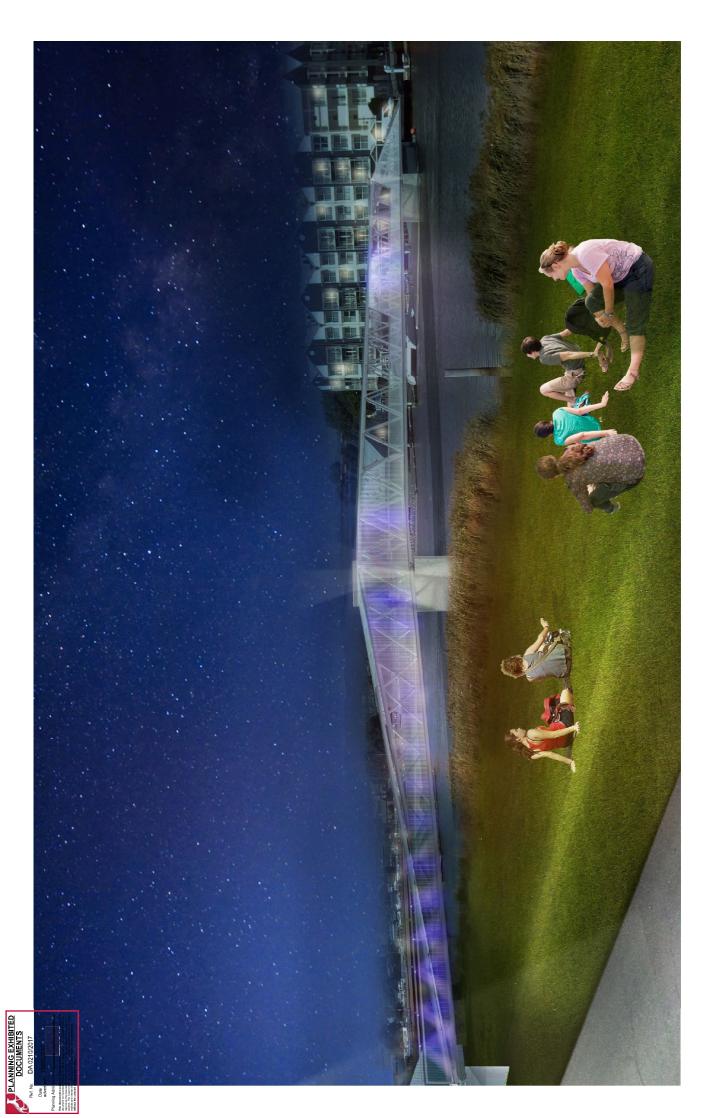
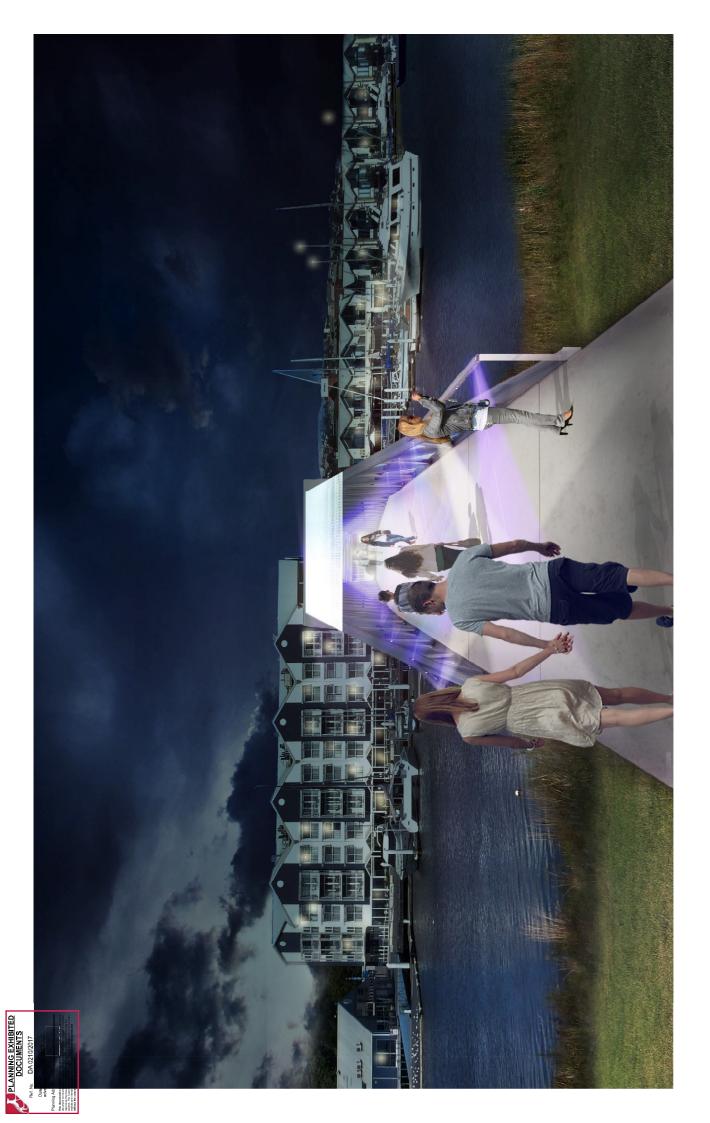


# Northbank Seaport Pedestrian Bridge |



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# North Bank Pedestrian Bridge Development Application

The City of Launceston

May 2017

COMMERCIAL PROJECT DELIVERY

Project + Construction Management

Document Set ID: 3524564 Version: 2, Version Date: 09/05/2017



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# **Appendices**

- A Development Plans
- B Certificates of Title
- C Draft Construction and Environmental Management Plan
- D Vegetation, Flora and Fauna Assessment
- E Approved Reserve Activity Assessment
- F Environmental Site Assessment
- G Hydraulic Modelling and Investigation for Pedestrian Bridges over the North Esk River

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# 1. Introduction

# 1.1 Purpose of the Report

Commercial Project Delivery (CPD) have been engaged on behalf of the Major Projects Department, The City of Launceston to prepare and lodge an application to construct a pedestrian footbridge over a portion of the North Esk River to connect the north-western and south-eastern banks of the river between the Seaport complex and the North Bank development site. The pedestrian bridge will provide an important pedestrian linkage between the Seaport and CBD and the North Bank recreation precinct (once developed).

This report forms the basis of the application and has been prepared taking into account the provisions of the Launceston Interim Planning Scheme 2015.

Enquiries relating to this request can be directed to:

Chloe Lyne Planning and Development Consultant Commercial Project Delivery 1/47A Brisbane St Launceston TAS 7250

0408 397 393

# 1.2 <u>Statutory References</u>

#### 1.2.1 Name of Planning Instrument

The subject of the proposed amendment is the *Launceston Interim Planning Scheme 2015* (hence forth referred to as the interim planning scheme).

#### 1.2.2 Name of Planning Authority

The Planning Authority is the Launceston City Council ('Council')

# 1.3 <u>Description of Proposed Development</u>

The proposed pedestrian bridge will span 118.85 metres across the North Esk River from the Seaport to North Bank as shown in the photomontage at Figure 1 below.

The Seaport abutment will be aligned such that it will line up with the existing pedestrian walkway on the south-western side of Mud Bar. The North Bank abutment will line up with future walkways along the levee bank. These works (including lowering of levee bank and construction of the walkway along it) will be subject to a separate Development Application.



Figure 1 - Visualisation of proposed pedestrian bridge

The bridge structure comprises four concrete piers which will be pile driven into the river bed. The shared access bridge is to have a 4 metre wide walking and three spans with the central span 60 metres and two smaller 28 metre spans at the abutments. The proposed bridge structure is to be a steel walk through truss to minimise the effect on the river and its users. The lowest point of the bridge deck is at 1:50 year ARI flood level whilst the centre of the bridge deck is design to be above 1:2000 year ARI. The steel trussed superstructure has a maximum height above deck level of 5 metres and a width of 5 metres (the deck width is 4 metres).

Details of the proposed works are summarised as follows:

- Installation of rock rip rap under the North Bank abutment of the bridge, 10 metres wide;
- Install a number of fill batters around the North Bank abutment;
- The North Bank abutment includes a retaining wall with a nominal maximum height of 2 metres::
- The crest of the bridge deck will be at RL 5.287; and is located to the east of pier 2;
- A tie rod/cable will be installed between Pier 2 and the North Bank abutment;
- 1.4 metre high hand rails will be installed along the edges of the deck;
- There will be a 2.5 metre clearance from the deck to the truss superstructure;

Note – there is reference on the development plans to levee lowering works which (as indicated on the plans) will be subject to a separate DA.

Development Plans, including additional photomontages are attached as *Appendix A*.

The Draft Construction Environmental Management Plan at *Appendix C* provides details as to the construction methodology.



# 1.4 Basis of Design

The Project Design Engineers, JMG prepared a basis of design report that outlined the various factors that influenced the design of the bridge. A summary of those factors is outlined below and provides an understanding of the resultant design.

- The current navigable width of the river at the location of the bridge is 44 metres. This width has been maintained by the main span of the bridge with the width of 60 metres.
- The location of the bridge will impact on the existing marina and reduce the ability for large boats and yachts to travel up stream beyond the bridge. However smaller power boats could still access this area so it may be possible for this section of the marina to cater for these vessels.
- The location of Pier 4 in line with the outer edge of the of the existing pontoon (to be removed) on the Seaport side is designed to not further restrict the access to vessels upstream and it is noted that the water velocities on this side are less.
- The layout of four piers is considered the best layout to limit impact on the river for users and hydraulic flows.
- The proposed bridge is for use by pedestrians and cyclists and as such the deck needs a minimum useable width of 3 metres for 2 way use. The proposed deck width is 4 metres;
- The bridge deck achieves the maximum deck slope of 1 in 33 over the length of the bridge profile which meets design requirements under the accessibility code AS1428 and negates the need for landings or stairs.
- On the Seaport side, the existing wharf level has been used as the start of the vertical alignment (AHD 2.72m).
- On the North Bank side, ultimately the bridge will provide level access to the old levee which is to be reduced in height to 4.2m and will have a 6 metre wide pathway along it. The levee works do not form part of this application. The reason being, is that they require additional design and investigation and the works programme for the bridge means that construction needs to commence in mid 2017.
- The bridge structure has been designed to maximise the navigable area under the bridge for rowers and other river users and to reduce the likelihood of inundation of the structure.:
- AS5100.2-2004 Clause 15.2.1 calls for the "bridge to withstand, without collapse, any flood of a
  magnitude up to and including that with a 1:2000 ARI event. The bridge has been designed to
  this standard which aims to minimise the likelihood of failure of the structure;



# 2. Subject Site

# 2.1 The Subject Land

The subject site extends from Seaport at the location of the existing western most pontoon to North Bank, at a location to the west of the St Patricks Rowing Club. The North Bank abutment is located on land at 79 Lindsay Street whilst the Seaport abutment is located on land at Home Point. The proposed bridge is located approximately 200 m downstream of the Charles Street Bridge. The proposed bridge is to be located on a straight section of the river, between two bends.



Figure 2 - Site Plan

The North Bank abutment is contained in the Open Space Zone, the North Esk River is within the Environmental Management Zone whilst the Seaport abutment is adjacent to the Particular Purpose Zone 3 – Seaport. An assessment of the proposal against the PPZ3 – Seaport provisions is included as there are some minor works within that zone but the bridge structure itself is confined to the Open Space and Environmental Management Zones.

Figure 2 shows that the site impacted by three Overlays being:

- Flood Risk Area Seaport abutment and North Esk River.
- Invermay/Inveresk Flood Risk Area North Bank abutment
- Priority Habitat North Esk River.





Figure 3- Zoning Plan

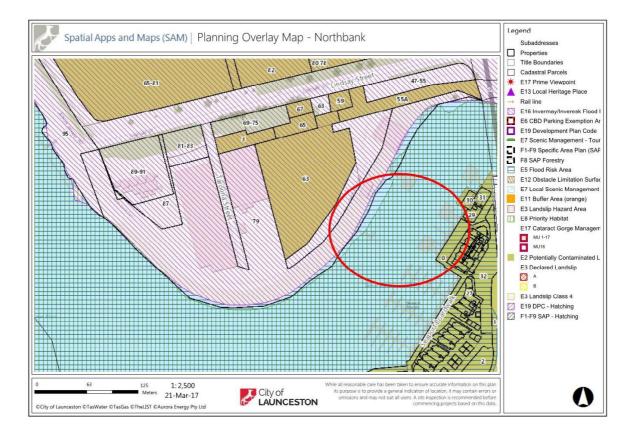


Figure 4 - Overlay Plan



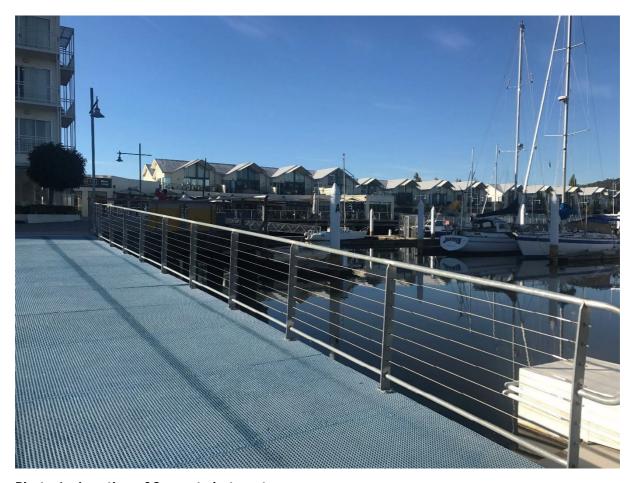


Photo 1 - Location of Seaport abutment





Photo 2 – Location of North Bank abutment looking across to Seaport abutment.

# 2.2 <u>Title Information</u>

The proposed development application relates to the following titles:

Address	Owner(s)	Title Reference	Existing Land Area
79 Lindsay Street, Invermay	City of Launceston	169882/1	59462m <sup>2</sup>
Home Point Parade	City of Launceston	136349/3	64573m <sup>2</sup>
North Esk River – between Seaport and North Bank development site	Crown Land Services (managed by Parks and Wildlife)		2

Copies of relevant certificate of titles are contained at  $\emph{Appendix B}$ .



# 2.3 <u>Description of Area</u>

Located in the inner-city suburb of Invermay, the North Bank Precinct encompasses the riverfront parcels of land at the confluence of the North Esk River and the Tamar Estuary to the south of Lindsay Street.

The site is in close proximity and within walking distance (500 metres) from the Central Business District (CBD). The Seaport is developed with a range of marina facilities, a hotel, restaurants and cafes and residential development. The North Bank abutment is located on the southern side of the old levee bank (no longer the primary flood protection tool for the City since the development of the larger levee further to the north). The North Bank Precinct has been compulsorily acquired as part of the levee development. Boral Concrete still operate from the eastern portion of the site. The Seaport abutment is at the wharf adjacent to a public walkway along the Seaport foreshore.

# 2.4 <u>Servicing</u>

Both abutments (North Bank and Seaport) can be connected to full reticulated services.

# 2.5 Access and Road Network

There is no direct road access or frontage to either of the titles to which the bridge is abutting. There are however, excellent pedestrian linkages to both abutments, being the Seaport Boulevard and the shared pathway along the levee embankment on the North Bank side of the river.



# 3. Background to the Proposed Development

The proposed pedestrian footbridge is a key element of the North Bank masterplan. It provides a safe pedestrian linkage between the well-utilised area of Seaport and the CBD beyond and the soon to be developed North Bank Recreation Precinct.

The key drivers for the project are as follows;

- Economic Development
- The linking of precincts within the CBD
- Enhance economic recreational activities for the regional public
- Improved visual amenity and outlook from the existing seaport precinct
- Expanded opportunities for interaction with the river edge environment
- Increased opportunities for passive and active recreational pursuits
- Completion of the missing link between established areas across the city
- Improved connectivity for pedestrians and cyclists from the CBD to the North Bank Precinct.

# 3.1 <u>Consideration of Aboriginal Heritage</u>

A review of the Aboriginal Heritage Register by Aboriginal Heritage Tasmania has confined that there are no present Aboriginal Heritage sites recorded within or close to the proposal site. Further, AHT responded that due to a review of previous reports and the area being highly disturbed that the area has a low probability of Aboriginal heritage being present. Accordingly, there was no requirement for an Aboriginal heritage investigation to occur.

# 3.2 <u>Consideration of Natural and Landscape Values</u>

A Vegetation, Flora and Fauna Assessment has been prepared for the subject site and a copy included as *Appendix D*. Further, the Reserve Activity Assessment that has been approved for the site discusses and considers natural and landscape values. A copy of this is included as *Appendix E*. The assessment confirms that the entirety of the project area contains non-native vegetation communities. No plant species listed as threatened on the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* were detected from within or adjacent to the study area.

Two plant species listed as rare under the *Tasmanian Threatened Species Act 1995*, were identified in the riparian vegetation within the proposed works area being *Calystegia sepium* (swamp bindweed) and *Schoenoplectus tabernaemontani* (river clubsedge). Given it will not be possible to avoid these species, application has been made to the Natural and Cultural Heritage Division of DPIPWE for a permit to remove.

The Vegetation, Flora and Fauna Assessment found no significant habitat for threatened fauna present within the proposed works area.

The Vegetation, Flora and Fauna Assessment made several recommendations, all of which are being/have been adhered to by the City of Launceston through the RAA process which required a detailed Construction Environmental Management Plan to be prepared. A copy of the draft CEMP is included as *Appendix C* to this report. The CEMP will be finalised once the tender for design and construction of the bridge is awarded.



# 4. Development Application Assessment

# 4.1 Zoning

As described in section 2.1, the subject site traverses the Open Space, Environmental Management and Particular Purposes – Seaport Zones under the interim planning scheme.

# 4.2 <u>Use Categorisation</u>

In accordance with Clause 8.2, the proposed pedestrian footbridge is appropriately classified as 'Passive Recreation', which is defined as follows in Table 8.2 of the interim planning scheme:

'use of land for informal leisure and recreation activities principally conducted in the open. Examples include public parks, gardens and playgrounds, and foreshore and riparian reserves.'

### 4.3 Approval Status

Passive Recreation is identified as a no permit required use class in all three zones. However, the application is assessed as discretionary as it does not comply with the acceptable solutions identified below. It relies on assessment against the associated Performance Criteria:

Open Space Zone:

• 19.4.1 – building height, setback and siting (P1 and P2)

Environmental Management Zone:

• 29.5.2 – building height, setback and siting (P2, P3)

Potentially Contaminated Land Code:

- E2.5.1 Use Standards (P1)
- E2.6.2 Excavation (P1)

Water Quality Code:

- E9.6.1 Development in the vicinity of watercourses and wetlands (P1)
- E9.6.2 Development of watercourses and wetland (P2)

Invermay/Inveresk Flood Inundation Code

• E16.7.2 Flood Impact (P3)

# 4.4 Open Space Zone Provisions

## 4.4.1 Zone Purpose

19.1 Zone Purpose



23.1.1 To provide land for open space purposes including for passive recreation and natural or landscape amenity.

The proposed use of the site for a pedestrian footbridge designed to connect two recreational areas and walking trails is entirely in accordance with the zone intent as demonstrated by its use status as 'no permit required.'

#### **Use Standards**

In accordance with Table 19.3, the Use Standards do not apply to Passive Recreation.

#### **Development Standards**

#### 19.4.1 Building height, setback and siting

### **Objective**

To ensure that building bulk, form and siting:

- (a) Is compatible with the character of the surrounding area;
- (b) Protects the amenity of adjoining lots and surrounding uses; and
- (c) Respects the natural and landscape values of the site.

#### Acceptable Solution

# P1

Performance Criteria

A1

Building height must be no greater than 5m.

Building height must be compatible with the character of the surrounding area, and protect the amenity of adjoining lots and surrounding uses, having regard to:

- (a) the topography of the site;
- (b) height of buildings on the site, adjoining lots and adjacent lots;
- (c) the natural and landscape values of the site:
- (d) the bulk and form of existing and proposed buildings;
- (e) the allowable building heights;
- (f) the apparent height when viewed from roads and public spaces;
- (g) sunlight to private open space and windows of habitable rooms on adjoining lots;
- (h) the existing screening or the ability to implement screening; and
- (i) any overshadowing of adjacent lots or public places.



#### A2

Setback from all boundaries must be no less than 10m

P2

Buildings must be sited so that there is not unreasonable loss of amenity to the occupiers of adjacent lots having regard to:

- (a) the topography of the site;
- (b) the size, shape and orientation of the site:
- (c) the natural and landscape values of the site:
- (d) the setbacks of surrounding buildings;
- (e) the height, bulk and form of existing and proposed buildings;
- (f) the privacy to private open space and windows of habitable rooms on adjoining lots;
- (g) sunlight to private open space and windows of habitable rooms on adjoining lots;
- (h) the existing screening or the ability to implement screening; and
- (i) the character of the surrounding area.

#### Complies with P1 and P2

Whilst the proposed superstructure of the bridge has a maximum height of 5 metres, the overall height to the river bed including the piers is approximately 12.7 metres (between pier 2 and 3), therefore compliance with A1 is not achieved. The following assessment is made against the relevant Performance Criteria (P1)

- (a) Given the proposed structure is a bridge across a river, its overall height above ground level (taken as the river bed) is necessarily going to be greater than 5 metres given the depth of the river. The overall height of the superstructure is 5 metres, which is consistent with the permitted standard and is in effect the portion of the bridge that will be visible from the surrounding area (excluding the piers above water level). The overall height of the structure visible above the water level will alter as the tides alter water height and the overall height from the river bed (whilst not visible) will also change as the river bed sedimentation moves.
- (b) The proposed bridge height is not such that it will dominate the landscape and the portion of the structure that will be visible above water level at any given time is much less than the overall height of the seaport buildings on the Seaport side and the Silos on the North Bank side.
- (c) The natural and landscape values were considered through the Reserve Activity Assessment process (approved).



- (d) (e) The 5 metre allowable building height is largely adhered to by the visible aspect of the structure being the deck and superstructure. There are a few existing buildings in the general area with significantly greater visible heights including the Seaport buildings and the Silos Hotel.
- (f) The overall height of the bridge when viewed from road and public spaces will not dominate the landscape. There are numerous buildings in the vicinity with significantly greater heights and a view of a bridge across a river is not an uncommon site.
- (g) The bridge will not impact on sunlight to private open spaces or windows of habitable rooms on adjoining lots in any way.
- (h) It is not practical to screen the bridge in any way. It has been designed to be aesthetically pleasing and a structure to be admired and noticed rather than screened.
- (i) The bridge will not cause any overshadowing of adjacent lots or public places.

The proposed footbridge will be constructed to the south-eastern title boundary of the Crown land within which the river lies and to the north-western boundary of 79 Lindsay Street. The application therefore relies on P2. Assessment against the matters in P2 is provided below, however it is noted that in this instance, reduced boundary setback is entirely appropriate given the nature of the proposal and the necessity of spanning the entire width of the river. The title boundaries do not have any bearing on design and given the bridge structure will not cause overshadowing or overlooking to adjacent properties.

- (a) The topography of the site does not have a bearing on reduced setbacks;
- (b) The width of the Crown land title encompassing the North Esk River and the long, narrow nature of 79 Lindsay Street, means that to design a bridge that spans the river, reduced boundary setbacks is inevitable and appropriate.
- (c) The natural values of the site have been considered and addressed through the design phase and the RAA.
- (d) (e) There are no buildings on the North Bank side of the bridge. The Seaport abutment at a zero boundary setback will have no impacts on the adjacent Hotel and will not cause any overshadowing or overlooking impacts. The location of the bridge immediately outside of the hotel offer additional walking and recreational activities for guests.
- (f) The overall height of the bridge when viewed from road and public spaces will not dominate the landscape. There are numerous buildings in the vicinity with significantly greater heights and a view of a bridge across a river is not an uncommon site.
- (g) The bridge will not impact on sunlight to private open spaces or windows of habitable rooms on adjoining lots in any way.
- (h) It is not practical to screen the bridge in any way. It has been designed to be aesthetically pleasing and a structure to be admired and noticed rather than screened.
- (i) The bridge will not cause any overshadowing of adjacent lots or public places.



#### 19.4.2 Landscaping

#### **Objective**

To ensure that development is landscaped to retain the natural values of the site and contributes to the broader landscape of the area.

#### Acceptable Solution

#### A1

If for no permit required uses.

#### Performance Criteria

P1

Development must be landscaped to respect the natural values of the site and the broader landscape of the area, having regard to:

- (a) location and height of retaining walls;
- (b) the existing vegetation and its retention to where it is feasible to do
- (c) the location of any proposed buildings, driveways, car parking, storage areas, signage and utility services;
- (d) proposed height and type of fencing;
- (e) the location of pedestrian movement routes;
- (f) maintenance of plantings, weed management and soil and water management; and
- (g) the character of the surrounding area

as shown in a detailed landscaping plan

Complies with A1 – passive recreation is a no permit required use.

Clause 19.4.3 Lot size and dimension – not applicable

Clause 19.4.4 Frontage and access - not applicable

Clause 19.4.5 Discharge of stormwater - not applicable

Clause 19.4.6 Water and sewerage services - not applicable



# 4.5 <u>Environmental Management Zone Provisions</u>

#### 4.5.1 Zone Purpose

29.1	Zone Purpose
29.1.1.1	To provide for the protection, conservation, and management of areas with significant ecological, scientific, cultural or aesthetic value, or with a significant likelihood of risk from a natural hazard.
29.1.1.2	To allow for complementary use or development where consistent with any strategies for protection and management.
29.1.1.3	To provide for complementary use and development on non-reserved land.

The proposed use of the site for a pedestrian footbridge designed to connect two recreational areas and walking trails is entirely in accordance with the zone intent as demonstrated by its use status as 'no permit required.'

#### **Use Standards**

#### 29.4.1 Reserved land

#### **Objective**

To ensure that use recognises and reflects relevant values of reserved land

#### **Acceptable Solution**

#### A1

Use is in accordance with:

- (a) a Reserve Activities Assessment approved under the National Parks and Reserves Management Act 2002, or Nature Conservation Act 2002; or
- (b) the approval of the Director General of Lands under the Crown Lands Act 1976.

#### Performance Criteria

P1

Use is consistent with the ecological, scientific, cultural or aesthetic values of the land, having regard to:

- (a) the significance of the ecological, scientific, cultural or aesthetic values;
- (b) the protection, conservation, and management of the values;
- (c) the risk from natural hazards;
- (d) the specific requirements of the use to operate;
- (e) the location and scale of the use proposed;
- (f) the characteristics and type of the use proposed;
- (g) traffic and parking generation;
- (h) any emissions and waste produced by the use;
- (i) the measures to minimise or mitigate



impacts;

- (j) the storage and handling of goods, materials and waste;
- (k) the proximity of any sensitive uses; and
- (I) the advice of the manager of the land.
- (m) sunlight to private open space and windows of habitable rooms on adjoining lots;
- (n) the existing screening or the ability to implement screening; and
- (o) any overshadowing of adjacent lots or public places.

## Complies with A1

Use is in accordance with an approved Reserve Activities Assessment (copy of approved RAA included as *Appendix E*).

#### 29.4.1 Use of non-reserved land

#### **Objective**

To ensure that the use on land that is not reserved land operates at a scale and manner that supports the zone purposes.

#### Acceptable Solution

#### A1

For a permitted or no permit required use..

#### Performance Criteria

P1

Use is compatible with the ecological, scientific, cultural or aesthetic values of the land, having regard to:

- (a) the significance of the ecological, scientific, cultural or aesthetic values;
- (b) the protection, conservation, and management of the values;
- (c) the risk from natural hazards;
- (d) the specific requirements of the use to operate;
- (e) the location and scale of the use proposed;
- (f) the characteristics and type of the use proposed;
- (g) traffic and parking generation;
- (h) any emissions and waste produced by



the use;

- (i) the measures to minimise or mitigate impacts;
- (j) the storage and handling of goods, materials and waste; and
- (k) the proximity of any sensitive uses.the characteristics and type of the use proposed;
- (I) traffic and parking generation;
- (m) any emissions and waste produced by the use;
- (n) the measures to minimise or mitigate impacts;
- (o) the storage and handling of goods, materials and waste;
- (p) the proximity of any sensitive uses; and
- (q) the advice of the manager of the land.
- (r) sunlight to private open space and windows of habitable rooms on adjoining lots;
- (s) the existing screening or the ability to implement screening; and
- (t) any overshadowing of adjacent lots or public places.

## Complies with A1

Passive Recreation is a no permit required use in the zone.

#### **Development Standards**

#### 29.5.1 Development area

#### **Objective**

To ensure the development area:

- (a) responds to the values of the site; and
- (b) minimises disturbance of the site.

Acceptable Solution	Performance Criteria
A1	P1
Development area must not;	Development does not adversely affect the
(a) be greater than 20%; or	values of the site, having regard to:
	(a) the design, siting, scale and type of



- (b) be in accordance with a Reserve Activity
  Assessment approval granted under the
  National Parks and Reserves Management
  Act 2002 or Nature Conservation Act 2002;
  or
- (c) be in accordance with an approval of the Director General of Lands under the Crown Lands Act 1976..

development;

- (b) the operation of the use;
- (c) any natural hazards;
- (d) the impact of the development on the values of the site;
- (e) the need for the development to be located on the site;
- (f) how any significant values are managed; and

any protection, restoration, remediation or mitigation works.

# Complies with A1

Development is in accordance with an approved Reserve Activities Assessment (copy of approved RAA included as *Appendix E*).

# 29.5.2 Building height, setback and siting

#### **Objective**

To ensure that the design and siting of buildings responds appropriately to the value of the site.

#### Acceptable Solution

#### A1

Building height must:

- (a) be no greater than 6m; or
- (b) be in accordance with a Reserve Activity
  Assessment approval granted under the
  National Parks and Reserves Management
  Act 2002 or Nature Conservation Act 2002;
  or
- (c) be in accordance with an approval of the Director General of Lands under the Crown Lands Act 1976.

#### Performance Criteria

#### P1

Building height must be appropriate to the values of the site, having regard to:

- (a) the values of the site;
- (b) the building bulk and form;
- (c) the topography of the site;
- (d) existing buildings on the site;
- (e) the height of buildings on the site, adjoining lots and adjacent lots;
- (f) the visual impact of the building when viewed from a road; and
- (g) the character of the surrounding area.

#### Complies with A1

Development is in accordance with an approved Reserve Activities Assessment (copy of approved RAA included as *Appendix E*).

A2.1	P2
Buildings, other than for a sensitive use,	Building setback must be appropriate to
must be setback from a frontage:	the values of the site, having regard to:
(a) no less than 10m; or	(a) the topography of the site;



(b) no less than the existing building for an extension; or

#### A2.2

Buildings for a sensitive use, must be setback from a frontage:

- (a) no less than 10m; or
- (b) no less than 100m from the boundary of a frontage, where the Rural Resource zone is located opposite the frontage; or
- (c) no less than the existing building for an extension; or

- (b) the setbacks of surrounding buildings;
- (c) the height, bulk and form of existing and proposed buildings;
- (d) the appearance when viewed from roads and public places;
- (e) the retention of vegetation;
- (f) the existing or proposed landscaping;
- (g) the safety of road users;
- (h) separation from agricultural uses or other primary industries; and the character of the surrounding area.

#### A2.3

Buildings must be setback from a frontage:

- (a) in accordance with a Reserve Activity
  Assessment approval granted under the
  National Parks and Reserves
  Management Act 2002 or Nature
  Conservation Act 2002; or
- (b) in accordance with an approval of the Director General of Lands under the Crown Lands Act 1976.

#### Complies with P2

The nature of the Crown land title over which the Environmental Management Zone exists (North Esk River) is such there is no defined frontage. It is submitted that in this instance, reduced boundary setback (zero setback to the south-eastern boundary with Seaport) are entirely appropriate given the nature of the proposal and the necessity of spanning the entire width of the river. The title boundaries do not have any bearing on design and given the bridge structure will not cause overshadowing or overlooking to adjacent properties.

A3.1

Buildings, other than for a sensitive use, must be setback from a side or rear P3

Building setback must be appropriate to the values of the site, having regard to:



boundary:

(a) no less than 10m; or

(b) no less than the existing building for an extension; or

A3.2

Buildings for a sensitive use, must be setback from a side or rear boundary:

(a) no less than 10m; or

- (b) no less than 200m from the boundary of the Rural Resource zone; or
- (c) no less than the existing building for an extension; or

A3.3

Buildings must be setback from a side or rear boundary:

(a) in accordance with a Reserve Activity
Assessment approval granted under the
National Parks and Reserves
Management Act 2002 or Nature
Conservation Act 2002; or

(b) in accordance with an approval of the Director General of Lands under the Crown Lands Act 1976.

Complies with P3

the values of the site, having regard to:

Building setback must be appropriate to

- (a) the topography of the site;
- (b) the setbacks of surrounding buildings;
- (c) the height, bulk and form of existing and proposed buildings;
- (d) the appearance when viewed from roads and public places;
- (e) the retention of vegetation;
- (f) separation from primary industry uses; and

the character of the surrounding area.

The nature of the Crown land title over which the Environmental Management Zone exists (North Esk River) is such there is no defined side or rear boundaries. It is submitted that in this instance, reduced boundary setback (zero setback to the south-eastern boundary with Seaport) are entirely appropriate given the nature of the proposal and the necessity of spanning the entire width of the river. The title boundaries do not have any bearing on design and given the bridge structure will not cause overshadowing or overlooking to adjacent properties.



#### 29.5.3 Exterior finish

#### **Objective**

To facilitate unobtrusive development

#### Acceptable Solution

A1

The exterior finish is:

- (a) a non-reflective material coloured in dark natural tones of grey, green, brown or black; or
- (b) in accordance with a Reserve Activity
  Assessment approval granted under the
  National Parks and Reserves
  Management Act 2002 or Nature
  Conservation Act 2002; or
- (c) in accordance with an approval of the Director General of Lands under the Crown Lands Act 1976...

#### Performance Criteria

P1

The building must be compatible with the natural landscape character of the site, having regard to:

- (a) the topography of the site;
- (b) the existing vegetation;
- (c) the dominant colours of the vegetation and surrounding area;
- (d) the nature of the development;
- (e) the nature of the exterior finishes;
- (f) the visual impact; and
- (g) the character of the surrounding area.

#### Complies with A1

Development is in accordance with an approved Reserve Activities Assessment (copy of approved RAA included as *Appendix E*).

#### 29.5.4 Landscaping and Vegetation Management

#### **Objective**

To ensure that the site contributes to the ecological, scientific, cultural or aesthetic values of the surrounding area.

# Acceptable Solution Performance Criteria

A1

Development is;

(a) for a permitted or no permit required use; or

P1

Development must be located to minimise the impact on the site and surrounding area,

having regard to:



- (b) is in accordance with a Reserve Activity

  Assessment approved under the National

  Parks and Reserves Management Act 2002

  or Nature Conservation Act 2002; or
- (c) in accordance with an approval of the Director General of Lands under the Crown Lands Act 1976.
- (a) the ecological, scientific, cultural or aesthetic values;
- (b) the removal of vegetation;
- (c) the type, size and design of development, including buildings, outbuildings, structures, car parking, roads, driveways, pathways, walking trails, storage areas, signage and utility services, fences, retaining walls and undisturbed areas;
- (d) the type, growth, habit, texture and suitability of any vegetation species proposed;
- (e) weed management;
- (f) the preparation, planting, timing and maintenance of the vegetation and landscaping during and after construction;
- (g) the extent that landscaping softens and screens the development;
- (h) the provision for native habitat for native fauna;
- (i) any remedial or mitigation measures or revegetation requirements; and
- (j) the management and treatment of the balance of the site;
- (k) as shown in a detailed plan.

Development is in accordance with an approved Reserve Activities Assessment (copy of approved RAA included as *Appendix E*).

Clause 29.5.5 Lot size and dimension - not applicable

Clause 29.5.6 Frontage and access - not applicable

Clause 29.5.7 Wastewater management - not applicable



# 4.6 Particular Purpose Zone 3 – Seaport

34.0	Zone Purpose
34.1.1.1	To provide for the redevelopment of the North Esk river edge and adjacent land, whilst providing for greater public access and use of the North Est and Tamar River frontages.
34.1.1.2	To provide for a range of tourist, recreational and residential uses and developments.
34.1.1.3	To provide for a range of commercial and retail uses in support of the tourism, recreational and residential uses.

The proposed pedestrian footbridge linking the Seaport to the future North Bank recreation area is entirely in accordance with the zone purpose. It will further facilitate recreational use of the Seaport precinct and provide pedestrian connection with North Bank. The bridge will enhance tourism opportunities within Seaport and provide a link to the new Silos development at North Bank.

#### **Use Standards**

34.5.1

In accordance with Table 34.3, the Use Standards do not apply to Passive Recreation.

#### **Development Standards**

Site coverage

Objective			
To ensure that site coverage:	To ensure that site coverage:		
(a) is compatible with the character of the zone,	; and		
(b) provides sufficient area for private open space	(b) provides sufficient area for private open space and landscaping.		
Acceptable Solution Performance Criteria			
A1	P1		
Site coverage must be no greater than 40%.	Site coverage must have regard to:		
	(a) the size and shape of the site;		
	(b) existing buildings and any constraints imposed by existing development;		
	(c) provision for landscaping and private open space;		
	(d) the site coverage of adjacent lots; and		

(e) the character of the zone.



# Complies with A1

The proposed pedestrian bridge does not actually extend into the Particular Purpose Zone 3 - Seaport, rather abuts adjacent to it. Some minor works are required within the Seaport title (136349/3), hence it has been included in this DA, but the bridge wont impact on existing site coverage.

# 34.5.2 Building height, setback and siting

# **Objective**

To ensure that building height, setback and siting is compatible with the character if the area.

Acceptable Solution	Performance Criteria
A1	P1
Building height must be no greater than:	Building height must be compatible with the character of the zone, having regard to:
(a) 10m; or	
(b) 1m greater than the average of the building heights on the site or	(a) the height of buildings on the site, adjoining lots and adjacent lots;
immediately adjoining lots;	(b) the bulk and form of existing and proposed buildings;
(c) which ever is the greater.	(c) the allowable building heights;
	(d) the apparent height when viewed
	from roads and public places; and
	(e) any overshadowing of adjoining lots or public places.
A2.1	P2
Buildings must be contained within a building envelope determined by a:	Buildings must be sited to be compatible with the character of the zone, having regard to:
	(a) the setback of surrounding buildings;
(a) setback of 8m from the North Esk boardwalk;	(b) the height, bulk and form of existing and proposed buildings;
(b) setback of 10m from a road; and	
(c) setback of 1.5m from side boundaries; and	(c) the appearance when viewed from a road or public land;



A2.2	(d) reduction in sunlight to a habitable room of a dwelling;
Protrusions such as eaves, steps, porches, and awnings may extend horizontally	<ul><li>(e) overshadowing of the private open space of a dwelling;</li></ul>
beyond the building envelope no more than 0.6 m.	(f) any overshadowing of adjoining lots or public places; and
	(g) the character of the surrounding area.

## Not applicable

The bridge structure is not located within the Particular Purpose Zone 3- Seaport

34.5.3	Location of	car parking
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#### **Objective**

To ensure that car parking:

(a) does not detract from the streetscape; and (b) provides for vehicle and pedestrian safety.

#### Acceptable Solution

#### A1

Car parking for residential development must be located:

(a)within the building structure; or (b)between the building and the frontage to Home Point Parade or Seaport Boulevard.

#### Performance Criteria

#### P1

Car parking must be located to minimise its visibility from a road, having regard to:

- (a) the existing streetscape;
- (b) the location of the car parking;
- (c) vehicle and pedestrian traffic safety;
- (d) measures to screen parking; and
- (e) any landscaping proposed.

#### A1.2

Garages and carports must be setback no more than 3m from a road.

#### A1.3



Vehicular access must only be provided for or from a road

#### Not applicable.

No car parking or vehicular access proposed.

#### 34.5.4 Active Ground Floors

#### **Objective**

To ensure that building facades promote and maintain high levels of pedestrian interaction and amenity.

#### Acceptable Solution

#### A1

New buildings with non-residential uses on ground floors must:

- (a) have clear glazing, display windows or glass doorways for a minimum of 80% of all ground floor facades to, roads, malls, laneways or arcades;
- (b) not have security grilles or screens that obscure the ground floor facades to roads, malls, laneways or arcades;
- (c) not have mechanical plant or equipment, such as air conditioning units or heat pumps located on the facade; and
- (d) not have blank walls, signage panels or blocked out windows, wider than 2m on ground floor facades to roads, malls, laneways or arcades.

#### A2

Alterations to ground floor facades of non-residential buildings must not:

(a) reduce the level of glazing on a

#### Performance Criteria

#### P1

Alterations to ground floor facades of non-residential buildings must be designed to maximise interaction between the use of the building and pedestrians, having regard to:

- (a) the level of glazing, openness and transparency on the ground floor facades to roads, malls, laneways or arcades;
- (b) the potential for security grilles or screens to reduce the amenity of the building or reduce levels of interaction with the public;
- (c) screen or obscure all mechanical plant or equipment such as air conditioning units or heat pumps so as they are not recognisable or visible from ground level public view points; and
- (d) minimise the area of all blank walls, signage panels or blocked out windows on ground floor facades to roads, malls, laneways or arcades.



facade to a road, mall, laneway or arcade that is present prior to alterations;

- (b) have security grilles or screens that obscure the ground floor facade;
- (c) introduce new or additional mechanical plant or equipment such as air-conditioning units or heat pumps located on the façade; and
- (d) increase blank walls, signage panels or blocked out windows, wider than 2m on ground floor facades to roads, malls, laneways or arcades.

#### Not applicable

Clause 34.5.5 - Daylight to Windows - Not applicable to Passive Recreation Use

Clause 34.5.6 - Private Open Space - Not applicable to Passive Recreation Use

Clause 34.5.7 – Overshadowing of Private Open Space - Not applicable to Passive Recreation Use

Clause 34.5.8 - Storage - Not applicable to Passive Recreation Use

Clause 34.5.9 - Common Property - Not applicable to Passive Recreation Use

Clause 34.5.10 - Lot size and dimensions - Not applicable

Clause 34.5.11 - Frontage and access - Not applicable

Clause 34.5.12 - Discharge of stormwater - Not applicable

# 4.7 <u>Bushfire Prone Area Code E1.0</u>

Not applicable because the subject site is not located within a bushfire prone area.

# 4.8 Potentially Contaminated Land Code E2.0

The Code is applicable with respect to the North Bank abutment. Given the piers will be pile driven into the river bed and that the Seaport abutment does not require excavation, these aspects of the proposal are exempt from the Potentially Contaminated Land Code.



Accordingly, the following assessment against the Code provisions is made in relation to the North Bank abutment only.

A copy of the Environmental Site Assessment undertaken for the North Bank abutment is included as **Appendix E**.

#### **Code Purpose**

E2.1

a) ensure that use or development of potentially contaminated land does not adversely impact on human health or the environment.

The ESA accompanying the application has determined that the main risk to human health and the environment is during the construction phase, but that the risk can be managed via soil and groundwater monitoring prior construction and the inclusion of Health and Safety Management measures during the construction phase.

#### Use Standards

#### E2.5.1 Use Standards

# **Objective**

To ensure that potentially contaminated land is suitable for the intended use.

#### Acceptable Solution

A1

The Director, or a person approved by the Director for the purpose of this Code:

- (a) certifies that the land is suitable for the intended use; or
- (b) approves a plan to manage contamination and associated risk to human health or the environment that will ensure the land is suitable for the intended use.

#### Performance Criteria

P1

Land is suitable for the intended use, having regard to:

- (a) an environmental site assessment that demonstrates there is no evidence the land is contaminated; or
- (b) and environmental site assessment that demonstrates that the level of contamination does not present a risk to human health or the environment; or
- (c) a plan to manage contamination and associated risk to human health or the environment that includes:
- (i) an environmental site assessment;
- (ii) any specific remediation and protection measures required to be implemented before any use commences; and



(iii) a statement that the land is suitable for the intended use.

# **Complies with P1**

The ESA accompanying the application has concluded that:

'the risk of exposure to contaminated groundwater at the site by current and future recreational users is likely to be low, given the relative small size of the site compared to the rest of the North Bank and given that access to North Bank from the bridge will be via a platform that will cover some of the site. The likelihood of groundwater at the site being contaminated with hydrocarbons to such levels that will pose a risk to recreational users from vapour inhalation is also likely to be low. '

# **Development Standards**

# E2.6.1 Subdivision - not applicable

#### E2.6.2 Excavation

#### **Objective**

To ensure that works involving excavation of potentially contaminated land does not adversely impact on human health or the environment.

impact on human health or the environment.	
Acceptable Solution	Performance Criteria
A1	P1
No acceptable solution	Excavation does not adversely impact on health and the environment, having regard to:
	(a) an environmental site assessment that demonstrates there is no evidence the land is contaminated; or
	(b) an environmental site assessment that demonstrates that the level of contamination does not present a risk to human health or the environment; or
	(c) a plan to manage contamination and associated risk to human health and the environment that includes:
	(i) an environmental site assessment;
	(ii) any specific remediation and protection measures required to be implemented before excavation commences; and



(iii) a statement that the excavation does not adversely impact on human health or the environment.

# Complies with P1

The ESA has concluded that whilst there are no potentially contaminating activities identified at the site itself, a number of potential historical sources of contamination exist from adjacent parcels of land that may present a potential risk of soil or groundwater contamination. The ESA has concluded that:

'The proposed bridge construction works will involve the excavation of soil to a depth of 1.5 metres (estimate 50-100m³ of excavated soil). It is expected that groundwater will be intercepted at that depth. There is therefore a potential risk that construction workers may be exposed to contaminated soil and/or groundwater through inhalation or direct contact.'

It is recommended that the groundwater and soil at the site are assessed prior to the commencement of excavation works through groundwater monitoring and that the EMP for the works should make allowance for the assessment of soil for offsite disposal and management of groundwater where encountered.

The draft CEMP details measures (section 7.) around the management of removed soil from the excavation area around the North Bank abutment /Pier 1. It is submitted that the permit conditions should require the additional groundwater monitoring to take place prior to the commencement of works on site and the CEMP updated according to findings.

# 4.9 Landslide Code E3.0

Not applicable because the subject site is not mapped as or otherwise known to be subject to a landslip hazard.

# 4.10 Road and Railway Asset Code E4.0

Not applicable – the proposed works do not require a new vehicle crossing, junction or level crossing or intensify an existing access nor involve a sensitive use within 50 metres of a rail network or Category 1 or 2 road.

# 4.11 Flood Prone Areas Code E5.0

The river bed and Seaport are shown in the Flood Prone Areas Overlay on the Planning Scheme maps. However, in accordance with Clause E5.4, use or development of land in the passive recreation use class is exempt from the code.



# 4.12 Parking and Sustainable Transport Code

## **Code Purpose**

- E6.1.1
- a) ensure that an appropriate level of car parking facilities are provided to service use and development;
- b) ensure that cycling, walking and public transport are supported as a means of transport in urban areas;
- c) ensure access for cars and cyclists and delivery of people and goods is safe and adequate;
- d) ensure that parking does not adversely impact on the amenity of a locality;
- e) ensure that parking spaces and accesses meet appropriate standards; and
- f) provide for the implementation of parking precinct plans.

#### **Use Standards**

# E6.5.1Car Parking Numbers

#### **Objective**

To ensure that an appropriate level of car parking is provided to meet the needs of the use.

# **Acceptable Solution**

#### A1.1

The number of car parking spaces must;

- a) not be less than 90% of the requirements of Table E6.1; (except for dwellings in the General Residential Zone) or
- b) not be less than 100% of the requirements of Table E6.1 for dwellings in the General Residential Zone; or
- c) not exceed the requirements of Table E6.1 by more than 2 spaces or 5% whichever is the greater, except for dwellings in the General Residential Zone; or
- d) be in accordance with an acceptable solution contained within a parking precinct plan.

#### Performance Criteria

P1.1

The number of car parking spaces for other than residential uses, must be provided to meet the reasonable needs of the use, having regard to:

- a) the availability of off-road public car parking spaces within reasonable walking distance;
- b) the ability of multiple users to share spaces because of:
  - (i) variations in car parking demand over time; or
  - (ii) efficiencies gained by consolidation of car parking spaces;
- the availability and frequency of public transport within reasonable walking distance of the site;
- any site constraints such as existing buildings, slope, drainage, vegetation and landscaping;



- e) the availability, accessibility and safety of on-road parking, having regard to the nature of the roads, traffic management and other uses in the vicinity;
- f) an assessment of the actual car parking demand determined in light of the nature of the use and development;
- g) the effect on streetscape; and
- h) the recommendations of any traffic impact assessment prepared for the proposal; or

#### P1.2

The number of car parking spaces for residential uses must be provided to meet the reasonable needs of the use, having regard to:

- a) the intensity of the use and parking required;
- b) the size of the dwelling and the number of bedrooms; and
- the pattern of car parking spaces complies with any relevant parking precinct plan.

#### P1.3

The number of car parking spaces complies with any relevant parking precinct plan.

# P2

No Performance Criteria

# A2

The number of accessible car parking spaces for use by persons with a disability for uses that require 6 or more parking spaces must be in accordance with Part D3 of the National Construction Code 2014, as amended from time to time.

Complies with A1 and A2



Table E6.1 does not stipulate a parking requirement for Passive Recreation and given the proposed use of the site is for a pedestrian footbridge linking existing pedestrian trails, it is considered that dedicated car parking for the bridge is not required. The pedestrian footbridge does not constitute the passive recreation in itself, rather it is a supporting structure to a larger network of passive recreation opportunities across the city.

It is noted that public car parking is available at Seaport and Royal Park and will be available in the future on the North Bank side once the North Bank recreation precinct is developed.

## 6.5.2 Bicycle Parking Numbers

# **Objective**

To ensure that an appropriate level of bicycle parking spaces are provided to meet the needs of the use.

#### Acceptable Solution

# A1 The number of bicycle parking spaces must be provided on either the site or within 50m of the site in accordance with the requirements of Table E6.1

#### Performance Criteria

- P1 Bicycle parking spaces must be provided to meet the reasonable needs of the use, having regard to:
  - a) likely number and characteristics of users of the site and their opportunities and likely need to travel by bicycle;
  - b) location of the site and the likely distance a cyclist needs to travel to reach the site; and
  - availability and accessibility of existing and planned parking facilities for bicycles in the vicinity.

#### Complies with A1

Table E6.1 of the Planning Scheme, stipulates no requirement for bicycle parking for the proposed use of Passive Recreation.

# E6.6.3 Taxi Drop-off and Pickup

#### **Objective**

To ensure that taxis can adequately access developments.

Acceptable Solution Performance Criteria

A1 P1



Except for dwellings in the General Residential Zone, uses that require greater than 50 car spaces by Table E6.1 must provide one parking space for a taxi on site, with one additional taxi parking space provided for each additional 50 car parking spaces required.

Taxi parking spaces must be provided to meet the reasonable needs of the use, having regard to:

- a) the nature of the proposed use and development;
- b) the availability and accessibility of taxi spaces on the road or in the vicinity; and
- c) any site constraints such as existing buildings, slope, drainage, vegetation and landscaping.

# Not applicable

Table E6.1 does not stipulate a requirement for car parking for 'Passive Recreation' as a use class.

# E6.6.4 Motorbike Parking Provisions

# **Objective**

To ensure that motorbikes are adequately provided for in parking considerations.

# **Acceptable Solution**

# Α1

Except for dwellings in the General Residential Zone, uses that require greater than 20 car parking spaces by Table E6.1 must provide one motorcycle parking space on site with one additional motorcycle parking space on site for each additional 20 car parking spaces required.

# Performance Criteria

Р1

Motorcycle parking spaces must be provided to meet the reasonable needs of the use, having regard to:

- a) the nature of the proposed use and development;
- b) the availability and accessibility of motorcycle parking spaces on the road or in the vicinity; and
- any site constraints such as existing buildings, slope, drainage, vegetation and landscaping

#### Not applicable



# E6.6.5 Loading Bays

#### **Objective**

To ensure adequate access for goods delivery and collection, and to prevent loss of amenity and adverse impacts on traffic flows.

#### Acceptable Solution

A loading bay must be provided for uses with a gross floor area greater than 1000m2 in a single occupancy.

#### Performance Criteria

Adequate space for loading and unloading must be provided, having regard to:

- a) the types of vehicles associated with the use:
- b) the nature of the use;
- c) the frequency of loading and unloading;
- d) the location of the site;
- e) the nature of traffic in the surrounding area;
- f) the area and dimensions of the site; and

any site constraints such as existing buildings, slope, drainage, vegetation and landscaping.

#### Not applicable

# **Development Standards**

# E6.6.1 Construction of Parking areas

#### **Objective**

To ensure that parking areas are constructed to an appropriate standard

#### Acceptable Solution

All parking, access ways, manoeuvring and circulation spaces must:

have a gradient of 10% or less;

- (a) be formed and paved;
- (b) be drained to the public stormwater system, or contain stormwater on the site;

#### Performance Criteria

- P1 All parking, access ways, manoeuvring and circulation spaces must be readily identifiable and constructed to ensure that they are useable in all weather conditions, having regard to:
- (a) the nature of the use;
- (b) the topography of the land;



- (c) except for a single dwelling, and all uses in the Rural Resource, Environmental Management and Open Space zones, be provided with an impervious all weather seal; and
- (d) except for a single dwelling, be line marked or provided with other clear physical means to delineate parking spaces.
- (c) the drainage system available;
- (d) the likelihood of transporting sediment or debris from the site onto a road or public place;
- (e) the likelihood of generating dust; and
- (f) the nature of the proposed surfacing and line marking.

# Not applicable.

#### E6.6.2 Design and Layout of parking areas

#### **Objective**

To ensure that parking areas are designed and laid out to provide convenient, safe and efficient parking.

# **Acceptable Solution**

# A1

Car parking, access ways, manoeuvring and circulation spaces must:

- (a) provide for vehicles to enter and exit the site in a forward direction where providing for more than 4 parking spaces;
- (b) have a width of vehicular access no less than the requirements in Table E6.2, and no more than 10% greater than the requirements in Table E6.2;
- (c) have parking space dimensions in accordance with the requirements in Table E6.3;
- (d) have a combined access and manoeuvring width adjacent to parking spaces not less than the requirements in Table E6.3 where there are 3 or more car parking spaces; and
- (e) have a vertical clearance of not less than 2.1 metres above the parking surface level.

#### Performance Criteria

#### P1

Car parking, access ways, manoeuvring and circulation spaces must be convenient, safe and efficient to use, having regard to:

- a) the characteristics of the site;
- b) the proposed slope, dimensions and layout;
- c) vehicle and pedestrian traffic safety;
- d) the nature and use of the development;
- e) the expected number and type of vehicles;
- f) the nature of traffic in the surrounding area; and
- g) the provisions of Australian Standards AS 2890.1 - Parking Facilities, Part 1: Off Road Car Parking and AS2890.2 Parking Facilities, Part 2: Parking facilities - Off-street commercial vehicle facilities.

# A1.2



All accessible spaces for use by persons with a disability must be located closest to the main entry point to the building.

#### A1.3

Accessible spaces for people with disability must be designated and signed as accessible spaces where there are 6 or more.

#### A1.4

Accessible car parking spaces for use by persons with disabilities must be designed and constructed in accordance with AS/NZ2890.6 – 2009 Parking facilities – Off-street parking for people with disabilities.

# Not applicable

:

# E6.6.3 Pedestrian Access

# **Objective**

To ensure pedestrian access is provided in a safe and convenient manner

# **Acceptable Solution**

# A1

Uses that require 10 or more parking spaces must:

- (a) have a 1m wide footpath that is separated from the access ways or parking aisles, except where crossing access ways or parking aisles, by:
- (i) a horizontal distance of 2.5m between the edge of the footpath and the access way or parking aisle; or
- (ii) protective devices such as bollards, guard rails or planters between the footpath and the access way or parking aisle; and
- (b) be signed and line marked at points where pedestrians cross access ways or parking aisles; and

# Performance Criteria

P1

pedestrian access must be provided within car parks, having regard to:

- a. the characteristics of the site;
- b. the nature of the use;
- c. the number of parking spaces;
- d. the frequency of vehicle movements;
- e. the needs of persons with a disability;
- f. the location and number of footpath crossings;
- g. vehicle and pedestrian traffic safety;
- h. the location of any access ways or parking aisles; and



i. any protective devices proposed for pedestrian safety.

## A1.2

In parking areas containing accessible car parking spaces for use by persons with a disability, a footpath having a minimum width of 1.5m and a gradient not exceeding 1 in 14 is required from those spaces to the main entry point to the building.

# Not applicable

## E6.6.4 Loading Bays

#### **Objective**

To ensure adequate access for goods delivery and collection and to prevent loss of amenity and adverse impacts of traffic flows.

## **Acceptable Solution**

#### **A1**

The area and dimensions of loading bays and access way areas must be designed in accordance with AS2890.2 – 2002, Parking <u>Facilities</u>, Part 2: Parking <u>facilities</u> - Off-street commercial vehicle <u>facilities</u>, for the type of vehicles likely to use the <u>site</u>.

#### A1.2

It must be demonstrated that the type of vehicles likely to use the site can enter, park and exit the site in a forward direction, without impact or conflicting with areas set aside for parking or landscaping, in accordance with AS2890.2 – 2002, Parking Facilities, Part 2: Parking facilities - Off-street commercial vehicle facilities.

#### Performance Criteria

#### **P1**

Loading bays must have area and dimensions suitable for the use, having regard to:

- (a) the types of vehicles likely to use the site;
- (b) the nature of the use;
- (c) the frequency of loading and unloading;
- (d) the area and dimensions of the site; and
- (e) the location of the site and nature of traffic.

# P2

Access for vehicles commercial vehicles to and from the site must be safe, having regard to:

- (a) the types of vehicles associated with the use;
- (b) the nature of the use;



- (c) the frequency of loading and unloading;
- (d) the area and dimensions of the site;
- (e) the location of the site and nature of traffic:
- (f) the effectiveness or efficiency of the surrounding road network; and
- (g) site constraints such as existing buildings, slope, drainage, vegetation, parking and landscaping.

Not applicable.

E 6.6.5 Bicycle Facilities

Not applicable.

E 6.6.6 Bicycle parking and storage facilities

Not applicable.

# 4.13 <u>Scenic Management Code E7.0</u>

Not applicable because the subject site is not mapped as being within a scenic management tourist road corridor or local scenic management area.

# 4.14 Biodiversity Code E8.0

The North Esk River within the project area forms part of the Tamar Conservation Area which is managed by the Tasmanian Parks and Wildlife Service. The Tamar Conservation Area is identified as Priority Habitat on the Planning Scheme maps and therefore the Biodiversity Code applies.

# **Code Purpose**

a) support the conservation of biodiversity in the planning scheme area and the northern region, including the extent, condition and connectivity of important habitats and priority vegetation communities, and the number and status of threatened species; and
b) consider and manage the impact of use or development on biodiversity through i) minimisation of vegetation and habitat loss or degradation; and
ii) appropriate location of development

# E8.6.1 Habitat and Vegetation Management



# **Objective**

To appropriately protect or manage vegetation identified as priority habitat and priority vegetation communities.

#### Acceptable Solution

#### A1

Clearance or disturbance of priority habitat is in accordance with a certified Forest Practices Plan.

#### Performance Criteria

#### P1

Clearance or disturbance of native vegetation within priority habitat or areas identified as priority vegetation communities does not compromise the adequacy of representation of species or vegetation communities, having regard to:

- (a) the quality of the site to provide habitat of significance to the maintenance or protection of biodiversity in the planning scheme area;
- (b) the need for the clearance or disturbance of the vegetation;
- (c) the method of clearance or disturbance of the vegetation;
- (d) the extent and quality of the vegetation or habitats affected by the proposal;
- (e) the value of the vegetation as a wildlife corridor;
- (f) the value of riparian vegetation to the protection of habitats and wildlife corridors;
- (g) any rehabilitation and maintenance measures;
- (h) the impacts of development and vegetation clearance, in proximity to the priority habitat or priority vegetation communities;



- (i) any conservation outcomes achieved and the long term security of any offset for the loss of the vegetation, provided in accordance with the General Offset Principles document published by the Department of Primary Industries, Parks, Water and Environment, available at http://dpipwe.tas.gov.au/Documents/General-Offset- Principles.pdf;
- (j) any agreement under section 71 of the Act relating to vegetation management;
- (k) any conservation covenant made under the Nature Conservation Act 2002, that exists on or adjacent to the site of the proposed development; and
- (I) any recommendations or advice contained in a flora and fauna report.

#### Not applicable

In accordance with the findings of the Vegetation, Flora and Fauna Assessment at **Appendix D**, no native vegetation is to be removed within the North Esk River over which the Priority Habitat overlay applies.

# 4.15 Water Quality Code E9.0

The Water Quality Code applies to the entire length of the proposed Pedestrian Footbridge as it is located within 30 metres of a watercourse. The Draft CEMP (*Appendix C*) provides some assistance in the assessment of the proposed footbridge against the Water Quality Code.

# **Code Purpose**

E9.1 The purpose of this provision is to:



(a) manage adverse impacts on wetlands and watercourses.

# **Development Standards**

# E9.6.1 Development in the vicinity of watercourses and wetlands

To protect watercourses and wetlands from the effects of development and minimise the potential for water quality degradation.

Acceptable Solution	Performance Criteria
A1	P1
No acceptable solution.	Development must not unreasonably impact the water quality of watercourses or wetlands, having regard to:
	(a) the topography of the site;
	(b) the potential for erosion;
	(c) the potential for siltation and sedimentation;
	(d) the risk of flood;
	(e) the impact of the removal of vegetation on hydrology;
	(f) the natural values of the vegetation and the land;
	(g) the scale of the development;
	(h) the method of works, including vegetation removal, and the machinery used;
	(i) any measures to mitigate impacts;
	(j) any remediation measures proposed;



(k) any soil and water management plan; and

(I) the requirements of the Department of Primary Industries, Parks, Water and Environment Wetlands and Waterways Works Manual.

#### Complies with P1

Referring to the CEMP (*Appendix C*), the following assessment is made against the relevant matters under the Performance Criteria:

(a) (b) (c) The potential for erosion is limited to the pile driving of Piers 2-4 and the excavation of approximately 50-100 cubic metres of soil for the construction of Pier 1 and the North Bank abutment. The North Bank abutment which has been subject to erosion in the past is to be surrounded by rock rip rap to minimise soil erosion and will actually improve bank stabilisation and prevent erosion. Pile driving for piers 2-4 will not require any sediment removal from the river, rather it will be displaced and an increase in turbidity will occur temporarily.

The CEMP requires all material excavated for Pier 1/abutment to be treated as potentially contaminated soil and placed in water tight skip bins with a lid to prevent the ingress of water or wrapped in plastic and contained within an earth bund. The soil may either be reused on site (buried and capped) or disposed offsite to an approved facility with disposal off-site to be approved by EPA Tasmania.

Siltation and sedimentation are current issues affecting the Tamar and North Esk River. This section of the river is affected by siltation and sedimentation and the proposed works will not improve or reduce the siltation issues already affecting the river.

- d) e) This has been addressed by the BMT report (Refer Appendix G).
- f) This has been addressed by the Flora and Fauna report (*Refer Appendix D*). Two plant species listed as rare under the TSP have been identified in the riparian vegetation of North Bank. A permit to remove these species has been lodged with DPIPWE by Council. The construction contractor will be required to include the following mitigation measures in their plan;
- Sediment and erosion controls to prevent impact on native foreshore vegetation and threatened flora;
- Weed management controls to prevent the spread off/onsite of weeds and introduction of weeds;
- Implementation of exclusion zones by the City of Launceston native flora/fauna expert.

#### (Refer Appendix D).

- g) The scale of the proposed development is appropriate for its intended use and construction methods such as pile driving of the piers will assist in managing water quality.
- h) Refer to the draft CEMP (section 2.2) for details of construction methods.



- i) Mitigation measures have been recommended in the draft CEMP and will be further refined in the construction contractors CMP. A summary of mitigation controls will be included in the signed draft CEMP.
- j) The riverbank at the location of pier 1 will be remediated as part of the bridge works and erosions prevention materials (i.e rip-rap, revegetation) installed.
- k) Refer to CEMP.
- I) DPIPWE have reviewed the application and approved the development with conditions (Refer to RAA, *Appendix E*)

# E9.6.2 Development of watercourses and wetlands

# **Objective**

To protect watercourses and wetlands from the effects of development and minimise water quality degradation.

Acceptable Solution	Performance Criteria
A1	P1
A wetlands must not be altered, modified, filled, drained, piped or channelled.	No performance criteria
A2	P2
A pipe or culvert crossing of a watercourse for access purposes.	Development within a watercourse must not unreasonably impact the water quality or ecological values of the watercourse, having regard to:
	(a) the topography of the site;
	(b) the potential for erosion;
	(c) the potential for siltation and sedimentation;
	(d) the potential for dust generation;



(e) the impact on hyd
-----------------------

- (f) the risk of flood;
- (g) the natural values of the watercourse;
- (h) the scale of the development;
- (i) the method of development, including any vegetation removal, and the machinery used;
- (j) the need for the development;
- (k) any measures to mitigate impacts;
- (I) any remediation measures proposed;
- (m) any soil and water management plan; and
- (n) the requirements of the Department of Primary Industries, Parks, Water and Environment Wetlands and Waterways Works Manual.

#### A1 - Not applicable

#### Complies with P2

Refer to the responses to P1 of E9.6.1.

# E9.6.3 Discharge to Watercourses and Wetlands

To manage discharges to watercourses and wetlands so as not unreasonably impact the water quality.

Acceptable Solution

Performance Criteria

Α1

P1

All stormwater discharge must be:



- a) connected to the public stormwater system; or
- b) diverted to an on-site system that contains stormwater within the site.

Stormwater discharges must not unreasonably impact on the water quality of watercourses or wetlands, having regard to:

- (a) the characteristics, volume and flow rates of the discharge;
- (b) the characteristics of the receiving waters;
- (c) the potential for erosion;
- (d) the potential for siltation and sedimentation;
- (e) the impact on hydrology;
- (f) any measures to mitigate impacts; ad
- (g) any soil and water management plan

Not applicable – the use and development will not generate stormwater flow.

# 4.16 Recreation and Open Space Code E10.0

Not applicable because the application does not constitute a subdivision.

# 4.17 <u>Environmental Impacts and Attenuation Code E11.0</u>

Not applicable because the application does not involve a sensitive use or an activity listed in Tables E11.1 or E11.2 with the potential to create environmental harm or nuisance.

# 4.18 Airports Impact Management Code E12.0

Not applicable because the subject site is not mapped as being within aircraft noise exposure forecast contours and is not within prescribed airspace.

# 4.19 Local Historic Heritage Code E13.0

Not applicable because the subject site is not within an identified heritage precinct and is not identified as a local heritage place or place of identified archaeological significance.



# 4.20 Coastal Code E14.0

Given the location of the proposed pedestrian footbridge across the North Esk River, the Coastal Code applies to use and development except for the North Bank abutment which is subject to the Invermay/Inveresk Flood Inundation Area.

# **Code Purpose**

#### E14.1.1

The purpose of this provision is to:

- (a) .minimise the impact of use and development on the coastal environment; and
- (b) ensure that use or development subject to risk from sea level rise, storm surge, and coastal inundation is appropriately located and managed.

#### **Use Standards**

#### E14.5.1 Risk to sensitive use

#### **Objective**

To minimise the risk of injury to, or loss of human life, or damage to property in relation to sensitive uses, as a result of coastal inundation or sea level rise.

Acceptable Solution	Performance Criteria
A1	P1
No acceptable solution	Sensitive use must be located to minimise the risk of injury to, or loss of human life, or damage to property, having regard to:
	(a) the need for the location;
	(b) the characteristics and scale of the use;
	(c) the characteristics of the inundation of the land that is subject to the risk;
	(d) any measures proposed to mitigate the risk;
	(e) the nature, degree, practicality and responsibility for any management activities to mitigate the risk; and
	(f) the level of risk identified in any report



prepared by a suitably qualified person.

**Not applicable** – the use does not constitute a sensitive use as defined in Clause 4.1 of the Planning Scheme.

## **Development Standards**

#### E14.6.1 Coastal Reserved Land

#### **Objective**

To maintain the integrity of reserved land or land dedicated for any public recreation purpose or the purposes of nature conservation and ensure that development does not dominate the natural and visual values of reserved land.

# Acceptable Solution

#### A1

# Development within reserved land, or land dedicated for any public recreation purpose or the purposes of nature conservation must be for public infrastructure or public facilities.

#### Performance Criteria

#### Р1

Development on reserved land must not dominate the natural and visual values of reserved land, having regard to:

- (a) the need for the location;
- (b) the proximity of existing infrastructure on the adjoining land;
- (c) any restriction of access to or across reserved land;
- (d) the impact on the natural values of reserved land;
- (e) the impact on views from adjoining public land or public facilities, to reserved land;
- (f) building design, its location, form, materials and other design mechanisms;



- (g) any proposed vegetation screening; and
- (h) the natural landscape of the area.

**Complies with A1** – the land is to be used and developed as a pedestrian footbridge which constitutes a public facility.

#### E14.6.2 Public Access

#### **Objective**

To maintain public access to reserved land or land dedicated for any public recreation purpose or the purposes of nature conservation.

# Acceptable Solution

# A1

All development, except for boat sheds and infrastructure, must not remove existing public access points or impede access to or along reserved land or land dedicated for any public recreation purpose or the purposes of nature conservation.

## Performance Criteria

#### Р1

Any restriction of public access to reserved land or land dedicated for any public recreation purpose or the purposes of nature conservation must be minimised, having regard to:

- (a) existing or alternative access available;
- (b) the need for rehabilitation;
- (c) the maintenance of any public infrastructure;
- (d) the convenience or safety of access; and
- (e) the protection or maintenance of natural values or the amenity, of reserved land.

A2 P2



Boat sheds must not remove existing public access points or impede access to or along reserved land or land dedicated for any public recreation purpose or the purposes of nature conservation

No Performance Criteria

#### A3

Infrastructure must not impede public access to or along reserved land or land dedicated for any public recreation purpose or the purposes of nature conservation. Р3

Any restriction of public access to reserved land or land dedicated for any public recreation purpose or the purposes of nature conservation must be minimised, having regard to:

- (a) existing or alternative access available;
- (b) the need for the location;
- (c) no reasonable alternative being available for the location of the infrastructure;
- (d) the convenience or safety of access; and
- (e) the purpose and nature of the proposed infrastructure.

# Complies with A1, A2 is not applicable and complies with A3

The proposed pedestrian footbridge will improve public access between the North Bank Precinct and Seaport and wont remove or restrict any existing public access points nor access to reserved land. A boat shed does not form part of this application.

# E14.6.3 Development of land subject to inundation

To minimise the impact of development on land subject to inundation.

Acceptable Solution	Performance Criteria			
A1	P1			
Development is for Natural and cultural values management or Passive recreation uses.	Development on land subject to inundation must minimise the impact on the coastal environment or coastal process, having regard to:			



- (a) the extent, depth and frequency of the inundation;
- (b) wave action and storm surge;
- (c) long term sea level rise predictions;
- (d) the need for the location;
- (e) erosion, siltation or tidal flushing affecting the site;
- (f) the impact on the normal flows of currents or tides and the movement of sediment;
- (g) the need to remove vegetation;
- (h) the extent and character of any earthworks or protective structures; and
- (i)
- (j) the need for dredging or channeling

A2
Boat sheds must have a maximum:

- (a) building height of 3m for a skillion roof or 3.5m for a gabled or hip roofs; and (b) a gross floor area of less than 30m<sup>2</sup>.
- Boat sheds must have a bulk and form to minimise the impact on the coastal environment or coastal process, having regard to:
- (a) the bulk and form of the boat shed;
- (b) the extent, depth and frequency of inundation;
- (c) wave action and storm surge;
- (d) long term sea level rise predictions;



the site;

(e) erosion, siltation or tidal flushing affecting

- (f) the impact on the normal flows of currents or tides and the movement of sediment:
- (g) the disturbance of wetlands, seagrasses or other natural habitats;
- (h)visual landscape values; and
- (i) any navigational hazardsP3letties must be located to min

Jetties must be located to minimise the impact on the coastal environment or coastal process, having regard to:

- (a) the need for the location;
- (b) the extent, depth and frequency of inundation;
- (c) wave action and storm surge;
- (d) long term sea level rise predictions;
- (e) erosion, siltation or tidal flushing affecting the site;
- (f) the impact on the normal flows of currents or tides and the movement of sediment;
- (g) the disturbance of wetlands, seagrasses or other natural habitats;
- (h) visual landscape values; and
- (i) any navigational hazards.

A3
No acceptable solution

55



#### Complies with A1, A2 and A3 are not applicable

The proposed pedestrian footbridge is classified as a passive recreation use.

# 4.21 <u>Telecommunications Code E15.0</u>

Not applicable because the application does not involve telecommunications facilities.

# 4.22 <u>Invermay/Inveresk Flood Inundation Area Code E16.0</u>

The North Bank abutment portion of the site is located within the Riveredge Recreational Precinct.

# **Code Purpose**

# E16.1.1

The purpose of this provision is to reduce risks and hazards from flooding in the Invermay/Inveresk flood inundation area and in particular:

- (c) to limit development that increases the potential flood damage to residential property subject to inundation;
- (d) to limit land uses that create unacceptable levels of risk for residents in the event of inundation; and
- (e) to ensure that consideration is given to community, infrastructure and environmental impacts of development on land subject to flood inundation.

**Response:** The proposed development of land adjacent to the flood levee for the purposes of a pedestrian footbridge is not for residential purposes and therefore will not increase the potential for flood damage to residential buildings. The development of a pedestrian footbridge will not pose unacceptable levels of risk to life during a flood event as it will be closed off during > 1:10, noting that at 1:50 events it will overtop the bridge deck and access points. The bridge design is informed by a report investigating Hydraulic Modelling for two pedestrian bridge locations (the subject site being one of them). A copy of this report is attached as **Appendix G**.

#### **Use Standards**

# E16.6.1 Unacceptable Uses

#### **Objective**

To prevent unacceptable uses from establishing in areas subject to or isolated by, flood inundation.

Acceptable Solution Performance Criteria

A1 P1

Must not be: No performance criteria



- a) Educational and occasional care; or
- b) Emergency services; or
- c) Hospital services..

# Not applicable

The proposed use is defined as 'Passive Recreation.'

Acceptable Solution	Performance Criteria
A2	P2
Must not be Residential unless:  (a) a single dwelling in the Invermay Residential or Inveresk Residential precincts;  (b) a multiple dwelling in the Invermay Residential Precinct; or  (c) associated with and supporting the educational activities within the Inveresk Cultural precinct.	No performance criteria

# Not applicable

The proposed use is defined as 'Passive Recreation'

Acceptable Solution	Performance Criteria
A3	P3
Must not be Community meeting and entertainment in the Riveredge Industrial or Inveresk Residential precincts.	No performance criteria

# Not applicable

The proposed use is defined as 'Passive Recreation.'

# **Development Standards**

# E16.7.1 Intensification of residential development

# **Objective**

To limit the intensification of residential development in areas subject to, or seriously affected by, flood inundation.

Acceptable Solution Performance Criteria



A1 P1

New residential development or extensions of existing buildings:

No performance criteria

- (a) must not increase the floor area of individual dwellings or total floor area on the title to more than 110% of that existing or approved on the 1st January 2008; or
- (b) must not result in more than 200m<sup>2</sup> of residential floor area on a single title; or
- (c) must be for residential uses associated with and supporting the educational activities within the Inveresk Cultural Precinct.

# Not applicable

The proposed use is defined as 'Passive Recreation'

Acceptable Solution	Performance Criteria
A2	P2
Subdivision or division of land by strata plan must not create any additional lots capable for any future residential development.	No performance criteria

# Not applicable

No subdivision is proposed.

#### E16.7.2 Flood Impact

#### **Objective**

To ensure that new buildings and infrastructure are sited and designed to avoid or mitigate the

risk and minimise the impact of flooding.	Ç Ç
Acceptable Solution	Performance Criteria
A1	P1
Floor levels of all habitable rooms within the Residential use class must be at least 3.7m AHD.	No performance criteria



#### Not applicable

#### Acceptable Solution

A2

No acceptable solutions

#### Performance Criteria

P2

Buildings for residential purposes within the Inveresk Cultural Precinct must be sited and designed in accordance with a hydrological report and an emergency management plan prepared by a suitably qualified engineer

The report and plan must detail the risks and likely impacts of a 1:20 year, 1:50 year and 1:100 year annual exceedance probability flood event on the site, the building and its occupant and how the development will be designed and how the use will be managed to avoid, mitigate or remedy the impacts to take account of:

- a) the risk of levee failure in the vicinity of the
- b) the likely velocity of flood waters and depth of inundation;
- c) the need to locate electrical equipment and other fittings above 1:100 year annual exceedance probability flood level; the likely affect of the use or development on flood characteristics:
- d) the safety of the occupants of the development, potential evacuation routes and whether there is a flood free access to the land; and
- e) the ability of the use or development to withstand flood inundation and debris damage and the necessity for the incorporation of any flood proofing or protection measures in the development.

# Not applicable

No buildings for residential purposes are proposed as part of the works.



#### Acceptable Solution

#### *A3*

All buildings not in the Residential use class must have a:

- (a) floor level of at least 3.4m AHD; and
- (b) gross floor area or not more than: i 400m<sup>2</sup>

ii 10% more than that existing or approved on the 1st January 2008

#### Performance Criteria

#### Р3

Buildings not in the Residential use class must be sited and designed in accordance with a hydrological report and an emergency management plan prepared by a suitably qualified engineer. The report and plan must:

- (a) detail:
  - (i) the risks to life;
  - (ii) the likely impact on the use or development; and
  - (iii) how the use or development will manage the risk to tolerable levels; during either an overtopping of the levee or a levee breach at the closest point in the levee during a 5% AEP, 2%AEP or a 1% AEP flood event; and
- (b) consider the following:
  - (i) the likely velocity and depth of flood waters:
  - (ii) the need to locate electrical equipment and other fittings above the 1% AEP flood level;
  - (iii) the likely effect of the use or development on flood characteristics;
  - (iv) the development and incorporation of evacuation plans into emergency management procedures for the precinct; and
  - (v) the ability of the use or development to withstand flood inundation and debris damage and the necessity for the incorporation of any flood proofing measures in the development.



# Complies with P3

BMT prepared a report detailing Hydraulic Modelling and Investigation for two potential locations for a pedestrian bridge across the North Esk River, the proposed bridge being one of them. A copy of the report is included as *Appendix G*.

An assessment of each of the matters under the Performance Criteria is provided below:

- (a)(i) South Esk floods have sufficient time (2-3days warning) to put bridge closures in place. North Esk Floods up to 1:2000 year do not reach the deck level of the bridge and South Esk floods in the lower recurrence intervals ie. 1:200 and below do not have high velocities.
- (ii) The bridge will be closed during floods >1:10 and potentially afterwards during clean-ups and replacement of some superficial elements like cladding and repair to the old levee walking track on the North Bank side. The bridge closure will form part of Council's emergency management response during a flood event.
- (iii) The bridge will be closed so the risk is low and the potential damage will be limited to claddings and the like.
- (b)(i) The BMT Report found that the peak levels for a 1:500 year ARI is 5.55m AHD for the Seaport to North Bank bridge. Peak velocities have also been modelled with the highest peak velocity being located in the channel centre at 5.4(m/s)¹ whilst the peak velocities at the pier locations being less than this. Refer to Table 3-1 of Appendix G. The report states that the peak velocities at all piers for Seaport to North Bank Bridge are lower than those in the centre of the river. This is representative of expected horizontal velocity distributions in relatively straight sections of a river channel. Also the piers are located in areas of the channel where flow is impeded by existing infrastructure.;

Further modelling was done on the flow angle in relation to the piers and the recommendation of piers situated perpendicular to the bridge deck has been adopted in the design.

The

- (ii) All electrical connections and switch boards will be placed above the 1%AEP level and where practical lights will be installed above this level or have appropriate water proof ratings
- (iii) See BMT REPORT
- (iv) Once developed, the infrastructure will be included in Council's list of assets to be managed during a flood event.
- (v) The bridge will be designed in accordance with AS5100 which states the bridges main structure is to withstand a 1:2000 year flood load including associated debris impacts.

# 4.23 Cataract Gorge Management Area Code E17.0

Not applicable because the subject site is not mapped as being within Management Units MU1 – MU18.



# 4.24 <u>Signs Code E18.0</u>

Not applicable. There are no signs proposed.

# 4.25 <u>Development Plan Code E19.0</u>

Not applicable because the application does not involve subdivision and is not mapped within an area mapped as DPC.



# 5. Conclusion

The proposed construction of a new pedestrian/cyclist bridge on a section of the North Esk River linking the Seaport and North Bank which is classified as a passive recreation use (no permit required) in all relevant zones has been assessed against all relevant standards of the interim planning scheme. The development does not meet permissible building height and setback standards for the Open Space and Environmental Management Zones but in this instance discretion is considered entirely appropriate given the standards were not written to allow for such structures as permissible and the bridge necessarily has reduced boundary setbacks. The overall height of the structure by the planning scheme definition is 12 metres but the actual structure clearly prominent above water level is in fact 5 metres plus pier height depending on tidal levels. The development relies on Performance Criteria in relation to the following matters under a number of Codes:

Potentially Contaminated Land Code:

- E2.5.1 Use Standards (P1)
- E2.6.2 Excavation (P1)

Water Quality Code:

- E9.6.1 Development in the vicinity of watercourses and wetlands (P1)
- E9.6.2 Development of watercourses and wetland (P2)

Invermay/Inveresk Flood Inundation Code

E16.7.2 Flood Impact (P3)

In all instances, compliance with the Performance Criteria has been demonstrated and significant supporting information and assessments are included with the application.

Based on all the supporting information provided in this report, it is submitted that there is sufficient justification to approve the development of a pedestrian bridge and that the proposed development will have significant benefits to the residents of and visitors to Launceston and surrounding areas and is a fundamental component of the development of the North Bank recreation precinct.



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# GENERAL CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

For CITY OF LAUNCESTON

# Pedestrian Bridge Northbank to Seaport

April 2017

Document Set ID: 3524564 Version: 2, Version Date: 09/05/2017





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- Appendix A Baseline Noise Report
- Appendix B Acid Sulphate Soils Management Plan
- Appendix C Soil and Sediment Erosion Control Plan J179002EL C01
- Appendix D Weed Management Plan
- Appendix E Flora and Fauna Report
- Appendix F DIER CEMP General Specification
- Appendix G Development Application Drawings J162422CL S01, S02 & S03
- Appendix H Permit to Take Flora Application



# 1. Executive Summary

City of Launceston have engaged Johnstone McGee and Gandy to prepare this Construction Environmental Management Plan (CEMP). This Plan addresses the main construction issues generally with a more specific plan to be prepared by the construction contractor prior to the commencement of works.

The construction of the pedestrian bridge presents potential risks of sediment erosion, impacts on existing vegetation and impacts on water quality.

This plan is limited to outlining the general requirements to be considered by the contractor because the methodology will determine how the mitigation measures are implemented. For example, Pier 2 may be constructed using land based equipment with ground stabilisation work or using equipment on a barge. These different methodologies will require different controls.

The Construction Management Plan (CMP) developed by the construction contractor shall address the following issues;

- Controlled storage of hazardous substances and potentially contaminated soil to prevent discharge to the North Esk River;
- Management of erosion from trafficable areas;
- Prevention of river bank collapse;
- Minimising noise impacts through implementation of block periods of pile driving and no after hours or weekend work;
- Implementation of health and safety controls including controlling public access and diverting public access away from construction zones;
- Limiting the removal of existing vegetation for the construction of Pier 2 only;
- Implementation of the Weed Management Plan to prevent the onsite and offsite migration and growth of weeds;
- Implementation of the Acid Sulphate Management Plan to prevent water impacts from disturbed acid sulphate soil;
- Communication strategy for communicating with the Council and the public.

# 2. Project Description

It is proposed to construct a 120 metre pedestrian bridge from Seaport to Northbank. The shared access bridge is to have a 4m wide walkway and 3 span with the central span 60m and two smaller back spans. The proposed bridge structure is to be a steel walk through truss to minimise the effect on the river and its users.

This plan provides a general overview of possible construction methods. However, the construction contractor shall provide a more detailed description in the construction management plan submitted to the City of Launceston for approval prior to commencement of construction.





#### 2.1 Construction Expected Timeframes

The current program has construction starting in July/August and works finishing in December 2017.

#### 2.2 Construction Methodology & Materials

The bridge is to be built for the City of Launceston under a design and construct contract. This document and any development approval conditions will form part of this contract. The general form of the bridge is to be as per the Development Application drawings in the attached appendices.

Lowering of the existing old earth levee by approximately 800mm and the construction of a new path on top of the levee is to be addressed under a separate development application and has not been addressed in this CEMP.

#### **Abutment/Pier Construction**

#### Abutment/Pier 1

- Construct temporary fence around work site for public safety and to limit construction disturbance in the area plus install silt fences. The earth levee path will be closed to pedestrian traffic and detours put in place. Install site office installed.
- Machinery access works including temporary crane pad and or piling platform between Abutment, Piers 2 and the St. Pats rowing shed, this is likely to required driven piles to provide a stable crane pad for safety of workers and to maintain river bank stability.
- Excavate for pile cap Nom 1.5m deep using excavator, soil to be stored and disposed of as per the soil management plan (section 7)
- Piles installed these maybe driven or/and bored using a land based driving rig, the noise disturbance is to be limited as per the contractors noise mitigation strategy. Any soil removed is to stock piled protected and checked for contaminants in accordance with the contractor's soil management plan.
- In situ, reinforced concrete pile cap is to be poured with temporary boxing
- Reinforced concrete Abutment and Wing walls poured, including bridge bearing pad
- Backfill to abutment
- Run on concrete slab constructed

#### Pier 2

- Excavate surface rubble and silt to -3m A.H.D. including as required for barge access, excavated material to remain on site as bank fill, material to be stored and disposed of as per the soil management plan (section 7)
- Install piles procedure as per pier 1 but from a barge or temporary platform
- Install temporary works for driving raked piles (platform or driving guide)
- Test piles PDA and horizontal load test
- Install precast panels, abutment or formwork using crane and set up on piles
- Install reinforcing
- Pour in situ concrete
- Install bridge bearings





• Install Rock rip rap protection under the bridge on the Northbank side between abutment/pier 1 and abutment 2, this will help to prevent further erosion where construction disturbance has occurred

A small compound and construction fence is likely to be installed on the existing wharf structure, access along the boardwalk is in general to remain open except where it must be closed for safety and operational reasons.

#### Pier 3

- Install vertical piles from barge
- Install temporary works for driving raked piles (platform or driving guide)
- Install raked piles
- Test piles PDA and horizontal load test
- excavation of silt Nom. 1 m deep, silt to remain in the river as per the soil management plan (section 7)
- Install precast panels, abutment or formwork with barge mounted crane
- Install reinforcing and pour concrete core this is likely to be pumped either across the river or from the hotel carpark
- Install HD bolts and bridge bearings

Pier 4 as per Pier 3 but with the addition of

- Expansion joint
- · Connecting section from wharf to bridge

#### Superstructure

The bridge truss is to be manufactured of steel off site in large sections and trucked to site ready for assembly and installation using barges and cranes. Painting is to be completed off site in a controlled workshop environment and protected during transport and assembly.

- The steel truss has been designed to be manufactured in 3 sections off site including all painting, handrails, balustrade and where possible lighting and architectural finishes ie. polycarbonate. Truss sections nominally 4.2m high x 5m wide x 40m long (note 4.2m high has been chosen as an efficient overall height can be transported but keeps member sizes to an efficient size)
- · Trusses trucked and barged to site.
- Northbank section installed by crane using piled crane platform
- Seaport section installed using barge and tide
- Central span installed using barge and tidal action
- Install lead on span to Seaport wharf and expansion joint
- Install precast or poured in situ concrete deck
- Install pier 3 & 4 precast concrete or steel arch and dynamic dampeners if required
- · Install lighting, power and water
- Install cladding

## 2.3 Operating Hours

#### Site Works

Working Hours are to be generally

Monday to Friday: 7am to 6pm

Saturday: 9am to 6pm (no pile driving)

Sunday and Public Holidays: 10am to 6pm (no pile driving)





Further restrictions will be put in place under the contractor's noise mitigation strategy for works such as pile driving.

Some work maybe required outside these times, for example work best undertaken during low tides and trucking of large deliveries to site. Council may provide dispensation for such after hours work if requested by the construction contractor.

# 3. Legal Compliance

The contractor shall be required to comply with relevant environmental legislation and instruments as follows;

- Development Approval (issued by CoL)
- Environmental Management and Pollution Control Act 1994 (Tas)
- Threatened Species Protection Act 1995 (Tas)
- Weed Management Act (Tas) 1999

Control measures shall be put in place by the contractor to prevent the following;

- Discharge of pollutants to the North Esk River;
- River bank erosion / collapse;
- Destruction of native vegetation and threatened species;
- Release of hazardous chemicals (i.e. fuel to land or water)
- Excessive noise emissions outside of work protocols
- Erosion of northbank operational areas;

# 4. Noise Impacts and Mitigation

Noise issues shall be addressed and communicated with the public through the implementation of the construction plan. It is expected that the piling operation will create noise likely to be heard at the nearest Seaport residential properties and possibly beyond the Seaport precinct. Background noise levels have been measured and the results are provided in the Baseline Noise Report (refer Appendices). Estimations of noise levels expected to be caused by the bridge building and piling activity have not been determined. Noise levels shall vary depending on the piling methodology chosen by the contractor.

It is recommended that piling is completed in blocks of time with breaks (for as long as possible) to allow some relief to nearby residents and businesses. For example, local seaport restaurants may prefer piling breaks to occur at lunchtime so to minimise the disturbance to businesses. It is also recommended that pile driving does not occur after 6pm and no activity on weekends.

If noise issues are raised by nearby residents or businesses then these shall be investigated by CoL and testing may be carried out.

Further noise and vibration advice shall be provided by noise consultants prior to and during the bridge construction to ensure that vibration and noise impacts are prevented where possible.





# 5. Protection of Native Vegetation

A flora and fauna report has been completed by K. Pugh (refer Appendix E). Desktop and field survey has not revealed any threatened fauna under the *Environmental Protection and Biodiversity Conservation Act* (EPBC) and *Tasmanian Threatened Species Protection Act* 1995 (TSP).

Two plant species (*Calystegia sepium* Swamp bindweed and *Schoenoplectus tabernaemontani* River Clubsedge) listed as rare under the TSP have been identified in the riparian vegetation of Northbank.

The area of impact is expected to extend up to 100 metres of the northbank foreshore. A permit to take for these identified species shall be lodged with DPIPWE PCAB by CoL.

The construction contractor shall include the following mitigation measures in their plan;

- Sediment and erosion controls to prevent impact on native foreshore vegetation and threatened flora;
- Weed management controls to prevent the spread off/onsite of weeds and introduction of weeds;
- Implementation of exclusion zones by the CoL native flora/fauna expert

# 6. Weed Management

Weed management controls implemented by the construction contractor shall aim to prevent the spread of weeds on the site and off site and the introduction of the weeds particularly in disturbed areas.

The construction contractor shall implement the following weed management controls;

- Washing all equipment prior to use on the site;
- Pre-treatment of localised weed infestations prior to commencement of construction works;
- Post work monitoring of weeds; and
- Control of any new infestations.

The contractor shall implement procedures to ensure compliance with the *North Bank Precinct Weed Management Plan* (CoL, April 2017)

# 7. Soil Management

#### **River Sediment**

It is expected that sediment will not be removed during pile driving at Piers 2 to 4 (under the water). Sediment will be displaced but will not be extracted from the river. Pile driving shall be completed in a way that minimises sediment disturbance where possible. However, it is expected that sediment will be displaced and an increase in turbidity may also occur temporarily.

#### Abutment / Pier 1

Approximately 50 to 100 cubic metres of soil shall be excavated from the location of Pier 1. The soil removed from this area shall be treated as potentially contaminated soil and





stored onsite awaiting the results of laboratory analysis. Previous testing in this area has found elevated levels of metals.

Excavated soil shall be placed in a water tight skip bin with a lid to prevent the ingress of water or wrapped in plastic and contained within an earth bund. The soil may be either reused on site (buried and capped) or disposed offsite to an approved facility with disposal off-site to be approved by EPA Tasmania (Waste Management Section).

#### **Acid Sulfate Soils**

The excavation and pile driving activities are likely to disturb acid sulfate soils along northbank and in the North Esk River.

Sediment under the water will be displaced but not removed from the River. The soil excavated at Pier 1 (on land) shall be tested for acid sulfate parameters and shall be treated as if acid sulfate soil. Sediment and erosion control infrastructure shall be installed around the site of Pier 1 to prevent runoff to the river and mobilisation of metals.

The contractor shall implement controls to comply with DPIPWE *Guidelines for Managing Acid Sulfate Soils* during works at Pier 1. Pile driving will attempt to minimise soil disturbance however this activity is expected to displace soil. The contractor shall also implement controls in accordance with the North Bank Acid Sulfate Soil Management Plan (CoL, April 2017) (refer Appendix) However, stabilisation of extracted water shall not be required where water or sediment are not extracted from the River.

### 8. Dust and Air Emissions

The activity is not likely to generate excessive dust or air emissions. Some dust may be created during excavation of Pier 1 on northbank. Dust is not expected to be a significant issue requiring design controls.

# 9. Storage of Hazardous Substances

The hazardous substances used on the site include fuel for vehicles and equipment and lubrication oils. All motor repairs shall be completed offsite. Fuel shall be transported onsite as needed. No fuel, lubricating oil or hazardous substances shall be stored onsite unless the contractor provides details of a safe storage area which is bunded to hold 110% of the total volume of hazardous substances and is not located within 20 metres of an area which may be subject to flooding. Such details shall be provided in the construction contractor's CMP.

# 10. Prevention of Water Discharges

The North Esk River must be protected from the discharge of pollutants including sediment and hazardous substances. Pollutants must not be permitted to enter the waterways except for building materials (i.e. concrete shall be piped into castings to construct the piers). Refuelling of mobile machinery /vehicles shall not be carried out within 30 metres of the riverbank (high tide mark). Refuelling of stationary /fixed plant and equipment shall be completed in accordance with procedures developed by the contractor in the Construction Management Plan.





# 11. Staff Training and Induction Procedures

The construction contractor shall be responsible for controlling access to the construction site and preventing access by unauthorised persons. Induction of site visitors and contractors shall be the responsibility of the contractor. Strict safety protocols are expected to be put in place as the site is likely to present significant hazards to workers, site visitors and the general public walking near the site. Training and Induction procedures are expected to address all significant safety hazards and reinforce the importance of a 'safety first' attitude.

# 12. Roles and Responsibilities

CoL shall engage a contractor to construct the bridge. CoL shall require the contractor to report on significant issues and provide interim reports. All site management issues shall be the responsibility of the contractor. The contractor shall provide the following plans for approval by CoL;

- Construction Plan
- Health and Safety Management Plan

The roles of the CoL and the contractor are summarised in Table 1.

Table 1: Construc	tion Contractor Roles and Responsibilities			
Subject	Task			
Health and Safety	Develop a Health and Safety Management Plan (HSMP)			
Management Plan	Implement, Monitor and Review the HSMP			
	Manage site access through an approval and induction system for visitors, employees, sub-contractors and CoL staff.			
	Provide Progress Reports to CoL			
	Notify CoL of any incidents, near misses or public complaints			
Complaints	Notify Construction Contractor of any public complaints			
	Ensure that the HSMP adequately addresses likely after hours issues and complaints.			
CEMP	Implement and Comply with the CEMP and contractor CMP (when developed)			
Environmental Compliance	Comply with state and national environmental protection legislation during the preconstruction (installation of equipment), construction and post construction phase (cleaning up).			
Noise	Develop a Noise mitigation strategy to minimise noise impacts to nearby residents and businesses			
Fire	Implement all necessary controls to prevent fire and procedures and equipment for fire fighting.			

# 13. Public and Worker Safety

The construction contractor shall be responsible for the planning and implementation of a health and safety system to protect workers, site visitors and the public. The location of the bridge presents challenges for preventing access to the construction areas. The Seaport boardwalk is a busy pedestrian and bike traffic area. The safety risks shall be assessed and managed by the construction contractor. A health and safety management plan shall be submitted to the City of Launceston for approval prior to commencement of works.





The plan shall include;

a. Daily Operation Management

The health and safety management plan shall require regular safety checks of safety controls.

b. Daily Site and Safety Checks

The construction manager shall ensure that daily site and safety checks are documented and provided to City of Launceston on request during site audits.

c. Reporting of Incidents

Reporting and rectification of near misses and incidents. Incidents shall be reported to City of Launceston, General Manager for information.

d. Mitigation Measures

All mitigation measures shall be regularly checked and documented including any corrective actions.

e. Communication with the Public

The health and safety measures must be adequately communicated to the public using easy to understand and effectively displayed safety signage.

# 14. Communication Strategy

A communication strategy shall be included in the Construction management plan which shall document how the construction company shall communicate with the public with regard to noise, amenity and any other environmental and public safety issues related to the bridge construction.

# 15. Complaints Management

The contractor shall develop a complaints management system and shall keep records of compliants. The contact and complaints management system shall include;

- Day-time and after hours contact phone number displayed on security fencing on the Northbank and Seaport sites;
- A complaint record form for documenting complaint details, complainant contact details and follow-up action.

# 16. Incident Management and Corrective Actions

All safety or environmental incidents shall be recorded and reported to CoL for their information. Where there is a release of a pollutant (i.e. discharge to the water) this must be reported to the EPA (if a significant discharge) and the CoL. Immediate action must be taken to contain and prevent further discharge. Incident management shall be included in the construction plan.





# 17. Summary of Commitments

The contractor will address the following commitments in the CMP.

Table 2: Contractor Commitments to be addressed in the CMP					
Public and Worker Safety	Develop a Health and Safety Management Plan.				
Noise Emissions	Include a noise mitigation strategy in the CMP.				
Waterway Protection	Include protection measures in the CMP.				
Flora and Fauna	Make arrangements with CoL for the marking out of vegetation protection zones and identification of problem weed areas.				
Weed Management	Identify areas requiring weed treatment pre- construction, during construction and post construction with careful consideration of spraying in close proximity to waterways.				
Hazardous Goods	Include handling and storage controls in the CMP.				

## 18. Recommendations

This Plan has been developed as a general plan outlining the significant issues to be addressed in a more specific CMP. The specific details and set up of work areas will be determined by the construction contractor based on the chosen methodology.

The CMP prepared by the construction contractor shall include the following items;

- Site Plan showing the following;
  - o location of the site office,
  - o temporary infrastructure,
  - dangerous good storage,
  - o bunded /contained soil stockpiles
  - o safety fencing, barriers, safety signage and detours
  - o vegetation protection zones,
  - o surface works on the river side of the levee to prevent erosion and riverbank collapse.
- Health and Safety Management Plan
- The CMP will comply with DIER General Specification for Construction Environmental Management Plan and will include regular third party audits (refer Appendix F)



# **APPENDIX A**

Baseline Noise Report



# Old Seaport Pedestrian Bridge Noise and Ground Vibration Baseline Monitoring Report

transport | community | mining | industrial | food & beverage | carbon & energy









Prepared for: City of Launceston

Client representative: Daniel Mace

Date: 21 February 2017

Rev00









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Prepared by: Date: 21 February 2017

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Revision History							
Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date		

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#### 1. Introduction

**pitt&sherry** has been commissioned by the City of Launceston to carry out baseline monitoring of noise and ground vibration in and around the site of a new pedestrian bridge, to be constructed between the Old Seaport boardwalk and the northern bank of the North Esk River during 2017. Two rounds of measurements are planned. This report provides details of results of the first round, completed in December 2016. A further round of measurements will be carried out in March 2017 and an additional report issued thereafter.

#### 2. Measurement Details

Measurements were made at seven locations, as indicated in Figure 1 below. The locations were selected to provide a representative indication of the noise levels and levels of ground and/or structure-borne vibration that are normally experienced at properties close to the bridge construction site. The closest property is the Seaport Hotel, followed by cafes and/or residences to the north and south. Noise exposure at these sites is dominated by traffic on Charles Street along with more distant traffic noise and to a lesser extent machinery operating on the Boral site across the river.

Noise measurements were made with a Rion NX42RT sound level meter. Extended measurements of 40 hours and 26 hours, were made at Locations 1 and 2. Shorter 10 minute measurements were made at Locations 4 to 7. The sound level meter was set to make a measurement every second and record statistics every 10 minutes.

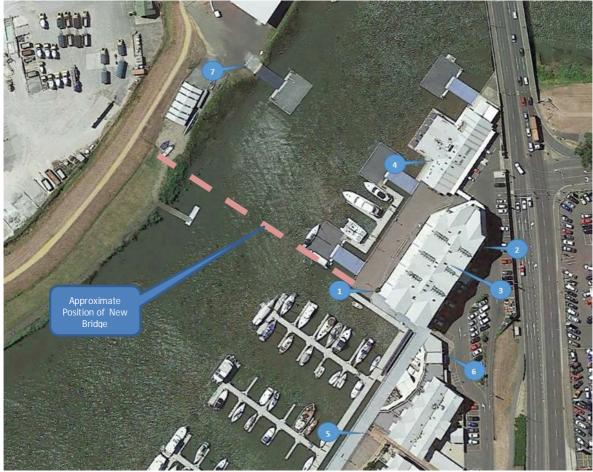


Figure 1 - Measurement Locations (Base image from Google Earth)

pitt&sherry ref: LN16297L003 rep 31P Rev 00/DF/tc





The intensity of ground vibration diminishes rapidly with the distance from the source. Ground and structural vibration results from heavy vehicle traffic, vibrating plant and machinery and from people walking, moving things, bumping into things etc. in close proximity to the measurement point. Structural vibration is more intense on relatively flexible structures such as a timber boardwalk and less intense on stiffer / more solidly support structures such as concrete slabs on the ground. Measurements at all locations except for Locations 2 and 6 are all on elevated structures, reflecting the hotel's site which is above the dry dock and wharves that previously utilised the site.

Ground and structure-borne vibration was measured using a geophone and a Kelunji Gecko seismic recorder. Extended measurements were made at Locations 1, 2 and 3 and 10 minute measurements at the other locations. Location 3 is on the third floor of the Seaport Hotel. It was included to check for any differences in the level of vibration on higher floors within the building structure. The seismic recorder records data at 1kHz. The results are presented as 1 minute peak particle velocities, i.e. the maximum vibration amplitude reached during each 1 minute monitoring interval.

#### 3. Noise Results

#### 3.1 Results Summary

The following table summarises the noise results. The noise levels measured are within the range expected for an urban environment with exposure to traffic and pedestrian activity. In the graphed results, the short term peaks relate generally to pedestrians, café patrons and/or vehicles movements in the near vicinity to the measurement locations. The longer term level swings reflect changing traffic volumes on nearby streets. In the results below, Lmax refers to maximum, short term peak noise levels, Leq may be thought of as a time based "average" noise level for a 10 minute period and L<sub>90</sub> is the "background noise level", defined as the noise level exceeded during 90% of a 10 minute measurement period. Noise from a new industrial or construction source, is often considered to be "intrusive" if it exceeds the existing background noise level by 5dB(A) or more. Results ranges indicated for the two extended measurements have been taken from daytime hours only (nominally 6am to 6pm) as the bridge construction work is planned for daytime hours only.

Dec	December Baseline - Noise Measurements							
	Measurement Location	Mea	surement Tin	ning	Daytime	Noise Result	s dB(A)	Noise Description
No.	Desecription	Start Date	Start Time	Length	Lmax,10min	Leq,10min	L90, 10min	
1	SW Corner Seaport Hotel	12/12/2016	12:02 PM	40hr	60-105	49-71	48-63	n/a
2	NE Corner Seaport Hotel	20/12/2016	12:45 PM	26hr	66-89	58-67	48-58	n/a
4	Boardwalk, outside "Fish & Chips"	22/12/2016	3:45 PM	10 min	67.7	50.8	47.6	Gulls, Distant Traffic, Boral Loader
5	Boardwalk - South of Cafés	22/12/2016	4:01 PM	10 min	52.8	50.6	50.1	Gulls, Distant Traffic
6	Footpath behind "Levee Food Co"	22/12/2016	4:12 PM	10 min	65.0	58.5	54.2	Distant & Local Traffic
7	Rowing Club - adjacent to Pontoon	22/12/2016	4:29 PM	10 min	60.8	49.1	45.6	Gulls, Distant Traffic

Figure 2 - Summary of Noise Results





#### 3.2 Graphs of Extended Measurements

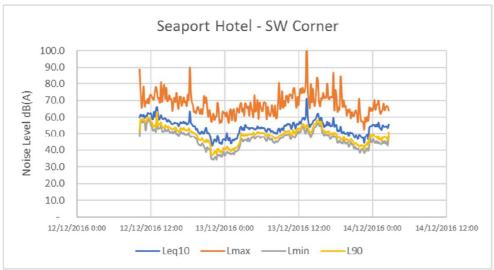


Figure 3 - Noise Logging Results - Location 1

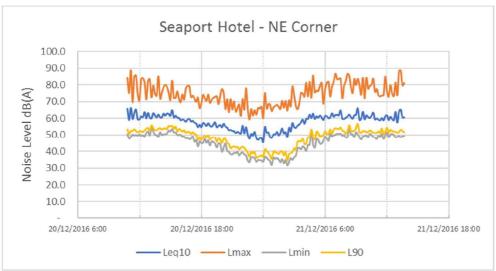


Figure 4 - Noise Logging Results - Location 2

#### 4. Ground Vibration Results

#### 4.1 Results Summary

The ground vibration results obtained are summarised in the table below. The table and graphs include measurements of vibration in three axes (X & Y are the horizontal components and Z is the vertical component of the vibration.) A statistical breakdown of the vibration amplitudes is included with each graph.

The maximum vibration levels recorded for each measurement location show a baseline level that varies with the time of day, reflecting the general levels of activity in the vicinity. The general ground /structural vibration is less than 0.2mm/sec at all locations, which is a typical level for an urban environment. Superimposed on top of this base level are less frequent peaks, which generally reflect shocks or impacts from people moving about close to the geophone. The characteristics of these vary with location.

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Location 1 at the SW corner of the Seaport Hotel, is in a garden bed, adjacent to an outdoor dining area, remote from any vehicles. Location 2 is in a garden bed close to the hotel carpark and is likely to be more affected by vehicle movements. Location 3 is in the cleaner's cupboard on the 3<sup>rd</sup> floor of the hotel. There are also a very small number of very strong peaks which most likely are caused by someone directly contacting the geophone.

Decembe	r Baseline	- Ground	Vibration

	Measurement Location	Measurement Timing			Peark Particle Velocity mm/s		
No.	Desecription	Start Date	Start Time	Length	Lmax, 1min	Lmax, 1min	Lmax, 1min
					Horizontal	Horizontal	Vertical
1	SW Corner Seaport Hotel	12/12/2016	12:02 PM	7 days	2.4	1.2	1.4
2	NE Corner Seaport Hotel	20/12/2016	12:45 PM	26hr	2.1	3.5	2.9
3	3rd Floor - Seaport Hotel (Cleaners' Cupboard)	21/12/2016	3:51 PM	24hr	19.3	25.8	26.7
4	Boardwalk, Outside "Fish & Chips"	22/12/2016	3:45 PM	10 min	0.09	0.13	0.37
5	Boardwalk - South of Cafés	22/12/2016	4:01 PM	10 min	15.91	7.62	18.93
6	Footpath behind "Levee Food Co"	22/12/2016	4:12 PM	10 min	0.10	0.08	0.29
7	Rowing Club - adjacent to Pontoon	22/12/2016	4:29 PM	10 min	0.04	0.05	0.03

**Figure 5 - Ground Vibration Results** 

#### 4.2 Graphs of Extended Measurements

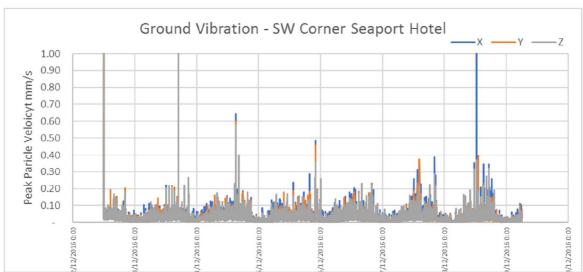


Figure 6 - Ground Vibration Results - Location 1

PPV 1minute - Statistics							
	Х	Υ	Z				
Max mm/s	2.4	1.2	1.4				
>1mm/s	0.02%	0.01%	0.01%				
>.5 mm/s	0.03%	0.03%	0.03%				
>.1 mm/s	2.4%	2.4%	2.4%				
>0.05mm/s	14.5%	14.5%	14.5%				
<=0.05mm/s	85.4%	85.4%	85.4%				

Figure 7 Ground Vibration Results - Location 1





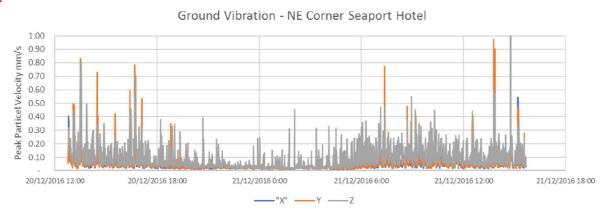


Figure 8 - Ground Vibration Results - Location 2

PPV 1minut			
·	Χ	Υ	Z
Max mm/s	2.1	3.5	2.9
>1mm/s	0.1%	0.1%	0.1%
>0.5mm/s	0.5%	0.7%	0.6%
>0.1mm/s	8%	8%	32%
>0.05mm/s	31%	37%	55%
<=0.05mm/	69%	63%	45%

Figure 9 - Ground Vibration Results - Location 2

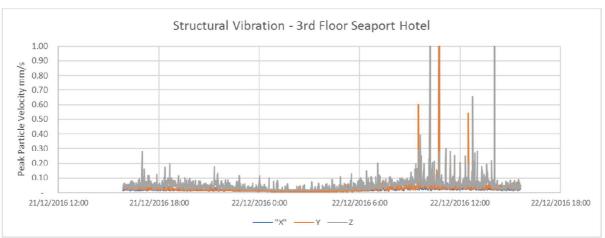


Figure 10 - Ground Vibration Results - Location 3

PPV 1minute - Statistics							
	Х	Υ	Z				
Max mm/s	19.3	25.8	26.7				
>1mm/s	0.2%	0.2%	0.1%				
>.5 mm/s	0.3%	0.4%	0.2%				
>.1 mm/s	1.3%	1.5%	6.1%				
>0.05mm/s	3.5%	7.2%	37.9%				
<=0.05mm/s	96.5%	92.8%	62.1%				

Figure 11 - Ground Vibration Results - Location 3

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#### 5. Conclusion

Following the first round of measurements, the noise and vibration level results are consistent with the anticipated background levels for the site. No intense sources of noise or vibration affecting the results were discovered other than some occasional high readings which are most likely to have been caused by accidental or curiosity driven direct contact with the sensors.

The planned second round of measurements will be carried out during March/April and the final report issued prior to the anticipated start of construction in July.



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# **APPENDIX B**

Acid Sulphate Soils Management Plan



# North Bank Precinct Acid Sulfate Soil Management Plan







#### 1. Introduction

Located in the inner city suburb of Invermay, the North Bank site area encompasses the riverfront parcels of land at the confluence of the North Esk River and the Tamar Estuary to the south of Lindsay Street, and the former light industrial and mixed use parcels to the north.

The southern river edge frontage to the North Esk River and Tamar Estuary is characterised by a high level of user amenity and high quality built form along the Royal Park and Old Seaport areas. In direct contrast to this aesthetically pleasing and active precinct, the northern river frontage is currently characterised by undesirable aesthetic qualities, low amenity river edge and intertidal zone, unmanaged natural environment, and poor quality built form. A Masterplan vision for the regeneration of the former commercial and industrial land on the southern side of Lindsay Street in Invermay is complete. This land includes the river edge parcels created by the new Flood Levee.

The redevelopment of this North Bank precinct will create an exciting new precinct on the northern edge of the city, and the project is aiming to 'break new ground' in urban riverside development. It will be a 'must visit' destination for both tourists and visitors to Launceston.

#### 2. Purpose and Scope

The City of Launceston (COL) is committed to achieving environmentally sustainable development. Major construction projects such as the North Bank Precinct are important to Launceston's economic development. However, during construction, such projects can pose a significant risk to the environment, which must be addressed. To maximise environmental outcomes, the COL requires the implementation of high quality environmental controls and effective environmental management systems for each project.

The management of Acid Sulfate Soils is identified as a high priority by CoL. This document outlines a management framework to be applied to construction activities with the potential to disturb Acid Sulfate Soils.

### 3. Background

Acid sulfate soils are natural soils that contain sulfides (mostly iron) which underlie many coastal areas and some inland areas of Australia. In an undisturbed state, these soils are Potential Acid Sulfate Soils (PASS); once they are disturbed and start oxidising, they are Actual Acid Sulfate Soils (AASS; DPIPWE 2009). Undisturbed and waterlogged PASS are harmless, but when disturbed and exposed to oxygen through drainage or excavation, oxidation can produce sulfuric acid. After rain and particularly following prolonged dry periods, the sulfuric acid in these soils can then be released into the surrounding environment. As the acid moves through the soil profile it may cause the release of heavy metals and other toxins, which can then flow into surrounding waterways. Toxic "slugs" of concentrated acid runoff can move downstream and flow into estuaries, reducing oxygen levels in the water, significantly decreasing water quality, killing fish and damaging sensitive ecosystems (DPIWE 2009).

Acid sulfate soils have been identified in a number of areas in Tasmania, including the banks of the North Esk River and Tamar Estuary. The construction activities for the North Bank Precinct have potential to cause disturbance to these soils.





The Tasmania Department of Primary Industries, Water and the Environment (DPIPWE) have prepared management guidelines to assist decision making and provide greater certainty in undertaking planning and implementation of operations that may disturb Acid Sulfate Soils.

Useful references:

DPIPWE 2009 Tasmanian Acid Sulfate Soil Management Guidelines www.dpipwe.tas.gov.au/Documents/ASS-Guidelines-FINAL.pdf

LISTMap http://maps.thelist.tas.gov.au

#### 4. Acid Sulfate Management Plan

Upon mobilisation to site, soils will be assessed in locations where construction excavation is to occur to a depth likely to disturb PASS. Soil samples will be collected and analysed for PASS in accordance with DPIPWE Guidelines (Appendix B, 2009).

In the event that AASS/PASS are detected, an appropriate management strategy for the specific soil type/situation will be implemented. Management strategies may include (but are not limited to) avoidance, covering in situ with clean fill, minimising disturbance, and neutralising.

Water exposed to AASS that has a pH<6.0 will be collected for management. Treatment and neutralisation will be accomplished with dissolved lime slurry, hydrated lime, quicklime or other suitable reagent, with liming rate determined following assessment of actual pH level. Discharge of water may occur when the pH is steady at within a pH range of 6.5-8.5. Regular testing will be implemented to ensure that water is not overdosed such that the pH rises above 8.5. Neutralised water will be discharged to the North Esk River/Tamar Estuary via the stormwater system.

Regular visual monitoring of the works area will be undertaken to identify signs on AASS oxidation. This monitoring will include detecting;

- Unexplained scalding, degradation or death of vegetation
- Unexplained death of aquatic biota
- Formation of the mineral jarosite and other acidic salts in exposed or excavated soils
- Areas of blue-green water or extremely clear water indicating high concentrations of aluminium
- Rust-coloured deposits on plants, banks of drains, waterbodies and watercourses indicating iron precipitates
- Excessive corrosion of concrete and/or steel structures in contact with soil or water
- Black waters indicating deoxygenation
- Sulfurous smells (eg hydrogen sulphide or rotten egg gas).

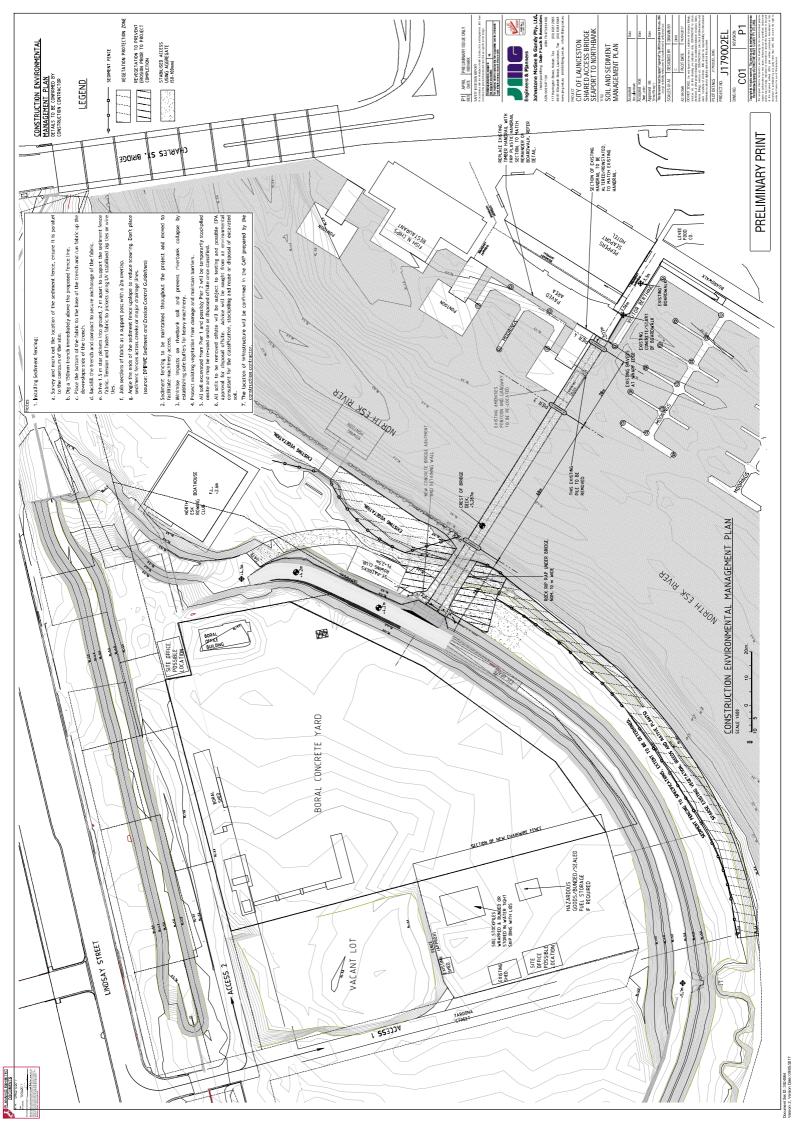
An incident reporting procedure will be implemented to record, investigate and report any spills or unscheduled discharges. In the event that an incident occurs, the project manager to co-ordinate corrective actions. Contingency measures will be developed based on the incident requirements (for example erecting bunds around excavation areas, lining for drainage systems).





# **APPENDIX C**

Soil and Sediment Erosion Control Plan J179002EL C01





# **APPENDIX D**

Weed Management Plan



# North Bank Precinct Weed Management Plan







#### 1. Introduction

Located in the inner city suburb of Invermay, the North Bank site area encompasses the riverfront parcels of land at the confluence of the North Esk River and the Tamar Estuary to the south of Lindsay Street, and the former light industrial and mixed use parcels to the north.

The southern river edge frontage to the North Esk River and Tamar Estuary is characterised by a high level of user amenity and high quality built form along the Royal Park and Old Seaport areas. In direct contrast to this aesthetically pleasing and active precinct, the northern river frontage is currently characterised by undesirable aesthetic qualities, low amenity river edge and intertidal zone, unmanaged natural environment, and poor quality built form. A Masterplan vision for the regeneration of the former commercial and industrial land on the southern side of Lindsay Street in Invermay is complete. This land includes the river edge parcels created by the new Flood Levee.

The redevelopment of this North Bank precinct will create an exciting new precinct on the northern edge of the city, and the project is aiming to 'break new ground' in urban riverside development. It will be a 'must visit' destination for both tourists and visitors to Launceston.

#### 2. Purpose and Scope

The City of Launceston (COL) is committed to achieving environmentally sustainable development. Major construction projects such as the North Bank Precinct are important to Launceston's economic development. However, during construction, such projects can pose a significant risk to the environment, which must be addressed. To maximise environmental outcomes, the COL requires the implementation of high quality environmental controls and effective environmental management systems for each project.

The management of weeds is identified as a high priority by CoL. This document outlines a weed management framework to be applied to the North Bank Precinct during construction.

### 3. Background

Weeds can be defined as introduced plants, both exotic and non-endemic native species, which have invaded natural ecosystems. Environmental weeds are often a symptom of other degrading impacts on bushland such as high nutrient stormwater runoff, erosion and sedimentation, dumping of green waste and clearing. Once established, the weed populations also become a degrading factor which further alters environmental conditions to promote increased native vegetation loss. Adverse impacts of environmental weeds include:

- Degraded landscape values and impeded access which impacts on urban amenity and tourism;
- Competition with local native plants for sunlight, moisture and nutrients;
- Inhibition of the native plant germination;
- Alteration of habitat for threatened/endemic species;
- Encouraging more frequent and intense fires;
- Changes to soil characteristics such as nutrient cycles, pH, moisture and microbiology; and





 Increase nutrient levels in water and lower levels of oxygen that may threaten aquatic fauna.

The site of the proposed North Bank Precinct and immediate surrounds contain "declared weeds" within the meaning of the Tasmanian Weed Management Act 1999:

- crack willow Salix spp.
- blackberry, Rubus fruticosus aggregate
- Paterson's curse Echium plantagineum
- ragwort Senecio jacobaea

Two species, willow and blackberry, are also Weeds of National Significance (WoNS).

The proposed project area also contains the environmental weed Scotch thistle, Cirsium vulgare.

#### 4. Weed Management Plan

Mitigation measures identified during the pre-construction phase include:

- Prior to works commencing, declared and environmental weeds within the construction area will be controlled by a licensed contractor;
- Prior to entering the construction area all personnel will complete a weed management inductions;
- A wash down area will be established on site, and will be maintained to prevent the further spread of declared and environmental weeds. Prior to leaving site vehicles and/or machinery must be adequately clean to prevent the spread of weeds;
- Soil and vegetative matter from the clean down area is to be removed regularly and stockpiled and/or disposed of to an appropriate site;
- Signage will be established at clean and wash-down points, directing machinery/ vehicle operators to use these facilities;
- Weeds have the potential to germinate in the project area during construction within areas such as around infrastructure, fencing, soil stockpiles, disturbed areas, etc. As such, on-going weed control works will be maintained during construction;
- Any topsoil/bedding that is imported to site is required to be certified weed free (where practicable);
- Any excess soil/fill cannot be used onsite, will be disposed of at a licensed receiving facility or other property with an approved planning permit to receive such material;
- Weed-infested stockpiles as well as topsoil which are to be transported away must be covered to protect against further spread and contamination; and
- Disturbed areas must be re-sown as soon as practicable to minimise the area of exposed soil for weed establishment and spread.

Post-works monitoring will be undertaken by CoL staff, with appropriate control of novel or exacerbated infestations.





# **APPENDIX E**

Flora and Fauna Report



# **APPENDIX F**

# DIER CEMP General Specification



# GENERAL SPECIFICATION

G10 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Date JUNE 2012





# DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES TASMANIA

#### GENERAL SPECIFICATION

#### G10 – Construction Environmental Management Plan June 2012

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# DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES TASMANIA

#### GENERAL SPECIFICATION

G10 – Construction Environmental Management Plan June 2012

#### G10.1 SCOPE

This specification sets out the requirements for the development, implementation and maintenance of the Contractor's Construction Environmental Management Plan (CEMP) for the contract. Implementation includes ongoing auditing, review and reporting.

The CEMP is to be supported by the Contractor's Environmental Management System (EMS). The EMS is to be certified in accordance with AS NZ ISO 14001 "Environmental Management Systems – Requirements with quidance for use".

Through the CEMP, the Contractor shall demonstrate that both known and potential environmental effects are clearly understood and are to be effectively managed throughout all stages of the contract including the defects liability period.

#### G10.2 OBJECTIVES

This specification defines the principles by which environmental management is to be achieved on DIER contracts.

The objectives of this specification are to:

- ensure that environmental management is appropriately planned, implemented and maintained
- ensure environmental management is included in the Contractor's Worksite Risk Management process
- ensure the principles of Best Practice Environmental Management (BPEM) feature throughout all stages of the project, and
- drive compliance (legislative, permit, DIER specification, EMS) and sound record keeping.

#### G10.3 REFERENCES AND STANDARDS

The Contractor's CEMP shall be compatible with the provisions of all DIER standard specifications for Design, Construction and Maintenance in particular:

- G1 General Provisions
- G2 Contract Management Plan
- G3 Traffic Management
- G8 Construction Survey
- G9 Product Quality
- T5 Environmental Investigations and Reports
- All other DIER specifications relevant to the project.

The Contractor's CEMP shall also be compatible with the provisions the following standards, Guides and Legislation:

Australian Standards and Guides

- AS NZ ISO 9001 "Quality Management System requirements"
- AS NZ ISO 14001 "Environmental Management Systems Requirements with guidance for use".
- AS/NZ4801 and 4804 "Occupational Health and Safety Management Systems",
- AS/NZS ISO 31000 Risk Management, Principles and Guidelines
- HB 206 Initial Environmental Review
- HB 327 Communication and Consulting
- ISO Guide 73 Risk Management, Vocabulary.



# DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES TASMANIA

#### **GENERAL SPECIFICATION**

G10 – Construction Environmental Management Plan June 2012

#### Austroads Guides

• AP-R185 Environmental Risk Management, Guidelines and Tools for Road Projects.

#### Legislation

- The Tasmanian Environmental Management and Pollution Control Act"
- the Commonwealth "Environmental Protection and Biodiversity Act" and
- the Regulations under these Acts.

#### G10.4 DEFINITION OF TERMS

The terms used in this specification shall be as defined in *Table G10.1 Definitions*.

#### Table G10.1 Definition of Terms

EMS	Environmental Management System
EER	Environmental Effects Report.
Environmental	Harm is a term defined by the Environmental Management &
Harm	Pollution Control Act 1994, however for the purpose of the CEMP,
	harm is defined as "any adverse impact on the natural environment."
	To that effect, use of the word "harm" in a CEMP extends to a
	diversity of legislation including, but is not limited to:
	<ul> <li>Threatened Species Protection Act 1995;</li> </ul>
	<ul> <li>Nature Conservation Act 2002, and the</li> </ul>
	<ul> <li>Environment Protection &amp; Biodiversity Conservation Act 1999.</li> </ul>
EMPCA	Environmental Management & Pollution Control Act 1995
EPA	Environmental Protection Authority
Environmental	The consequence of a given action that results in a change to
Effect	environmental condition that would not have occurred otherwise. An
	environmental effect can be both positive and negative, however is
	more often referred to in the negative. Often referred to as an
	'environmental impact'.
EPBCA	Environment Protection & Biodiversity Conservation Act 1999
ESR	Environmental Scoping Report.
DPEMP	Development Proposal & Environmental Management Plan.
FPA	Forest Practices Act 1985
Management	Are actions/measure developed to prevent/mitigate/offset an
Measures or	expected/known environmental effect, the direct/indirect result of a
Mitigation	given action. The measures are to be auditable and may be
Measures	integrated in to DIER's contractor auditing program.
NCA	Nature Conservation Act 2002
NoI	Notice of Intent
TSPA	Threatened Species Protection Act 1995
The 'Board'	Board of Environmental Protection Authority

#### **G10.5 INTELLECTUAL PROPERTY**

Information, data and outputs that are the direct and/or indirect result of works conducted for and on behalf of DIER, is the Intellectual Property (IP) of DIER. All project related information that is sourced, collated, generated and produced by virtue of a DIER contract, is owned by DIER.

#### G10.6 INFORMATION PROVIDED BY THE PRINCIPAL

The Principal will provide all relevant documents associated with project planning and approval, e.g. Environmental Effects Report (EER) or Development Proposal & Environmental

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#### **GENERAL SPECIFICATION**

G10 – Construction Environmental Management Plan June 2012

Management Plan (DPEMP). (Refer Standard Specification T5 Environmental Investigations and Reporting)

Information provided by the Principal may include a list of environmental commitments made by DIER during the project planning process. These commitments may be included in environmental permits issued by the relevant regulators. These commitments are to be honoured where appropriate and incorporated in to the CEMP.

#### Note:

The pre-existing commitments cannot be modified or dropped without documented justification to do so. This may require formal notification from the regulator. Additional commitments are encouraged.

#### G10.7 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

The Construction Environmental Management Plan (CEMP) is the environmental element of the Contract Management Plan (CMP) refer Standard Specification G2 Contract Management Plan.

The Contractor shall detail the requirements of this specification and the specific environmental requirements in all other specifications in the CEMP.

The CEMP must show that the Contractor has considered and understood the requirements of the specification and has:

- obtained the required level of third party certification with respect to the Contractor's EMS
- demonstrated project specific environmental understanding
- demonstrated skills, experience, capacity and competence relevant to the project
- provided a tool that will assist all persons to effectively manage environmental harm throughout all stages of construction
- demonstrate sound project specific environmental understanding
- provided the key reference tool to be used by all persons to prevent and/or effectively manage environmental harm throughout all stages of construction
- a demonstrated monitoring process including an outline of how monitoring information will be communicated (and to whom) to improve site management and how 'reactive' monitoring (i.e. monitoring that is outside the scope of routine monitoring programs) is to be managed
- a demonstrated auditing process including reporting.

Appendix G10A CMP/CEMP Structure and Content Guide lists a minimum number of topics that DIER expects would be addressed depending on the complexity of the contract.

#### G10.8 ENVIRONMENTAL MANAGEMENT

#### G10.8.1 Contractor's Responsibilities

The Contractor shall:

- identify and prevent environmental harm from occurring
- manage construction activities to mitigate unavoidable environmental impacts
- monitor and track change in environmental condition over time
- respond effectively to environmental incidents
- undertake remedial works in a manner appropriate to the effect/impact document and maintain records in accordance the Contractors EMS.

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#### **GENERAL SPECIFICATION**

G10 – Construction Environmental Management Plan June 2012

#### G10.8.2 Environmental Management Systems (EMS)

The Contractor is required operate in accordance with a certified EMS as per AS NZ ISO 14001 "Environmental Management Systems – Requirements with guidance for use".

Alternatively the Contractor may have achieved certification under the Civil Contractors Federation, "Civil Construction Management Code".

#### G10.8.3 Risk Management

Risk assessments shall be undertaken in accordance with the documents listed in this specification and other relevant documents as required. The objective (refer AS/NZS ISO 31000 clause 2.1) of any CEMP risk management process is to reduce the likelihood of a legislative breach, through sound project understanding and site management practices. This includes residual risk, i.e. the risk that remains post implementation of all practical and feasible mitigation measures.

It is essential that key outcomes (i.e. location of conservation areas) of the planning and design process are incorporated in to, and feature heavily throughout the CEMP. It should be noted that a failure to manage for known environmental values, or a failure to manage for potential environmental impact, may result in a breach of environmental legislation, be it State or Federal.

#### G10.8.4 Environmental Monitoring

Environmental performance and condition shall be monitored throughout all stages of construction (including the defect liability period). Monitoring programs are to be tailored to each environmental aspect (e.g. hazardous materials or stormwater) with the preferred method and frequency of monitoring clearly identified.

The location of monitoring sites shall be identified (on site maps), where possible even though locations may be indicative only.

#### G10.8.5 Environmental Auditing

The Contractor shall undertake audits to verify that the systems and processes designed to prevent and manage environmental impact have been implemented correctly, are operating effectively and can used to identify where improvements can be made.

The Contractor shall have an audit programme that is tailored to the project. The programme should outline the purpose/type of auditing (1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup>), frequency, triggers, review process and proposed circulation of audit results.

The Contractor's environmental audits shall be undertaken at the direction of an Environmental Professional who is to be a full member of an Australian recognised Professional Environmental or Engineering Institute or Association.

#### G10.8.6 Completion Audit

The Contractor will arrange an environmental completion audit by a third party environmental professional for submission to the Superintendent prior to requesting a Certificate of Practical Completion. This audit must cover all the requirements of this specification.

The Contractor's environmental completion audit shall be undertaken at the direction of an Environmental Professional who is to be a full member of an Australian recognised Professional Environmental or Engineering Institute or Association.



#### **GENERAL SPECIFICATION**

G10 – Construction Environmental Management Plan June 2012

#### G10.8.7 Qualifications of Environmental Professional

All environmental auditing and reporting shall be undertaken by a field- related professional with demonstrated experience and competence relevant to the project/task in question.

The environmental professional's qualifications shall be relevant to the individual elements required by the audit or report, i.e. experienced and qualified geoscientists, terrestrial ecologists, geomorphologists, water quality, environmental assessment and management specialists or other as identified by the task.

#### G10.8.8 Non-conformances

For the purposes of this specification non-conformances are defined as any deviation from what is required by law, what is stipulated by environmental permit/planning approval, or what is agreed to as an environmental commitment. Non-conformance's can range from minor through to extreme and can be a one-off or continuous.

#### G10.8.9 Incident Management

The Contractor shall have an incident management process that clearly define an incident and identifies:

- · how an incident may be identified
- how an incident can be reported (and to whom)
- who has responsibility for an incident
- how an incident can be recorded
- how an incident is communicated (and to whom) i.e. communication protocol, and
- procedures for incident follow-up, resolution and close-out.

#### G10.8.10 Complaints Management

The Contractor shall have a management system for both internal and external complaints that identifies how complaints:

- can be made (e.g. phone or in person) and to whom
- will be managed (e.g. response times, notifications, follow-up procedures)
- will be documented and communicated (and to whom), and
- will be 'closed out' and reviewed over the course of the project.

#### G10.8.11 Emergency Management

Further to Standard Specification G2 Contract management Plan Clause G2.5.5 Emergency Management the Contractor shall have emergency response procedures covering all plausible environmental related emergencies that may include fire, explosion, chemical spill, landslip and flooding.

#### G10.8.12 Records

#### G10.8.12.1 General

The Contractor shall maintain records to provide a traceable link between identification of known and potential environmental effects and the subsequent management of them in the implementation of the requirements of the contract.

The records must be kept in an orderly manner to demonstrate that the works comply with the specification.

During the currency of the contract all inspection records and management records are to be made available for inspection within twenty four (24) hours of the completion of the inspection or management activities as requested by the Superintendent.



#### **GENERAL SPECIFICATION**

G10 – Construction Environmental Management Plan June 2012

#### G10.8.12.2 Audit Reports

Audit reports shall include as a minimum the following:

- a summary of audit results (e.g. based on inspections and monitoring events)
- a list of non-conformances, inclusive of an 'action list'/remedial works program
- a list of environmental incidents/emergencies and associated response measures/ remedial actions, and
- copies of key correspondence, stakeholder/community engagement, public complaints and follow-up.

#### G10.8.12.3 Environmental Performance Reporting

The Contractor shall have an Environmental Performance Reporting (EPR) process that includes the defects liability period and documents the required reporting timeframes and also provides a reporting template. The EPR shall be a summary reporting tool that compares environmental performance against the Contractor's EMS, the provisions of the CEMP and relevant permits and approvals. The EPR will also report on complaints.

#### G10.8.12.4 Evidence of Compliance

The Contractor shall demonstrate compliance with all the requirements of this specification as a condition of payment.

The methods by which the Contractor will monitor and demonstrate compliance shall be detailed in the Contractor's Construction Environmental Management Plan.

The performance of the Contractor shall be measured according to the following criteria:

- the procedures detailed in the Construction Environmental Management Plan
- provision of adequate resources both to manage and respond to actual events within the required response time
- provision of all reports generated during the contract.

#### G10.9 PAYMENT

Payment for the development, implementation and maintenance of the Construction Environmental Management Plan shall be at the lump sum item in the schedule of rates (Item 8.08) paid on a pro rata monthly basis. Any non conformances (as measured against the requirements of this specification) identified during the month will result in a 20% reduction in the monthly payment. This reduction shall be non redeemable.

Payment for the third party environmental completion audit shall be at Schedule Item 8.06 (b).

#### G10.10 HOLD POINTS

The following hold points are identified in this Specification.

Ref	Description of Hold Point	Nominated Work not to proceed	
G10.8.6	Completion of Environment Audit	Issue of Practical Completion	
G10.8.8	Environmental non-conformances	All work impacted by non-conformance	



#### **GENERAL SPECIFICATION**

G10 – Construction Environmental Management Plan June 2012

#### ANNEXURE G10.A - CMP/CEMP STRUCTURE AND CONTENT GUIDE

This information is provided to assist in the preparation of a CEMP that contains the minimum information requirements expected by DIER.

## GENERAL INFORMATION Scope

 how does the CEMP support other project related documents? How will the CEMP support the proposed works?

#### Objective(s)

 the objectives of the CEMP need to be clear, tangible and drive the structure and content of the CEMP.

#### **Project History**

 provide a history of the project to date; include critical timelines from early stages of planning through to present. What are the needs/drivers for the project and what is the context?

#### **Project Overview**

- summarise the proposed works program
- document key stages of the project
- document major challenges and hurdles
- project timelines.

#### Project Location & Site Description

- address, location map, road number, Link/Chainage (if applicable).
- describe the site and surrounding landscape (where relevant) in terms of geography, topography, vegetation, land use, transport infrastructure, demographics, weather patterns etc.

#### Contractor(s) Description, Competence & Capability

- provide a brief description of the lead contractor/organisation/company
- provide a capability statement for the lead contractor and each key sub-contractor
- document relevant certifications, training courses and memberships that demonstrate competence and capability (include copies where relevant).

#### Key Roles and Responsibilities

- document the key roles and the responsibilities of positions that will drive implementation and compliance of the CEMP:
  - o construction Manager/Foreman
  - o superintendent
  - o safety Manager
  - o environment & Community Manager.

#### Policy & Management Systems

- include a copy of relevant environmental/sustainability policy
- document relevant management systems (e.g.)
  - o AS/NZS ISO 9001:2008 Quality Management System
  - o AS/NZS ISO 14001: 2004 Environmental Management System



#### **GENERAL SPECIFICATION**

G10 – Construction Environmental Management Plan June 2012

• provide evidence of currency.

#### PERMITS AND APPROVALS Legislative Framework

• document the relevant legislation, regulations, standards, policies and guidelines *etc* that apply to the proposed works (include local, state and federal).

#### Permits and Approvals

- document all relevant permits and approvals (include full copies as appendices)
- provide a summary table of relevant permit conditions and reference to sections within the CEMP
- example permits/approvals include:
  - o planning Permit (Land Use Planning & Approvals Act)
  - o permit to 'Take' (Threatened Species Protection Act)
  - o grant of Authority (GoA) (Nature Conservation Act)
  - o permit to Interfere/Destroy (Aboriginal Relics Act)
  - o access works permit/services (Roads & Jetties Act 1935).

#### Standard Operating Procedures (SOPs)

- auditing
- · incident management
- · complaints management
- · emergency managements

#### Risk Management

#### **Environmental Management**

- soil, water
- flora
- fauna

#### Reporting

G10 Construction Environmental Management Plan



#### **GENERAL SPECIFICATION**

G10 – Construction Environmental Management Plan June 2012

# ANNEXURE G10.B - GUIDE TO SPECIFIC ACTIVITIES TO BE ADDRESSED IN THE CEMP

Activities that with potential environmental aspects that may be considered by a CEMP include but not limited to:

#### **Earthworks**

- erosion and sediment control
- import/export of construction materials (e.g. earth, general fill, aggregate, gravel and rock)
- · acid-sulphate soils
- Topsoil
- · air quality
- noise (construction) and dust
- Stream Diversions

#### Drainage

- stormwater and surface water
- protection of drainage features
- Stream Flow and Flooding

#### Site Hygiene/Hazardous Materials

- weeds, pests and diseases
- waste management (solid)
- waste management (liquid)
- chemical and hazardous materials
- Run Off
- Waste Materials

#### Flora (native) and fauna management

#### Heritage

- cultural (European) heritage management
- aboriginal heritage management
- · natural features.

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Visit: <a href="www.dier.tas.gov.au">www.dier.tas.gov.au</a>



### **APPENDIX G**

Development Application Drawings J162422CL S01, S02 & S03



### **APPENDIX H**

Permit to take Flora Application



#### Department of Primary Industries, Parks, Water & Environment Natural and Cultural Heritage Division



# PERMIT APPLICATION FORM To Apply for the Taking of Native Flora<sup>i</sup>

(Issued under Section 29 of the Nature Conservation Act 2002
Regulation 4 of the Threatened Species Protection Regulations 1996
Regulation 28 of the National Parks and Reserved Land Regulations 2009
Section 46(1) of the Crown Lands Act 1976
Regulation 22 of the Crown Lands Regulations 2001)

Please ti	ck appropriate bo	x: Threatened flo	ora species	■ Non-thr	eatened flora species	L	Both 🎞
Surname	Pugh	Given	Names K	athryn Olivia		] Title	Mrs
Organisati	on/Institution:						
City of La	unceston						
Street add	ress (street address	of institution or bus	siness is acce	ptable):			
Town Hal	II, 18-28 St John Sti	reet, Launceston,	7250				
Postal add	ress (if different fron	n above):					
PO Box 3	396, Launceston, 72	250					
Contact D	etails: Phone	6323 3622	] Email	kathryn.pug	h@launceston.tas.gov	/.au	
					require a permit. For pro tion and the name of the		
Mr Jade k Dannielle	t Dobrzynski, Gene Kaye, Major Project Denning, Parks Pl d approved employ	ts, City of Launces anner, City of Laur	ton nceston		of Launceston		
Short title	of project						
	nk Precinct - Pedes	trian Bridge Const	truction				
	1/6/2	2017			31/7/2018		
Proposed	start date			End date			
<b>Brief description of the proposed activity</b> and expert advice that has been provided (~150 words). Where a document already exists which provides a description send a copy of it along with the application form instead.							
Located in the inner city suburb of Invermay, the North Bank Precinct encompasses the riverfront parcels of land at the confluence of the North Esk River and the Tamar Estuary to the south of Lindsay Street, and the former light industrial and mixed use parcels to the north. It is proposed to transform the industrial estate to riverside parkland. To link the proposed riverside parkland to the existing Sea Port restaurant precinct, a footbridge is proposed to cross the North Esk River.  There are no records of flora species listed under the Tasmanian Threatened Species Protection Act 1995 (TSPA) from within the proposed project area, however on-ground assessment identified two listed threatened flora species within the proposed project area. Both species, listed as rare under the TSP Act, were identified in the riparian vegetation: Calystegia sepium (swamp bindweed) and Schoenoplectus tabernaemontani (river clubsedge).							



List the plant species to be taken<sup>1</sup> (include scientific name), estimated number of plants to be impacted and the type and quantity of materials requested (eg botanical specimens, seed etc.). Attach a list if insufficient space.

For applications where destruction of threatened species is requested you must also provide an estimate of the species population size, area occupied and distribution (eg clumped, scattered) and what proportion of the population will be affected for the area where the destruction is proposed.

The City of Launceston (CoL) is applying for a permit to take for the following species: *Calystegia sepium* (swamp bindweed) and *Schoenoplectus tabernaemontani* (river clubsedge). The area of disturbance is anticipated to be <2000m<sup>2</sup> along a 100m length of the North Esk River.

Schoenoplectus tabernaemontani

River clubsedge occurs in all of the Australian States and is also known from New Zealand. In Tasmania, it inhabits the margins of lagoons on King Island, Flinders Island and on some riverbanks in the Midlands, with the Tamar identified as a key site. This species may have been introduced to Tasmania: it was first collected in 1894 from Launceston and it is likely that it would have been found earlier if native. The next collection was not until 1966 on King Island (A. Buchanan, pers. comm.). If deemed to be introduced a nomination to delist the species will be prepared.

There are limited count data available on the NVA and as such a meaningful assessment of the population size cannot be made. River clubsedge has been recorded at sites both upstream and downstream of the proposed works area. The species can reproduce vegetatively from rhizomes and persists after flooding and as such it is anticipated that the disturbance will be temporary and will not have a long-term detrimental effect on the species.

Calystegia sepium

Swamp bindweed was presumed extinct in Tasmania until March 2001, when a specimen was collected from the Tamar River Reserve. This species is locally abundant around the Tamar River between Launceston and the Tamar Island Wildlife Sanctuary. The number of mature individuals is estimated at >100 000. Calystegia sepium occupies an area of 120-150 hectares and the extent of occurrence is approximately 16 kilometres (Schahinger 2002). The greater proportion of the species distribution is found within the Tamar River Reserve. The species is known to occur both upstream and downstream of the proposed works area, and was observed to be locally abundant in the 2016/17 spring/summer season (K. Pugh unpub data). Given the abundance at a local level, it is anticipated that the disturbance from the proposed works will be temporary and will not have a long-term detrimental effect on the species.

Distribution maps are provided in Appendix 1.

Attach a <u>legible</u> map (scale, map sheet no., easting/northing, datum grids) and/or describe in detail the location/s (e.g. place name or reserve name). For each location provide the land tenure (national park, conservation area, etc.), grid references (easting and northing) and the species targeted. Where destruction of Threatened Species is proposed, provide an additional map showing the exact location of each threatened species and/or plant community within the take area in relation to the works location/s and the approximate area occupied by the species. For general collecting /research permits you need only provide the name and tenure of the reserves you are intending to take from.

The CoL plans to commence construction on the pedestrian footbridge in mid-2017. The proposed works area is located on CoL land and Marine Crown Land administered by the Parks and Wildlife Service. A Reserve Activity Assessment will be lodged as part of the permitting process for this project. Maps attached as Appendix 1 show the location of the project area and the known distribution of the threatened species included in this permit application.

#### Provide a description of what the plant material taken will be used for.

Threatened flora may be disturbed during the construction of the pedestrian footbridge.				

<sup>&</sup>lt;sup>1</sup> For the purposes of this permit **take** includes destroy or damage a plant and take destroy or damage any fruit, seed, product or other plant parts.

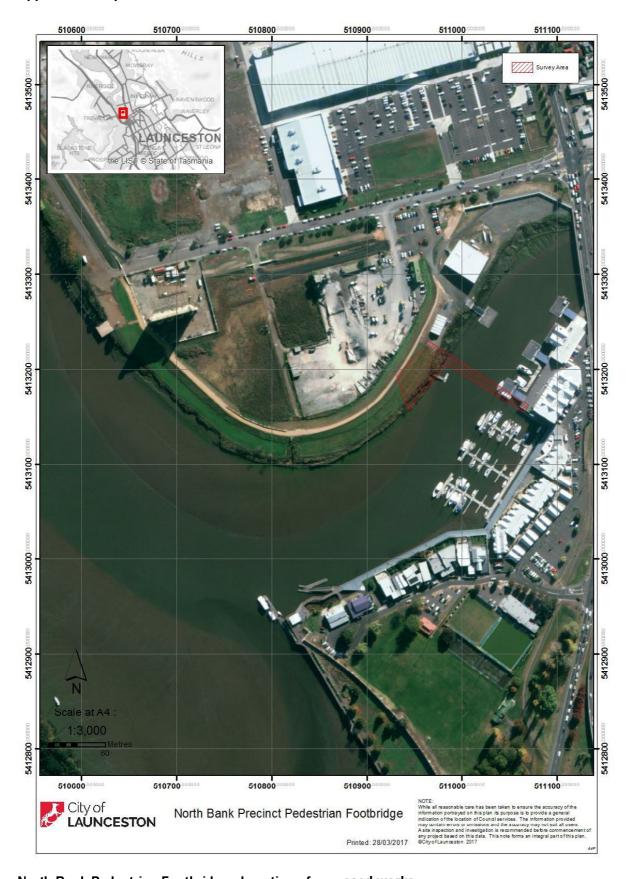


Location/s where the plant material taken will be used or lodged (eg glasshouse, herbarium).
N/A
List any significant biosecurity risks to research target or other local biota that are posed by the proposed activities.
N/A
List biosecurity controls that will be applied to limit potential risks.
N/A
<b>List proposed mitigation measures to minimise physical impact to plants</b> (e.g. sampling to affect < 5% of population at location, specimens will compose no more than 5% of the foliage of the individual plants).
Mitigative controls to limit the potential impact to these species will be implanted, including sediment and erosion controls, a weed management plan and marking of exclusion zones by a suitably qualified expert prior to works commencing.
Have you previously been issued with a permit to Take Native Flora requiring, as one of the conditions,
that a report be submitted? (this may be in the form of data being uploaded to the NVA).
<b>Report submitted?</b> Yes No The report must be completed and submitted to the relevant officer before further permits will be issued.
f applicable please provide number of last permit issued:
Signature of Applicant Date 28/3/17
Please Read Carefully: The Department retains the authority to reject any permit application and also to each our living to

Please Read Carefully: The Department retains the authority to reject any permit application and also to apply conditions to any permit issued. Allow 4 weeks for processing of applications. Permission must be sought from the relevant land manager(s) to access land. Fees for permits may apply.



Appendix 1: Map series



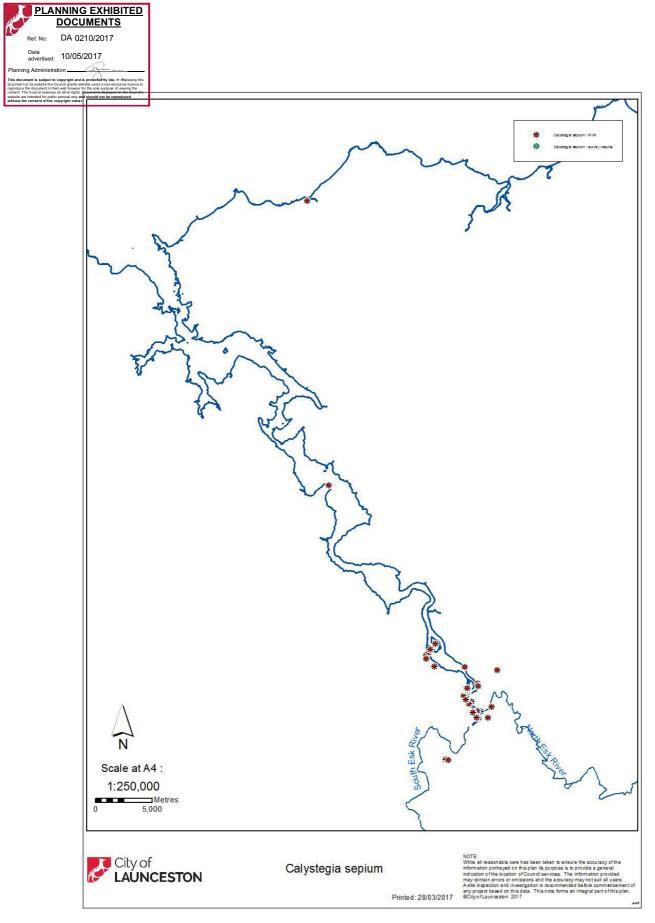
North Bank Pedestrian Footbridge - Location of proposed works



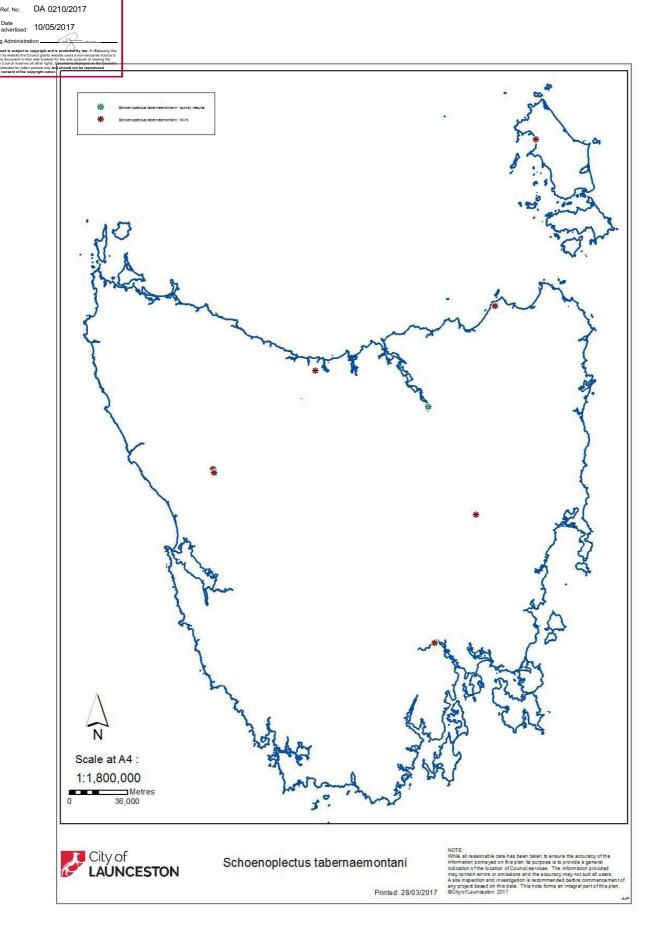
North Bank Pedestrian Footbridge - Threatened flora locations

PLANNING EXHIBITED
DOCUMENTS

ef. No: DA 0210/2017



Distribution of Calystegia sepium



Distribution of Schoenoplectus tabernaemontani

PLANNING EXHIBITED DOCUMENTS



#### Permit Applications can be emailed or posted to:

 Non-Threatened Plants from Reserved Lands – Ecologist, Biodiversity Monitoring Section, Natural Values Conservation Branch:

FloraPermit.Enquiries@dpipwe.tas.gov.au

Phone: 03 6165 4348

Natural and Cultural Heritage Division, Department of Primary Industries, Parks, Water & Environment, GPO

Box 44 Hobart, TAS 7001

Threatened Native Plants, including permits for planned burns which impact threatened species – Threatened Species

ThreatenedSpecies.Enquiries@dpipwe.tas.gov.au

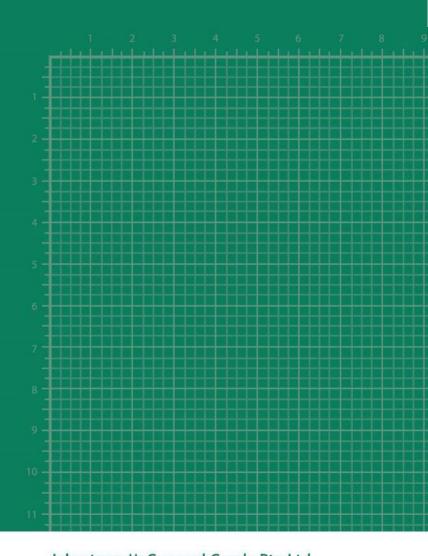
Phone: 03 6165 4340

Natural and Cultural Heritage Division, Department of Primary Industries, Parks, Water & Environment, GPO

Box 44 Hobart, TAS 7001

- 1. Personal information will be collected from you for the purpose of managing Tasmania's flora and will be used by DPIPWE for assessing, considering, advising upon, managing and/or determining the relevant application and may be used for other purposes permitted by the Crown Lands Act 1976, National Parks and Reserves Management Act 2002, Nature Conservation Act 2002 and Threatened Species Protection Act 1995 and regulations made under these Acts.
- You are required to provide this information by the Crown Lands Act 1976, National Parks and Reserves Management Act 2002, Nature
  Conservation Act 2002 and Threatened Species Protection Act 1995 and regulations made under these Acts. Failure to provide this information
  may result in your application not being able to be processed or the service not being able to be provided
- 3. Your personal information will be used for the primary purpose for which it is collected, and may be disclosed to contractors and agents of the Resource Management and Conservation Division, law enforcement agencies, courts and other organisations authorised to collect it
- 4. Your basic personal information may be disclosed to other public sector bodies where necessary, for the efficient storage and use of the information
- 5. Personal information will be managed in accordance with the Personal Information Protection Act 2004 and may be accessed by the individual to whom it relates on request to DPIPWE. You may be charged a fee for this service.





#### Johnstone McGee and Gandy Pty Ltd

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# North Bank Precinct - Footbridge Vegetation, Flora and Fauna Assessment



February 2017





Revision	Date of	Revision	Nature of Amendment	Document	Document
No.	Revision	Description		Author	Approved By
Final draft	24/2/2017			Kathryn Pugh	



North Bank Precinct - Footbridge - Vegetation, Flora and Fauna Assessment



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#### **SUMMARY OF KEY FINDINGS**

#### Vegetation communities

The entirety of the project area contains non-native vegetation.

#### Threatened flora

No plant species listed as threatened on the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* were detected from within or adjacent to the study area. No such species are known from database records, and the survey corridor does not support potential habitat strongly associated with such species.

Two plant species listed as rare under the Tasmanian *Threatened Species Protection Act* 1995, were identified in the riparian vegetation within the proposed works area.

#### Threatened fauna

No significant habitat for threatened fauna is present within the proposed works area. Potential marginal habitat for the Australasian bittern and the green and gold frog was identified on the river margins, and the Australian grayling is known to migrate through the area. The white-bellied sea eagle is known to occur along the river margins in Launceston, however there are no trees either within or adjacent to the proposed project area that are suitable for nesting or perching.

#### Weeds

The site and immediate surrounds contain four "declared weeds" within the meaning of the Tasmanian *Weed Management Act 1999* and one environmental weed.

#### Summary of recommendations

In summary, it is recommended that:

- a Construction Environmental Management Plan (CEMP) is prepared;
- an Acid Sulfate Soil Management Plan is incorporated into the CEMP;
- a Sediment and Erosion Control Plan is incorporated into the CEMP;
- a permit to take application is lodged with PCAB for swamp bindweed and river clubsedge; and
- a Weed Management Plan is incorporated into the CEMP.





#### INTRODUCTION

Located in the inner city suburb of Invermay, the North Bank Precinct encompasses the riverfront parcels of land at the confluence of the North Esk River and the Tamar Estuary to the south of Lindsay Street, and the former light industrial and mixed use parcels to the north. It is proposed to transform the industrial estate to riverside parkland. To link the proposed riverside parkland to the existing Sea Port restaurant precinct, a footbridge is proposed to cross the North Esk River.

#### **SCOPE**

This report relates to the proposed North Bank Precinct Footbridge, as presented in Figure 1:

- flora and fauna species of conservation significance, including listed threatened species potentially present;
- vegetation communities present, including a discussion of the distribution, condition, extent and conservation significance of each community;
- weed and soil management issues; and
- a discussion of some of the policy and legislative implications of the identified ecological values.

#### **METHODOLOGY**

A desktop assessment was conducted to determine species and communities likely to be present at the site. Available sources of threatened flora and fauna records, vegetation mapping and other potential environmental values were interrogated. These sources include:

- Commonwealth Department of the Environment Protected Matters Search Tool Report (PMST Report) for approximate project area -41.431559 147.126731,-41.430449 147.133083,-41.43172 147.13319,-41.433828 147.130207,-41.433168 147.127525,-41.431592 147.126452,41.431559 147.126731), buffered by 5 km, dated 4 November 2016 (DoE 2016);
- Tasmanian Department of Primary Industries, Parks, Water & Environment's (DPIPWE) NVA data for threatened flora and fauna, introduced species and weed species as GIS data, dated 1 November 2016 (DPIPWE 2016);
- Land Information System Tasmania (TheList) for soil and reserves as GIS data, dated 1 November 2016 (TheList 2016);
- Online Zoological Collections of Australian Museums (OZCAM) database dated 1 November 2016 (OZCAM 2016);
- Launceston Interim Planning Scheme 2015 Codes; and
- Various recovery plans, approved conservation advice, and other sources listed in tables and text as indicated.

An on-site assessment to ground-truth the results of the desktop assessment was conducted on 17 November 2016 and 17 February 2017 by the COL Environmental Scientist Kathryn Pugh and Parks Planner Dannielle Denning. The location of the North Bank Precinct Footbridge is presented in Figure 1.



Figure 1: Location of the North Bank Precinct Footbridge





#### **RESULTS**

The footprint for the proposed bridge mainly spans the North Esk River, with a small landing site on the northern bank. The site is located on a riverfront parcel within 30m of a watercourse, and as such the Water Quality Code of the Launceston Interim Planning Scheme 2015 applies. The North Esk River at this location is contained within the Tamar Conservation Area, which is managed by the Tasmanian Parks and Wildlife Service. This conservation area covers almost 4,500ha, extending from Johnston Road Bridge on the North Esk River at St Leonards to the Batman Bridge on the Tamar Estuary at Rowella. The Tamar Conservation Area is identified as Priority Habitat under the Biodiversity Code of the Launceston Interim Planning Scheme 2015.

#### Soil & Sediment

The geology of the proposed project area is generally defined as estuarine deposits of clay, silt, sand and subordinate gravels (Qhiv, Launceston 1:25,000 Geological Maps; pitt&sherry 2013). At the time of European settlement, the area was a marshy peninsula, subject to regular inundation at the confluence of two rivers (Bain & Kleine 2011). Reclamation works were facilitated by a need to dredge the river to maintain shipping access and by 1904 reclamation work at the site had begun. Reclamation works included driving hardwood piles around the perimeter of the point, and placing dredged material from the river on the point (Bain & Kleine 2011). As a result of the placement of dredged river sediments and the low-lying coastal nature of the site, the margin of the river's edge has a high probability of the occurrence of acid sulfate soils (>70% chance of occurrence).

Sedimentation has been an issue of long-standing concern, both for reasons of amenity and environmental quality. Inputs of sediments from the catchment, through the action of tidal currents, tend to accumulate as fine- grained silt deposits in the upper reaches of the system. The confluence of the North Esk River and the Tamar Estuary is some 300m downstream of the proposed footbridge, and as such, the North Esk is strongly tidal at this site, with extensive mudflats exposed at low tide.

The area has been extensively modified by dredging, reclamation and foreshore modification.

#### Vegetation communities

The entirety of the survey area contains non-native vegetation or a natural waterway. As such, no vegetation listed under the Tasmanian *Nature Conservation Act 1992* (NCA) or ecological communities listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) were identified in the project area. A narrow strip along the river's edge is mapped as a weed infestation (Figure 2). An extensive area of mature willows was removed from this section in 2014. This area is now primarily mown grass with a ribbon of native reeds along the waterline, dominated by common reed (*Phragmites australis*; Figure 3).

There are two vegetation communities listed under the NCA: *Melaleuca ericifolia* swamp forest (NME) and saline sedgeland/rushland (ARS) within 1km of the project area. Neither of these communities are present within the project area.

#### Threatened flora





There are no recent records of flora species listed under the EPBC Act within the proposed project area or within 500m of the proposed project area. There are no records of flora species listed under the Tasmanian *Threatened Species Protection Act 1995* (TSPA) from within the proposed project area, but there are recent records of eight flora species listed under this Act from a 1km radius of the survey area, (Table 1).

On-ground assessment identified two listed threatened flora species within the proposed project area. Both species, listed as rare under the TSP Act, were identified in the riparian vegetation: *Calystegia sepium* (swamp bindweed) and *Schoenoplectus tabernaemontani* (river clubsedge). The location of these species is presented in Figure 2.

Table 1 NVA records of listed threatened flora species within 1km of the proposed project area

Species	Common name	TSPA status	EPBCA status
Alternanthera denticulata	lesser joyweed	endangered	-
Bolboschoenus caldwellii	sea clubsedge	rare	-
Calystegia sepium	swamp bindweed	rare	-
Lycopus australis	Australian gypsywort	endangered	-
Lythrum salicaria	purple loosestrife	vulnerable	-
Persicaria subsessilis	bristly waterpepper	endangered	-
Schoenoplectus tabernaemontani	river clubsedge	rare	-
Teucrium corymbosum	forest germander	rare	-



Figure 2: Flora observations - desktop assessment







Figure 3: North Bank Precinct Footbridge riverside vegetation

#### Threatened fauna

There are no records of fauna species listed under either the EPBC Act or the TSP Act from within the proposed project area. There are recent records of two listed threatened fauna species from a 1km radius of the survey area (Table 2, Figure 4). A further four species were identified as having potential to occur within the vicinity (Table 3).

Potential habitat for the Australasian bittern, green and gold frog, and Australian grayling is present within the survey area. The white-bellied sea eagle is known to occur along the river margins in Launceston, however there are no trees either within or adjacent to the proposed project area that are suitable for nesting or perching (Figure 3).

No threatened fauna were observed during the on-ground assessment.

The likelihood of occurrence and potential impact of the project on these species is discussed in Appendix 1.

Table 2 NVA records of listed threatened fauna species within 1km of the proposed project area

Species	Common name	TSPA status	EPBCA status
Accipiter novaehollandiae	Grey goshawk	endangered	-
Lathamus discolor	Swift parrot	endangered	critically endangered





# Table 3 Listed threatened fauna species with potential habitat in the vicinity of the proposed project area

Species	Common name	TSPA status	EPBCA status
Haliaeetus leucogaster	White-bellied sea eagle	vulnerable	listed marine species
Botaurus poiciloptilus	Australasian bittern	-	endangered
Litoria raniformis	Green and gold frog	vulnerable	vulnerable
Prototroctes maraena	Australian grayling	vulnerable	vulnerable

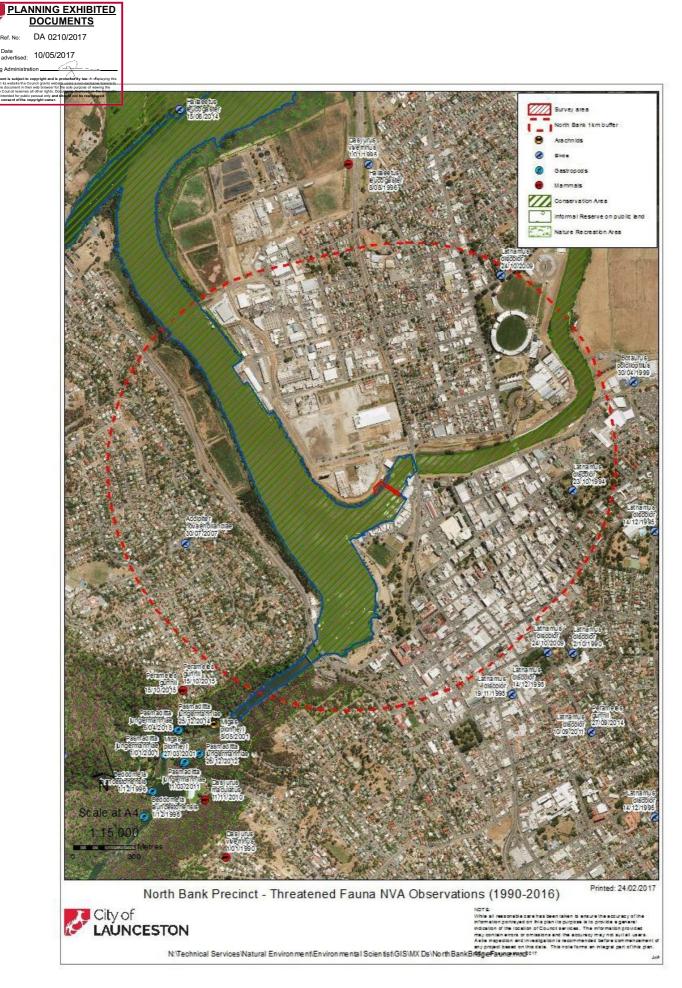


Figure 4: Fauna observations - desktop assessment





#### Weeds

The site of the proposed North Bank Precinct Footbridge and immediate surrounds contain "declared weeds" within the meaning of the Tasmanian Weed Management Act 1999:

- crack willow Salix spp.
- blackberry, Rubus fruticosus aggregate
- Paterson's curse Echium plantagineum
- ragwort Senecio jacobaea

Two of these species, willow and blackberry, are also considered as Weeds of National Significance (WoNS).

#### **DISCUSSION**

A high potential for acid sulfate soils was identified along the river edge, which will require careful management during construction to avoid the release of contaminants to the waterways. It is unlikely that the proposed pile-driving works will disturb the sediments along the river bank.

On-ground assessment confirmed the absence of NCA-listed vegetation, EPBCA-listed ecological communities, and TSPA/EPBCA-listed fauna within in the project area. The river's edge provides potential habitat for three listed threatened fauna species. In addition, two listed threatened flora species were identified in this narrow strip along the river's edge.

A number of declared and environmental weeds were also identified. There is the potential for works to spread weeds to and from the site, therefore this will require careful management during construction.

The potential impact of the proposed project has been considered for threatened species which may have habitat in the vicinity (Appendix 1). The project will not have a significant impact on any threatened flora or fauna provided appropriate mitigative controls are implemented.

Mitigative controls can be outlined in a Construction Environmental Management Plan (CEMP) for the project.

#### LEGISLATIVE AND POLICY IMPLICATIONS

Commonwealth Environment Protection and Biodiversity Conservation Act 1999

No flora or ecological communities listed under the EPBC Act were identified within or adjacent to the proposed works area.

A significant impact test was applied to all fauna species with potential habitat identified within the vicinity of the proposed works area. The project will not have a significant impact on these species.

A referral under the EPBC Act is not warranted.

Tasmanian Environmental Management and Pollution Control Act 1994

Under Section 23A General environmental duty of the Environmental Management and Pollution Control Act 1994: (1) A person must take such steps as are practicable or reasonable to prevent or minimise environmental harm or environmental nuisance caused, or likely to be caused, by an activity conducted by that person.





It is recommended that if acid sulfate soils are likely to be disturbed by the proposed project, then an Acid Sulfate Soil Management Plan should be included in a CEMP for the project.

#### Tasmanian Nature Conservation Act 2002

No vegetation types classified as threatened on Schedule 3A of the Act were identified within or adjacent to the survey area.

#### Tasmanian Threatened Species Protection Act 1995

Two plant species listed as threatened on the Tasmanian *Threatened Species Protection Act 1995* were detected within the proposed works area. Threatened flora on this Act are managed under Section 51, where a permit is required to knowingly "take" (which includes kill, injure, catch, damage, destroy and collect), keep, trade in or process any specimen of a listed species. Where threatened flora are likely to be disturbed, an application for a permit under Section 51 of the Act should be lodged with the Policy & Conservation Assessment Branch (PCAB, DPIPWE).

Mitigative controls will be applied to the site to protect threatened flora species and potential fauna habitat, including sediment and erosion controls, weed management and the marking of exclusion zones by suitably qualified expert prior to works commencing.

In order to prevent delays in construction activities, it is recommended that a permit to take application is lodged with PCAB for swamp bindweed and river clubsedge.

#### Tasmanian Weed Management Act 1999

Four declared weeds were identified within the North Bank area.

It is recommended that a Weed Management Plan is incorporated into a CEMP to reduce the risk of the project works exacerbating infestations or distributing weeds to new sites. Machinery that has operated in weed-infested parts of the project area should not be moved to another property without being subject to machinery hygiene protocols.

Pre-treatment of localised infestations in areas adjacent to the proposed works site prior to the commencement of works is recommended.

Post-works monitoring is recommended with appropriate control of novel or exacerbated infestations.

#### Launceston Interim Planning Scheme 2015

The site is located on a riverfront parcel within 30m of a watercourse, and as such the Water Quality Code of the Launceston Interim Planning Scheme 2015 applies.

In addition to acid sulfate soil management, it is recommended that a Sediment and Erosion Control Plan be developed to protect the adjacent waterways from sediment incursions.

The North Esk River within the project area forms part of the Tamar Conservation Area, which is managed by the Tasmanian Parks and Wildlife Service. This conservation area covers almost 4,500ha, extending from Johnston Road Bridge on the North Esk River at St Leonards to the Batman Bridge on the Tamar Estuary at Rowella. The Tamar Conservation Area is identified as Priority Habitat under the Biodiversity Code of the Launceston Interim Planning Scheme 2015. There was no priority habitat identified in this survey that will be significantly impacted by the proposed project. As such, the Biodiversity Code is not applicable.





#### **SUMMARY OF RECOMMENDATIONS**

In summary, it is recommended that:

- a Construction Environmental Management Plan (CEMP) is prepared;
- an Acid Sulfate Soil Management Plan is incorporated into the CEMP;
- a Sediment and Erosion Control Plan is incorporated into the CEMP;
- a permit to take application is lodged with PCAB for swamp bindweed and river clubsedge; and
- a Weed Management Plan is incorporated into the CEMP.





#### **REFERENCES**

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Forest Practices Authority (2013b). 'Threatened frogs', Fauna Technical Note No. 18 Forest Practices Authority, Hobart, Tasmania.

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Threatened Species Section (2017). <u>Calystegia sepium</u> (swamp bindweed): Species Management Profile for Tasmania's Threatened Species Link.

Threatened Species Scientific Committee (2016). *Approved Conservation Advice Lathamus discolor (swift parrot)* 

TPT (2015). Threatened Plants Tasmania Newsletter July 2015

Saunders, D.L. and Tzaros, C.L. (2011). *National Recovery Plan for the Swift Parrot Lathamus discolor*. Birds Australia, Melbourne

Schahinger, R. (2002). *Nomination for listing of <u>Calystegia sepium</u> under the Tasmanian Threatened Species Protection Act 1995*, Threatened Species Unit, Department of Primary Industries, Water & Environment, Hobart.





Appendix 1. Potential impact on listed threatened species

Species	Likelihood of presence	Nature and extent of likely impact	
Accipiter novaehollandiae (grey goshawk)	Grey goshawks occupy rainforest, wet sclerophyll forest and woodland habitat, particularly blackwood swamp forest, <i>Leptospermum</i> or <i>Melaleuca</i> swamp forest, riparian blackwood and tea-tree scrub communities, wet eucalypt forest with blackwood/myrtle understorey and rainforest (FPA 2010). Goshawk breeding is restricted to mature blackwood swamp forest, wet forest (particularly in riparian areas) with a closed canopy and low stem density and open understorey, generally in areas where there are dense stands of tea tree within 500m. Nest sites are almost always associated with watercourses or swamps (Mooney & Holdsworth 1998 in Brereton & Mooney 1994). Potential habitat is described as "native forest with mature elements below 600 m altitude, particularly along watercourses" (FPA 2013a).  The proposed project area does contain potential habitat for the species.  The species is known to occur within the vicinity of the project area.	The FPA Planning Guideline 2008/1 identifies widespread native vegetation clearance leading to a loss of mature forest as a key threat for the grey goshawk. The species listing under the TSP Act was revised from Rare to Endangered in 2000, due to continuing decline in numbers of individuals (both mature and juveniles) in a single population of <250 mature adults (FPA 2013a). The survey area does not contain either priority nesting habitat or foraging habitat, as defined in FPA Fauna Technical Note 12 (2010): wet forest in riparian areas with a closed canopy, low stem density and open understorey, with dense stands of <i>Leptospermum</i> or <i>Melaleuca</i> within 500m.  The proposed project will not clear vegetation important for grey goshawk nesting or foraging.  The project will not have a	
Botaurus poiciloptilus (Australasian bittern)	The Australasian bittern is a large, mottled brown, heron-like waterbird that inhabits dense reed beds in wetlands and estuaries. It favours wetlands with tall dense vegetation where it forages in still, shallow water up to 0.3m deep (TSSC 2010). Australasian bitterns feed mainly at night on a wide range of small animals, including birds, mammals, fish, frogs, yabbies, snails, insects and spiders (Marchant and Higgins 1990). The species breeds from Oct - Feb in solitary pairs, nesting in relatively deep, densely vegetated freshwater swamps (Marchant and Higgins 1990). The species prefers to nest in vegetation that is up to 2.5m tall.  The species has been observed in the North Esk marshes and Queechy Lake, upstream of the proposed project area. The narrow strip of reeds on the riverbank may represent marginal foraging habitat for the species. There is no potential	significant impact on the grey goshawk.  Approved Conservation Advice identifies the main threats for the species as reduction in extent and quality of habitat (diversion of water away from wetlands; draining swamps; clearing for urban and agricultural development; peat mining, predation (foxes and cats); reduced water quality (salinity, siltation and pollution), overgrazing, and detrimental fire regimes.  The proposed project will not impede migration, divert water from a wetland or decrease water quality within the North Esk River or the Tamar Estuary. It will not increase predation pressure. As such, the project will not lead to a decrease in the current population, reduce the area of occupancy, disrupt the breeding cycle or adversely affect habitat critical to the survival of the	



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ertised: ministration subject to copy to be the Counc ment in their we if reserves all of	0/05/2017  Ight and is protected by law in displaying his system of the first protection of the reproduced and the reproduced of the country but covered to the first protection of the reproduced of the re		breeding habitat within or adjacent to the proposed project area.  There is a moderate likelihood that the species is present periodically in the vicinity of the project area.	species. The project will not have a significant impact on the Australasian bittern.
	Haliaeetus le (white-bellied	•	White-bellied sea eagles are known to occupy areas characterised by the presence of large areas of open water (larger rivers, swamps, lakes, the sea). The species is mostly recorded in coastal lowlands, within 5km of the coast (TSS 2006). There are no formal observations of the white-bellied sea eagle in the Natural Values Atlas, however anecdotal evidence suggests that the species is frequently observed foraging in the vicinity of the confluence of the Esk rivers and the Tamar Estuary.  There is a high likelihood that the white-bellied sea eagle is present in vicinity of the project area.	There is no suitable nesting habitat or known nests within 1km of the proposed works area. As such, no white-bellied sea-eagle nest sites will be disturbed by noise from construction activities.  The project will not have a significant impact on white-bellied sea-eagle.
	Lathamus dis (swift parrot)		The swift parrot is a migratory species that breeds in Tasmania and then flies north in February-March, dispersing throughout Victoria and NSW.  The core habitat for the species in Tasmania is a 10km coastal strip in south and eastern Tasmania where nests are located in dry forests.  The project area is not situated within the area identified as the core range of the species (NVA 2016). The nearest important breeding habitat for the species is 45km east of the irrigation district. During the breeding season swift parrots rely predominantly on the nectar from the flowers of <i>Eucalyptus globulus</i> and <i>E. ovata</i> .  There are records of the species across the Launceston region (NVA 2016).	A significant impact test was applied to determine the likelihood of a significant impact on the swift parrot (Appendix 2).  The proposed project will not have a significant impact on the swift parrot
	Litoria ranifol (green and g		Potential habitat includes permanently or seasonally inundated swamps and wetlands (FPA 2013b). Green and gold frogs are found mostly amongst emergent vegetation, in or at the edges of still or slow-flowing water bodies such as lagoons, swamps, lakes, ponds and farm dams; submerged vegetation is important habitat for breeding success.  In Tasmania, <i>L. raniformis</i> once occurred broadly across the north and east of the island and on Bass Strait Island. The species range has contracted in northwest, central and south Tasmania within	The construction of the proposed North Bank Precinct Footbridge could impact on the green and gold frog if habitat supporting a significant population was physically disturbed. No significant potential habitat for the species has been identified within the proposed project area. Potential habitat on the western shore of the Tamar Estuary will not be affected by the proposed North Bank Precinct.  The proposed project will not have a significant impact on the green



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Prototrocte (Australian		The Australian grayling is known to inhabit the lower and middle reaches of rivers that enter the sea, particularly in the north and east of Tasmania. It occurs in unpolluted streams with large pools and in major rivers, particularly in low and mid catchment where there are no barriers between the sea and the breeding grounds. The species spawns in streams over gravel beds in spring and summer and the larvae are swept down river to the sea after hatching. They return back to the river after six months at sea, where they spend most of their lives in fresh water (Backhouse et al. 2008).  The Australian grayling is likely to pass along the North Esk River as part of its life cycle as it migrates between fresh and marine waters.  There are historical records of the species within the North and South Esk rivers (NVA data 2016). In addition, there are numerous anecdotal observations of the species in the North Esk River and Tamar Estuary.  Potential habitat for the species occurs in the lower and middle reaches of the North Esk River.  The species is known to migrate past the project area.	The National Recovery Plan (Backhouse et al. 2008) for the Australian grayling identifies barriers to movements (dams, weirs etc), river regulation (absence of flooding to initiate spawning), water quality, siltation, fishing, and competition, predation, disease and habitat modification by introduced pest fish as the main threats to the species.  The proposed project will not impede migration, alter water levels or decrease water quality within the North Esk River or the Tamar Estuary. As such, the project will not lead to a decrease in the current population, disrupt the breeding cycle or adversely affect habitat critical to the survival of the species.  The proposed project will not have a significant impact on the Australian grayling.
Calystegia (swamp bin		Swamp bindweed is a robust perennial vine species that is found climbing 3-4 metres over supporting vegetation. Calystegia sepium is a riparian species that is widespread throughout temperate Australia, and in Tasmania, has been recorded from riverbanks and the margins of forests in the Tamar region.  The species was presumed extinct in Tasmania until March 2001, when a specimen was collected from the Tamar River Reserve. It is locally abundant around the Tamar River between Launceston and the Tamar Island Wildlife	The construction of the proposed North Bank Precinct Footbridge could impact on the swamp bindweed if a significant population was physically disturbed. The current areas occupied by <i>C. sepium</i> are in poor condition and subject to the threats of exotic weed invasion.  The identified population occupies a small area of river margin within the project area.  In the event that physical



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-	and is protected by law. In displaying this iss works to sear a non-section is become to the section of the section of the section of the high December displayed on the Canada  The Section of the section of the section of the section of the works.	Sanctuary, and is known to occur both upstream and downstream of the proposed works site. The number of mature individuals is estimated at >100 000, across an area of occupancy of 120-150 hectares (Schahinger 2002 in TSS 2017). A large population was identified in the West Tamar Wetlands in February 2015 (TPT 2015).  The species was identified along the river margins within the project area.	disturbance of the area cannot be avoided, a permit under section 51 of the TSPA will be required to disturb the site. Mitigative controls will be applied to the site to protect the habitat of the swamp bindweed, including sediment and erosion controls, weed management and the minimising disturbance to the population.  The proposed project will not impact significantly on the swamp bindweed.
			The construction of the proposed North Bank Precinct Footbridge could impact on the river clubsedge if a significant population was physically disturbed. The current areas occupied by this species are in poor condition and subject to the threats of exotic weed invasion.
		River clubsedge occurs in all Australian states and is also known from New Zealand. In Tasmania, it inhabits the	The identified population occupies a small area of river margin within the project area.
1	Schoenoplectus tabernaemontani (river clubsedge)	margins of riverbanks, with the Tamar identified as a key site. It is known to occur both upstream and downstream of the proposed footbridge location.  The species was identified along the river margins within the project area.	In the event that physical disturbance of the area cannot be avoided, a permit under section 51 of the TSPA will be required to disturb the site. Mitigative controls will be applied to the site to protect the habitat of the swamp bindweed, including sediment and erosion controls, weed management and the minimising disturbance to the population.
			The proposed project will not impact significantly on river clubsedge.

Appendix 2: EPBC Act Significant Impact Test - Swift parrot, Lathamus discolor

Critically endangered species: EPBC Act significant impact criteria			
Criteria	Likelihood of significant impact		
Lead to a long-term	The Approved Conservation Advice (TSS 2016) identifies predation by sugar gliders, habitat loss and alteration, competition, collision mortality, disease, and illegal wildlife trade as key threats to the swift parrot.		
decrease in the size of a population	There are no known swift parrot populations that regularly feed or forage in the vicinity of the proposed project area. There is no identified swift parrot habitat (feeding or foraging) within 5km of the proposed project area. The Launceston region is not identified as priority habitat for the swift parrot (Saunders & Tzaros		



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	Reduce the area of occupancy of the species	There are no known populations of swift parrots within the vicinity of the project area. Similarly, there is no identified swift parrot habitat within 5km of the project area. A <i>Eucalyptus ovata</i> forest community is located within a larger bushland patch 5.5km south of the project, outside the Launceston city limits.  The proposed project will not reduce the area of occupancy of the species.
	Fragment an existing population into two or more population	There are no known swift parrot populations that regularly feed or forage in the vicinity of the proposed project area.  The proposed project will not fragment an existing population.
	Adversely affect habitat critical to the survival of a species	There is no identified swift parrot habitat (feeding or foraging) within 5km of the proposed project area. The Launceston region is not identified as priority habitat for the swift parrot (Saunders & Tzaros 2011).  The proposed project will not adversely affect habitat critical to the survival of the
		species.  The swift parrot breeding range is largely restricted to the south and south-east coast of Tasmanian, in blue gum communities. While some breeding occurs in the north of the state between Launceston and Smithton, the potential breeding habitat
	Disrupt the breeding cycle of a population	is scarce and highly fragmented (TSSC 2016).  There is no potential breeding habitat ( <i>Eucalyptus globulus</i> forest) within 10km of the project site. The nearest <i>E. globulus</i> forest is a small patch <1ha in size 13km east of the project area, well outside the Launceston city limits. There are no hollow-bearing eucalypts in the immediate vicinity of the proposed project area.
	Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is	The project will not disrupt the breeding cycle of a population of swift parrots.  There is no identified swift parrot habitat (feeding or foraging) within 5km of the proposed project area. The greatest potential for negative impacts in Tasmania in the urban and rural residential areas are in the greater Hobart area, particularly where there are important breeding sites (Saunders & Tzaros 2011).  The proposed project will not modify, destroy, remove, isolate or decrease the greater that the appears in likely to decline
	Result in invasive species that are harmful to a critically endangered or endangered species becoming established	The Approved Conservation Advice identifies predation by sugar gliders as a key threat to the swift parrot. There are no records of this species within the vicinity of the proposed project area, and no identified habitat for the sugar glider.  There are no known swift parrot populations that regularly feed or forage in the vicinity of the proposed project area.
	in the endangered or critically endangered species' habitat	The proposed project will not result in invasive species that are harmful to the swift parrot established in swift parrot habitat.
	Introduce disease that may cause the species to decline	The Approved Conservation Advice identifies Psittacine Beak and Feather Disease (PBFD) as key threat to the swift parrot and could have serious implications if the general health of birds is reduced from stress associated with competition for nesting and food resources. The virus may be distributed from rescued and rehabilitated lorikeets, who often carry the PBFD virus when released back into the wild. There are no practical actions that can be identified to address this threat (Saunders & Tzaros 2011).



Ref. No: Date advertised: 1 Planning Administration This document is subject to copy document on its website her Council content. The Countil reserves all the Countil rese	browser for the sole purpose of viewing the er rights. Documents displayed on the Council's sal only and should not be reproduced	The proposed project will not introduce disease that may cause the species to decline.
	Interfere with the recovery of the	Recovery actions identified for the swift parrot include the mapping and protection of important breeding and foraging habitat, development of disease management protocols, and monitoring and managing the incidence of collisions, particularly in known high risk areas such as greater Hobart (Saunders & Tzaros 2011).
	species.	There are no recovery actions relevant to the Launceston region that will be affected by the proposed North Bank Precinct Footbridge.  The proposed project will not interfere with the recovery of the swift parrot.
	Overall assessment	There is little to no likelihood that the proposed North Bank Precinct Footbridge will have a significant impact on the critically endangered swift parrot ( <i>Lathamus discolor</i> ).



### PWS Reserve Activity Assessment - Level 2 to 4



### Activity Title: Pedestrian Foot Bridge - Seaport

### RAA Administration and Tracking

### Important Dates and Information

Start Date (Date RAA submitted)	27-02-2017 (final)	Decision Required by
Return comments on RAA to		jade.kay@launceston.tas.gov.au e and Gandy – cparker@jmg.net.au
Hobart office file Number		Region file Number
PWS Cost Centre (if assigned)		· · · · · · · · · · · · · · · · · · ·

### Step 1. Activity Summary

This step states the details of the proposed activity. Enough information is provided so that someone unfamiliar with the activity will gain a clear idea of what is involved and where the activity will occur. Use the Maplink, Natural Values Atlas and PWS Site Register reports to help in filling out this step (see RAA Manual).

### 1.1 Contact Details (who)

Initiating Organisation	Johnstone McGee an	d Gandy obo Launcesto	n City Council
Initiating Person	Carmel Parker	Phone contact:	0409623615
Initiating Person Email	cparker@jmg.net.au		
Initiating Person Address	49-51 Elizabeth Stree	t Launceston TAS 7250	
PWS Contact Officer	Stan Matuszek	Phone contact:	(03) 6777 2180
PWS Contact Officer Email	stan.matuszek@parks	s.tas.gov.au	

### 1.2 Location Information (where)

Location of Activity	North Esk	River – between Seaport a	and North Bank development site
Reserve Name & Tenure	North Bank	***************************************	•
Grid Ref (GDA): Easting	511014	Northing	5413192
PWS Field Centre	Tamar	PWS Region	Northern
IMS/RSF Site Number	N/A	IMS/RSF Site Name	N/A
Map. Number (1:25000)		Map Name (1:25000)	

### 1.3 Description (what)

Construction of a pedestrian foot bridge over a portion of the North Esk River to connect the north-western and south-eastern banks of the river between the Seaport complex and the North Bank development site.

### 1.4 Objective/s (the aim) and Outcome/s (aimed for change)

To establish safe and enjoyable pedestrian connectivity between the Seaport complex including Home

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Point and the North Bank development site

### 1.5 Outputs or Products (results)

The activity will produce a pedestrian only foot bridge.

### 1.6 Evaluation (how you know it worked)

The proposed pedestrian foot bridge will be engineered and constructed to the relevant Australian Standards to ensure it is safe and functional.

### 1.7 Need (why)

Safe pedestrian access is required to the northbank precinct where further development has been approved (Silo's Hotel and Parkland). The footbridge will be essential to the success and safe access to the parkland by the general community.

In the absence of a footbridge the public will access the park via the Charles Street Bridge and Lindsay Street which are roads with high traffic volumes.

In addition, the foot bridge will enable continuous connection between the Gorge, Royal Park and Home Point and the North Bank precinct with minimum interaction with heavy traffic.

### 1.8 Timetable (when)

Works are expected to commence in July 2017 subject to approvals.

### 1.9 Environmental Benefits and Impacts (summary Use the Maplink report to assist here)

No significant environmental impacts are envisaged as a result of the construction of the pedestrian foot bridge. Disturbance of the benthic layer within proximity to the pier holes will occur in addition to disturbance to the northern bank within the riparian zone. A preliminary Natural Values Atlas Report (NVAR) was produced within a minimum buffer of 500m and a maximum buffer of 5000m. The report included a search for Freshwater Ecosystems Values for rivers and estuaries.

The nearest threatened flora species was sighted approximately 145m to the west of the location of the proposed foot bridge adjacent to Taroona Street which has recently been cleared. The nearest threatened fauna species was sighted approximately 376m to the south of the location of the proposed foot bridge within Royal Park. Accordingly, the proposed foot bridge is not expected to impact any threatened flora or fauna species.

The NVAR identifies the North Esk River as a conservation area.

### 1.10 Cultural and Social Benefits and Impacts (summary)

The primary benefits of the proposed pedestrian foot bridge are expected to be social (mental and physical) benefits. This will primarily be ahieved through enhanced connectivity between the Seaport and North Bank precincts which is expected to encourage the use of the public areas between the two sites through passive and active recreation activities. The foot bridge will also enable greater connectivity between the Inveresk cultural precinct and the Gorge whilst minimising pedestrian interaction with major traffic routes.

### 1.11 Economic Benefits and Impacts (summary)

All expenses associated with the construction of the pedestrian foot bridge will be met by the developer.

### 1.12 Alternatives (other ways)

Explain the other options that were considered to meet your outcome/s and cost and why they were not preferred? State why the preferred option is supported. (Attach additional information if necessary at part 1.13)

part 1.13)	Options	Comments	
Do nothing	N/A	N/A	
Eliminate	N/A	N/A	



Isolate/Substitute	N/A	N/A
Engineer	N/A	N/A
Administrate	N/A	N/A
Preferred Option	Proposed pedestrian foot bridge.	The proposed pedestrian foot bridge is the preferred option for pedestrian connectivity between the Seaport and North Bank precincts. The location of the proposed foot bridge is considered to be practical and functional in terms of avoiding significant impediment to vessels utilising the Marina and reducing the length of the bridge and subsequently the disturbance to the riparian environment.

### 1.13 Attachments

No.	Description/Details of Attachment eg. maps, photos, reports
1	Northbank Precinct – Footbridge Vegetation, Flora and Fauna Assessment dated 24th Feb 2017 – authored by Kathryn Pugh
2	Design Drawings S01P4 and S02P4 by Johntone McGee & Gandy Pty Ltd dated 7th Feb 2017
3	ABORIGINAL HERITAGE DESKTOP ASSESSMENT & Unanticipated Discovery Plan AHTP3340 - North Bank Pedestrian Footbridge – Seaport dated 24th Feb 2017
4	3 3 3 5 5 5 7 7 CD 2017
5	
6	
7	

### 1.14 Third Party Description and Interest in the Activity

The proposed pedestrian foot bridge will be for the benefit of the public. In essence, there will be no changes or restrictions to the land from an accessibility point of view. Furthermore, it is not expected that any third party will be disadvantaged by this project.



### Step 2 - Concept Review

At this step the activity is considered against legislation, management plans, subsidiary plans and PWS policies. PWS activities are checked to ensure they have been approved and funded. This step examines whether there are any major flaws in the activity that would make it inappropriate to continue the assessment.

2.1 Legislation and State Policies

Note: see manual for summaries of the legislation listed below. Place an 'X" in the relevant column in the table below.

Acts Is the activity compliant with the following Acts:	Compliant	Potentially Compliant	Not compliant	Act not Applicable	Details  Note relevant section/s of the Act and explain why the activity complies, potentially complies or does not comply with the Act. If it is potentially compliant state what is required to make it compliant.
Core Acts (always check)					
National Parks and Reserves Management Act 2002	х				
Crown Lands Act 1976	x				
Nature Conservation Act 2002	х				
Threatened Species Protection Act 1995	x				
Aboriginal Relics Act 1975	x				
Historic Cultural Heritage Act 1995	х				
Land Use Planning and Approvals Act 1993	x				
Environment Protection and Biodiversity Conservation Act 1999				x	Fauna and Flora Report has confirmed that an EPBC assessment is not required.
Work Health and Safety 2012	х				
Other Acts (check as relevant)					
Environmental Management and Pollution Control Act 1994	x				
Water Management Act 1999 / State Policy on Water Quality Management 1997	x				
Fire Service Act 1979				х	
Forest Practices Act 1985		<u> </u>		х	
Living Marine Resources Management Act 1995				x	
Mineral Resources Development Act 1995				×	
Building Act 2000 Building Reg's 2004, Plumbing	X X				

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Acts Is the activity compliant with the following Acts:	Compliant	Potentially Compliant	Not compliant	Act not Applicable	Details  Note relevant section/s of the Act and explain why the activity complies, potentially complies or does not comply with the Act. If it is potentially compliant state what is required to make it compliant.
Reg's 2004					
State Coastal Policy 1996	х				
Other: State Act			~		

### 2.2 PWS Management Plans, Subsidiary Plans and Policies

List any management plan, site plan, maintenance plan or other planning document, strategy or policy relevant to the activity below.

Plan/Document Name	Compliant	Potentially Compliant	Details State relevant sections and page numbers. Explain why the activity does or does not comply and any required conditions if it is potentially compliant. List any proposed changes to plans and their rationale. Ensure the activity fits with plan zoning.

### 2.3 Reserves Standards Framework (RSF)

2.5 Reserves Standa	ida i idille	WOIK (ING)		
Current RSF Category	N/A		Aspirational RSF Category	N/A
Does the activity conform current RSF category? (U	Ise the <u>PWS</u>	Site Registe	F category, or, if this has er to find RSF information	s not been determined, the
f No, state the proposed PWS I/C	new categor	y below and	detail the business case	for the change.
2.4 PWS Priorities				
Is the activity listed in the PWS Strategic Plan?	e current	☐ Yes ☐ No	Comment: N/A	
Is the activity listed in a Regional/Branch busines strategic plan?	ss plan or	☐ Yes ☐ No	Comment: N/A	
What is the budget priori	ty score		Comment: N/A	

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Policy Owner: Director Operations
Document and data is controlled

Date of last issue: 1 July 2010
Date of issue: 1 March 2015
Date of next review: March 2020

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2.5 Comment on Concept Review

Bearing in mind the environmental, social/cultural and economic benefits and impacts at Step 1 (parts 1.9)

assist the Regional Manager'	s decision	below.				
Comment : Section 1		13,744 <sup>3</sup>			ARVER 1943.	
2.6 Decision Point – Co	ncept Re	view				
Following consideration of the whether the concept is supposted (Step 3). It can also be the concept is not supported  Concept Supported (Ass  Concept Supported - Pa	orted or not parked' at the project sessment n	t. If the co this step ( does not noves to r	ncept is signification move for proceed an ext step)	upported it progression in the and the reason	roceeds to tl assessmen ons are give	he next assessme it at a later time). I
☐ Concept NOT Supported	I (Activity of	annot pro	ceed furth	ier)		
Why not appropriate?	Details					///
☐ The proposed activity conflicts with legislative or policy requirements.						
The proposed activity contravenes an existing planning document or strategy.						
☐ The proposed activity is likely to cause unacceptable environmental, social or economic impacts.						
Other						
Signed:	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
- 4.	Mouth					
Title: Regional4์ฟิลnager	HOLEH					
11/2/12						
Date: $21/3/17$ .			partament to the second to the content and appropriate the second			
Date: $21/3/7$ . Comment, explanation	gang gananang agan agan galagilinah di Perilik II.M. Arawa				====	

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### Step 3 – Assessment Scope

This step determines the scope of all relevant assessments and the level of documentation that will be required. It determines the level of RAA - levels 2, 3 or 4, (note: level 1 RAA's use a separate form) and it integrates with all internal (PWS) and related external assessment processes. The PWS Initiating/Contact Officer recommends and the PWS Regional Manager decides which options are selected at this step.

selected at this step.	TWO Neglonal Manager decides which options are
3.1 RAA Documentation (Select one op	tion only)
RAA Documentation Required	Additional Information/Requirements
Level 2: RAA	
Level 3: RAA (L2 + surveys)	
Level 4: RAA (DPEMP)	
3.2 Circulation List (RAA levels 2 to 4 o	nly, list approved at Step 3, circulated at Step 5)
PWS Head Office	☐ Visitor Services Branch, PWS
(134 Macquarie St, Hobart)	☐ Planning
GPO Box 1751, Hobart 7001	☐ Education & Interpretation
	Historic Heritage
	Operations Branch, PWS
	☐ Fire Management
	Asset Services
	Business Services Branch, PWS
	Commercial Visitor Services (CVS)
	Leases and Licences (non visitor)
Region (only fill out if an additional	Regional Manager
region is to comment) ☐ North	Regional RAA Coordinator
NorthWest	Other
South	
Aboriginal Heritage Tasmania	☐ Aboriginal Heritage, DPIPWE
GPO Box 771, Hobart 7001	
Natural and Cultural Heritage Division	☐ Branch – RMC (specialist review of flora, fauna,
DPIPWE	geo etc)
GPO Box 44	
Hobart 7001	
Advisory / Consultative Committees	☐ National Parks and Wildlife Advisory Council
	Tas. Wilderness WHA Consultative
	Committee
Other (add organisation)	Other:



3.3 Additional Internal (PWS) assessme	ents	ents
--	------	------

Select (replace the checkbox with an 'X') and state any additional PWS assessments required, and their relationship to the RAA.

Additional PWS Assessment	Relationship to RAA / Further Information

### 3.4 Additional External Assessments

This step determines whether additional external assessments are required beyond those conducted by the PWS. The most commonly integrated external assessments are LUPAA and EPBC but others are also possible – refer to the RAA Manual).

Development Application (under Land Use Planning and Approvals Act (LUPAA))

Development	Application (dilder Edild of	
Municipality	City of Launceston	
Zoning under	the Council Planning Scheme	Launceston Interim Planning Scheme 2015

Under the relevant Planning Scheme the activity is: (check one option only)

LUPAA Status	Further Detail	Development Application
☐ Exempt		Not required
A Permitted Use		Required
A Discretionary Use	It is acknowledged that a Discretionary Development Application is required to be lodged with the City of Launceston in order to obtain planning approval.	Required
A Prohibited Use		Required

Environment Protection and Biodiversity Conservation Act 1999 (EPBC)

EPBC Impact: Will the activity impact on:	What is the likely impact? Is there likely to be a 'significant' impact on any matter of national environmental significance from the activity?	Referral under EPBC recommended?
World Heritage Sites (Tasmanian Wilderness, Macquarie Island)		☐ Yes ⊠ No
Ramsar Wetlands		☐ Yes ☒ No
Nationally Threatened Species		☐ Yes ⊠ No
Protected Migratory Species		☐ Yes ⊠ No
Commonwealth Marine Areas		☐ Yes ☒ No
National Heritage Places		☐ Yes ☒ No
Other		☐ Yes ⊠ No

Note that the General Manager PWS determines whether a referral under EPBC is required, actual referral occurs at Step 7.

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### **OTHER External Assessment**

State any other external assessments required, and their relationship to the RAA (e.g. Dam, beekeeping, Hydro, Mineral exploration). See manual for all potential external assessments and list them below.

Other External Assessment	Relationship to RAA / Further Information
	Flora and Fauna Desktop Study completed by Ecologist Kathryn Pugh
The signature of the RM (and t	and external assessments required are as indicated above.  the additional signature of the General Manager in some circumstances) the assessment can commence, it does not grant any form of approval at
Date: 23/3/14.	
Date: Explanation, further assessmen	anager (only if required see RAA Manual):  It of action required
PWS RM	



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# Step 4 - Impact Assessment and Proposed Management

This part of the RAA records the impacts and benefits of the activity in detail. Impacts and benefits are examined under three headings — Natural Values, Cultural Values and Economic Values. Use N/A if a value is not applicable for this activity. Consider cumulative effects that may result from the activity.

# 4.1 Natural Values Assessment: Impacts, Benefits and Management

Natural Values (including natural assets, processes and systems)	General description and existing conditions. List values/assets of significance, surveys completed (by whom and when), specialist staff consulted and relevant refs.	Likely impact / benefit on values / assets (natural processes and systems, including cumulative effects). Particularly assess impact on world heritage and other significant natural values.	Risk level (no controls)	List control options Management actions to be taken to avoid or minimise any likely negative impacts, include ongoing monitoring.	Risk level (controls)	X Ref. Action Plan
Flora (threatened species, priority communities, critical	Two plant species listed as rare under the Tasmanian	Calystegia sepium, Swamp bindweed, although once	Low	Mitigative controls will be applied to the site to	Very low	
habitats and endemic,	Threatened Species	presumed extinct, is known		protect threatened flora,		Marri
regionally or locally	Protection Act 1995, were	to be locally abundant		including sediment and		
priority forest types, WHA	identified in the riparian	along the shores of the North Esk River and Tamar		management and the		
flora values)	bank of the North Esk River	Estuary. There will be a		marking of exclusion		
	at the location of the	temporary area of		zones by suitably		
	proposed footbridge.	disturbance of	,,,,	qualified expert prior to		
		approximately 100m of		works commencing.		
		foreshore (<0.5ha), which		CoL will lodge a permit-		
		does not represent a		TO-take application with		
		population. Recent	-2	swamp bindweed and		
		observations (K. Pugh		river clubsedge. The		
		unpub. data 2017) indicate		area of impact will be		
		that swamp bindwind		minimised to limit the		
	-	extends along several km		temporary disturbance		
		of the North Esk River		to these species.		
		foreshore in the immediate		Weed management will		
		vicinity of the proposed		include pre-treatment of		
		tootbridge, and is present		localised weed		
		both upstream and		infestations in areas		
this it is						

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grayling, with migration of waterway for the Australian are no trees either within or adjacent to the proposed in Launceston, however there occur along the river margins identified as an important The North Esk River is for nesting or perching. project area that are suitable adjacent to the proposed within or immediately bellied sea eagle is known to project area. The white-Australian grayling is found green and gold frog, and for the Australasian bittern. project area. Potential habitat likely to have a signicficant

habitats, endemic species, Threatened species, critica Fauna (Rare or significant species, WHA regionally or locally auna values) from within the proposed species listed under either the EPBC Act or the TSP Act There are no records of fauna

or the Tamar Estuary. It will within the North Esk River water from a wetland or not impede migration, divert not increase predation decrease water quality The proposed project will

survival of these species. affect habitat critical to the breeding cycle or adversely of occupancy, disrupt the decrease in the current project will not lead to a pressure. As such, the population, reduce the area

pedestrian bridge will not Similarly, pile-driving is not create a barrier to Australian grayling. movement for the Pile-driving activity for the

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site. It is known to also occur both upstream and proposed footbridge downstream of the margins riverbanks with the states and is also known occurs in all Australian clubsedge: this species Schoenoplectus tootbridge location downstream of the ocation. Γamar identified as a key Fasmania, it inhabits the from New Zealand. In *tabernaemontani*, river

appropriate control of

weed monitoring, with

novel or exacerbated

intestations.

site and post-works

to the proposed works within and/or adjacent

protect threatened be applied to the site to Mitigative controls will

sediment and erosion fauna, including

Very low

within and/or adjacent infestations in areas ocalised weed Weed management will nclude pre-treatment of

accordance with

DPIPWE guidelines.

Acid Sulfate in

controls for Potential

controls will include

Sediment and erosion

works commencing.

qualified expert prior to

zones by suitably

marking of exclusion management and the controls, weed

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RAA Form Level 2-4 EF-373 Policy Owner: Director Operations Document and data is controlled	6. Threats (diseases such as Phytophthora and Chytrid Fungus, introduced animals	5. Wilderness and wild rivers (impact of proposal on Wilderness quality using modified NWI mapping, any effects on wild rivers)	4. Landscape and viewfields (Consider impact of the proposal on viewfields into the site and from the site)	3. Geoconservation Geology (uncommon rock types, minerals, fossils or similar; significant outcrop or landform, WHA geo values) Geomorphology (sensitive landform systems e.g. karst, dunes, rivers, marshes, estuaries coasts) Soils (rare soil types e.g. Basalt derived and hosting native vegetation; soils sensitive to disturbance eg. peats, sands, alpine soils)	
Date of last issue: 1 July 2010 Date of issue: 1 March 2015 Date of next review: March 2020	Drilling equipment cleaned prior to commencement of	There are no wilderness or wild rivers within the proposed project area.	The proposed project will link a public restaurant and recreation area on the south bank to a recreational parkland that is will be developed on a former industrial site on the north bank of the North Esk River. The project as a whole will significantly improve the visual amenity of the site.	Geomorphology- Development within the North Esk River.	larvae downstream likely to occur in Dec-Jan. Return migration occurs in Jul-Aug, with increased river flow an identified cue for migration.
2010 Page 12 of 28 015 Status: Approved ch 2020 Version No: 2.0	The project will not provide a mechanism that will that	N/A		Construction of the pedestrian bridge will involve pile driving in three places across the river and one location on land. Pile driving will occurring using a barge to transport materials and operate a hammer drill.	impact on turbidity levels in the river. Turbidity is often elevated in this waterway at this location (>100NTU).
2.0	Moderate			Moderate level of risk to existing microfauna and increase turbidity temporarily.	
	Weed and hygiene controls will be			Pile drivng to occur in an way that minimise sediment disturbance.	to the proposed works site and post-works weed monitoring, with appropriate control of novel or exacerbated infestations.
	Minor			Moderate level of risk. Disturbance of sediments necessary to complete the work.	



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quality. Inputs of sediments tend to accumulate as finethe action of tidal currents, from the catchment, through

broad descriptors of important features like 7. Estuarine or Marine (add tauna/flora) Estuary is some 300m Esk River and the Tamar The confluence of the North lamar.

which pose a significant Gambusia holbrooki, both of

threat to the ecology of the

concern include rice grass

identified as an issue of Introduced weeds and pests

(Spartina anglica) and

proposed footbridge.

appropriate control of weed monitoring, with site and post-works

novel or exacerbated

infestations.

to the proposed works within and/or adjacent

intestations in areas

localised weed

environmental weed (Scotch and ragwort) and one blackberry, Paterson's curse

weeds (crack willow

There are four declared

vicinity of the proposed phytophthora within the tungus, mucormycosis or

thistle) in the vicninity of the

amenity and environmental concern, both for reasons or issue of long-standing Sedimentation has been an mudflats exposed at low tide this site, with extensive North Esk is strongly tidal at downstream of the proposec footbridge, and as such, the

Construction of the footbridge is not likely to the natural values in the have a significant impact on

North Esk River or Tamar 10W

controls, weed sediment and erosion values, including protect environmental be applied to the site to Mitigative controls will

marking of any management and the Very low disease or pest species or spread of weeds, will lead to the introduction

There are no recorded observations of chytrid

use on the site.

and weeds

equipment prior to use

on the site.

Weed management will

include pre-treatment of

the washing of

implemented, including

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accordance with Acid Sulfate in controls for Potentia controls will include Sediment and erosion commencing. prior to works suitably qualified expert exclusion zones by

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and downstream of the

monitored upstream

Turbidity will be

DPIPWE guidelines

construction.

footbridge during

8. Water quality (PEV's) important features like (add broad descriptors of deposits are considered as an effective trap for heavy While these sediment upper reaches of the system. dredging, reclamation and contaminants. The area has metals and other unsightly by many, they serve nutrient and turbidity levels Water quality in the lower foreshore modification. been extensively modified by be generally poor, with high North Esk River is known to construction of the and diffuse inputs to the system and myriad point have a significant impact on hydrodynamics of the upstream catchment, Given the size of the footbridge is not likely to North Esk River, the appropriate control of weed monitoring, with site and post-works within and/or adjacent Weed management will DPIPWE guidelines. to the proposed works infestations in areas localised weed include pre-treatment of prevent pollution of be applied to the site to Mitigative controls will novel or exacerbated accordance with controls. These will sediment and erosion waterways, including Potential Acid Sulfate in include controls for infestations. Very low

fauna/flora)

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# 4.2 Cultural Values Assessment: Impacts, Benefits and Management

Social Values  General description and existing conditions. Describe how the activity is likely	Historic heritage values  (e.g. historic places, movable heritage or relics)  No heritage values identified	Aboriginal heritage values (e.g. landscapes areas, sites, artefacts, relics, resources, WHA Aboriginal resources, WHA Aboriginal values)  Aboriginal fithe Aboriginal Heritage Register (AHR) regarding the proposed North Bank Pedestrian Footbridge at Seaport, Launceston, and can advise that there are no Aboriginal heritage sites recorded within or close to the proposal. Due to a review of previous reports and the area being highly disturbed it is believed that the area has a low probability of Aboriginal heritage being present.  Accordingly there is no requirement for an Aboriginal heritage investigation to the project proceeding.	(including cultural assets, processes and systems)  processes and systems)  documents. List any values/assets of significance. List any surveys completed by whom and when.
on and existing ibe how the area	s identified	ge Tasmania ge ted a search Heritage egarding the agarding the Bank Pedestrian aport, can advise that riginal heritage thin or close to a review of and the area irbed it is area has a low riginal heritage is no n Aboriginal of the project to the project of the project of the project of the project of the search and the area has a low riginal heritage of the project of the projec	relevant people sees to any surveys m and when.
Likely impact on current social values	NA	Proposed North Bank Pedestrian Footbridge construction unlikely to have an impact on aboriginal heritage values.	(cultural assets, landscapes and systems, including cumulative effects). Particularly assess impact on world heritage and other significant cultural values.
Risk	N A	Low	level (no controls)
List control options Management actions to be taken to avoid or	NA	Please be aware that all Aboriginal heritage is protected under the Aboriginal Relics Act 1975. If at any time during works you suspect Aboriginal heritage, cease works immediately and contact AHT for advice.  Attached is an Unanticipated Discovery Plan, which you should have on hand during ground disturbing works, to aid you in meeting your requirements under the Act.	List control options Management actions to be taken to avoid or minimise any likely negative impacts, include ongoing monitoring.
Risk	N	Low	Risk level (controls)
X Ref.			X Ref. Action Plan

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Note people consulted, references is used and how the activity is likely to change the way the area is used.

(no controls)

ongoing monitoring.

minimise any likely impacts, include actions to be taken to avoid or List control options Management

Risk (controls)

X Ref. Action Plan



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4.3 Activity Hazards 5. Surrounding land uses Recreational values Leases and licences established uses **Activity Hazards** 2. Visitor Risk 1. Occupational Health and 3. Other - Dangerous goods, controlled waste, fire etc. opportunities for the local community and visitors to the bridge will improve recereational Construction of the pedestrian Recreational land uses and to documents. List any social of hazards/risks. site is used and existing nature public open space use values/assets of significance. General description of how the will be required to prevent procedures as required. implement their WHS The works contractor will require fuel Drill rig mounted on barge will access by the public to the Barriers, signage and controls Construction waste generated works area. parkland areas access to walkways and new severity of hazards/risks. Improved social values addressed and planned prior Construction of the bridge Likely impact on nature and need to be addressed as a Public and Worker safety will to work commencement. issues which will need to be presents potential safety Potential trip, fall and other high priority before the prevent spillage during Constrcution mgmt. plan will construction can proceed address storage of fuel to workers. hazards to the public and high Risk high controls) level (no high Z  $\frac{Z}{V}$ Š Z management actions to be implement a WHS Plan for the taken to avoid or minimise List control options and practices for storage of fuel and develop and implement implement a WHS Plan for the The works contractor will The works contractor will The works contractor will (controls) Risk level medium medium medium  $\frac{Z}{P}$  $\frac{Z}{Z}$ Plan Action X Ret.



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### 4.4 Community Consultation

Launceston community.  St Giles (occupational therapy team)  Playgroup Tasmania (peak body representing playgroup and other informal childcare organisations through Tasmania)  Child Health Tasmania)  Four groups responded to an open call to come forward with possible user groups needs/ideas for North Bank.	Stakeholders with an interest & contact details
⊠ Yes	Consulted?
Although only only small number of organisations consulted, interest is high.	Interest Level
No concern expressed, just great area for opportunities and general interest.	Concern Level
Council's online engagement platform Your Voice Your Launceston invited people to comment on Your Vision for North Bank. Duration of engagement 4/9/2013 to 5/11/2013.  1,208 people visited the site 1,208 people visited the site 1,100 people took the quick poll 1,11 people completed the survey General interest for the project was expressed. Following people's review of the Masterplan, the following project objectives were scored in this priority. It was generally agreed to expand the established riverside walking and cycling trails and enhance the connectivity along the public open space network. Provide enhanced access to the river e3dge and improve the natural value and visual amenity of the area. Invest in infrastructure to suppor tocmmunity based events and recreational activities and to Provide a framework to identify and inform specific opportunities for both public and private sector investment and to maximise the synergies between these development opportunities. Face to face meetings with listed organisations. They have offered to act as a conduit for further information/feedback via their membership network.	If consulted detail how this was done and the stakeholder's views on the activity.
Further consultation will take place by virtue of the discretionary development application to be publicly advertised for a period of two weeks. In this time, the public are invited to review the application and make comments. The process will enable all relevant land use planning matters to be addressed. The appeal process allows RMPAT to review decisions if appeals are upheld.  Further engagement will take place with identified key stakeholders (includes those previously consulted) for the playground design and equipment that will be in the new development.  The whole Launceston community will be made aware of the project, kept informed throughout the works and encourage to come to the area following the works.	Details of further consultation required or planned, if any.

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### 4.5 Economic Values Assessment: Impacts, Benefits and Management

1. Economic Assessment of Options	Current Management Regime (\$)	New Management Regime (\$)
Capital Costs PROJECT MANAGEMENT (e.g. Salary, oncosts, expenses, travel, other)	\$145,000.00	\$145,000.00
PLANNING, PRE-WORKS (e.g. Advertising / meetings, consultants, documentation & certification, approvals: RAA & Regulatory)	\$477,308.00	\$477,308.00
WORKS/CONSTRUCTION (e.g. Materials & Supplies, labour & equipment, rehabilitation)	\$3,671,600.00	\$3,671,600.00
TOTAL CAPITAL COST	\$4,293,908.00	\$4,293,908.00
Annual Operating Costs		
(e.g. PWS labour, other labour, consultants, contractors materials & Supplies)	\$48,000	\$48,000
NET ANNUAL OPERATING COSTS		
TOTAL COSTS (Capital and Operating)	\$4,341,908	\$4,341,908

### 2. Economic Questions

Will the project create a new asset or alter/upgrade an existing asset?	The project will create a new asset (a pedestrian foot bridge).
Does the project require PWS or other Government funding for infrastructure upgrades?	The project does not require external funding from PWS or other government agencies for infrastructure upgrades.
Who is / will be responsible for annual operating costs?	The City of Launceston will be responsible for annual operating costs.
What is the fund source for capital and maintenance works?	The City of Launceston will be the funding source for capital and maintenance works.
Is there any requirement for PWS involvement in ongoing management?	There is no requirement for PWS to be involved with the ongoing management of the pedestrian foot bridge.
What are the implications of not implementing the project (in terms of assets and finance):	No implications have been identified.

Economic Comment (Comment on the Impacts / benefits of each option)

PWS I/C



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Step 5 - Advice on Impact Assessment and Proposed Management

								works - Point 7.	 planning Land Leases	PWS conditions. Land Tenures to be investigated by RLLL.	Step 6. Natalie Supports Activity Controls requiring Launceston City Council to negotiate Send copy of signed RAA to RLLL for Activity Plan Clifford – lease prior to construction and requires copy of signed RAA to inform lease reference.	eer have discussed with JMG Engineers who are working on final design.	Holley Lees – Initial comments from preliminary drawings re compromised levee height,	Section	Part of RAA Name, and Advice, and Comment	Summary of comment received.
The second secon	NATIONAL CONTRACTOR CO		The state of the s								f signed RAA to RLLL for	not change.	(approved by council) will		son's / Regional Response	

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### Step 6 – Activity Plan

column to cross-reference actions with the Impact Assessment and Proposed Management table - Step 4. requirements are met. These are actions that are critical to implement to achieve the environmental, social and economic outcomes. Use the activity reference The Activity Plan shows the key actions required to ensure that short and long term high risk aspects of the activity are minimised or addressed and legislative

The Activity Plan details the critical actions that have emerged from steps 1, 4 and 5. Only list important actions not day-to-day or operational tasks. Make sure evaluation and reporting tasks (Step 10) are listed (see Step 1, part 8 for success indicators).

	7.	တ	Ċυ	4.	က်	2		Activity	Activity Order
THE PROPERTY OF THE PROPERTY O	Legalise ownership and maintenance of infrastructure.	Community and Stakeholder Communication	Footbridge Design	Aboriginal Heritage Desktop Assessment.	Ecological Assessment.	Dangerous goods, controlled waste, fire etc.	Workplace Health and Safety.	Activity initiation and planning prior to works	Activity Details
המסטרייטש בשווע היטשטטט א הוטטווטפט פסטווטוו,	Negotiate lease agreement with PWS	Consult with stakeholders and community as part of DA process	Engage Engineer to finalise design	Engage AHT to prepare report.	Engage consultant to prepare report.	The works contractor will develop practices for storage of fuel, re-fuelling operations and waste removal.	Construction of the bridge presents potential safety issues which will need to be addressed and planned prior to work commencement. Public and Worker safety will need to be addressed as a high priority before the construction can proceed.  The works contractor will prepare a WHS Plan for the site.		Activity Controls
City Codifor	Launceston	Launceston City Council	Launceston City Council	Launceston City Council / Consultant	Launceston City Council	Contractor	Contractor	7.000	Responsible Officer
						·			Start Date
COUSTINCTION	Finalise prior to	, rotation	Final design underway	Report completed 24-2-2017	Report completed 24-2-2017	Add controls to CMP	WHS Plan		Notes

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5		Activity Delivery
Threatened Fauna.  There are no records of fauna species listed under either the EPBC Act or the TSP Act from within the proposed project area. Potential habitat for the Australasian bittern, green and gold frog, and Australian grayling is found within or immediately adjacent to the proposed project area. The whitebellied sea eagle is known to occur along the river margins in Launceston, however there are no trees either within or adjacent to the proposed project area that are suitable for nesting or perching.  The North Esk River is identified as an important waterway for the Australian grayling, with migration of larvae downstream likely to occur in Dec-Jan. Return	Threatened Flora.  Calystegia sepium, Swamp bindweed: Although once presumed extinct, is known to be locally abundant along the shores of the North Esk River and Tamar Estuary. There will be a temporary area of disturbance of approximately 100m of foreshore (<0.5ha), which does not represent a significant loss of habitat or population. Recent observations (K. Pugh unpub. data 2017) indicate that swamp bindwind extends along several km of the North Esk River foreshore in the immediate vicinity of the proposed footbridge, and is present both upstream and downstream of the footbridge location.  Schoenoplectus tabernaemontani, river clubsedge: This species occurs in all Australian states and is also known from New Zealand. In Tasmania, it inhabits the margins of riverbanks with the Tamar identified as a key site. It is known to also occur both upstream and downstream of the proposed footbridge location.	elivery
The proposed project will not impede migration, divert water from a wetland or decrease water quality within the North Esk River or the Tamar Estuary. It will not increase predation pressure. As such, the project will not lead to a decrease in the current population, reduce the area of occupancy, disrupt the breeding cycle or adversely affect habitat critical to the survival of these species.  Pile-driving activity for the pedestrian bridge will not create a barrier to movement for the Australian grayling.  Similarly, pile-driving is not likely to have a	Mitigative controls will be applied to the site to protect threatened flora, including sediment and erosion controls, weed management and the marking of exclusion zones by suitably qualified expert prior to works commencing. CoL will lodge a permit-to-take application with DPIPWE PCAB for swamp bindweed and river clubsedge. The area of impact will be minimised to limit the temporary disturbance to these species.  Weed management will include pretreatment of localised weed infestations in areas within and/or adjacent to the proposed works site and post-works weed monitoring, with appropriate control of novel or exacerbated infestations.	Contact Chris Price on Phone: 616 54269 Email: Chris.Price@parks.tas.gov.au
Launceston City Council, Consultants and Contractors	Launceston City Council, Consultants and Contractors	
Add controls to CMP	Add controls to CMP	



uad				
	5	4.	μ	
The state of the s	Estuarine or Marine Environment.  The confluence of the North Esk River and the Tamar	Chytrid Fungus, introduced animals and weeds)  There are no recorded observations of chytrid fungus, mucormycosis or phytophthora within the vicinity of the proposed.  There are four declared weeds (crack willow blackberry, Paterson's curse and ragwort) and one environmental weed (Scotch thistle) in the vicinity of the proposed footbridge.  Introduced weeds and pests identified as an issue of concern include rice grass (Spartina anglica) and Gambusia holbrooki, both of which pose a significant threat to the ecology of the Tamar.	Geo-Conservation.  Construction of the pedestrian bridge will involve pile driving in three places across the river and one location on land. Pile driving will occurring using a barge to transport materials and operate a hammer drill.	
Silver values, illeradilly	Mitigative controls will be applied to the site to protect environmental values, including	Weed and hygiene controls will be implemented, including the washing of equipment prior to use on the site.  Weed management will include pretreatment of localised weed infestations in areas within and/or adjacent to the proposed works site and post-works weed monitoring, with appropriate control of novel or exacerbated infestations.	Pile drivng to occur in an way that minimises sediment disturbance.	waterway at this location (>100NTU).  Mitigative controls will be applied to the site to protect threatened fauna, including sediment and erosion controls, weed management and the marking of exclusion zones by suitably qualified expert prior to works commencing.  Sediment and erosion controls will include controls for Potential Acid Sulfate in accordance with DPIPWE guidelines. Weed management will include pre-treatment of localised weed infestations in areas within and/or adjacent to the proposed works site and post-works weed monitoring, with appropriate control of novel or exacerbated infestations.
City Council,	Launceston	Launceston City Council, Consultants and Contractors	Launceston City Council, Consultants and Contractors	
CMP	Add controls to	Add controls to CMP	Add controls to CMP	

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တ 7 concern, both for reasons of amenity and at this site, with extensive mudflats exposed at low catchment, through the action of tidal currents, tend to environmental quality. Inputs of sediments from the footbridge, and as such, the North Esk is strongly tidal Estuary is some 300m downstream of the proposed effective trap for heavy metals and other contaminants are considered unsightly by many, they serve as an accumulate as fine-grained silt deposits in the upper Sedimentation has been an issue of long-standing at five sites along the North Esk River and its The pollutants are then trapped within the lower be generally poor, with high nutrient and turbidity levels reclamation and foreshore modification. reaches of the system. While these sediment deposits within or close to the proposal. Due to a review of Aboriginal Heritage Tasmania (AHT) has completed a Water quality does not currently meet the PEVs for this tributaries as part on an on-going monitoring program. The City of Launceston currently monitors water quality reaches by the tidal regime. from the upper catchment as well as urban inflows. for much of the time. High pollutant loads are delivered Water quality in the lower North Esk River is known to Water Quality. The area has been extensively modified by dredging, search of the Aboriginal Heritage Register (AHR) Aboriginal Heritage values. Aboriginal heritage being present is believed that the area has a low probability of previous reports and the area being highly disturbed it that there are no Aboriginal heritage sites recorded Footbridge at Seaport, Launceston, and can advise regarding the proposed North Bank Pedestrian the project proceeding. heritage investigation and AHT have no objection to Accordingly there is no requirement for an Aborigina sediment and erosion controls, weed exclusion zones by suitably qualified expert management and the marking of any and post-works weed monitoring, with and/or adjacent to the proposed works site controls for Potential Acid Sulfate in construction. appropriate control of novel or exacerbated accordance with DPIPWE guidelines. Weed Sediment and erosion controls will include prior to works commencing. accordance with DPIPWE guidelines. include controls for Potential Acid Sulfate in sediment and erosion controls. These will to prevent pollution of waterways, including localised weed infestations in areas within management will include pre-treatment of is protected under the Aboriginal Relics Act downstream of the footbridge during Mitigative controls will be applied to the site during ground disturbing works, to aid you Please be aware that all Aboriginal heritage Turbidity will be monitored upstream and in meeting your requirements under the Act Plan, which you should have on hand immediately and contact AHT for advice. suspect Aboriginal heritage, cease works Attached is an Unanticipated Discovery 1975. If at any time during works you Contractors and Consultants Consultants City Council City Council Contractors Launceston Consultants Contractors Launceston Add controls to Add controls to



RAA Form Level 2.4 EF-373
Policy Owner: Director Operations
Document and data is controlled

For projects that involve a project team detail the governance structures below. For simple PWS projects just list the responsible officer. Governance Activity Closure (including evaluation and reporting) 4 ω Ŋ 0 တ ω Compliance evaluation and reporting. Dangerous goods, controlled waste, fire etc. workers. Potential trip, fall and other hazards to the public and Visitor Risk. issues to the general public and workers on site. Construction of the bridge presents potential safety Workplace Health and Safety. and PWS Grant of Authority. Reserve Activity Assessment Activity Plan storage and re-fuelling operations. In accordance with CMP, WHS Plan, and disposed of at a registered waste All waste generated onsite will be removed storage of fuel to prevent spillage during disposal site. Constrcution mgmt. plan will address required to prevent access by the public to Plan for the site. implement a WHS Plan for the site. the works area. The works contractor will Barriers, signage and controls will be The works contractor will implement a WHS and City Council Contractors Consultants Contractor Contractor Launceston Contractor, closure of project. compliance and Advise PWS re CMP Add controls to WHS Plan WHS plan

\_aunceston City Council

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Date of next review: March 2020

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### Step 7 - External Assessment

If the activity *does* require external assessment (as identified at Step 3), this takes place at this step. At this point the assessment from a PWS perspective is complete and PWS is signalling it plans to approve the Activity Plan (for a level 2-3 RAA, or a DPEMP for a Level 4 RAA) subject to any further conditions that are imposed by external assessment.

If the activity does not require external assessment, go direct to Step 8.

PWS will refer the activity for assessment under the process/es below (check those that								
apply): ☑ LUPAA (Development Application, RM decides) ☑ EPBC (EPBC Referral, General Manager decides whether to refer) ☑ Other PWS I/C								
Authorised for External	Assessment by:							
Signed (RM): All		Date: 23/3/17. Position: RM NORTH						
Note for a referral under EPBC, EPBC or a DPEMP the approval of the General Manager is also required.								
Signed (GM):	Name:	Date:						
Add results of external assessments here.								
Add any changes or new conditions/controls to the Activity Plan (Step 6) that are required as a result of these assessments. State which conditions have been added/modified in the Notes column and also state the assessment process that required the change/addition.								
Any Further Comment:								



Step 8 – Final Determ	nination							
Activity Plan and PWS Standard	•							
Activity Plan and any additional	<b>ctivity Approved with conditions</b> (Can be implemented subject to the conditions in the ity Plan and any additional or changed conditions listed below.)							
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Why not approved	Details							
The proposed activity is like to cause unacceptable environmental impacts.								
The proposed activity is like to cause unacceptable social impacts.	ely							
☐ The proposed activity is like to cause unacceptable economimpacts.	ely nic	AVAIL						
Other								
Any Further Comment: PWS I/C	·							
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Signed (RM):	Date: 23/	3/17.						
Name: Chris Colley	Position: Regional Ma	•						
Note for a proposal referred unde Manager is required.	r EPBC or a level 4 (DPEMP) RAA the ap	oproval of the General						
Signed (GM):								
Name: PWS GM	Date: PWS GM							
RAA Form Level 2-4 EF-373 Policy Owner: Director Operations	Date of last issue: 1 July 2010 Date of issue: 1 March 2015	Page 27 of 28						
Document and data is controlled	Date of issue: 1 March 2015 Status: Approved Date of next review: March 2020 Version No: 2.0							



### Step 9 - Notification and Implementation

**PWS proposals:** An approved RAA indicates to staff the proposal can be implemented, subject to any conditions stated in the approval at Step 8.

**External proposals:** the PWS provides <u>written authority</u> including any conditions to external proponents. Following notification and the fulfilment of any pre-conditions the activity proceeds.

### Step 10 – Report and Evaluation

At completion of works a final report and evaluation of the project is completed. This is to be completed within three months of the project finishing using the table below:

### Final Report and Evaluation

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### Environmental Site Assessment Pedestrian Bridge North Bank to Seaport

transport | community | mining | industrial | food & beverage | carbon & energy









Prepared for: Launceston City Council

Jade Kay

**Client representative:** 

2 May 2017

Rev 00

Date: 2 Ma









### PS

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### **Appendices**

Appendix A: Concept design of proposed development Appendix B: Underground services (Northbank) Historical aerial photographs

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PS

Prepared by: Date: 2 May 2017

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Reviewed by: Date: 2 May 2017

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Authorised by: Date: 2 May 2017

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Brad May (Registration No. 15029)



Revisio	ion History					
Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date	
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#### 1. Introduction

#### **Background** 1.1

pitt&sherry were commissioned by the City of Launceston (Council) to prepare an Environmental Site Assessment (ESA) for a 1300 m<sup>2</sup> area of land located at 79 Lindsay Street, Invermay.

The area of land is subject to a development application for construction of a pedestrian bridge from Northbank to the Seaport precinct. Construction of the footbridge is part of the larger redevelopment of the Northbank area into a parkland.

An ESA is required as part of the development application to ensure the site is suitable for its proposed use. This ESA reviewed all available historical environmental information to identify areas and specific contaminants of concern that may require further investigation.

A separate environmental assessment has been undertaken by **pitt&sherry** for the whole of the Northbank area<sup>1</sup>. Some of the outcomes of the investigation have been included in this report.

#### **Objectives** 1.2

The principal objective of the ESA is to assess the likelihood of contamination from historical activities and make recommendations as to:

- The level of risk to human health or the environment from historical activities; and
- The suitability of the site for the proposed development.

#### 1.3 **Scope of Work**

The ESA was carried out in accordance with the National Environment Protection (Assessment of Site Contamination) Measure 1999 ('NEPM' - amended 2013), Tasmanian EPA guidelines and Australian Standards. The scope of work included the following.

- Review of all available sources of information to compile a site history.
- Review available site plans, historical maps and aerial photographs.
- A review of title ownership to identify past users of the site to determine historical activities relevant to potential contamination, including those surrounding the site.
- Review historical environmental records for the site to confirm any incidents or issues that may have given rise to localised soil or groundwater contamination.
- Interviews with relevant persons conducted to gain additional relevant site information.

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<sup>&</sup>lt;sup>1</sup> Draft Environmental Site Assessment, Northbank Redevelopment – Launceston City Council. pitt&sherry, 13 April 2017.





# 2. Site Setting

## 2.1 Site identification

The site reflects the extent of works that will be associated with the construction of the footbridge.



Figure 1 – Location map (red hatched area shows the site and the location of the proposed footbridge)

Table 1 - Site details

	Site Details
Street address	79 Lindsay Street, Invermay (Tasmania)
Property ID	2860709
Title references	169882/1
Site area	Around 1,300 m <sup>2</sup>
Owner	Launceston City Council
Local Government Area	Launceston City Council
Current land use	Passive recreational (rowing club)

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## 2.2 Current and proposed land use and zoning

Council is planning on constructing a pedestrian bridge linking Northbank to the Seaport precinct, as part of the redevelopment of Northbank into a recreational area (see concept design of proposed development in Appendix A). Construction of the bridge will include soil excavation to a depth of 1.5m within the site subject to this ESA (estimate of 50-100 m³ of excavated soil). Works on the Seaport side will not require soil disturbance.

Under the Launceston Interim Planning Scheme 2015, 79 Lindsay Street is zoned Open Space.

## 2.3 Surrounding land use

The site is surrounded by vacant and recreational land (rowing clubs), the currently operating Boral site to the north-west and by the North Esk River to the south.

## 2.4 Geology

As identified in The LIST<sup>2</sup>, the Mineral Resources Tasmania (MRT) Geological Polygons, 1:25,000 mapping, the site is underlain by Quaternary sediments of the Undifferentiated Cenozoic sequences. The geology of the investigation area is generally defined as *Qhiv*.

*Qhiv* is described as estuarine deposits of clayey silt, silt, sand and subordinate gravel, supra-estuarine swamp and laterally derived alluvial, deposits, unmapped man-made deposits including silt dredgings; in environments inferred to lie above frequent tidal influence.

This description is consistent with observations of cuttings along Lindsay Street and other investigations completed by **pitt&sherry** for unrelated projects along Lindsay Street.

The site was not reclaimed or infilled.

## 2.5 Topography

The site sits at an elevation of approximately 0-20m. The site is generally level, with a gentle slope toward the river.

## 2.6 Vegetation

According to TASVEG 3.0 mapping, the vegetation community at most of the site would be classified as Agricultural, urban and exotic vegetation (FUR), Urban areas. The site hosts very little vegetation, consistent with its previous semi-industrial use.

A 10-20m strip of land at the southern end of the site between the site and the river is classified as FWU, Weed infestation. This area is visible on the location map in Figure 1.

Due to the previous disturbance at the site and the surrounding area, there is considered to be no significant flora or fauna values within or surrounding the site. A review of the Natural Values Atlas (DPIPWE) identified no threatened flora or fauna species within or in the vicinity of the site.

-

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<sup>&</sup>lt;sup>2</sup> http://maps.thelist.tas.gov.au/listmap/app/list/map





#### 2.7 Surface water and site drainage

The site is located on the North Esk River, near the confluence between the North Esk and Tamar Rivers.

A plan showing underground services for the whole of Northbank has been provided in Appendix B. A stormwater drain runs across Northbank along Taroona Street into the river. As the vast majority of Northbank comprises unsealed open ground, surface water is anticipated to either recharge to groundwater or run-off into the river either directly or through the stormwater drain. All stormwater from the Boral plant is directed to the local municipal wastewater treatment plant.

#### 2.8 **Hydrogeology**

Groundwater is expected to be intercepted at shallow depths based on experiences from other sites in Invermay and the local topography, and is expected to flow toward the river.

A groundwater bore was installed and monitored by pitt&sherry at the end of Taroona Street in September 2014. The measured groundwater depth was 0.5 m below natural ground level. Refer to Section 4.3 for further information on groundwater quality monitored in the bore.

No other groundwater bores are registered within a 2 km radius of the site. No known groundwater uses exist on site and demand for groundwater is unlikely as the site is serviced by potable water network and no stock grazing or irrigation occurs on or around the site.

#### 2.9 **Acid sulfate soils**

The LIST database identifies the 30-40 m strip of land between the site and the river (0-5 m AHD zone) as having a high probability of costal acid sulfate soil (ASS) occurrence (>70% chance). In floodplains under 2m AHD, ASS is generally present within the upper 1m.

The rest of the site (5-20 m AHD) is considered to have a low probability of coastal ASS occurrence (6-70%).

#### 3. **Historical Review**

Information on the history of the site and surrounding land was obtained from the following sources:

- Historical aerial photographs from the Department of Primary Industries, Parks, Water and Environment (DPIPWE)
- Historical property records and certificates of title from The List (DPIPWE)
- Current or historical dangerous good registered with Workplace Standard Tasmania (WST)
- Property Information Request from the Contaminated Sites Unit of the Tasmanian EPA
- Enquiries and interviews with Launceston City Council<sup>3</sup> and Boral staff<sup>4</sup> regarding any environmental protection infringement notices issues at the site and historical activities.

#### 3.1 **Property title records**

Property information reports were obtained from The LIST in March 2017. Ownership and known uses of the parcel of land in recent years is shown in Table 2.

<sup>&</sup>lt;sup>3</sup> Jade Kay, Max Butler and Robert Holmes (Launceston City Council)

<sup>&</sup>lt;sup>4</sup> Angela Riley, Production Manager (Boral)





Current use of the site is passive recreational (rowing club).

Table 2 - Site ownership details

Original Derivation	Ownership	Time	Uses and leases
The Crown	Launceston City Council	1/2016 - current	Club room
			(rowing), shed
	DPIPWE	5/2008 – 1/2016	
	Launceston City Council	4/2008 – 1/2016	

# 3.2 Aerial photography

A total of nine historical aerial photographs of the Northbank area were examined from 1921 to 2009 in order to determine past activities and land use at the site. Copies of the photographs are available in Appendix C and a detailed review has been included in Table 3.

The photographs show the progressive development of the Northbank area from agricultural and vacant grassland to an industrial area. However, the specific area of land subject to this ESA was never developed and has remained vacant land used to access the river for recreational purposes.

Table 3 - Review of historical aerial photographs

Item	Date and scale	Observations
Photo	1921	Northbank and surroundings mostly vacant grassland. Some shed present on site,
1	Scale unknown	possibly for agricultural use or for cargo shipping.
Photo	1955	79 Lindsay Street: Large Grain Shed and Roberts Wool Store present.
2	Scale unknown	Surroundings: Land for future concrete manufacturing (north-west of site) is still
		vacant. Dirt track runs through northern part of Northbank, appears to be old railway line from timber mill. Sheds present in Photo 1 no longer present.
Photo	1971	Large track and small marina built along North Esk river.
3	Scale 1:6000	Surroundings: Large gravel yard present north-west of the site with office building
		(Woodfield & French). Railway line for timber mill visible through north of
		Northbank. Grain storage in silos present north of the railway line (two large ASTs
		and one smaller AST).
Photo	1976	The white track running along the banks appears to a flood levee.
4	Scale 1:6200	Surroundings: Four large grain silos (Tas Grain) present in the north-west corner of
		Northbank.
Photo	1984	Surroundings: Concrete manufacturing plant has been developed (BMG, later Boral)
5	Scale 1:5000	north of the site, with two new buildings and concrete plant.
Photo	1986	<u>Surroundings</u> : Boral concrete plant further developed, layout similar to present.
6	Scale unknown	
Photo	1991	Surroundings: Taroona Street appears to be a bitumen road. Railway line no longer
7	Scale 1:4000	present. Location of fuel dispensing stations identified in WST files apparent at Boral
		site (just outside north-west corner of office building and opposite chemical storage
		area). Port area developed on the southern side of the North Esk, generally referred
		to as 'Seaport'.
Photo	2002	<u>Surroundings</u> : Concrete plant expanded (three new tanks at 65 Lindsay Street).
8	Scale 1:10000	Truck wash bay visible in south eastern part of Boral site.
		Tank farm present just north of 3 Taroona Street, believed to be owned by Tas Grain.
		Additional small tanks near two large silos. Seaport being redeveloped into a marina.
		Carios Body Works building present adjacent to 55A Lindsay Street.
Photo	2009	Surroundings: Rowing club rooms built (large white square roof). Seaport has been
9	Scale 1:7000	developed into a marina.





## 3.3 Planning and regulatory review

Information from the following regulatory agencies was gained in 2012 for the whole of Northbank<sup>5</sup>: Tasmanian EPA and WorkSafe Tasmania (WST). This information has not been updated for this ESA as the only changes in land use that have occurred since that time have been to create vacant land (cessation of activities and demolition of buildings).

## 3.3.1 EPA Property Information Request

A Property Information Request Form (PIR) was submitted to the Tasmanian Environment Protection Authority's (EPA) Contaminated Sites Unit (CSU) in October 2012<sup>6</sup>.

The CSU maintains databases and records held by the EPA relating to the *Environmental Management and Pollution Control (Underground Petroleum Storage Systems) Regulations 2010;* industrial sites (which are or have been regulated by the EPA); historic landfills; contamination issues reported to the Division; and incidents and complaints that have been recorded relating to historical storage of dangerous goods (prior to 1993).

The search of relevant databases and records by the CSU identified no records relating to contamination or potentially contaminating activities at the site. EPA records identified that fuel storage occurred at properties along Lindsay Street, however their locations could not be confirmed due to incomplete records.

## 3.3.2 Dangerous Goods Register

A search of Workplace Standards Tasmania (WST) records of dangerous goods information was carried out in October 2012. No files were identified for the area of land subject to this ESA.

However, a file was found for the adjacent Boral site (WST Reference: 0242)<sup>6</sup>. A review of the file indicated some underground fuel storage of Petrol (5.4 kL) was licensed on 61 Lindsay Street, however a Statutory Declaration dated 9 August 2000 indicated all dangerous goods kept or stored on 61 Lindsay Street had been removed. The Statutory Declaration was accepted by WST.

The site plans included in the WST file highlighted two locations where underground tanks were housed. Locations were near the site entrance and administration building and south west corner of the site. These locations were later confirmed during **pitt&sherry** site inspection. The location of the second tank is about 40 m from the site subject to this ESA.

The two tanks near the entrance are thought to be 1000 gallons each (or 4,500 L each). The volume at the second location is unknown but is thought to be 5,000 L based on anecdotal evidence from site employees and the dimensions of the concrete patch over the interpreted former tank location observed on site.

The file does not contain a decommissioning report for the underground tanks or reasons why they were removed. It is assumed that no environmental assessment occurred during decommissioning of the underground tanks as no relevant documentation is contained or referred to in the WST file.

The WST file also refers to above ground storage. A diesel tank is present on site and used for the water heating system.

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<sup>&</sup>lt;sup>5</sup> Preliminary Contamination Investigation, North Bank, Launceston. pitt&sherry, July 2013

<sup>&</sup>lt;sup>6</sup> Preliminary Site Investigation, Northbank – Launceston City Council (pitt&sherry, July 2013)





## 3.4 Launceston City Council records

Council does not hold any records of relevant environmental incidents that may have caused localised environmental nuisance or harm and impact on future use or users of the site<sup>7</sup>.

Clearance certificates for the removal of asbestos from the Roberts store buildings (79 Lindsay Street) are held by Council.

## 3.5 Environmental prosecutions

There have been no recorded prosecutions by court proceedings or environment protection notices for the responsible persons or companies nominated on the EPA and WST files and databases.

## 4. Other Northbank investigations

A separate ESA has been prepared by **pitt&sherry** for the whole Northbank area:

 Draft Environmental Site Assessment, Northbank Redevelopment (13 April 2017) – Launceston City Council.

The Northbank ESA includes a detailed description and results of the following previous investigations:

- Preliminary Site Investigation, Northbank (July 2013) prepared by pitt&sherry for Launceston City Council
- Due Diligence Investigation, 61 Lindsay Street, Launceston (20 February 2015) prepared by pitt&sherry for Launceston City Council
- Installation and sampling of one groundwater bore at the end of Taroona Street (refer to Memo from **pitt&sherry** addressed to Max Butler dated 7 October 2014).

A brief summary of these investigations has been included below. The outcomes of all previous assessments have been included in the summary of past potentially contaminating activities in Section 6.

## 4.1 Northbank Preliminary Investigation (2013)

Launceston City Council engaged **pitt&sherry** to conduct some preliminary soil sampling at Northbank, to highlight any contamination issues that may require further investigation before redevelopment of the site.

The results of the preliminary investigation showed that no soil samples analysed recorded contaminants exceeding the adopted criteria for recreational use. However, asbestos was detected in surface soils at the location of the former wool store.

The report recommended immediate management of the identified asbestos, including fencing the site of the former wool store to prevent public access and establishing a suitable cover to limit the potential for airborne fragments. This was later implemented (refer to Section 4.2).

As no contaminants were identified in exceedance of the recreational use criteria, no further investigations were recommended. However, assessment of the Boral site was recommended as it could not be assessed at the time of the investigation. This was later done in 2014-2015 (refer to Section 4.2).

The installation of a groundwater monitoring bore at the end of Taroona Street was recommended to determine whether any groundwater contamination is present that could potentially affect future users. A bore was further installed and monitored in 2015 (refer to Section 4.3).

pitt&sherry ref: HB17014H002 REP 31P BRIDGE PHASE 1 ESA REV00/SLR/lc

<sup>&</sup>lt;sup>7</sup> Verbal communication, Matthew Skirving and Jade Kaye of Launceston City Council.





#### 4.2 **Boral (61 Lindsay St) Due Diligence Investigation (2015)**

This investigation was a targeted soil sampling program to investigate the potential for soil contamination from former underground storage tanks at the Boral site.

Former underground fuel storage tanks were identified at two separate locations within the Boral site (Figure 2), through WST records and interviews with site employees. It is believed that all storage tanks were removed but that no environmental assessment was carried out at the time of decommissioning.



Figure 2 - Locations of former underground storage petroleum tanks

A total of 16 soil samples were collected by **pitt&sherry** in September 2014 at the two locations of the former tanks, at depths between 0.5 and 2.6 m below ground level. Lead and petroleum hydrocarbon concentrations were identified in exceedance of health investigation levels in three samples near the administration block (Location A), and hydrocarbons in one sample in the middle of the yard (Location B).

The lead contamination levels exceeded the health investigation level for recreational use (NEPM, 2013)8.

#### 4.3 **Groundwater bore installation and sampling (2015)**

Launceston City Council engaged pitt&sherry to install and sample a groundwater bore at the end of Taroona Street to identify any localised groundwater impacts that may need to be managed during the Northbank redevelopment.

The groundwater was measured at 0.5 m below ground level in the bore. No odours, sheens or scums were observed during sampling which may indicate gross contamination.

Phenolic compounds, polyaromatic hydrocarbons, mercury and PCBs were all below the limit of reporting. Petroleum hydrocarbons were mostly below the limit of reporting or marginally detected.

Arsenic and lead levels in the groundwater exceeded the drinking water criteria. No further investigations were recommended at the time of the assessment as drinking water was not identified as a potential use at the site.

pitt&sherry ref: HB17014H002 REP 31P BRIDGE PHASE 1 ESA REV00/SLR/lc

<sup>&</sup>lt;sup>8</sup> National Environmental Protection (Assessment of Site Contamination) Measure 1999 (amended 2013)





## Site inspection and interviews

A site inspection and interviews with Boral and Launceston City Council staff<sup>9</sup> were carried out on 16 March 2017 by Sophie Le Roux, Senior Environmental Scientist at pitt&sherry.

The purpose of the site inspection was to assess current site conditions. The main site features observed during the walkover are shown on the site photographs in Figure 3.



Figure 3 - Site photographs

The main information relevant to this ESA gained from the site inspection and interviews is as follows:

- The site was overgrown with weeds
- There was no sign of disturbance or distressed vegetation at the site or in the immediate vicinity
- St Patrick's rowing room was still present, adjacent to the site (Figure 2)
- New flood levees and gates have been constructed on Taroona Street toward the Lindsay Street end, along the boundary with the grain silos site and along Lindsay Street in front of the large rowing club. The source of fill for the new levees is clay from the Carrick clay pit (assumed to be clean fill). Council staff believe that the source of fill for the old levees is the same, although this could not be verified

<sup>&</sup>lt;sup>9</sup> Mr Max Butler and Mr Robert Holmes, Launceston City Council; Ms Angela Riley, Boral.





- The sites of the former Roberts buildings have been backfilled with clayey soil and are overgrown with grass and weeds. The fill source is from the Kings Meadow High School (assumed to be clean fill – total of 1500 m³). It is assumed that these parcels were backfilled to limit exposure to asbestos fines that may have been present at the surface of the soil
- A new bitumen road has been constructed through 3 Taroona Street and 65 Lindsay Street to provide access to the Boral site and to the rowing rooms
- The ground surface on the eastern portion of the Boral site is paved with concrete, with gravel surface on the western portion
- All sewage and stormwater from the Boral site report to the municipal sewage treatment system. A sump is present at the north of the Boral site near the laboratory building
- The truck wash runoff in the south-east corner of the Boral site is piped directly to sewer
- There are no known environmental incidents at the Boral site. Spills are dealt with using spill kits (dust) kept on site.





#### Summary of past potentially contaminating activities 6.

No current or past potentially contaminating activities were identified within the boundary of the site (area of works for pedestrian bridge). Uncontrolled fill has not been considered as a potential source of contamination as Council indicated that all fill imported to site for construction of the levees or as backfill originated from known sources assumed to be clean (Carrick clay pit and Kings Meadow high school).

A number of current and historical potential sources of contamination have been identified on land surrounding the site and have been summarised in Table 4. Also refer to the Northbank ESA<sup>10</sup> for a detailed description of former uses within the whole of Northbank area.

Table 4 - Summary of potential off-site sources of contamination

Potential sources of contamination	Potential contaminants	Distance to site	Existing information
Concrete plant, waste oil storage, above ground fuel storage tank and former underground storage tanks (61 Lindsay Street – Boral site) Former grain	Hydrocarbons, metals, asbestos  Pesticides and	40m to closest underground tank; 80m to other tank.	<ul> <li>Lead measured in soil (1.2 and 1.8m depth) at location of former underground storage tank, at levels exceeding recreational use and industrial use criteria</li> <li>Hydrocarbons measured in soils (0.5 and 0.8 m depth) at levels exceeding management limits</li> <li>Arsenic and lead measured in groundwater bore (0.5 m) at end of Taroona Street above drinking water levels (Section 4.3).</li> </ul>
storage (79 Lindsay Street)	fungicides	7140111	
Railways	Petroleum hydrocarbons, polycyclic aromatic hydrocarbons, pesticides, metals	>110m	Nil. The location of the former railway line has now been covered in bitumen.
Asbestos in two former Roberts store buildings and other old buildings on site	Asbestos (buried)	>90m	Asbestos removed from buildings and was detected in soils at location of former wool store. Fill was subsequently imported as cover.

<sup>&</sup>lt;sup>10</sup> Draft Environmental Site Assessment, Northbank Redevelopment – Launceston City Council. pitt&sherry, 13 April 2017.





#### 7. Risk assessment

A risk assessment has been prepared to specifically address the potential contamination risk to human receptors during and after construction of the footbridge. Given the small size of the area of land subject to this ESA and given the lack of on-site potential sources of contamination, the potential risk to ecological receptors has been addressed separately under the whole of Northbank ESA<sup>11</sup>.

#### 7.1 **Preliminary Conceptual Site Model**

A preliminary Conceptual Site Model (CSM) has been developed based on pitt&sherry's understanding of the site setting, in order to identify potentially significant source-pathway-receptor linkages with regard to human health and the environment (Figure 3).

Potential sources of off-site contamination and potential contaminants of concern have been identified in Section 6. Human receptors identified for the site are:

- Current passive site users (rowing clubs)
- Future users of the proposed recreational area and bridge.
- Construction workers.

The identified potential sources of contamination may have impacted the site through groundwater migration. Consequently, the identified pathways by which the human receptors listed above may be exposed to contaminants are:

- Direct contact with impacted shallow groundwater and subsurface soil (metals, hydrocarbons)
- Exposure to vapours from impacted shallow groundwater and subsurface soil (hydrocarbons).

#### 7.2 **Preliminary risk evaluation**

Hydrocarbon and lead impacted soil was identified at the Boral site at a distance of around 40m from the area of land subject to this ESA (footprint of pedestrian bridge). Groundwater has not been assessed at the Boral site, but it is likely that contamination is present in groundwater from contact with the impacted soil. Any contaminated groundwater may have migrated toward the river and may be present under the site.

Additionally, groundwater monitored by pitt&sherry in 2015 at the end of Taroona Street (around 130m from the site) found some levels of arsenic and lead above drinking water guidelines in shallow groundwater (0.5m).

The risk of exposure to contaminated groundwater at the site by current and future recreational users is likely to be low, given the relative small size of the site compared to the rest of Northbank and given that access to Northbank from the bridge will be via a platform that will cover some of the site (refer to Appendix D). The likelihood of groundwater at the site being contaminated with hydrocarbons to such levels that it will pose a risk from vapour inhalation is also likely to be low.

The proposed bridge construction works will involve excavation of soil to a depth of 1.5m (estimate of 50-100 m<sup>3</sup> of excavated soil). It is expected that groundwater will be intercepted at that depth. There is therefore a potential risk that construction workers may be exposed to contaminated soil and/or groundwater through inhalation or direct contact.

It would be preferable that groundwater and soil at the site are assessed prior to commencement of excavation works. As a minimum, the Health and Safety Management should include protective measures to address the potential exposure to contaminated soil and groundwater.

pitt&sherry ref: HB17014H002 REP 31P BRIDGE PHASE 1 ESA REV00/SLR/lc

<sup>&</sup>lt;sup>11</sup> Draft Environmental Site Assessment, Northbank Redevelopment – Launceston City Council. pitt&sherry, 13 April 2017.

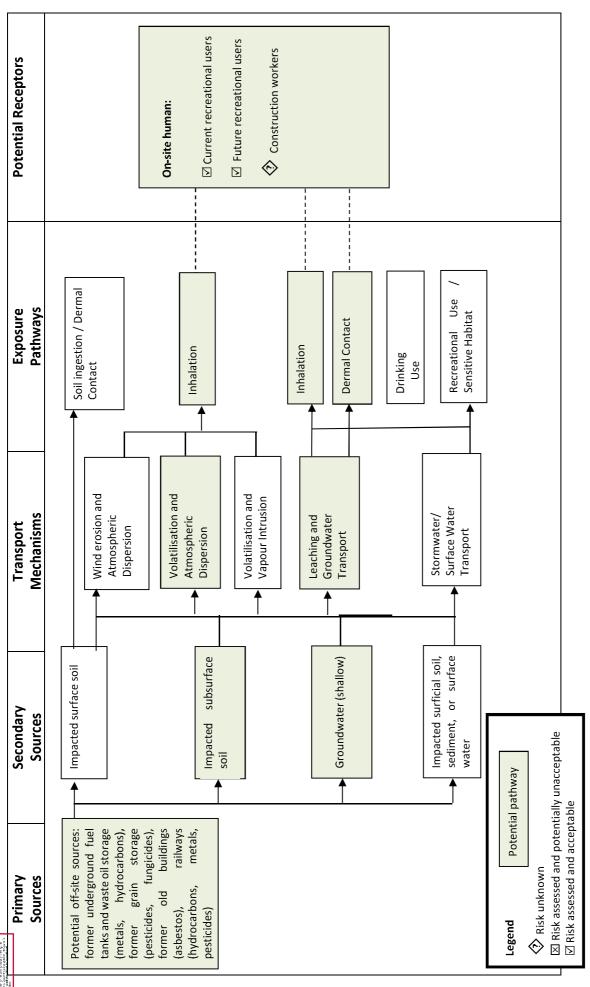


Figure 4 - Conceptual Site Model (green shading denotes potential pathway)





## 8. Conclusions and recommendations

**pitt&sherry** has undertaken a preliminary site assessment of the area of land that will be impacted by construction of the pedestrian bridge linking the planned Northbank recreational area and the Seaport precinct. A separate environmental site assessment has been prepared by **pitt&sherry** for the whole Northbank redevelopment.

This assessment included a site history review, a site inspection and interviews, and the outcomes of previous investigations carried out since 2013 for the whole of Northbank.

A summary of the information gained through this site assessment is as follows:

- The site history review indicated that the area of land subject to this ESA was never developed and has been used for passive recreational use (rowing clubs) over the last few years. However, Northbank has been an industrial/commercial area since the 1950's with the following activities carried out: storage of grain and wool, gravel yard and concrete manufacturing. Flood levees were constructed along the southern boundary of Northbank in the 1970's and more recently along the northern boundary
- The fill imported to construct the old and new flood levees was sourced from the Carrick clay pit; anecdotal information from Council indicated that the fill was clean
- While no potentially contaminating activities were identified at the site itself, a number of potential historical sources of contamination exist from adjacent parcels of land that may present a potential risk of soil or groundwater contamination via groundwater migration, in particular the presence of a former underground fuel storage system at the Boral site, 40m to the north of the site. Previous targeted soil sampling (2015) at the location of the former underground tanks identified lead and hydrocarbons in soils at depths between 0.5m and 1.8m at levels exceeding the adopted investigation criteria (including recreational use criteria)
- Groundwater monitoring in one well installed at the end of Taroona Street in 2015 (around 130m from the site) found arsenic and lead concentrations in shallow groundwater (0.5 m depth) above drinking water levels.

A Preliminary Conceptual Site Model was developed based on all the information gained to date and the following preliminary risk assessment has been made:

- The risk to off-site ecological receptors is likely to be low, and has been addressed separately in the whole
  of Northbank assessment
- The risk of exposure to contaminated groundwater at the site by current and future recreational users is likely to be low, given the relative small size of the site compared to the rest of Northbank and given that access to Northbank from the bridge will be via a platform that will cover some of the site. The likelihood of groundwater at the site being contaminated with hydrocarbons to such levels that it will pose a risk to recreational users from vapour inhalation is also likely to be low
- The proposed bridge construction works will involve excavation of soil to a depth of 1.5m (estimate of 50-100 m³ of excavated soil). It is expected that groundwater will be intercepted at that depth. There is therefore a potential risk that construction workers may be exposed to contaminated soil and/or groundwater through inhalation or direct contact.

While the area of land subject to this ESA is considered suitable for its proposed use, it would be preferable that groundwater and soil at the site are assessed prior to commencement of excavation works through the installation of a groundwater monitoring network upgradient from the site along the Boral boundary, which would allow to assess the potential for off-site contamination to impact the current area.





The Health and Safety Management should include protective measures to address the potential exposure of construction workers to contaminated soil and groundwater. The EMP for the works should make allowance for the assessment of soil for offsite disposal and management of groundwater where encountered.

## 9. Important Information

## 9.1 Scope of services

This report ("the Report") has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the client and **pitt&sherry** ("the scope of services"). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

The Report may only be used and relied on by the client for the purpose set out in the contract or as otherwise agreed between the client and **pitt&sherry**. Any use which a third party makes of this document, or any reliance on or decisions to be made based on it, is the responsibility of such third parties.

## 9.2 Reliance on data

In preparing the Report, **pitt&sherry** has relied upon data, surveys, analyses, designs, plans and other information provided by the client and other individuals and organisations, most of which are referred to in the Report ("the data").

Except as otherwise stated in the Report, **pitt&sherry** has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the Report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data.

**pitt&sherry** does not warrant the accuracy will not be liable in relation to conclusions should any of the data, be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to **pitt&sherry**.

#### 9.3 Conclusions and recommendations

The conclusions in this Report are based on conditions encountered and information reviewed at the date of preparation of the Report. **pitt&sherry** has no responsibility or obligation to update this Report to account for events or changes occurring subsequent to the date that the Report was prepared.

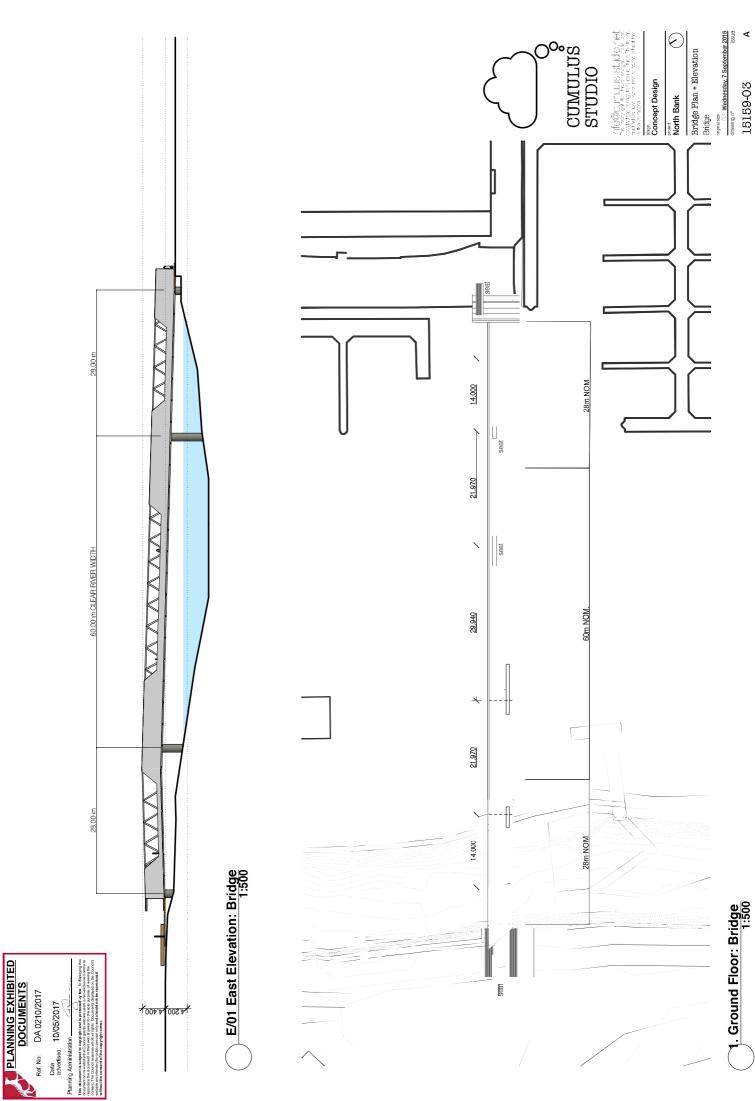


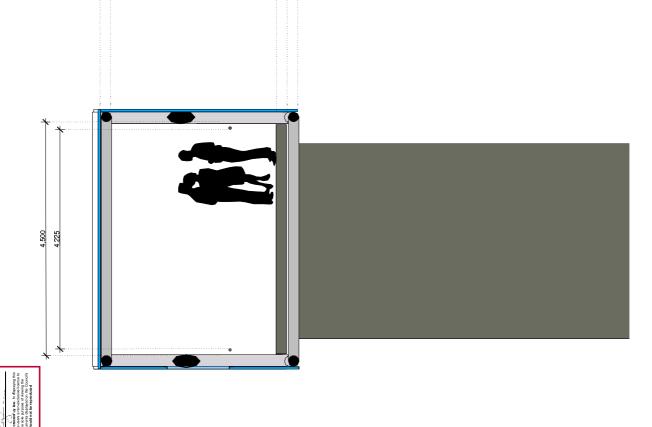


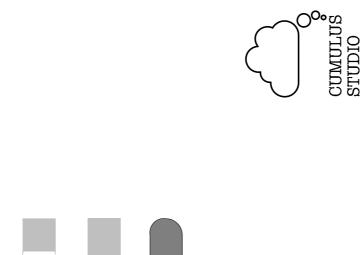
# **Appendix A**

**Concept Design for Proposed Development** 

pitt&sherry ref: HB17014H002 REP 31P BRIDGE PHASE 1 ESA REV00/SLR/Ic







opt 4

opt 3

opt 1

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PLANNING EXHIBITED DOCUMENTS Ref. No: DA 0210/2017 Date advertised: 10/05/2017

Planning Administration

opt 2

S/01 Section Bridge

organal sca /ে Wednesday, 7 September 2016 drawing n° issue

15159-05

Bridge Section

Project: North Bank

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Concept Design

PLANNING EXHIBITED DOCUMENTS Ref. No: DA 0210/2017 Date advertised: 10/05/2017 Planning Administration

Bridge - Perspective









Concept Design

Bridge Perspectives North Bank

original size া Wednesday, 7 September 2016 drawing n°

15159-04

Document Set ID: 3524564 Version: 2, Version Date: 09/05/2017

Bridge - Perspective 2





**Appendix B** 

**Underground services (Northbank)** 

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PLANNING EXHIBITED DOCUMENTS



Utilities Points

Sewer man holes

Legend

Stormwater Points

Water points

- Sewer

Drainage

Underground

Launceston City Council Northbank

Coordinate System: GDA 1994 MGA Zone 55 1:2,360 When Printed at A4





# **Appendix C**

**Historical Aerial Photographs** 

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Photo 1. 1921

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Photo 2. 1955





Photo 3. March 1971





Photo 4. April 1976



Photo 5. December 1984



Photo 6. 1986

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Photo 7. December 1991



Photo 8. March 2002

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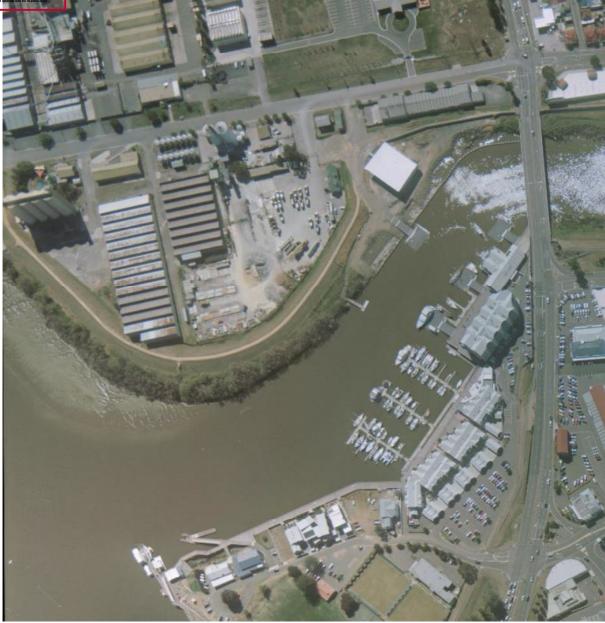


Photo 9. March 2009



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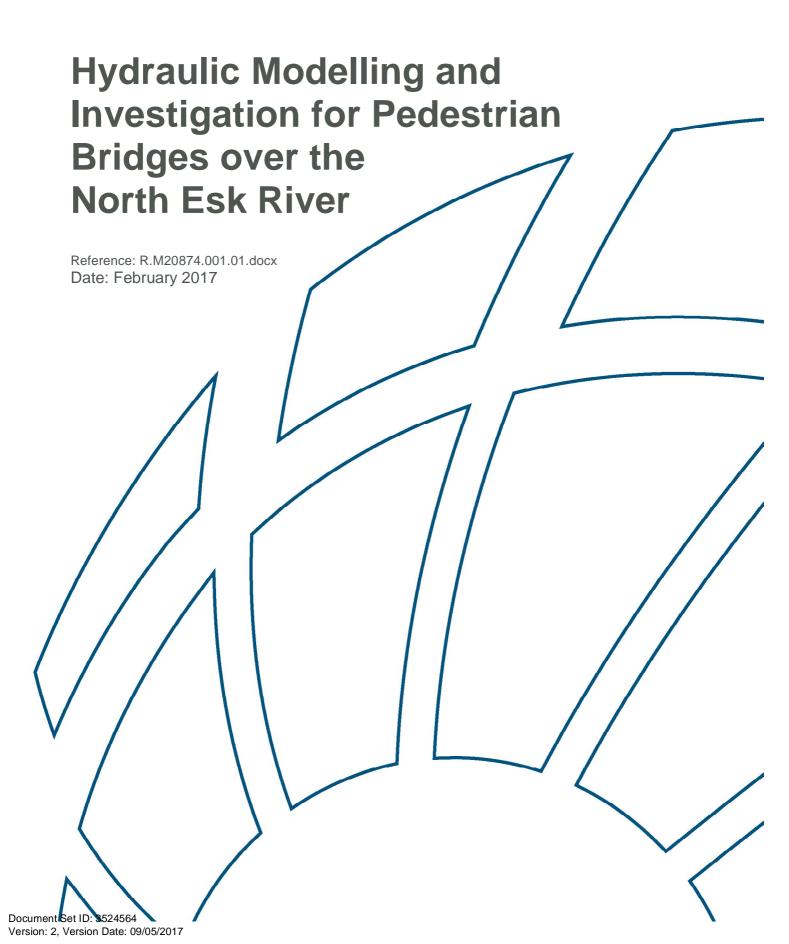














# Hydraulic Modelling and Investigation for Pedestrian Bridges over the North Esk River

Prepared for: City of Launceston

Prepared by: BMT WBM Pty Ltd (Member of the BMT group of companies)

#### Offices

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# **Document Control Sheet**

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analysis undertake	This report presents the methodology and results of the hydraulic modelling and analysis undertaken to support the design of the proposed Seaport to Northbank and Inveresk to Willis Street pedestrian bridges over the North Esk					

#### **REVISION/CHECKING HISTORY**

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#### Introduction



## 1 Introduction

This report presents the methodology and results of the hydraulic modelling and analysis undertaken to support the design of the proposed Seaport to Northbank and Inveresk to Willis Street pedestrian bridges over the North Esk River. The location of the two proposed pedestrian bridges and other significant features are shown in Figure 1-2.

Hydraulic modelling was undertaken for the 5%, 2%, 1% 0.5%, 0.2%, 0.1% and 0.05%, or 1 in 20, 1 in 50, 1 in 100, 1 in 200, 1 in 500, 1 in 1000 and 1 in 2000, Annual Exceedance Probability (AEP) events for the following flow scenarios:

- Design events as prescribed by BMT WBM (2008)
- North Esk River flows only with a constant low tide
- · North Esk River flows only with a constant high tide
- South Esk River flows only with a constant low tide
- South Esk River flows only with a constant high tide

It is recognised that adopting constant tide levels (tailwater level) does not represent realistic flood events. However, these scenarios are useful in determining flow behaviour under 'worst case' hydraulic conditions.

The design events adopt a tide cycle with North Esk River and South Esk River inflows of the same AEP, with the inflow hydrographs offset to represent the difference in catchment response times. As an example, the 0.05% AEP design event inflow hydrographs are shown in Figure 1-1.

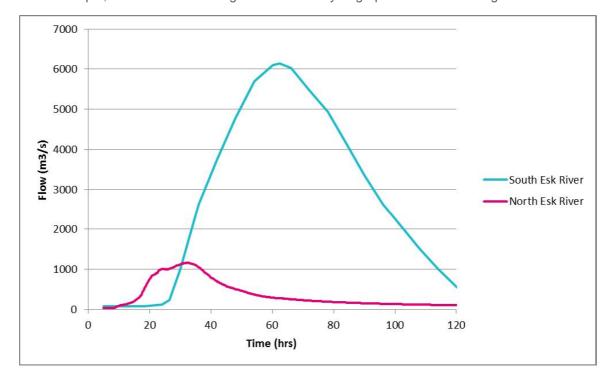
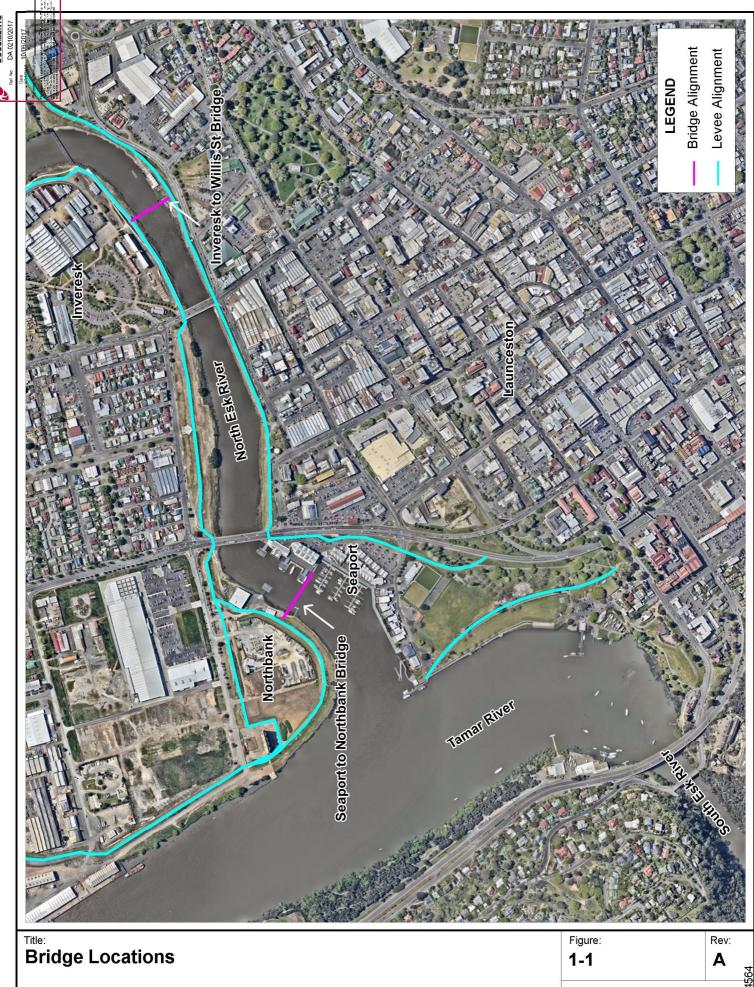


Figure 1-1 0.05% AEP Design Event Model Inflow Hydrographs





400m

Approx. Scale

www.bmtwbm.com.au

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BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.



## 2 Hydraulic Modelling

### 2.1 Model Updates

The TUFLOW hydraulic model used for this study was based on the model developed as part of BMT WBM (2008) and last updated for the Proposed Town Point Training Levee Flood Impact Assessment (BMT WBM 2014).

The majority of the levees in this model did not have an accurate representation of their height as the levees are designed to protect during flood events of up to and including the 0.5% AEP flood event. Consequently, the levee heights in the hydraulic model were simply set to be above the 200 year ARI flood level. To accurately represent flood mapping behind the levee in flood events larger than the 0.5% AEP flood event, survey of the elevations along the top of the levees was provided by City of Launceston and included in the model.

The City of Launceston also provided preliminary drawings of the two proposed pedestrian bridges. These structures were included in the model to ensure correct flow behaviour was modelled in the areas of interest and allow for afflux to be assessed.

#### 2.2 River Inflows

The hydraulic model has inflow boundaries on both the North Esk and South Esk Rivers. The 2008 River Tamar and North Esk River Flood Study (BMT WBM 2008) produced flood mapping for events up to the 0.2% AEP event. To support bridge design, modelling for a range of scenarios with flows up to the 0.05% AEP is required.

The peak flows for the South Esk River inflow were taken from the Trevallyn Flood Frequency Review for Launceston City Council (Hydro Tasmania Consulting 2008). Using a flood frequency analysis (FFA), Hydro Tasmania Consulting (2008) produced flows up to the 0.001% (1 in 100,000) AEP event.

The peak flows for the North Esk River inflow were extrapolated from the flows derived by a FFA undertaken at Corra Linn (Water Research Laboratory 2006), which included flows for events up to the 0.2% AEP event.

Table 2-1 presents the peak flows for events up to the 0.05% AEP event for both the North and South Esk Rivers. These flows were applied to the model by scaling the hydrographs adopted in BMT WBM (2008).



#### **Hydraulic Modelling**



Table 2-1 Peak Flows

Event (AEP)	South Esk Flow (m³/s)	North Esk Flow (m³/s)
5%	1,810	419
2%	2,330	526
1%	2,910	614
0.5%	3,430	710
0.5% (95% Confidence) (used to assess afflux)	4,000	787
0.2%	4,630	851
0.1%	5,330	970
0.05%	6,140	1,166

## 2.3 Tidal Boundary

As per BMT WBM (2008), the tidal boundary used at the mouth of the Tamar Estuary had an amplitude range of 2.48 m with a peak tide level of 1.24 m AHD. The timing of the tide was adjusted such that the peak tide level at Launceston coincided with the peak flood at Launceston.

A requirement of the current study is to determine flow characteristics in the North Esk River at both mean high and low tide levels of 1.68 m AHD and -1.62 m AHD respectively. To do this, the downstream boundary and initial water levels for the model were set at constant values matching the mean high and low tide.

It should be noted that the tide levels amplify as they propagate along the estuary to the tidal limit just upstream of Launceston. For this reason the adopted tide amplitude at Launceston between the mean high and low tides levels of 3.3 m is greater than that at the mouth of Tamar Estuary.





# 3 Hydraulic Outputs and Design Recommendations

#### 3.1 Peak Water Levels

The peak water levels for all of the events and scenarios modelled are shown in Figure 3-1 and Figure 3-2 for the Seaport to Northbank Bridge and Inveresk to Willis Street Bridge respectively.

The levee elevations shown in Figure 3-1 and Figure 3-2 were taken from the survey data provided by the City of Launceston. The elevation used for the Northbank Levee at the Seaport to Northbank Bridge represents the lowered level of 4.2 m AHD for the Town Point Levee, not the secondary higher levee along Lindsay Street.

As would be expected in the lower reaches of the North Esk River, the critical peak water levels were obtained from the 0.05% AEP Design Event. The peak water level at the Seaport to Northbank Bridge and Inveresk to Willis Street Bridge is 5.55 m AHD and 5.47 m AHD respectively.

For the Design Events, at the Seaport to Northbank Bridge, the Northbank levee is overtopped by the 0.5% AEP event (the Northbank levee has recently been lowered) and the Seaport levee is overtopped by the 0.1% AEP event. At the Inveresk to Willis Street Bridge the northern and southern levees are overtopped in the 0.1% AEP event.

Flows remain within the levees at both locations in North Esk River for the low and high tide scenarios with only the North Esk River in flood for all events up to and including the 0.05% AEP event.





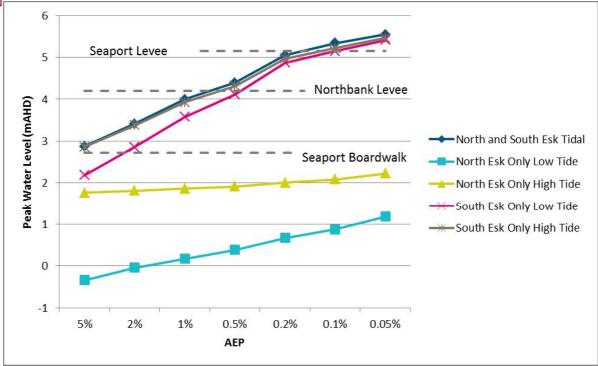


Figure 3-1 Seaport to Northbank Bridge Peak Water Level

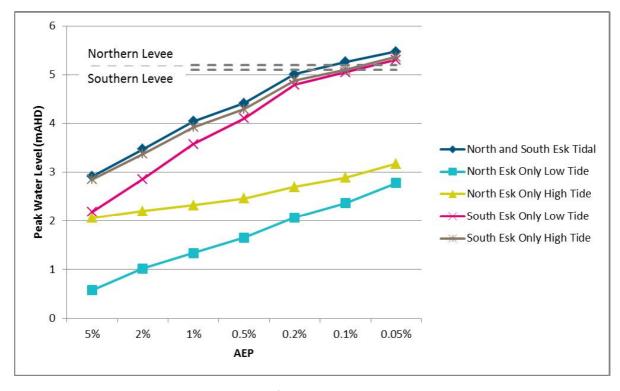


Figure 3-2 Inveresk to Willis Street Bridge Peak Water Level



Hydraulic Outputs and Design Recommendations
PLANNING EXHIBITED
DOCUMENTS

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Date dispersage: 10/05/2017

#### 3.2 Peak Velocities

The peak velocities for all of the events and scenarios modelled are shown in Figure 3-3 and Figure 3-4 for the Seaport to Northbank Bridge (at river channel centre) and Inveresk to Willis Street Bridge respectively. The peak velocities from the South Esk River flows only scenarios occurred due to backwater flowing up the North Esk River. It should be noted that the velocities presented in Figure 3-3 and Figure 3-4 represent the peak velocity, not the velocity at peak water level as shown in Figure 3-1 and Figure 3-2.

1D and 2D hydraulic models report vertically averaged velocities. Peak velocity is assumed to occur near the surface and is approximated as the vertically averaged velocity divided by 0.7. This assumption is based on a typical depth-velocity distribution.

Table 3-1 shows the peak velocity and critical event at each bridge, including at the individual piers for the Seaport to Northbank Bridge. The Seaport to Northbank Bridge is located in the 2D hydraulic model domain. Therefore varying peak velocities can be extracted from the model across the river channel. The Willis Street Bridge is located in the 1D model domain. Therefore only a uniform velocity can be extracted across the channel.

It should be noted that as per JMG's concept drawings, Pier 1 is located on the northern side of the river at both locations.

**Peak Velocity** Location 0.05% AEP Critical Scenario  $(m/s)^1$ Seaport to Northbank Bridge **Channel Centre** 5.4 North Esk River flows only with a constant low tide Pier 1 1.7 Design Event Pier 2 4.3 North Esk River flows only with a constant low tide 3.6 Pier 3 North Esk River flows only with a constant low tide South Esk River flows only with a constant low tide -1.4 Pier 4 **Inveresk to Willis Street Bridge** Uniform 4.6 North Esk River flows only with a constant low tide

Table 3-1 Peak Velocities

As shown in Table 3-1 the peak velocities at all piers for the Seaport to Northbank Bridge are lower than those in the centre of the river. This is representative of expected horizontal velocity distributions in relatively straight sections of a river channel. Also the piers are located in areas of the channel where flow is impeded by existing infrastructure.

Pier 1 of the Seaport to Northbank Bridge has a bed elevation of approximately 2.54 m AHD, as a result the pier is not inundated during the North Esk River flows only scenarios, therefore the Design Event, which has higher tail water levels result in the critical velocity. Pier 4 is located downstream of an inside bend on the North Esk River and is obstructed by Alexandra Walk and the



<sup>&</sup>lt;sup>1.</sup> A negative velocity value represents flow in the upstream direction, i.e. backwater from South Esk River flows.



attached berthing facilities. As a result the South Esk River flows only with a constant low tide result in the critical velocity.

As shown in Figure 3-3 and Figure 3-4 the peak velocities from the South Esk River flows only scenarios produce significantly lower velocities the scenarios with flow in the North Esk River. This indicates that the training wall remains an affective mechanism for minimising upstream velocities into the North Esk River for events up to and including 0.05% AEP event.

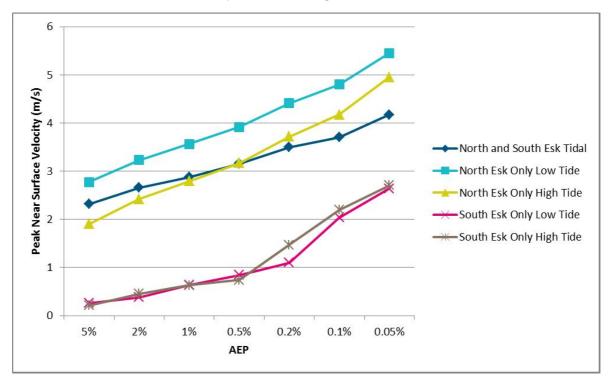


Figure 3-3 Seaport to Northbank Bridge Peak Velocity at Channel Centre



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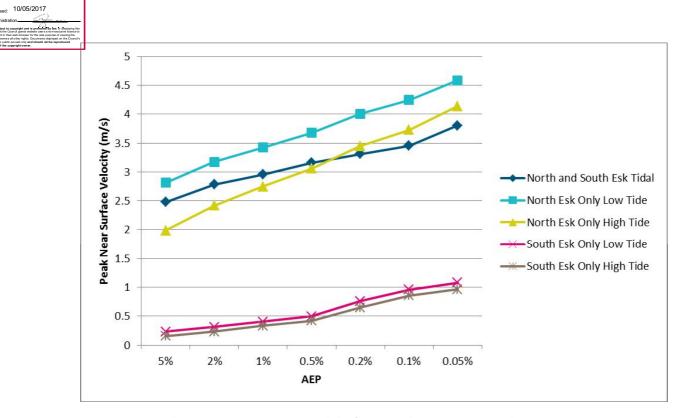


Figure 3-4 Inveresk to Willis Street Bridge Peak Velocity

## 3.3 Flow Angle

Assuming pier direction perpendicular to the bridge, the flow angle is that between direction of flow and the piers as shown in Figure 3-5.

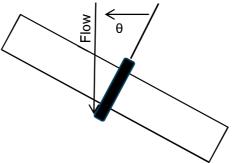


Figure 3-5 Flow Direction Angle (for conceptualisation only)

Table 3-2 presents the flow angles for each pier at the Northbank to Seaport Bridge for events with North Esk River dominated flow and events with South Esk River backwater dominated flow. Given that higher flow velocities are modelled during North Esk River dominated flow events it is recommended that the current perpendicular to bridge deck pier arrangement is adopted.





Table 3-2 Seaport to Northbank Bridge Flow Angles

Pier	North Esk River Dominated Flow Angle	South Esk River Dominated Flow Angle
1	2°	21°
2	4°	21°
3	0°	21°
4	0°	21°

The flow angle could not be determined for the Inveresk to Willis Street bridge as it is located in the 1D domain and flow direction is merely a function of model digitalisation. However, it can be assumed that in a defined channel like the North Esk River that flow direction will be approximately in parallel with the channel direction.

### 3.4 Water Flow Force

As per equation 15.3.1(1), AS5100.2-2004, the ultimate design drag force (horizontal thrust) on the bridge piers is a function of the flow characteristic variables of flow depth, velocity and angle of water flow. Therefore the critical velocities listed in Table 3-1 do not necessarily result in the critical ultimate design drag force.

Table 3-3 presents the combination of water level and flow velocity for each modelled scenario that resulted in the greatest ultimate design drag force (horizontal thrust) on the bridge piers.

Table 3-3 Water Flow Force on Piers Critical Scenario Characteristics

Pier	Water Level (m AHD)	Peak Velocity (m/s)	0.05% AEP Critical Scenario		
	Seaport to Northbank Bridge				
1	3.72	1.7	Design Event		
2	2.24	4.0	North Esk River flows only with a constant high tide		
3	5.46 (submerged superstructure)	2.1	South Esk River flows only with a constant high tide		
4	5.24 (submerged superstructure)	1.4	South Esk River flows only with a constant low tide		
	Inveresk to Willis Street Bridge				
1	3.17	4.1	North Esk River flows only with a constant high tide		
2	2.78	4.6	North Esk River flows only with a constant low tide		
3	3.17	4.1	North Esk River flows only with a constant high tide		
4	3.17	4.1	North Esk River flows only with a constant high tide		
5	3.17	4.1	North Esk River flows only with a constant high tide		

It should be noted that due to the high bed level of Pier 1 of the Seaport to Northbank Bridge the higher tailwater level produced by the beginning of the South Esk River hydrograph resulted in the



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critical scenario being the design event while flow direction was positive (dominated by North Esk River flow).

Table 3-4 and Table 3-5 present the water flow characteristics to allow for the force on the bridge superstructures.

The horizontal velocity distribution (presented as a ratio to the channel centre velocities) across the river channel at the Seaport to Northbank Bridge is presented in Figure 3-6. Towards the river banks, the horizontal velocity distribution is highly dependent on the channel conditions, i.e. surrounding structures and bank vegetation. It is therefore recommended that conservative estimates of velocity be adopted during design at each end of the bridge.

Table 3-4 Seaport to Northbank Bridge Water Flow Force on Superstructure Characteristics

Water Level	Near Surface Velocity (m/s) <sup>1.</sup>		
(m AHD)	North Esk Dominated Flow	South Esk Dominated Flow	
2	3.9	-	
2.5	4.2	-	
3	3.8	-	
3.5	3.0	-	
4	2.3	-	
4.5	1.2	-0.3	
5	0.2	-0.7	
5.46	-	-2.7	

<sup>&</sup>lt;sup>1</sup> A negative velocity value represents flow in the upstream direction, i.e. backwater from South Esk River flows.

Table 3-5 Inveresk to Willis Street Bridge Water Flow Force on Superstructure Characteristics

Water Level	Near Surface Velocity (m/s) <sup>1.</sup>		
(m AHD)	North Esk Dominated Flow	South Esk Dominated Flow	
4	2.7	-	
4.5	1.9	-	
5	0.7	-0.2	
5.47	-	-0.4	

<sup>&</sup>lt;sup>1.</sup> A negative velocity value represents flow in the upstream direction, i.e. backwater from South Esk River flows.





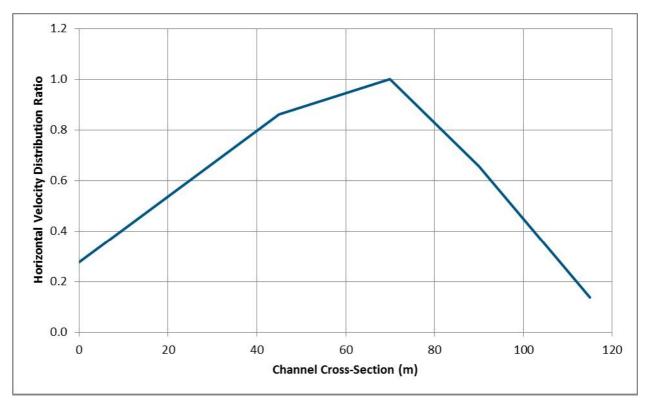


Figure 3-6 Seaport to Northbank Bridge Horizontal Velocity Distribution Ratio

#### 3.4.1 Probable Debris Loading

There are several bridges upstream of Seaport to Northbank and the Inveresk to Willis Street bridges. These bridges will likely prevent the majority of significant debris from reaching the two proposed bridges from the upper catchment. It is therefore recommended that the minimum debris depth mat depth of 1.2 m as recommended in AS5100.2 – 2004, S15.5.1 be adopted.

The majority of debris originating from the South Esk River is expected to be deposited along the banks of the Tamar River estuary upstream of the North Esk River or continue to travel down the estuary. Therefore the same minimum debris depth mat depth of 1.2 m is recommended.

#### 3.5 Pier Scour

An analysis of the scour potential for the bridge piers was undertaken for the 0.05% AEP flood event for all scenarios to provide input into the structural design. The analysis used the numerical methodologies for local pier scour as described in Austroads (1994).

There is not expected to be any substantial contraction of flow into the bridges as the designs are spanning the current existing channel. Therefore the analysis considers local scour at the piers and abutments only. Given that the peak velocity occurs near the surface the vertically averaged velocities have been used for the scour calculations. It has also been assumed that the footing or pile cap is below the bed level.

The calculated scour depth for the Seaport to Northbank and Inveresk to Willis Street bridges is provided in Table 3-6. The deepest scour depths occurred during North Esk River dominated flows at Piers 1 and 2 and during South Esk dominated flows at Piers 3 and 4 at the Seaport to





Northbank Bridge. The deepest scour depths occurred during North Esk River dominated flows for all piers at the Inveresk to Willis Street Bridge.

It should be noted that the critical velocities listed in Table 3-1 do necessarily result in greatest pier scour depths. This is because pier scour is calculated using the variables of flow depth, velocity and angle of water flow. It should also be noted that the scour calculations do not account for time varying flow; therefore critical flow conditions were adopted.

**Inveresk to Willis** Seaport to **Northbank Depth Street Depth** Pier below bed level below bed level (m) (m) Pier 1 3.0 3.0 Pier 2 5.0 3.5 Pier 3 5.5 2.5 Pier 4 4.5 2.5 Pier 5 2.5

Table 3-6 Calculated Scour Depth

At the Seaport to Northbank Bridge, Tasman Geotechnics have provided preliminary borelog data. A comparison of the calculated scour depths to the borelogs indicates that at Piers 2 and 4 scour is calculated to occur well into the silt soil horizons, while at Pier 3 is calculated to extrude into a horizon of cobbles.

It is recommended that when the full analysis of the borehole material is available that the sediment stiffness characteristics for each layer be assessed against the calculated scour depth to determine a more accurate expected scour depth. For example, if the calculated scour depth is well into a layer of very stiff material, then the adopted scour depth would be less than that calculated, or vice versa. If the calculated scour depth is into the weaker material layer, the adopted scour depth would be assumed into the weaker material layer and typically down to the start of the next stiff layer.

#### 3.5.1 Degradation of the River Bed

BMT WBM (2008) states that: '[sediment] accumulation has been occurring as the river returns to equilibrium following an extended period of dredging'. This is shown in a comparison of channel cross-sections at the Seaport to Northbank Bridge (Figure 3-7) where the bathymetry used in the hydraulic model for the 2008 study is lower than the 2016 bathymetry surveys across the bottom of the channel. There appears to bed degradation occurring at the base of the Northbank river bank.

General bed scour can also occur during flood events. Change in bed elevation supplied to BMT WBM comparing bathymetry survey captured on 2 June 2016 and 18 June 2016 shows that during the June 2016 event, estimated to be between a 0.5% and 0.2% AEP event for the North Esk River (City of Launceston 2016), scour to a maximum depth of approximately 1 m occurred in a localised area at the base of the Northbank river bank, while sediment was deposited on the Seaport side of the channel.





Taking into consideration the above information, there is not expected to be any significant long-term degradation of the river bed. However continued monitoring of the scour at the base of the Northbank river bank may be required to ensure the bank does not continue to degrade.

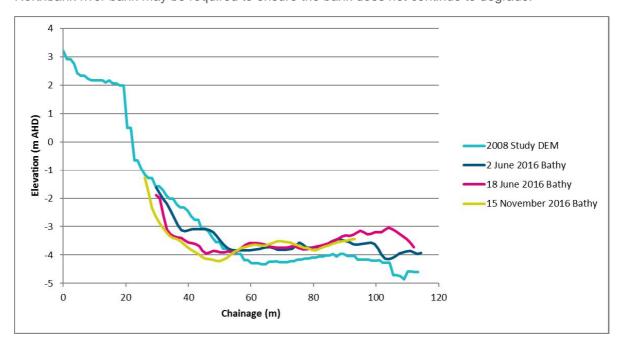


Figure 3-7 Seaport to Northbank Bridge Cross-Section Comparisons



#### Seaport to Inveresk Bridge Afflux



# 4 Seaport to Inveresk Bridge Afflux

To determine the impact of afflux resulting from the construction of the Seaport to Inveresk Bridge on the flood immunity provided by the levees the 0.5% AEP 95% confidence was run for both the existing and bridge scenarios. A comparison of the water levels along on the southern edge of the channel where the proposed bridge design creates the most blockage is shown in Figure 4-1.

In Figure 4-1 the bridge is located at chainage 0m, with negative chainages going upstream and positive chainage going downstream. Figure 4-1 shows that a maximum afflux of 1 mm downstream of the bridge at the peak water level (occurring from backflow from the South Esk River). This will not impact on the flood immunity provided by the levees.

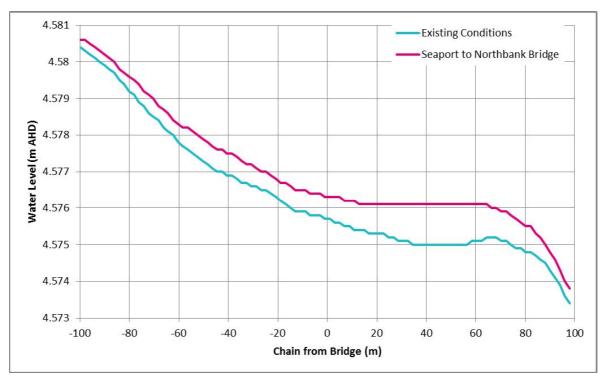


Figure 4-1 Seaport to Northbank Bridge 0.5% AEP 95% Confidence Afflux



#### **Peak Tidal Velocities**



# 5 Peak Tidal Velocities

At the Seaport to Northbank Bridge, the peak tidal velocities extracted from the TUFLOW FV 3D model for a spring tide during a 'dry' period are 0.6m/s in the flood current and 0.75 m/s in the ebb current.

Upstream of the East Tamar Highway bridge, the peak velocity is 0.9 m/s in the flood current and 1.0 m/s in the ebb current.



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