The Mercury, Saturday 18 February 1995, p.5

The Mercury, Monday 20 March 1995, p.5

9.1.3 Websites

ABC, Australia's oldest single span wooden bridge facing concrete future after Christmas eve fire: https://www.abc.net.au/news/2020-02-21/tasmania-tunbridge-wooden-span-bridge-fight-over-fix/11982966

http://www.environment.nsw.gov.au/nswcultureheritage/ConvictSitesAlongTheWay.htm

9.2 Primary Materials

9.2.1 Published Sources

Ross, J, *The Hobart Town Almanack, for the year 1829*, James Ross: Hobart Town, 1829

9.2.2 Archival Materials

TAHO, CSO1/1/316/7578, Nominal List of Inquisitions held by Mr Anstey on the bodies of twenty two persons murdered by the Aborigines from the 8th November 1826 to the 31st December 1830

9.2.3 Historic Plans, Images etc

TAHO, AF395/1/14, Map - Exploration Chart 2 - South Esk, Macquarie and Elizabeth Rivers - surveyor W Wedge Darke

TAHO, *The Weekly Courier*, Thursday 22 November 1917, p.17

9.2.4 Personal Communications

Pers. Comm., Vincent Tang (State Growth) 25 March 2015

Email, Darren McConnon (State Growth) to Lillian Reardon (State Growth), 16 April 2015

Email, Ian Berger (RMS) to James Puustinen (Austral Tasmania), 27 March 2015

Email, Lillian Reardon (State Growth) to Darren McConnon (State Growth), 15 April 2015

APPENDIX 1: TASMANIAN HERITAGE REGISTER

Tasmanian Heritage Register Datasheet

Tasmanian Heritage Council

134 Macquarie Street (GPO Box 618)
Hobart Tasmania 7001
Phone: 1300 850 332 (local call cost)
Email: enquiries@heritage.tas.gov.au
Web: www.heritage.tas.gov.au

Name: Tunbridge Bridge (Blackman River)
Status: Permanently Registered
Tier: State
State

THR ID Number: 5585
Municipality: Southern Midlands Council

Location Addresses
Old Main RD, Tunbridge 7120 TAS

Title References

Property Id
2085706

Side view

Tunbridge Bridge pier

Stone blocks

Timber deck and stone pier

Roadway

Setting: This bridge spans the Blackman River at the northern end of Tunbridge. It provides a crossing for Tunbridge's Main Road, which was once the Midland Highway. It is an impressive structure encompassing a solid timber deck atop stone supports, and harks back to the period when the bridge was a key river crossing and the township was a key stopover on the major transport route between Hobart and Launceston, prior to twentieth century developments in transport and the construction of the Tunbridge bypass.

Description: The Tunbridge Bridge has three intermediate piers of picked stone with four spans. Each intermediate stone pier is topped with a short tower with corbelled top. Timber balustrades link the towers on either side of the bridge.

The deck is constructed of squared whole logs, covered with hardwood planking. At about the level of the wooden deck, stringcourses are blocked out on the piers above oblong dentils. On the upstream side only, the piers have cut waters finishing with weathered tops below the dentil course. The stonework of the bridge has been finished with strong attention to decorative detail, well in excess of the bridge's functional needs.

The bridge is subject to ongoing conservation and maintenance. A considerable number of the main supporting logs have been replaced since the 1970s, most of the remaining timberwork (deck, handrails) is subject to cyclical replacement and the stonework subject to repointing or replacement of deteriorated individual stones.

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Page 1 of 3

History:

The first bridge across the Blackman River, very close to the location of the present bridge, was constructed by convict road gangs working under Major Thomas Bell, Van Diemen's Land's Acting Engineer and Inspector of Public Works, who had the task of building the first line of road between Hobart and Launceston. This bridge was a primitive timber causeway about 30 metres long and was finished by 1822 (John Thompson, A Road in Van Diemen's Land, Department of Infrastructure, Resources and Energy, Hobart, 2004, p.45).

By the mid-1840s the town of Tunbridge was established; there was an inn there, a police station, a convict barracks and a few cottages. Captain Frederick Forth, the Superintendent of Public Works, had charge of repairs and rerouting of the Main Road. He had completed a lot of this work with the use of convict labour, when in July 1847 he was dismissed from his position for incompetence. At the time, the bridge across the Jordan River at Jericho was underway and Forth had developed designs and specifications for a new Blackman River bridge at Tunbridge.

The incoming Superintendent of Public Works was William Pordon Kay, whom Lt-Governor Franklin had brought out to Van Diemen's Land as Colonial Architect a few years earlier. On 12 August 1847 Kay reported to the Colonial Secretary that in his view the completion of a new bridge across the Blackman River was secondary in importance to the completion of the main road; he thought that the old timber bridge could be made passable, and that with low river levels in the summer the Tunbridge ford could be used as an alternative.

Kay recommended that when the bridge was built, the work should be carried out not by convicts but by private contract. He advised that there was a good supply of local freestone that could be quarried within a mile of the bridge site, as well as ironstone on the spot if that were required. Sawn timber, though, was double the Hobart price and lime had to be brought in from either Launceston or Bothwell.

Lt-Governor Eardley-Wilmot took Kay's advice and tenders were called. On 12 September the plan and specifications (drawn up by Forth) as well as four tenders were passed to the Colonial Secretary. It is recorded that Graham Walker was contracted to deliver 1,000 bushels of lime needed for the bridge, but the name of the successful tenderer for the actual bridge building has not come to light (TAHO: CSO 24/16/354). The bridge was probably completed in 1848.

Within a few years, the Blackman River bridge featured in the Tasmanian story of the Young Irelanders. These seven leaders of the failed 1848 uprising at Ballingarry, County Tipperary, were exiled to Van Diemen's Land , arriving between 1849 and 1850. Initially, each was sentenced to reside within a separate district of the island, the boundaries of which he was not permitted to cross. One of the rebels, Thomas O'Meagher, lived at Ross, and another, Kevin O'Doherty, lived at Oatlands in the district immediately to the south. The border between the two districts was the Blackman River, and there at the middle pier of the Blackman River Bridge at Tunbridge O'Meagher and O'Doherty used to meet on Mondays, while technically not leaving their allotted districts. At their second such meeting, the pair christened the middle pier of the bridge the Irish Pier. The Monday meetings continued for several months until they transferred to Lake Sorell, the meeting point of three districts, O'Meagher's, O'Doherty's and that of another exiled Irish rebel, John Martin, who lived at Bothwell (Thomas Francis Meagher: the Making of an Irish American (eds. John M Hearne & Rory T Cornish), Irish Academic Press, Dublin, 2005, p.106-122; Blanche M Touhill, William Smith O'Brien and His Irish Revolutionary Companions in Penal Exile, University of Missouri Press, Columbia, 1981, p.41). The meetings of O'Meagher and O'Doherty on the Blackman River Bridge at Tunbridge have been the subject of re-enactments (pers. com., Mary Ramsay, 19 Jan 2010).

The Blackman River bridge at Tunbridge was used by vehicular traffic passing between Hobart and Launceston until 1972, when the town was bypassed by the new Midland Highway. At about this time, the three bays of the bridge were supported by steel cylinders filled with concrete (Roy Smith, Early Tasmanian Bridges, self-published, Launceston, 1969, p.37). These were probably installed to support the heavy trucks which then used the road. Such trucks caused considerable damage to the bridge when it formed part of the main Hobart to Launceston road, several of its freestone blocks having been knocked into the Blackman River.

In 1973 the bridge was restored to close to its original condition, and the blocks in the river were hoisted up and replaced in their former positions (Mercury, 11 April 1973). The steel cylinders were probably removed at the same time. They were certainly no longer in place in 2009, and the bridge is now much as it was when constructed. It is often described as the oldest timber spanned bridge in Australia (http://www.tasmaniacentral.tas.gov.au/site/page.cfm?u=245).

Statement of Significance: *(non-statutory summary)*

The Tunbridge Bridge is of historic cultural heritage significance for its ability to demonstrate the development of the former Main Line of Road between Hobart and Launceston, the bridge being a key river crossing and stopover point on the Road from c1822 to c1970. The bridge is also of engineering significance as one of the oldest surviving timber spanned bridges in Australia, and in demonstrating engineering construction methods and detailing from the mid-nineteenth century. It also has associations with the Young Irelander rebels who were exiled to Van Diemens Land in the late 1840s. Two of their number met regularly on the bridge in 1849.

Significance:

The Heritage Council may enter a place in the Heritage Register if it meets one or more of the following criteria from the Historic Cultural Heritage Act 1995:

a) **The place is important to the course or pattern of Tasmania's history.**

The Tunbridge Bridge is of historic cultural heritage significance because it demonstrates the development of the former Main Line of Road between Hobart and Launceston, the bridge being a key river crossing and the township being a keystopover point on the Road from c1822 to c1970. It also demonstrates the working of the convict labour system in the first half of the 19th century and the evolution of public infrastructure. The flat timber girder bridge is of a type favoured in Tasmanian road works from the 1840s, distinct from the masonry arch road bridges such as the one at Kempton which preceded it.

b) **The place possesses uncommon or rare aspects of Tasmania's history.**

The Tunbridge Bridge is of historic cultural heritage significance because it is one of the oldest surviving timber-spanned bridges in Australia. Unlike the road bridges at Melton Mowbray and Jericho, this bridge has retained its timber decking.

c) **The place has the potential to yield information that will contribute to an understanding of Tasmania's history.**

No Data Recorded

d) **The place is important in demonstrating the principal characteristics of a class of place in Tasmania's history.**

The Tunbridge Bridge is of historic cultural heritage significance because it demonstrates the principal characteristics of a simple bridge constructed with a whole-log deck laid between a series of stone piers. The decorative treatment of the stonework is of special interest.

e) **The place is important in demonstrating a high degree of creative or technical achievement.**

No Data Recorded

f) **The place has a strong or special association with a particular community or cultural group for social or spiritual reasons.**

No Data Recorded

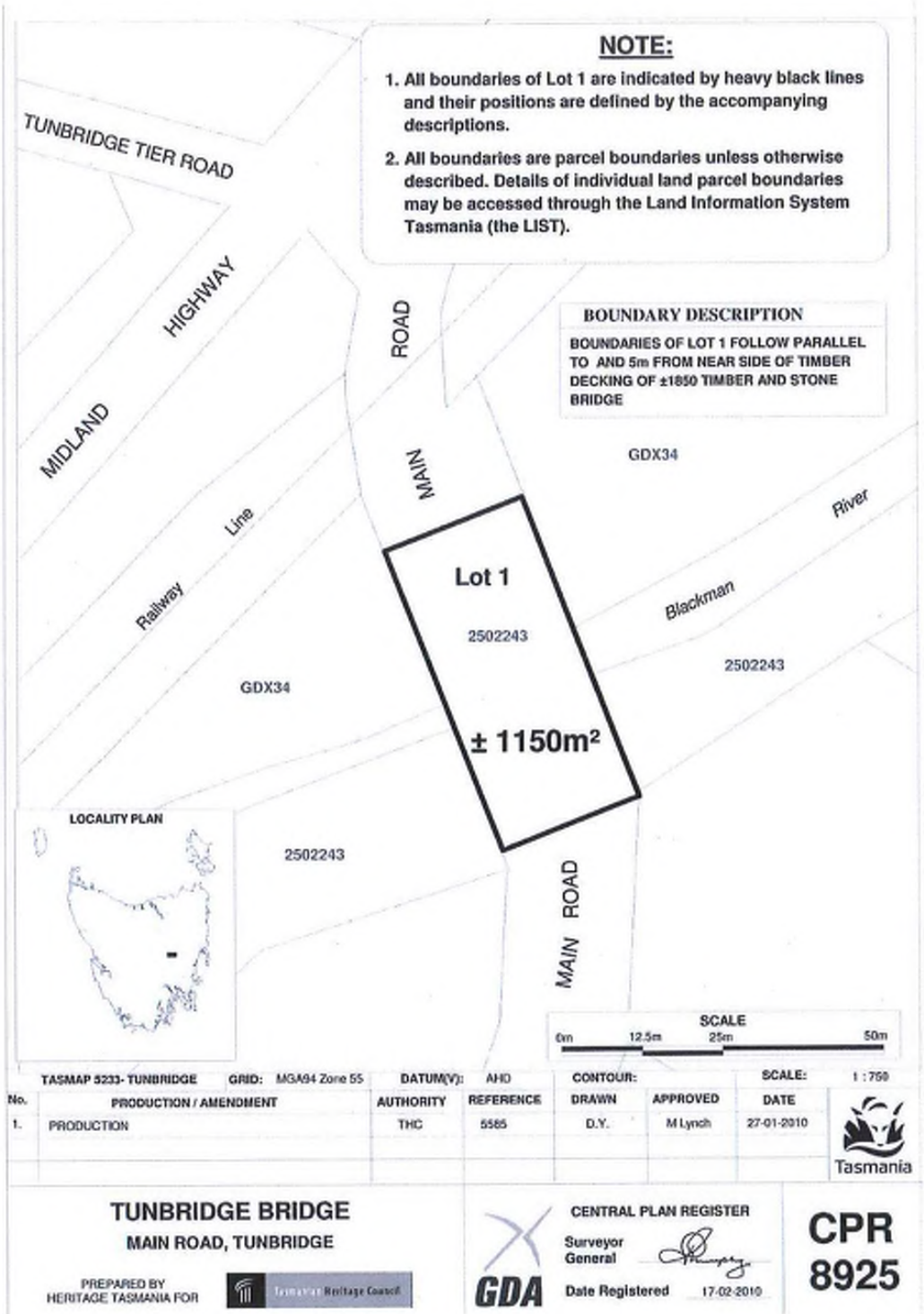
g) **The place has a special association with the life or works of a person, or group of persons, of importance in Tasmania's history.**

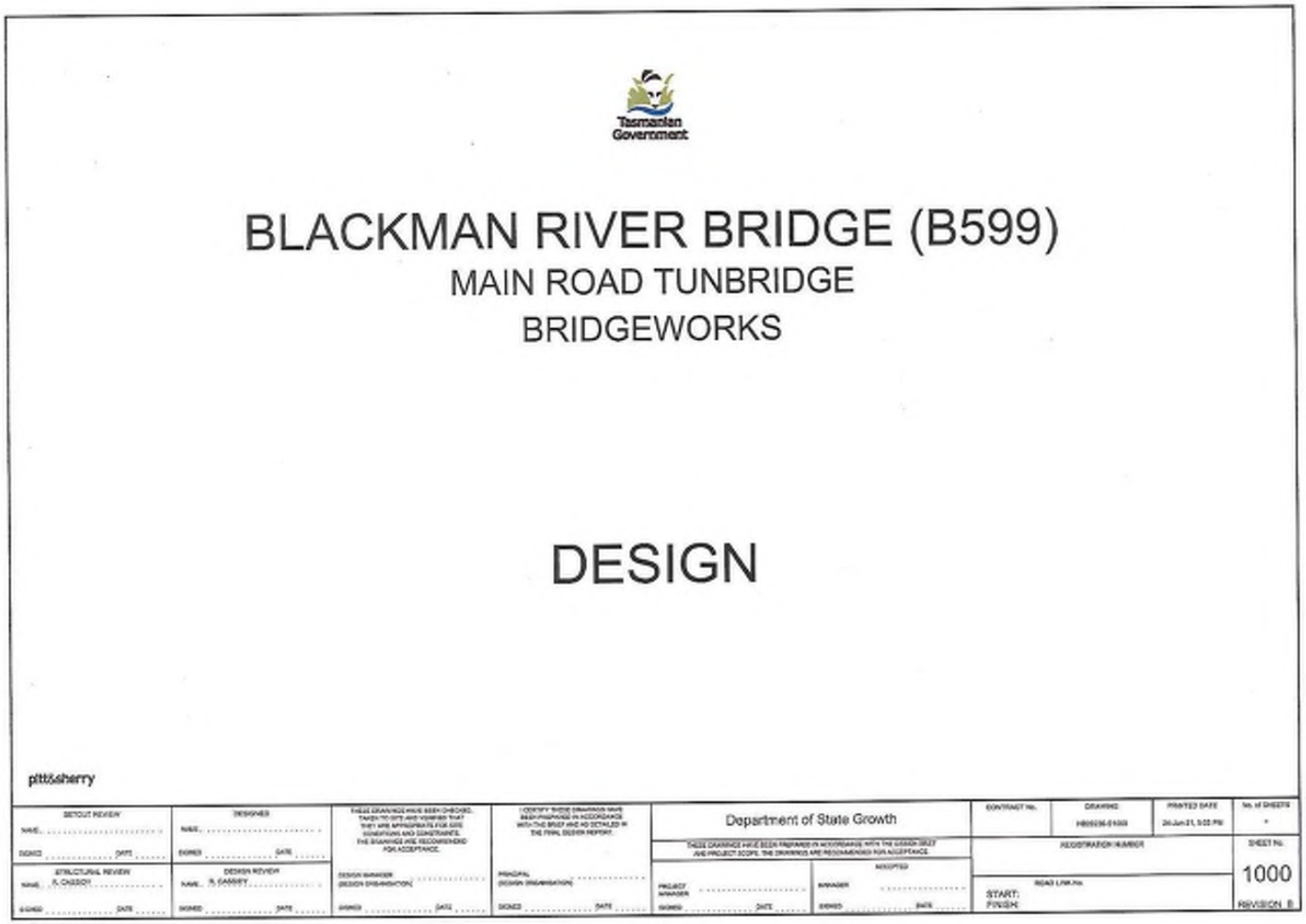
The Tunbridge Bridge is of historic cultural heritage significance because of its special association with the Young Irelanders, who were exiled to Van Diemen's Land following the failed rebellion of 1848. During 1849, two of their number, Thomas O'Meagher and Kevin O'Doherty, met on the bridge regularly, it being the border of the separate districts to which the pair had been exiled. These meetings have been the subject of re-enactments.

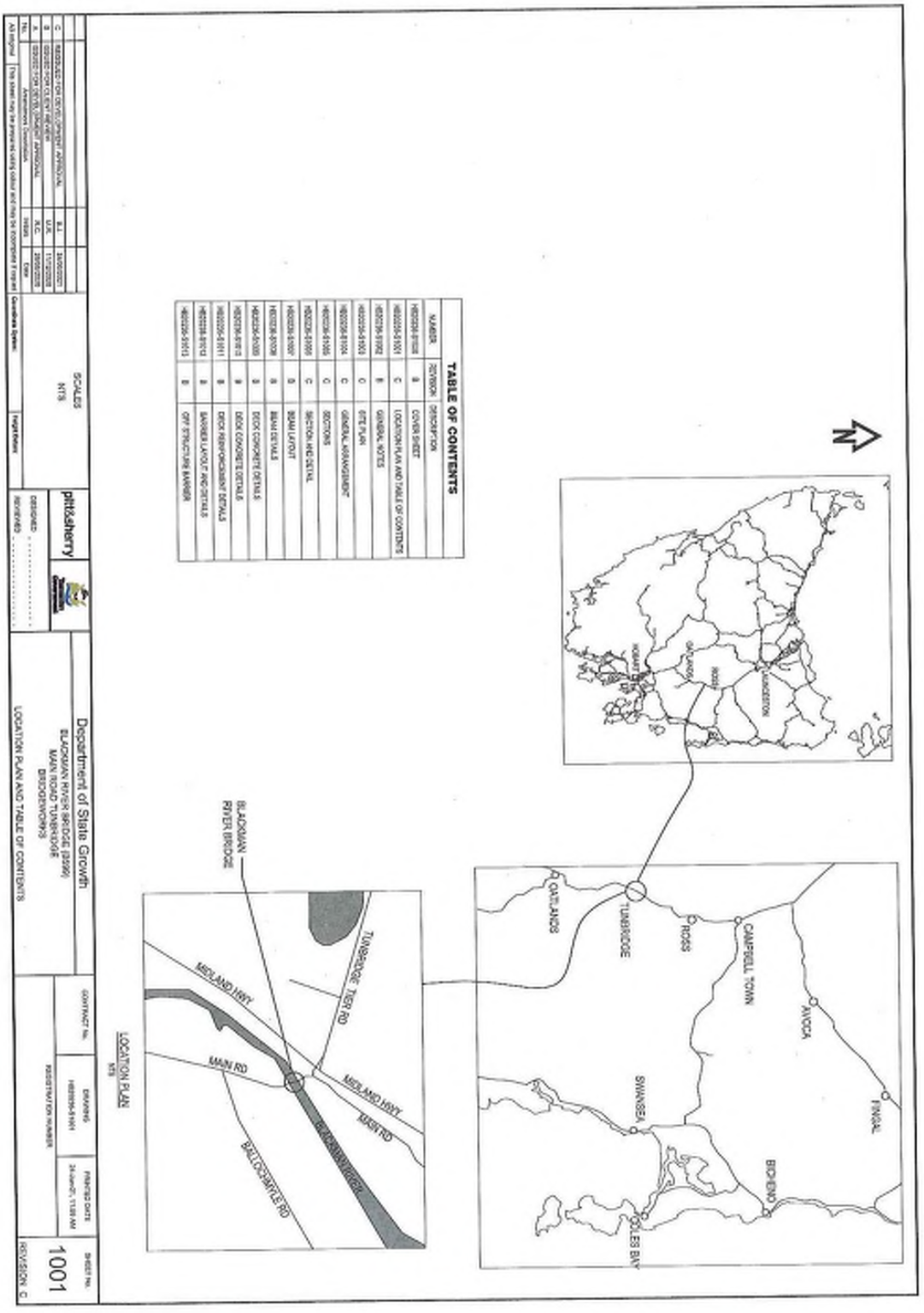
h) **The place is important in exhibiting particular aesthetic characteristics.**

No Data Recorded

PLEASE NOTE This data sheet is intended to provide sufficient information and justification for listing the place on the Heritage Register. Under the legislation, only one of the criteria needs to be met. The data sheet is not intended to be a comprehensive inventory of the heritage values of the place, there may be other heritage values of interest to the Heritage Council not currently acknowledged.


NOTE:
1. All boundaries of Lot 1 are indicated by heavy black lines and their positions are defined by the accompanying descriptions.
2. All boundaries are parcel boundaries unless otherwise described. Details of individual land parcel boundaries may be accessed through the Land Information System Tasmania (the LIST).
TUNBRIDGE TIER ROAD
HIGHWAY
MIDLAND
ROAD
MAIN
BOUNDARY DESCRIPTION
BOUNDARIES OF LOT 1 FOLLOW PARALLEL TO AND 5m FROM NEAR SIDE OF TIMBER DECKING OF ±1850 TIMBER AND STONE BRIDGE
GDX34
Railway
Line
River
Blackman
Lot 1
2502243
± 1150m²
2502243
GDX34
LOCALITY PLAN
2502243
MAIN ROAD
SCALE
0m 12.5m 25m 50m
TASMAP 5233- TUNBRIDGE GRID: MGA94 Zone 55 DATUM(V): AHD CONTOUR: SCALE: 1 : 750
No. PRODUCTION / AMENDMENT AUTHORITY REFERENCE DRAWN APPROVED DATE
1. PRODUCTION THC 5585 D.Y. M Lynch 27-01-2010
Tasmania
TUNBRIDGE BRIDGE
MAIN ROAD, TUNBRIDGE
PREPARED BY HERITAGE TASMANIA FOR
GDA
CENTRAL PLAN REGISTER
Surveyor General
Date Registered 17-02-2010
CPR 8925




Blackman River Bridge, Tunbridge:
Conservation Management Plan & Heritage Impact Statement
Austral Tasmania Pty Ltd ABN: 11 133 203 488
May 2021
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SWANSEA
FINGAL
BICHENO
ORFORD
SORELL
BLACKMAN RIVER BRIDGE
TUNBRIDGE TIER RD
MIDLAND HWY
MAIN RD
BALLOCHMYLE RD
EXHIBITED

GENERAL

G1. CONTRACTOR SHALL CONFIRM ALL DIMENSIONS ON SITE PRIOR TO COMMENCING WORK.
G2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE IN A STABLE CONDITION AND ENSURING NO PART BE OVERSTRESSED DURING CONSTRUCTION ACTIVITIES.
G3. WORKMANSHIP AND MATERIALS FOR ALL WORKS (TEMPORARY OR OTHERWISE) ARE TO BE IN ACCORDANCE WITH (IN ORDER OF PRECEDENCE) THE PROJECT SPECIFICATION, THE DRAWINGS, DEPARTMENT OF STATE GROWTH STANDARD SPECIFICATIONS AND THE BRIDGE DESIGN CODE.
G4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY WORKS.
G5. THE CONTRACTOR SHALL ONLY BUILD FROM DRAWINGS WITH THE STATUS "FOR CONSTRUCTION". DRAWINGS HAVING ANY OTHER STATUS, INCLUDING "ISSUED FOR TENDER", "DRAFT" OR "FOR APPROVAL" ARE SUBJECT TO CHANGE.

DESIGN SPECIFICATIONS

BRIDGE DESIGN STANDARD : AS5100-2017
DESIGN LOADS:

DESIGN LANE VEHICLE	LLD	DLA	ACCOMPANYING VEHICLE	LLF	DLA	ALF
SM1600	1.8	0.35	NIL		-	-
PBS-3A HML (PBS RV2)	2	0.4	PBS-3A HML (PBS RV2)	3	0.4	0.4
PLATFORM RV20	1.5	0.4	NIL	-	-	-
PLATFORM RV28	1.5	0.4	NIL	-	-	-
SPV RV6	1.6	0.4	NIL	-	-	-

BARRIERS ARE DESIGNED FOR LOW LEVEL BARRIER PERFORMANCE.

DIMENSIONS

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. REDUCED LEVELS, CHAINAGES & COORDINATES ARE ALL IN METRES. ALL LEVELS ARE TO AUSTRALIAN HEIGHT DATUM.
3. DIMENSIONS SHALL NOT BE SCALED FROM DRAWINGS
4. ANY DISCREPANCIES SHALL BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE DESIGNERS.
5. ALL CHAINAGES REFER TO THE ROAD DESIGN LINE AND ARE IN METRES

GLUE-LAMINATED BEAM NOTES

1. ALL TIMBER BEAMS SHALL BE GRADE GL18, BE SOURCED FROM A REPUTABLE SUPPLIER, BE CONSTRUCTED IN ACCORDANCE WITH AS 1328.1 AND HAVE THE FOLLOWING MINIMUM PROPERTIES:

MODULUS OF ELASTICITY (E)	16500	MPa
CHARACTERISTIC BENDING STRENGTH (f'b)	45	MPa
CHARACTERISTIC SHEAR STRENGTH (f's)	5	MPa
CHARACTERISTIC COMPRESSIVE STRENGTH (f'c)	43	MPa
CHARACTERISTIC TENSILE STRENGTH (f't)	26	MPa

2. ALL PROPERTIES NOT PROVIDED IN THE ABOVE TABLE MUST COMPLY WITH THE HIGHEST VALUES PROVIDED IN AS5100.9:2017, AS1720.1:2010 AND THE SPECIFICATION.
3. ALL TIMBER BEAMS SHALL BE TREATED IN ACCORDANCE WITH AS1604.1 FOR HAZARD CLASS H3
4. ALL BEAMS TO BE STRENGTH GROUP SD1, SD2 OR SD3.
5. ALL BEAMS TO BE JOINT GROUP JD1, JD2 OR JD3.
6. ALL GLUE-LAMINATED BEAMS SHALL BE BONDED WITH TYPE 1 ADHESIVE IN ACCORDANCE WITH AS/NZS 1328.1.

CONCRETE NOTES

1. MAXIMUM AGREGATE SIZE SHALL BE 20 mm UNLESS NOTED OTHERWISE
2. CONCRETE FOR DECK ELEMENTS SHALL BE GRADE VR400/50, HAVE A MINIMUM COMPRESSIVE STRENGTH OF 50 MPa AT 28 DAYS AND HAVE A MINIMUM COVER OF 40mm
3. EXPOSURE CLASSIFICATION B1

STRUCTURAL STEELWORK

SW1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE NOTES, THE SPECIFICATION AND AS5100.
SW2. WELDING SHALL BE PERFORMED BY A QUALIFIED OPERATOR IN ACCORDANCE WITH AS 1554.
SW3. STRUCTURAL STEEL SHALL BE GRADE 300, UNO.
SW4. BOLT AND NUTS TO AS 1252 CLASS 8.8/S, UNO, WASHERS TO AS 1252.
SW5. STEEL PLATE SHALL BE GRADE 300 AND COMPLY WITH AS 3678, UNO.
SW6. ALL BOLTS, NUTS AND WASHERS TO BE HOT DIPPED GALVANISED.
SW7. ALL WELDS TO BE 6mm CONTINUOUS FILLET WELDS UNO
SW8. GALVANIZING SHALL COMPLY WITH AS/NZS 4680.
SW9. WELDING SHALL BE CATEGORY SP TO COMPLY WITH AS/NZS 1554 PART 1.
SW10. ALL STRUCTURAL STEELWORK SHALL BE HOT DIP GALVANIZED AFTER FABRICATION

REINFORCEMENT

1. ALL REINFORCEMENT IS DESIGNATED AS FOLLOWS UNLESS IT IS DESCRIBED FULLY IN ACCORDANCE WITH AS 4671 SECTION 5.

SYMBOL	DESCRIPTION	TYPE TO AS 4671
SL	MESH-SQUARE GRID	D500L
RL	MESH-RECTANGULAR GRID	D500L
R	PLAIN BARS	R250N
S	DEFORMED BARS	D250N
N	DEFORMED BARS	D500N

2. ALL REINFORCEMENT IS DESIGNATED AS FOLLOWS:
e.g. 2-N12-150 T
- THE NUMBER PRECEDING THE BAR SYMBOL (2) IS THE NUMBER OF BARS
- THE NUMBER FOLLOWING THE BAR SYMBOL (12) IS THE NOMINAL BAR DIAMETER IN MILLIMETRES
- THE NUMBER FOLLOWING THE 'DASH' (150) IS THE SPACING IN MILLIMETRES
- THE LETTER FOLLOWING THE SPACING (T) IS THE LOCATION OF THE BAR IN THE ELEMENT AS FOLLOWS:

T	TOP
B	BOTTOM
NF	NEAR FACE
FF	FAR FACE
EF	EACH FACE
LV	LENGTH VARIES

STRUCTURAL ELEMENT CODES
A : ABUTMENT
W : WINGWALLS
C : COLUMNS
B : BEAMS
H : CROSSHEAD
S : SLAB
R : RUN ON SLAB
T : TRAFFIC BARRIER
P : PILES

3. REINFORCEMENT SPACING NOT SHOWN SHALL BE TAKEN AS EQUAL.
4. REINFORCING BAR SHOWN ON THESE DRAWINGS ARE DIAGRAMMATIC ONLY. IT IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.
5. BARS SHOWN MAY REPRESENT MORE THAN ONE LENGTH AND/OR PROFILE.
6. BARS MAY NOT BE SHOWN IN TRUE POSITION FOR CLARITY.
7. ALL HOOKS, BENDS AND COGS ARE STANDARD AND SHALL BE IN ACCORDANCE WITH AS5100 BRIDGE DESIGN 2017 UNLESS NOTED OTHERWISE.
8. ALL REINFORCEMENT IS DIMENSIONED OUT-TO-OUT ALONG EACH STRAIGHT PORTION OF THE BAR.
9. WELDING OF REINFORCEMENT NOT PERMITTED UNLESS NOTED OTHERWISE.

LAP LENGTHS FOR REINFORCEMENT

1. LAPS AND OTHER SPLICES IN REINFORCEMENT SHALL ONLY BE MADE AT THE POSITION SHOWN ON THE DRAWINGS, UNLESS ALTERNATIVE OR EXTRA LOCATIONS ARE APPROVED IN WRITING BY THE DESIGNERS. LAP LENGTHS SHALL BE AS TABULATED BELOW UNLESS SHOWN OTHERWISE ON THE DRAWINGS.

LAP LENGTHS FOR REINFORCEMENT (CONTINUED)

BAR DIAMETER	MIN. LAP LENGTH
12	450
16	600
20	800
24	1000
28	1200
32	1500

(NOTE: THE MINIMUM LAP LENGTH SHOWN SHALL BE INCREASED BY 30% FOR HORIZONTAL BARS WITH 300mm OR MORE CONCRETE CAST BELOW THE BAR.)
2. REINFORCEMENT SPLICES SHALL BE STAGGERED AND NO MORE THAN 50% OF SPLICES SHALL BE AT ANY ONE SECTION UNLESS SHOWN OTHERWISE.
3. WHERE MORE THAN HALF THE BARS ARE SPLICED AT ANY ONE SECTION, THE SPLICE LENGTHS SHALL BE INCREASED BY 30%.

SITE SAFETY

SS1. ALL WORK SITES CAN BE POTENTIALLY HAZARDOUS TO PEOPLE, PROPERTY AND EQUIPMENT. ALL PEOPLE WHO ARE AUTHORISED TO BE ON A WORK SITE MUST CAREFULLY CONSIDER, DOCUMENT AND ADOPT SUITABLE SAFE WORK PROCEDURES FOR ALL REQUIRED ACTIVITIES.

SS2. CURRENT LEGISLATION: CURRENT LEGISLATION REQUIRES THAT ALL PERSONS ARE TO CONSIDER THEIR ACTIONS OR INACTION ON THE HEALTH AND SAFETY OF OTHERS AND THEMSELVES.

SS3. THE CONTRACTOR SHALL ABIDE WITH AND IS BOUND BY THE CURRENT SAFE WORK AUSTRALIA ACT, REGULATIONS AND CODES OF PRACTICE ISSUED BY STATE GOVERNMENTS AND FOR THEIR AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMPLEMENTATION, DOCUMENTATION AND MAINTENANCE OF WORK SAFETY PROCEDURES AND OTHER RELEVANT DOCUMENTATION. THE CONTRACTOR SHALL ENSURE THAT ALL SUB CONTRACTORS AND OTHER AUTHORISED PEOPLE COMPLY WITH THE ABOVE.

SS4. THE CONTRACTOR SHALL BE ALERT AND PROACTIVE TO IDENTIFY HAZARDS AND MANAGE THE ASSOCIATED RISKS TO ELIMINATE THEM OR MINIMISE THEM TO AN AGREED RISK LEVEL.

SS5. THE CONTRACTOR SHALL CONSULT WITH THE ENGINEER IF THERE IS ANY PERCEIVED RISK RELATING TO THE DESIGN OR CONSTRUCTION OF THE DESIGN. THE CONTRACTOR SHALL ENGAGE SUITABLY QUALIFIED ENGINEERS TO CERTIFY ALL TEMPORARY STRUCTURAL WORKS.

SS6. THE CONTRACTOR SHALL ENGAGE WITH THE SUBCONTRACTOR AND OTHER AUTHORISED PEOPLE WHO USE THE SITE TO IDENTIFY THEIR RISKY WORK PROCEDURES AND OTHER ACTIVITIES.

SS7. SUBCONTRACTORS AND OTHER AUTHORISED PEOPLE SHALL PROVIDE DOCUMENTATION ABOUT THEIR RISK ASSESSMENTS AND RISK MINIMISATION.

SS8. PUBLIC SAFETY: A LIVE SITE THAT HAS WORK UNDERWAY OR IS UNATTENDED HAS A STRONG ATTRACTION TO THE PUBLIC IN GENERAL. THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO PREVENT UNAUTHORISED PEOPLE ENTERING THE SITE. EXCAVATIONS, STRUCTURES AND ACCESS EQUIPMENT SHALL BE LEFT IN A SECURE MANNER AS IS REASONABLY PRACTICABLE TO PREVENT ANY UNAUTHORISED PEOPLE FROM ENTERING, CLIMBING OR FALLING. THE SITE SHALL HAVE CLEAR WARNING SIGNS IN APPROPRIATE LOCATIONS, E.G. - "DANGER KEEP OUT" AND BE SECURELY BARRICADED AND WHEN UNATTENDED LEFT IN A LOCKED CONDITION AS IS REASONABLY PRACTICABLE.

SS9. SPECIFIC ATTENTION SHALL BE PAID TO RISKY ACTIVITIES INCLUDING BUT NOT LIMITED TO: SITE ESTABLISHMENT DEMOLITION, RECYCLING AND REMOVAL TEMPORARY WORKS EXCAVATION AND TRENCHING
: CONSTRUCTION PROCESSES TRIPS AND FALLS (GENERAL) WORKING AT HEIGHT WORKING OVER WATER.

REFER ALSO TO THE PROJECT SID REPORT

SAFETY IN DESIGN (SID)

SD1. SD GENERALLY
THIS STRUCTURE HAS BEEN DESIGNED TO ELIMINATE HAZARDS TO HEALTH AND SAFETY WHEREVER POSSIBLE. WHERE THIS HAS NOT BEEN POSSIBLE, THE RISK TO HEALTH AND SAFETY OF PERSONS HAS BEEN MINIMISED TO BE REASONABLY PRACTICABLE FOR THE LIFE OF THE STRUCTURE.

SD2. WORK HEALTH AND SAFETY:
THE CONTRACTOR SHALL ENSURE THAT THE CONSTRUCTION OF THIS PROJECT IS CARRIED OUT UNDER A WORK HEALTH AND SAFETY CO-ORDINATION PLAN AND COMPLIANT WITH ANY 'SAFETY IN THE WORKPLACE LEGISLATION' APPLICABLE IN THE STATE IN WHICH THE WORK IS CARRIED OUT.

SD3. IDENTIFY HAZARDS:
THE CONTRACTOR SHALL MAKE EVERY EFFORT TO ENSURE THAT ALL PERSONS WHO ENTER THE CONSTRUCTION SITE ARE MADE AWARE ABOUT THE RISK OF HAZARDS AND POTENTIAL HAZARDS WHICH MAY OCCUR ON THE SITE. ANY SUCH HAZARD SHALL BE ISOLATED AND CLEARLY IDENTIFIED. THE CORRECT LEVEL OF TRAINING SHALL BE MANDATORY BEFORE ANY PERSON ENTERS THE CONSTRUCTION AREA. ALL PERSONS SHALL WEAR THE APPROPRIATE SAFETY PROTECTION APPAREL SPECIFIED BY THE CONTRACTOR BEFORE ENTERING THE SITE. A QUALIFIED GUIDE SHALL ACCOMPANY ALL NEW CONSTRUCTION WORKERS DURING THEIR INITIATION AND ALL SITE VISITORS WHILE ON THE SITE.

SD4. STABILITY OF THE STRUCTURE:
TEMPORARY MEASURES ARE REQUIRED DURING CONSTRUCTION AND DEMOLITION TO ENSURE THE STABILITY OF THE STRUCTURE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND THE CONTRACTOR'S ERECTION DESIGN ENGINEER TO TAKE ALL MEASURES NECESSARY TO MAINTAIN STRUCTURAL INTEGRITY DURING ALL PHASES OF DECONSTRUCTION AND CONSTRUCTION. TEMPORARY SUPPORT IS EXPECTED TO BE NECESSARY.

SD5. TEMPORARY SUPPORT REQUIRED:
CONCRETE FORMWORK TO FACILITATE CONCRETE PLACEMENT
TIMBER ELEMENTS
STATIC OR OPERATING PLANT AND EQUIPMENT
STORED MATERIALS
STABILITY OF THE EXISTING STRUCTURE.

SD6. SPECIALIST CONTRACTOR:
SOME ACTIVITIES REQUIRED TO BE CARRIED OUT DURING THE CONSTRUCTION ARE NOT CONSIDERED TO BE NORMAL BUILDING PRACTICE. THEREFORE ENGAGEMENT OF A SPECIALIST CONTRACTOR, IS EXPECTED TO BE NECESSARY FOR THE FOLLOWING ACTIVITIES, BUT NOT LIMITED TO.

LIFTING AND PLACEMENT OF HEAVY ELEMENTS
USE OF HAZARDOUS MATERIALS
USE OF HEAVY EQUIPMENT
DEMOLITION WORKS
DRILLING
ANCHOR INSTALLATION
WORK NEAR LIVE EQUIPMENT, INCLUDING COMMS AND WATER SUPPLY.

ELASTOMERIC BEARING PADS

1. ALL ELASTOMERIC BEARINGS SHALL BE SOURCED FROM A REPUTABLE SUPPLIER, COMPLY WITH AS5100.4 AND THE SPECIFICATION AND HAVE THE FOLLOWING MINIMUM PROPERTIES:

HARDNESS	60	IRHD +/-5
ELASTIC MODULUS (E)	3.8	MPa
SHEAR MODULUS (G)	0.9	MPa
BULK MODULUS (B)	2000	MPa
ULTIMATE TENSILE STRENGTH (Fu)	3.8	MPa
ELONGATION AT BREAK	475	%

2. ALL PROPERTIES NOT PROVIDED IN THE ABOVE TABLE MUST COMPLY WITH THE HIGHEST VALUES PROVIDED IN AS5100.4 AND THE SPECIFICATION.

Rev	Description	Init.	Date
B	ISSUED FOR DEVELOPMENT APPROVAL	B.J.	24/06/2021
A	ISSUED FOR CLIENT REVIEW	J.R.	11/12/2020
No.	Amendment Description	Initials	Date

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Department of State Growth
BLACKMAN RIVER BRIDGE (B599)
MAIN ROAD TUNBRIDGE
BRIDGEWORKS
GENERAL NOTES

CONTRACT No.	DRAWING	PRINTED DATE	SHEET No.
	H320206-01002	24-Jun-21, 11:59 AM	1002
REGISTRATION NUMBER			REVISION B

Blackman River Bridge, Tunbridge:
Conservation Management Plan & Heritage Impact Statement
Austral Tasmania Pty Ltd ABN: 11 133 203 488

May 2021
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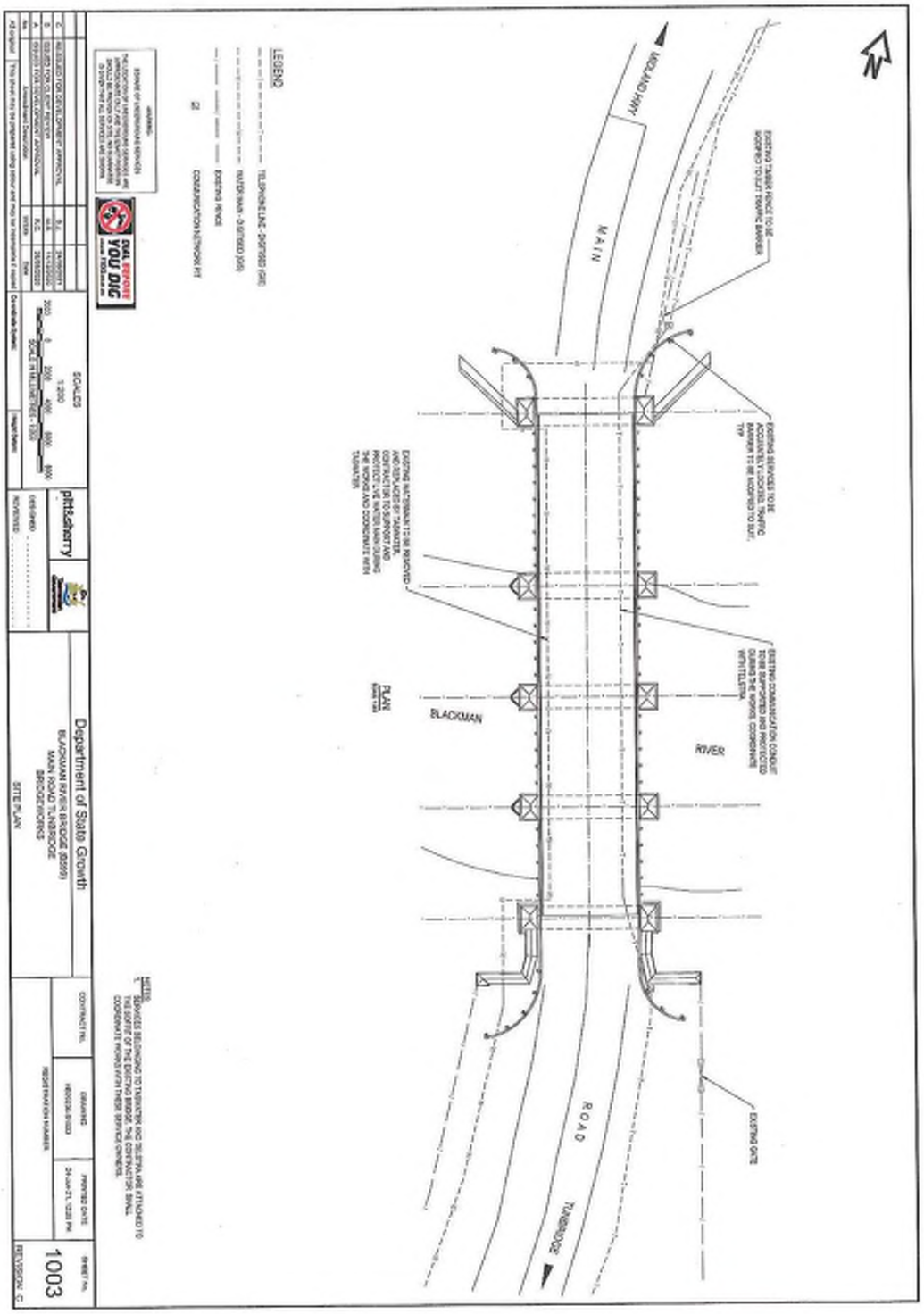
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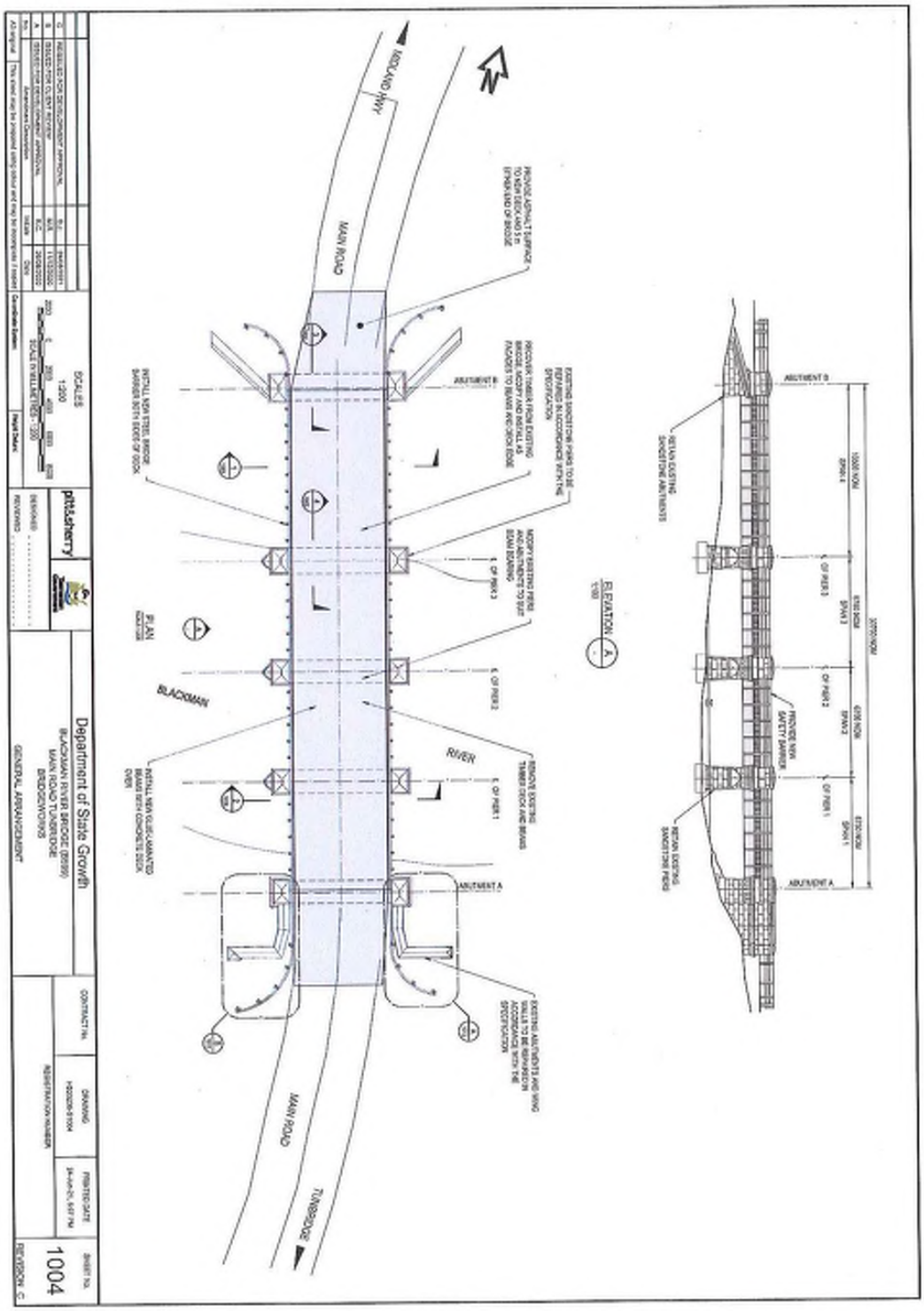

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Conservation Management Plan & Heritage Impact State nt
Austral Tasmania Pty Ltd ABN: 11 133 203 488

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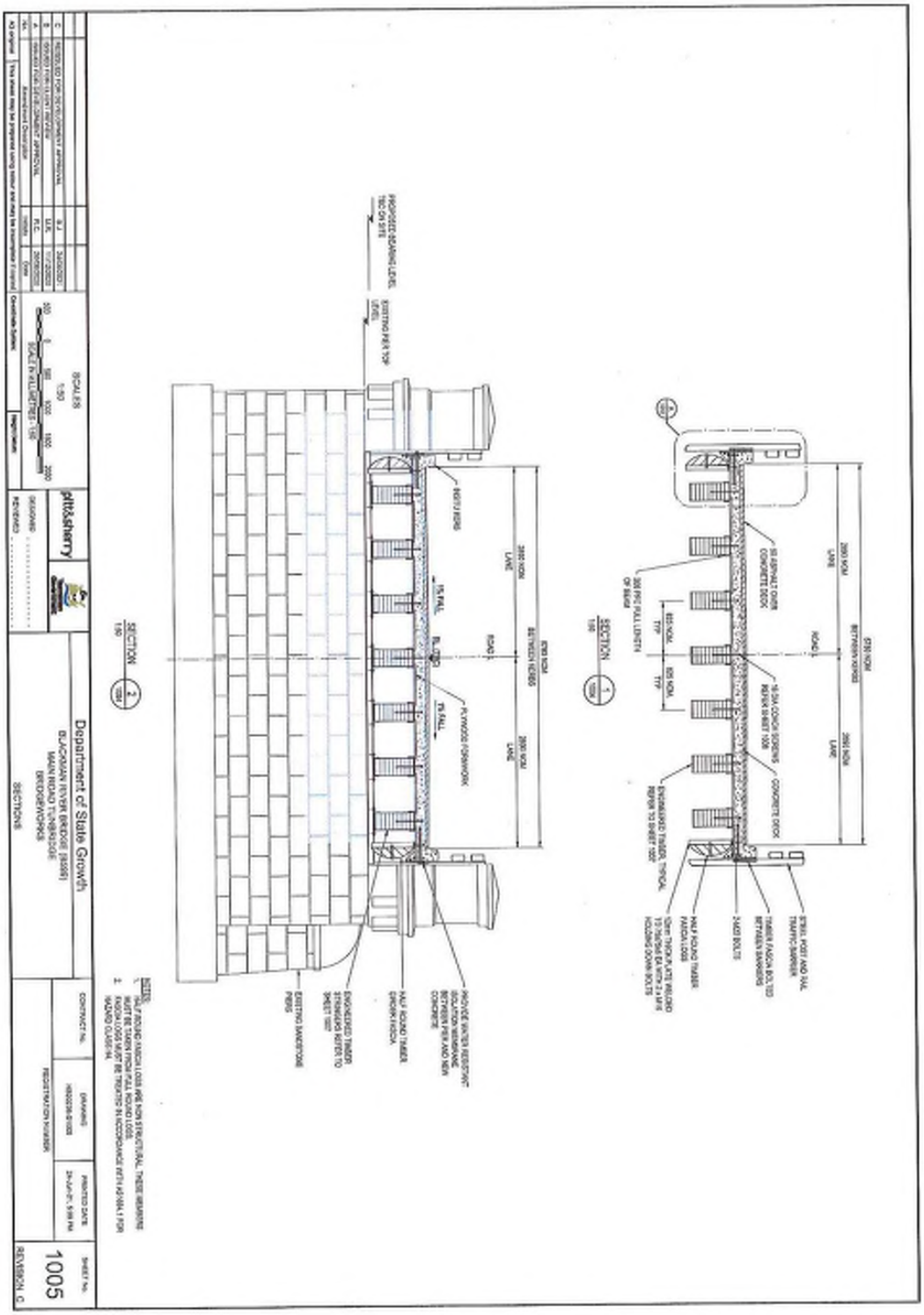

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Austral Tasmania Pty Ltd ABN: 11 133 203 488

May 2021
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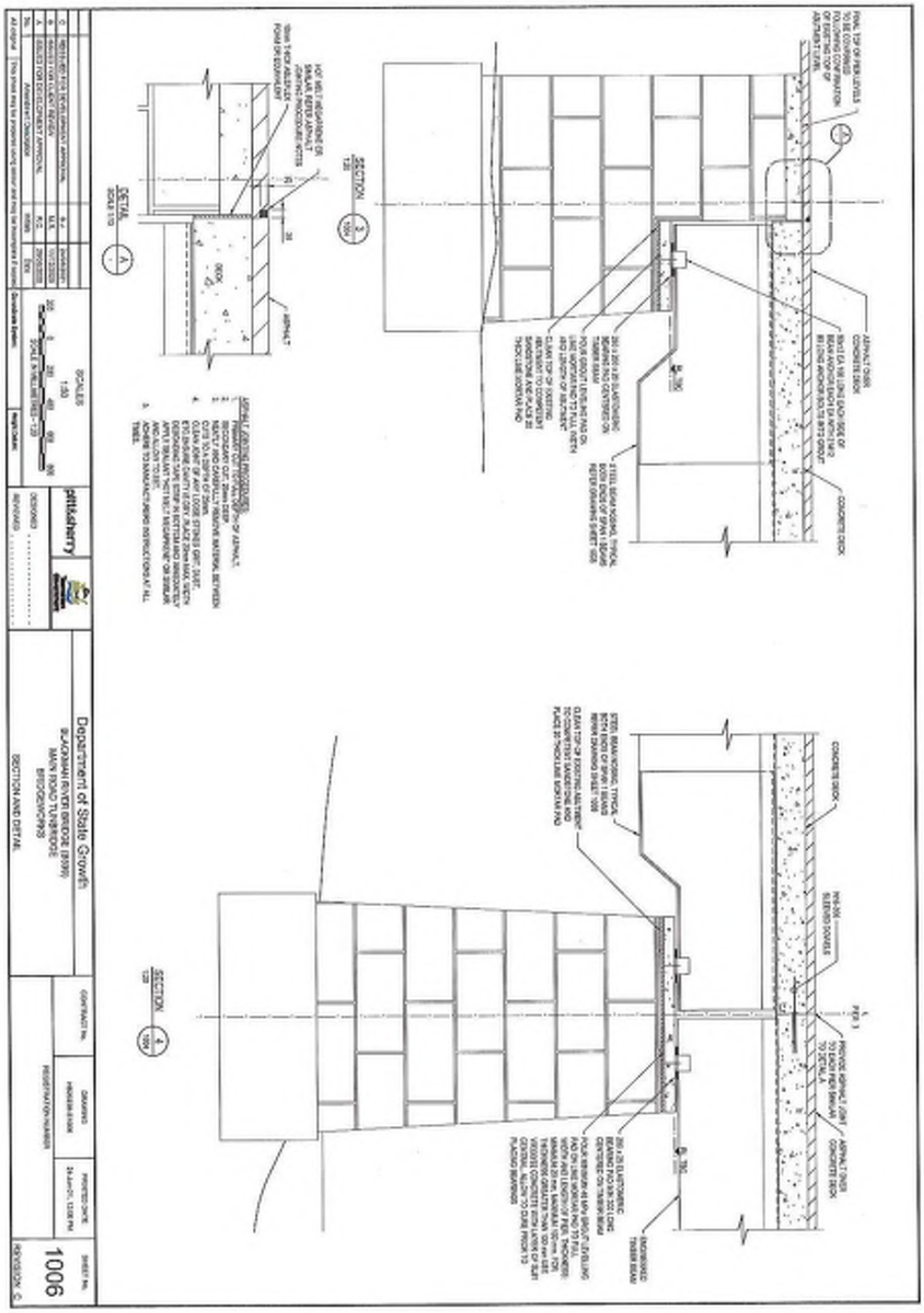

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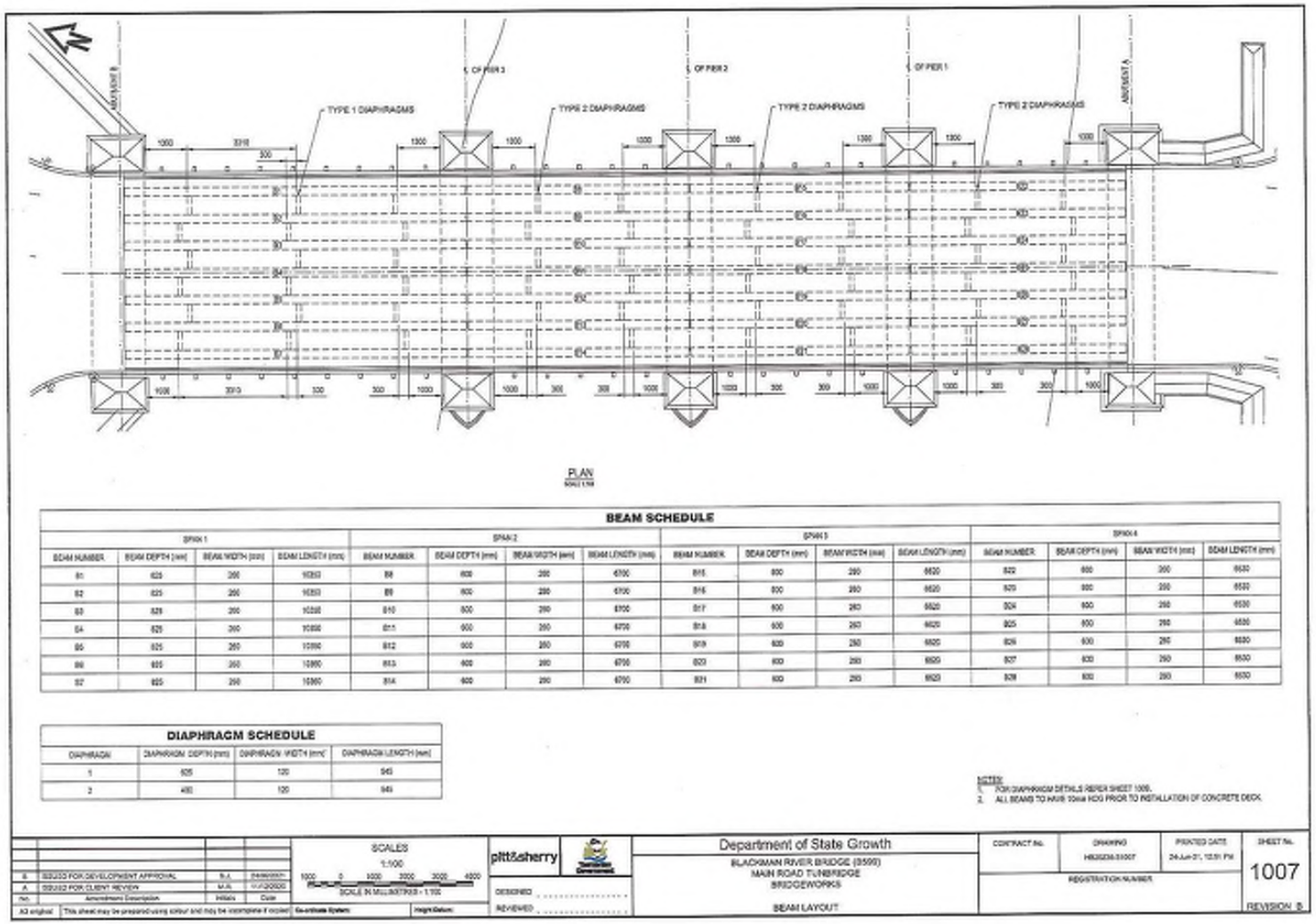

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B3	825	280	10250	B10	800	280	6700	B17	800	280	6620	B24	800	280	6630
B4	825	280	10250	B11	800	280	6700	B18	800	280	6620	B25	800	280	6630
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DIAPHRAGM SCHEDULE

DIAPHRAGM	DIAPHRAGM DEPTH (mm)	DIAPHRAGM WIDTH (mm)	DIAPHRAGM LENGTH (mm)
1	825	120	940
2	400	120	940

NOTES:
1. FOR DIAPHRAGM DETAILS REFER SHEET 1005.
2. ALL BEAMS TO HAVE 10mm HDS PRIOR TO INSTALLATION OF CONCRETE DECK.

A	ISSUED FOR DEVELOPMENT APPROVAL	R.A.	04/06/2021
A	ISSUED FOR CLIENT REVIEW	M.R.	11/12/2020
no.	Amendment Description	Initials	Date

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BLACKMAN RIVER BRIDGE (3509)
MAIN ROAD TUNBRIDGE
BRIDGEWORKS
BEAM LAYOUT

CONTRACT No.	DRAWING	PRINTED DATE	SHEET No.
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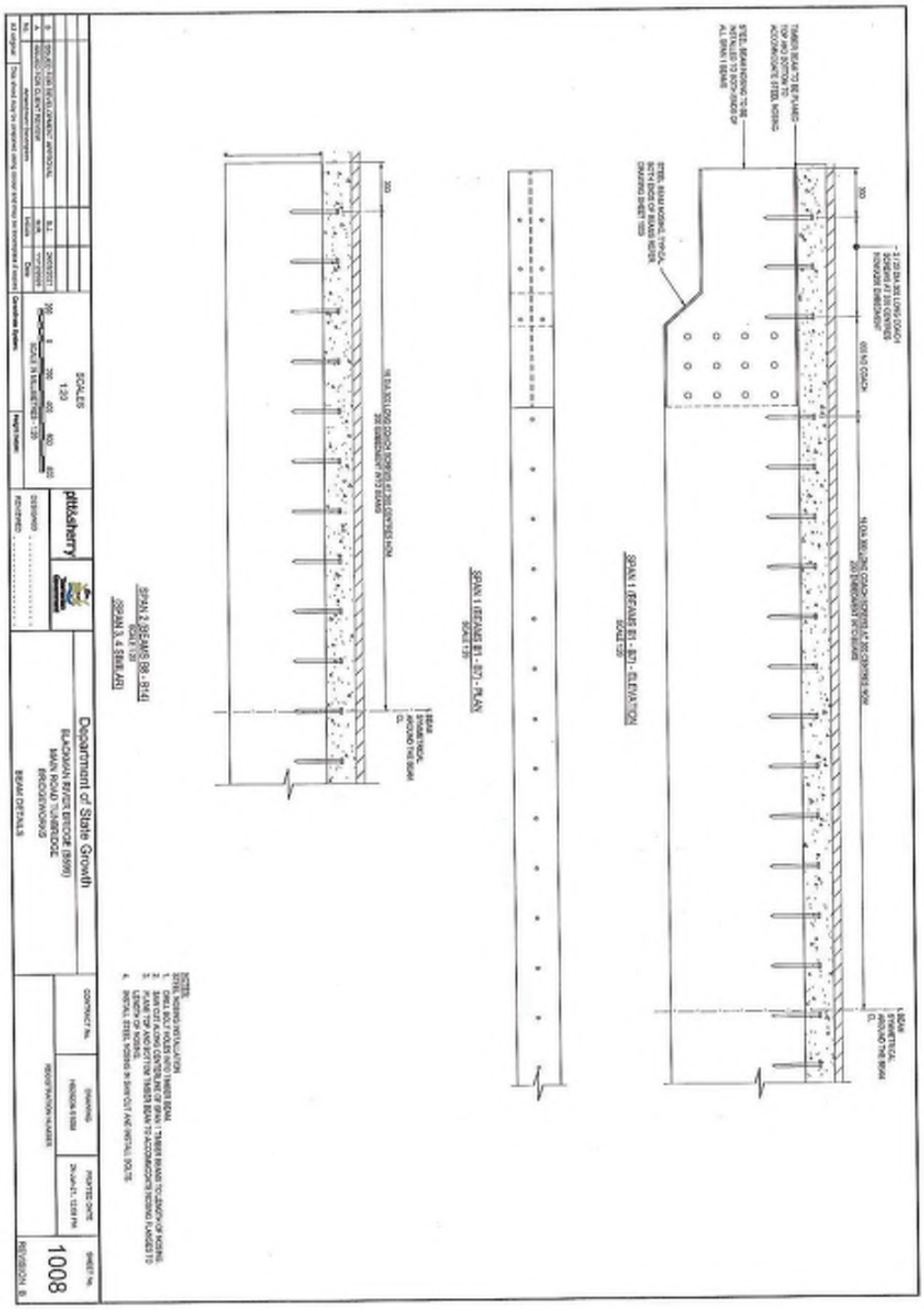

Blackman River Bridge, Tunbridge:
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Austral Tasmania Pty Ltd ABN: 11 133 303 488
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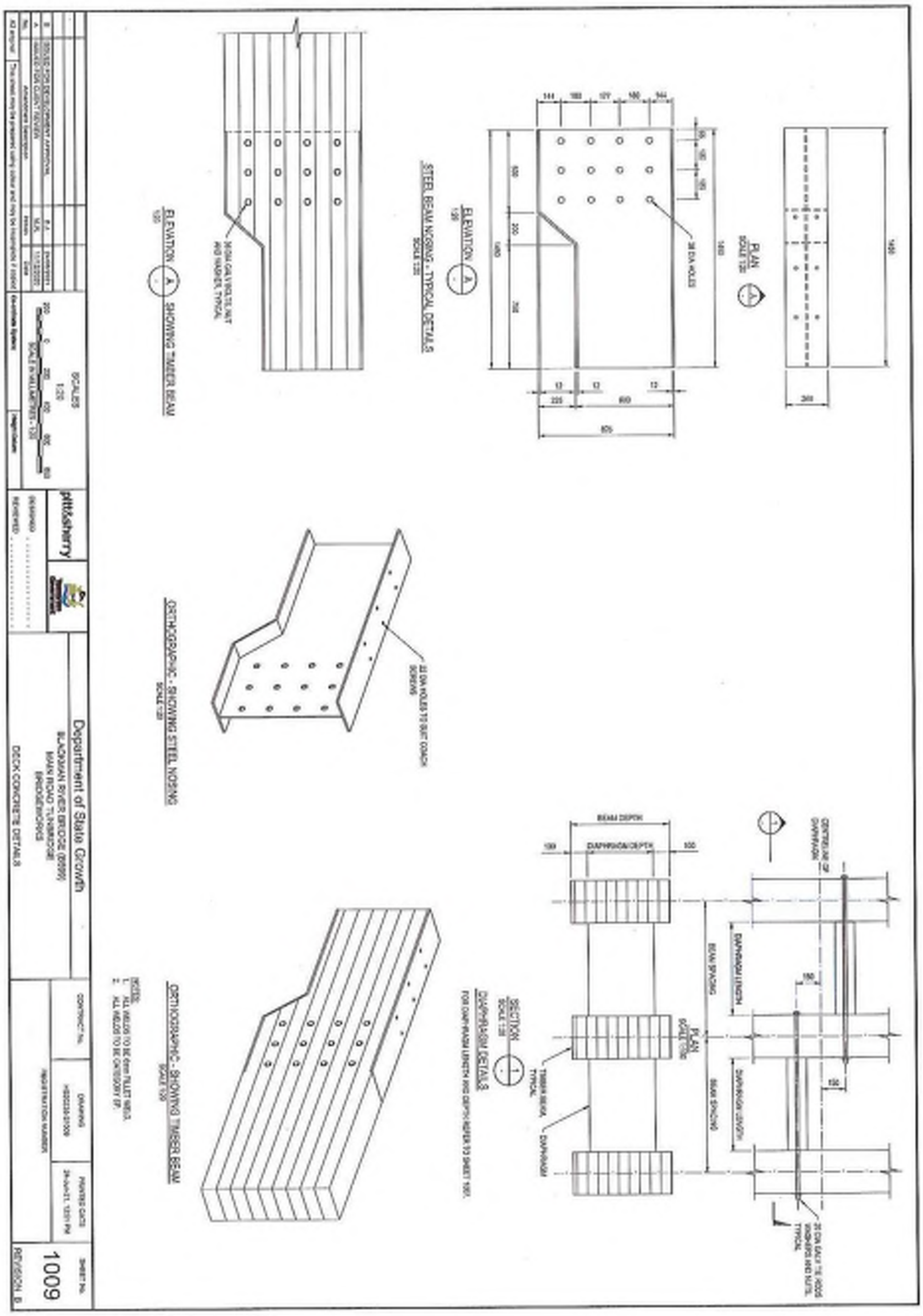
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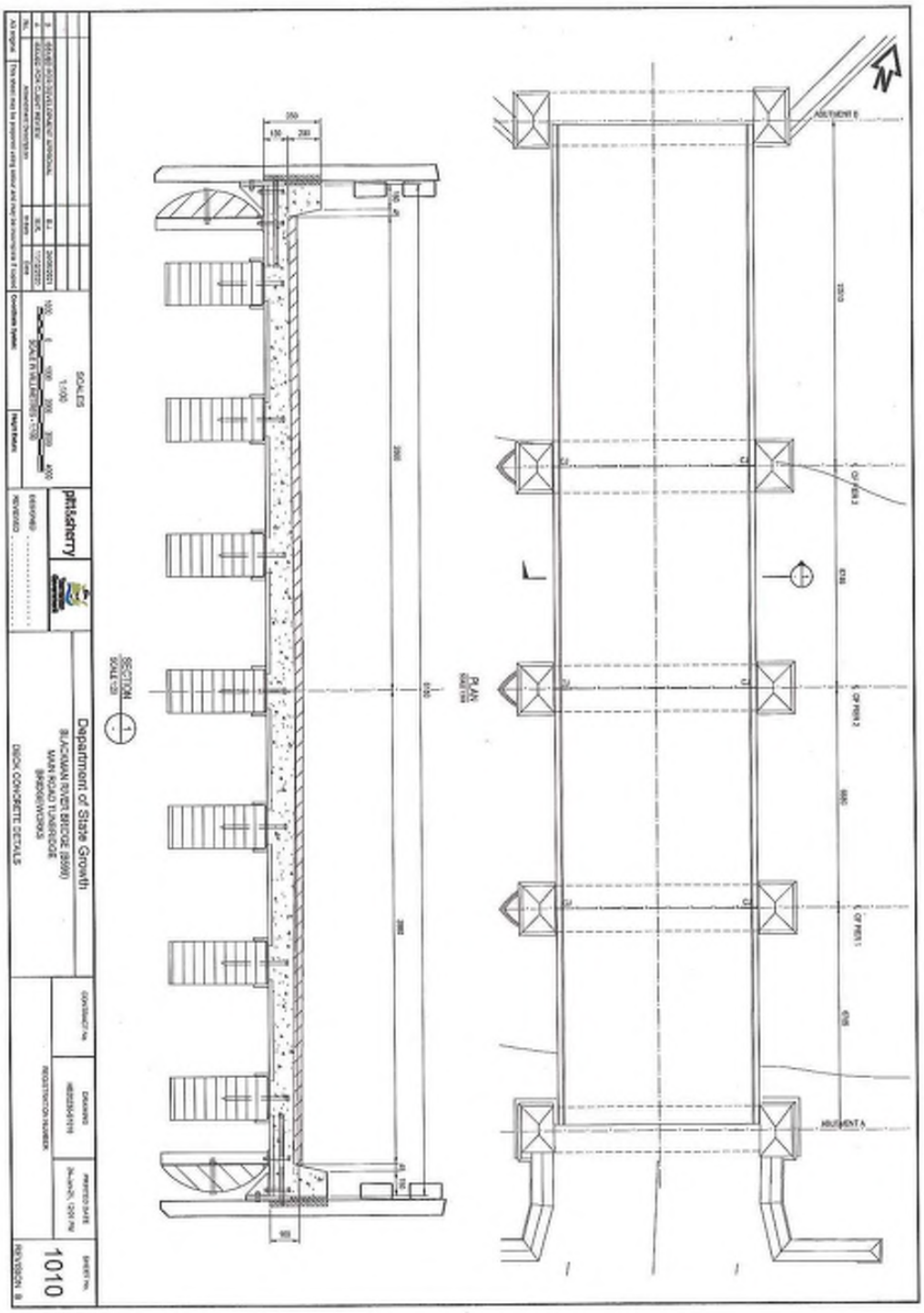
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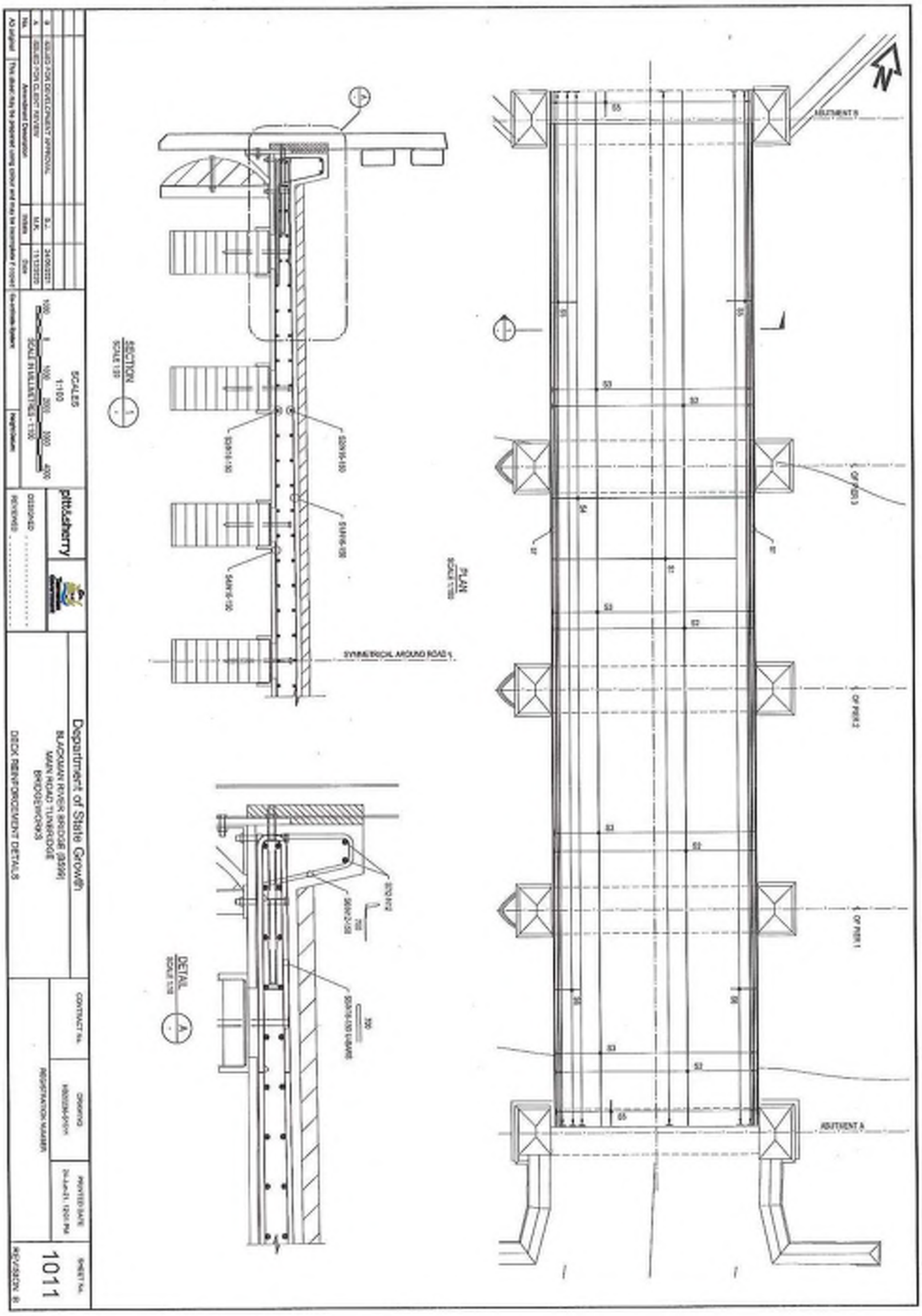
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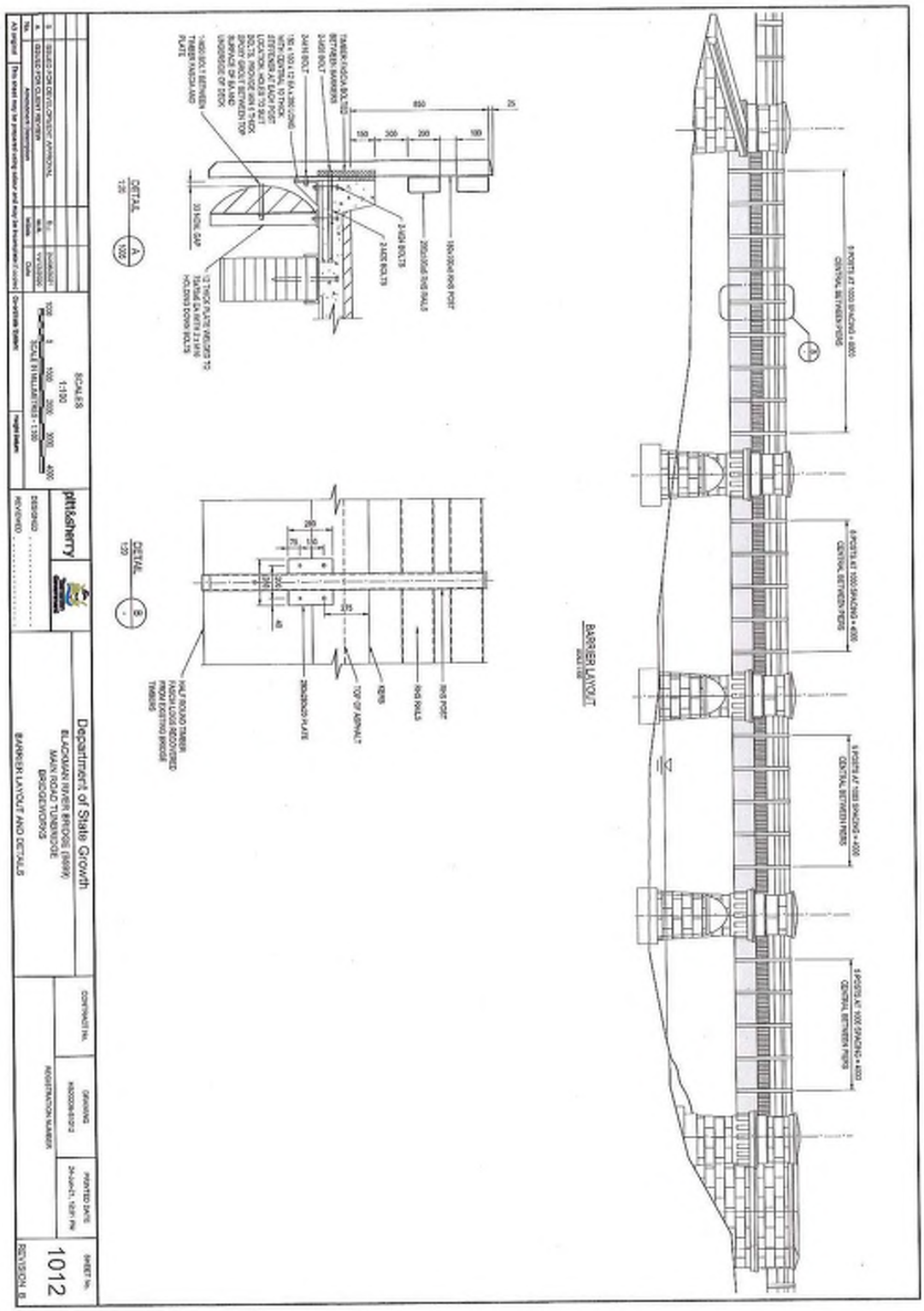
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BARRIER LAYOUT AND DETAILS
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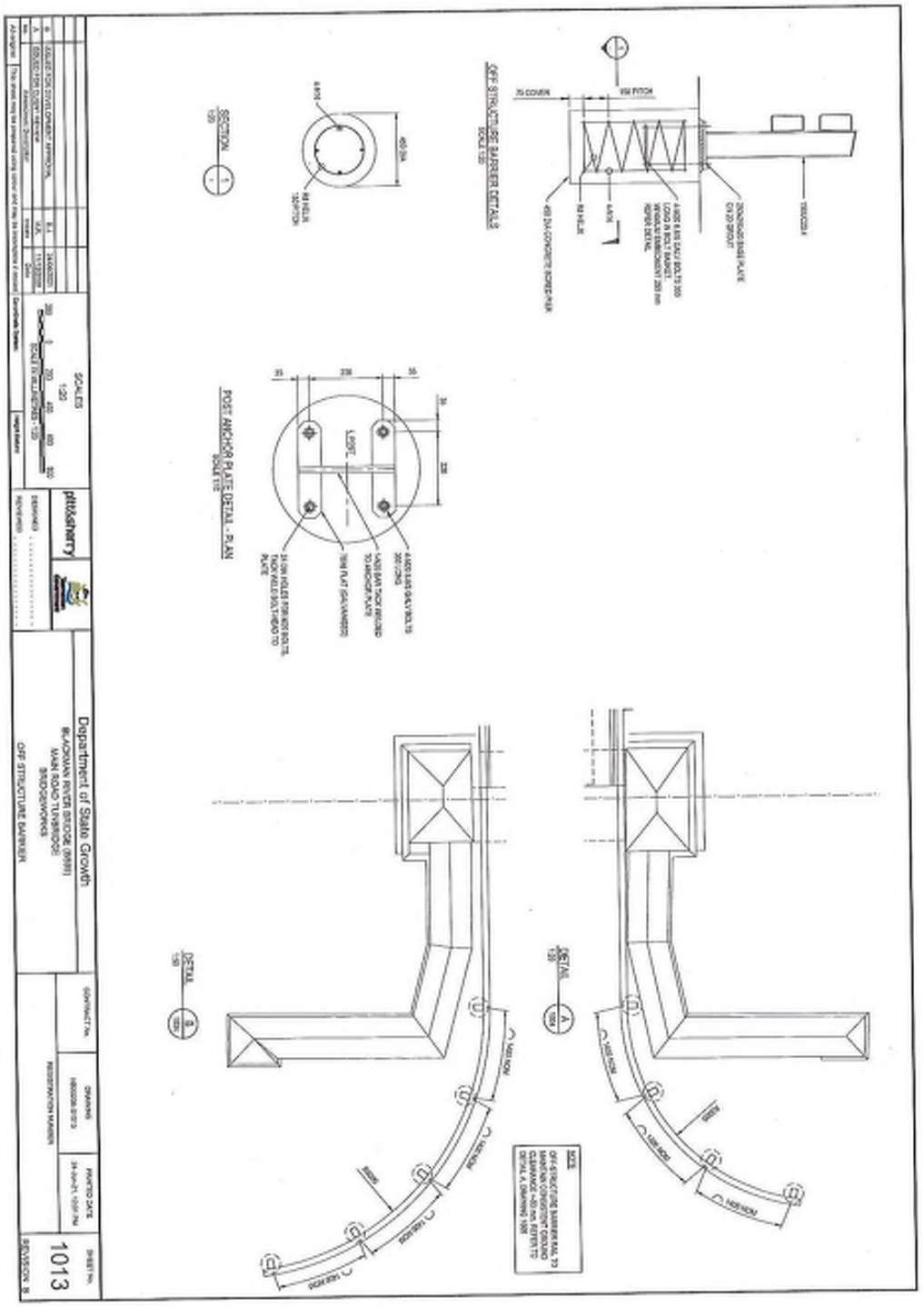
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DETAIL
EXHIBITED

APPENDIX 3: CONDITION ASSESSMENT REPORTS

pitt&sherry

Blackman River Bridge B599

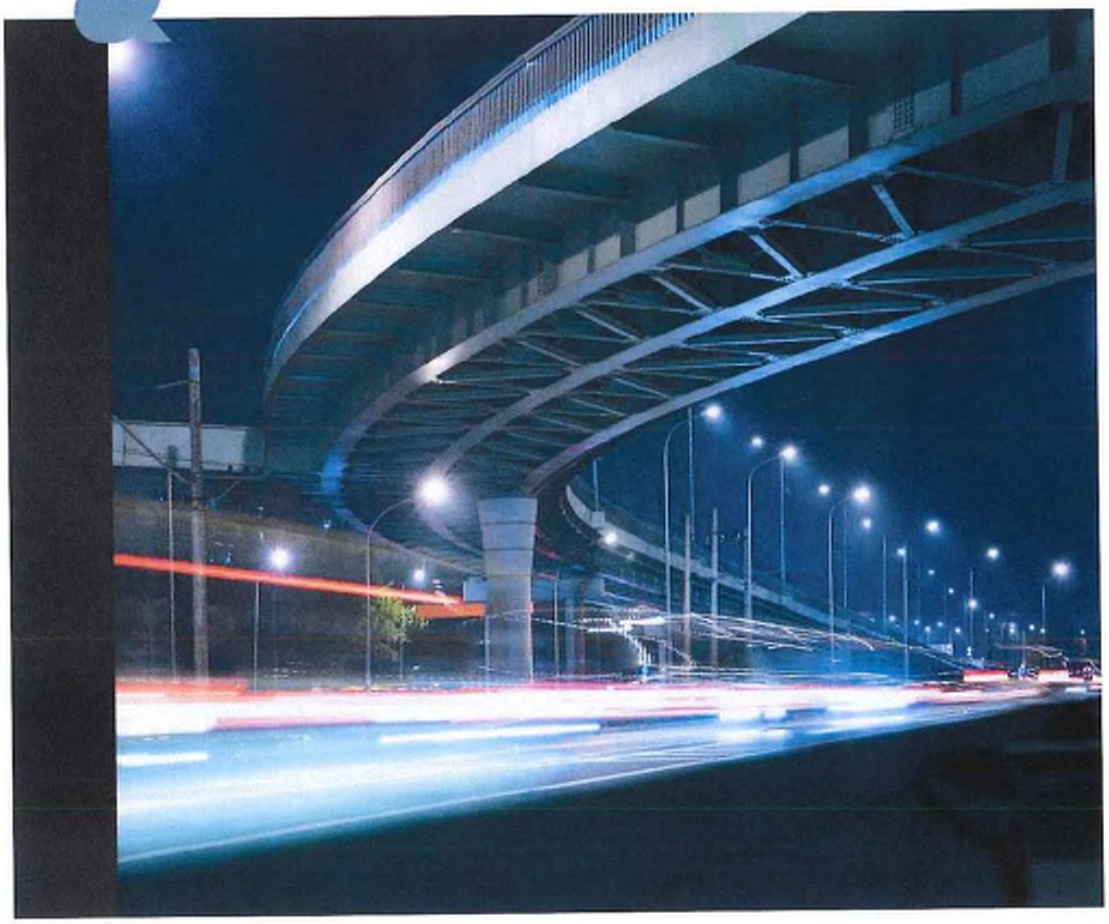
Structural Assessment

Prepared for
Department of State Growth

Client representative
Darren McConnon

Date
13 May 2021

Rev00



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Prepared by — Bjorn Jensen	Bjorn Jensen	**Date — 13 May 2021**
Reviewed by — Noel Carroll		**Date — 13 May 2021**
Authorised by — Richard Cassidy		**Date — 13 May 2021**

ref: T-P.20.0707.003-STR-REP-001/BHJ/mjs

Revision History

Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
00	Client Issue	B. Jensen	N. Carroll	R. Cassidy	13/05/2021

ref: T-P.20.0707.003-STR-REP-001/BHJ/mjs

1. Introduction

The Blackman River Bridge at Tunbridge (Department of State Growth bridge number B599) is located at the northern end of the township, on the boundary between the LGA's of Southern Midlands Council (SMC) and Northern Midlands Council (NMC).

Due to the current condition of the bridge, Department of State Growth (DSG) commissioned pitt&sherry to provide engineering design support for a significant refurbishment. Following discussions with the two councils in late 2020, SMC requested that a Conservation Management Plan (CMP) be prepared for the bridge. At DSG's request, pitt&sherry engaged Austral Archaeology to prepare the CMP.

This report is a necessary input to the CMP.

2. The Bridge

The first iteration of the present Blackman River Bridge at Tunbridge was constructed in June 1848[1]. Initially the bridge consisted of a 3-span (equal span lengths) timber bridge with sandstone abutments and piers[2]. Between 1894 and 1897, the bridge was modified to its current arrangement, whereby the northern sandstone abutment was converted to a pier and a new abutment was constructed to create an additional span.

Figure 1 shows the location of the bridge.

Figure 1: Location of bridge (Source: LISTmap, 2021)

[1] Peter Spratt, *Blackman River Bridge, Tunbridge – Detailed Fabric Assessment*, April 2021
[2] Roy Smith, *Early Tasmanian Bridges*, 1969, Foot & Playsted

Figures 2 to 4 are images of the extant bridge and are sourced from *Blackman River Bridge (B599), Renewal of Timber Superstructure and Barriers – Concept Design Report*, pitt&sherry, October 2019.

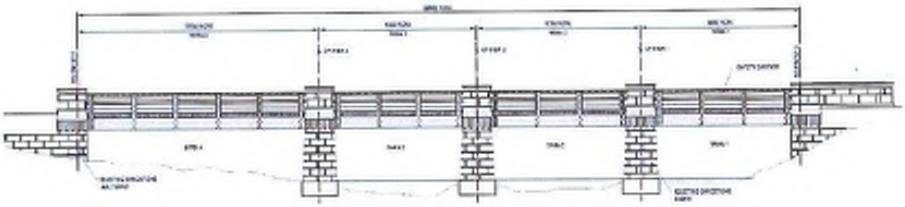

Figure 2: Elevation of existing bridge

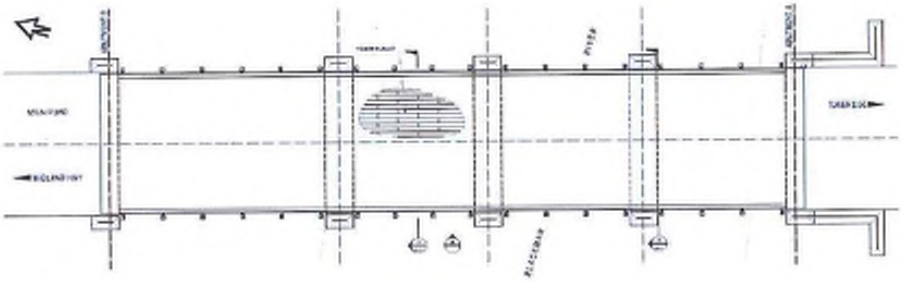

Figure 3: Plan of existing bridge

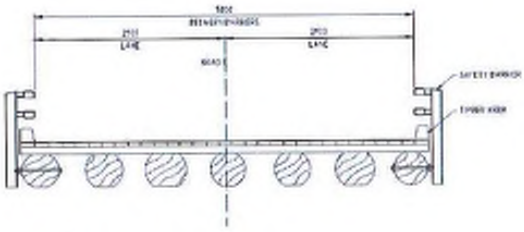

Figure 4: Cross-section of existing bridge

Since its construction, the timber and sandstone portions of the bridge have required regular maintenance and repair activities[3]. These include the following:

- Timber decking and fencing replaced 1879
- Major repairs in 1894
- Repairs in 1906-7
- Various timbers girder, decking and rails replaced between 1914-19
- Bridge declared unsafe in 1922
- Various girders and decking planks replaced between 1922-28
- Urgent repairs to bridge deck in 1933
- Decking partially replaced in 1935
- Stone abutment damaged by truck in 1938
- Extensive repairs and replacement of timber girders and decking as well as sandstone repairs between 1943-51
- More girders and decking replaced between 1956-61
- Temporary propping was installed to allow heavy loads to cross in 1962
- Permanent propping installed in 1966-67
- Damaged stonework (due to vehicle impacts) repaired in 1972
- Decking replaced in 1994
- Seven girders replaced in 2007-08; and
- The bridge was narrowed to reduce load on a damaged girder in 2014-15.

Following a report[4] prepared for DSG in 2018, the bridge was found to be unsuitable for traffic due to timber rot and was subsequently closed to all users. The bridge continues in this state to the present day.

3. Structural Assessment

This report seeks to examine the ability of the existing bridge to be reused for future ongoing use.

3.1 Timber Superstructure

From the findings of the January 2018 pitt&sherry letter, the timber superstructure is considered unsuitable for vehicular loads in its present state.

This viewpoint was further reinforced following several more recent visits to the site by pitt&sherry staff including in August 2020, December 2020 and April 2021. It is apparent that the timber rot in the beams and deck planks is progressing, as indicated in Figure 5 below.

[3] *Blackman River Bridge, Tunbridge – Historic Heritage Impact Assessment* – Austral Tasmania April 2015
[4] *B599 Blackman River Bridge Inspection Post Fire* – pitt&sherry letter to Aaron Percy – 15 January 2018

Figure 5: Condition of girder - northern span, western external girder

A series of holes drilled into various girders indicated that the rot extends, in layers, to at least 125 mm inside the girders. Although some girders are in better condition than others (in particular the internal girders are generally in better condition than external girders), all show signs of rot.

The timber spreader beams, which sit on the top of the piers and abutments and support the main girders, are deeply rotted. Due to the rot, these beams are, in places, collapsing under the weight of the superstructure above. Refer to Figure 6 below, where the spreader beam at the southern abutment is seen to be folding under load.

Figure 6: Timber girders and spreader at southern abutment

Similarly, the deck of the bridge is in very poor condition, as shown in Figure 7 below. Many top layer deck planks are missing. In some places, both layers of the deck planks are holed and the river below is visible through the deck.

Figure 7: Deck condition

With the foregoing observations and in consideration of the previous reports, this report will not attempt to assess the load carrying capacity of the existing timber superstructure. It is assumed that the existing superstructure will be fully replaced as part of any future remediation as it does not appear economical to reuse any parts of it.

3.2 Sandstone Substructure

The sandstone substructure is in good condition. The sandstone blocks are solid and there is no evidence of significant movement or cracking in the abutments or piers, despite their use for over 170 years.

An inspection involving Peter Spratt, Edrei Stanton (Tasmanian Heritage Masonry) and Bjorn Jensen (pitt&sherry) on 1 April 2021, found that some repairs of jointing and blockwork are necessary, particularly to the sandstone columns. Nonetheless, the load carrying capacity of the sandstone piers and abutments is assessed to be fully intact. Figure 8 and Figure 9 below show examples of the sandstone substructure and its condition.

Figure 8: Southern face of the southern pier 1

Figure 9: Face of northern abutment

Advice obtained from Peter Spratt[1], utilising his extensive database of Tasmanian sandstones, indicates that the unconstrained compressive strength of the sandstone used at this bridge is likely to be in the order of 15 MPa.

During the April 2021 inspection, an assessment of the founding conditions was made. The existing condition of the piers and abutments lacked cracking, rotation or other signs of movement after more than 170 years of service; this is a primary indication that the founding conditions are good.

The southern abutment clearly sits directly on solid bedrock. Likewise, solid rock was observed around the northern abutment and northernmost pier. The area adjacent to the two southern piers is underwater and cannot be directly viewed. This area was sounded using a long steel rod and solid rock was typically indicated at 0.5 to 0.75 m below water level.

Given the above observations, it is our opinion that the existing sandstone abutments and piers are founded on solid rock and have capacity to carry the significant vertical and horizontal loads into the future.

3.3 Loading

3.3.1 Vertical loading

The current Australian Standard for bridges, AS5100, specifies several loading configurations. In addition, DSG regularly assesses existing Tasmanian bridges using other more typical heavy truck loads.

The application of vehicular loading is dependent on roadway width, as wider roads are capable of carrying 2 or more lanes of vehicles.

The width of the bridge roadway is currently approximately 5.8 m between barriers (refer to Figure 4). AS5100.2 (*Bridge Design – Part 2: Design loads)* proscribes a "design" lane width of 3.2 m, thus the existing bridge is capable of carrying only a single design lane of vehicles.

The *Standard* recommends the use of a quasi-realistic truck load known as M1600 for bridges with span lengths in the range of those at the Blackman River Bridge (refer to Figure 10).

Whilst the M1600 load is highly unlikely to ever traverse the bridge, we propose to assess the sandstone substructure for this load arrangement, as that is considered to be a conservative approach.

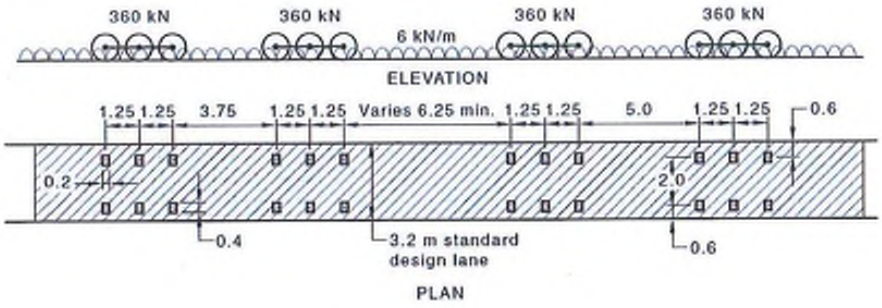

Figure 10: M1600 design vehicle load (Source: Australian Standard AS 5100.2-2017)

3.3.2 Horizontal Loading

Horizontal loading generally consists of two possible components, stream flow and braking and/or centrifugal loads.

Horizontal transverse forces due to stream flow are unlikely to significantly change into the future. Given the age of the existing structure, it has undoubtedly withstood a wide range of stream flow scenarios within its lifetime.

The consideration of horizontal loads due to centrifugal forces is not necessary for this structure, as it is not positioned on a curve.

The possibility exists for braking forces on the bridge. In accordance with AS5100.2-2017, an unfactored design braking force of 325 kN is proposed.

3.4 Structural Assessment of sub-structure

For brevity, this report considers only the load effects at the northernmost pier. Pier 3 receives the highest forces as it supports the 10.05 m span and a 6.5 m span.

The load factors to be added to this vehicle load case, along with dead load, are as shown in Table 1.

Table 1: Applicable Load Factors

	Dynamic Load Allowance*	Ultimate Load Factor
M1600 vehicle load	0.3	1.8
Dead load	0	1.2

* DLA applied only to vertical loads

3.4.1 Vertical Forces

The calculated total unfactored vertical load at the pier due to the M1600 vehicle is 590 kN. Thus, the factored ultimate load is 1380 kN. Given the spacing of the bridge girders, this load is conservatively estimated to be distributed over the equivalent of 3 beams, or 2 m width.

Over the same width, the total ultimate dead load (assuming a future concrete deck on timber beams) is estimated to be 225 kN over a 2 m width.

Hence, over the estimated 2 m width, the pier experiences an ultimate vertical load of 1605 kN = 802 kN/metre equivalent loading on the pier top surface. Assuming that this loading can be distributed reasonably evenly to the top of the pier (approximately 1.2 m wide), the loaded ultimate pressure on the top of the pier is in the order of 0.7 MPa, which is significantly less than the assumed UCS of the stone noted in Section 3.2 above. This force will spread further as it descends through the sandstone pier to the foundation rock below. Hence, in terms of carrying vertical load, the existing piers are assessed to be sufficient for future heavy vehicle loading.

Any future superstructure replacement should account for adequate load spreading from the beams into the top of the sandstone piers and abutments. Currently this is achieved by means of timber spreader beams, however the ongoing use of this same timber is clearly unsatisfactory given the amount of rot noted whilst on site. Alternative options may include timber of a more durable nature, galvanised steel or a cast in situ concrete spreader (with due consideration given to preventing moisture from accumulating at the concrete/sandstone interface).

3.4.2 Horizontal Forces

Horizontal forces due to stream flow are considered to be adequately carried by the existing piers and abutments. Given the range of stream flow forces these elements have carried in the past 170 years, without apparent degradation, it is unlikely that future forces will exceed the capacity of the sandstone substructure.

Braking forces are resisted by a combination of passive soil pressure at one abutment, along with sliding/overturning resistance at piers and abutments. The factored design braking force is 585 kN. The factored resistance to the braking forces due to the combined actions of the substructure (passive soil resistance and overturning) is estimated to be in the order of 765 kN (of which 740 kN is attributable to overturning and 35 kN is attributable to passive soil resistance). These figures are considered to be conservative in that they do not take into account the contribution of the wing walls, the mass of the columns above the deck level or mass of the vehicle itself. The sliding capacity resistance (sandstone on sandstone) is greater than the overturning resistance. These calculations assume that the deck is a monolithic structure, capable of efficient horizontal load transfer.

3.5 Traffic barriers

The Australian Standard AS5100.1 defines road barriers categories. Given the situation of this bridge, "Low performance level" barriers are considered necessary.

It is noted that, over its life, the sandstone columns projecting above the substructure of the existing bridge have been struck and moved several times by vehicular traffic. Hence it would seem that traffic barriers could serve a useful purpose both in terms of traffic safety and protection of the historic structure.

The existing traffic barriers are of timber construction and are attached to the timber deck. The barrier rails terminate each side of the sandstone columns and thus currently provide no protection to the columns. By inspection, the capacity of the existing timber barriers is not sufficient to carry the loads required for "Low performance level" barriers in accordance with the *Standard*. Neither the posts, the rails, nor the connection of the posts to the bridge deck are considered satisfactory. The barriers as constructed would likely not prevent an errant vehicle, especially not a heavy vehicle, from breaking through and plunging into the river below.

It is recommended that the existing barriers be replaced with other barriers capable of higher load capacity. Depending on the final deck configuration chosen, it may be difficult to fully achieve compliance with the "Low performance level" barrier requirements, but additional capacity, and a design that carries the rail past the sandstone columns, would significantly improve public safety and assist in the preservation of the historic structure.

Any design of future barrier will need to confirm that the additional strength or stiffness of the barrier does not have unintended negative consequences for the sandstone substructure. These may include the transfer of additional load to the substructure, resulting in sliding and/or shearing of the sandstone.

4. Conclusion

At over 170 years old, the Blackman River Bridge at Tunbridge is a significant historic structure. Nonetheless, during its lifetime, the timber portions of the bridge have been fully replaced several times. The sandstone components have been repaired in some places but are largely in their original form. Each time the timber portions of the bridge have required replacement, the serviceability of the structure has been impacted for a period of time until the bridge could be returned to a safe condition (i.e. load carrying capacity reduced or bridge completely closed, as at present).

The existing timber structure, including the existing traffic barriers, is unfit for purpose in nearly all aspects. The bridge is currently closed to both vehicles and pedestrians and this is justified due to rotting girders and rotting or missing deck planks. It is recommended that all timber components of the bridge be replaced.

The sandstone sub-structure of the bridge is in very good condition given its age. There is no evidence of structural degradation in the sandstone sub-structure, although we note that the recent *Detailed Fabric Assessment*, recommends that preventative maintenance should be carried out to the sandstone elements.

The sandstone sub-structure, along with its foundations, is considered to have adequate vertical strength to carry contemporary loads. The design of any superstructure replacement should provide for adequate spreading of loads under beams, preferably using a structural material that is more degradation resistant than the existing timber spreader beams. The use of in situ cast concrete spreaders would not only allow such load spread but also permit the top of the piers and abutments to be well tied together, thus reducing the risk of future movement degrading the sandstone. It will be necessary to give careful consideration to avoiding future degradation to the sandstone by preventing the movement of moisture.

The sandstone substructure has sufficient capacity to resist expected horizontal loads due to stream flow and vehicles braking.

The existing timber traffic rails are unfit for purpose and should be replaced as part of any future superstructure replacement. Future "Low performance level" barriers may not fully comply with Australian Standards or DSG requirements but should provide the best outcome possible for traffic safety and protection of the sandstone bridge columns.

In summary, it is our opinion that the existing sandstone substructure has sufficient capacity to carry contemporary traffic loads, but that special consideration should be given to the design of the interface between the superstructure and the piers/abutments to prevent long term damage to the sandstone. The sandstone substructure, along with any future superstructure, should continue to be inspected regularly to allow early intervention should degradation become evident.

pitt&sherry

Blackman River Bridge B599
Structural Assessment

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Located nationally —
Melbourne
Sydney
Brisbane
Hobart
Launceston
Newcastle
Devonport

ref: T-P.20.0707.003-STR-REP-001-Rev00\BHJ\mjs

PETER SPRATT
CONSULTING CHARTERED ENGINEER
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ABN 55 120 015 973

14th. April 2021

Ref No 7775

Mr Bjorn Jensen
Pitt and Sherry
Level 1 Surrey House
199 Macquarie Street
Hobart TAS 7001

Blackman River Bridge, Tunbridge
Detailed Fabric Assessment

Dear Sir,
I have, to your request, carried out the above assessment.
I visited the site on the 1st. April last and carried out a visual inspection with some fabric testing in your company and that of Stonemason Edrei Stanton.
I advise that –

1. Previous Assessments.
I have had reference to the following-

- Blackman River Bridge. Historic Survey Report to Department of Transport. Lindy Scripps 1996.
- Blackman River Bridge, Heritage Assessment of Superstructure Replacement. Peter Spratt. June 2014.
- Blackman River Bridge, Historic Heritage Impact Assessment. Austral Archaeology. April 2015.
- Blackman River Bridgeworks- Concrete Slab Design Plans. Pitt and Sherry December 2020.
- Request for Additional Information. Southern Midlands Council December 2020.

2. Bridge Alterations

- The original bridge, of timber, was constructed in June 1841 and was damaged by a fire leading to a lengthy period of dilapidation until 1848 when the first iteration of the present sandstone foundation/timber girder planked deck bridge was constructed.
- The present four span bridge has sandstone abutments and three piers with superstructure of longitudinal timber beams supporting a timber planked deck set across the beams with longitudinal planks forming the roadway.
  There are large stone posts set on top of the piers.
- The first sandstone/timber girder bridge had only two piers giving three spans.
- From 1894 t0 1897 the bridge was altered to the 1889 specification-

  - the wing walls of the abutment on the Ross side to be taken down
  - a cutwater to be built to the existing abutment to match the other piers
  - excavation of the embankment for new abutment
  - a new abutment and wingwall to be built using the stone obtained from the demolition of the existing wing walls and to correspond with the old work

- two columns to with caps to correspond with the old ones
- two plates 10" x 3" x 23 feet long to be fixed on new pier and abutment to carry girders
- the seven girders to be 18" x 10" x 35 feet long and placed similarly to the old ones
- the decking to comprise planks 6" x 4" fastened to the girders with 8" spikes.
- a fence to be erected to the new span with 5" x 3" rails let into the stonework
- both old and new sections of the fence to be painted
- the girders to receive protective coatings of chenam and tar
- gravel boards to be laid on the whole length of deck with metal laid in between [see Appendix 1 for complete specification][2]

- Periodic replacement of rotted timbers has been necessary to the present day.
- In 1940, following a number of motor vehicle impacts, it was found necessary to repair cracked post stones, rebuild a south side post and pull three posts back into alignment.
- In 1943 the fourth span was given 5 timber piles at midspan to support the rotted girders.
- In 1951 work was carried out as -
  - filling in the centre of the upstream centre cap and replacing the back flagstone block
  - repairing the upstream intermediate cap and refacing the corners with sandstone rendering
  - reassembling the downstream pier and cap and replacing in its original position
  - refacing with rendering sections of the abutment on the southern side.
- In1962 the bridge was temporarily tommed to allow for a heavy load and in 1996-7 concrete and steel toms were placed under each span.
- In 1972 further vehicle damage repairs to the posts were carried out with some stones replaced.
- The toms were removed in 1983.

3. Assessment of Alterations

The original section of the bridge is the Eastern abutment but it appears to have been raised as indicated in photographs 6 and 9 below. This aligns with the 1889 specification requiring level adjustments.
The three present piers are not equally spaced. It is unknown as to whether the present spacing reflects foundation conditions, which pier has been inserted or whether new piers were constructed.
The piers were not mentioned in the 1889 specification.
The western abutment and its wing wall are an 1894-97 construction.

The original design of a timber girder bridge with longitudinal timber planked deck has been kept.
The bridge construction using timber has never been satisfactory with a record of continuing timber replacement at regular short intervals due to rot.
The massive stone posts have a record of damage, of movement and repairs due to motor vehicle impact.
The bridge load capacity has been severely impacted over its life due to timber rot with consequent usage limitations being imposed.
Tasmanian structural timbers are of low durability Class 4 giving an effective life span of only 5 years in harsh conditions. This compares with the 50 year durability of Class 1 timbers, such as Blackbutt and Ironbark, in other Australian States.

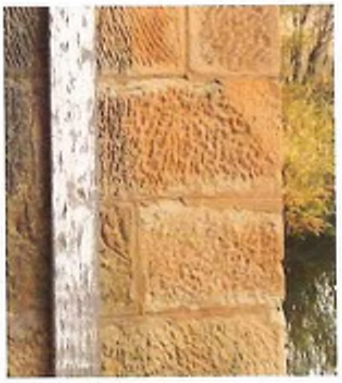
4. Inspection Observations
The following comments are illustrated by photographs 1-10.

- Trial drilling of stretcher pier stones shows them to be 370 thick with a small gap to other stone. There are full pier header stones under the posts suggesting that the piers have full width headers with little rubble infill between stretchers giving good solid construction.

View of full width header stone in pier.

Photograph 1.

- Drilling through bed joints in the piers shows the bedding is site soil with very little quicklime. This was common practice at the time but gives no bond strength and little resistance to washout with water entry following pointing loss.
- There is no structural cracking and no defects requiring attention in the piers and abutments other than the pointings.
- Pointing of stonework is a mix of good quality quicklime and later cement. There is substantial pointing loss in all stone faces.
- There is some damage from water retention and fretting where cement mortars have been used and replacing these mortars in fretting locations is warranted

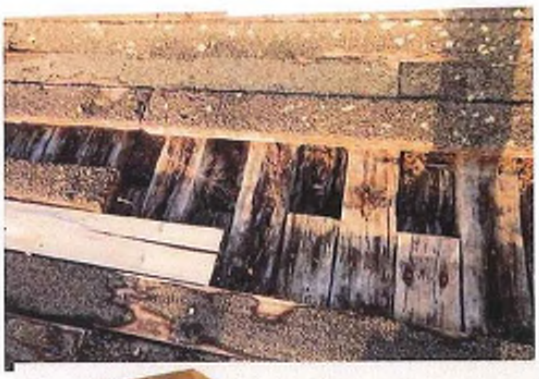


Fretting at cement pointing.

Photograph 2.

- There is severe rot in all deck timbers and drilling of the girders shows severe internal rot.

  Photograph 3.



- All of the posts exhibit horizontal movements consistent with the historical record of vehicle impact. The posts have been altered with removal of supporting edge stones to allow for the insertion of the timber girders.

  Photograph 4.

- Concrete has been placed around some girders to support the cut back post edge. The work is clearly inadequate.

  Photograph 5.

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- The change in stone heights on the eastern abutment suggests an alteration in adding height with a later extra height stone course.

  Photograph 6.

- There is significant rainwater runoff onto the eastern abutment.

  Photograph 7.

- Cracked and previously repaired post cap stone.

  Photograph 8.

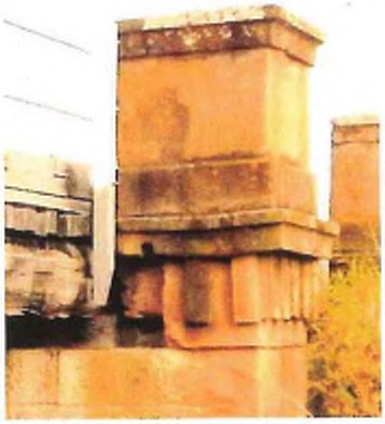
5

- View of eastern abutment, northern wall. Previous extensive stone fretting from rising damp due to downhill water runoff has been controlled by an air vent drain installed by Spratt around 8 years ago. Note stone height change.

  Photograph 9.

- This post is recorded as being render repaired in 1940 after vehicle damage. It is severely cracked and distorted. It has no visible cracking to the render but will have no strength.

  Photograph 10.



5. Strength of Tasmanian Sandstones

Compression The typical compressive strength of Tasmanian Sandstones is 60 MPa.
Tension Measured by - Dry Point Load Strength Index. (I_s) on 50dia.x50 specimens.
This is a good criteria for durability and varies widely in Tasmanian Sandstone.

Examples	Plummers Quarry	0.25MPa
	Tea Tree	1.13
	Ross	0.64
	Campania	0.31
	Waterworks	0.91
	Knocklofty	2.42
	Oatlands	0.90
	Melton Mowbray	1.51

I suggest the Ross data as best choice for the area.
Source - Sharples, Green, Spratt, Banks - Tasmanian Building Sandstones Vol 2. Dept of Mines Tas Unpub. Report September 1984

This source gave the Uniaxial Compressive Strength (UCS), as =24X I_s=15.36 for Ross.
The data and testing is 1984 and recent work has shown large errors may occur.
The (UCS), from recent testing, varies from 15-24x I_s giving large inaccuracy.
Current practice, for accuracy, is to measure the UCS directly and this is recommended.

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6. Recommendations

The bridge is to have a major overhaul with new deck designed and constructed for a long life span.
This warrants remedial works to the sandstone abutments and piers to match this lifespan.

Making good the sandstone requires works as –

1. Replace and make good missing, defective and cracked stonework to posts.
2. Reface stonework on eastern abutment where face fretting exceeds 15mm.
3. Remove cement pointings where fretting is occurring.
4. Make good defective pointings in piers and abutments.

Cost Estimate

The costs are subject to uncovery to determine unknowns and no detail work has been done.
The estimate is subject to the above, is preliminary and suitable only for budget purposes.
Based on similar works I expect costs to be-

	$95,000
Contingency	$9000
Fees	$7000
GST	$11,000
TOTAL	**$122,000**

Yours faithfully,

PETER SPRATT AM

pitt&sherry

DA 2020/145 - Alterations to Blackman River Bridge Tunbridge
Additional Information Response

Contact

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Sydney
Brisbane
Hobart
Launceston
Newcastle
Devonport

ref: HB20236 PLA-REP Additional information NMC/author/wp

SOUTHERN MIDLANDS COUNCIL

Our ref: **No PID available Blackman River Bridge Tunbridge**

09 June 2022

Pitt & Sherry
GPO Box 94
HOBART TAS 7000

Dear Sir/Madam

Amendment to Planning Permit No DA 2020/145
Alterations to Bridge
Blackman River Bridge Tunbridge

* Amended Permit dated 09 June 2022 – Issued in accordance with TASCAT decision 29/21P.

The Permit relates to the development and use of the land irrespective of the applicant or subsequent occupants and whoever acts on it shall comply with all conditions attached thereto.

Should you wish to discuss the above further please contact me on 6259 3011.

Yours faithfully

Louisa Brown
Planning Officer
Development & Environmental Services

Phone (03) 62545056 (direct line)
lbrown@southernmidlands.tas.gov.au

Address all correspondence to: The General Manager, PO Box 21, Oatlands, Tasmania 7120
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Email Address: mail@southernmidlands.tas.gov.au Web: www.southernmidlands.tas.gov.au
ABN 68 653 459 589

SOUTHERN MIDLANDS COUNCIL

Our Ref:No PID available Blackman River Bridge Tunbridge
DA 2020 / 00145

09 June 2022

Pitt & Sherry
GPO Box 94
HOBART TAS 7000

Dear Sir/Madam

Amendment to Planning Permit Nº DA 2020/145 Alterations to Bridge
Blackman River Bridge Tunbridge

***Amendment dated 09 June 2022 -** Amended Permit Issued in accordance with TASCAT decision 29/21P

Council has issued this Permit, subject to the conditions set out below, for the development and use Alterations to Bridge at the land situated at Blackman River Bridge Tunbridge and described as Certificate of Title 214293/14 and submitted by Pitt & Sherry obo Department of Primary Industries, Park, Water & Environment.

This Permit will lapse after a period of two (2) years from the date on which it was granted if the use or development in respect of which it was granted has not substantially commenced within that period.

CONDITIONS

The use or development must be carried out substantially in accordance with the application for planning approval, the endorsed drawings and reports and with the conditions of this permits must not be altered or extended without the further written approval of Council.

Amendment

1) Amended Permit, Condition 4 – Issued in accordance with TASCAT decision 29/21P

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SOUTHERN MIDLANDS COUNCIL

Blackman River Bridge Tunbridge
DA 2020/145

Discretionary
Heritage Place

PLANNING PERMIT Nº DA 2020/145
Alterations to Bridge
Blackman River Bridge Tunbridge

Council has issued this Permit, subject to the conditions set out below, for the Alterations to Tunbridge Bridge (Blackman River Bridge) at the land situated at Blackman River Bridge Tunbridge, as described and submitted by Pitt & Sherry obo Southern Midlands Council.

This Permit will lapse after a period of two (2) years from the date on which it was granted if the use or development in respect of which it was granted has not substantially commenced within that period.

CONDITIONS

General

1) The use or development must be carried out substantially in accordance with the application for planning approval, the endorsed drawings and with the conditions of this permit and must not be altered or extended without the further written approval of Council.
2) This permit shall not take effect and must not be acted on until 15 days after the date of receipt of this letter or the date of the last letter to any representor, whichever is later, in accordance with section 53 of the Land Use Planning and Approvals Act 1993.

Heritage

3) That the installation of a **concrete deck is not approved**. Specifications for a timber deck must be provided to the satisfaction of Council's Planning Officer prior to the commencement of works. If possible, this is to be constructed by traditional methods using Australian hardwood, however an alternative methodology may be considered provided that timber is the predominant material.

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4) That the steel railings must be of a specification and an assessment of their potential to negatively impact upon the stone bridge abutments and pylons must be undertaken further to Section 3.5 of the Blackman River Bridge Structural Assessment (Pitt & Sherry 13/5/2021). Specifications to achieve this must be provided to the satisfaction of Council's Planning Officer prior to the commencement of works.

5) The recommendations for sandstone repair/conservation of Section 6 of the Blackman River Bridge, Tunbridge, Detailed Fabric Assessment (Peter Spratt, 14/4/2021) must be implemented as part of any superstructure renewal works.

Heritage Tasmania

6) Compliance with any conditions or requirements of the Tasmanian Heritage Council in the attached 'Notice of Heritage Decision' No. 6420 dated 24 August 2021 (as attached).

Environmental Management Plan

7) The applicant shall provide Council with an approved copy of the Environmental Management Plan.

Services

8) The developer must pay the cost of any alterations and/or reinstatement to existing services, Council infrastructure or private property incurred as a result of the development. Any work required is to be specified or undertaken by the authority concerned.

Protection of Water Quality

9) Before any work commences a soil and water management plan (SWMP) prepared in accordance with the guidelines *Soil and Water Management on Building and Construction Sites*, by the Derwent Estuary Programme and NRM South, must be approved by Council's Development and Environmental Services before development of the land commences (refer to advice below). The SWMP shall form part of this permit when approved.

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10) Before any work commences install temporary run-off, erosion and sediment controls in accordance with the recommendations of the approved SWMP and maintain these controls at full operational capacity until the land is effectively rehabilitated and stabilised after completion of the development in accordance with the guidelines *Soil and Water Management on Building and Construction Sites*, by the Derwent Estuary Programme and NRM South and to the satisfaction of Council's Development and Environmental Services.

Construction Amenity

9) The development must only be carried out between the following hours unless otherwise approved by the Council's Manager of Development and Environmental Services:

Monday to Friday	7:00 a.m. to 6:00 p.m.
Saturday	8:00 a.m. to 6:00 p.m.
Sunday and State-wide public holidays	10:00 a.m. to 6:00 p.m.

10) All works associated with the development of the land shall be carried out in such a manner so as not to unreasonably cause injury to, or prejudice or affect the amenity, function and safety of any adjoining or adjacent land, and of any person therein or in the vicinity thereof, by reason of:

a. Emission of noise, artificial light, vibration, odour, fumes, smoke, vapour, steam, ash, dust, waste water, waste products, grit or otherwise.
b. The transportation of materials, goods and commodities to and from the land.
c. Obstruction of any public footway or highway.
d. Appearance of any building, works or materials.
e. Any accumulation of vegetation, building debris or other unwanted material must be disposed of by removal from the site in an approved manner. No burning of such materials on site will be permitted unless approved in writing by the Council's Manager of Development and Environmental Services.

11) Public roadways or footpaths must not be used for the storage of any construction materials or wastes, for the loading/unloading of any vehicle or equipment; or for the carrying out of any work, process or tasks associated with the project during the construction period.

12) The developer must make good and/or clean any footpath, road surface or other element damaged or soiled by the development to the satisfaction of the Council's Manger of Works and Technical Services.

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The following advice applies to this permit:

A. This Planning Permit is in addition to the requirements of the *Building Act 2016*. Approval in accordance with the *Building Act 2016* may be required prior to works commencing. A copy of the *Directors Determination – categories of Building Work and Demolition Work* is available via the Customer Building and Occupational Services (CBOS) website.

B. If you notify Council that you intend to commence the use or development before the date specified above you forfeit your right of appeal in relation to this permit.

C. This planning approval shall lapse at the expiration of two (2) years from the date of the commencement of planning approval if the development for which the approval was given has not been substantially commenced. Where a planning approval for a development has lapsed, an application for renewal of a planning approval for that development shall be treated as a new application.

D. Appropriate temporary erosion and sedimentation control measures during construction include, but are not limited to, the following -
    a. Minimise site disturbance and vegetation removal;
    b. Diversion of up-slope run-off around cleared and/or disturbed areas, or areas to be cleared and/or disturbed, provided that such diverted water will not cause erosion and is directed to a legal discharge point (e.g. temporarily connected to Council's storm water system, a watercourse or road drain);
    c. Sediment retention traps (e.g. sediment fences, straw bales, grass turf filter strips, etc.) at the down slope perimeter of the disturbed area to prevent unwanted sediment and other debris escaping from the land;
    d. Sediment retention traps (e.g. sediment fences, straw bales, etc.) around the inlets to the stormwater system to prevent unwanted sediment and other debris blocking the drains; and
    e. Rehabilitation of all disturbed areas as soon as possible.

Dated 22 September 2021
*** Amended Permit dated 09 June 2022 – Issued in accordance with TASCAT decision 29/21P**

Louisa Brown
Planning Officer
Southern Midlands Council

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