

Engineering Heritage Victoria Newsletter – December 2012

This is an occasional newsletter from **Engineering Heritage Victoria** sent to all members on our mailing list. Enquiries, discussion or correspondence related to the Newsletter should be directed to the Editor at doring.belgrano@bigpond.com or address postal correspondence to the Chairman, Engineering Heritage Victoria, Engineers House, 21 Bedford Street, North Melbourne, Vic 3051.

Editorial

This last newsletter for 2012 is being issued very late in the year, after the AGM. The delay was for personal reasons, but has the advantage that I am able to include the Chairman's Annual Report as presented to the AGM in November. If you weren't able to make it to some of the functions hosted by EHV since July, I hope you enjoy reading a little about them in section 2. Some of the plans for next year are set out in Sections 3 and 4 – and note that Owen Peake will be replacing Miles Pierce as Chairman of EHV. We thank Miles for his dedication and enthusiasm during his time as Chairman.

1. EHV Annual Report – 2012

1. COMMITTEE

The committee members for 2012 were as follows:

Miles Pierce (Chairman); David Beauchamp (Deputy Chairman); Owen Peake (Secretary); Paul Balassone; Matthew Churchward; Carl Doring; Margret Doring; Will Gielewski (YEA-V); Ken McInnes; David LeLievre (David LeLievre joined the committee this year).

Corresponding members during this year were David Brown and Lawrence Reddaway.

2. GUEST SPEAKERS PROGRAM

The Guest Speaker Series was continued with EHV hosting six sessions during the year:

- February – *Submarines in Australia* – Indecision to Success - Owen Peake
- April – *The Archaeology of Early Steam Locomotives* – Michael Bailey
- April – *The Great Melbourne Telescope* – Richard Gillespie
- June - *William Thwaites, Engineer to Marvellous Melbourne* – Robert La Nauze
- August - *Barwon Heads Bridge, History or Heritage* – David Beauchamp
- October - *Goldfields Railways mini-seminar* – B Harper, K McInnes, M Churchward

The attendance at these meetings was generally good. Copies of the flyers were sent out to other outside organizations/societies judged as likely to be interested in the respective presentations and this is believed to have increased attendances.

3. EHV WEB PAGES

The EHV pages on the E A Victoria Division web site have been operational throughout this year although some problems remain with making changes to content. The VicNet sponsored web site for EHV, managed by Ken McInnes has also continued in operation with periodically updated information on forthcoming EHV events. Other sections of it still require completion and/or updating.

4. HERITAGE RECOGNITION PROGRAM

The Geelong to Ballarat railway was recognized in ceremonies to unveil interpretive panels at the Geelong and Ballarat stations on 10 April. The event coincided with regional celebrations to mark the 150th anniversary of the opening of this goldfields railway line. EHV also collaborated with the EA Geelong and Ballarat Region Groups in regard to separate celebratory activities arranged by those groups.

On Friday 12 October an Engineering Heritage Recognition ceremony was conducted at the Fyansford Monier Arch Bridge which was built by the partnership of Monash and Anderson, 1899-1900, to replace an earlier timber bridge across the Moorabool River on the Geelong to Hamilton Road. The ceremony preceded the Victoria Division 'Regional Engineering on Show' weekend hosted by the EA Geelong Regional Group.

The Melbourne to Bendigo railway was recognised in a ceremony at Malmsbury on 20 October to coincide with the 150th anniversary of the opening of this goldfields railway line. The Engineering Heritage National Landmark and associated interpretive panel are located in the Malmsbury botanical gardens in sight of the impressive multi-span masonry viaduct carrying the railway over the Coliban River.

A nomination of the Great Ocean Road was researched and drafted by Victoria University Student, Carlos Negron, with guidance and assistance from EHV committee members. It is intended to finalise and submit the nomination next year and to arrange with VicRoads to conduct a marking ceremony.

5. SITE VISITS AND FIELD TRIPS

In August EHV ran two guided tours of selected sites of engineering heritage interest in the Melbourne CBD as a part of Victoria Division's Engineering Week activities. A handout produced for this EHV event was prepared as a spin-off from the work of the subcommittee charged with the preparation of the 'Discover Engineering Heritage – Central Melbourne' public brochure.

A site visit to the Melbourne Water's Preston Reservoirs is planned for November.

6. EHV NEWSLETTER

Two issues of the EHV occasional Newsletter edited by Margret Doring were sent out to the EHV members address list during February and July. A final 2012 Newsletter is planned for November.

7. THREATENED SITES OF ENGINEERING HERITAGE SIGNIFICANCE

The EHV executive committee has continued liaison with Major Projects Victoria to have the steam pumping station for the former Duke and Orr's dry dock secured against flooding risk and adequately managed to preserve its Robison Bros engines and pumps and to arrange for suitable interpretive signage.

8. CENTRAL MELBOURNE ENGINEERING HERITAGE BROCHURE

A subcommittee has continued to work on the preparation of an engineering heritage self guided tour brochure for the Melbourne CBD area. A handout brochure was prepared from this initiative for the Engineering Week guided tours of selected CBD engineering heritage sites (see above).

In due course, it is hoped to develop similar brochures for engineering heritage places/objects beyond the Melbourne CBD.

9. VICTORIAN ENGINEERING HERITAGE DATABASE/REGISTER

A 'first cut' database has been set up on the EHV VicNet website and the information for a small number of sites/works entered on a trial basis. This has revealed the need for some further refinement of and additions to the database framework that has yet to be done.

It is intended that each entry will have a descriptive summary of at least one page and including at least one photograph. The entry would also include information on ownership, location, accessibility, references, etc. The printout for an individual entry in the database should typically fit on a single page and not exceed two pages.

10. TECHNICAL INITIATIVE FUND

A plan to utilise monies in this fund to facilitate digitizing of the Proceedings of the former Victorian Institute of Engineers has stalled following Informit declining to submit a quotation for the task. It is hoped that this initiative will be able to be progressed in the coming year.

11. MAILING LIST

The EHV mailing list has continued to be held by Division Office and the committee / executive have not been able to access it directly. Some earlier addresses, particularly those of non-members of E A, appear to have 'dropped off' the list, based on anecdotal comments. The list is believed to run to approximately 500 addresses.

12. OTHER ACTIVITIES

The EHV committee has supported deputy chairman, David Beauchamp, in his efforts to raise funds to have the grave of engineer/architect John Grainger marked with a headstone. An order has now been placed for the headstone and it is expected to be erected on the grave at Box Hill cemetery early next year.

Miles Pierce, Chairman

2. Guest Speakers & Other Functions – 2012 to 2013

FUTURE FUNCTIONS — (2013)

GUEST SPEAKER PROGRAM

Guest Speaker Meetings will be held on the third Thursday of the month, every 2 months except December. They will usually be held in the John Connell Auditorium at EA Victorian Division offices, Bedford Street, North Melbourne. 2013 subjects to be notified in due course. The dates for your calendar will be:

21 Feb 2013, 18 Apr 2013, 20 June 2013, 15 Aug 2013, 17 Oct 2013.

HERITAGE RECOGNITION PROGRAM AND OTHER POSSIBILITIES.

A number of interesting projects are in the pipeline for 2013, but none have been tied down so far, and no dates have been set. However, for more information, see Section 4 below '**THEMES FOR 2013**'.

FUNCTIONS PAST — (2012):**Monday 6th & Wednesday 8th August** — Owen Peake and Miles Pearce conducted two**MELBOURNE WALKING TOURS – DISCOVER ENGINEERING HERITAGE.**

These were two-hour walking and tram explorations of the engineering heritage of Melbourne's CBD, starting at Federation Square and finishing at Melbourne Central.

Melbourne was founded in 1835 and grew very rapidly during the gold rush of the 1850s. Its heyday as Marvellous Melbourne was in the 1880s. Today it is a major metropolis housing more than 4 million people who come from many countries. More than one in three of us were born overseas. Engineering played a huge part in Melbourne's development, and the tours explored some of the engineering heritage gems of the city. An early focus was on transport infrastructure, principally to facilitate the importation and movement of people and goods. The wealth from the gold rush enabled the city to develop rapidly and magnificently. The guided tours took in some of the city bridges, selected buildings of note from an engineering heritage perspective and evidence of some early utility services.

The tours proved extremely popular and were booked out almost as soon as bookings opened.

Thursday 16th August 2012 — David Beauchamp spoke on**BARWON HEADS BRIDGE — HISTORY OR HERITAGE?**

David Beauchamp is a forensic and heritage engineer and deputy chair of Engineering Heritage Victoria. In 2002 he wrote a conservation management plan for the Barwon Heads Bridge. In 2006 he prepared a 'Cultural Heritage Study of the Options for Replacing the Barwon Heads Bridge' and he subsequently prepared a conservation management plan for VicRoads' 2007 proposal for a new bridge. When this proposal was rejected in 2008, he wrote a further conservation management plan for the bridge that has now been built.

The Barwon Heads Bridge, built in 1927, near the mouth of the Barwon River, was the largest timber bridge built for the Country Roads Board. During its life it was altered, widened and strengthened to meet changing traffic requirements. In 1999 it was placed on the Victorian Heritage Register.

Because of the high cost of maintenance of the bridge, and concern about its load carrying capacity, VicRoads, in 2005, commissioned a study of ten options for a new bridge at three different locations. In 2006 it was announced that the bridge was to be demolished and replaced. After a huge public outcry to save the bridge the Government set up an Advisory Committee to look at alternative solutions for the bridge. VicRoads first attempt at meeting the Committee's recommendations was much criticised. The final solution was to dismantle the existing bridge and replace it with a steel and concrete 'replica', which is on the Victorian Heritage Register, and to build a timber clad, concrete pedestrian and cyclist bridge downstream from the new road bridge.

David's talk covered the history of the original bridge, a description of the new bridges and examined the question of the heritage value of the new road bridge.

Friday 12th October — **HERITAGE RECOGNITION CEREMONY for the FYANSFORD MONIER ARCH BRIDGE**

A Heritage Recognition Ceremony was held on 12th 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 12th to 14th October. The ceremony was 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 of 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.



*Unveiling the Fyansford Bridge interpretation panel and marker.
From left: Mario Fantin, Madeleine McManus and Mayor John Mitchell.*



Engineer & historian Peter Alsop speaking at Fyansford. Image: Miles Pierce

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.

THE STORY OF THE BRIDGE

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 concrete T beam it was in the vanguard of the use of reinforced concrete for road bridges.

Investigations at the bridge site commenced in late 1897, largely involving Joshua Anderson while 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.



Placing concrete in the central span of the bridge, 1899.

Image: University of Melbourne.



Fyansford Bridge, 2012, taken from near the interpretation panel.

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.

Owen Peake, Engineering Heritage Victoria

Thursday 18th October 2012 — Brian Harper, Ken McInnes and Matthew Churchward spoke about various aspects of **THE GOLDFIELDS RAILWAYS**, from Geelong to Ballarat & Melbourne to Bendigo

The Goldfields Railways were the first railways built by Victorian Railways. The connection from Spencer Street and Williamstown was also completed at the same time. The railways to Ballarat and Bendigo were opened in 1862.

Brian Harper spoke about the Railway Designers and examined the contribution of George Christian Darbyshire and Robert Adams, two local engineers and major figures in the design of the Goldfields Railways.

Ken McInnes spoke about Engineer Francis Bell CE MInstCE (c1800-1879) who deserves greater recognition. In 1854 he was the engineer for the £1,000,000 '*Geelong, Ballarat & North Western Railway Company*', incorporated by Act of Parliament to raise the funds, design, build and operate the railway. Recent research indicates that it was his design that was used by the Victorian Railways to build the Geelong-Ballarat Railway.

Matthew Churchward spoke about working the Victorian goldfields railways. The completion of Victoria's two goldfields railways was an undeniable achievement, however, the next engineering challenge would be to utilise the infrastructure to develop a safe and efficient transport system for the colony. The extension of the Bendigo line to Echuca in 1864, enabled Melbourne merchants and shipping firms to capture much of the significant Riverina trade and became as crucial to the success of the Victorian Railways as the investment in suitable rolling-stock and locomotives. Over subsequent decades the Bendigo and Ballarat lines would continue to be the backbones of much railway expansion. So important was the Bendigo route that it continued to be referred to as 'The Main Line' long after the first interstate rail connections to Sydney and Adelaide were made in the 1880s.

Saturday 20th October 2012 — **GOLDFIELDS RAILWAY HERITAGE RECOGNITION CEREMONY at MALMSBURY** for the **150th Anniversary of the opening of the Melbourne to Bendigo Railway**.

The Melbourne to Bendigo Railway was opened for service to Bendigo on 20 October 1862. On the 150th anniversary of the opening a large group of locals and a few visitors from further afield gathered to recognise the railway. The ceremony was held in the grounds of the Malmsbury Botanical Gardens below the great bluestone Malmsbury railway viaduct.

Engineering Heritage Victoria selected the site at Malmsbury to recognise the whole railway due to the high significance of the Malmsbury Viaduct which remains in service, unmodified after 150 years.

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

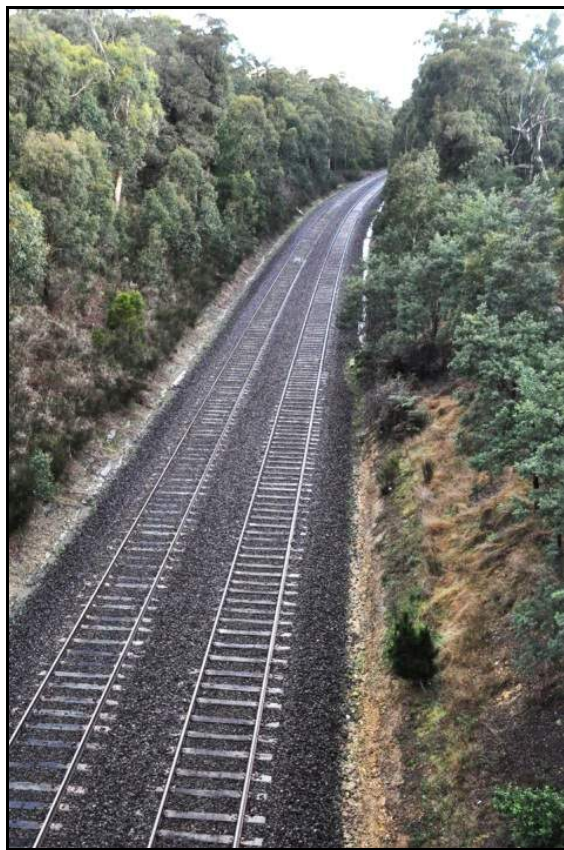
An interpretation panel and Engineering Heritage National Landmark were unveiled at the conclusion of the ceremony. This site is the 160th site recognised under Engineering Heritage Australia's Heritage Recognition Program.



The Malmsbury Viaduct, the National Landmark plaque for the Bendigo Railway, and its interpretation panel, photographed on 20th October 2012.

THE STORY of the RAILWAY

The railway 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 the high British standard of the day and exhibited little of the light duty "colonial development railway" characteristics so often encountered around the Empire. The construction of the railways was initiated because of the gold rushes at Ballarat, Castlemaine and Bendigo.



The Melbourne to Bendigo railway tracks below Mt Macedon near where they cross the Great Dividing Range. The crossing was higher than any railway in the United Kingdom at the time of its construction.



A commuter train crossing the Malmsbury Viaduct on the day of its sesqui-centenary – 20th October 2012.

George Christian Darbyshire was appointed as Engineer-in-Chief. He came to the task with considerable railway experience and had worked with George Stephenson before coming to Australia. At this time there was a slump in railway work in the United Kingdom and many engineers with railway experience were unemployed. Some of these emigrated to the colonies in order to find work in their areas of experience. Darbyshire employed a number of these engineers who possessed the skills to design and supervise the construction of complex railway works.

A contract was let to Cornish and Bruce for the Footscray to Sandhurst (now Bendigo) section with the work to commence on 1 June 1858 and be completed by 31 July 1861. Work proceeded quickly at first with the line being opened to Sunbury in January 1859. However further up the line there were major challenges. There were two very large viaducts to be built at Malmsbury and Taradale.



Some of the crowd who attended the ceremony in the Malmsbury Botanical Gardens on October 20th 2012.



The Taradale Viaduct today. Its original wrought-iron continuous tubular beams were propped by intermediate piers built in 1933-1934.

Further north there were two tunnels at Elphinstone and Big Hill. Both tunnels were through very hard rock and it was these which delayed the completion of the line. The line was opened to Woodend in July 1861, Kyneton in April 1862, and Bendigo in October 1862.

The extension of the line from Bendigo to Echuca was a relatively simple matter as that part of the line was across plain country without significant engineering challenges. Tenders were called for the work in 1863 and the work was completed on 19 September 1864. The contractor for the work was Collier and Barry.

Owen Peake — Engineering Heritage Victoria

3. **EHV AGM — Some Notes from the Minutes of 8th November 2012**

Committee & Office Bearers for 2013.

The same 10 people comprising the 2012 committee (as listed in the Annual Report above) nominated for the 2013 committee and were duly elected. The following office bearers were appointed un-opposed:

- Chairman - Owen Peake
- Deputy Chair - David Beauchamp
- Secretary - Miles Pierce (on an Acting basis)

Miles Pierce thanked the 2012 office bearers and committee members for their contributions to the success of EHV during the year and noted that a lot had been achieved during the year.

Engineering Heritage Recognition Program.

The 2013 program was discussed in detail and it was agreed that EHV should try to achieve as much as possible from a list of 12 sites to be recognised in 2013 (See Section 4 below – Themes for 2013. Tasks were allocated and it was agreed that as many people as possible be involved to maximise our program achievements in 2013. Victoria University Work Experience Project will most likely proceed for the 2012/13 vacation period. Briefing and selection of students is in progress.

Field/Site Visits

Possibilities for next year include the Great Melbourne Telescope and the former Railway Goods Shed at Docklands. This will be a joint Young Engineers (YEAV) EHV excursion in February, with a breakfast, presentation and tour of the recycled Goods Shed. EHV is to provide a speaker to talk about the history of the Goods Shed.

4. **EHV — Themes & Planning for 2013** — from Owen Peake

Great Ocean Road

2013 is significant for VicRoads who own the Great Ocean Road as it is the centenary of the formation of the Country Roads Board. EHV plan to hold a heritage recognition ceremony in association with VicRoads. Other events celebrating the centenary of the CRB/VicRoads may also be developed in association with VicRoads.

Monash Bridges

In the lead-up to the centenary of the landings at Gallipoli in 1915 Engineering Heritage Australia will be trying to place emphasis on engineering heritage projects in Australia which are significant with regard to the ANZAC centenary. EHV has already commenced a program of Heritage Recognition of significant Monash sites. In 2011 we held heritage recognition ceremonies for Janevale Bridge and Yallourn Power Station. In 2012 we held a heritage recognition ceremony for the Fyansford Bridge in association with the Country Weekend at Geelong.

In 2013 EHV is planning to carry out heritage recognition ceremonies for two more Monash sites:

- Wheelers Bridge near Creswick (another early Monier arch bridge).
- The group of Monier arch bridges over Bendigo Creek in the centre of Bendigo. (There were originally 8 bridges).

This theme will continue until 2015.

Melbourne Sewerage System

In 2012 EHV held a successful Guest Speaker Program event on William Thwaites who was the “father of the Melbourne Sewerage System”. William Thwaites is under-recognised and this theme will strive to correct this situation. A heritage recognition nomination is currently being written for the Melbourne Sewerage Scheme and a ceremony will be held in 2013. Other events celebrating the life and works of William Thwaites may also be developed.

Engineering Heritage in the Melbourne CBD

EHV has been working on a tourist brochure for a walk around the engineering heritage of the Melbourne CBD for some time. In Engineering Week 2012 this was developed into two guided walking tours on 6 and 8 August 2012. Publication of the tourist brochure will proceed as soon as possible. The big challenge will be finding sponsorship for printing costs. Other events celebrating the engineering heritage of the CBD may also be developed.

5. The Former Newport Substation – Successfully Recycled — from Miles Pierce

The former railway electric traction substation building near Newport station has been 'recycled' to become the 'Hobson's Bay Community Arts Centre' which first opened in the iconic grand substation building in 2008. This innovative venue for arts and community purposes has been dubbed 'The Substation'.

The Newport railway traction substation was one of the first five substations designed by Charles Merz as the Victorian Railways' consulting engineer for the then ground breaking electrification of Melbourne's steam locomotive based suburban rail network. The substations were supplied at 20kV, 25Hz, from the Railways' purpose built power station located beside the Yarra River at Newport (later called Newport 'A'). The substations contained 20kV switchgear bays with oil circuit-breakers for incoming and outgoing AC circuits, plus transformers and large rotary converter¹ machines for provision of the 1500 volt DC traction supplies. 1500V DC circuit breakers also contained within the substation then controlled outgoing feeders to the overhead traction conductors suspended above the railway lines.

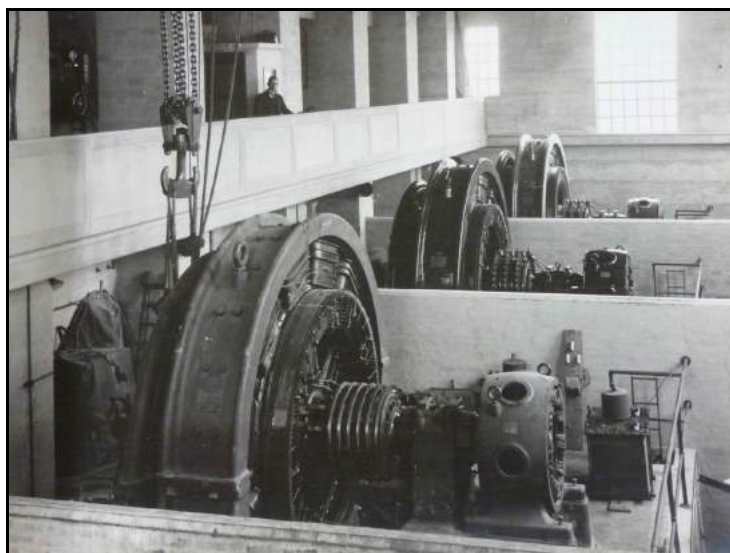


Left: The Substation in December 2011,
Photo – Miles Pierce

The Victorian Railways Way & Works Branch was responsible for the architectural design of the substation buildings and for their construction to meet the functional requirements for the electrical plant being designed and specified by Merz. Like its contemporaries, the Newport Substation building, dating from 1916, is on a grand scale (see photograph) and described as a neo-classical style masonry structure with a large internal hall for the rotary converter sets and their associated transformers, overlooked by an operating gallery and complemented by a full height AC switchgear annexe.

Below: Rotary converter machines installed in a similar but later substation in Caulfield. The open-top bays were similar to those at Newport. Image from the 'VR Electrification Photo Album', VPRS 12397/P0001/1.

The Newport substation came into service in 1920 and operated continuously as a manned substation until its plant was ultimately retired and its function superseded by a new rectifier substation at Yarraville in 1967. From the beginning of the 1970s the building was disused and by the 1990s decidedly derelict, having suffered from the deprivations of neglect, vandalism and occupation by 'squatters'. In 1996 two inspired local residents developed the idea of restoring and adapting the building for community use. The Hobson's Bay Community Arts Centre Inc. was established and a 25 years lease on the building and surrounding land arranged from VicTrack. After much organization and physical work by the volunteer organisation, assisted by government grants, 'The Substation' Community Arts Centre was opened for use in 2008 and continues today as a vibrant community facility in Melbourne's western suburbs.



¹ Rotary converters were originally developed in the USA c1890 and are essentially a direct current generator but with armature taps connected to AC sliprings at the opposite end to the commutator. They were widely used for AC to DC conversion into the early 20th century for both public DC supply networks - including the Melbourne CBD from 1915 - and for supply to DC electric traction systems. The 25cps (25Hz) AC generation frequency at the Railway's Newport power station was deliberately chosen to facilitate operation of the 1500V DC rotary converters. Rotary converters were later superseded by mercury-arc rectifier plant and then in turn by solid-state semiconductor rectifiers, with progressive gains in conversion efficiency

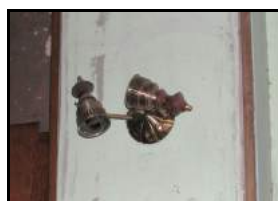
By the beginning of the 1970s most of the electrical plant had been removed for use elsewhere or for sale as scrap metal, and what was left was largely destroyed by vandalism. In reworking the internals of the building some new floors have been added, including a floor over the dividing walls of the original rotary converter bays to form the large performance space in what was originally used for lifting plant in and out via a travelling gantry crane which itself still exists. Extensive use has been made of plate-glass panelling and burnished steel in an effort to reflect the industrial character of the building. Various early hand-painted signs denoting room and bay functions have also been preserved.

Whilst from an engineering heritage perspective, 'The Substation' in its new functionality has very little of its original electrical plant intact, the iconic large scale heritage building has been saved from eventual demise and successfully recycled by the Hobson's Bay Community Arts Centre Inc. into a dynamic community resource. Aside from the various retained signs, the traveling crane and a couple of cable termination potheads, there is at present not a lot to inform users of the facility of its original function and arrangement. The entry foyer in what was formerly the first rotary converter bay could hopefully in due course feature an interpretive display and/or some early photographs to convey the underlying heritage of the site and its part in the first large scale overhead collection 1500V DC electric traction scheme in the world.

More information on 'The Substation' community arts centre, including a brief write up of the significance of the site and of the restoration works is available from the Hobson's Bay Community Arts Centre Inc website: <http://www.thesubstation.org.au>.

The author was given a guided tour of 'The Substation' by one of the facility volunteers in December 2011.

[The Editor visited the Newport Substation on a tour organised by the Victorian Heritage Office and the Hobson's Bay City Council on 28th May 2004. The group of photographs below were taken by the Editor on that tour, and show details of the exterior, some of the original wall and ceiling finishes, some later (Art Deco) light fittings and an original panelled double door with an elaborate fanlight. — Ed.]



6. Some More News About John Grainger – from David Beauchamp

John Grainger Honoured

On Sunday the 2nd of December Peter Ryan, the Deputy Premier of Victoria, officially named a new bridge on the South Gippsland Highway **Grainger's Bridge**. This bridge is near the Sale Swing Bridge that John Grainger designed in 1880 (and which was awarded an Historic Engineering Marker in 2010). **Grainger's Bridge** has been built over the Thomson River flood-plain, near Sale, by VicRoads as part of the Cox's Bridge Flood Protection Project.

John Grainger also designed and supervised the Sale Water Supply Scheme and the first Bairnsdale Water Supply Pumping Station and reservoir. In 1878, he won the competition for the design of Albert Bridge over the Torrens River in Adelaide and in 1880 he won the design competition for Princes Bridge in Melbourne. He later designed numerous buildings in Melbourne including the Georges Department Store in Collins Street and additions to the Town Hall. He was principal architect in the Public Works Department in Western Australia at the end of the 19th and beginning of the 20th Century. After his death in 1917, he was largely forgotten and it is excellent that he is now being honoured.

John Grainger's Headstone

Engineering Heritage Victoria has raised money to put a headstone on John Grainger's unmarked grave at the Box Hill Cemetery. The marble headstone has been ordered from China and the foundations to support it have been poured. Once the headstone has arrived, been engraved and installed, an unveiling ceremony will be held at the cemetery, hopefully early in the new year.

7. Some Details About the Great Ocean Road Nomination – from David Beauchamp

The nomination for engineering heritage recognition of the Great Ocean Road is almost complete. Much of the work for the nomination was done by a Victoria University student Carlos Negron as a work experience project. It is hoped to have a plaque unveiled next year, which will coincide with the 100th anniversary of VicRoads (formerly the Country Roads Board).

If anyone wants to see photos of the construction of the Great Ocean Road they can look up "A Pot-holed History of the Great Ocean Road" on You Tube. This is a short film produced by the staff and students of Lorne-Aireys Inlet P12 College, with assistance from the Lorne Historical Society.

Late in November this year a vintage car rally from Melbourne to Warrnambool was held to celebrate the 80th anniversary of the completion of the Great Ocean Road.

8. Advanced Short Training Courses in Structural Analysis of Existing Buildings, Monuments & Historical Constructions – from the Editor.

Information about these courses was posted on a Heritage email Chat Group back in June, but it appears applications for the 2013/2014 year (September to March) are still current until about January 20th 2013. And by the way, the courses you choose could happen at universities in Portugal & Italy or the Czech Republic & Spain and they're in English. Wow! If you've got the money and the time – go for it!

Here are some notes which came with the email:

These short courses, which are integrated in the Erasmus Mundus SAHC Master Course (www.msc-sahc.org) can now be attended separately, without the need to enroll in the Master Course.

The courses will be of interest to those interested in the conservation, repair and strengthening of the built heritage, be it monuments, other cultural heritage buildings or existing buildings in general. This includes mainly civil engineers and architects, but also, for some courses, art historians, archaeologists and others interested in cultural heritage buildings, interested in complementing or updating their knowledge with the most recent professional and scientific approaches and techniques.

The attendees can be professionals such as consultants, employees in building contractors, building material producers and suppliers, heritage authorities and others, as well as graduate students (MSc or PhD) enrolled in other programs.

Detailed information can be found in the leaflet (downloadable at: www.msc-sahc.org/upload/docs/Advanced_Training_Courses_SAHC.pdf) or by visiting the webpage at: www.msc-sahc.org. For further information, please contact the Secretariat at secretariat@msc-sahc.org.

[The 2 websites above are well worth a squiz, even if it's only to make you feel wildly envious. They did that for me, anyway. – Ed.]

9. Guilfoyle's Volcano in the Melbourne Royal Botanic Gardens – from the Editor.



Left: This brilliant photo of Guilfoyle's Volcano was taken by Katie O'Brien of the Royal Botanic Gardens in April or May of 2012.

The "Volcano" was built in 1876 under the supervision of William Guilfoyle, the second Director of the Gardens. It was constructed as an artificial hill on the highest point of the Gardens next to Anderson Street, and took the form of a volcanic crater with a reservoir inside, providing gravity fed water for the Gardens.

The original water for the reservoir was pumped up from the river, but many years later, after the Gardens presumably changed its water supply to Melbourne's high pressure reticulated system, the Volcano fell into disuse.

When I was at school, that part of the Gardens was a wild and inaccessible jungle, and I often wondered, looking through the fence in Anderson Street, what was meant to be hiding in there – apart from the flashers waiting for passing schoolgirls. Now all is revealed. The Volcano has emerged from its jungle and has been put to a new and ecological use. It's now part of the Garden's "Working Wetlands".

I particularly like the way the floating "wetlands" have been designed to resemble giant lily pads. The whole scheme is a wonderful local illustration of how modern engineering technology can be used to conserve, restore and revitalise an historic engineering structure from the Victorian era.

The following story appeared in the October 2012 issue of *Water Engineering Australia*:

'A four-year, \$6.5 million project to improve water quality and provide a sustainable water supply for the Royal Botanic Gardens in Melbourne was opened in August. The Working Wetlands water management system aims to revitalise the Gardens' lake system and reduce reliance on potable water for irrigation. The Gardens predicts that a total of 52 ML/a of lake water will be available for irrigation, providing up to 40% of the required amount of water. The Working Wetlands project includes 14 floating treatment "wetlands" (nine in Ornamental Lake and five in Guilfoyle's Volcano). The wetlands modules are made from recycled plastic covered in coir (coconut fibre) and altogether cover an area of 1020m² (160m² in Guilfoyle's Volcano).

Working Wetlands collects storm-water from surrounding streets in an ecologically sustainable four-part water harvesting and treatment process. Firstly, storm-water is diverted from Anderson Street and Domain Road through gross pollutant traps to wetlands at Nymphaea Lily Lake and Ornamental Lake. The floating wetlands treat the water as it flows through Guilfoyle's Volcano and Ornamental Lake. Water is then pumped from the Lake, filtered, treated with UV, and stored in four large water tanks. The stored water is then pumped into the existing irrigation system for overnight usage.'

If you would like to read the rest of this article, and you don't have access to *Water Engineering*, it should be available on the EA website after the next issue of the magazine. If it's really urgent, I could email you a copy in JPEG format. Otherwise, there is a lot more information – not so engineering oriented – on the following websites:

ABC Gardening Australia 3rd Sept 2010: <http://www.abc.net.au/gardening/stories/s3306733.htm>

Royal Botanic Gardens: <http://www.rbv.vic.gov.au/horticulture/landscape-projects/guilfoyles-volcano>

Melbourne Places, Melbourne City Australia:

<http://www.melbourneplaces.com/melbourne/guilfoyle%E2%80%99s-volcano-overlooks-melbournes-royal-botanic-gardens/>

Denise Gadd, The Age, March 30th 2010:

<http://www.theage.com.au/national/botanic-gardens-volcano-gets-ready-to-rumble-20100329-r8b2.html>

Miles Pierce suggests the following additional references:

Pescott, RTM, *The Royal Botanic Gardens Melbourne – A History from 1845 to 1970*, pub. O.U.P. 1982;

Lamb, R., *Under Pressure - the evolution of the water supply of the Royal Botanic Gardens*, Victorian Historical Journal, Vol 67, No 1, April 1996; and an article from *The Age* July 4th 2008 by Orietta Guerrera..

This newsletter has been prepared on behalf of Engineering Heritage Victoria which is a Special Interest Group of the Victoria Division of Engineers Australia. The Editor is Margret Doring, who can be contacted on 03 5729 7668 or doring.belgrano@bigpond.com

Contributions for the next Newsletter will be gratefully received.

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