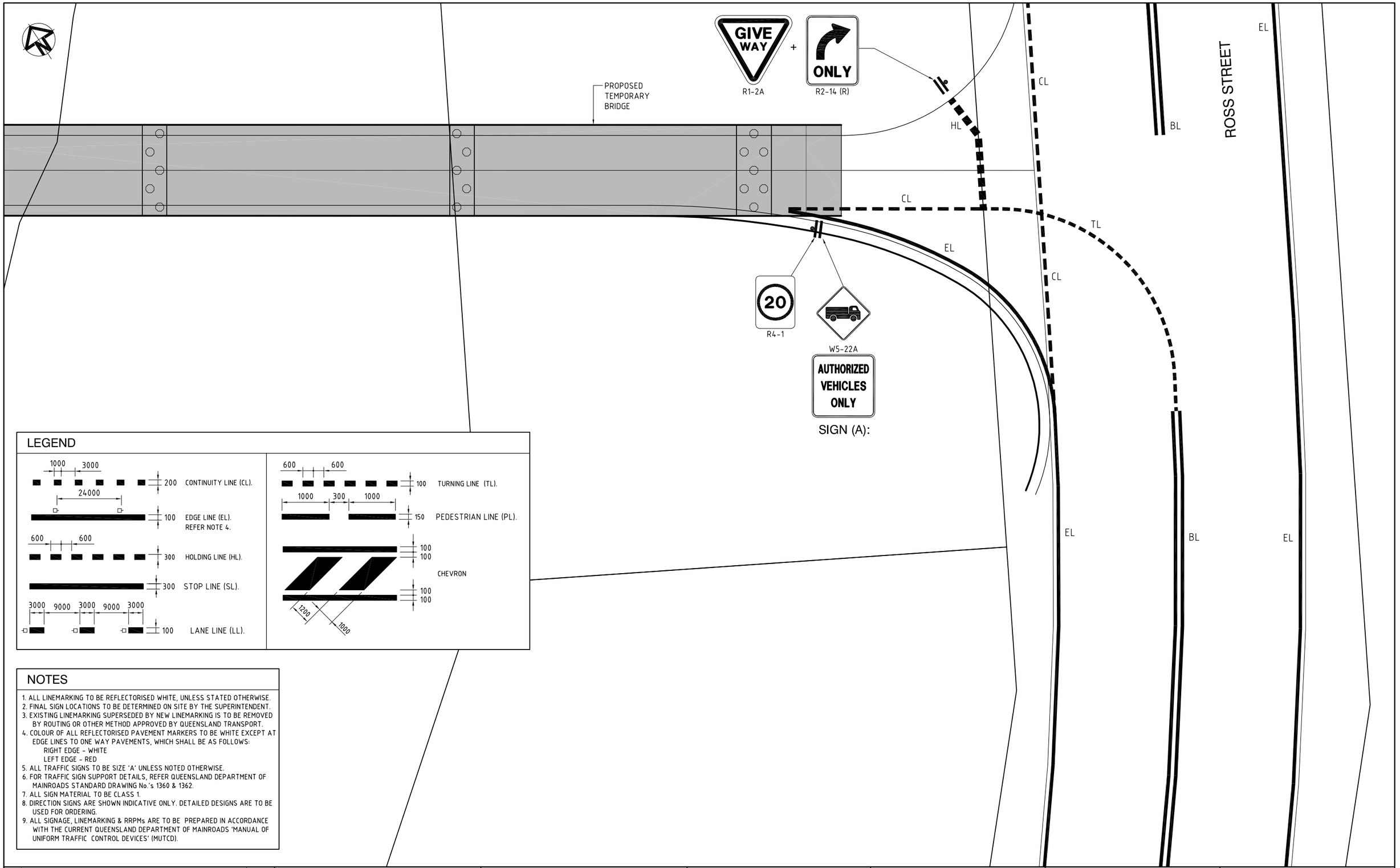
100mm on Original

10/Sep/2007 9:40 AM F:\QL00704\E-CAD\C-Civil\B-Sketches\K056.dwg V1



LEGEND

1000 3000 — 200 CONTINUITY LINE (CL).

24000 — 100 EDGE LINE (EL). REFER NOTE 4.

600 600 — 300 HOLDING LINE (HL).

300 STOP LINE (SL).

3000 9000 3000 9000 3000 — 100 LANE LINE (LL).

600 600 — 100 TURNING LINE (TL).

1000 300 1000 — 150 PEDESTRIAN LINE (PL).

100 / 100 CHEVRON / 100 / 100

1200 1000

NOTES

1. ALL LINEMARKING TO BE REFLECTORISED WHITE, UNLESS STATED OTHERWISE.
2. FINAL SIGN LOCATIONS TO BE DETERMINED ON SITE BY THE SUPERINTENDENT.
3. EXISTING LINEMARKING SUPERSEDED BY NEW LINEMARKING IS TO BE REMOVED BY ROUTING OR OTHER METHOD APPROVED BY QUEENSLAND TRANSPORT.
4. COLOUR OF ALL REFLECTORISED PAVEMENT MARKERS TO BE WHITE EXCEPT AT EDGE LINES TO ONE WAY PAVEMENTS, WHICH SHALL BE AS FOLLOWS:
   RIGHT EDGE - WHITE
   LEFT EDGE - RED
5. ALL TRAFFIC SIGNS TO BE SIZE 'A' UNLESS NOTED OTHERWISE.
6. FOR TRAFFIC SIGN SUPPORT DETAILS, REFER QUEENSLAND DEPARTMENT OF MAINROADS STANDARD DRAWING No.'s 1360 & 1362.
7. ALL SIGN MATERIAL TO BE CLASS 1.
8. DIRECTION SIGNS ARE SHOWN INDICATIVE ONLY. DETAILED DESIGNS ARE TO BE USED FOR ORDERING.
9. ALL SIGNAGE, LINEMARKING & RRPMs ARE TO BE PREPARED IN ACCORDANCE WITH THE CURRENT QUEENSLAND DEPARTMENT OF MAINROADS 'MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES' (MUTCD).

Issue	Description	Date
01	ORIGINAL ISSUE	07.09.2007

100mm on Original

Scale (Plan): 0 1 2 4 6 8 10m — 1 : 100 @ A1

Scale (Sections)

Surveyor: BRAZIER MOTTI

Architect: BUCHAN GROUP

Filename: K057.DWG

Client: Townsville Ocean Terminal

Status: **PRELIMINARY** NOT TO BE USED FOR CONSTRUCTION

Approved — R.E.P.Q No :

Scales: 1:100 @ A1, 1:200 @ A3 — Current Issue Signatures

Original Size: A1

Height Datum

Grid

Author I.G

Designer C.W

Reviewer R.M

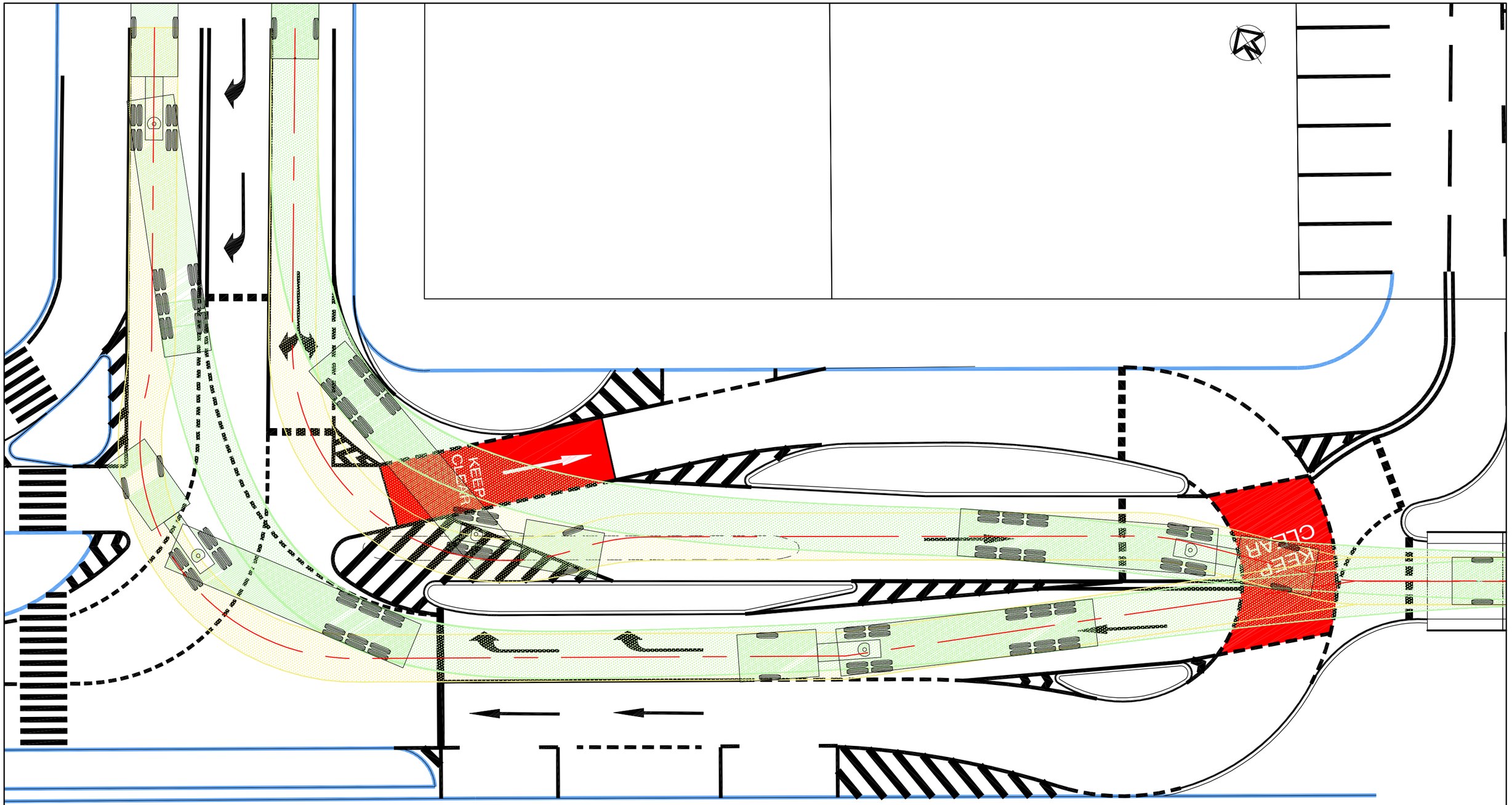
Project: TOWNSVILLE OCEAN TERMINAL PROJECT

Title: ROSS RIVER TEMPORARY BRIDGE LINEMARKING & SIGNAGE LAYOUT PLAN - ROSS STREET

HYDER CONSULTING
ABN 48 010 924 866
P O Box 1653, Southport, Queensland, 4215 Australia
Tel: (+617) 5532 3933
Fax: (+617) 5591 4778
E-mail: goldcoast@hyderconsulting.com
Web: www.hyderconsulting.com

Drawing No.	Project No.	Issue
K057	QL00704	01

10/Sep/2007 9:41 AM F:\QL00704\E-CAD\C-Civil\B-Sketches\K057.dwg V1



Issue	Description	Date
01	ORIGINAL ISSUE	06.09.2007

100mm on Original

Scale (Plan)

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1 : 125 @ A1

Scale (Sections)

Surveyor: BRAZIER MOTTI

Architect: BUCHAN GROUP

Filename: K058-QL00704-TURNING CIRCLE-LEFT TOWARDS BRIDGE.DWG

Client: Townsville Ocean Terminal

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION

Approved

R.E.P.Q No :

Scales: 1:125 @ A1, 1:250 @ A3

Current Issue Signatures

Original Size: A1

Author I.G

Designer C.W

Reviewer R.M

Height Datum

Grid

Project: TOWNSVILLE OCEAN TERMINAL PROJECT

Title: TURNING CIRCLE- OFF BRIDGE- RIGHT LEFT- TOWARDS BRIDGE

Hyder Consulting

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Web: www.hyderconsulting.com

Drawing No.	Project No.	Issue
K058	QL00704	01

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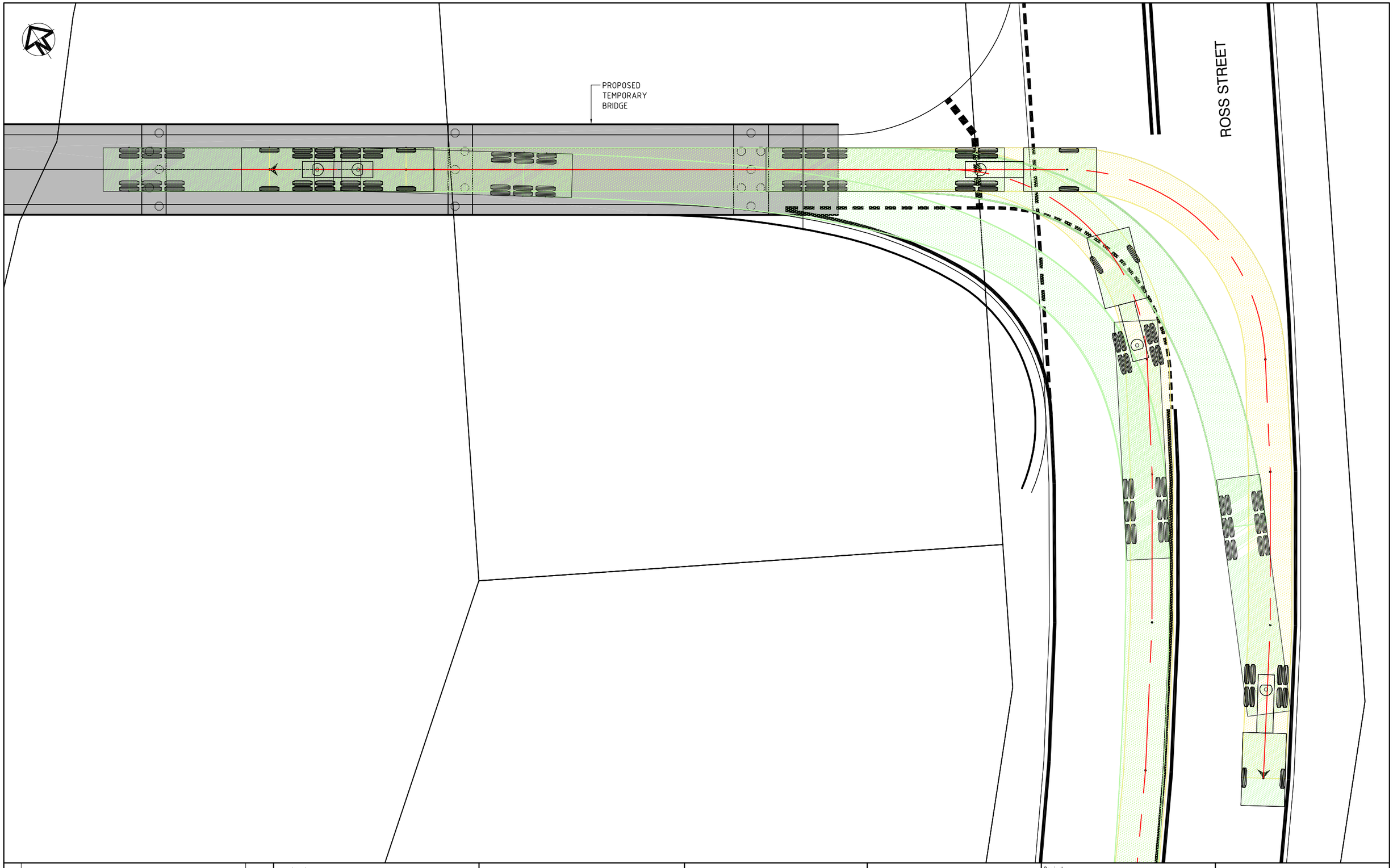

Issue	Description	Date
01	ORIGINAL ISSUE	07.09.2007

100mm on Original

Scale (Plan)
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1 : 100 @ A1

Scale (Sections)

Surveyor
BRAZIER MOTTI

Architect
BUCHAN GROUP

Filename: K059-QL00704-TURNING CIRCLE- RIGHT LEFT ONTO BRIDGE.dwg

Client
Townsville Ocean Terminal

Status
PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Approved

R.E.P.Q No :

Scales	1:100 @ A1 1:200 @ A3	Current Issue Signatures
		Author I.G
Original Size	A1	Designer C.W
Height Datum		Reviewer R.M
Grid		© Copyright reserved

Project
TOWNSVILLE
OCEAN TERMINAL
PROJECT

Title
ROSS RIVER
TEMPORARY BRIDGE
TURNING CIRCLE - OFF BRIDGE
RIGHT LEFT - ONTO BRIDGE

Hyder Consulting
HYDER CONSULTING
ABN 48 010 924 866
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Queensland, 4215
Australia
Tel: (+617) 5532 3933
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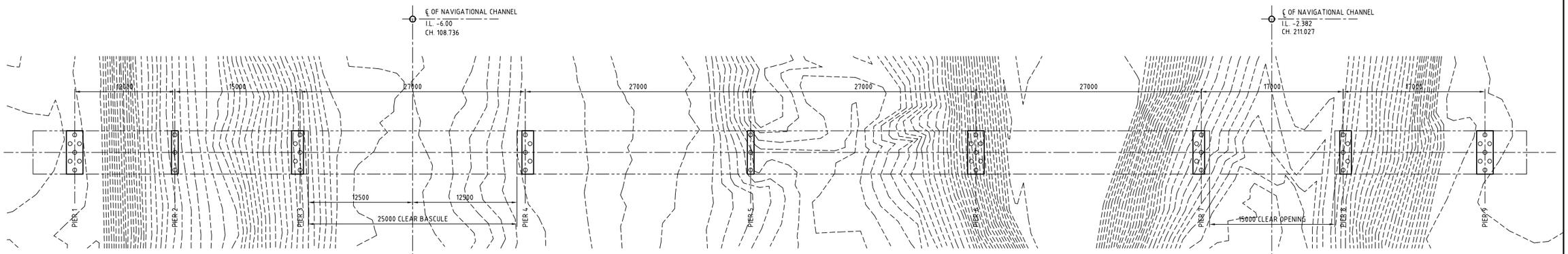
E-mail: goldcoast@hyderconsulting.com
Web: www.hyderconsulting.com

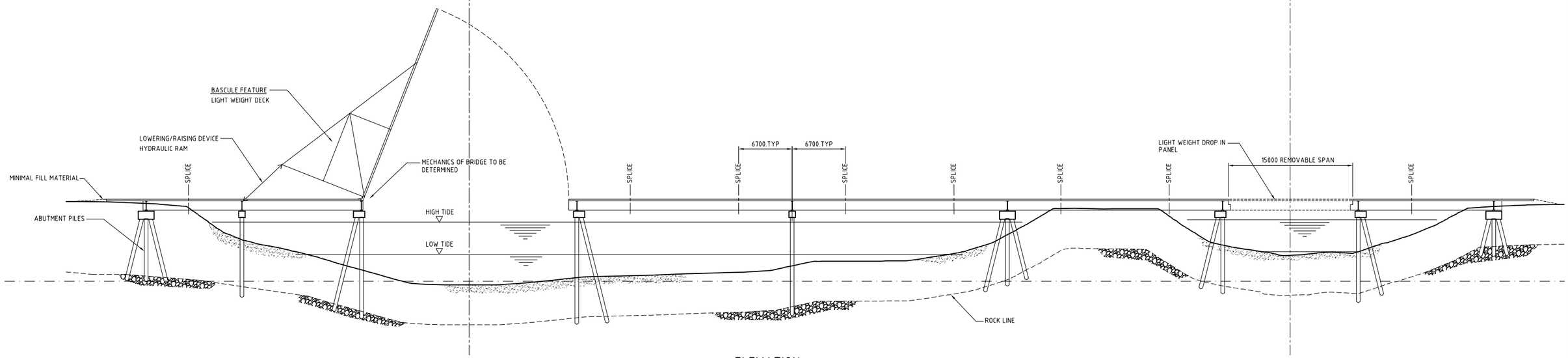
Drawing No.	Project No.	Issue
K059	QL00704	01

10/Sep/2007 9:41 AM F:\QL00704\E-CAD\C-Civil\B-Sketches\K059-QL00704-TURNING CIRCLE- RIGHT LEFT ONTO BRIDGE.dwg V1

ATTACHMENT 4: TEMPORARY BRIDGE DESIGN CONCEPT PLAN



PLAN (SCALE 1:200)



ELEVATION (SCALE 1:200)

01	FIRST ISSUE	07.09.07
Issue	Description	Date

100mm on Original

Scale (Plan)

Scale (Sections)

Surveyor: BRAZIER MOTTI

Architect: BUCHAN GROUP

Filename: K053.DWG

Client: Townsville Ocean Terminal

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION

Approved

R.E.P.Q No :

Scales: 1:250 @ A1, 1:500 @ A3

Current Issue Signatures

Author: PAUL MEREDITH

Original Size: A1

Designer: GEOFF BROWN

Height Datum: DATUM

Reviewer: ROBERT MASKEY

Grid: GRID

Project: TOWNSVILLE OCEAN TERMINAL PROJECT

Title: ROSS RIVER TEMPORARY BRIDGE GENERAL ARRANGEMENT CONCEPT PLAN

HYDER CONSULTING
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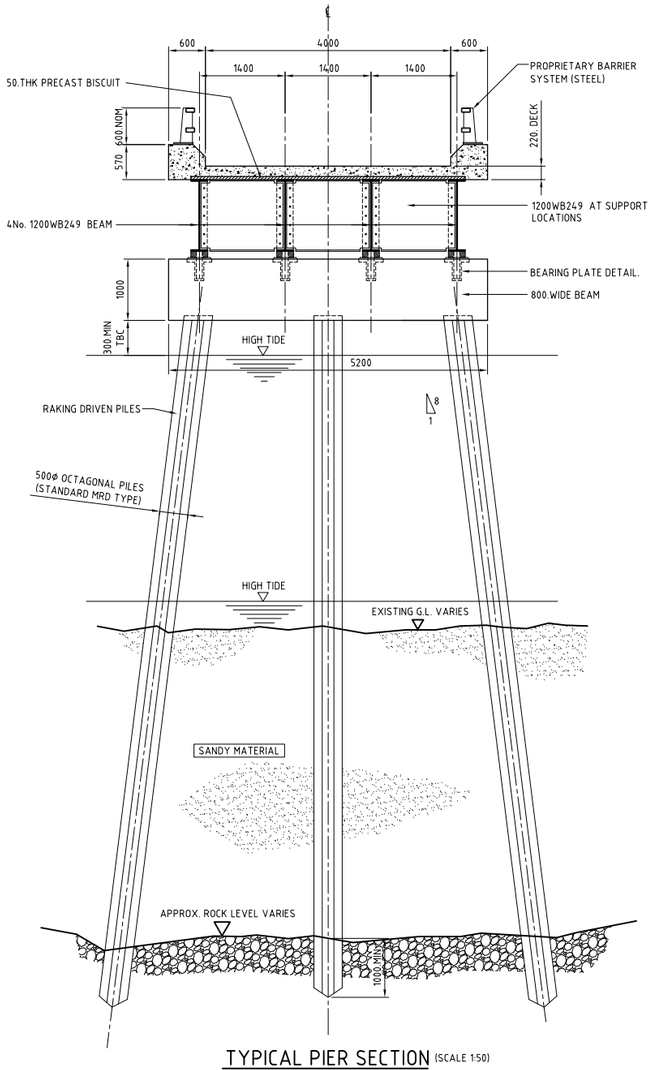
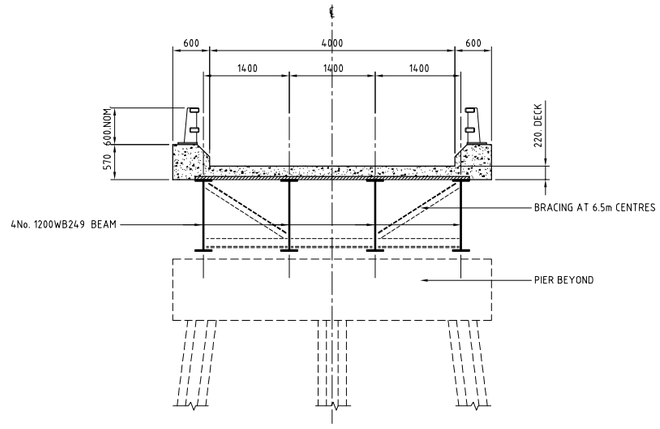
Web: www.hyderconsulting.com

Drawing No. K053 — Project No. QL00704 — Issue 01

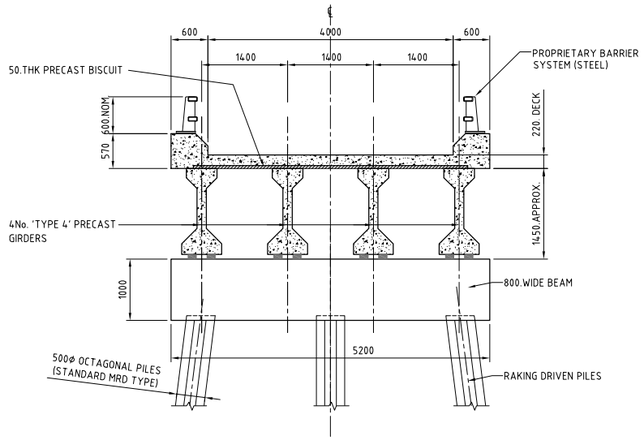
10/Sep/2007 9:39 AM F:\QL00704\E-CAD\C-Civil\C-Concept\K053.dwg V1



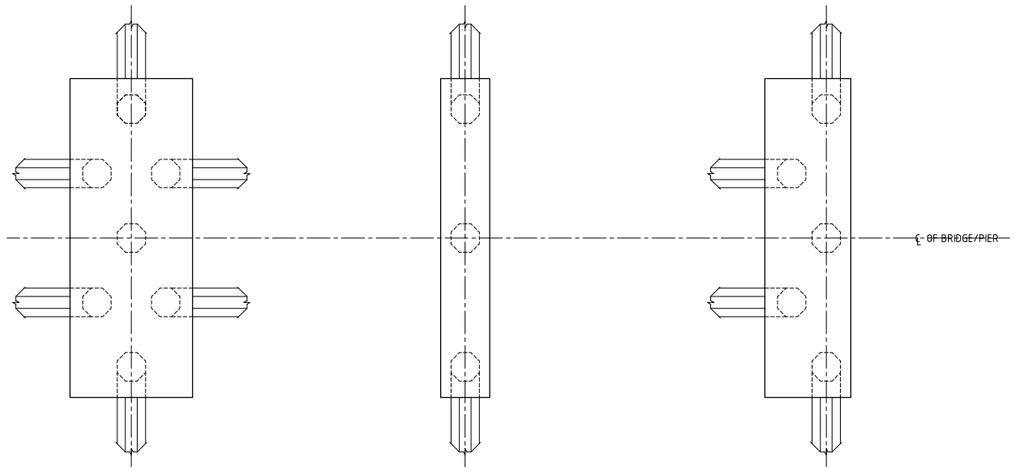
TYPICAL PIER SECTION (SCALE 1:50)
(AS DRAWN PIER 5)



TYPICAL SECTION BETWEEN PIERS (SCALE 1:50)



TYPICAL PIER SECTION (SCALE 1:50)
(ALTERNATIVE SOLUTION)



PIERS 1, 6 & 9 | PIERS 2 & 5 | PIERS 3, 4, 7 & 8

TYPICAL PILE CONFIGURATION OF PIERS (SCALE 1:50)

Issue	Description	Date
01	FIRST ISSUE	07.09.07

100mm on Original

Scale (Plan)

Scale (Sections)

Surveyor: BRAZIER MOTTI

Architect: BUCHAN GROUP

Filename: K054.DWG

Client: Townsville Ocean Terminal

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION

Approved

R.E.P.Q No :

Scales: 1:250 @ A1, 1:500 @ A3

Current Issue Signatures

Original Size: A1

Author: PAUL MEREDITH

Designer: GEOFF BROWN

Height Datum: DATUM

Reviewer: ROBERT MASKEY

Grid: GRID

Project: TOWNSVILLE OCEAN TERMINAL PROJECT

Title: ROSS RIVER TEMPORARY BRIDGE SECTIONS & DETAILS

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Web: www.hyderconsulting.com

Drawing No.	Project No.	Issue
K054	QL00704	01

10/Sep/2007 9:40 AM F:\QL00704\E-CAD\C-Civil\C-Concept\K054.dwg V1

ATTACHMENT 5: HAULAGE TRAFFIC MANAGEMENT PLAN

HAULAGE TRAFFIC MANAGEMENT PLAN

Environmental Objectives	▪ To maintain safe and equitable traffic and pedestrian movement on and around the site and haulage routes during all stages of construction. ▪ To ensure construction traffic impacts on the Local and State controlled road network are minimised.
Environmental Values	▪ Road pavement conditions ▪ Road user safety ▪ Amenity and well-being of sensitive receivers

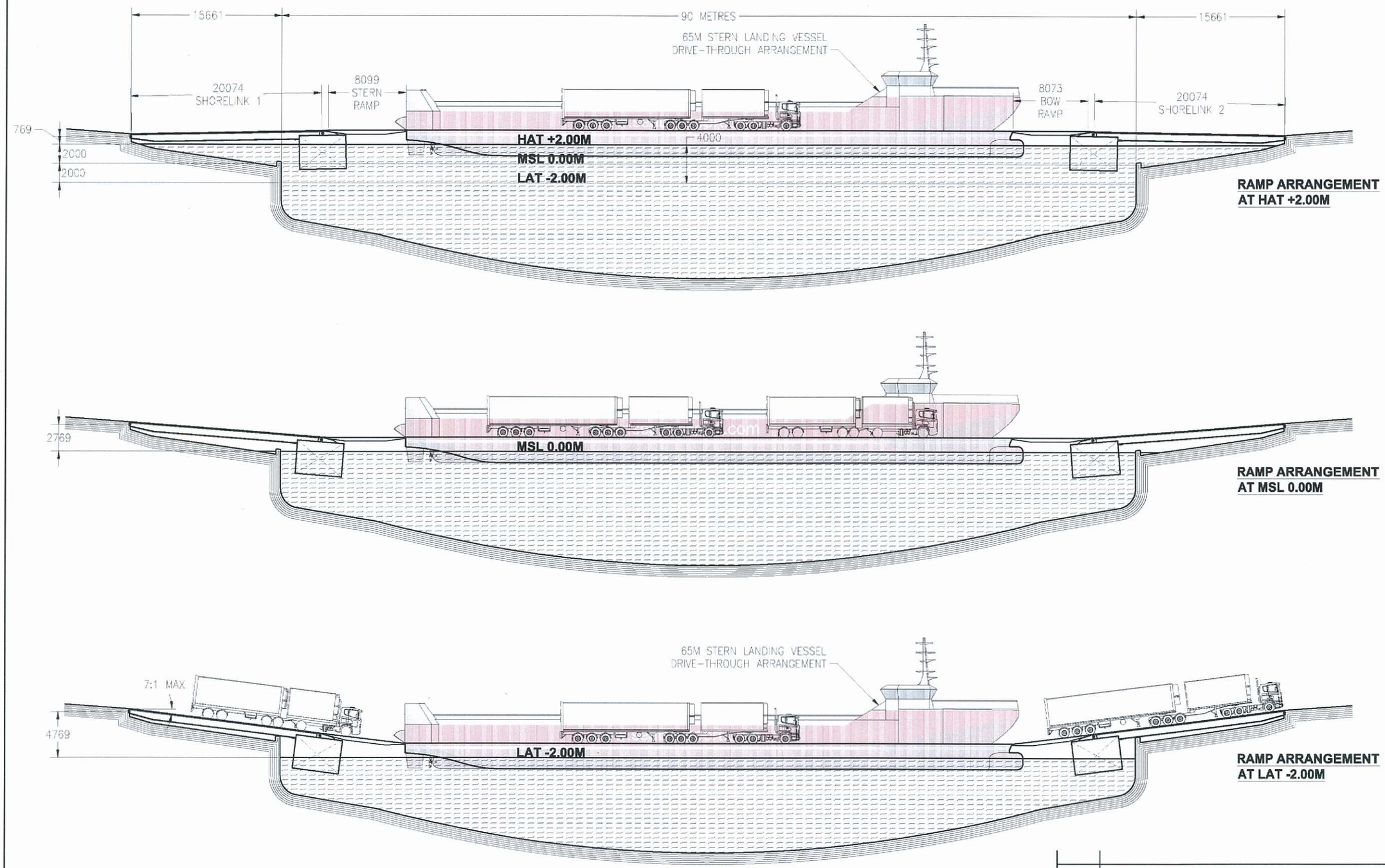
Control Measures	Responsibility
The contractor shall seek advice and direction from the Department of Main Roads, Queensland Transport and the EIS relating to required traffic control measures.	Haulage Contractor
All haulage contractor staff and sub-contractors shall attend an induction training program prior to commencing work on the TOT project.	Haulage Contractor
Haulage personnel and subcontractors shall comply with all Department of Transport road vehicle registration compliance and road rules at all times.	Vehicle Operator
Haulage personnel and subcontractors shall comply with all speed limits at all times.	Vehicle Operator
All road train operators shall, where practical and safe, either slow down or pull over to allow any queued traffic to pass.	Vehicle Operator
Drivers shall report any pavement damage to the Haulage Contractor's representative	Vehicle Operator
The Haulage Contractor shall consult with the Department of Main Roads on pavement damage where required.	Haulage Contractor
All planned stops and parking shall only occur at approved locations along the haulage route.	Vehicle Operator
A haulage vehicle must not pull up on the side of a highway for a planned stop.	Vehicle Operator
In the event of an unplanned stop, the driver shall pull the vehicle well off the road and request assistance from the relevant service vehicle.	Vehicle Operator
In the event of a driver being unable to pull the vehicle well off the road, safety road triangles shall be appropriately placed to indicate the parked vehicle to other road users.	Vehicle Operator
If necessary, the local police shall be notified of an unplanned vehicle stop to gain traffic control assistance.	Vehicle Operator
No haulage shall be permitted between 7:00pm and 6:00am during construction unless otherwise approved by the proponent and all relevant agencies.	Haulage Contractor

All haulage vehicles shall only be serviced within designated areas.	Haulage Contractor
Re-fuelling of haulage vehicles shall only be undertaken at approved areas along the haulage route.	Vehicle Operator
All drivers shall limit exhaust braking in close proximity to residences along the haul route.	Vehicle Operator
Vehicle movements shall be controlled to avoid peak traffic and scheduled events at nearby schools, local businesses and entertainment facilities.	Haulage Contractor
Where required by authorities, additional measures including traffic controllers, traffic signalling, message signage and real-time monitoring of traffic conditions shall be employed to ensure safe traffic conditions are maintained.	Haulage Contractor
Prior to haulage of material on or off-site, road pavement assessment of haul routes shall be undertaken for the monitoring of construction impacts.	Haulage Contractor
All haulage vehicles shall be appropriately maintained to prevent impacts relating to air and noise emissions and the safety of road users.	Vehicle Operator
All haulage vehicles leaving the site shall be directed through a truck 'shake down' or 'wheel wash' for removal of loose soil and other material.	Vehicle Operator
Construction vehicles shall be restricted to designated access roads and a speed limit of 20km/hour shall be maintained by within the project site.	Vehicle Operator
Access roads within the site shall be watered as required to prevent dust generation. Over-watering shall be avoided to prevent ponding or runoff and water waste.	Principal Contractor
Vehicle loads that are subject to loss by wind suspension shall be covered prior to transport to and from the site.	Vehicle Operator
All drivers shall comply with the specific safety signage and access protocols when traversing the temporary construction bridge or floating bridge	Vehicle Operator
Monitoring	Responsibility
All vehicle operators shall conduct mechanical inspections of their road trains prior to the commencement of haulage.	Vehicle Operator
All vehicle inspections will be appropriately documented and records kept by the operator.	Vehicle Operator
The Haulage Contractor shall appoint a suitably qualified person conduct random inspections of haulage vehicles and audits of inspection documentation.	Haulage Contractor
All haulage vehicles shall be inspected and approved by a representative of the Haulage Contractor prior to use on the project.	Haulage Contractor
Reporting	Responsibility
Driver log books shall be inspected regularly.	Haulage Contractor
The Haulage Contractor shall report to the Principal Contractor on complaints received and corrective actions undertaken.	Haulage Contractor

The Haulage Contractor shall report to the Principal Contractor on meetings held with the local community and other project stakeholders.	Haulage Contractor

Performance Indicators	Responsibility
All operators shall comply with directions issued by the Principal Contractor and the Haulage Contractor and with the requirements of this TMP.	Vehicle Operator
Corrective Actions	**Responsibility**
Haulage vehicles that fail to demonstrate compliance with this TMP shall be stood down until such time as corrective action has been completed.	Haulage Contractor
Incidents, accidents and near miss events shall be recorded and fully investigated by the Haulage Contractor and relevant authorities shall be notified as required.	Haulage Contractor
Non-conformance with this TMP shall be documented and a corrective action request (CAR) issued. All CAR's shall be implemented in a timely manner and shall be included in a non-conformance register.	Haulage Contractor

ATTACHMENT 6: FLOATING BRIDGE DESIGN



CLIENT: CITY PACIFIC

REV.	MODIFICATION	DATE
TITLE	**FLOATING BRIDGE PROPOSAL TOWNSVILLE**	
VESSEL	**65m SLV (DRIVE-THROUGH) FOR CITY PACIFIC**	
SCALE **1:400**	CHECKED	APPR'D
DATE **05.09.07**	DRAWN **A. SED.**	DWG

SEATRANSPORT
(PROPRIETOR: ASDMAR PTY LTD)
P.O. Box 1043, Southport, Queensland 4215
Phone(07) 55295 777 Fax(07) 55295 177
Email: admin@seatransport.com

ATTACHMENT 7: ESA HAULAGE LOADINGS

Townsville Ocean Terminal Project

T.C.C and DMR Road Haulage Options ESA Loadings

Option 1 - Temporary Bridge & Haul Road Route

Stage 1 (Month 1 - 12)

Vehicle	Trips / Hour	Hours / Day	Total Loaded Vehicles / Day	ESA Loaded Vehicle to Site	Total Days	Project ESA / Year
Vehicle Loaded						
Tri-axle Semi Tripper	1.66	10	16.6	4.97	302	24916
B Doubles	4.13	10	41.3	4.97	302	61989
Vehicle	**Trips / Hour**	**Hours / Day**	**Total Loaded Vehicles / Day**	**ESA Loaded Vehicle to Site**	**Total Days**	**Project ESA / Year**
Vehicle Unloaded						
Tri-axle Semi Tripper	1.66	10	16.6	0.555	302	2782
B Doubles	4.13	10	41.3	0.555	302	6922
						96609 *Total ESA / Year 1*

Stage 2 (Month 13 - 24)

Vehicle	Trips / Hour	Hours / Day	Total Loaded Vehicles / Day	ESA Loaded Vehicle to Site	Total Days	Project ESA / Year
Vehicle Loaded						
Tri-axle Semi Tripper	3.99	10	39.9	4.97	302	59888
B Doubles	2.96	10	29.6	4.97	302	44428
Vehicle	**Trips / Hour**	**Hours / Day**	**Total Loaded Vehicles / Day**	**ESA Loaded Vehicle to Site**	**Total Days**	**Project ESA / Year**
Vehicle Unloaded						
Tri-axle Semi Tripper	3.99	10	39.9	0.555	302	6688
B Doubles	2.96	10	29.6	0.555	302	4961
						115964 *Total ESA / Year 2*

Stage 3 (Month 25 - 36)

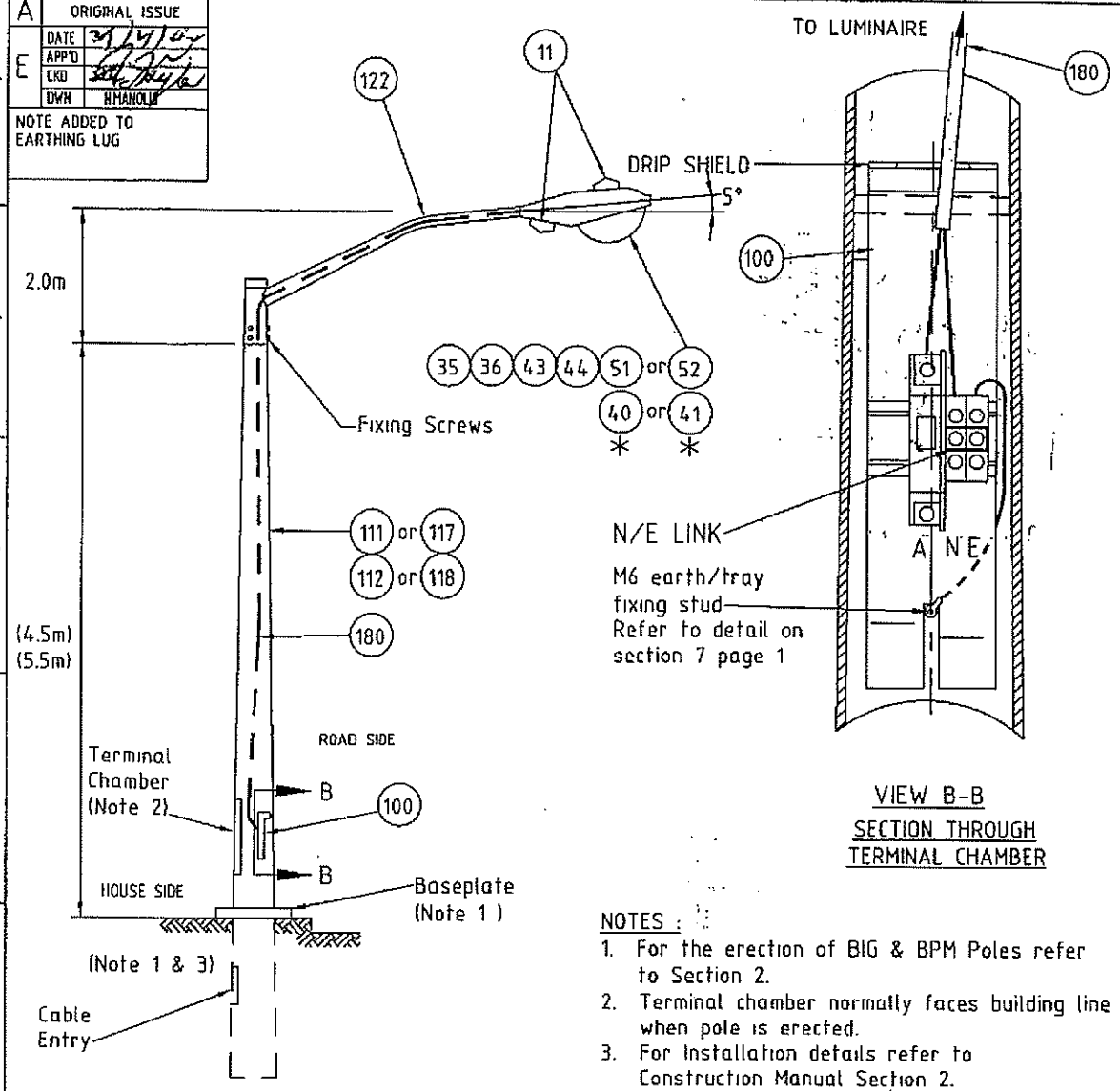
Vehicle	Trips / Hour	Hours / Day	Total Loaded Vehicles / Day	ESA Loaded Vehicle to Site	Total Days	Project ESA / Year
Vehicle Loaded						
Tri-axle Semi Tripper	0.49	10	4.9	4.97	302	7355
B Doubles	3.7	10	37	4.97	302	55535
Vehicle	**Trips / Hour**	**Hours / Day**	**Total Loaded Vehicles / Day**	**ESA Loaded Vehicle to Site**	**Total Days**	**Project ESA / Year**
Vehicle Unloaded						
Tri-axle Semi Tripper	0.49	10	4.9	0.555	302	821
B Doubles	3.7	10	37	0.555	302	6202
						69912 *Total ESA / Year 3*

Denotes ESA for the design vehicle for the B Double - This has been assumed to be equal to the design Tri-axle Semi Tipper
Main Roads in different districts may adopt a differing ESA for the loaded and unloaded B Double.
For this report we have assumed it to be equal to the Tri-axle Semi Tipper

ATTACHMENT 8: ELECTRICAL REFERENCE INFORMATION

A	ORIGINAL ISSUE
E	DATE 31/7/02
	APP'D
	CKD
	DWN H.MANOLIS

NOTE ADDED TO EARTHING LUG



VIEW B-B
SECTION THROUGH TERMINAL CHAMBER

NOTES :

1. For the erection of BIG & BPM Poles refer to Section 2.
2. Terminal chamber normally faces building line when pole is erected.
3. For installation details refer to Construction Manual Section 2.

* OBSOLETE ITEM (USE AS SPARE/ REPLACEMENT ONLY)

PART	DESCRIPTION	S.C.	QTY	PART	DESCRIPTION	S.C.	QTY
43	Luminaire, M50	05418	AR	122	1.5m Minor Road Single Arm	05733	1
44	Luminaire, M50 AERO	05443					
51	Luminaire, S70	13399		111	Pole, 4.5m BIG Steel	05632	AR
52	Luminaire, S70 AERO	13499		117	Pole, 4.5m BPM Steel	05631	
35	Luminaire, M80	16055		112	Pole, 5.5m BIG Steel	05636	
36	Luminaire, M80 AERO	16056		118	Pole; 5.5m BPM Steel	05635	
11	P.E. Cell D-2 Low Rating	05503	AR	40	Luminaire, S50 *	09932	AR
				41	Luminaire, S50 AERO *	09949	AR
100	Terminal Panel (Minor Road)	05487	1	180	Cable, 2.5mm² 2c Flat PVC/PVC	07112	AR

energex

PUBLIC LIGHTING CONSTRUCTION MANUAL

MINOR ROAD
U/G SUPPLY, 4.5m & 5.5m BIG & BPM
STEEL POLE WITH SINGLE 1.5m
OUTREACH ARM

APP'D	S.B.
DATE	5-3-93
REC'D	
CKD	R.W.
DWN	M.W.

4927-A4 E

SECT	PAGE
6	3

SHEET 1 OF 1

FILE 4927A4\S6\stc6-3e.dwg

Areaflood 7

HST (ST) E27 70W
HIT (MT) E27 70W
AS/NZS 60598 Class I Electrical
5 Nm impact resistant IP65

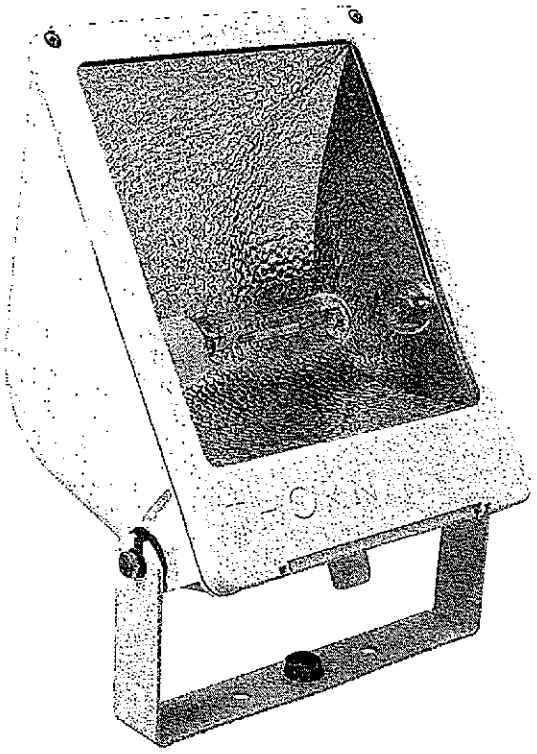
A range of compact high performance floodlights housing 70W discharge lamps

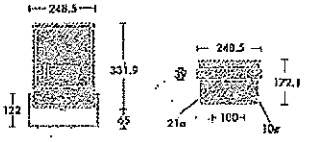
- Wide angle floodlight with asymmetric vertical distribution
- 70W HST versions with anti-cycling ignitor
- Integral photocell option
- Robust recyclable aluminium body with vandal-resistant enclosure
- Streamlined stirrup with easy aim device and stainless steel body bolts

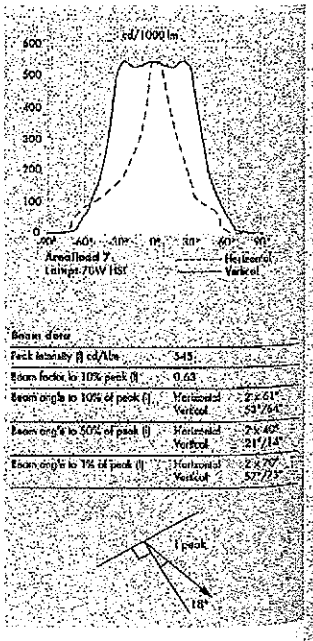
Materials/Finish
Body: recyclable pressure die-cast LM6 aluminium body finished white.
Body bolts: stainless steel.
Lens: toughened soda lime glass in an aluminium frame.
Stirrup: galvanised steel.

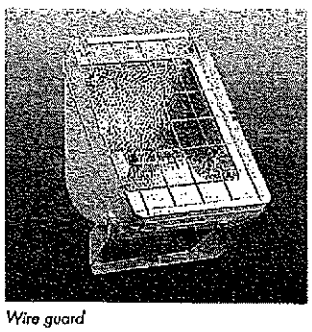
Installation/Mounting
Cable entry by combined gland/cord grip for 6-12mm o/d cable.
Access to terminal block by hinging down the visor or glass-mounting frame. Terminal block takes 6mm² conductors.
Especially suitable for 5-8m mounting height.

Specification
To specify state:
Enclosed floodlight for 70W HST/HIT lamp with white aluminium body, flat glass.
Sealed to IP65.
As Thorn Areaflood 7.









Wire guard

Ordering Guide Supplied complete with lamp

Description	Ikos Code	Socket	Weight (kg)	Cat. No.	SAP Code
AREAFLOOD 7 HST 70W	ST	E27	2.8	AF7SG70W.4	96100157
AREAFLOOD 7 HIT 70W	MT	E27	3.4	AF7CSG70W.4	96200570
Attachments					
SPILL SHIELD			1.2	AF7 SS	96003886
WIRE GUARD IN WHITE HOLDER			0.6	AF7 WGW	96005578

* Black available for special order.

VOS HASTHILL PTY LTD

CALCULATION SHEET

Designed: CO

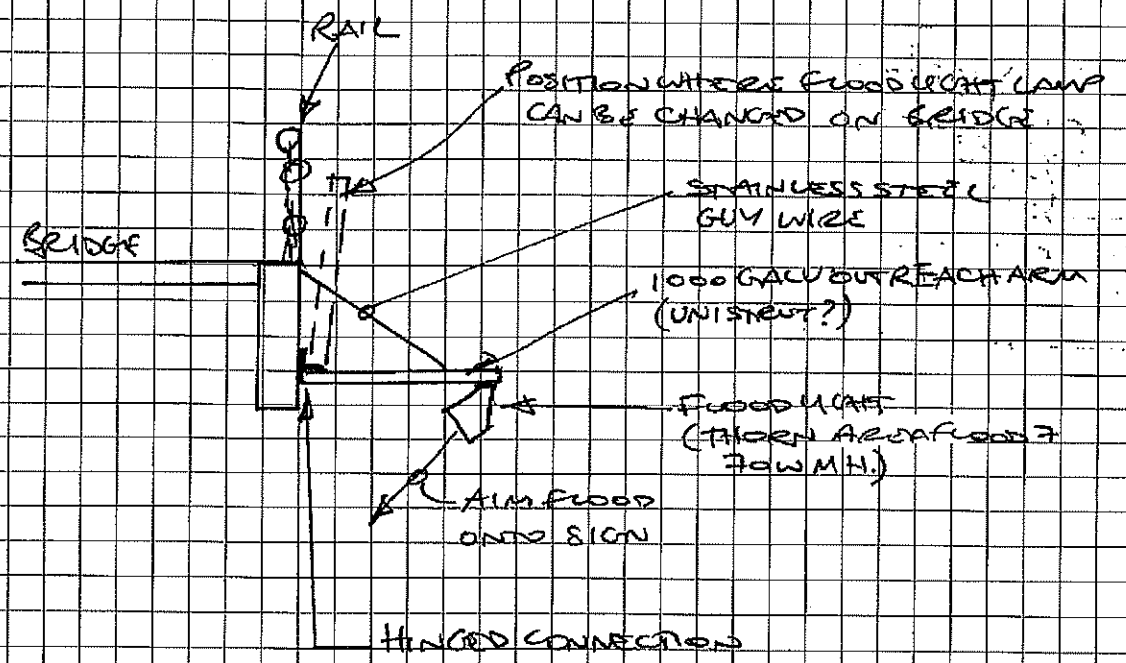
Checked: CO

Project No: 6582

Project: TOT – BRIDGE

Date: 7/9/07.

Sheet: 1 of 1




CXCV310A


CXCV432A


CXCV532A


CXSW332A


CXSO310A


CXSO532A


CXE1


CXE2

DESCRIPTION	CATALOGUE NUMBER	SPLIT PK TRADE EACH $	TRADE EACH $	RETAIL EACH $ (Inc GST)	STD PK	CTN QTY
CLIPSAL XTREME Hi-Impact Industrial Switchgear						
Clipsal Xtreme products have been tested for protection against ingress of water and dust to International Protection Rating IP66. Available in Grey (GY) only						
Combination Switched Socket Outlets - IP66 (40803)						
250V 10A 3 Flat pin	CXCV310A		76.52	105.22	1	
250V 15A 3 Flat pin	CXCV315A		88.68	121.94	1	
250V 20A 3 Round pin	CXCV320A		197.30	271.29	1	
250V 32A 3 Round pin	CXCV332A		266.32	366.19	1	
500V 10A 4 Round pin	CXCV410A		167.50	230.31	1	
500V 20A 4 Round pin	CXCV420A		181.07	248.97	1	
500V 32A 4 Round pin	CXCV432A		295.59	406.44	1	
500V 40A 4 Round pin	CXCV440A		437.52	601.59	1	
500V 50A 4 Round pin	CXCV450A		518.20	712.53	1	
500V 10A 5 Round pin	CXCV510A		205.81	282.99	1	
500V 20A 5 Round pin	CXCV520A		202.74	278.77	1	
500V 32A 5 Round pin	CXCV532A		290.35	399.23	1	
500V 40A 5 Round pin	CXCV540A		448.39	616.54	1	
500V 50A 5 Round pin	CXCV550A		525.92	723.14	1	
Surface Switches - IP66 (40805)						
250V 10A Single Pole	CXSW110A		50.41	69.31	1	
250V 10A Single Pole 2 way switch mechanism	CXSW110/2A		64.61	88.84	1	
250V 10A Single Pole Intermediate switch mechanism	CXSW110/IA		84.01	115.51	1	
250V 16A Single Pole	CXSW116A		60.90	83.74	1	
250V 20A Single Pole	CXSW120A		56.88	78.21	1	
250V 32A Single Pole	CXSW132A		69.08	94.99	1	
250V 50A Single Pole	CXSW150A		80.99	111.36	1	
500V 10A Double Pole	CXSW210A		84.34	115.97	1	
500V 16A Double Pole	CXSW216A		87.59	120.44	1	
500V 20A Double Pole	CXSW220A		105.10	144.51	1	
500V 32A Double Pole	CXSW232A		136.92	188.27	1	
500V 50A Double Pole	CXSW250A		145.36	199.87	1	
500V 10A Triple Pole	CXSW310A		84.91	116.75	1	
500V 20A Triple Pole	CXSW320A		84.74	116.52	1	
500V 32A Triple Pole	CXSW332A		117.18	161.12	1	
500V 50A Triple Pole	CXSW350A		138.13	189.93	1	
Insulated Socket Outlets - IP66 (40802)						
250V 10A 3 Flat pin	CXSO310A		71.02	97.65	1	
250V 15A 3 Flat pin	CXSO315A		75.47	103.77	1	
250V 20A 3 Round pin	CXSO320A		119.01	163.64	1	
250V 32A 3 Round pin	CXSO332A		159.24	218.96	1	
500V 10A 4 Round pin	CXSO410A		127.05	174.69	1	
500V 20A 4 Round pin	CXSO420A		137.63	189.24	1	
500V 32A 4 Round pin	CXSO432A		182.92	251.52	1	
500V 40A 4 Round pin	CXSO440A		264.04	363.06	1	
500V 50A 5 Round pin	CXSO450A		328.51	451.70	1	
500V 10A 5 Round pin	CXSO510A		131.58	180.92	1	
500V 20A 5 Round pin	CXSO520A		145.19	199.64	1	
500V 32A 5 Round pin	CXSO532A		190.57	262.03	1	
500V 40A 5 Round pin	CXSO540A		270.64	372.13	1	
500V 50A 5 Round pin	CXSO550A		334.25	459.59	1	
Modular Range Enclosures (Back Boxes) IP66						
1 Gang (101x101x63mm)	CXE1		19.78	27.20	1	
2 Gang (198x101x63mm)	CXE2		39.60	54.45	1	
2 Gang C/w divider (198x101x63mm)	CXE2DIV		39.60	54.45	1	
4 Gang (203x203x65mm)	CXE4		79.13	108.80	1	

Trade prices are shown EXCLUSIVE of GST - Retail prices are shown INCLUSIVE of GST

ATTACHMENT 9: HAUL ROUTE PLANS

KEY PLAN

01	ORIGINAL ISSUE	23.07.2007
Issue	Description	Date

100mm on Original

Scale (Plan): NOT TO SCALE

Scale (Sections):

Surveyor: BRAZIER MOTTI

Architect: BUCHAN GROUP

Filename: K417-K423-QL00704-01-TEMP BRIDGE MARINE HAUL ROUTE.DWG

Client: Townsville Ocean Terminal

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION

Approved

R.F.P.Q No :

Scales	NTS	Current Issue Signatures	
		Author P.S.M	
Original Size	A1	Designer R.M	
Height Datum	AHD	Reviewer J.S	
Grid	GRID	© Copyright reserved	

Project: TOWNSVILLE OCEAN TERMINAL PROJECT

Title: TEMPORARY BRIDGE HAUL ROUTE MARATHON QUARRY

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E-mail: goldcoast@hyderconsulting.com
Web: www.hyderconsulting.com

Drawing No.	Project No.	Issue
K417	QL00704	01

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KEY PLAN

01	ORIGINAL ISSUE	23.07.2007
Issue	Description	Date

100mm on Original

Scale (Plan): NOT TO SCALE

Scale (Sections):

Surveyor: BRAZIER MOTTI

Architect: BUCHAN GROUP

Filename: K424-K425-QL00704-01-TEMP BRIDGE HAUL PINNACLE.DWG

Client: Townsville Ocean Terminal

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION

Approved

R.E.P.Q No :

Scales	NTS	Current Issue Signatures	
		Author P.S.M	
Original Size	A1	Designer R.M	
Height Datum	AHD	Reviewer J.S	
Grid	GRID	© Copyright reserved	

Project: TOWNSVILLE OCEAN TERMINAL PROJECT

Title: TEMPORARY BRIDGE HAUL ROUTE PINNACLE QUARRY

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Drawing No.	Project No.	Issue
K424	QL00704	01

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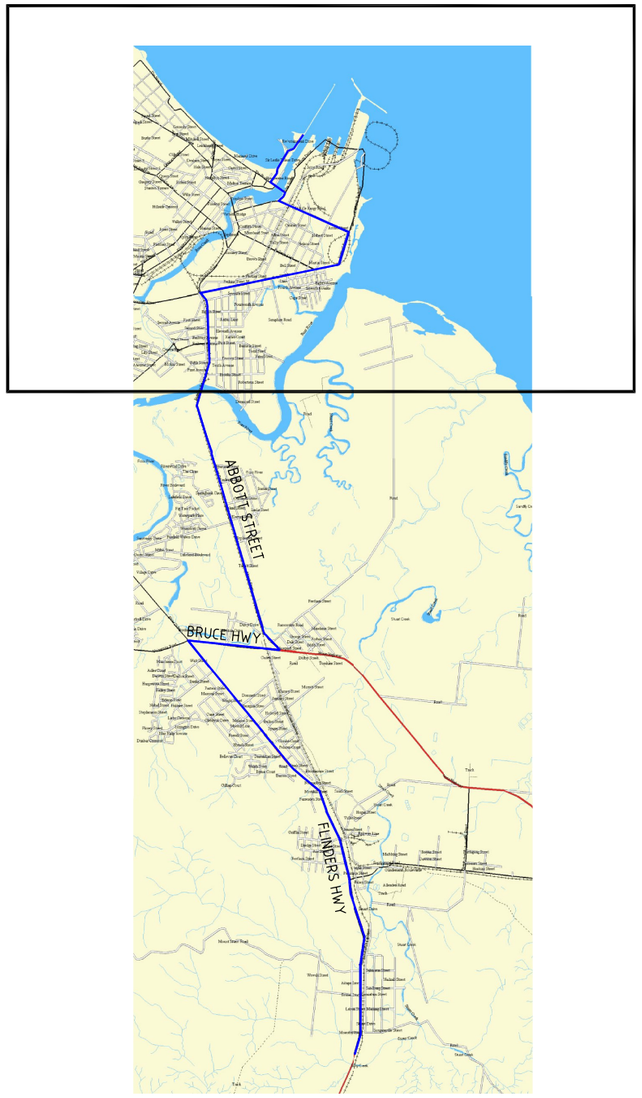

KEY PLAN

01	ORIGINAL ISSUE	23.07.2007
Issue	Description	Date

100mm on Original

Scale (Plan): NOT TO SCALE

Scale (Sections):

Surveyor: BRAZIER MOTTI

Architect: BUCHAN GROUP

Filename: K426-K428-QL00704-01- TEMP BRIDGE HAUL ROSENEATH.DWG

Client: Townsville Ocean Terminal

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION

Approved

R.E.P.Q No :

Scales	NTS	Current Issue Signatures	
		Author P.S.M	
Original Size	A1	Designer R.M	
Height Datum	AHD	Reviewer J.S	
Grid	GRID	© Copyright reserved	

Project: TOWNSVILLE OCEAN TERMINAL PROJECT

Title: TEMPORARY BRIDGE HAUL ROUTE ROSENEATH QUARRY

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Drawing No.	Project No.	Issue
K426	— QL00704	— 01

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