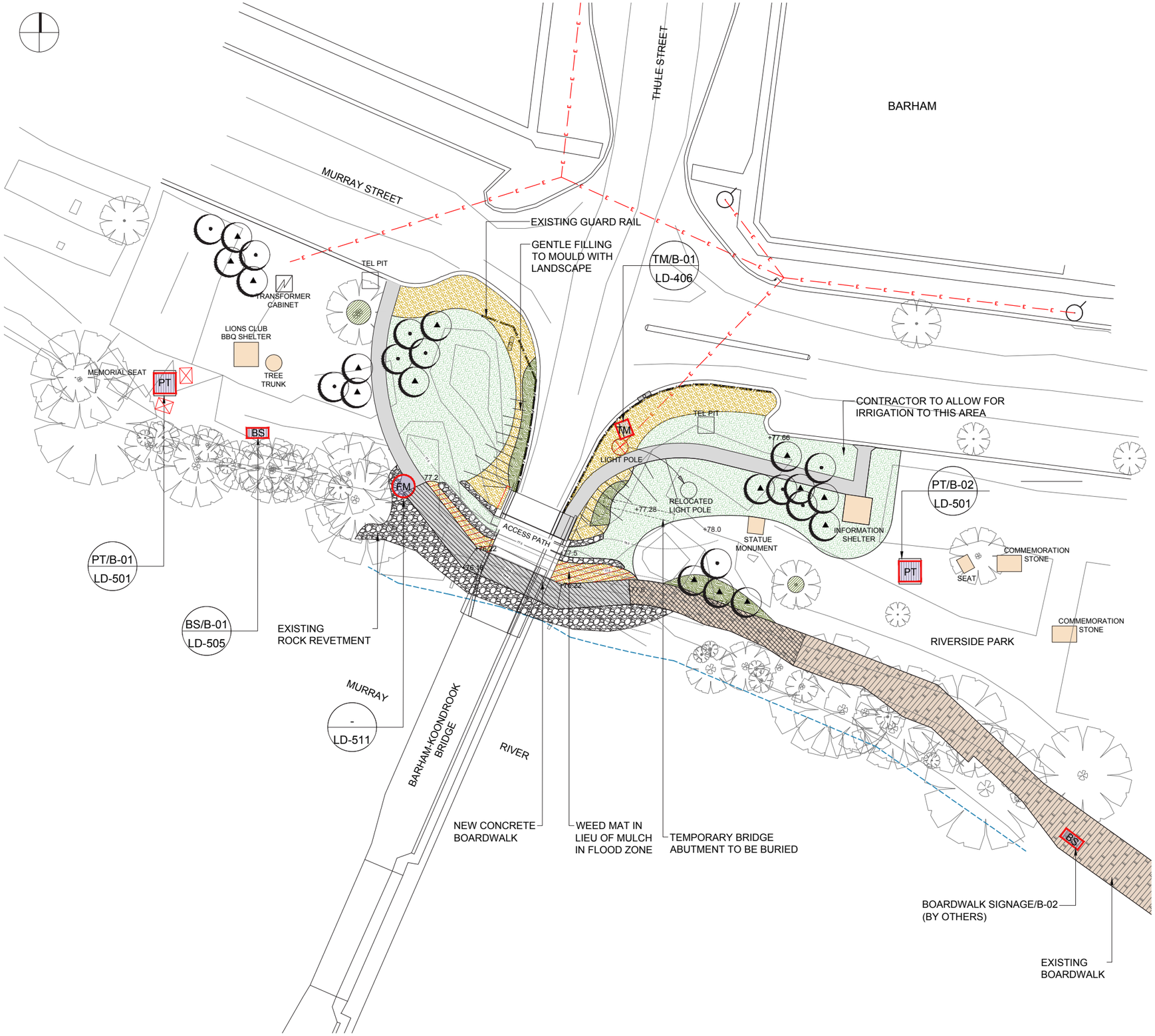


LEGEND

EXISTING ELEMENTS

- EXISTING TREES PROTECTED & RETAINED
- EXISTING AERIAL POWER CABLE
- EXISTING PARK FURNITURE TO BE RETAINED
- EXISTING SIGNAGE
- +78.0 SPOT LEVELS
- EXISTING BOLLARDS RETAINED
- HIGH / LOW TIDE LEVEL
- GUARD RAIL

SURFACES & INCIDENTAL WORKS

- CONCRETE PATH
- NEW BOARDWALK, BY OTHERS

NEW FURNITURE INCLUDING INTERPRETATION ELEMENTS

- PT **PICNIC TABLE (PT)** REFER DETAIL LD-401
- INTERPRETATION ELEMENT OPPORTUNITY
- BS **BENCH SEAT (BS)** REFER DETAIL LD-403
- FM **FLOOD MARKER (FM)** REFER DETAIL LD-405
- TM **TOWN MARKER (TM)** REFER DETAIL LD-406

PLANTING

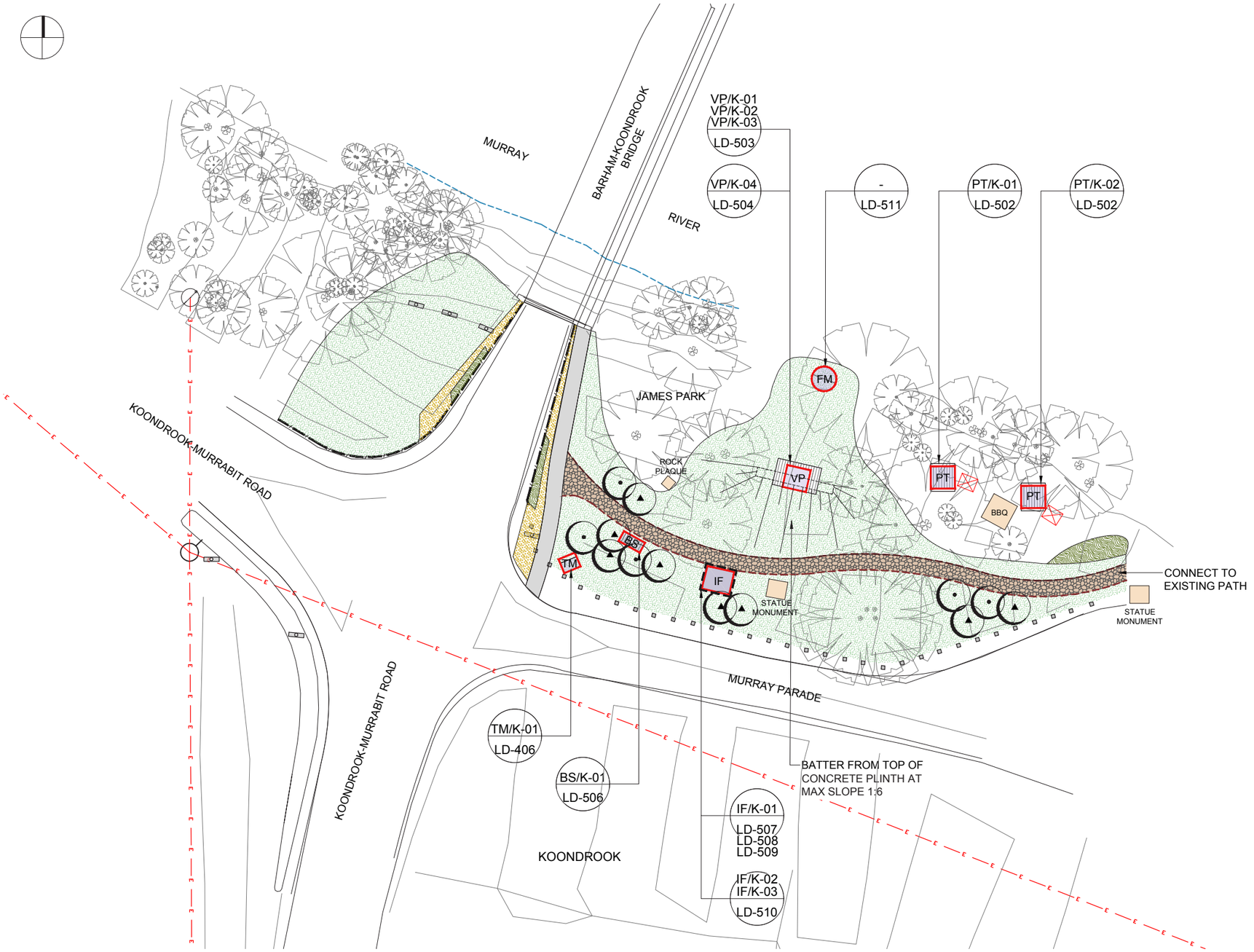
- MASS PLANTING BED - NATIVE GRASSES & GROUND COVERS
  REFER DETAIL 1&2/LD-201
  - 100MM TUBES PLANTED @ 6/M²
  - 200MM DEPTH CULTIVATION
  - 150MM DEPTH TOPSOIL (UNLESS OTHERWISE SHOWN)
  - 75MM DEPTH MULCH
- MASS PLANTING BED - LOW SHRUBS
  REFER DETAIL 3/LD-201
  - TUBESTOCK @ 1/M² OR AS SHOWN
  - 200MM DEPTH CULTIVATION
  - 150MM DEPTH TOPSOIL (UNLESS OTHERWISE SHOWN)
  - 75MM DEPTH MULCH
- TURF
  REFER DETAIL 3/LD-201
  - MIN. 75MM DEPTH TOPSOIL
  - SEEDING AS PER SPECIFICATION
- MULCH ONLY
- WEED MAT USED IN LIEU OF MULCH

TREE PLANTING

- *Eucalyptus largiflorens* - 45L Black Box
- *Eucalyptus camaldulensis* - 45L River Red Gum

LOCATION OF INTERPRETIVE ARTWORK

- LD-XXX



LEGEND

EXISTING ELEMENTS

- EXISTING TREES PROTECTED & RETAINED
- EXISTING PARK FURNITURE TO BE RETAINED
- +78.0 SPOT LEVELS
- HIGH / LOW TIDE LEVEL
- GUARD RAIL
- EXISTING AERIAL POWER CABLE
- EXISTING SIGNAGE
- EXISTING BOLLARDS RETAINED
- EXISTING FURNITURE REMOVED

SURFACES & INCIDENTAL WORKS

- CONCRETE PATH
- STABILISED GRANITE GRAVEL
- HARDWOOD EDGING

NEW FURNITURE INCLUDING INTERPRETATION ELEMENTS

- PT **PICNIC TABLE (PT)** REFER DETAIL LD-401
- VP **VIEWING PLATFORM (VP)** REFER DETAIL LD-402
- BS **BENCH SEAT (BS)** REFER DETAIL LD-403
- IF **INFORMATION SHELTER (IF)** REFER DETAIL LD-404
- FM **FLOOD MARKER (FM)** REFER DETAIL LD-405
- TM **TOWN MARKER (TM)** REFER DETAIL LD-406
- INTERPRETATION ELEMENT OPPORTUNITY

PLANTING

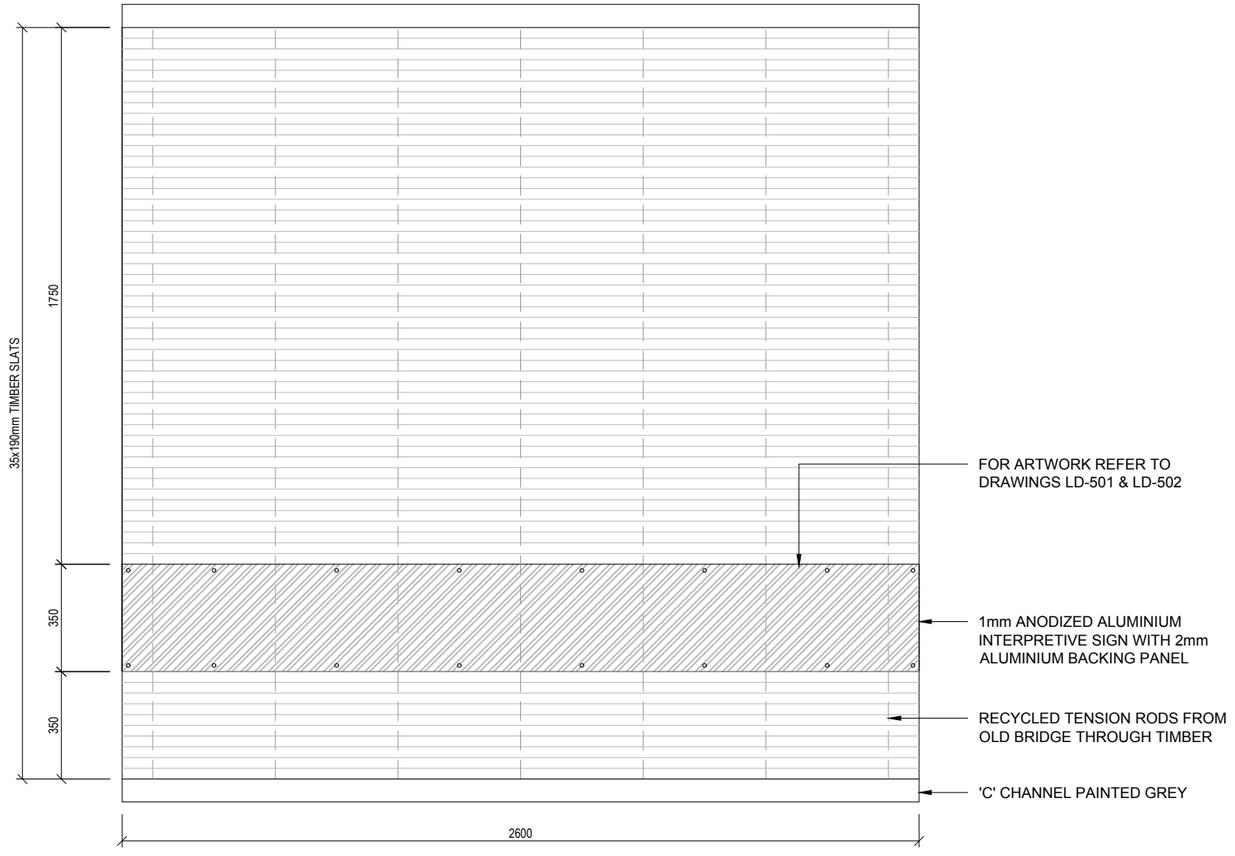
- MASS PLANTING BED - NATIVE GRASSES & GROUND COVERS
  REFER DETAIL 1&2/LD-201
  - 100MM TUBES PLANTED @ 6/M²
  - 200MM DEPTH CULTIVATION
  - 150MM DEPTH TOPSOIL (UNLESS OTHERWISE SHOWN)
  - 75MM DEPTH MULCH
- MASS PLANTING BED - LOW SHRUBS
  REFER DETAIL 3/LD-201
  - TUBESTOCK @ 1/M² OR AS SHOWN
  - 200MM DEPTH CULTIVATION
  - 150MM DEPTH TOPSOIL (UNLESS OTHERWISE SHOWN)
  - 75MM DEPTH MULCH
- TURF
  REFER DETAIL 4/LD-201
  - MIN. 75MM DEPTH TOPSOIL
  - SEEDING AS PER SPECIFICATION

TREE PLANTING

- *Eucalyptus largiflorens* - 45L Black Box
- *Eucalyptus camaldulensis* - 45L River Red Gum

LOCATION OF INTERPRETIVE ARTWORK

- \- / LD-XXX



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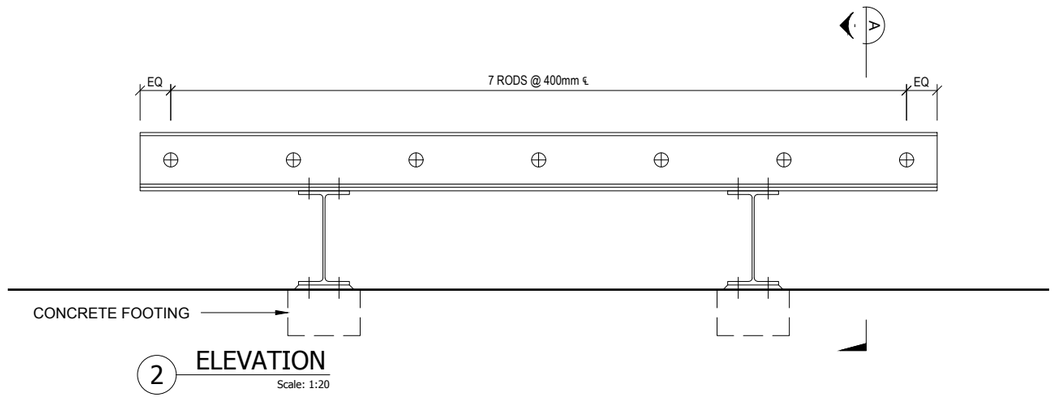

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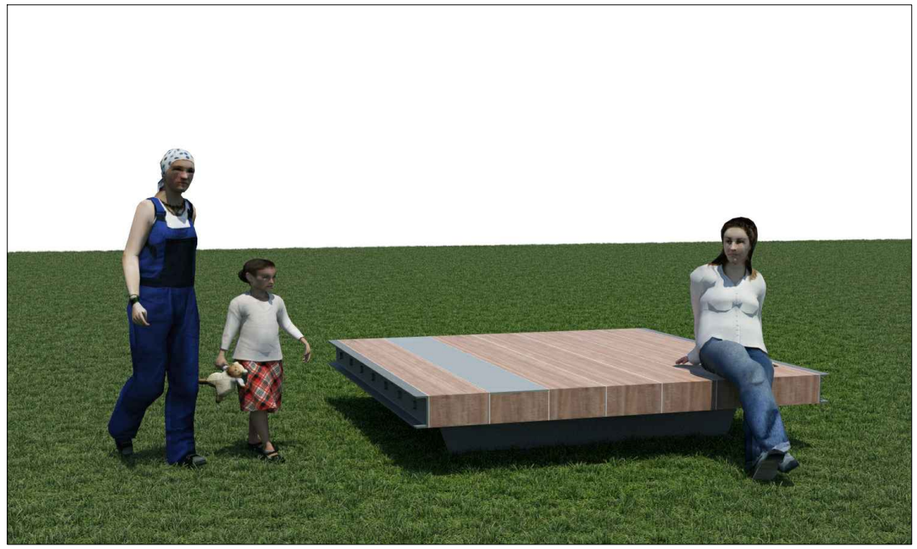

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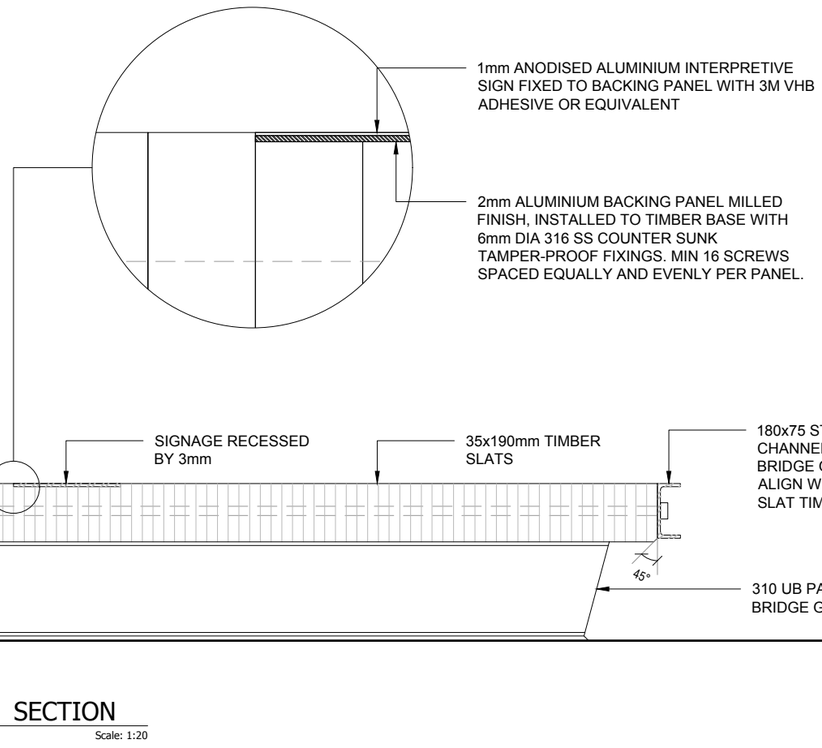
Not to Scale



A SECTION
Scale: 1:20

NOTES

1. ALIGN SIGNAGE WITH TIMBER SLATS.
2. TOLERANCES TO BE COORDINATED BETWEEN SIGNAGE MAKER AND FURNITURE MAKER.
3. ALL SIGN DIMENSIONS TO BE MEASURED ON SITE PRIOR TO MANUFACTURE AND INSTALL.

No.	Amendment Description	Initials	Date
02	100% DOCUMENTATION	MMG	23/05/2017
01	FOR INFORMATION	MMG	2/03/2017

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SCALES
0 400 800mm
1 : 20

Co-ordinate System: MGA Zone 56 | Height Datum: A.H.D.

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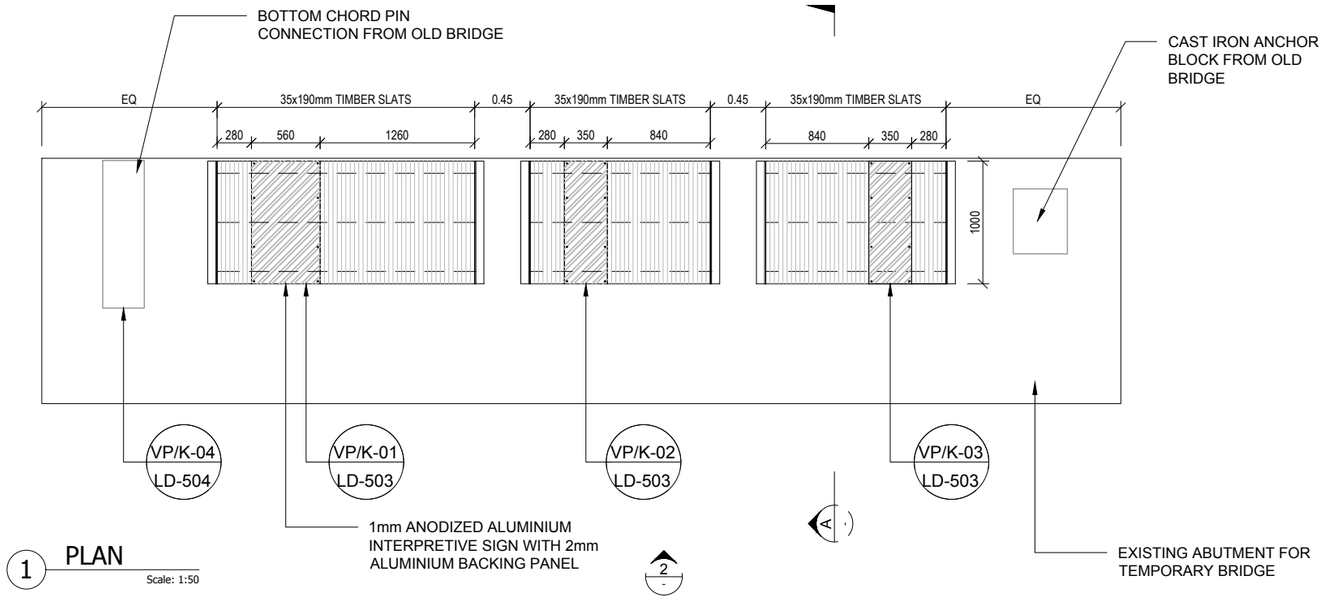
DESIGNED. MW/MMG
REVIEWED. JVG

ROADS AND MARITIME SERVICES

BARHAM-KOONDROOK BRIDGE
LANDSCAPE DESIGN & HERITAGE INTERPRETATION
HERITAGE INTERPRETATION ELEMENTS
PICNIC TABLE (PT)

FILE No.	DRAWING	PRINTED DATE	SHEET No.
16_07	DWG_LD_401	23/05/2017	08

REGISTRATION NUMBER
KIS-1607-DWG-LD-401



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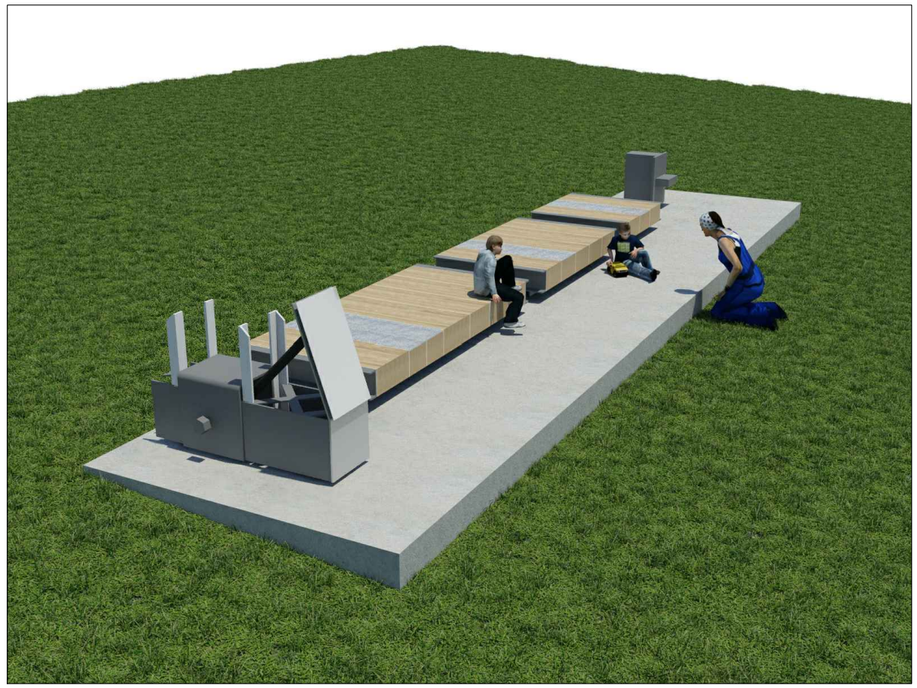

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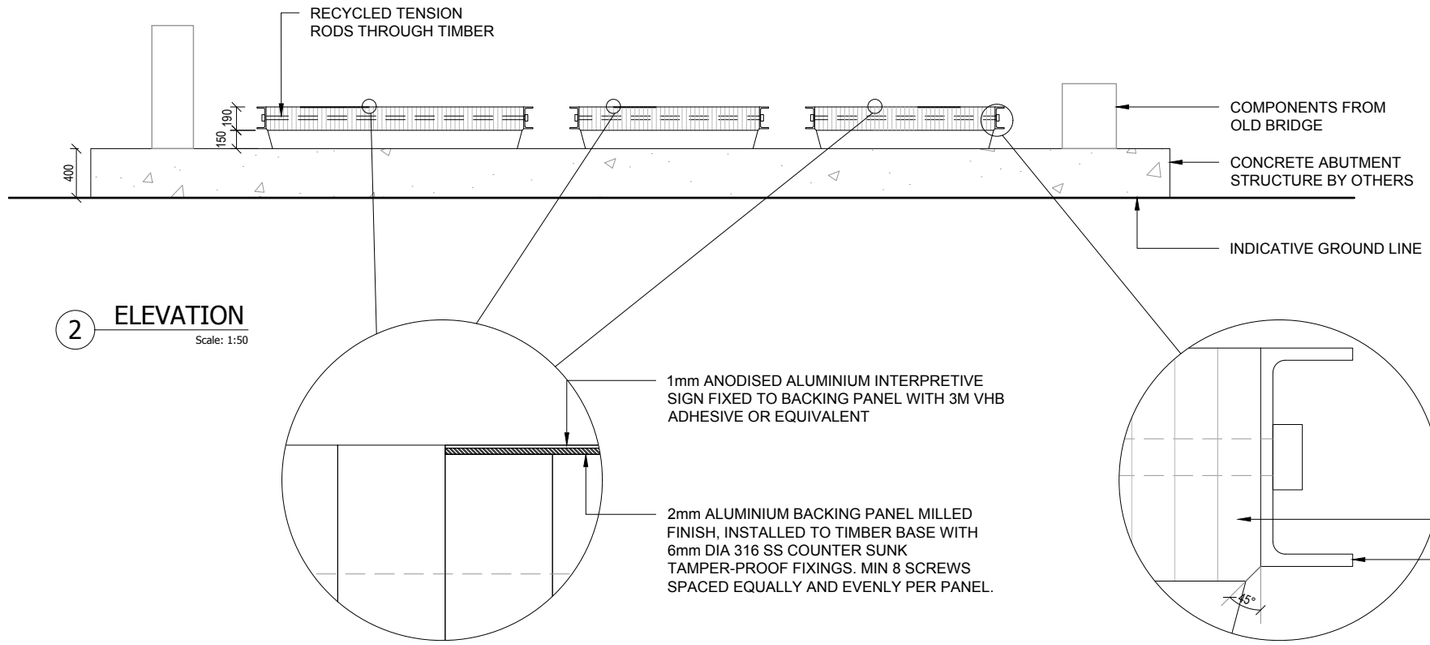

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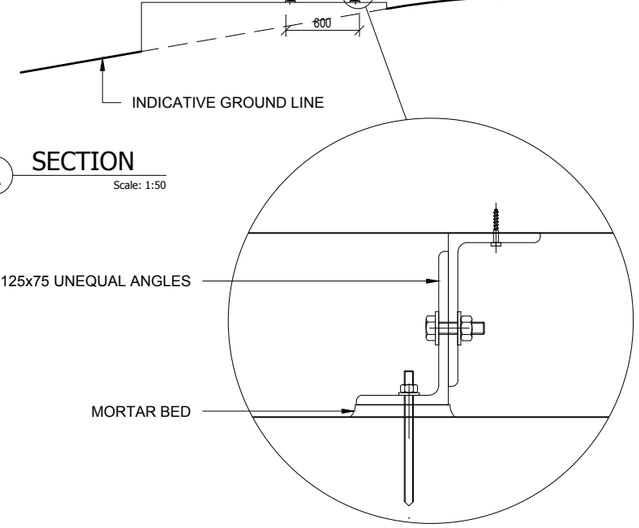

A SECTION
Scale: 1:50

NOTES
1. ALIGN SIGNAGE WITH TIMBER SLATS.
2. TOLERANCES TO BE COORDINATED BETWEEN SIGNAGE MAKER AND FURNITURE MAKER.
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No.	Amendment Description	Initials	Date
02	100% DOCUMENTATION	MMG	23/05/2017
01	FOR INFORMATION	MMG	2/03/2017

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SCALES
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1 : 5

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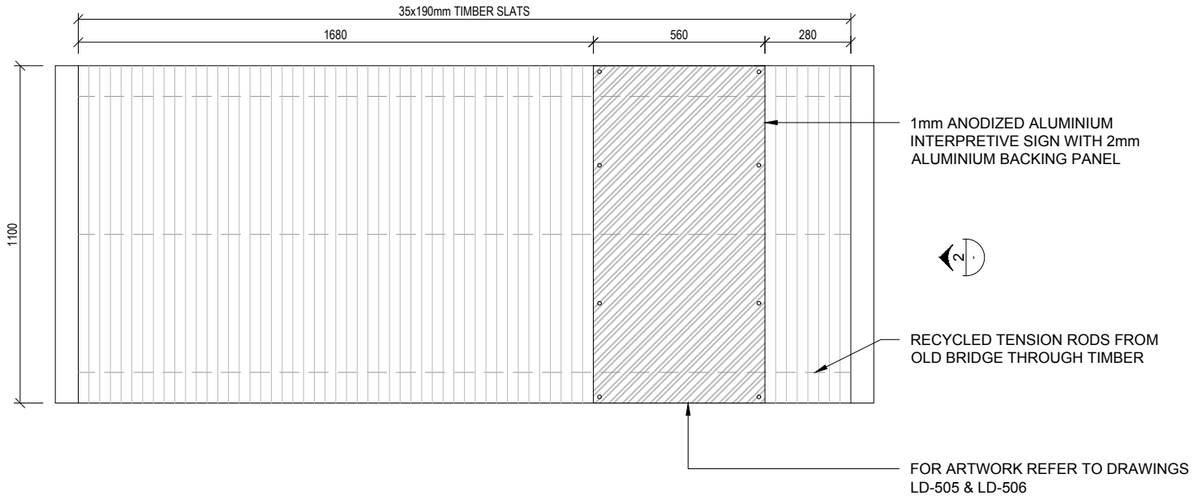
REVIEWED. JVG

ROADS AND MARITIME SERVICES

BARHAM-KOONDROOK BRIDGE
LANDSCAPE DESIGN & HERITAGE INTERPRETATION
HERITAGE INTERPRETATION ELEMENTS
VIEWING PLATFORM (VP)

FILE No.	DRAWING	PRINTED DATE	SHEET No.
16_07	DWG_LD_402	23/05/2017	09

REGISTRATION NUMBER
KIS-1607-DWG-LD-402



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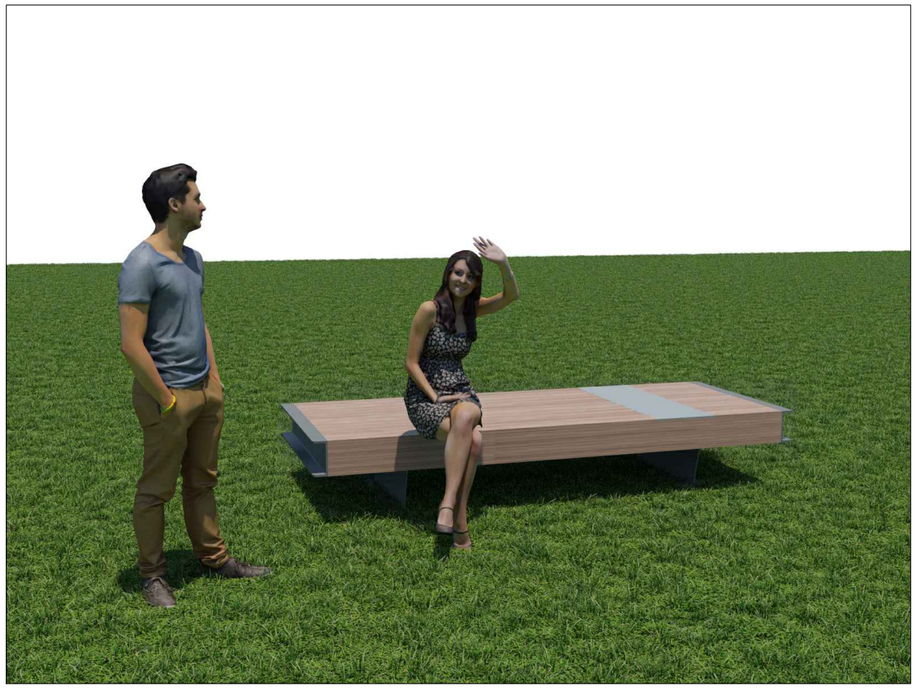

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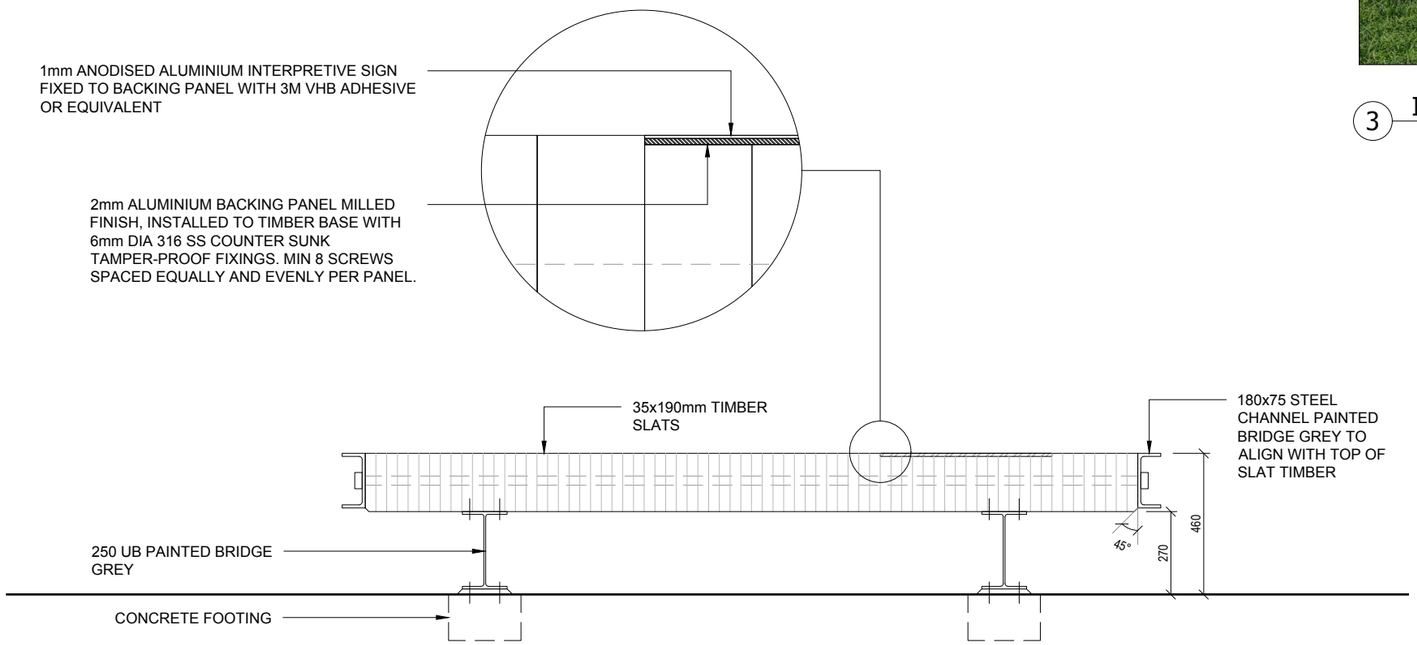

A SECTION
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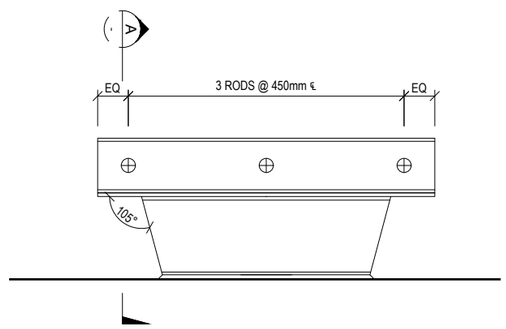

2 ELEVATION
Scale: 1:20

NOTES

1. ALIGN SIGNAGE WITH TIMBER SLATS.
2. TOLERANCES TO BE COORDINATED BETWEEN SIGNAGE MAKER AND FURNITURE MAKER.
3. ALL SIGN DIMENSIONS TO BE MEASURED ON SITE PRIOR TO MANUFACTURE AND INSTALL.

No.	Amendment Description	Initials	Date
02	100% DOCUMENTATION	MMG	23/05/2017
01	FOR INFORMATION	MMG	2/03/2017

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SCALES
0 400 800mm
1 : 20

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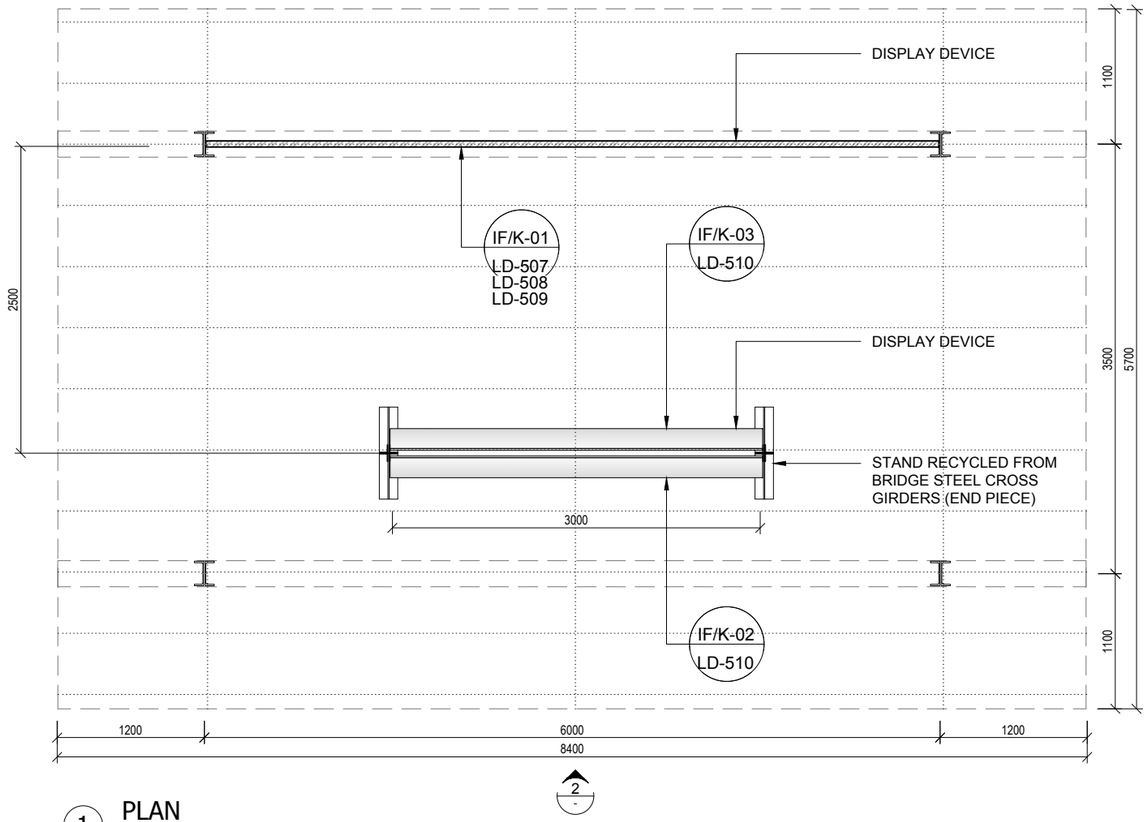
DESIGNED. MW/MMG
REVIEWED. JVG

ROADS AND MARITIME SERVICES
BARHAM-KOONDROOK BRIDGE
LANDSCAPE DESIGN & HERITAGE INTERPRETATION
HERITAGE INTERPRETATION ELEMENTS
BENCH SEAT (BS)

FILE No.	DRAWING	PRINTED DATE	SHEET No.
16_07	DWG_LD_403	23/05/2017	10

REGISTRATION NUMBER
KIS-1607-DWG-LD-403



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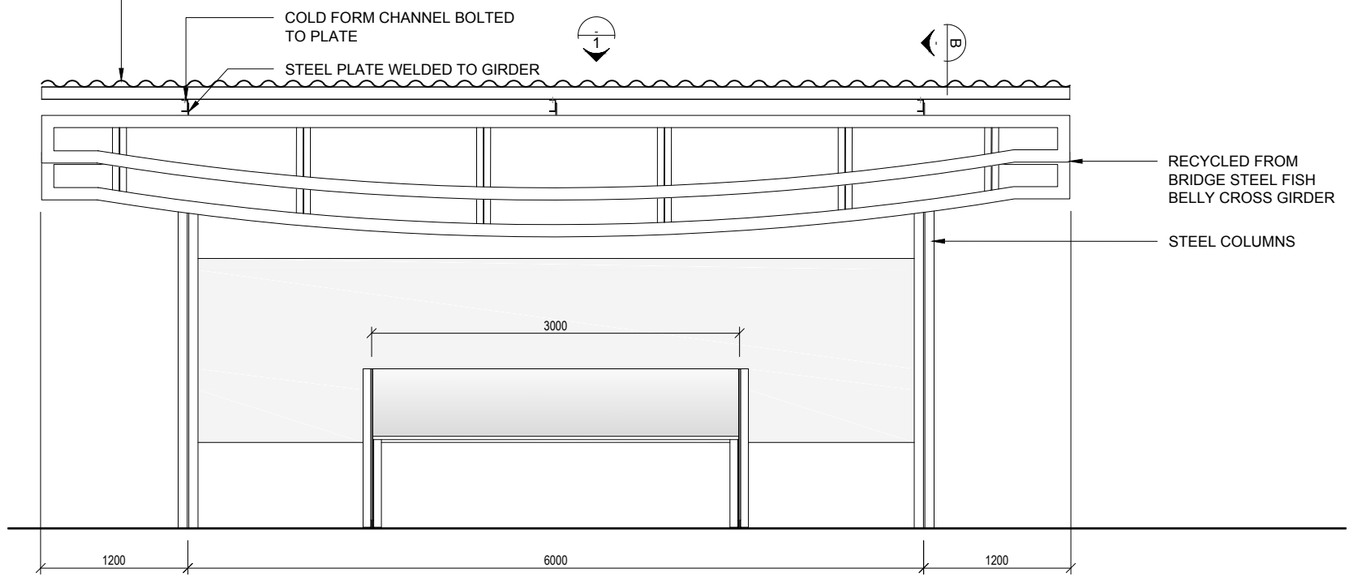

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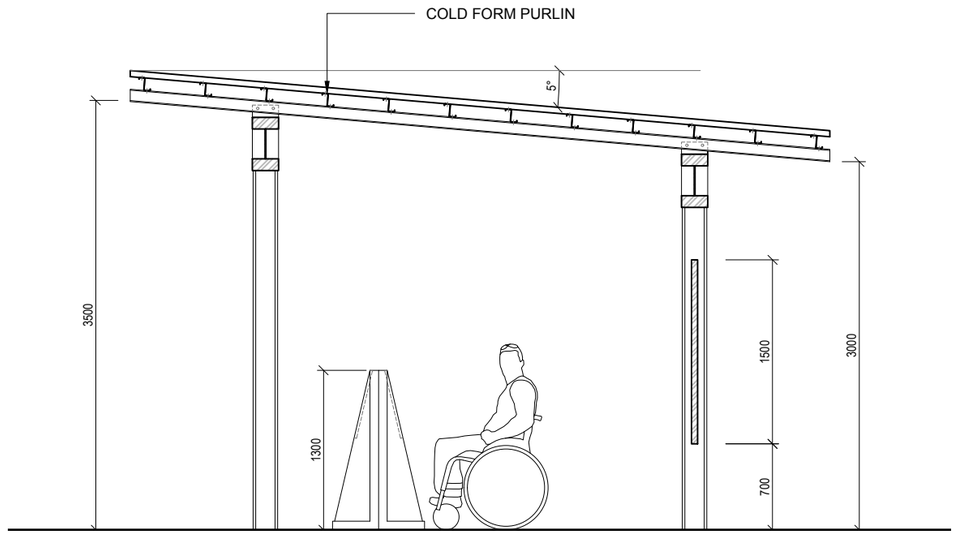

B SECTION
Scale: 1:50

No.	Amendment Description	Initials	Date
02	100% DOCUMENTATION	MMG	23/05/2017
01	FOR INFORMATION	MMG	2/03/2017

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SCALES
0 1 2m
1 : 50

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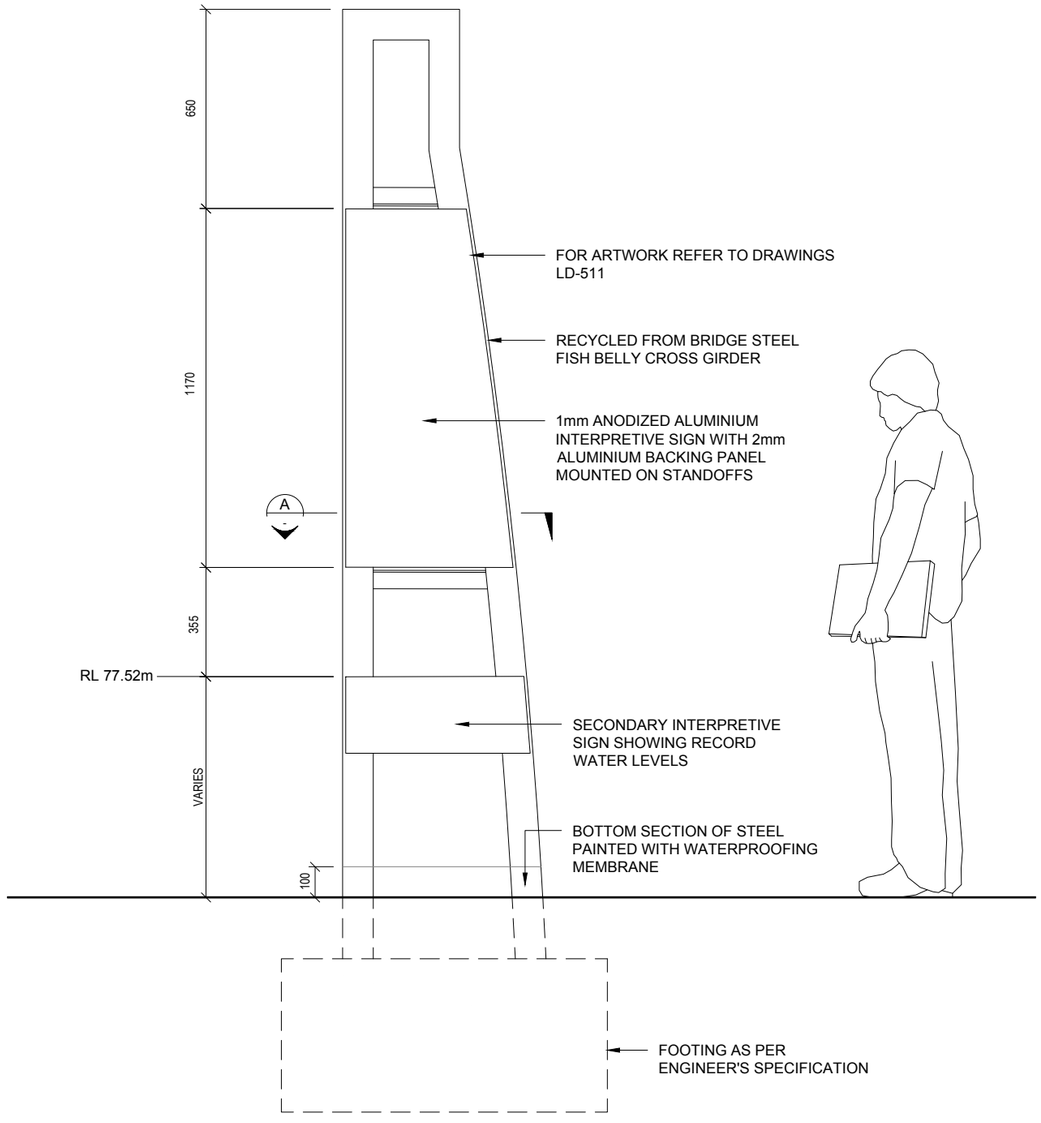
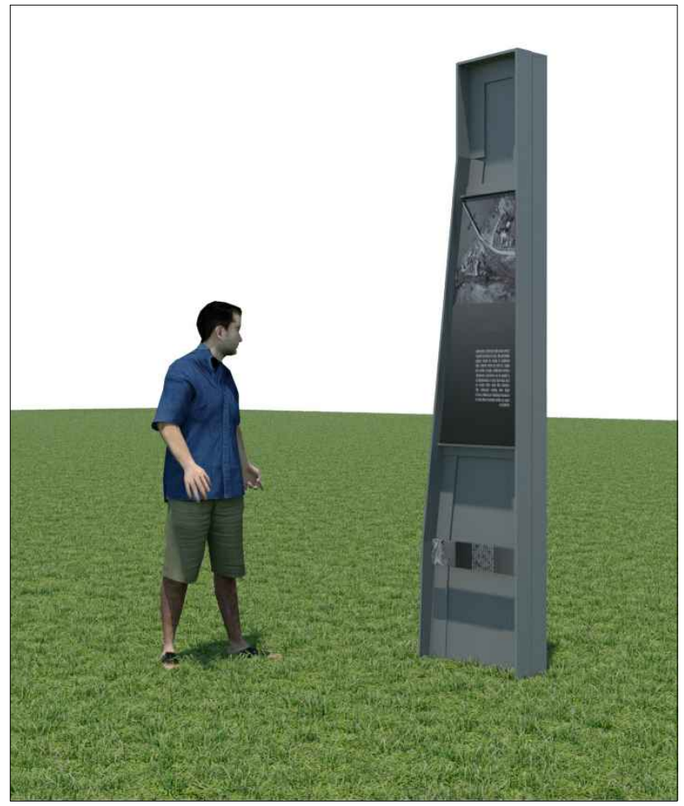
DESIGNED. MW/MMG
REVIEWED. JVG

ROADS AND MARITIME SERVICES
BARHAM-KOONDROOK BRIDGE
LANDSCAPE DESIGN & HERITAGE INTERPRETATION
HERITAGE INTERPRETATION ELEMENTS
INFORMATION SHELTER (IF)

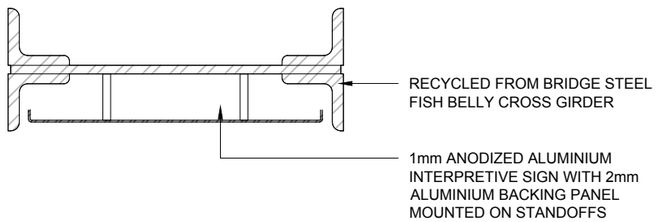
FILE No. 16_07
DRAWING DWG_LD_404
PRINTED DATE 23/05/2017
REGISTRATION NUMBER KIS-1607-DWG-LD-404
SHEET No. 11



1 ELEVATION
Scale: 1:20



2 INDICATIVE 3D
Not to Scale



A SECTION
Scale: 1:10

NOTES
1. ALL FIXINGS TO BE TAMPER PROOF

No.	Amendment Description	Initials	Date
02	100% DOCUMENTATION	MMG	23/05/2017
01	FOR INFORMATION	MMG	2/03/2017

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SCALES
0 400 800mm
1 : 20

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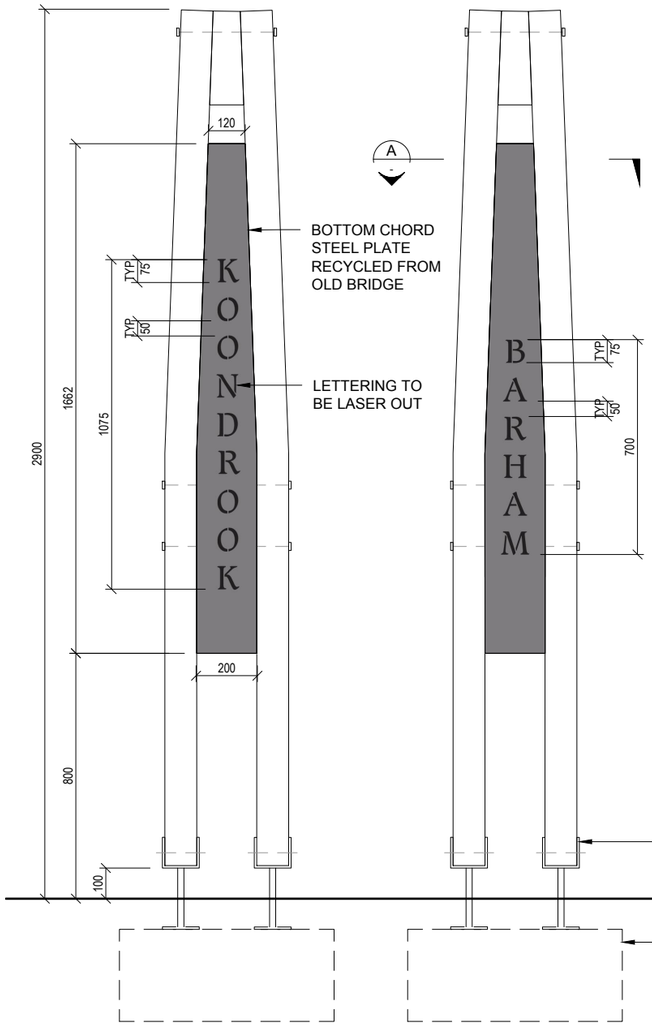
DESIGNED. MW/MMG
REVIEWED. JVG

ROADS AND MARITIME SERVICES
BARHAM-KOONDROOK BRIDGE
LANDSCAPE DESIGN & HERITAGE INTERPRETATION
HERITAGE INTERPRETATION ELEMENTS
FLOOD MARKER (FM)

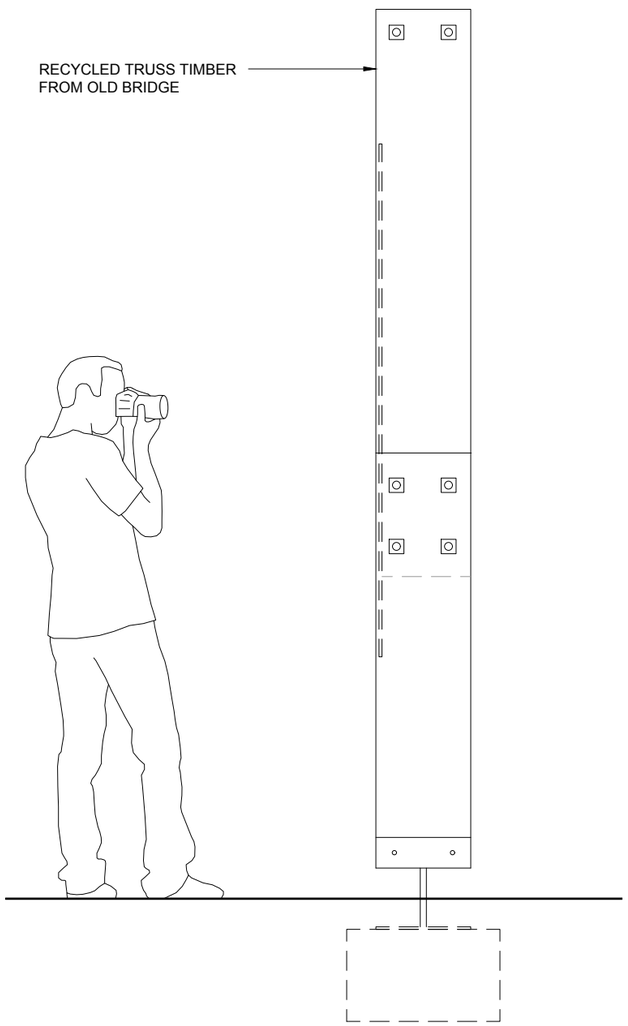
FILE No.	DRAWING	PRINTED DATE	SHEET No.
16_07	DWG_LD_405	23/05/2017	12

REGISTRATION NUMBER
KIS-1607-DWG-LD-405

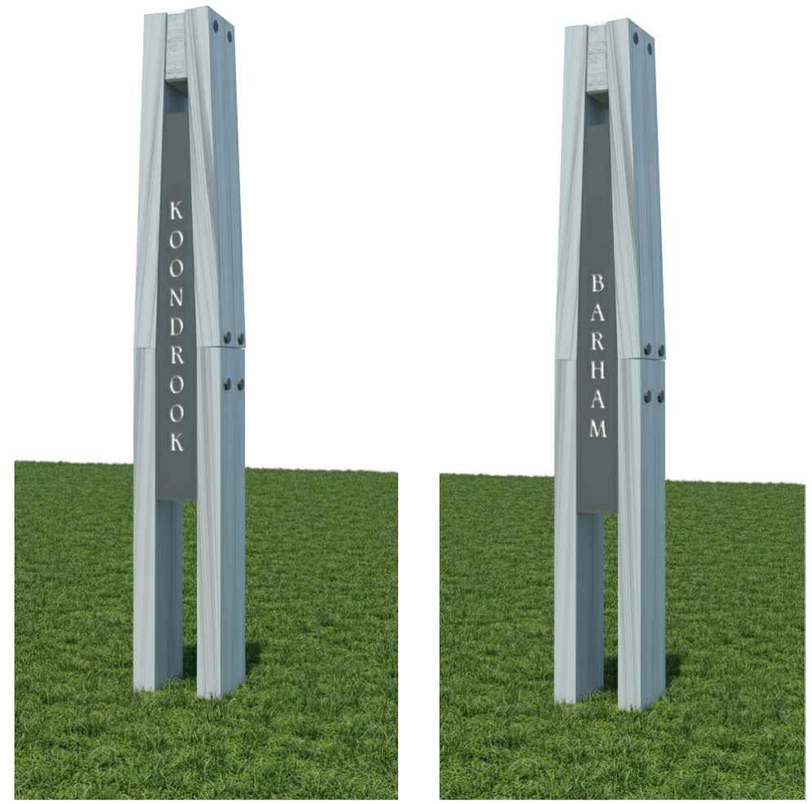


TM/K-01 LD-102 ELEVATION
Scale: 1:20

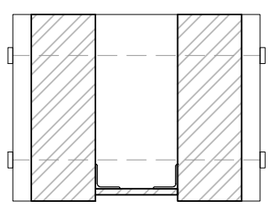
TM/B-01 LD-101 ELEVATION
Scale: 1:20



2 ELEVATION
Scale: 1:20



3 INDICATIVE 3D
Not to Scale



A SECTION
Scale: 1:10

NOTES

1. MINIMUM WIDTH OF STEEL FOR STENCIL CUT OUT TO BE CONFIRMED / REVIEWED BY CONTRACTORS / RMS.

No.	Amendment Description	Initials	Date
02	100% DOCUMENTATION	MMG	23/05/2017
01	FOR INFORMATION	MMG	2/03/2017

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SCALES
0 400 800mm
1 : 20

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DESIGNED. MW/MMG
REVIEWED. JVG

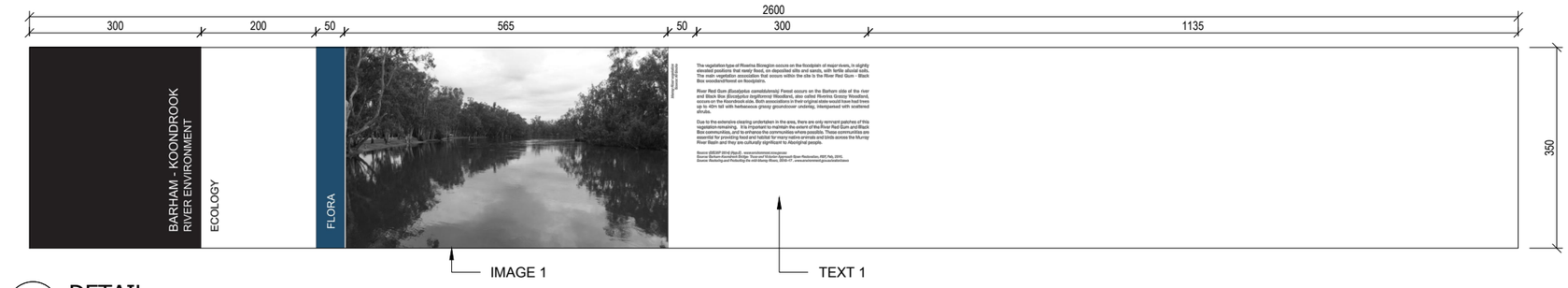
ROADS AND MARITIME SERVICES

BARHAM-KOONDROOK BRIDGE
LANDSCAPE DESIGN & HERITAGE INTERPRETATION
HERITAGE INTERPRETATION ELEMENTS
TOWN MARKER (TM)

FILE No.	DRAWING	PRINTED DATE	SHEET No.
16_07	DWG_LD_406	23/05/2017	13

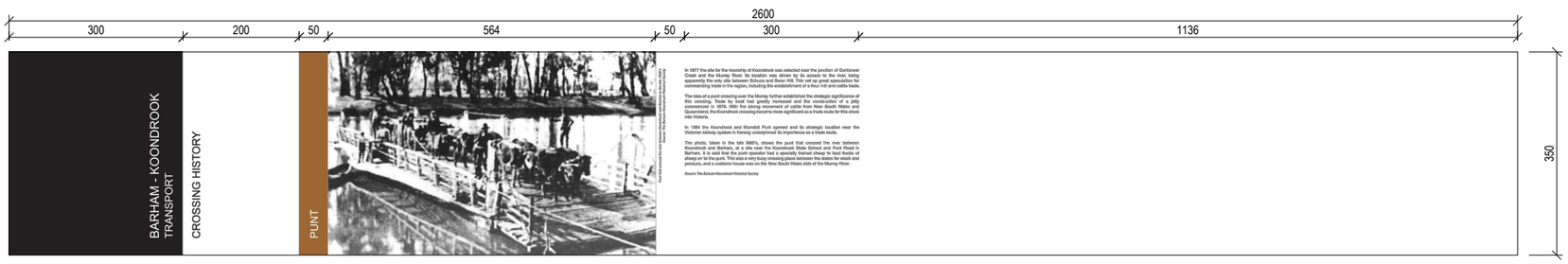
REGISTRATION NUMBER
KIS-1607-DWG-LD-406

ITEM	LOCATION	THEME	IMAGE 1	TEXT 1
PT/ B - 01	BARHAM	RIVER ENVIRONMENT ECOLOGY / FLORA	 *Murray River vegetation* *Source: KI Studio*	The vegetation type of Riverina Bioregion occurs on the floodplain of major rivers, in slightly elevated positions that rarely flood, on deposited silts and sands, with fertile alluvial soils. The main vegetation association that occurs within the site is the River Red Gum - Black Box woodland/forest on floodplains. River Red Gum *(Eucalyptus camaldulensis)* Forest occurs on the Barham side of the river and Black Box *(Eucalyptus largiflorens)* Woodland, also called Riverina Grassy Woodland, occurs on the Koondrook side. Both associations in their original state would have had trees up to 40m tall with herbaceous grassy groundcover underlay, interspersed with scattered shrubs. Due to the extensive clearing undertaken in the area, there are only remnant patches of this vegetation remaining. It is important to maintain the extent of the River Red Gum and Black Box communities, and to enhance the communities where possible. These communities are essential for providing food and habitat for many native animals and birds across the Murray River Basin and they are culturally significant to Aboriginal people. *Source: (DELWP 2014) (App.E) . www.environment.nsw.gov.au* *Source: Barham-Koondrook Bridge- Truss and Victorian Approach Span Restoration, REF, Feb, 2016.* *Source: Restoring and Protecting the mid-Murray Rivers, 2016–17 . www.environment.gov.au/water/cewo*



PT/B-01 LD-101 **DETAIL**
Scale: 1:10

ITEM	LOCATION	THEME	IMAGE 1	TEXT 1
PT/ B - 02	BARHAM	TRANSPORT CROSSING HISTORY / PUNT	 *Punt that crossed the river between Koondrook and Barham in the late 1880's.* *Source: The Barham-Koondrook Historical Society*	In 1877 the site for the township of Koondrook was selected near the junction of Gunbower Creek and the Murray River. Its location was driven by its access to the river, being apparently the only site between Echuca and Swan Hill. This set up great speculation for commanding trade in the region, including the establishment of a flour mill and cattle trade. The idea of a punt crossing over the Murray further established the strategic significance of this crossing. Trade by boat had greatly increased and the construction of a jetty commenced in 1878. With the strong movement of cattle from New South Wales and Queensland, the Koondrook crossing became more significant as a trade route for this stock into Victoria. In 1884 the Koondrook and Murrabit Punt opened and its strategic location near the Victorian railway system in Kerang underpinned its importance as a trade route. The photo, taken in the late I880's, shows the punt that crossed the river between Koondrook and Barham, at a site near the Koondrook State School and Punt Road in Barham. It is said that the punt operator had a specially trained sheep to lead flocks of sheep on to the punt. This was a very busy crossing place between the states for stock and produce, and a customs house was on the New South Wales side of the Murray River. *Source: The Barham-Koondrook Historical Society*



PT/B-02 LD-101 **DETAIL**
Scale: 1:10

NOTES
1. TO BE INSTALLED ON PICNIC TABLE AS DETAILED IN LD-401

No.	Amendment Description	Initials	Date
02	100% DOCUMENTATION	MMG	23/05/2017
01	FOR INFORMATION	MMG	2/03/2017

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SCALES
0 200 400mm
1 : 10

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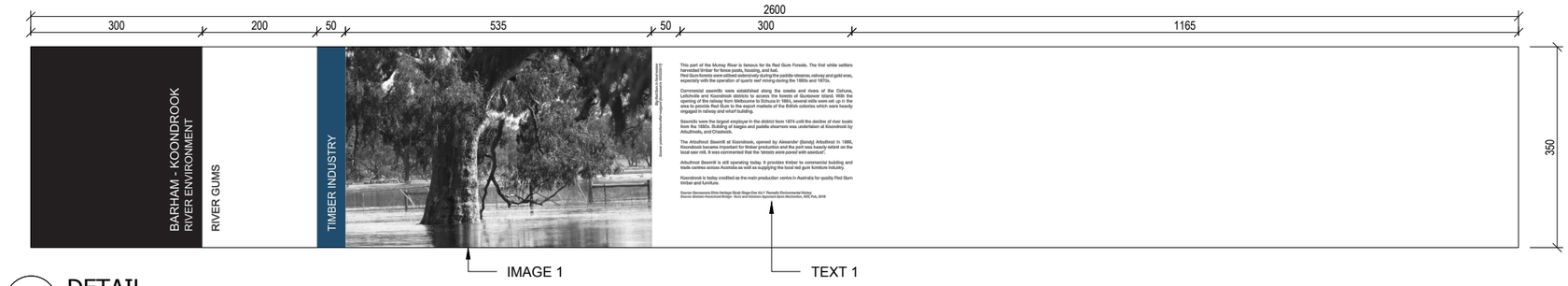
DESIGNED. MW/MMG
REVIEWED. JVG

ROADS AND MARITIME SERVICES
BARHAM-KOONDROOK BRIDGE
LANDSCAPE DESIGN & HERITAGE INTERPRETATION
HERITAGE INTERPRETATION DETAILS
PICNIC TABLE ARTWORK I

FILE No.	DRAWING	PRINTED DATE	SHEET No.
16_07	DWG_LD_501	23/05/2017	15

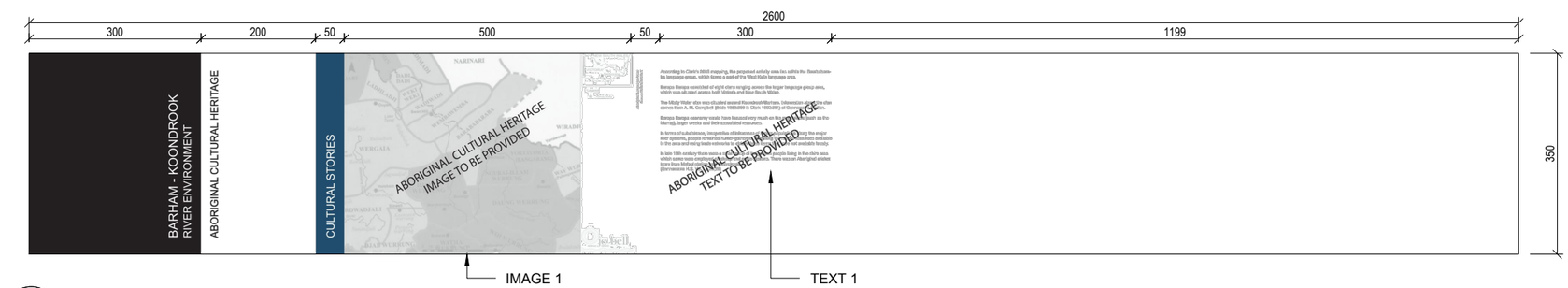
REGISTRATION NUMBER
KIS-1607-DWG-LD-501

ITEM	LOCATION	THEME	IMAGE 1	TEXT 1
PT/ K - 01	KOONDROOK	RIVER ENVIRONMENT RIVER GUMS TIMBER INDUSTRY	 *Big Red Gum in flood waters* *Source: youtum.tv/love-affair-redgum/ [Accessed in 12/05/2017]*	This part of the Murray River is famous for its Red Gum Forests. The first white settlers harvested timber for fence posts, housing, and fuel. Red Gum forests were utilised extensively during the paddle-steamer, railway and gold eras, especially with the operation of quartz reef mining during the 1860s and 1870s. Commercial sawmills were established along the creeks and rivers of the Cohuna, Leitchville and Koondrook districts to access the forests of Gunbower Island. With the opening of the railway from Melbourne to Echuca in 1864, several mills were set up in the area to provide Red Gum to the export markets of the British colonies which were heavily engaged in railway and wharf building. Sawmills were the largest employer in the district from 1874 until the decline of river boats from the 1890s. Building of barges and paddle steamers was undertaken at Koondrook by Arbuthnots, and Chadwick. The Arbuthnot Sawmill at Koondrook, opened by Alexander (Sandy) Arbuthnot in 1889, Koondrook became important for timber production and the port was heavily reliant on the local saw mill. It was commented that the *'streets were paved with sawdust'*. Arbuthnot Sawmill is still operating today. It provides timber to commercial building and trade centres across Australia as well as supplying the local red gum furniture industry. Koondrook is today credited as the main production centre in Australia for quality Red Gum timber and furniture. *Source: Gannawarra Shire Heritage Study Stage One Vol.1 Thematic Environmental History* *Source: Barham-Koondrook Bridge- Truss and Victorian Approach Span Restoration, REF, Feb, 2016.*



PT/K-01 LD-102 **DETAIL**
Scale: 1:10

ITEM	LOCATION	THEME	IMAGE 1	TEXT 1
PT/ K - 02	KOONDROOK	RIVER ENVIRONMENT ABORIGINAL CULTURAL HERITAGE / RELATIONSHIP TO RIVER	 *Aboriginal Language Areas* *Source: XXXXXXXx*	According to Clark's 2005 mapping, the proposed activity area lies within the Barababaraba language group, which forms a part of the West Kulin language area. Barapa Barapa consisted of eight clans ranging across the larger language group area, situated across both Victoria and New South Wales. The Mially Water clan was situated around Koondrook/Barham. Information comes from A. M. Campbell (Bride 1983:350 in Clark 1990:391) of Gannawarra Station. Barapa Barapa economy would have focused very much on rivers (such as the Murray), larger creeks and their associated resources. In terms of subsistence, irrespective of inference, populations along the major river systems, people remained hunter-gatherers, exploiting the natural resources available in the region and using trade networks to obtain those items that were not available locally. In late 19th century there were a small group of Aboriginal people living in the shire area which some were employed on sheep and cattle stations. There was an Aboriginal cricket team from Melool station near Koondrook. (Gannawarra H.S. Vol.1 p.25,26) ABORIGINAL CULTURAL HERITAGE TEXT TO BE PROVIDED



PT/K-02 LD-102 **DETAIL**
Scale: 1:10

NOTES
1. TO BE INSTALLED ON PICNIC TABLE AS DETAILED IN LD-401

No.	Amendment Description	Initials	Date
02	100% DOCUMENTATION	MMG	23/05/2017
01	FOR INFORMATION	MMG	2/03/2017

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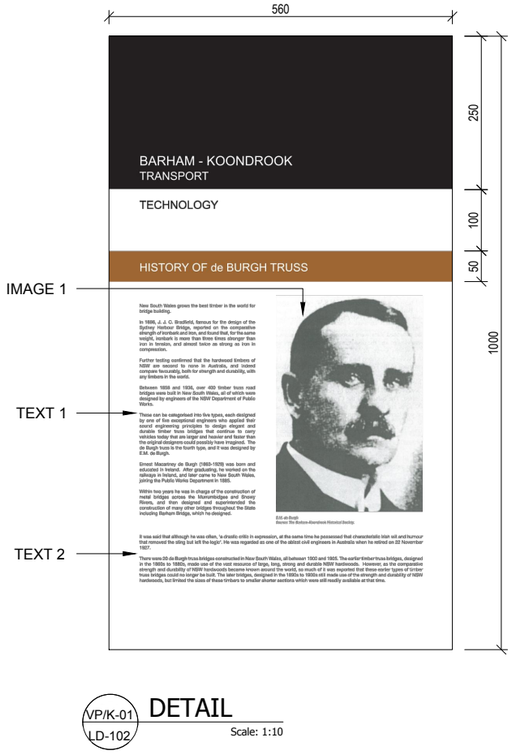
REVIEWED. JVG

ROADS AND MARITIME SERVICES
BARHAM-KOONDROOK BRIDGE
LANDSCAPE DESIGN & HERITAGE INTERPRETATION
HERITAGE INTERPRETATION DETAILS
PICNIC TABLE ARTWORK II

FILE No.	DRAWING	PRINTED DATE	SHEET No.
16_07	DWG_LD_502	23/05/2017	16

REGISTRATION NUMBER
KIS-1607-DWG-LD-502



VP/K-01 LD-102 **DETAIL** Scale: 1:10

ITEM	VP/K-01
LOCATION	KOONDROOK
THEME	TRANSPORT / TECHNOLOGY / HISTORY OF de BURGH TRUSS

IMAGE 1

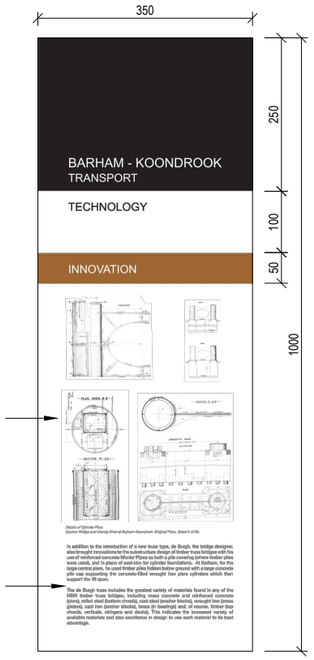
E.M.de Burgh
Source: The Barham-Koondrook Historical Society.

TEXT 1

New South Wales grows the best timber in the world for bridge building.
In 1896, J. J. C. Bradfield, famous for the design of the Sydney Harbour Bridge, reported on the comparative strength of ironbark and iron, and found that, for the same weight, ironbark is more than three times stronger than iron in tension, and almost twice as strong as iron in compression.
Further testing confirmed that the hardwood timbers of NSW are second to none in Australia, and indeed compare favourably, both for strength and durability, with any timbers in the world. Between 1858 and 1936, over 400 timber truss road bridges were built in New South Wales, all of which were designed by engineers of the NSW Department of Public Works.
These can be categorised into five types, each designed by one of five exceptional engineers who applied their sound engineering principles to design elegant and durable timber truss bridges that continue to carry vehicles today that are larger and heavier and faster than the original designers could possibly have imagined. The de Burgh truss is the fourth type, and it was designed by E.M. de Burgh.
Ernest Macartney de Burgh (1863-1929) was born and educated in Ireland. After graduating, he worked on the railways in Ireland, and later came to New South Wales, joining the Public Works Department in 1885.
Within two years he was in charge of the construction of metal bridges across the Murrumbidgee and Snowy Rivers, and then designed and superintended the construction of many other bridges throughout the State including Barham Bridge, which he designed.

TEXT 2

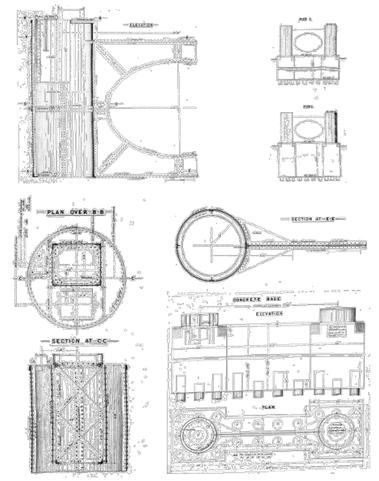
It was said that although he was often, *'a drastic critic in expression, at the same time he possessed that characteristic Irish wit and humour that removed the sting but left the logic'*. He was regarded as one of the ablest civil engineers in Australia when he retired on 22 November 1927.
There were 20 de Burgh truss bridges constructed in New South Wales, all between 1900 and 1905.
The earlier timber truss bridges, designed in the 1860s to 1880s, made use of the vast resource of large, long, strong and durable NSW hardwoods.
However, as the comparative strength and durability of NSW hardwoods became known around the world, so much of it was exported that these earlier types of timber truss bridges could no longer be built.
The later bridges, designed in the 1890s to 1900s still made use of the strength and durability of NSW hardwoods, but limited the sizes of these timbers to smaller shorter sections which were still readily available at that time.



VP/K-02 LD-102 **DETAIL** Scale: 1:10

ITEM	VP/K-02
LOCATION	KOONDROOK
THEME	TRANSPORT / TECHNOLOGY / INNOVATION

IMAGE 1

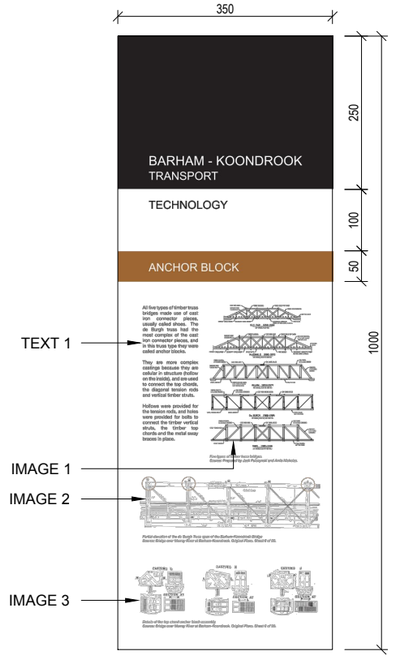


Details of Cylinder Piers
Source: Bridge over Murray River at Barham-Koondrook. Original Plans. Sheet 2 of 20.

TEXT 1

In addition to the introduction of a new truss type, de Burgh, the bridge designer, also brought innovations to the substructure design of timber truss bridges with his use of reinforced concrete Monier Pipes as both a pile covering (where timber piles were used), and in place of cast-iron for cylinder foundations. At Barham, for the large central piers, he used timber piles hidden below ground with a large concrete pile cap supporting the concrete-filled wrought iron piers cylinders which then support the lift span.

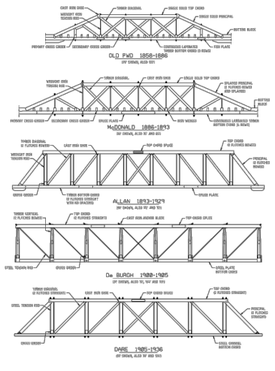
The de Burgh truss includes the greatest variety of materials found in any of the NSW timber truss bridges, including mass concrete and reinforced concrete (piers), rolled steel (bottom chords), cast steel (washer blocks), wrought iron (cross girders), cast iron (anchor blocks), brass (in bearings) and, of course, timber (top chords, verticals, stringers and decks). This indicates the increased variety of available materials and also excellence in design to use each material to its best advantage.



VP/K-03 LD-102 **DETAIL** Scale: 1:10

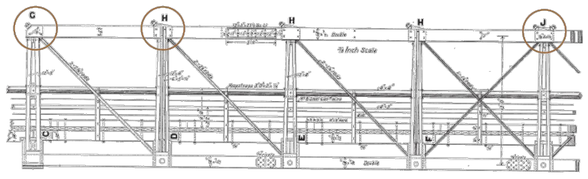
ITEM	VP/K-03
LOCATION	KOONDROOK
THEME	TRANSPORT / TECHNOLOGY / ANCHOR BLOCK

IMAGE 1



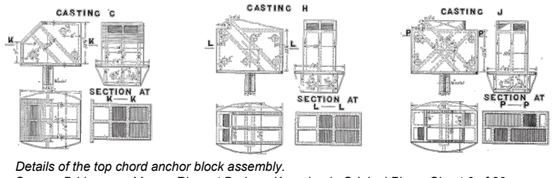
Five types of timber truss bridges.
Source: Prepared by Jack Pulczynski and Amie Nicholas

IMAGE 2



Partial elevation of the de Burgh Truss span of the Barham-Koondrook Bridge
Source: Bridge over Murray River at Barham-Koondrook. Original Plans. Sheet 6 of 20.

IMAGE 3



Details of the top chord anchor block assembly.
Source: Bridge over Murray River at Barham-Koondrook. Original Plans. Sheet 6 of 20.

TEXT 1

All five types of timber truss bridges made use of cast iron connector pieces, usually called shoes. The de Burgh truss had the most complex of the cast iron connector pieces, and in this truss type they were called anchor blocks.
They are more complex castings because they are cellular in structure (hollow on the inside), and are used to connect the top chords, the diagonal tension rods and vertical timber struts.
Hollows were provided for the tension rods, and holes were provided for bolts to connect the timber vertical struts, the timber top chords and the metal sway braces in place.

NOTES
1. TO BE INSTALLED ON VIEWING PLATFORM AS DETAILED IN LD-402

No.	Amendment Description	Initials	Date
02	100% DOCUMENTATION	MMG	23/05/2017
01	FOR INFORMATION	MMG	2/03/2017

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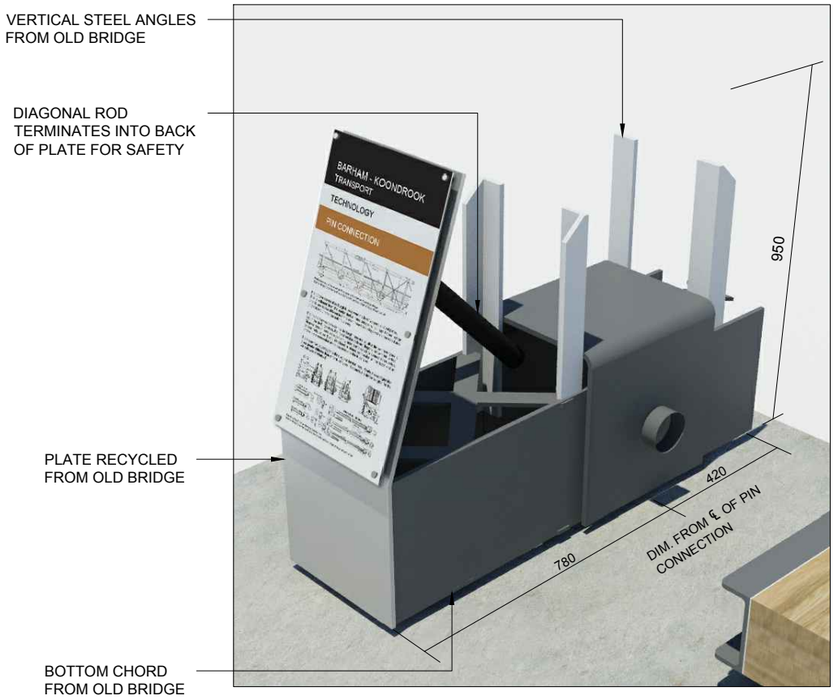
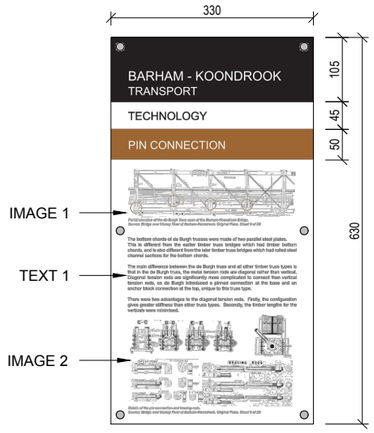
ROADS AND MARITIME SERVICES
BARHAM-KOONDROOK BRIDGE
LANDSCAPE DESIGN & HERITAGE INTERPRETATION
HERITAGE INTERPRETATION DETAILS
VIEWING PLATFORM ARTWORK I

FILE No.	DRAWING	PRINTED DATE	SHEET No.
16_07	DWG_LD_503	23/05/2017	17

REGISTRATION NUMBER
KIS-1607-DWG-LD-503





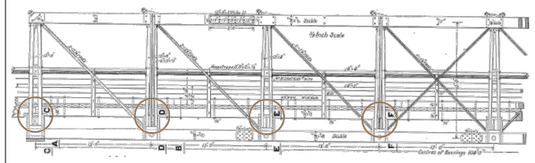
VP/K-04
LD-102

DETAIL

Scale: 1:10

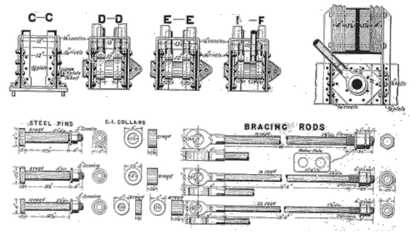
	ITEM	VP/K-04
	LOCATION	KOONDROOK
	THEME	TRANSPORT / TECHNOLOGY / PIN CONNECTION

IMAGE 1



Partial elevation of the de Burgh Truss span of the Barham-Koondrook Bridge.
Source: Bridge over Murray River at Barham-Koondrook. Original Plans. Sheet 6 of 20

IMAGE 2



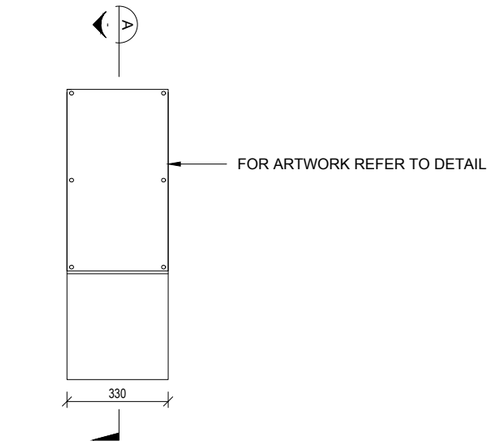
Details of the pin connection and bracing rods.
Source: Bridge over Murray River at Barham-Koondrook. Original Plans. Sheet 6 of 20

TEXT 1

The bottom chords of de Burgh trusses were made of two parallel steel plates. This is different from the earlier timber truss bridges which had timber bottom chords, and is also different from the later timber truss bridges which had rolled steel channel sections for the bottom chords.

The main difference between the de Burgh truss and all other timber truss types is that in the de Burgh truss, the metal tension rods are diagonal rather than vertical. Diagonal tension rods are significantly more complicated to connect than vertical tension rods, so de Burgh introduced a pinned connection at the base and an anchor block connection at the top, unique to this truss type.

There were two advantages to the diagonal tension rods. Firstly, the configuration gives greater stiffness than other truss types. Secondly, the timber lengths for the verticals were minimised.



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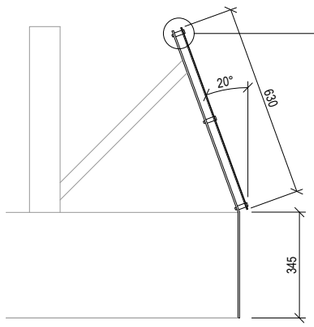

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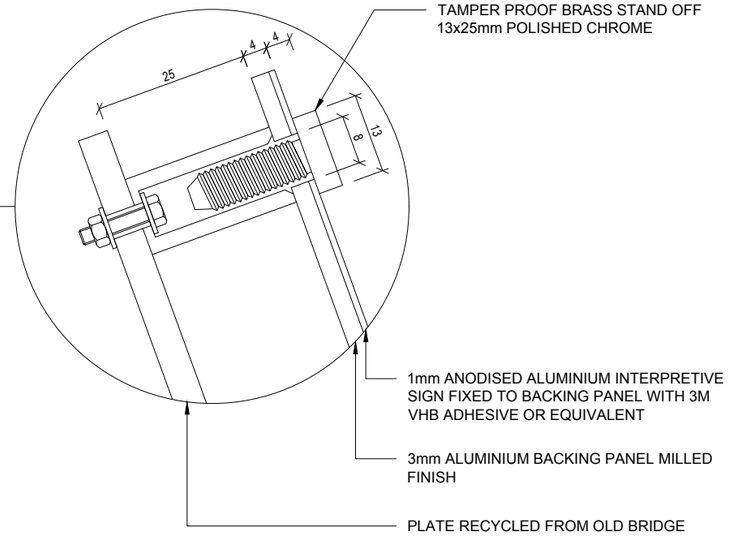

NOTES

1. TO BE INSTALLED ON VIEWING PLATFORM AS DETAILED IN LD-402
2. ALL EDGES TO BE ROUNDED OFF

No.	Amendment Description	Initials	Date
02	100% DOCUMENTATION	MMG	23/05/2017
01	FOR INFORMATION	MMG	2/03/2017

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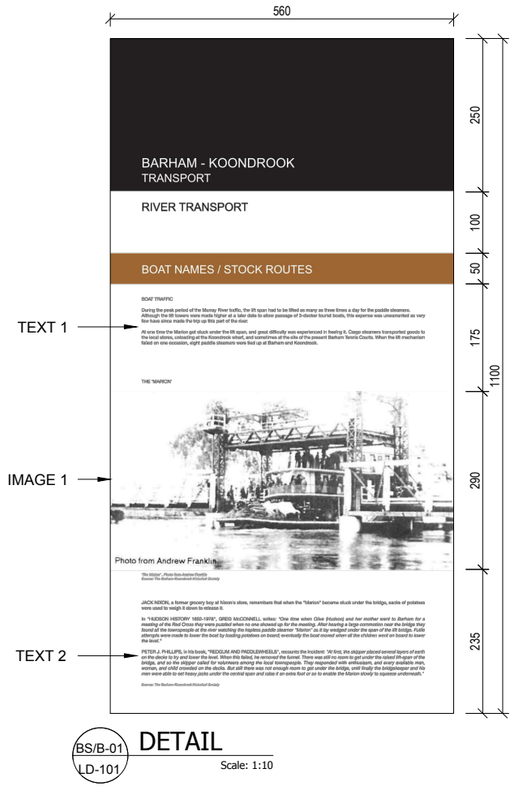
REVIEWED. JVG

ROADS AND MARITIME SERVICES

BARHAM-KOONDROOK BRIDGE
LANDSCAPE DESIGN & HERITAGE INTERPRETATION
HERITAGE INTERPRETATION DETAILS
VIEWING PLATFORM ARTWORK II

FILE No.	DRAWING	PRINTED DATE	SHEET No.
16_07	DWG_LD_504	23/05/2017	18

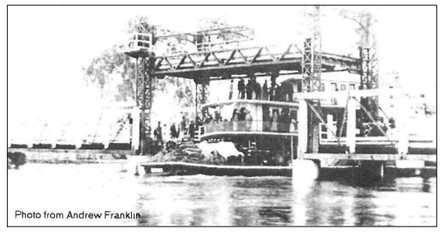
REGISTRATION NUMBER
KIS-1607-DWG-LD-504



BS/B-01 LD-101 **DETAIL**
Scale: 1:10

ITEM	BS/B-01
LOCATION	BARHAM
THEME	TRANSPORT / RIVER TRANSPORT / BOAT NAMES / STOCK ROUTES

IMAGE 1



'The Marion' . Photo from Andrew Franklin
Source: The Barham-Koondrook Historical Society

TEXT 1

BOAT TRAFFIC

During the peak period of the Murray River traffic, the lift span had to be lifted as many as three times a day for the paddle steamers.
Although the lift towers were made higher at a later date to allow passage of 3-decker tourist boats, this expense was unwarranted as very few have since made the trip up this part of the river.

At one time the Marion got stuck under the lift span, and great difficulty was experienced in freeing it. Cargo steamers transported goods to the local stores, unloading at the Koondrook wharf, and sometimes at the site of the present Barham Tennis Courts. When the lift mechanism failed on one occasion, eight paddle steamers were tied up at Barham and Koondrook.

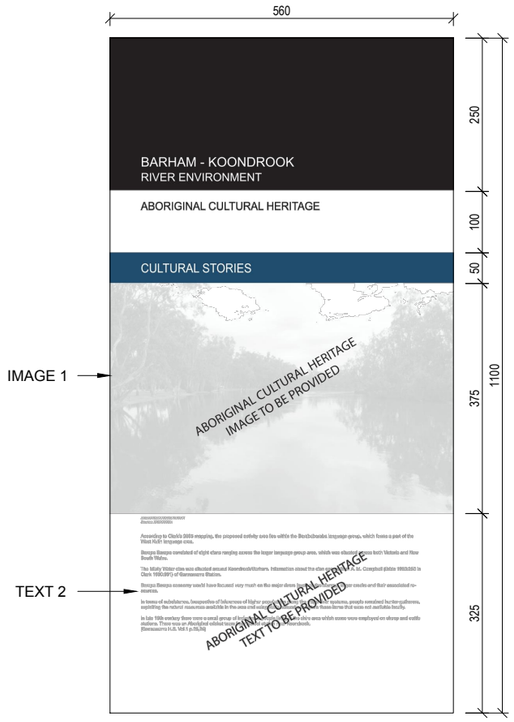
TEXT 2

JACK NIXON, a former grocery boy at Nixon's store, remembers that when the "Marion" became stuck under the bridge, sacks of potatoes were used to weigh it down to release it.

In "HUDSON HISTORY 1852-1978", GREG McCONNELL writes: *"One time when Olive (Hudson) and her mother went to Barham for a meeting of the Red Cross they were puzzled when no one showed up for the meeting. After hearing a large commotion near the bridge they found all the townspeople at the river watching the hapless paddle steamer "Marion" as it lay wedged under the span of the lift bridge. Futile attempts were made to lower the boat by loading potatoes on board; eventually the boat moved when all the children went on board to lower the level."*

PETER J. PHILLIPS, in his book, "REDGUM AND PADDLEWHEELS", recounts the incident: *"At first, the skipper placed several layers of earth on the decks to try and lower the level. When this failed, he removed the funnel. There was still no room to get under the raised lift-span of the bridge, and so the skipper called for volunteers among the local townspeople. They responded with enthusiasm, and every available man, woman, and child crowded on the decks. But still there was not enough room to get under the bridge, until finally the bridgekeeper and his men were able to set heavy jacks under the central span and raise it an extra foot or so to enable the Marion slowly to squeeze underneath."*

Source: The Barham-Koondrook Historical Society



BS/B-02 LD-101 **DETAIL**
Scale: 1:10

ITEM	BS/B-02
LOCATION	BARHAM
THEME	RIVER ENVIRONMENT / ABORIGINAL CULTURAL HERITAGE / WATER TRIBE

IMAGE 1

XXXXXXXx
Source: XXXXXXXx

TEXT 1

According to Clark's 2005 mapping, the proposed activity area lies within the Barababaraba language group, which forms a part of the West Kulin language area.

Barapa Barapa consisted of eight clans ranging across the larger language group area, which was situated across both Victoria and New South Wales.

The Mially Water clan was situated around Koondrook/Barham. Information about the clan comes from A. M. G... ...le 1983:350 in Clark 1990:391) of Gannawarra Station.

Barapa Barapa economy would have focused very much on the major rivers (such as the Murray), for... ...d their associated resources.

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In late 19th century there were a small group of indigenous people living in th... ...ch some were employed on sheep and cattle stations. There was an Aboriginal cricket team from Melool station near Koondrook.
(Gannawarra H.S. Vol.1 p.25,26)

ABORIGINAL CULTURAL HERITAGE
TEXT TO BE PROVIDED

NOTES
1. TO BE INSTALLED ON BENCH SEAT AS DETAILED IN LD-403

No.	Amendment Description	Initials	Date
02	100% DOCUMENTATION	MMG	23/05/2017
01	FOR INFORMATION	MMG	2/03/2017

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ROADS AND MARITIME SERVICES
BARHAM-KOONDROOK BRIDGE
LANDSCAPE DESIGN & HERITAGE INTERPRETATION
HERITAGE INTERPRETATION DETAILS
BENCH SEAT ARTWORK I

FILE No.	DRAWING	PRINTED DATE	SHEET No.
16_07	DWG_LD_505	23/05/2017	19

REGISTRATION NUMBER
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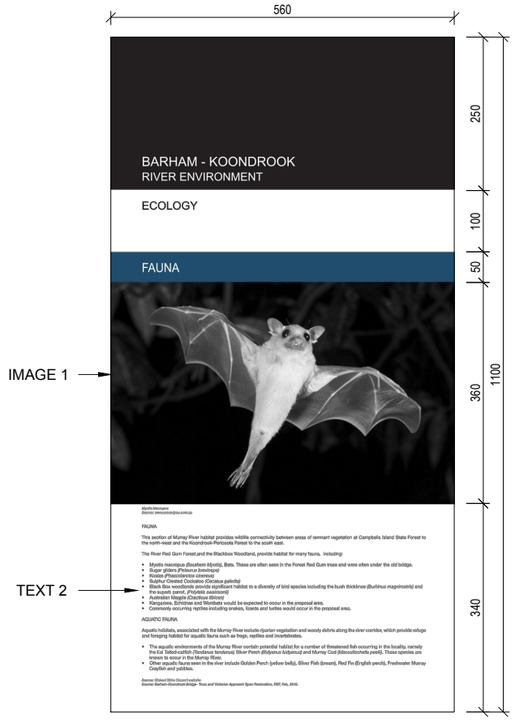

BS/K-01
LD-102

DETAIL

Scale: 1:10

ITEM	BS/K-01
LOCATION	KOONDROOK
THEME	RIVER ENVIRONMENT / ECOLOGY / FAUNA

IMAGE 1

Myotis Macropus
source: www.aroundyou.com.au

TEXT 1

FAUNA

This section of Murray River habitat provides wildlife connectivity between areas of remnant vegetation at Campbells Island State Forest to the north-west and the Koondrook-Pericoota Forest to the south east.

The River Red Gum Forest,and the Blackbox Woodland, provide habitat for many fauna, including:

- Myotis macropus *(Southern Myotis)*, Bats. These are often seen in the Forest Red Gum trees and were often under the old bridge.
- Sugar gliders *(Petaurus breviceps)*
- Koalas *(Phascolarctos cinereus)*
- Sulphur Crested Cockatoo *(Cacatua galerita)*
- Black Box woodlands provide significant habitat to a diversity of bird species including the bush thickknee *(Burhinus magnirostris)* and the superb parrot, *(Polytelis swainsonii)*
- Australian Magpie *(Cracticus tibicen)*
- Kangaroos, Echidnas and Wombats would be expected to occur in the proposal area.
- Commonly occurring reptiles including snakes, lizards and turtles would occur in the proposal area.

AQUATIC FAUNA

Aquatic habitats, associated with the Murray River include riparian vegetation and woody debris along the river corridor, which provide refuge and foraging habitat for aquatic fauna such as frogs, reptiles and invertebrates.

- The aquatic environments of the Murray River contain potential habitat for a number of threatened fish occurring in the locality, namely the Eel Tailed-catfish *(Tandanus tandanus)* Silver Perch *(Bidyanus bidyanus)* and Murray Cod *(Maccullochella peelii)*. These species are known to occur in the Murray River.
- Other aquatic fauna seen in the river include Golden Perch *(yellow belly)*, Silver Fish *(bream)*, Red Fin *(English perch)*, Freshwater Murray Crayfish and yabbies.

Source: Wakool Shire Council website
Source: Barham-Koondrook Bridge- Truss and Victorian Approach Span Restoration, REF, Feb, 2016.

NOTES
1. TO BE INSTALLED ON BENCH SEAT AS DETAILED IN LD-403

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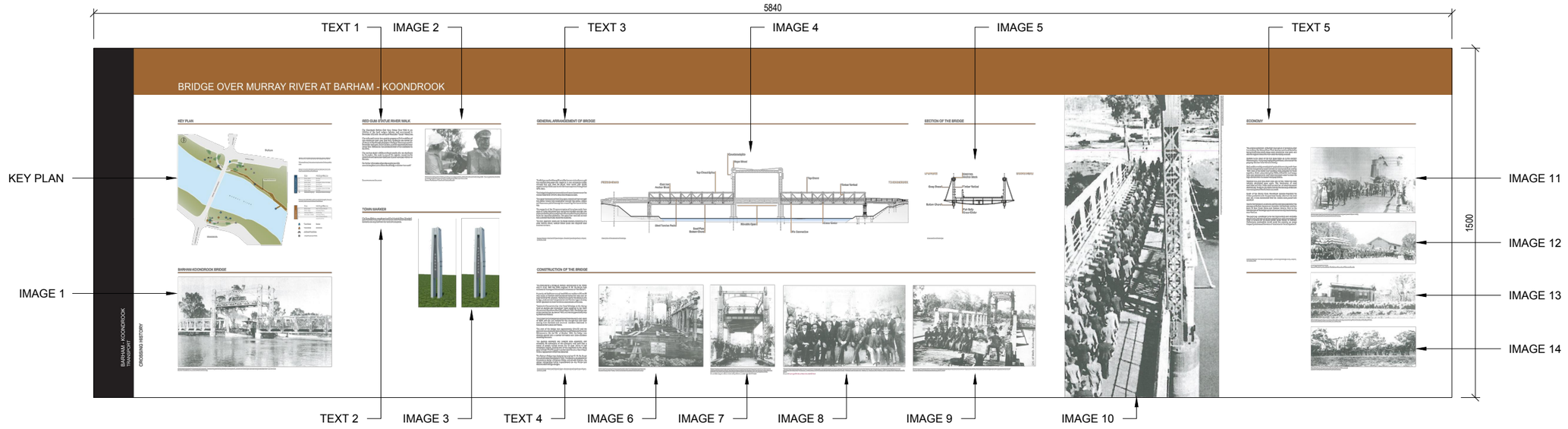
ROADS AND MARITIME SERVICES

BARHAM-KOONDROOK BRIDGE
LANDSCAPE DESIGN & HERITAGE INTERPRETATION
HERITAGE INTERPRETATION DETAILS
BENCH SEAT ARTWORK II

FILE No.	DRAWING	PRINTED DATE	SHEET No.
16_07	DWG_LD_506	23/05/2017	20

REGISTRATION NUMBER
KIS-1607-DWG-LD-506



IF/K-01
LD-102

DETAIL

Scale: 1:20

ITEM	IF/K-01
LOCATION	KOONDROOK
THEME	TRANSPORT / CROSSING HISTORY

IMAGE 1

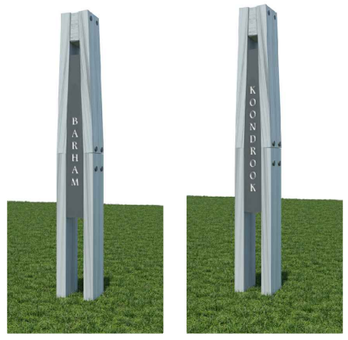
BARHAM - KOONDROOK BRIDGE

Photograph supplied by Raymond Hollingsworth. It shows his grandfather, Llewellyn Hollingsworth, at work on the bridge. Lew was bridge caretaker from 1912 to 1928.
Source: The Barham-Koondrook Historical Society

IMAGE 2

Chainsaw sculptor, Kevin Gilders, working on a redgum statue of Sir John Monash in October, 2003. The completed work will be unveiled at the centenary celebrations in Barham on October 10th, 2004.
Source: The Barham-Koondrook Historical Society

IMAGE 3



TEXT 1

RED GUM STATUE RIVER WALK

The Koondrook Barham Red Gum Statue River Walk is an initiative of the local redgum industry and commenced in November 2002 with the carving of Alexander "Sandy" Arbuthnot.

The walk continues to be a work in progress with the addition of new sculptures each year. Red Gum sculptures are carved by chainsaw at the Koondrook Barham Redgum Showcase event in November each year. Kevin Guilders, a world renowned chainsaw carver from Melbourne, has produced most of the sculptures in the Walk.

The carvings depict wildlife and local people who are significant to the region. The work is one of the region's newest tourist attractions and generates significant interest amongst visitors to the area.

For further information about the sculptures visit:
www.murrayriver.com.au/koondrook/redgum-statue-river-walk/

Source: www.murrayriver.com.au

TEXT 2

TOWN MARKER

The Town Markers use elements of the historic bridge. The steel plate has been recycled from the bottom chord whilst the timber elements are recycled from the vertical truss posts.

NOTES

1. TO BE INSTALLED ON INFORMATION SHELTER AS DETAILED IN LD-404
2. FOR ALL OTHER TEXT & IMAGE REFER TO LD-508 & LD-509

No.	Amendment Description	Initials	Date
02	100% DOCUMENTATION	MMG	23/05/2017
01	FOR INFORMATION	MMG	2/03/2017

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SCALES
0 400 800mm
1 : 20

Co-ordinate System: MGA Zone 56 | Height Datum: A.H.D.

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ROADS AND MARITIME SERVICES

BARHAM-KOONDROOK BRIDGE
LANDSCAPE DESIGN & HERITAGE INTERPRETATION
HERITAGE INTERPRETATION DETAILS
INFORMATION SHELTER ARTWORK I

FILE No.	DRAWING	PRINTED DATE	SHEET No.
16_07	DWG_LD_507	23/05/2017	21

REGISTRATION NUMBER
KIS-1607-DWG-LD-507

TEXT 3

GENERAL ARRANGEMENT OF BRIDGE

The Bridge over the Murray River at Barham consists of a wrought iron vertical lifting span with length 58 ft. two composite timber, wrought iron and steel De Burgh truss spans with length approximately 104 ft. and two timber beam spans with lengths of 30 ft. each.

The bridge is largely two lanes wide and has a clearance over the normal water level of 49 ft. when the lift span is open.

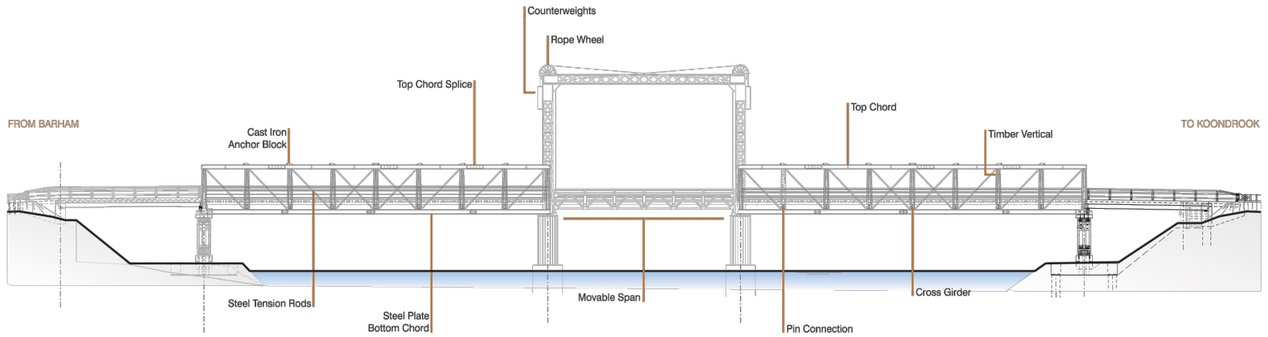
The upper framework of the lifting span consists of four wrought iron lattice towers with longitudinal wrought iron lattice girders and transverse plated truss girder connecting the towers at the top.

The supports of the lift span comprise of two piers made from pairs of tubes fabricated from curved and shaped wrought iron plates riveted together, and joined with cross ties forming elliptical holes for improved aesthetics. The piers then continue as cast iron concrete filled tubes below the waterline.

The two approach spans are De Burgh trusses consisting of a steel bottom chord, vertical timber posts and diagonal steel tension members.

Source: www.murrayriver.com.au

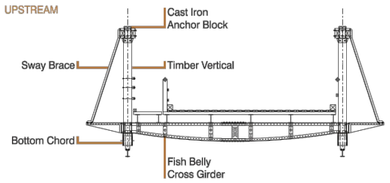
IMAGE 4



Description of the elements of the bridge

IMAGE 5

SECTION OF THE BRIDGE



Cross section of the bridge

TEXT 4

CONSTRUCTION OF THE BRIDGE

The lobbying for a bridge at Barham commenced in the 1890s and in June 1900 the PWD engineer E. M. De Burgh took evidence at Kerang and Koondrook in reference to *"the matter"*.

It was found that there were at least 200 new settlers within a 50 mile radius of Barham and Koondrook hence the area was an ideal outlet for the produce. Furthermore due to the absence of a bridge, produce was transported across the river approximately 90 km upstream at Swan Hill 90 km downstream at Echuca.

Tenders for the construction of a *"steel lift bridge on the Murray River at Barham and Koondrook"* were called for in the NSW Government Gazette on the 10th of March 1902. The Bridge was under construction by June of 1903, with funding provided jointly by NSW and Victoria.

The timber for the bridge was obtained from the north east coast of NSW with the raw material for the wrought iron and steel coming from Scotland and structural members fabricated in Ballarat at the Eureka Iron Works.

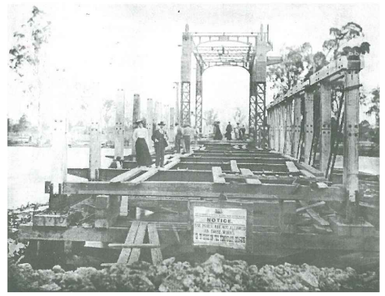
The cost of the bridge was approximately £11,358 and the payment was covered by both the New South Wales and Victorian Governments. On the 8th of October 1904 the bridge was officially opened with a number of Federal and State members attending the event.

The opening ceremony and banquet were apparently well attended; the enthusiasm of the spectators was such that a crowd of people rushed across the lift span before it had completely closed, causing one of the cogwheels in the lifting gear to break. The lifting gear was shut down for a number of days while a replacement wheel was obtained.

The Barham Bridge was designed by engineer E. M. De Burgh with construction completed in 1904. The design is an adoption of his previous design of Cobram Bridge and as with Cobram, the design incorporates further improvements on the Hinton and Murwillumbah Bridge designs.

Source: Volume 1: Vertical Lift Span Bridges - Movable Span Bridge Study - Project, 22/16519, GHD

IMAGE 6



The bridge in course of construction from the New South Wales side of the river.
Source: Kerang New Times, 1904,The Barham-Koondrook Historical Society

IMAGE 7

The photograph above was apparently taken at the same time as the two photos next to it. The original obtained from the Uni.of Melb. Archives is clearly marked "September, 1904" on the back. Taken from the Victorian side of the river, it is interesting to note the absence of development on the Barham side.
Source: Photo by Louis Adams. University of Melbourne Archives, BWP/23843

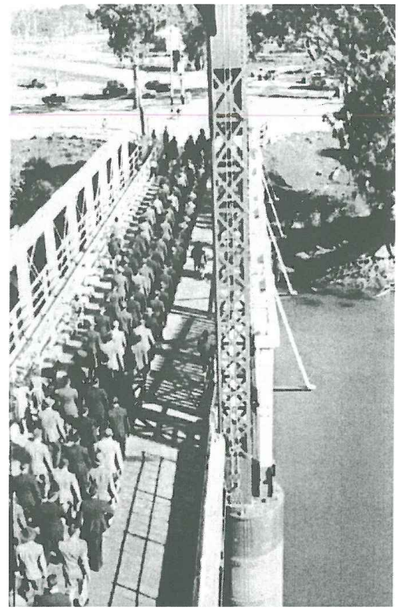
IMAGE 8

The above photograph has been widely circulated in the past as having been taken on opening day. Regrettably, it is not possible to identify all persons in the photos, but it is believed that the front row includes a Mr. Vains, D.W. Williamson, Cr. McLennan, P.J. O'Donnell, Donald McDonald and a Mr. French. The back row includes A.G. Adams, J.J. Cadusch, D.G. Rattray, J.W. Chanter, Martin Peacock and Mr. Reed.
Source: XXXXXXXXXXXXX

IMAGE 9

The above photograph is been recently obtained and was clearly marked on the reverse "September, 1904. It indicates that the bridge was not completed at that time."
Source: University of Melbourne Archives, BWP/23844

IMAGE 10



This photograph was taken by the late Reg Todd and supplied by his grandson, Chris Niblett. Among various occupations, Reg was at times a professional photographer, projectionist and radio repairman.
Source: The Barham-Koondrook Historical Society

TEXT 5

ECONOMY

The original settlement of Barham was typical of numerous other towns along the Murray River. Their development is attributed to being those sites where deep water allowed for river ports and also the regions where the river could be readily crossed.

Barham is the result of the first lease taken up in the western Wakool region. It was acquired by Edward Green, who named the property *'Barham'* after his wife's family.

Early settlers mainly consisted of pastoralists moving north from Victoria that primarily used the land for wool production and by 1850 most of the better river locations were occupied by these squatters. Gold rushes during the 1850s shifted the land usage from wool production to beef cattle farming in order to meet the high demand from increased rural populations.

However this shift was short lived and by the 1860s the wool industry dominated once again. The dominance of wool continued until the 1890s when production of wheat increased dramatically. Finally in July 1893 a site for the township of Barham was surveyed and the first lots were sold.

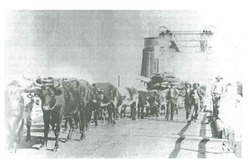
South of the Murray River, Koondrook became important for timber production and the port was heavily reliant on the local saw mill. It was commented that the *'streets were paved with sawdust'*.

Due to the increase in economic activity and local population the passage at Barham became an important link between southern parts of New South Wales and northern Victoria. Prior to the construction of the bridge a punt served as the only local crossing over the river.

The punt was considered to be too inconvenient and unreliable due to its limited operating hours and old age, as it was previously used at Echuca for 30 years before being moved to Barham. Furthermore pastoralists would avoid the crossing as usage frequently decreased the value of stock due to *"knocking about"*.

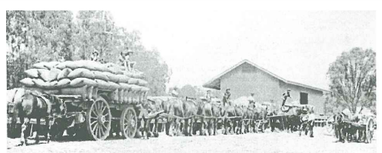
Source: Volume 1: Vertical Lift Span Bridges - Movable Span Bridge Study - Project, 22/16519, GHD

IMAGE 11



Bullock team hauling wheat over the Murray River bridge at Swan Hill (built 1896).
Source: The Barham-Koondrook Historical Society.

IMAGE 12



Loading wheat at Koondrook.
Source: Photo from Don Muller. The Barham-Koondrook Historical Society.

IMAGE 13

A flock of sheep, having crossed over from Koondrook, proceed along Thule Street past the Royal Hotel.
Source: The Barham-Koondrook Historical Society.

IMAGE 14

Heavily laden wool wagons would cross the river at Koondrook
Source: The Barham-Koondrook Historical Society.

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01	FOR INFORMATION	MMG	2/03/2017

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REVIEWED. JVG

ROADS AND MARITIME SERVICES

BARHAM-KOONDROOK BRIDGE
LANDSCAPE DESIGN & HERITAGE INTERPRETATION
HERITAGE INTERPRETATION DETAILS
INFORMATION SHELTER ARTWORK II

FILE No.	DRAWING	PRINTED DATE	SHEET No.
16_07	DWG_LD_508	23/05/2017	22

REGISTRATION NUMBER
KIS-1607-DWG-LD-508

KEY PLAN

BARHAM-KOONDROOK BRIDGE HISTORY

Take a stroll through the park and explore the rich history of this area.

To learn more about the history of the local river environment, head towards the items listed below.

RIVER ENVIRONMENT

	Item	Heritage Theme
A	Picnic Table	Ecology
B	Flood Marker	Barham
C	Bench Seat	Aboriginal Cultural Heritage
D	Flood Marker	Koondrook
E	Picnic Table	River Gums
F	Picnic Table	Aboriginal Cultural Heritage
G	Bench Seat	Ecology
H	Boardwalk Signage	Aboriginal Cultural Heritage

For more about the history of transport both along the river and across it, head towards the items listed below.

TRANSPORT

	Item	Heritage Theme
1	Bench Seat	River Transport/Boats
2	Picnic Table	Crossing History
3	Viewing Platform	Technology
4	Information Shelter	Crossing History
		River Transport/Boats
		Local Economy

Town Marker	Barham
Town Marker	Koondrook
Additional Picnic Tables	
Sculpture Walk Elements	

No.	Amendment Description	Initials	Date
02	100% DOCUMENTATION	MMG	23/05/2017
01	FOR INFORMATION	MMG	2/03/2017

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ROADS AND MARITIME SERVICES

BARHAM-KOONDROOK BRIDGE
LANDSCAPE DESIGN & HERITAGE INTERPRETATION
HERITAGE INTERPRETATION DETAILS
INFORMATION SHELTER ARTWORK III

FILE No. 16_07
DRAWING DWG_LD_509
PRINTED DATE 23/05/2017
REGISTRATION NUMBER KIS-1607-DWG-LD-509
SHEET No. 23

2980

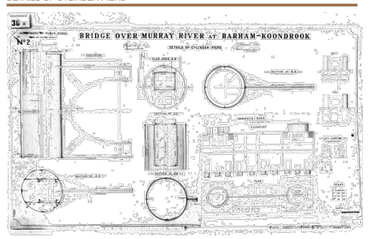
564

BARHAM - KOONDROOK
TRANSPORT

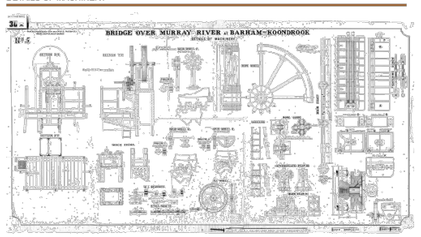
CROSSING HISTORY

BRIDGE OVER MURRAY RIVER AT BARHAM - KOONDROOK
ORIGINAL PLANS

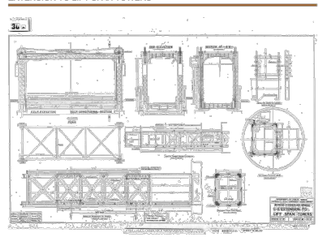
DETAILS OF CYLINDER PIERS

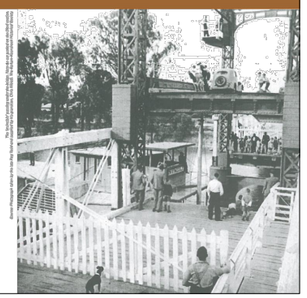


DETAILS OF MACHINERY



EXTENSION TO LIFT SPAN TOWERS





IF/K-02
LD-102

DETAIL
Scale: 1:10

2980

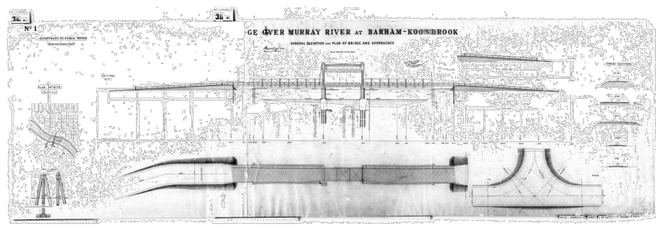
564

BARHAM - KOONDROOK
TRANSPORT

CROSSING HISTORY

BRIDGE OVER MURRAY RIVER AT BARHAM - KOONDROOK
ORIGINAL PLANS

GENERAL ELEVATION AND PLAN OF BRIDGE AND APPROACHES



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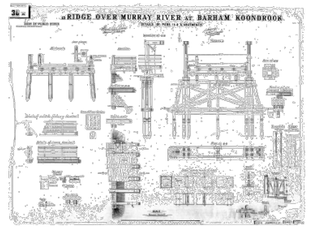
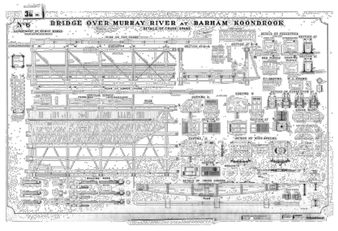


DETAILS OF TRUSS SPANS



IF/K-03
LD-102

DETAIL
Scale: 1:10

NOTES
1. TO BE INSTALLED ON INFORMATION SHELTER AS DETAILED IN LD-404

No.	Amendment Description	Initials	Date
02	100% DOCUMENTATION	MMG	23/05/2017
01	FOR INFORMATION	MMG	2/03/2017

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ROADS AND MARITIME SERVICES

BARHAM-KOONDROOK BRIDGE
LANDSCAPE DESIGN & HERITAGE INTERPRETATION
HERITAGE INTERPRETATION DETAILS
INFORMATION SHELTER ARTWORK IV

FILE No.	DRAWING	PRINTED DATE	SHEET No.
16_07	DWG_LD_510	23/05/2017	24

REGISTRATION NUMBER
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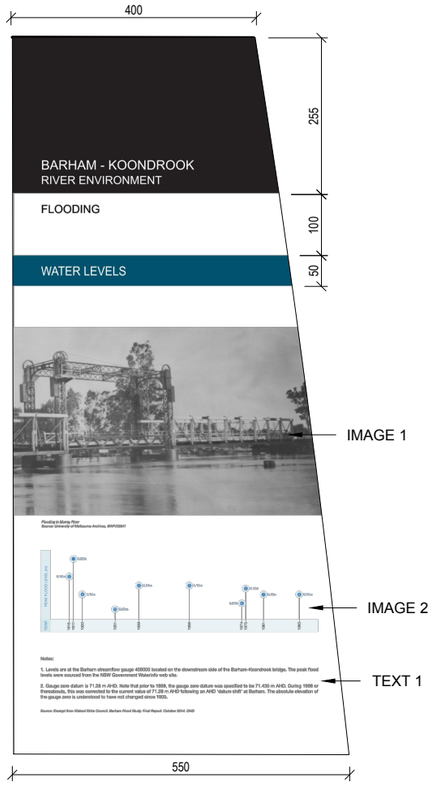
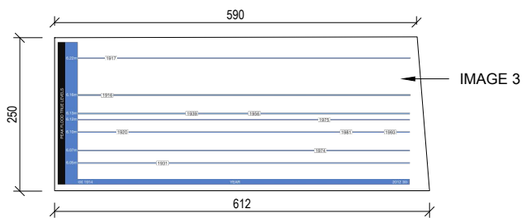




DETAIL
LD-101
LD-102
Scale: 1:10

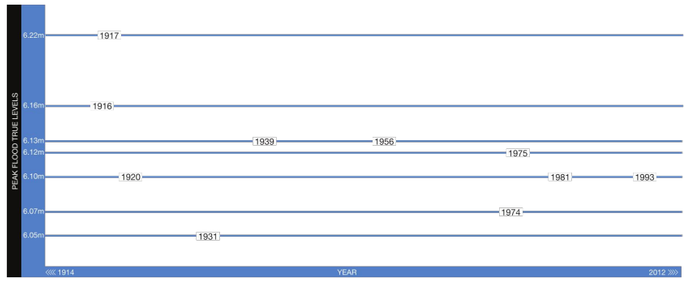
ITEM	FM/B-01
LOCATION	BARHAM & KOONDROOK
THEME	RIVER ENVIRONMENT / FLOODING / WATER LEVELS

IMAGE 1

Flooding in Murray River
Source: University of Melbourne Archives, BWP/23841

IMAGE 2

IMAGE 3



TEXT 1

Notes:

1. Levels are at the Barham streamflow gauge 409005 located on the downstream side of the Barham-Koondrook bridge. The peak flood levels were sourced from the NSW Government Waterinfo web site.

2. Gauge zero datum is 71.28 m AHD. Note that prior to 1998, the gauge zero datum was specified to be 71.435 m AHD. During 1998 or thereabouts, this was corrected to the current value of 71.28 m AHD following an AHD 'datum shift' at Barham. The absolute elevation of the gauge zero is understood to have not changed since 1905.

Source: Excerpt from Wakool Shire Council. Barham Flood Study. Final Report. October 2014. GHD

NOTES
1. TO BE INSTALLED ON FLOOD MARKER AS DETAILED IN LD-405

No.	Amendment Description	Initials	Date
02	100% DOCUMENTATION	MMG	23/05/2017
01	FOR INFORMATION	MMG	2/03/2017

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ROADS AND MARITIME SERVICES
BARHAM-KOONDROOK BRIDGE
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HERITAGE INTERPRETATION DETAILS
FLOOD MARKER ARTWORK

FILE No.	DRAWING	PRINTED DATE	SHEET No.
16_07	DWG_LD_511	23/05/2017	25

REGISTRATION NUMBER
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