ENGINEERS AUSTRALIA

CEREMONY REPORT

Fyansford Monier Arch Bridge

Heritage Recognition Ceremony

Fyansford, 4 km west of Geelong, Victoria

Friday 12 October 2012

Cover Photograph:

56Unveiling of the interpretation panel and marker at Fyansford Monier Arch Bridge on 12 October 2012.

The official party which has just unveiled the panel and marker are grouped closely around the panel. From left: Mr Mario Fantin, Principal Bridge Engineer, VicRoads; Councillor Madeleine McManus, member of National Council, Engineers Australia and Councillor John Mitchell, Mayor of City of Greater Geelong.

Image: Owen Peake

CONTENTS

1 Introduction:

The ceremony for the marking of the **Fyansford Monier Arch Bridge** with an **ENGINEERING HERITAGE MARKER** were conducted at on 12 October 2012 at the bridge site at 3 pm.

Attendance: 62

2 Invitations:

There were two forms of invitation:

2.1 Written invitation (see Attachment 1) sent by mail to 130 people listed by Engineering Heritage Victoria. This list included civic leaders, politicians, heritage professionals and other interested parties and stakeholders

2.2 Email invitations (see copy of flyer at Attachment 2) sent to the following address lists:

- All Victorian Division Members (approx 20,000 on list)
- Engineering Heritage Victoria list (approx 400 on list)
- Victoria Division Board of Engineering members (approx 40 on list)
- Geelong Regional Group (number not known - say 200)
- Engineering Heritage Australia Member and Corresponding Members (45 on list)

Hence the total number of invitations issues was about 21,000. With at total attendance of 72 at the ceremony the response rate is approximately 0.33%.

3. Distinguished Guests and Apologies:

Listed on the Running Sheet. See Attachment 3.

4 Program & Running Sheet:

The Running Sheet (Attachment 3) shows:

- Those who spoke at the event and timing
- Suggested speech topics for various VIPs.
- Distinguished Guests who were acknowledged
- Apologies received who were acknowledged

The ceremony at commenced at about 3:05 pm and took about 40 minutes. The Master of Ceremonies was David LeLievre, Chair of Geelong Regional Group of Engineers Australia.

5 Speech Notes:

Speech Notes for the following speakers are provided at Attachments 8, 9, & 10:

- Councillor Madeleine McManus
- Mayor Councillor John Mitchell
- Mr Brendan Grace, VicRoads

6 Ceremony Handout:

A 12 page A5 ceremony handout was prepared and handed out to all those who attended the ceremony. A copy is at Attachment 4. The handout was based largely on the material from the Interpretation Panels. 100 copies were printed.

7 Media Release:

On this occasion there was no Media Release. Engineers Australia has changed its policy and the National Office media person no longer puts out Media Releases for events which they do not regard as 'national' events. There is apparently no capacity to issue a Press Release from Victoria Division office.

8 Media Articles:

8.1 ARTICLE FOR ENGINEERING HERITAGE AUSTRALIA NEWSLETTER

Article written by Owen Peake is at Attachment 5.

8.2 ARTICLE FOR EV NEWSLETTER

Article written by Owen Peake is at Attachment 6.

8.3 ARTICLE FOR ENGINEERS AUSTRALIA MAGAZINE

Article written by Owen Peake is at Attachment 7.

9 Letters of Thanks:

Letters on EA Victoria Division letterhead were sent out over Glenda Graham or Owen Peake's signatures to the following:

Ms Madeleine McManus
BEng BEc FIEAust FCILT
Councillor
Engineers Australia

Councillor John Mitchell
Mayor
City of Greater Geelong Council

Mr Brendan Grace
Senior Planning Officer
VicRoads - South Western Victoria

Mr Peter Alsop
(engineering historian of the Geelong area)

Mr John McIntosh
Division President
Engineers Australia

Mr David LeLievre
Chair
Geelong Group
Engineers Australia

Mr Alan Holgate
(researcher with specialisation in the works of General Sir John Monash)

Mr Mario Fantin
Principal Bridge Engineer
VicRoads

A typical draft letter for the above is at Attachment 11.

10 Costing

Costs of the project were incurred as per the following table:

Item No.	Description	Funding Source	Amount
1	Interpretation Panel Manufacture - Glassmetal Industries, Geelong	Greater Geelong City Council	$1408.00
2	Graphic Design of Interpretation Panel - Richard Venus	EHA Budget (through National Office)	$420.90
3	Manufacture of Mounting Frame for Interpretation Panel	Greater Geelong City Council	$1200 (estimate)
4	Car travel costs to Owen Peake for 2 return trips to Geelong (see Note 5)	EHV Budget	$298.50
5	Printing of 4 copies of nomination document	Owen Peake	$56.00
6	Hire of PA system by EA Victoria Office	EHV Budget	$114.40
7	Printing of Handout documents (100 off) by EA Victoria Office	EHV Budget	$296.67
8	Installation of Interpretation Panel Mounting Frame at Fyansford Bridge by Council contractor	Greater Geelong City Council	$400 (estimate)
9	Provision of 300mm diameter EHA marker from EA National Office	EHA Budget (through National Office)	$200 (estimate)
		TOTAL	**$4494.47**

NOTES:

1. No Engineers Australia staff time included above.
2. No Engineering Heritage Victorias volunteer time included above.
3. No Greater Geelong City Council staff time included above.
4. No VicRoads staff time included above.
5. Claim details for Owen Peake claim for expenses to EA:

Private Car Use All travel related to use of Land Cruiser 4.2L diesel

- 11 October 2012. Return trip Collingwood to Geelong to take delivery of interpretation panel from Glassmetal Industries and to carry out trial fit at site. 184 km $138.00

- 12 October 2012. Return trip Collingwood to Geelong to deliver interpretation panel to site for fitting and deliver lectern and other equipment from EA office North Melbourne for ceremony. Equipment subsequently returned to North Melbourne
  214 km $160.50

TOTAL **$298.50**

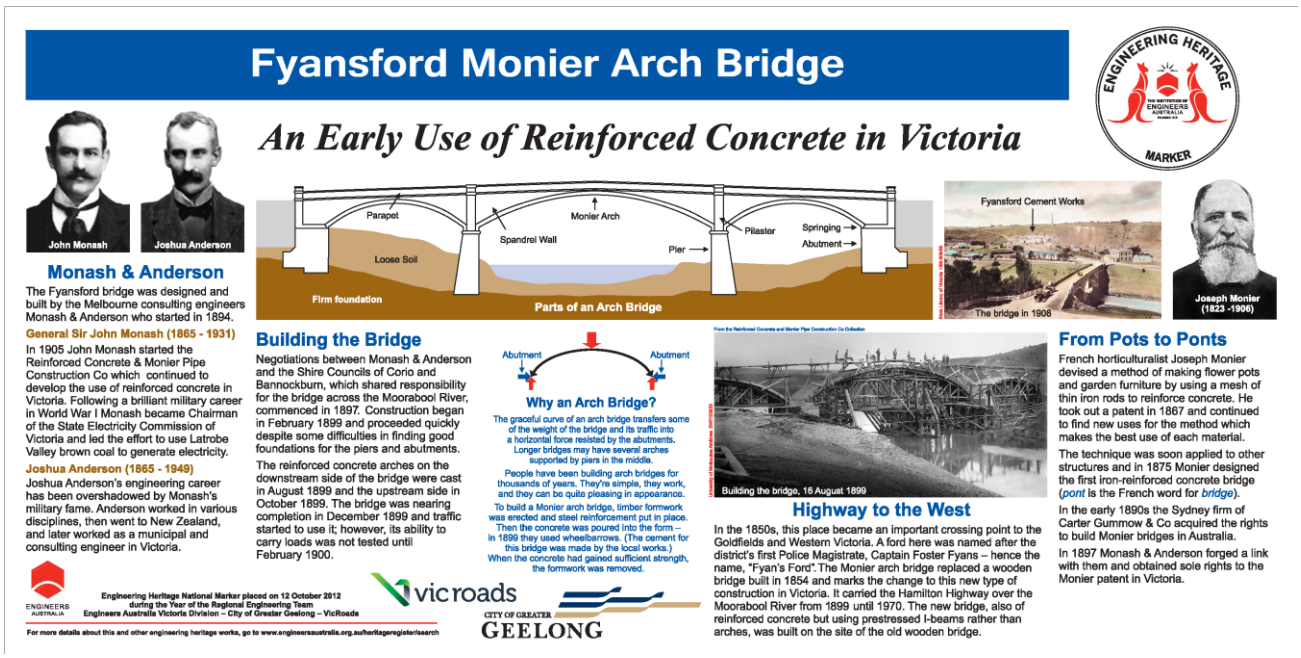
11 Allocation of Tasks

A schedule showing the Allocation of Tasks between the various stakeholders was used to ensure smooth running of the event. This document ensured that all details of organisation were attended to and served as a check list in the run-up to the event.

The tasks of planning of the ceremony were primarily shared between Jessica Bradley in the Victoria Division EA office and Owen Peake, EHV volunteer.

12 Interpretation Panel:

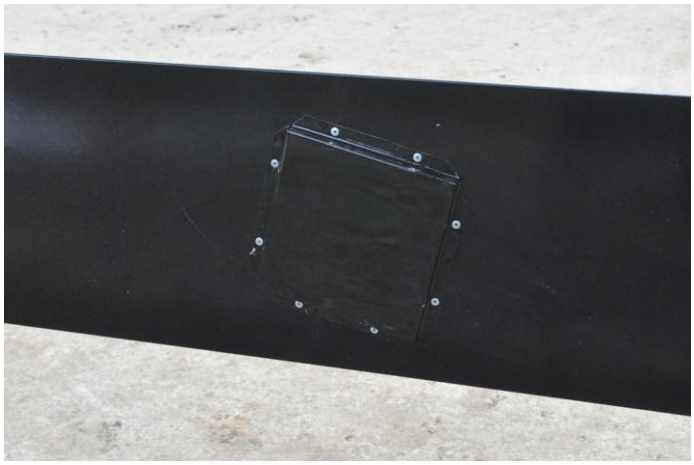
The interpretation panel has been erected on a steel support frame near the bridge on the Geelong (eastern bank) upstream of the bridge. The panel is 1200 mm wide and 600 mm high and designed by Richard Venus and produced in vitreous enamel on a steel substrate by Glassmetal Industries, Geelong. The marker, also of vitreous enamel on steel is mounted on the crossbar below the panel.



This interpretation panel mounting frame contains a new innovation. One of the vulnerabilities of this design has been that the nuts on the back of the marker are able to be undone by vandals. Previously lumps of epoxy putty have been used to protect the nuts however this was not considered to be an adequate solution.

In this case a sheet metal box has been pop riveted over the back of the marker to hide and protect the nuts. The 8 pop rivets are so located that they are within the rear space of the marker and hence not visible from the front. In this case the Nut Guard is at an angle as the manufacture of the markers has not previously required the mounting studs to be indexed to the horizontal line of the marker. The studs are mounted in a square formation but at random with respect to the horizontal line of the text on the marker.

The arrangement is shown in the image below from the rear of the panel mounting frame.

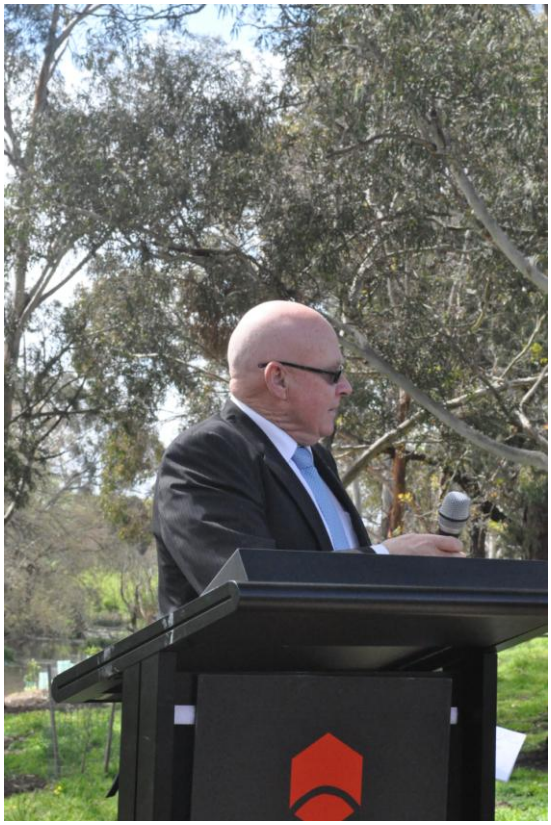


Nut Guard on rear of marker

13 Photographs:

David LeLievre speaking at the ceremony as Master of Ceremonies

Madeleine McManus speaking at the ceremony



Mayor John Mitchell speaking at the ceremony

Brendan Grace of VicRoads speaking at the ceremony

Audience at the ceremony. Taken from the bridge roadway

Historian Peter Alsop speaking at the ceremony.

Attachment 1 - Invitation Letter

date

«Title» «First_Name» «Surname» «Post_Noms»
«Position»
«Company»
«Address_1»
«Address_2»
«Suburb» «State» «Postcode»

Dear «Title» «Surname»,«Next Record»

Engineering Heritage Recognition of the Fyansford Monier Arch Bridge, Geelong

Engineers Australia Victoria Division, in conjunction with City of Greater Geelong and VicRoads cordially invite you to attend:

The Fyansford Monier Arch Bridge
Engineering Heritage Marker
Dedication Ceremony

Friday 12th October 2012

3:00 PM, at the bridge site on the Hamilton Highway where it crosses the Moorabool River, Fyansford, 4 km west of the Geelong Railway Station

The National Heritage Recognition Program is conducted by Engineers Australia through Engineering Heritage Australia. At the ceremony an interpretation panel and Engineering Heritage Marker will be unveiled. Speakers at the ceremony will outline the significance of the Fyansford Bridge.

The Fyansford Monier Arch Bridge was built in 1899 for the Corio and Bannockburn Shire Councils by Monash and Anderson, Melbourne. The bridge was one of the first reinforced concrete bridges built in Victoria and marks an early success of John, later General Sir John, Monash. Monash and his business partner, Joshua Anderson, were involved in many innovative engineering projects. Later Monash became Australia's best know engineer for his achievements and leadership during the First World War.

For more information or to register, please visit:
www.engineersaustralia.org.au/
or contact the Engineers Australia Victoria Division on (03) 9321 1709
This event is free

I hope to meet you there.
Yours sincerely,

Glenda Graham
Executive Director
Victoria Division

Attachment 2 - Advertising Flyer

Fyansford Monier Arch Bridge
Engineering Heritage Marker Dedication Ceremony

Engineering Heritage Victoria - Heritage Recognition Program

The Story:
The Fyansford Bridge was built by Melbourne consulting engineers, Monash & Anderson who started their practice in 1894. Negotiations with the Shire Councils of Corio and Bannockburn, which shared responsibility for the bridge across the Moorabool River at Fyansford, commenced in 1897. Construction began in 1899 and proceeded quickly despite some difficulties in finding good foundations for the piers and abutments.

The reinforced concrete arches on the downstream side were cast in August 1899 and the upstream side in October 1899. The bridge was approaching completion in December 1899 and traffic started to use it; however, it was not tested until February 1900.

The bridge carried the Hamilton Highway over the Moorabool River from 1899 until 1970. A new bridge was then built to carry an increased traffic flow; made of reinforced concrete but used precast girders rather than arches.

The Fyansford Bridge is still in use, carrying pedestrian and bicycle traffic.

The use of reinforced concrete for bridge construction was in its infancy at the time of construction of the Fyansford Bridge. It was one of the first Monier reinforced concrete bridges built in Victoria and therefore represents a significant change in the materials and methods used for building road bridges.

Engineering Heritage Marking Ceremony:
The Fyansford Bridge Marking Ceremony will include the unveiling of an interpretation panel and an Engineering Heritage Marker.

This is the latest addition to the Engineering Heritage Program by Engineers Australia and Engineering Heritage Australia.

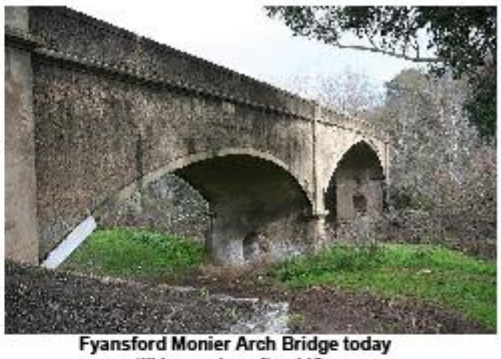
This is a free event for members of Engineers Australia and interested community members.

This ceremony will be held in conjunction with the Engineers Australia's **Regional Engineering on Show 2012** in Geelong from 12-14 October:
http://www.engineersaustralia.org.au/victoria-division/regional-engineering-show

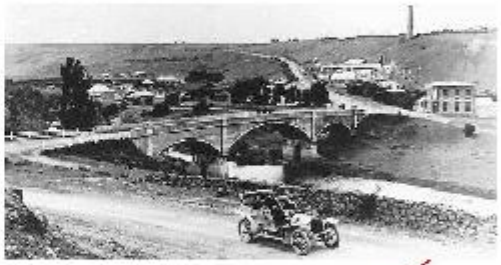
Friday 12 October 2012
3:00pm – 4:00pm

Fyansford Monier Arch Bridge Site,
Hamilton Highway (B140),
Fyansford
(Melways reference - Map 450, K2)
4 km west of Geelong Railway Station

Register
http://www.engineersaustralia.org.au/events/fyansford-monier-arch-bridge-engineering-heritage-marker-dedication-ceremony



Fyansford Monier Arch Bridge today
- still in service after 112 years



Contact:
Jessica Bradley
Membership Coordinator
Engineers Australia, Victoria Division
03 9329 8188
jbradley@engineersaustralia.org.au

ENGINEERS
AUSTRALIA

Attachment 3 - Running Sheet

ENGINEERS AUSTRALIA VICTORIA DIVISION
ENGINEERING HERITAGE VICTORIA

ENGINEERING HERITAGE RECOGNITION PROGRAM

FYANSFORD BRIDGE
GEELONG 12 OCTOBER 2012

RUNNING SHEET

Ceremony to be conducted at the bridge site, on the Geelong side of the river.
Unveiling of Engineering Heritage Marker and Interpretation Panel.

Start of ceremony may be delayed up to 15 minutes to allow for late-comers.

PROGRAM - COMMENCING 3:00 PM

- Welcome by Master of Ceremonies (MC) Mr David LeLievre, Chair, Engineers Australia, Geelong Group Including acknowledgment of Distinguished Guests and Apologies.
    - Acknowledgment of Distinguished Guests and Apologies.
    - If the weather is inclement it should be announced that we will retire to the Fyansford Hotel as soon as possible. If the weather is OK we will also retire to the Fyansford Hotel for afternoon tea and a drink.

  5 minutes

- Representative of the National President of Engineers Australia, Professor David Hood, Councillor Madeleine McManus 5 minutes

- Mayor of City of Greater Geelong, Councillor John Mitchell. Including the following Welcome to Country: “I would like to acknowledge the traditional owners and custodians of the lands and waters in our region – the Wathaurong – and pay my respects to their Elders both past and present”.

  5 minutes

- Senior Planning Officer, VicRoads,

South Western Office, Brendan Grace 4 minutes

- Mr Peter Alsop, Geelong-based Historian and bridge Expert. Previously engineer for the Country Roads Board, Victoria. 4 minutes

- MC invites Madeleine McManus, John Mitchell and Mario Fantin to unveil the marker and interpretation Panel. 4 minutes

- Closing Remarks (MC). To include thanks to the following:
  - City Of Greater Geelong (particularly for the funding of the interpretation panel).
  - VicRoads, owners of the bridges on this site.
  - The staff of Engineers Australia, Victoria Division
  - Mr Richard Venus who carried out the graphic art work on the interpretation panel.
  - All of the researchers who assisted with the development of the nomination document for this site.
  - All of the speakers at this ceremony.

  1 minute

TOTAL 28 minutes

End of ceremony scheduled for 3:30 PM

LIST OF PROSPECTIVE SPEECH TOPICS

Councillor Madeleine McManus, Engineers Australia

- The role of Engineers Australia in the community
- Body of Knowledge and heritage activities
- The national Heritage Recognition Program

Cr John Mitchell, Mayor of the City of Greater Geelong

- The history of the Hamilton Highway
- The role of the Fyansford Bridge over more than a century.

Brendan Grace

- The evolution of road bridges in Victoria

Peter Alsop

- The history of the Fyansford Bridge.

LIST OF DISTINGUISHED GUESTS PRESENT

- Mayor of City of Greater Geelong, Cr. John Mitchell
- Councillor Madeleine McManus, member of National Council, Engineers Australia
- Mr Greg Mashiah, Chair, Regional Engineers Special Interest Group, Engineers Australia and Regional Engineers from across Australia.
- Mr John McIntosh, President, Victoria Division, Engineers Australia.
- Ms Glenda Graham, Executive Director, Victoria Division, Engineers Australia.
- Mr Mario Fantin, Principal Bridge Engineer, VicRoads
- Mr Ian Trezise, MLA, Member for Geelong
- Mr Gary Van Driel, General Manager City Services, City of Greater Geelong
- Mr Miles Pierce, Chair, Engineering Heritage Victoria.
- Ms Jennifer Bantow, President, Geelong & Region Branch, National Trust of Australia (Victoria)
- Staff of the Greater Geelong City Council
- Staff of VicRoads South Western Office

LIST OF APOLOGIES RECEIVED

- Professor David Hood, National President, Engineers Australia
- Ms Marlene Kanga, National Deputy President, Engineers Australia
- Mr Stephen Durkin, Chief Executive, Engineers Australia.
- Mr John Anderson, Director of Engineering Practice and CPD, Engineers Australia.

- Mr Rupert Grayston, Deputy Chief Executive, Engineers Australia
- Mr John Heathers, Chair, National Board, Engineering Heritage Australia.
- Mr Jim Gard'ner, Executive Director, Heritage Victoria
- Dr Graeme Blackman OAM, Chair, National Trust of Australia (Victoria)
- Mr Martin Purslow, CEO, National Trust of Australia (Victoria)
- Senator Mitch Fifield
- Senator Helen Kroger
- Senator Michael Ronaldson
- Senator Scott Ryan
- Senator Bridget McKenzie
- Mr David Koch MLC, Member for Western Victoria
- Ms Jaala Pulford MLC, Member for Western Victoria
- Ms Gayle Tierney MLC, Member for Western Victoria
- Mr Geoff Howard MLA, Member for Ballarat East
- Mr Richard Marles MP, Member for Corio

Attachment 4 - Ceremony Handout Document

ENGINEERS AUSTRALIA
ENGINEERING HERITAGE VICTORIA,
CITY OF GREATER GEELONG
&
VICROADS

Fyansford Monier Arch Bridge

Heritage Recognition Ceremony

Friday 12 October 2012

The Story of the Bridge

ENGINEERS
AUSTRALIA

CITY OF GREATER GEELONG

vicroads
keeping victorians connected

The History of the Fyansford Bridge

The area around Fyansford was settled by Europeans relatively early as it offered a good water supply and land that was suitable for grazing and growing crops. Its location at the junction of the Moorabool and Barwon Rivers, with reliable rainfall, supported several industries including the production of paper, timber, flour, and cement.

Fyansford is located on the Hamilton Highway on the western outskirts of Geelong. Fyansford - Fyan's Ford - is named after Captain Foster Fyans, the first Police Magistrate for Geelong and district. When Fyans took up his post in 1837, he settled on land near the crossing point, or ford, over the Moorabool River that later formed the common border between the Shires of Corio and Bannockburn. As Magistrate, Fyans' role included Protector of Aborigines and he undertook to take a census of the Aboriginal population, calling upon Buckley[1] to gather the Wathaurong people and count them. In 1840, he was also Commissioner of Crown Lands for the western area of the Port Phillip District, a position from which he played a significant role in local government and in the development and planning of early settlement in Geelong and surrounding areas.

Before his death in 1870, he had served as a Councillor and Mayor of the City of Geelong and as Deputy Sheriff.[2]

The Fyansford Bridge was built at the turn of the twentieth century, and at a time when bridge construction was undergoing a major change. Technology in Australia 1788-1988 [3] says:

> "With the start of the twentieth century, however, three important factors came to bear on Australian bridge design - the advent of concrete and steel, and the emergence of scientific design".

One system which flourished to utilise concrete in structures was the Monier system:

[1] William Buckley was a white man and escaped convict who had been living with the Aborigines for many years. Refer Wikipedia on William Buckley.

[2] RBA Architects and Conservation Consultants Pty Ltd, Conservation Management Plan, August 2009, page 5.

[3] Australian Academy of Technological Sciences and Engineering, Technology in Australia 1788-1988, 1988.

> "The Monier system of construction was patented in 1867 by Joseph Monier, a French manufacturer of garden ware. He manufactured planter pots made of coarse mortar reinforced with a grid of small-diameter iron bars. The technique and patents were gradually extended to cover, amongst other things, arch bridges. The technique was forcefully developed and promoted in the German-speaking world by a number of licensees, amongst whom G A Wayss became dominant. It was formally introduced to Australia in the early 1890s by W J Baltzer, a German immigrant working for the NSW Public Works Department, who joined several businessmen to obtain licenses through Wayss to cover the Australian Colonies. The firm of Carter Gummow & Co was formed and built two important arched sewage aqueducts in Sydney and a number of smaller structures. Baltzer moved across to become effectively its Chief Design Engineer".[4]

Monash and Anderson, in Melbourne, took up the Monier system and built a number of arch bridges using the system under an arrangement with Carter Gummow & Co in Sydney.

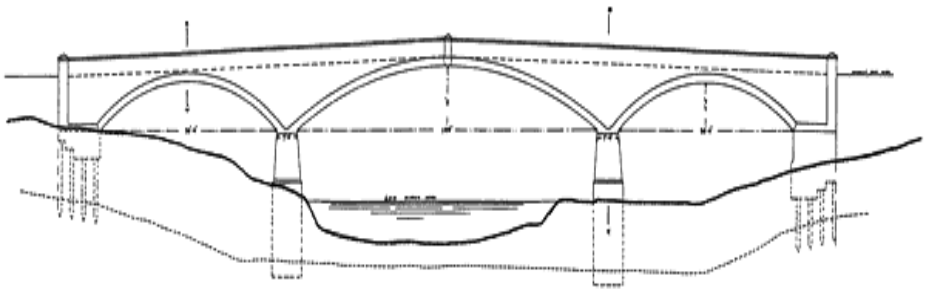
The Anderson Street bridge over the Yarra River (also known as the Morell Bridge) and the Fyansford Bridge were the first two projects using the Monier arch in Victoria.

The proposed bridge at Fyansford was to replace a deteriorated wooden bridge and was the joint responsibility of the Corio and Bannockburn shires as their boundary was the Moorabool River.

The Fyansford bridge project was initiated largely by JTN Anderson while John Monash was preoccupied with legal cases. [5]

> "By 5 October 1897 Anderson had investigated site conditions at Fyansford and sent Gummow a preliminary sketch.... Carter Gummow responded with a drawing showing three arches, each with a 90-foot (27.4m) clear span".[6]

Negotiations between Anderson and the two councils commenced. The councils formed a Joint Committee to oversee the awarding of a contract. The councils decided that they would not call tenders. Several different bridge arrangements were considered and many variations in the details of construction were discussed.



Fyansford Bridge as finally agreed with one 100 foot river span and two 60 foot side spans.
Image: Alan Holgate paper on Fyansford Bridge.

The work of Alan Holgate goes into detail about these negotiations at pages 3-5 of his paper.[7] A great deal of the discussion revolved around the cost of the project. With hindsight we can see that the councils were attempting to manoeuvre Monash & Anderson into a situation which would later prove financially disastrous for Monash & Anderson. The behaviour of the councils was later described by one of the judges involved as "entrapment". It could also be said

[4] Holgate, Alan, John Monash Engineering enterprise prior to WW1, Fyansford Monier Arch Bridge, Dossier, with acknowledged reliance on Alsop, 1982, page 2.

[5] Ibid, page 1,2.
[6] Ibid, page 3.
[7] Holgate, Alan, John Monash Engineering enterprise prior to WW1, Fyansford Monier Arch Bridge, Dossier, with acknowledged reliance on Alsop, 1982.

that Monash & Anderson were not sufficiently careful in establishing that a correct written record of the contract was in their possession.

Placing concrete in the central span 1899.
Image: University of Melbourne Archives

Workers at the bridge construction site 1899.
John Monash and his wife Vic are at the extreme left.
Image: Monash University

In February 1899 work commenced and despite tactics of delay, obstruction and obfuscation by the councils the downstream arches were successfully cast on 14, 15 and 16 August [8] and the upstream arches on 11, 25 and 26 October [9] 1899. The bridge was load tested on 16 February 1900. [10]

[8] Holgate, Alan, John Monash Engineering enterprise prior to WW1, Fyansford Monier Arch Bridge, Dossier, with acknowledged reliance on Alsop, 1982, page 7.

[9] Ibid, page 8.
[10] Ibid, page 9.

The work was satisfactorily completed in less than one year but the councils were not prepared to pay for much of the work. Legal action commenced on 17 June 1901 to force the final claim for payment and the judgment was in favour of Monash & Anderson. Despite this result the councils still did not pay and in December 1901 Monash & Anderson had the Sheriffs seize the contents of the two town halls although this netted only a small sum for Monash & Anderson. The matter then went to appeal which overturned the original decision in favour of Monash & Anderson. Monash & Anderson did not have the financial resources to take the matter to the next court of appeal which was the Privy Council. [11]

Monash & Anderson made a loss of approximately £3000 on the project including losses on the actual construction and the cost of the ultimately unsuccessful legal case against the councils.[12]

In 1970 a new road bridge was built on the site of the old wooden bridge to carry heavier traffic on the Hamilton Highway; the 1900 bridge was retained for pedestrians and cyclists.[13]

The bridge in 1910 with the Fyansford Hotel and the cement works in the background.
Image: Tom Roberts Collection

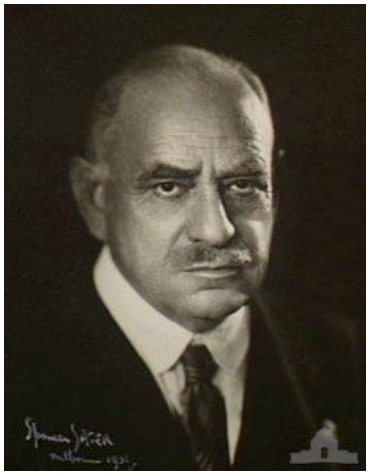
The bridge today. Still in service and little changes after 112 years.
Image: Owen Peake

[11] Ibid, pages 9-12.
[12] RBA Architects and Conservation Consultants Pty Ltd, Conservation Management Plan, Aug 2009, page 14.

[13] Wikipedia, Moorabool River, version last updated on 25 October 2011, downloaded 6 July 2012.

The Engineers who built the bridge - Monash and Anderson

Sir John Monash (1865–1931) [14]



Sir John Monash

"John Monash was born in Melbourne on 27 June 1865 into a Prussian-Jewish family. He was educated at Scotch College and Melbourne University. By 1895 he had degrees in arts, engineering and law and had qualified as a municipal surveyor, an engineer of water supply and a patent attorney. As an engineer Monash's early career was in bridge construction working for a time with the Melbourne Harbour Trust, before becoming a partner in a bridge building firm. By the turn of the century his focus had changed to building construction.

Monash's military career began in 1884 with his membership of the Melbourne University company of the 4th Battalion, Victoria Militia, and then moving to the North Melbourne Battery of the Metropolitan Brigade of the Militia Garrison Artillery. He was commissioned in 1887. By 1913 Monash had the rank of Colonel and was appointed to command the 13th Infantry Brigade. With the outbreak of World War I in 1914, Monash was transferred from the militia to active service. In 1915 he served as Chief Censor until taking command of the 4th Infantry Brigade (AIF). In this command he served at Gallipoli.

Promoted to Major-General, he commanded the 3rd Division, AIF in France in 1916. Monash succeeded General Birdwood as Australian Corps commander in 1918 and, in the same year, was knighted by King George V in recognition of his role in the Battle of Hamel Hill. With the conclusion of the war, Monash became Director-General of Repatriation and Demobilisation with responsibility for arranging the return of Australian troops from Europe.

Back in Australia Monash resumed his engineering career firstly as General Manager and later as Chairman of the State Electricity Commission (SEC) of Victoria. Under his leadership the SEC became an important body in developing Victoria's brown coal reserves as an electricity source and, by 1930, extending the power grid across the whole of the State.

John Monash died in Melbourne on 8 October 1931."

[14] National Archives of Australia, http://www.naa.gov.au/aboutus/publications/factsheets/fs121.aspx, 1997. This document was copied from the Engineering Heritage Victoria Nomination for the Yallourn Power Station by Udara Almeida, 2011.

Joshua Thomas Noble Anderson (1865-1949) [15]

"John Monash's subsequent fame overshadowed the contribution made by J. T. N. Anderson to engineering in Victoria and to Monash's early career. The pair formed a business partnership in 1894. In 1897, while Monash was in Western Australia, Anderson forged a link with the Sydney firm of Carter Gummow & Co and obtained through them sole rights to the Monier patent in Victoria. He oversaw the initial negotiations, planning and design for the partnership's first two Monier arch bridges (Fyansford and Wheeler's); obtained many of their commissions and contracts; and consulted widely in the fields of mechanical engineering, water resources and mining. By 1902 a downturn in the economy and two serious misfortunes had placed the partnership in severe financial trouble and its future was uncertain. Anderson elected to take up a salaried position in charge of design and construction of a new sewerage scheme for Dunedin, New Zealand. It is likely that the pair hoped to form a bridgehead there for the partnership and its related pipe factory, though nothing eventuated. Monash worked in Victoria at trading the firm out of debt and in 1905 it was agreed that the partnership be dissolved. Anderson relinquished his rights and was absolved from his share of the remaining debt. He travelled overseas for some time, then returned to Australia and spent the rest of his life in municipal engineering in Victoria, while retaining his independence as a consulting engineer". [16]

The Monash and Anderson families in 1897.
John Monash (standing, left) and Joshua Anderson (standing, right) with their wives and children seated. The man seated at left is thought to be Anderson's brother.
Image: National Library of Australia

[15] Alan Holgate Vicnet web site downloaded 10 July 2012.

[16] Anderson's life is summarised in a paper by Brian Lloyd. Stories of the bridge projects in which JTNA was concerned are available on the Alan Holgate web site via the following links: Morell Bridge; Fyansford Bridge; Wheeler's Bridge; Bendigo Arch Bridges; Kings Bridge, Bendigo; Barbers Creek Bridge and Woolert Bridge. There is much more in the archives at UMA and NLA on JTNA's consulting work, e.g. for the Mildura Irrigation Board and the Ballarat Woollen Mills.

This document has been prepared as a handout for the ceremony to recognise the Fyansford Monier Arch Bridge, Geelong under the Engineering Heritage Australia, Heritage Recognition Program.

Prepared by Engineering Heritage Victoria.

The ceremony was arranged by Engineering Heritage Victoria in association with the City of Greater Geelong and VicRoads.

October 2012.

Attachment 5 - EHA Newsletter Article

ARTICLE FOR EHA NEWSLETTER
HERITAGE RECOGNITION PROGRAM
FYANSFORD BRIDGE

Heritage Recognition for Fyansford Monier Arch Bridge

A heritage Recognition Ceremony was held on 12 October 2012 for the early reinforced concrete bridge across the Moorabool River at Fyansford, 4 km west of Geelong, Victoria. The event was part of the Engineers Australia Regional Engineering on Show weekend at Geelong from 12 to 14 October.

Around the turn of the 20th century the Monier patent for reinforced concrete started to be used for the construction of bridges, including in Australia. In Victoria the firm of Monash & Anderson obtained rights for the use of the patent and built many bridges using the method. The Fyansford Bridge was the first Monier arch bridge in Victoria to go into service, in late 1899.

The construction of Monier bridges marked the change for most road bridges from construction with wood or masonry to reinforced concrete. Whilst the Monier arch was soon replaced by the now-familiar reinforced T beam it was in the vanguard of the use of reinforced concrete for road bridges.

The heritage recognition ceremony was jointly sponsored by Engineers Australia, VicRoads, and the City of Greater Geelong.

Investigations at the bridge site commenced in late 1897, largely involving Joshua Anderson whilst John Monash was busy with other business in Western Australia. Negotiations with the two councils whose boundaries ran along the Moorabool River (Shire of Corio and Shire of Bannockburn) commenced but were protracted. The two councils were in conflict over many issues and they both wanted lower prices for the work than Anderson could offer. Several different bridge arrangements were discussed but the option eventually adopted was for three spans consisting of a central span of 100 feet and two shorter side spans of 60 feet each.

Work commenced in February 1899 and despite delay, obstruction and obfuscation by the councils the downstream arches were successfully cast in August 1899 and the upstream arches in October 1899. The bridge was load tested on 16 February 1900 although it had been in service since late 1899.

The whole work was successfully completed in less than one year but the councils were not prepared to pay for much of the work. Legal action commenced in June 1901 to force the final claim for payment and the judgment was in favour of Monash & Anderson. Despite this result the councils still did not pay and Monash & Anderson had the Sheriffs seize the contents of the two town halls although this netted only a small sum for Monash & Anderson. The matter then went to appeal which overturned the original decision in

favour of Monash & Anderson. Monash & Anderson did not, by this time, have the financial resources to take the matter to the next court of appeal which was the Privy Council.

The bridge carried traffic on the Hamilton Highway until 1970 when a new bridge was built alongside it. The old bridge has been maintained over the years by VicRoads and is still in service as a pedestrian and bicycle bridge.

An interpretation panel and Engineering Heritage Marker were unveiled at the conclusion of the ceremony. This site is the 159th site recognised under Engineering Heritage Australia's Heritage Recognition Program.

Owen Peake
Engineering Heritage Victoria

IMAGES CAPTIONS

1) Placing concrete in the central span of the bridge, 1899. *Image: University of Melbourne*

Image ID: Fyansford Turning the Central Span.University of Melbourne

2) Fyansford Bridge, 2012 from near the interpretation panel location.

Image ID: 111.Fyansford Bridge.Aug 2012

Attachment 6 - EV Magazine Article

ARTICLE FOR EV MAGAZINE
HERITAGE RECOGNITION PROGRAM
FYANSFORD AND MALMSBURY

Heritage Recognition Ceremonies - Fyansford and Malmsbury

Victoria Division conducted two heritage recognition ceremonies in October. The first was coordinated with the Regional Engineering on Show weekend at Geelong from 12 to 14 October to recognise the early reinforced concrete bridge at Fyansford, 4km west of Geelong. The second, the following weekend, recognised the Melbourne to Bendigo and Echuca Railway on the 150th anniversary of its opening.

Around the turn of the 20th century the Monier patent for reinforced concrete started to be used for the construction of bridges, including in Australia. In Victoria the firm of Monash and Anderson obtained rights for the use of the patent and built many bridges using the method. The Fyansford Bridge was the first Monier arch bridge in Victoria to go into service, in late 1899.

The construction of Monier bridges marked the change for most road bridges from construction with wood or masonry to reinforced concrete. Whilst the Monier arch was soon replaced by more modern designs was in the vanguard of the use of reinforced concrete for road bridges.

The old bridge has been maintained over the years by VicRoads and is still in service as a pedestrian and bicycle bridge alongside a newer reinforced concrete bridge which now carries the Hamilton Highway.

The heritage recognition ceremony was jointly sponsored by Engineers Australia, VicRoads, and the City of Greater Geelong.

On the 150th anniversary of the opening of the Melbourne to Bendigo Railway a large group of locals and a few visitors from further afield gathered to recognise the railway in the grounds of the Malmsbury Botanical Gardens, under the shadow of the mighty bluestone Malmsbury railway viaduct.

The line from Melbourne to Bendigo was one of two initial projects undertaken by the newly formed Victorian Railways in 1856. The other line was the Geelong to Ballarat Railway. Both railways were constructed to high British standard of the day. The construction of the railways was initiated because of the gold rushes at Ballarat, Castlemaine and Bendigo. The railway to Bendigo was almost immediately extended to Echuca, opening up access from the Port of Echuca to the Port of Melbourne. The railway captured the majority of the Murray River trade for Victoria as it was the first railway connection to the river.

The heritage recognition ceremony was a jointly sponsored by Engineers Australia, Macedon Ranges Shire Council and the Malmsbury Historical Society.

Owen Peake
Engineering Heritage Victoria

IMAGE CAPTIONS

1) Unveiling the interpretation panel and marker at Fyansford. From left: Mario Fantin, Madeleine McManus and Mayor John Mitchell.

Image ID: Fyansford Unveiling.033

2) Crowd in the Malmsbury Botanical Gardens during the ceremony.

Image ID: Malmsbury Ceremony.044

Attachment 7 - EA Magazine Article

ARTICLE FOR EA MAGAZINE
HERITAGE RECOGNITION PROGRAM
FYANSFORD BRIDGE

Heritage Recognition for Monier Bridge

The Regional Engineering on Show weekend at Geelong from 12 to 14 October got under way with a heritage recognition ceremony for a very important early concrete bridge at Fyansford, 4 km west of Geelong.

Around the turn of the 20th century the Monier patent for reinforced concrete started to be used for the construction of bridges, including in Australia. In Victoria the firm of Monash and Anderson obtained rights for the use of the patent and built many bridges using the method. The Fyansford Bridge was the first Monier arch bridge in Victoria to go into service in late 1899.

The construction of Monier bridges marked the change for most road bridges from construction with wood or masonry to reinforced concrete. Whilst the Monier arch was soon replaced by the now-familiar reinforced T beam it was in the vanguard of the use of reinforced concrete for road bridges.

The old bridge has been maintained over the years by VicRoads and is still in service as a pedestrian and bicycle bridge alongside a newer concrete bridge which now carries the Hamilton Highway.

The heritage recognition ceremony was a jointly sponsored by Engineers Australia, VicRoads, and the City of Greater Geelong.

National Councillor Madeleine McManus represented the National President of Engineers Australia, Professor David Hood. Councillor John Mitchell, Mayor the City of Greater Geelong represented the Council which funded the interpretation panel and its installation. Brendan Grace, Senior Planning Engineer of the South Western Geelong Office of VicRoads and Mario Fantin, Principal Bridge Engineer of VicRoads represented VicRoads which owns the old bridge.

We were also honoured to have Mr Peter Alsop, retired engineer of VicRoads and well known local historian in Geelong speak to the 61 guests at the ceremony about his recollections of the bridge.

An interpretation panel and Engineering Heritage Marker were unveiled at the conclusion of the ceremony. This site is the 159th site recognised under Engineering Heritage Australia's Heritage Recognition Program.

Owen Peake
Engineering Heritage Victoria

IMAGES CAPTIONS

1) Engineer and historian Peter Alsop speaking at Fyansford. *Image: Miles Pierce*

Image ID: Fyansford Ceremony.3.MP.Oct 2012

2) Unveiling the interpretation panel and marker. From left: Mario Fantin, Madeleine McManus and Mayor John Mitchell.

Image ID: Fyansford Unveiling.033

Attachment 8 - Speech Notes - Councillor Madeleine McManus

Fyansford Bridge
Heritage Recognition Ceremony

Speaking Points
EA Representative: Councillor Madeleine McManus

Mr Mayor, Distinguished Guests, Members of Engineers Australia Ladies and Gentlemen

I am delighted to be representing Engineers Australia's National President, Adjunct Professor David Hood, today at this important engineering heritage recognition ceremony.

Madeleine to insert reference to the Mayor and Council

> **As I said to the Mayor earlier, I am absolutely delighted we were able to include this important recognition ceremony as part of our *Regional Engineering On Show* - a 3-day celebration of regional engineering this weekend in Geelong.**

Engineers Australia is a large organisation representing all aspects of the engineering profession throughout Australia.

We have over 100,000 members and are involved in every discipline of engineering from the civil engineers who design and build our roads, to those involved in the specialised areas at the very cutting edge of new and developing technologies in space sciences, biomedical technology, robotics and more.

While we are a very young organisation, with over 50% of our 100,000 strong Members under the age of 35, we also celebrate a proud 90 year heritage of our engineers contribution to the growth and wealth of this country.

Our Heritage Recognition Program joins with local communities to recognise and celebrate the great engineering achievements of the past, and honour the contribution of our forefathers.

The program has been in place since 1984 and every year about 8 sites around the country are recognised at ceremonies such as this.

The sites and works recognised represent all aspects of engineering with the works coming from many differing time periods.

Our earliest engineering infrastructure is recognised at Budj Bim, near Warrnambool, where we acknowledge the significance of the 6,600 year old Aboriginal Hydraulic Works.

Early Colonial works are recognised such as the Great North Road which was built from Sydney north to the Hunter Valley.

And works from the late 19th Century and very early 20th Century when so much impressive infrastructure was built all around the country such as this bridge *Point to bridge* which was built in the last year of the 19th Century and tested for public service in the first months of the 20th Century.

Great nation building works of the 20th Century such as the Sydney Harbour Bridge and the Snowy Mountains Scheme have been recognised and the Melbourne sewerage scheme with its treatment farm at Werribee and the great pumping station at Spotswood on the Yarra River. When completed around the turn of the 20th Century it was one of the greatest sewerage systems in the world.

During the course of the heritage recognition program 159 sites or works have been recognised. In the last year. 9 new sites were recognised, 4 of which were in Victoria, including the two Goldfields Railways which were completed in 1862 to connect Geelong with Ballarat and Melbourne with Bendigo.
Madeleine to make a personal comment along the following lines?

I was delighted to also participate in Geelong to Ballarat Railway ceremony with the Mayor, and one of the highlights of this year was the opportunity to ride the historical rail-line.

Each one of these sites is painstakingly researched by the volunteers of Engineering Heritage Australia, the Special Interest Group which carries out this work within Engineers Australia, in conjunction with relevant local communities.

Ceremonies are then arranged in collaboration with local organisations and where-ever possible, an interpretation panel is unveiled together with a marker to formally recognise the significance of the site.

The Heritage Recognition Program is a very important part of our community work. It celebrates the achievements of local communities which had a hand in building the engineering works, used this community infrastructure over its useful life and continues to care for it in retirement…….or in the case of THIS BRIDGE, in semi-retirement, as it is still in service as a pedestrian and bicycle bridge.
…….And we hope that it will continue in that role for many decades to come!

So in closing, I ask you to remember that this bridge is not just the result of the work of two great engineers (and their construction team) from more than a century ago, but that our celebration of its life and usefulness demonstrates the ongoing commitment of the local community to care for important engineering infrastructure and its heritage.

The development of the nomination document which contains the full engineering and historical story of this bridge took many months and much research to put together. It also found many "unknowns" which remain to be researched. I would like to acknowledge and thank the many people were involved in this work and will continue to build the historical record of the Fyansford Bridge.

And Mr Mayor, I hope that this recognition, along with our other Heritage Markers will bring many engineering tourists to enjoy your great city!
Thank you.

Attachment 9 - Speech Notes - Mayor Councillor John Mitchell

Fyansford Bridge
Engineering Heritage Recognition Ceremony
12 October 2012
Speech Notes for Mayor of Greater Geelong City Council

- During the very early days of settlement in Victoria Melbourne and Geelong were locked in a competition to be the major port on Port Phillip Bay.

- It had been recognised very early that the Western District contained large areas of good farming land. This land was largely accessed from the ports of Geelong in the east and Portland in the west.

- Settlements were started at Portland in 1834, Melbourne in 1835 and Geelong in 1837.

- A road from Geelong into this vast area of good country in the Western District started to be formed soon after these early settlements. This road is now the Hamilton Highway running from Geelong west to Hamilton, north of Portland, a distance of 254 km. This road was important in the early days of settlement of the Western District and it is still important today.

- This key highway into the Western District had a major hurdle to cross just as it left Geelong - the Moorabool River.

- Fyans Ford (now Fyansford) is named after Captain Foster Fyans, the first Police Magistrate for Geelong and district. When Fyans took up his post in 1837, he settled on land near the crossing point, or ford, over the Moorabool River that later formed the common border between the Shires of Corio and Bannockburn. As Magistrate, Fyans' role included Protector of Aborigines. In 1840, he was also Commissioner of Crown Lands for the western area of the Port Phillip District, a position from which he played a significant role in local government and in the development and planning of early settlement in Geelong and surrounding areas.

- Before his death in 1870, he had served as a Councillor and Mayor of the City of Geelong and as Deputy Sheriff.

- Fyansford offered a good water supply and land that was suitable for grazing and growing crops. Its location at the junction of the Moorabool and Barwon Rivers, with reliable rainfall, supported several industries including the production of paper, timber, flour, and cement.

- The first bridge at Fyansford was built in 1854 as a toll bridge. It was a wooden bridge. In the same year the Fyansford Hotel was opened.

- There has been a highway bridge on this site ever since and the Fyansford community grew up firstly around the ford and then around the bridge.

- The original wooden bridge was inadequate but it took over 40 years to build a more permanent structure.

- Approaching the turn of the twentieth century the two councils who shared responsibility for this crossing at that time; the Corio Shire Council and the Bannockburn Shire Council decided that a more permanent bridge should be built.

- It took some time to decide what type of bridge to build and to arrange a contract.

- It was eventually decided to build a concrete bridge of the Monier arch type - a very early use of reinforced concrete for bridge construction in Australia.

- A contract was negotiated with Monash and Anderson of Melbourne who had rights to the Monier patents in Victoria.

- The bridge was built in 1899 and went into service at the end of 1899 with the load testing of the bridge carried out in February 1900. It remains in service as a pedestrian bridge.

- Thank you.

Attachment 10 - Speech Notes - Mr Brendan Grace

Old Fyansford bridge – speech notes Brendan Grace (DRAFT)

- Mayor, Cr McManus, distinguished guests, ladies & gentlemen,

- Let me say how pleased I am to see so many here today to recognise the special place of the Fyansford Monier arch bridge in the engineering history of Victoria.

- As well as being a fine and pleasing structure, it also has a unique significance in bridge construction in Victoria & Australia.

History

- ~~The Monier arch bridge was built in 1899. It replaced a timber bridge which stood roughly where the current road bridge is now. The timber bridge had been built in 1854.~~

- ~~The current road bridge came into service in 1900.~~

~~*Fyansford history – Foster Fyans (police supt & mayor), William Buckley, Wauthaurong.*~~

Bridge construction

- ~~Moorabool River was on the border between Corio & Bannockburn Shires.~~

- By 1890s the original 1854 timber bridge had deteriorated to such an extent that a 2 ton load limit was placed on it. It was now inadequate for the traffic demands being placed on it.

- Two relatively young engineers (John Monash & Joshua Anderson) had formed a partnership. They were aware of a new form of bridge construction that had been developed in Europe, the Monier system.

- Monash & Anderson proposed a Monier arch bridge to replace the timber bridge. This was a radical and basically untried construction method in Victoria.

- More conventional methods were considered – timber, masonry, steel – but after much debate the Monash & Anderson proposal for a Monier arch bridge was accepted.

- ~~It was constructed in 1899 and formally opened in 1900.~~

- There followed a long dispute between M & A and the Councils over contract payments. In the end, M & A took a hit of 3,000 ($500,000 today). A crippling blow to the fledgling engineering partnership.

Monier system

- The Monier system was a radical new method on construction, involving forming concrete around steel/iron bars/lattice.

- The steel reinforcement allowed the concrete to flex; to operate in tension as well as compression.

- To this time, bridge construction had been limited to timber, stone, mass concrete. This required formation of an arch because of the weakness of these materials in tension. Steel construction was more expensive.

- At the time this bridge was commenced, there were only ??? such bridges in Australia and none in Victoria (At that time, the first Monier arch bridge - the Morell bridge - was still under construction).

- The Fyansford bridge represents a moment in time, a point of change, at which reinforced concrete was adopted as the construction material for large bridges in Victoria.

- Given the ubiquitous presence of reinforced concrete these days – in bridges, buildings, roads, pipes – it is easy overlook the significance of the point of time represented by the Fyansford bridge.

Joseph Monier

- I must mention Joseph Monier, the inventor of the Monier system. He was a Frenchman and manufacturer of garden pots in the mid 19th century.

- He developed a method of embedding a lattice of iron bars into concrete to improve strength and durability. He eventually developed his system to construct the first reinforced concrete bridge in 1875, spanning 14m. The bridge still stands today at Chateau de Chazelet.

Details of bridge (p11 CMP)

- The principal component of the Monier arch bridge is the thin barrel vault (rib or arch ring) spanning between abutments or piers (masonry or concrete). The vault was reinforced with a mesh of iron rods placed close to the intrados (underside).

- The Old Fyansford bridge has a central 30m span and 18m east and west spans. Abutments and piers are mass concrete.

The current bridge

- By late 1960s, car and particularly truck traffic had increased to the point that there were road safety problems, particularly for pedestrians on the bridge.
  (2,200 vehicles/day, 41% trucks)

- The current bridge was built. Reinforced concrete was still used, but techniques had progressed. Precast prestressed beams were used.

- ~~There were even suggestions that the old bridge be demolished~~.

- I now introduce Mr Peter Alsop. Mr Alsop was an engineer with CRB/RCA and has had a close connection with the bridge going back to 1960s. He remains to this day involved in the history of Geelong. He made a vital contribution to its preservation, by providing the information on the bridge's cultural and engineering significance to ensure it was not demolished.

- Mr Alsop initiated and supervised the restoration works in 1989 & I invite him to share some of his experiences.

Restoration 1989

- *Peter Alsop to provide information*

Future

- In 2009 VicRoads commissioned a Conservation Management Plan (CMP) for the bridge. The CMP will provide guidance for the ongoing care of the site. Interestingly, one of the CMP recommendations is the installation of interpretive panels here.

Conclusion

- In concluding, I thank Engineers Australia and Engineering Heritage Victoria for recognising the bridge and also City of Greater Geelong for their generous funding to the panel and carrying out works on the site.

Monash & Anderson

- *Any recognition of Monash & Anderson?*

Attachment 11 - Body of typical thank you letter

DRAFT 1 (Several Speakers)

On behalf of Engineers Australia, Victoria Division and Engineering Heritage Victoria, I would like to take this opportunity of thanking you for your support of the Fyansford Bridge Heritage Recognition Ceremony on 12 October 2012.

The event was very successful and the marking of the site is an important step to inform present and future generations of Australians of the significant heritage values of Victorian engineering.

Your speech was most impressive and your participation is much appreciated.

Yours sincerely

Glenda Graham
Executive Director
Engineers Australia
Victoria Division

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