

### 9.3 OLD GOULBURN RIVER BRIDGE - FUTURE WORKS

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**File No:** CM18/353

- Attachments:**
1. *Detailed Design for Pedestrian Structure*
  2. *Structural Timber Rehabilitation Plan*
  3. *Old vs. New Bridge Refurbishment Methodologies*
  4. *Cable Stabilisation Works*
  5. *Rehabilitation and Refurbishment Preliminary Cost Estimate*
  6. *Statement of Heritage Significance*
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### SUMMARY

To update Council on the progress of impending works to complete stabilisation works of the Old Goulburn River Timber Bridge structure.

This report also outlines the previous design work prepared for the future rehabilitation and re-use of the timber heritage structure and seeks approval from Council to re-engage with the community for the review and advancement of these designs.

**RECOMMENDATION****THAT** Council:

1. Progress work on the Old Goulburn River Bridge as per the project stages below;
  - a) Complete Stage 1 works to stabilise the timber structure.
  - b) Engage with the local community for the review of the bridge rehabilitation plan (as per Attachment 2) and the original refurbishment plan (as per Attachment 1) and revised refurbishment plan (as per Attachment 3).
  - c) In partnership with the community, review, update and finalise detailed design plans and costings for the rehabilitation and refurbishment of the bridge utilising the funding committed in the 2018-2019 Capital Works program.
  - d) Obtain a new permit from Heritage Victoria for the proposed works.
  - e) Continue to seek external grant funding for the rehabilitation and refurbishment works.
  - f) Stage 2 works – Rehabilitation of damaged and deteriorated timber elements (timing TBC subject to funding)
  - g) Stage 3 works – Refurbishment i.e. installation of new pedestrian structure and ancillary works (timing TBC subject to funding)

**BACKGROUND**Engineers Structural Assessment and Detailed Design

In 2007 an Engineers Report was prepared which assessed the structural condition of the timber structure and contemplated a plan to stabilise, secure and rehabilitate the Old Goulburn River Bridge with a view to potentially use the bridge as a pedestrian-only bridge at a future time.

The report identified the following stages of works to achieve this long-term goal;

- Remove damaged and decaying elements of the bridge including the existing bitumen road surface, timber decking, cross beams and guard rails
- Restoration and refurbishment of timber bridge components including piers, cross bracing and cross-head beams;
- Installation of a pedestrian-only bridge structure utilising two (2) of the seven (7) existing steel I-beam girders as well as salvaged decking timber deemed suitable for re-use.

In 2010 an Engineers specification and detailed design was prepared which detailed the above works. Following this, a Heritage Permit was issued in October 2010 which would allow Council to undertake these works.

An extract from this design package is shown in Attachment 1 depicting the general arrangement for the installation of a pedestrian bridge structure utilising the existing timber sub-structure (pier sets) and some reclaimed superstructure elements including steel girders and timber decking.

The extent to which public consultation was conducted for these designs is not known to officers.

#### 2014 Stabilisation Works

In June 2014 Council engaged a contractor to carry out works on the historic structure to stabilise and secure the bridge from further deterioration. These works involved the removal of the bridge superstructure including bridge decking and kerbing, guard railing, cross beams and the main steel I-beam girders.

As these works progressed, it became apparent that the bridge structure had deteriorated beyond the extents that were originally understood and that works could not progress due to safety concerns with the stability of the remaining structure.

Heritage Victoria also raised concerns with the methodology being used by the contractor to perform these works as it was inherently different to the methodology recommended in the 2007 Engineers Report. As a result, these works were suspended immediately.

Heritage Victoria subsequently requested that an updated Engineering inspection of the bridge be undertaken by GMR Engineering Services to establish the current condition of the bridge and whether the current refurbishment techniques and methodology were compatible with the state of deterioration of the structure and the current heritage permit.

#### 2015 Engineers Structural Assessment

In January 2015 GMR Engineering Services was engaged to undertake a structural assessment of the heritage bridge. The scope of these works was to:

- Determine the structural capacity of the remaining structure including piles and piers, through non-destructive condition assessments;
- Design review of the original refurbishment proposal as documented by GMR in 2007;

- Provide advice on the appropriateness of proceeding with this original refurbishment design with regard to the current condition and level of deterioration of the bridge and the existing heritage permit; and
- To give consideration to deploying an alternative refurbishment methodology with consideration for the current condition and level of deterioration of the bridge.

The Engineers report found that the bridge structure had deteriorated considerably since the last structural assessment in 2007. It found the deterioration is partly due to the continued natural decay of the various bridge elements, but also from the mechanical damage that resulted from a number of uncontrolled collapses of steel I-beam girders as part of the 2014 stabilisation works.

Despite the obvious visual degradation of some structural elements, the report also suggests that the majority of the pile x-sections are likely to remain intact and are structurally sound below water level and below ground level.

The report concludes that while many elements of the bridge remain sound, some elements of the previous refurbishment methodology may no longer be appropriate or applicable for this now weakened structure and an alternative methodology should be pursued.

Attachment 2 details the timber elements in need of replacement or rehabilitation in order for the timber structure to be deemed fit for re-use as a pedestrian bridge.

#### Design review of previous works methodology

The previous refurbishment design involved the re-use of the some of the existing steel beams, the cross beams and some of the timber decking. This refurbishment methodology would rely on the support provided by the remaining steel I-beam girders (2 girders to remain in place) to provide lateral support and restraint to the pier sets. Unfortunately, the progressive deterioration of the structure since the previous Engineers assessment has made that an unlikely proposition. The review concluded that very little (if any) of the superstructure (ie. beams, cross beams and timber decking) is now recoverable.

Further, the Engineers report found that the retention of these steel girders could be detrimental to the health of the bridge due to the sheer weight of the girders. The report concluded that if the existing refurbishment methodology were to be retained, the sub-structure (ie. the piles and piers) will require significant strengthening and upgrading works which may warrant the replacement or rehabilitation of much of the timber structure. A likely consequence being that very little of the original structure will be retained.

#### Refurbishment Methodology Review

A key departure from the original refurbishment methodology is the exclusion of the use of the existing rolled steel girders in the final refurbishment, both a) as a means of reducing risk liability associated with these heavy structural elements remaining in place while refurbishment is carried out and b) by reducing the dead load on the remaining timber structure into the future.

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Whilst it is accepted that these steel beams represent an important element in the timeline of this heritage bridge, the alternative methodology (which retains all other timber elements of the bridge) is considered to be a complementary alternative that will allow future works (if funded) to enhance the remaining timber structure.

The revised bridge refurbishment would involve the installation of lightweight trussed bridge beams in lieu of the existing main steel girders and the installation of lighter weight bridge decking in lieu of reclaimed timber decking.

A comparison of the existing and proposed refurbishment methodologies is shown in Attachment 3.

With the removal of the existing steel I-beams from the future rehabilitation plans, which would have provided interim lateral support to the structure until the ultimate refurbishment of the structure could take place, an alternative system to provide lateral support to the bridge structure is required.

### Stabilisation Works

With the findings of the 2015 Engineers report and in consultation with Heritage Victoria, a proposal to secure the stability of the bridge using a system of cables spanning the length of the bridge and anchored to either side of the river has been designed and documented.

With a bracing system in place, works to secure the bridge from further deterioration can re-commence. These works are identified as Stage 1 works and will include;

- The implementation of the bridge bracing system as documented in Attachment 4;
- Removal of all remaining steel girders, timber cross beams, decking and guardrail;
- Application of a waterproofing membrane to all exposed upper faces of structural cross head beams.
- Abutment areas adjacent to the structure will also be cleared of remaining debris to ensure public access to these areas and the reinstatement of river front paths.

A tender was recently released for the completion of these stabilisation works and submissions are currently under evaluation. It is expected that a report will be prepared for the June Council meeting for the award of these works.

### **FUTURE ACTION**

If Council resolves the recommendation officers will undertake the actions for the future stabilisation, rehabilitation and refurbishment of the timber heritage bridge;

### **FINANCIAL, RESOURCE AND ASSET MANAGEMENT IMPLICATIONS**

#### Stage 1 Works

The following table summarises the project funding allocated to the Old Goulburn River Bridge – Stabilise and Secure project

Item	Status	Committed Amount	Received To Date	Yet to receive
Regional Development Victoria (RDV) Grant	Confirmed	\$250,000	\$125,000	\$125,000
Heritage Victoria (HV) Grant	Confirmed	\$92,000	\$69,000	\$23,000
Mitchell Shire Council (13/14 CapEx Budget)	Confirmed	\$55,000	\$55,000	
Mitchell Shire Council (17/18 Capex Budget)	Confirmed	\$120,000	\$120,000	
Mitchell Shire Council (18/19 Capex Budget)	Confirmed	\$185,000	\$185,000	
	<b>Total</b>	<b>\$702,000</b>	<b>\$554,000</b>	<b>\$148,000</b>

The following table is a summary of the current financial position for the Old Goulburn River Bridge Project.

Item	Amount
Income	\$702,000
Expenditure (Life to Date)	\$348,100
<b>Total Remaining Budget</b>	<b>\$353,900</b>

### Stage 2 and 3 Works

As part of the 2015 GMR report, a schedule of costs for the bridge rehabilitation and refurbishment was prepared. These total costs for the complete refurbishment of the bridge structure are estimated at \$925,000. It is noted that this estimate encompasses a project contingency of just 5% which is well below the recommended contingency amount for a project of this type and complexity. A contingency of 20% is considered more appropriate for a project of this type and complexity given the current phase of the project.

The draft preliminary cost schedule, shown in Attachment 5, assumes the works would be completed as a single continuous project.

Due to the significant investment required to deliver the Stage 2 and 3 works in a single package of works, coupled with the practical limitations of combining these two phases of works, it is recommended that a staged approach is adopted for the rehabilitation and ultimate refurbishment of the historic bridge.

### Asset Management Implications

Prior to making a future commitment towards the rehabilitation and refurbishment of this timber heritage structure (Stage 2 and 3 works), it is the officer's recommendation that a detailed Whole of Life cost analysis be undertaken and that a Business Case be prepared to assess the merits of a full refurbishment of the bridge including its role in the wider off-road trail network.

## POLICY AND LEGISLATIVE IMPLICATIONS

The *Heritage Act 2017* places obligations on all owners of a State-significant property place (including local councils) to maintain it to the extent that its conservation is not threatened, and to ensure that it does not fall into a state of disrepair. Recent legislation changes now mean the State Government has stronger powers to enforce repairs if it is deemed that future preservation is under threat.

Council also has obligations under the *Planning and Environment Act 1987* which include a role in the identification, protection and management of heritage places. Council should be setting an example for heritage sites under its management / ownership as a benchmark for heritage properties places in private ownership.

The Statement of Significance for the Old Goulburn River Bridge is shown in Attachment 6 of this report.

## PROJECT RISKS

A project of this type and complexity contains numerous risks, both physical, financial and reputational.

- Stabilisation works may reveal additional deterioration of the bridge structure beyond that which is currently understood resulting in additional costs to rehabilitate the bridge.
- Timber is natural building material and is subject to natural defects which may be obscured for visual inspection. Further, the timber elements of the existing structure are over 100 years old and have been exposed to cycles of wetting and drying for their entire life. Therefore, it is impossible to definitively determine the condition of some timber elements which may result in risk of failure of some timber elements.
- A large flood could destroy the bridge.
- The investment in the bridge structure may be considered by some community members as a misallocation of public funds.
- Members of the public may consider that there are higher priorities for off-road path infrastructure in and around Seymour.
- In the absence of a clear and definitive plan for an off-road trail network on the North side of the Goulburn River, the merits of the bridge refurbishment may be questioned by some members of the community.
- Members of the public may be frustrated by the apparent lack of progress on this project.

**SUSTAINABILITY IMPLICATIONS (SOCIAL AND ENVIRONMENTAL)**

No sustainability implications associated with the contents of this report.

**CHARTER OF HUMAN RIGHTS IMPLICATIONS**

The rights protected in the *Charter of Human Rights and Responsibilities Act 2006* were considered in preparing this report and it's determined that the subject matter does not raise any human rights issues.

**CHILDREN AND YOUNG PEOPLE IMPLICATIONS**

Not applicable.

**OFFICER DECLARATION OF CONFLICT OF INTEREST**

No officers involved in the preparation of this report have any direct or indirect interest in this matter.

**CONCLUSION**

In 2010 an Engineers specification and detailed design was prepared which detailed a rehabilitation and re-use plan for the Old Goulburn River Bridge.

With the passage of time and the documented decline in the condition of the bridge, a review of this rehabilitation and refurbishment plan is appropriate.

Officers propose to conduct a review of this work in partnership with the community ahead of ongoing grant seeking efforts to secure funds to complete rehabilitation and refurbishment work.

# **MITCHELL SHIRE COUNCIL**

## **Council Meeting Attachment**

### **DEVELOPMENT AND INFRASTRUCTURE**

**20 MAY 2019**

**9.3**

#### **OLD GOULBURN RIVER BRIDGE - FUTURE WORKS**

**Attachment No: 1**

**Detailed Design for Pedestrian Structure**

**STRUCTURAL STEELWORK NOTES:**

1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 4100;
2. ALL HOT ROLLED SECTIONS ARE TO BE GRADE 300 PLUS;
3. ALL STRUCTURAL HOLLOW SECTIONS ARE TO BE GRADE 350 MPa;
4. WELDING SHALL BE PERFORMED BY AN EXPERIENCED OPERATOR IN ACCORDANCE WITH AS 1564, INSPECTED AND CERTIFIED BY A QUALIFIED PERSON AS DESCRIBED IN AS 2214;
5. THE BOLTING PROCEDURES ARE TO BE IN ACCORDANCE WITH AS 1111 AND AS 1252;
6. THE CONTRACTOR SHALL PROVIDE TEMPORARY BRACING AND LEAVE IN PLACE UNTIL PERMANENT BRACING ELEMENTS ARE CONSTRUCTED, SUCH TEMPORARY BRACING AS IS NECESSARY TO STABILISE THE STRUCTURE;
7. CONCRETE ENCASED STEELWORK SHALL BE COMPLETELY WRAPPED WITH FGW41 GIRDER WRAP FABRIC, UNLESS OTHERWISE SHOWN;
8. THE ENDS OF ALL HOLLOW SECTION MEMBERS ARE TO BE SEALED WITH NORMAL THICKNESS PLACES AND CONTINUOUS FILLET WELD UNLESS OTHERWISE SHOWN;
9. UNLESS OTHERWISE SPECIFIED SHALL BE PAINTED ONE SHOP COAT OF RED OXIDE ZINC PHOSPHATE PRIMER, MEMBERS ENCASED IN CONCRETE, FIRE SPRAYED OR FRiction GRIP BOLTED CONNECTIONS MUST NOT BE PAINTED;
10. PAINTING, AS SPECIFIED BY THE PRINCIPAL, SHALL BE IN ACCORDANCE WITH AS 2312, TO SUIT SITE EXPOSURE CONDITIONS;
11. EXCEPT WHERE OTHERWISE SHOWN, WELDS ARE TO BE 6mm CONTINUOUS FILLET WELDS. ALL WELDS ARE TO BE STRUCTURAL PURPOSE UNO;
12. THE CONTRACTOR IS TO ALLOW FOR ALL THE NECESSARY TRIMMING ANGLES AND FIXINGS TO SUPPORT CLADDING AND FLASHINGS AT ROOF OR WALL INTERSECTIONS;
13. UNLESS OTHERWISE SHOWN, PROVIDE SINGLE LINE OF BOLTS CLEATED CONNECTIONS, 10mm CLEAT PLATE, 6mm CONTINUOUS FILLET WELD AND M20 8.85 BOLTS. PROVIDE 2 NO. BOLTS TO MEMBERS 200mm DEEP & LESS. A.I.S.C. STANDARDIZED STRUCTURAL CONNECTIONS;
14. IN ADDITION THE FABRICATOR SHALL SUBMIT THREE SETS OF SHOP DRAWINGS TO THE ENGINEER FOR REVIEW, APPROVAL OF THE SHOP DRAWINGS SHALL BE OBTAINED FROM THE ENGINEER PRIOR TO COMMENCEMENT OF THE STEELWORK MANUFACTURE.

**TYPICAL STEEL CONNECTION NOTES:**

1. ALL PLATES AND FLATS SHALL BE GRADE 300 PLUS AND SHALL BE 10mm THK (MIN) - UNO.
2. ALL WELDS SHALL BE 6CPW ALL AROUND, BOTH SIDES - UNO. BE PERFORMED
3. ALL BOLTS SHALL BE M20 8.8 - UNO.
4. PROVIDE A MINIMUM OF TWO BOLTS PER FIXING - UNO.
5. PROVIDE THREE BOLTS PER SUPPORT FOR BEAM DEPTHS BETWEEN 300 AND 399mm - UNO.
6. PROVIDE FOUR BOLTS PER SUPPORT FOR BEAM DEPTHS BETWEEN 400 AND 499mm - UNO.
7. WHERE OVERTSIZE HOLES HAVE BEEN USED FOR ERECTION TOLERANCE - SITE WELD MATING PLATES TOGETHER WITH 10mm LENGTH OF 6CPW (MIN) AFTER BOLTING. MAKE GOOD ALL DAMAGED PAINTWORK.

**STRUCTURAL STEEL GALVANISING NOTES:**

- ALL EXPOSED STRUCTURAL STEEL SHALL BE HOT DIP GALVANISED IN ACCORDANCE WITH AS1650 WITH A MINIMUM ZINC MASS OF 600 g/m<sup>2</sup>.  
ALL GALVANISING DRAIN HOLES ARE TO BE PLUGGED WITH SILICONE SEALANT.  
ALL SITE WELDING TO GALVANISED STEELWORK SHALL BE APPROPRIATELY PREPARED AND SHALL BE PRIMED AND HAVE TWO COATS OF AN APPROVED ZINC RICH PAINT FINISH COAT.  
ALL COLUMNS & BASE PLATES IN CONTACT WITH THE GROUND ARE TO HAVE TWO COATS OF TAUBMANS DURAMASTIC.

**CONCRETE SLAB & FOOTING NOTES:**

1. PROVIDE CONSTRUCTION JOINTS ALONG BRICK WALLS AT MAXIMUM SPACING OF 5.0m. LOCATIONS TO ALIGN WITH WINDOWS, DOORS, ETC AND JUNCTION OF EXISTING AND NEW BRICKWORK.
2. THE FINISHED SURFACE AROUND THE SLAB AND FOOTINGS SHALL BE GRADED AWAY FROM THE FOUNDATIONS;
3. MAXIMUM OVERHANG OF MASONRY IS 15MM;
4. AT RE-ENTRANT CORNERS, ONE STRIP OF 3-N16 BARS SHALL BE PLACED DIAGONALLY ACROSS POTENTIAL CRACK;
5. DIMENSIONS SHOWN ARE THE MINIMUM REQUIRED. SETOUT & SLAB DIMENSIONS ARE TO BE DERIVED FROM THE ARCHITECTURAL DRAWINGS;
6. THE BUILDER IS TO CONFIRM REGULATORY FINISHED FLOOR HEIGHT REQUIREMENTS;
7. MATERIALS & WORKMANSHIP TO BE IN ACCORDANCE WITH THE RELEVANT CURRENT CODE OF THE STANDARDS ASSOCIATION OF AUSTRALIA AS2870 & THE BUILDING REGULATIONS;
8. REMOVE ORGANIC LAYER OF TOPSOIL & SOFT AREAS PRIOR TO PLACING FILLING UNDER SLAB. FILL TO BE GRANULAR MATERIAL WELL COMPACTED TO 96% MAX LAYERS;
9. FOOTINGS ARE TO BE FOUNDED IN ORIGINAL UNDISTURBED GROUND HAVING A SAFE BEARING CAPACITY OF 120 kPa. AFTER ANY CONCRETE IS PLACED, THE SAFE BEARING CAPACITY SHALL BE VERIFIED BY A QUALIFIED ENGINEER, OR A REGISTERED BUILDING PRACTITIONER. THE CONTRACTOR IS TO ALLOW IN THEIR TENDER PRICE FOR THOSE INSPECTIONS AND REPORTING TO BE UNDERTAKEN BY THEIR GEOTECHNICAL ENGINEER. ALL DOCUMENTATION IS TO BE SUBMITTED TO THE PRINCIPAL WITHIN 48 HOURS OF THE INSPECTION;
10. EXCAVATIONS BEYOND THE DIMENSIONS SPECIFIED SHALL BE FILLED WITH MINIMUM 15MPa CONCRETE;
11. THE CONTRACTOR IS TO UNDERTAKE ALL OF THE NECESSARY INVESTIGATIONS TO LOCATE UNDERGROUND SERVICES WITHIN THE SITE OR LIKELY TO BE INFLUENCED BY THE PROPOSED WORKS. THE CONTRACTOR SHALL INFORM THE PRINCIPAL IF ANY SERVICES ARE FOUND PRIOR TO PROCEEDING;
12. ALL FOUNDATIONS ARE TO BE FREE OF WATER AND LOOSE MATERIAL PRIOR TO POURING ANY CONCRETE;
13. PROVIDE 0.2mm WATERPROOF VAPOR BARRIER, ALL LAPS 200mm (MIN) & JOINTS TO BE TAPE. ANY TERMITE TREATMENTS TO BE UNDER VAPOR BARRIER TO AS3666 & TO THE BUILDING SURVEYORS REQUIREMENTS;
14. THE CONTRACTOR IS TO ALLOW FOR ANY ADDITIONAL INVESTIGATIONS, TESTING, ANALYSIS OR ANY OTHER WORK TO BE UNDERTAKEN NECESSARY TO SATISFY THEMSELVES OF THE GROUND CONDITION, SUCH THAT THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING ALL MATERIAL QUANTITIES AND CONSTRUCTION TECHNIQUES NECESSARY TO ACHIEVE THE MINIMUM SAFE SOIL BEARING PRESSURE NOMINATED;
15. SERVICE PIPING TRENCHES TO BE OFFSET FROM FOOTINGS 500mm (MIN). INSTALL SLEEVES THROUGH STIFFENER BEAMS WITH 50mm CLEARANCE. WHEN SERVICE PENETRATION IS WITHIN 150mm OF BASE OF BEAMS PROVIDE LOCAL THICKENING;
16. CONCRETE Fc = N25 GRADE @ 28 DAYS, 80 SLUMP. CONCRETE TO BE COMPACTED & WORKED AROUND REINFORCEMENT BY USE OF MECHANICAL VIBRATOR. CONCRETE TO BE CURED FOR 7 DAYS BY APPROVED METHOD. CONCRETE IS TO BE AVAILABLE FOR TESTING DURING POURING;
17. REINFORCED CONCRETE AS PER AS3000-1994. TRENCH MESH SHALL HAVE ALL CROSS WIRES CUT FLUSH WITH OUTER MAIN WIRES & A MINIMUM LAP OF 500mm; REINFORCEMENT CLEAR COVER 40mm TOP OF SLAB, 30mm COVER TO BOTTOM BEAMS. REINFORCEMENT LAPS ON FABRIC TO BE ONE FULL MESH PANEL. BOTH SIDES & END LAPPED. REINFORCING STEEL IS TO BE FREE OF LOOSE RUST, GREASE, OIL OR SOIL & TO BE IN ACCORDANCE WITH AS/NZ24671;
18. PROVIDED BAR CHAIRS @ 1.0m CENTERS (MAX);
19. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CSIRO INFORMATION SHEET BT18, WHICH REPLACES INFORMATION SHEET 109/1;
20. WHERE PIPES CONNECT TO THE SLAB, ALLOWANCE SHOULD BE MADE FOR DIFFERENTIAL MOVEMENT BY SLEEVING OR TAPING PIPES WITH FOAM TO ALLOW 25mm RADIAL CLEARANCE.

**STRUCTURAL NOTES: CONCRETE GENERAL**

- R.1 All hooks and cogs shall comply with AS 3600 unless otherwise shown
- R.2 All reinforcement shall be held rigidly in position within the specified tolerances before and during concrete placing  
- Non corrosive bar chairs shall be used for all off form surfaces
- R.3 Conduits etc. shall be fabricated and installed so that no cutting, bending or displacement of the reinforcement from its proper position will be required
- R.4 Details of reinforcement at approved penetrations shall be as shown on the drawings, or as directed by the engineer on the site.
- R.5 Concrete below ground in walls, beams, columns or pedestals shall be placed into properly constructed forms.  
- If approved by the engineer, concrete may be placed against an earth face but the concrete dimensions shown on the drawings shall be increased to provide 20mm additional cover to the reinforcement adjacent to the earth face
- R.6 Splices shall only be used as shown on the drawings or when bars longer than normal stock length would be required.  
- In lap splices, the overlap length shall be to the requirements of AS 3600 or as otherwise dimensioned on the drawings.
- R.7 Welding of reinforcement shall not be allowed without the approval of the engineer.
- R.8 In walls the vertical reinforcement shall be placed inside the horizontal reinforcement, unless otherwise shown on the drawings.
- R.9 All reinforcement minimum cover 65mm unless stated otherwise.

**GENERAL NOTES - INGROUND DRAINAGE**

1. THE CONTRACTOR SHALL ENSURE THAT ALL INGROUND DRAINAGE IS STRAIGHT AND AT GRADE..
2. ANY CHANGES IN GRADE OR ALIGNMENT SHALL INCORPORATE A PIT AND OR INSPECTION OPENING.
3. ALL DRAINAGE PIPES SHALL BE HANDLED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS.
4. ALL TRENCHING TO BE IN ACCORDANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY (MINES) REGULATIONS 2000. MANUFACTURERS REQUIREMENTS.
5. COMPACTION TESTS REQUIRED ON ALL TRENCHES. REFER TO STANDARD DRAWINGS FOR DETAILS. BACK FILL IN TRENCHES TO BE GENERALLY AT 95% STANDARD COMPACTION.
6. ALL ROAD CROSSINGS TO BE BACKFILLED WITH CLAS 2 FOR COMPACTED TO 96% STANDARD COMPACTION. WHERE INSUFFICIENT COVER IS AVAILABLE TO ENSURE PROTECTION OF THE PIPE THE SUPERINTENDENT MAY REQUIRE THE USE OF CEMENT STABILISED BACKFILL MATERIALS.
7. NO DRAINAGE INFRASTRUCTURE WILL BE FOUNDED IN FILL.
8. ALL SUBSOIL DRAINAGE SHALL INSTALLED AT GRADE AND INCLUDE A GEOTEXTILE FILTER CLOTH (REFER TO STANDARD DRAWINGS FOR DETAILS).
9. ALL SUBSOIL DRAINAGE SHALL INCLUDE PROVISION FOR FLUSH POINTS (REFER TO STANDARD DRAWINGS FOR DETAILS).
10. ALL PITS, PUMPS STATIONS, VENTS, SHAFTS AND INSPECTION OPENINGS SHALL BE PLUMB AND SQUARE UNLESS SPECIFIED OTHERWISE. REFER TO STANDARD DRAWINGS FOR STRUCTURAL DETAILS.
11. ALL PIPES SHALL BE INSTALLED IN ACCORDANCE WITH THE NOMINATED INVERT LEVELS, COVER, GRADES AND ALIGNMENTS AS SPECIFIED.
12. ALL CAST INSTITU CONCRETE TO BE 20MPA CONCRETE STRENGTH. MAXIMUM SLUMP 80MM UNLESS SPECIFIED OTHERWISE. THE CONTRACTOR MAY BE REQUIRED TO PROVIDE TEST CYLINDERS AND CRUSHING TESTS TO DEMONSTRATE COMPLIANCE.

**GENERAL NOTES - TIMBER**

1. All timber shall be new, unless agreed otherwise and shall be select grade only and shall be free from defects, gum veins, shakes, splits, cracks and twists.
2. Field cutting, drilling or fabrication should be done away from the river & other sensitive areas, where practicable. All waste shall be collected & disposed of appropriately & on a regular basis.
3. All sawn timber shall be OB, not dressed.
4. All exposed surfaces shall have arrases removed, and shall be made splinter free and rough sanded.
5. A minimum of two applications of Copper Naphthalene solution is to be applied to all Instu timber to protect the timber against fungal decay and borers.
6. Copper Naphthalene has been deemed non environmentally hazardous as opposed to the conventional CCA (Copper Chromium Arsenic) treatment. The active constituent in copper naphthalene is exempt from the poison scheduling under the National Health and Medical Research Council's Uniform Poison Standard (1987).
7. All replacement timbers shall have sapwood removed prior to treatment & be pre-treated with an approved preservative, being non-toxic and certified suitable for use in a potable water catchment environment. A material safety data sheet shall be provided from the supplier confirming the suitability of the material prior to use. Prior to treatment the wood shall be inspected to ensure it is reasonably clean and free of dirt and sawdust. A minimum of two applications of copper naphthalene, one before installation and the second after assembly will be applied by hand, no sprays will shall be used.
8. All end grain and freshly cut or exposed inner surfaces of any checkouts, mortices, rebates or holes drilled though or into timber elements shall be treated with at least two applications of hot petroleum jelly, immediately after installation and where possible a PVC layer should be placed between the ground and the timbers where they come into contact at ground level.
9. All supporting surfaces will have new DPC throughout. DPC shall be 3mm bituminous felt, Malithold, and shall wrap over each object at least 20mm along the edges of the object being protected. Exposed stringers and cross beams will also be fitted with DPC and additional 1.4mm thick galvanised steel sheeting fitted over the DPC. Sheetng will be attached to the element it is protecting to prevent it being dislodged.
10. Care shall be taken to avoid preservative residues entering the waterways or spillages on the ground or vegetation surfaces.
11. A visual inspection shall be performed to verify the treated product meets the criteria specified above.

**MASONRY**

- M.1 All blocks shall have a minimum compressive strength C = 30 Mpa, unless otherwise noted.
- M.2 All blocks shall have a minimum compressive strength C = 12 Mpa, unless otherwise noted.
- M.3 Mortar shall be 1:1.5 (Cement:Lime:Sand) machine mixed and volume batched unless otherwise noted.
- M.4 All bed and header joints shall be solidly filled with mortar to a nominal thickness of 10mm.
- M.5 Bonding of masonry shall be stretcher bond, unless otherwise noted.
- M.6 Details of the bearing of steel and concrete members on masonry, at the heads of non - bearing walls and of ties between masonry and structure shall be as shown on the drawings.
- M.7 Masonry tiles shall be in accordance with AS 2699 and AS 3700, unless otherwise noted.
- M.8 When constructing masonry walls on suspended slabs:  
- All masonry shall be stacked near the final position before construction begins.  
- All props and formwork shall be removed before wall construction on suspended slab begins.
- M.9 Non load bearing walls are to be kept 25mm clear of the soffit of slab and beams.  
- The gap is to be filled with approved compressible filler and sealant.  
- Filler and sealant are to provide appropriate fire proofing rating where required.
- M.10 Unless otherwise noted, tops of non load bearing masonry walls are to be supported by appropriate lateral restraints at maximum 800 CTRS.  
- Restraints shall have the capacity to allow vertical movement of the structure over the life of the masonry and its required reinforcement shall be as shown on the drawings.
- M.11 Block work cores containing reinforcement, and only such cores, shall be filled with grout.  
- Masonry cores when noted on the drawings shall also be filled with grout.  
- Grout shall have a characteristic compressive strength (fc) of not less than 12Mpa and a slump of 230mm +/- 30mm
- M.12 Clean-out blocks are to be used for the base course in reinforced block walls unless otherwise noted.  
- All excess and loose grout is to be removed prior to filling the voids.

DESIGNED	DRAFTED	NDR	November 2006
VERIFIED			
0 0.5 1 2m SCALE			
4 CHANGES TO CONDITIONS	17/09/10		
2 ISSUED TO CLIENT	03/03/07		
1 INITIAL DRAFT	JAN 2007		
REV AMENDMENTS	DATE		

**GMR Engineering Services****Mitchell Shire Council****Timber Bridge Refurbishment**

Seymour, VICTORIA

Proposed Works

Structural Notes

Drawing No. GMR07048.5.P04

Revision. 1 Sheet No. 8





**GMR Engineering Services**

FOR TENDER  
22/09/10

# Mitchell Shire Council

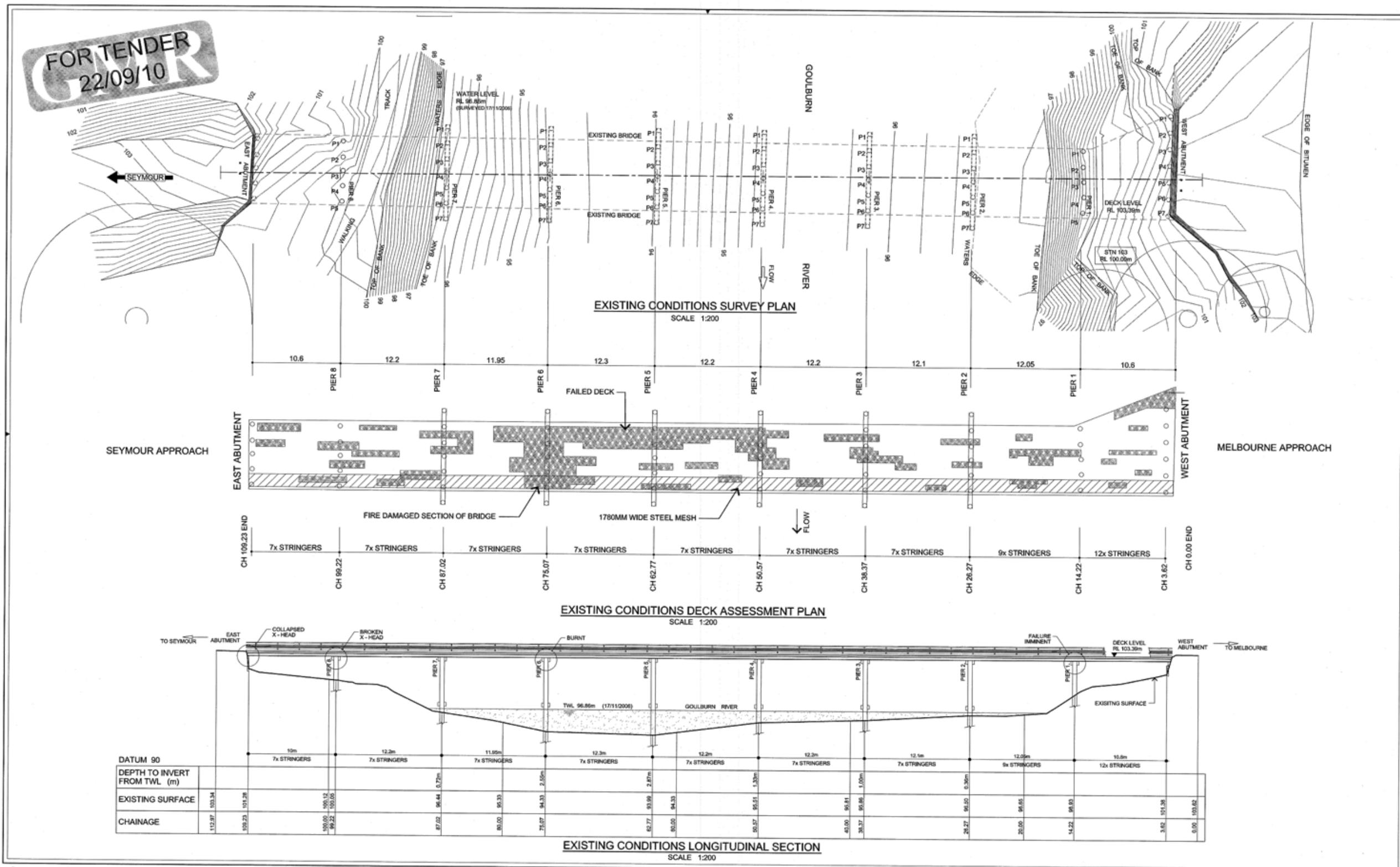
## Refurbishment of Heritage Timber Bridge over the Goulburn River

### at Seymour, Victoria



<b>DRAWING SCHEDULE</b>			
<b>DRAWING No.</b>	<b>DRAWING TITLE</b>	<b>SHEET NO</b>	<b>REVISION</b>
GMR07048.Z00	Face Sheet & Drawing Schedule	1	A
GMR07048.E02	Existing Conditions - Plan & Long Section	2	A
GMR07048.E03	Existing Conditions - Bridge Cross Sections	3	A
GMR07048.E04	Proposed Works - Typical Bridge Plan	4	A
GMR07048.P01	Proposed Works - Pile Details	5	A
GMR07048.P02	Proposed Works - Bridge Abutments	6	A
GMR07048.P03	Proposed Works - Details	7	A
GMR07048.P04	Proposed Works - Notes	8	A

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Drawings not to be scaled.



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#### LEGEND.

STORMWATER PIPE	MINOR CONTOUR INTERVAL IS 0.20m	OVERHEAD ELECTRICITY	OPTIC FIBRE CABLE
JUNCTION PIT	MAJOR CONTOUR INTERVAL IS 1.0m	UNDERGROUND ELECTRICITY	E
SIDE ENTRY PIT		LIGHT POLE	UE
GRADED TOP ENTRY PIT		STAY POST	SY
KERB AND CHANNEL		SILICE VALVE	S
CENTRELINE OF BITUMEN		UNDERGROUND WATER MAIN	W
EDGE OF SEAL		FIRE HYDRANT	H
INVERT OF TABLEDRAIN		HOUSE DRAIN CONNECTION	HD
		WATER TAP	V
		GATE	G
		FENCELINE	- - -

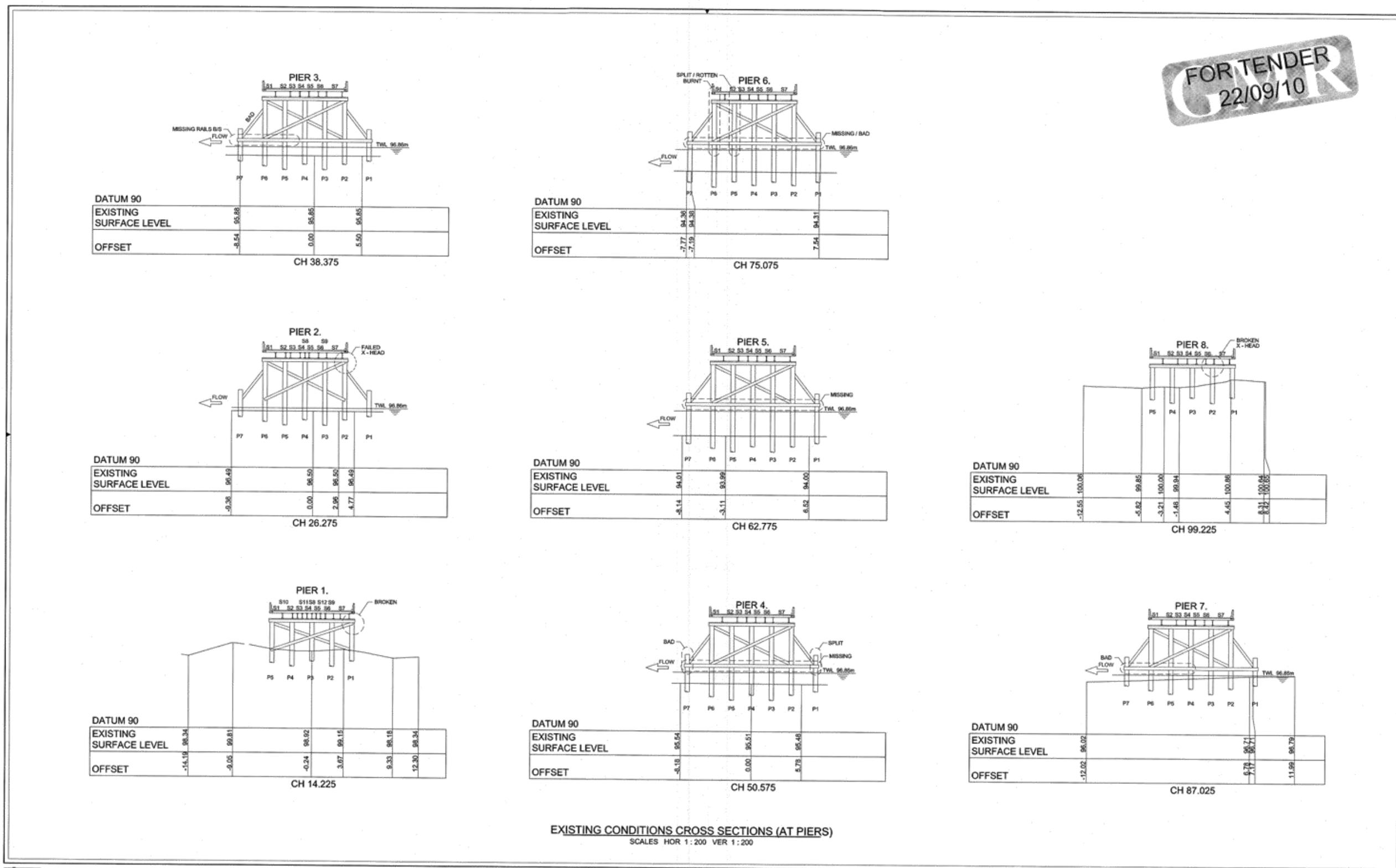
4	CHANGES TO CONDITIONS	17/6/10	
3	ISSUED TO CLIENT	02/03/07	
2	CHANGES AS PER CONDITION ASSESSMENT	23/02/07	
1	INITIAL DRAFT	NOV 2006	
REV	AMENDMENTS	DATE	



**GMR Engineering Services**

**Mitchell Shire Council**  
**Tmber Bridge Refurbishment**

**Seymour, VICTORIA**  
**Existing Conditions**  
**Survey Plan, Deck Assessment & Long Section**  
**Drawing No. GMR07048.5.E02**  
**Revision. A**  
Sheet No. 2  
06041.E03+04 Long Sec.dwg  
A1



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DESIGNED	GMR	June 2010
DRAFTED	EM	June 2010
VERIFIED		
		0 2 4 8m
		SCALE 1:200
4	CHANGES TO CONDITIONS	17/6/10
3	ISSUED TO CLIENT	02/09/10
2	CHANGES AS PER MARKUPS	23/02/07
1	INITIAL DRAFT	NOV 2006
REV	AMENDMENTS	DATE
		08041.E03+04 Long Sec.dwg

**GMR Engineering Services**

**Mitchell Shire Council**  
**Timber Bridge Refurbishment**

Seymour, VICTORIA

Existing Conditions

Bridge Cross Section

Drawing No. GMR07046.5.E03

Revision. A Sheet No. 3

A1