



**STEAM TUG
YOUNG
AUSTRALIAN
Remote Recognition
Ceremony on the
Roper**

There aren't many places in Australia more remote than the Roper River below Roper Bar. More than 600 km south east of Darwin and nearly 200 km from the Stuart Highway, which runs down the centre of the Northern Territory, there are many flooded creeks to cross in the early Dry Season and 100 km of dirt road. Mrs Aeneas Gunn called this country the Never Never in her famous book *We of the Never Never*. It is wild and beautiful country.

On 23 May 2011 a small group visited the Tomato Island boat ramp on the south bank of the Roper River, about seven kilometres upstream from the Aboriginal Community of Ngukurr, to erect and unveil an interpretation panel and marker for the steam tug *Young Australian*, which was wrecked in the river while engaged on the construction of the Overland Telegraph Line in 1872.

The group consisted of Bronwyn Russell, Executive Director of Northern Division; Trevor Horman, Chair of the Northern Division Heritage Group; Owen Peake, Chair of Engineering Heritage Australia and Kezia Purick MLA, Member for Goyder in the Northern Territory Legislative

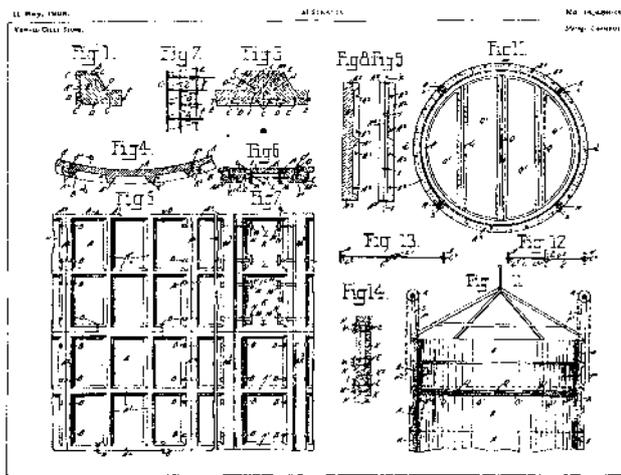


Engine and boiler of the 'Young Australian' in the Roper River

Continued on page 3

PREFAB!

Stone and Siddeley's Prefabricated Reinforced Concrete Construction



Detail of Stone & Siddeley Silos, Allied Mills, Albury, 2010

Introduction

In addition to industrial structures, housing and public works, the engineer Edward Giles Stone (1876-1947) developed a number of unique prefabricated reinforced concrete above-ground silos. This article surveys some of the silos constructed by Stone and Siddeley.

Stone's first ferrous concrete reinforcement patents were lodged in 1908 ("fodder storage chambers"), 1909 ("improvements to storage chambers") and 1910, (concrete "building plates"). He had an 11-year partnership with E.J. Siddeley (ca.1910-1921) and continued his innovative

structural work along with experimental work in cement manufacture until his death. Six of Stone's works are now on the NSW State Heritage Register and/or Heritage Inventory.

Stone was born in NSW and studied engineering at Sydney Technical College. Initially employed by the NSW Public Works Department, he later joined the Sydney Harbour Trust Commission, the precursor to Sydney Ports Corporation. E.G. Stone began private

Continued on page 2

INSIDE this edition

- Engineering Heritage Recognition for the Boyer Newsprint Mill 2
- Heritage Revisited - An Occasional Series Revisiting Previously Recognised Sites 3
- Protection of Australia's Movable Cultural Heritage 4
- Heritage Recognition for 1902 Bundaberg Waterworks 5
- A Peake at Steam - The Washington Winch 5
- Rock Bolting Heritage Exposure 6
- Engineering Heritage Recognition for Rottneest Island Defence Facilities

Engineering Heritage Recognition for the Boyer Newsprint Mill

The Boyer Mill was the first paper mill in the world to make newsprint from hardwood fibre.

About 75 guests attended a ceremony on 17 November at the Boyer Mill on the Derwent River 30 km from Hobart, where the Governor of Tasmania unveiled a marker and interpretation panel, awarding Engineering Heritage National Landmark status to the Boyer Mill.

The mill produced its first newsprint in 1941, averting a shortage of newsprint during World War Two. While international experts had advised that Australian hardwoods would not be suitable for papermaking, due to their inherently short fibres, two young Australian scientists, Lou Benjamin and John Somerville, persevered with their work and established a pilot plant at Kermadie in the Huon Valley. By 1926 this experimental work had produced sheets of paper that could not be distinguished from “real” imported newsprint.

In 1934 at Ocean Falls Mills in British Columbia, Canada, Benjamin and staff carried out a large mill-scale test, using 1000 tons of Tasmanian eucalypt. On arrival some logs were lost when the wharfies tossed them overboard expecting them to float, and some of the pulp from Tasmania was stained with coal dust and rust. However the trial was successful in so far as the problems of using this wood for making newsprint were sufficiently resolved to commence the design of a pulp and paper mill.

The Boyer Mill was established by a consortium of Australian newspaper publishers. The Tasmanian Government supported the project by providing a large timber concession area in the Derwent Valley.

Canadian Engineer Percy Sandwell led the design team and supervised construction. While the paper machine and boilers were imported, 65% of the machinery and equipment was manufactured in Australia. Sadly Percy Sandwell died eight days before the first newsprint was produced.

The Governor outlined the 20 years of research and trials before the project was launched. John Laughler described the construction of the mill and subsequent developments. National President Doug Hargreaves outlined EA’s Heritage Recognition Program and presented the Marker. Mill General Manager Rod Bender accepted the marker. The master of ceremonies was Bruce Cole, chair of Engineer Heritage Tasmania.

The miniature paper making machine used for the trials at Kermadie was on display at the ceremony. It was manufactured in 1908 and loaned by the CSIRO for the occasion. Tours of the mill were held before the ceremony.



With the model paper machine after the ceremony, left to right, Rod Bender, General Manager Boyer Mill; model operator Len Johnson; the Governor of Tasmania, the Honourable Peter Underwood AC and model operator Allan Pearson

Bruce Cole

Continued from page 1 - PREFAB! Stone and Siddeley’s Prefabricated Reinforced Concrete Construction Introduction

employment as a “Consulting Engineer” in 1906. He specialized in developing, designing and manufacturing reinforced concrete structures employing the steel reinforcement techniques first developed by the French engineer Armand Considère (1841-1914).

The Stone and Siddeley Partnership

Stone began his partnership with Ernest Joshua Siddeley in ca. 1910. Much less is known of E.J. Siddeley (1872-1965). He was born in Kew, Victoria but died in the Sydney suburb of St Leonards. Stone and Siddeley held offices in Sydney and they maintained patents for “Improvements relating to the manufacture of concrete and plastic castings”. The partners continued to share patents until the business was terminated in 1921. Stone and Siddeley built a wide range of civic reinforced concrete works and other structures for commercial clients including grain silos, a Geelong woolstore, floating pontoons and aqueducts.

Stone and Siddeley’s Silo Innovations

Until the first two decades of the 20th century, Australian storage of grain in reinforced concrete silos was rare if not unknown. The well-known engineer John Monash introduced the ubiquitous Riverina wheat region concrete silo. Using a licensed Monier steel reinforcement system, Monash’s company built a well-documented slip-form (“climbing form”) concrete silo in Tocumwal in 1912.

In contrast, the Stone and Siddeley reinforced concrete silos were manufactured in large quantities as prefabricated units under factory-controlled conditions at their prefabrication works at the Emu and Prospect Gravel and Road Metal Company

quarry at Emu Plains, NSW, adjacent to a railway siding. Their silo forms featured pneumatic injection of concrete into their patented moulds. These semi-circular sections were cured under quality-controlled conditions at the factory, shipped to the construction site via rail wagons and erected by unskilled labour onto pre-formed concrete pads. Once the silos were erected, the silo components’ seams were grouted closed, the moulded surfaces washed with cement mortar to seal surface cracks and the silos were operational. The factory-made prefabrication of concrete building components for site assembly was a visionary programme for the first decade of the 20th century and the methods were described in detail in the press of the period.

By 1910, Stone had refined his reinforced concrete silo into what was described in the literature of the era as “A Portable, Sectional, Reinforced Concrete Silo”. This coffered pattern silo design is the prototype for later silos including surviving examples at the Manifie Mills, Melbourne; Cliffdale, Parkville, near Scone; and a 1912 grouping of nine storage and grading silos at the John Burrows Hume Mills, Albury. As the concept matured, later silos omitted the external bolt system used at Parkville and incorporated an unknown form of internal interlocking flange to counter the internal forces of the grain storage. The internal structure of these silos has not been explored to date and the interlocking system remains a mystery.

*Michael Bogle
(The author is a heritage consultant specialising in the history of Australian design. An expanded treatment of the development of Stone’s NSW concrete silos is covered in his 2010 study of the Albury silos titled “Heritage Assessment. Albury Mill and Associated Structures” available from the Library of the Heritage Branch, NSW Department of Planning.)*

Heritage Revisited - An Occasional Series

Revisiting Previously Recognised Sites

Tharwa Bridge Reopens

After a 'restoration' lasting many years, the Allan Truss bridge across the Murrumbidgee River at Tharwa in the ACT was reopened on the 24th of June. The bridge has been subjected to closures and restrictions since 2005 when an inspection revealed extensive deterioration of the timber structure.



The renewed Tharwa Bridge

Intense public debate ensued as to the future of the bridge, fuelled in part by the ACT Government's original plan to remove the historic bridge, marked by EHA with a Historic Engineering Marker in 1995, and erecting in its place a modern concrete structure, citing cost pressures and improved usability. Following vocal opposition the Government reversed its decision and committed to repairing and upgrading the original structure. Virtually all of the timber was replaced, and steel beams were inserted longitudinally in order to allow the removal of load limits placed on the bridge.

The work undertaken means the bridge is a bit like Grandfather's axe, and raises questions about when is a 'restoration' a restoration. Others may question the ongoing validity of the HEM awarded by EHA. But the fact of the matter is that all pieces of public infrastructure undergo gradual metamorphous over time, and any bridge over 115 years old can be expected to have substantial structural members replaced, just as a road is resurfaced, or a dam wall is strengthen or raised. In the case of the Tharwa Bridge, the basic Allan truss design has been retained and in appearance it is little changed from before the restoration. The increase in load limit is a sensible move that provides an improved level of service to the village of Tharwa. Steps were also taken during the rebuilt to reduce the level of maintenance required in the future.

The reopening of the bridge has been great news for the local and visitors of Tharwa. Let's hope it lasts another 115 years!

Tamworth Power Station



The replica generator and its driving engine at Tamworth Powerstation Museum

with the help of the local council, have even constructed a detailed working replica of an original generator, powered by a steam engine authentic to the period. EHA's marker has a prominent position. The collection of historical working light bulbs and other early electrical artefacts is worth a visit on its own for anyone travelling the New England Highway.

Lyndon Tilbrook and Bill Jordan

** Readers are invited to send articles and photos providing news of sites or items previously recognised by EHA under its Heritage Recognition Program.*

Continued from page 1 - STEAM TUG YOUNG AUSTRALIAN - Remote Recognition Ceremony on the Roper

Assembly and Deputy Leader of the Opposition. Also on hand were Eddie Weber from Parks and Wildlife Service NT, and Gordon Atkinson from the NT Department of Construction and Infrastructure.

This was an unusual heritage recognition ceremony in that, on arrival the official party dug the post holes, mixed concrete, erected the interpretation panel, placed the concrete and levelled the structure.

The interpretation panel and marker were then unveiled by Kezia Purick and Owen Peake during a brief ceremony followed by a picnic lunch. After lunch some of us borrowed a "tinny" and visited the wreck site 700 metres up the river from the boat ramp. The engine and boiler are still above water level and appear to be in good condition after 140 years in the river. Like all the tidal rivers of the Northern Territory, the Roper is home to a



The Young Australian at the wharf at the Telegraph Depot in 1972. Photo: Northern Territory Library PictureNT

thriving population of crocodiles which grow larger and bolder with each passing year. We kept an eye out for crocs but as the experienced bushman Eddie Webber said "It's the one you don't see that gets you". The steam paddle tug *Young Australian* was purchased by Charles Todd in Adelaide to be used as a tug on the Roper River. Todd had experienced considerable difficulties in construction of the Overland Telegraph line during the Top End Wet Season and the project had fallen seriously behind schedule. Todd decided to establish the Telegraph Depot near Roper Bar, 140 km up the Roper River from the sea. This was successful and materials were transported from the Depot to the telegraph line.

After completion of the telegraph the *Young Australian* was grounded during a towing mishap on 30 December 1872 and could not be re-floated.

The Adelaide to Darwin section of the Overland Telegraph was completed on 22 August 1872. The *Young Australian* story is a testament to the ingenuity and determination of the builders of the Overland Telegraph which reduced the time for communications between Europe and Australia from months to hours.

Trevor Horman

Protection of Australia's Movable Cultural Heritage

Engineers Australia, working with many other interested organisations and the responsible Federal Government Department has contributed to a review of legislation relating to the protection of movable cultural heritage. The report from the Review makes many recommendations for increasing the level of protection and Engineers Australia has committed to assist to implement the recommendations.

Background

Through the mid 2000s Engineering Heritage Australia became increasingly concerned by the large quantities of vintage machinery being exported permanently from Australia.

It had been claimed that overseas collectors had removed 25% of the steam traction engines in Australia during the past 15 years.

It was decided that EHA should take a lead role in seeking increased levels of protection for objects of movable cultural heritage – i.e. “stuff that could be picked up and taken away!”

A number of key principles were adopted and followed:

- find and share factual information;
- encourage other interested organisations to participate;
- consider all objects of movable cultural heritage, not only engineering objects;
- work constructively with the federal department.

Protection of Movable Cultural Heritage in Australia

The federal Movable Cultural Heritage Act 1986 provides the framework for the protection of defined categories of objects:

- Australian Aboriginal and Torres Strait Islander Heritage,
- Archaeology,
- Natural Science,
- Applied Science or Technology,
- Fine or Decorative Arts,
- Numismatics,
- Philately,
- Historical Significance ,

It is administered by the Department of Environment, Water, Heritage and the Arts (DEWHA) and covers administration, money, export permits and enforcement.

It also introduces the concept of Class A objects (which can never be exported under any circumstances) and Class B objects (which may be exported).

The Protection of Movable Cultural Heritage Regulations 1987 provide more detail of the types of objects within each of the categories. For example, Part 4 deals with “Objects of Applied Science and Technology” and goes on to include:

- any agricultural object including.....,
- any engineering object including.....,
- any object of scientific interest including....., etc.

The only items afforded Class A status (never to be exported) are Victoria Crosses won by Australian service personnel, specified Aboriginal & Torres Strait Islander objects and Ned Kelly's armour.

All other objects may be exported unless it can be proved, to the satisfaction of an Expert Examiner, that they meet all four of the following criteria. The object MUST:

- be of the kind mentioned in the Regulations, AND
- be over 30 years old, AND
- not be represented in at least 2 public collections, AND
- be of significance to Australia.

Protection in Practice

Since 1997-1998 a total of 457 objects have been granted permanent export permits. Of these approximately 25% have been objects of Applied Science and Technology.

This does not represent the full situation.

In order to deal with the huge number of applications received each year the Department allows an applicant to explain, often over the phone, that an object does not meet the criteria shown above. If convinced, the Department issues a Letter of Clearance for the export of the object.

On average 4500 objects each year are issued Letters of Clearance - mainly to commercial dealers.

By contrast only 63 objects have ever been refused an export permit.

In effect, objects are presumed NOT to be worthy of protection unless proven otherwise – “guilty until proven innocent” with the sentence being transportation!

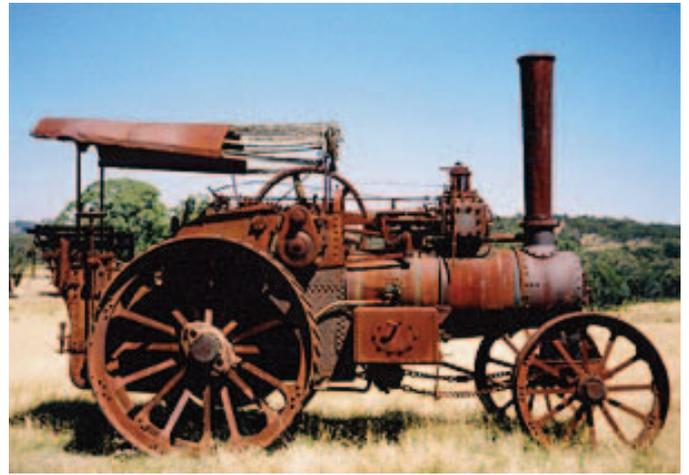
Engineering Heritage Australia's Position

The Act provides an adequate framework for the protection of MCH.

The Regulations can be improved:

- objects should be presumed to be protected and the exporter must be responsible for proving that the object is not worthy of protection;
- two examples currently in public collections should not deny protection;
- significance should be determined by an objective and transparent process—the document “Significance 2.0” produced by the Collections Council should be adopted as the basis for assessing significance;
- all objects must be assessed according to the revised criteria—Letters of Clearance should be discontinued;
- there must be broader community consultation in the assessment process, particularly in assessing significance.

During 2007 and 2008 Engineers Australia encouraged the Department to conduct a review of the legislation and communicated with other heritage organisations to encourage them to present their concerns and recommendations to the Department.



Clayton & Shuttleworth traction engine now preserved at Milthorpe NSW. Photo: Kylie Winkworth

Heritage Recognition for 1902 Bundaberg Waterworks



The 1902 Bundaberg water tower

On a warm, sunny afternoon on 22 March 2011, some 50 guests gathered by the 1902 brick water tower in East Bundaberg, Queensland to witness Her Excellency, the Governor of Queensland, Ms Penelope Wensley AC, unveil an Engineering Heritage Marker for the 1902 Bundaberg Waterworks. Among the guests were the Mayor of the Bundaberg Regional Council, Councillor Lorraine Pyefinch, the Deputy Mayor Councillor Tony Ricciardi and eight councillors, and Professor Doug Hargreaves, National Immediate Past President of Engineers Australia. The President of Engineers Australia, Queensland Division, Mr Dennis Wogan, welcomed her Excellency. In his address, the chairman of Engineering Heritage Queensland, Mr Andrew Barnes, drew attention to the fact that this was the 150th engineering heritage ceremony held since the Heritage Recognition Program began in 1984, and, by coincidence, the very first ceremony had been in Bundaberg to honour the Toft/Massey Ferguson automated cane harvesting machine. Mr Michael Egan, an Engineers Australia Queensland Divisional Committee Member and Group Manager, Infrastructure Support Services with the Bundaberg Regional Council spoke about the development of the 1902 waterworks scheme which comprised a steam pumping station, the 40,000 gallon (182 kilolitre) water tower and a system of water mains servicing 800 properties.

A Bundaberg landmark for over a century, the water tower is the only remaining feature of the 1902 waterworks and is a remarkable and robust relic of late 19th century water supply technology.

The tower is a fine example of the art of the industrial designers of the Queensland Water Supply Department including Queensland Hydraulic Engineer J B Henderson. It also demonstrates the bricklaying skills of the builder N C Steffensen. Despite these difficulties, his peers regarded Steffensen's work as a "masterpiece of bricklaying", displaying as it does complex masonry and brickwork with its arched windows and projecting bands of brickwork.

Her Excellency expressed her admiration not only for the planning and design work of "Hydraulic Henderson", the bricklaying skills of Steffensen, and the skill of the boilermakers from Bundaberg Foundry who fabricated the tank in place some 30 metres above the ground, but she also paid tribute to the extensive research and documentation work about the scheme carried out by former Council Engineer Geoff Bullpitt who was also present at the ceremony.

Brian McGrath

A Peake at Steam

The Washington Winch

One of two steam winches imported from the United States in the 1920s, and used by the Kauri Timber Company in Western Australia, it was later purchased by the Forests Commission of Victoria for salvaging timber after the disastrous 'Black Friday' bush fires in 1939; this winch was later bought by Jack Ezard. He installed it in the Nugong Range about 16 km east of Swifts Creek at an elevation of about 1250 metres amongst stands of Alpine Ash. Jack Ezard moved to Swifts Creek in 1950 where he worked until selling his mill and timber licences in 1990. Ezard last used the winch during the 1960/1961 season.

The Ezards were innovative sawmillers who introduced high lead logging into Victoria. They had owned and operated sawmills in the Warburton area from 1907, before shifting to Gippsland in 1932.

The winch is the last survivor of its type in Victoria. It was originally rigged by men who had used the high lead system through the peak years of steam powered logging, and left it intact in a readily accessible site surrounded by abundant regrowth.

The winch was manufactured by the Washington Iron Works Company, Seattle, Washington USA. The company was active from 1882 until the 1980s when its various divisions manufactured cranes, logging equipment, and presses were gradually sold off. The works closed in 1986.

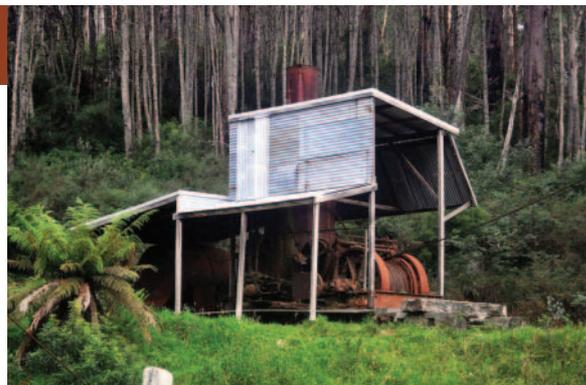
The winch was specifically designed to haul big logs up steep slopes. In the loading area just below the winch it was also used to lift logs onto trucks for transport to sawmills. The engine is a two cylinder horizontal with piston valves. There are three winch drums mounted on a steel frame and massive log base with the engine cylinders at either side of the drums and a vertical boiler with a very large fire box mounted behind. There is also a large water tank behind the firing platform.

Interestingly, the winch engine has no reversing mechanism. It is probable that reversing was achieved by mechanical gearing between the engine crankshaft and the winding drums. The drums were all fitted with foot-operated band brakes.

Such winches revolutionised steam logging in the 1920s and 1930s. They used the high lead system to haul logs up-slope from where they were cut, up to 800 metres from the winch, and the skyline system adjacent to the road to load the trucks. In front of the winch there were two bare tree trunks opposite the engine acting as head and tail spars, each supporting an array of steel cables for log hauling and spar bracing. A skyline cable suspended between these spars supported a carriage and fall block. Large tree stumps are used as anchor points for both the skyline cable and the bracing cables.

Two strong men managed the heavy main line, a steel cable 800 metres long with a wire rope "choker" for attaching the log. The tail line used for pulling the main line back into the bush was over 1500 metres long, and a "straw line" pulled the other cables into position. A steam whistle on the winch (controlled with a cord from the bush) signalled instructions to the winch operator.

The site is listed on the Victorian Heritage Register, and managed by the Victorian Department of Natural Resources and Environment.



The Washington Winch, east of Swifts Creek

Owen Peake

Rock Bolting Heritage Exposure

(In EHA Newsletter No.20, we reported on the recognition ceremony at the Cooma rock bolting test site. The site is continuing to get favourable exposure as described in the following article — Ed.)

The development of rock bolting for tunnel construction on a sound engineering basis was recognised with a National Engineering Heritage Landmark Award presented in Cooma NSW, in October 2009. The ceremony was held with great support from the Sydney Engineering Heritage Committee during the community organised Reunion which celebrated the 60th anniversary from the official commencement of the Snowy Mountains Scheme.

With a background of many thousands of people from all over the world who had worked on the Snowy Mountains Scheme, it was not surprising that after 35 years since the last of the Scheme's projects was officially completed, the attendance at the Award ceremony numbered more than 500. They came from near and distant places in Australia, some from NZ, USA, and Germany. It was necessary to make small groups to have a guided walk, using EA Monaro Group members as guides and commentators, to the site of the Rock Bolting Development interpretive sign.

A special tourist leaflet and a booklet for the Rock Bolting Landmark heritage site were produced at the time of the Reunion and Award. The Booklet "The Snowy Men behind Tunnel Rock Bolting" profiles the engineering personnel bringing the rock bolting development story to its pinnacle of success and has had a steady demand through the Visitors Centres in Cooma. Nevertheless, the local population still were not all fully aware of the engineering heritage in their midst.

When the Engineers Australia Monaro Group was invited to make a feature of the local engineering contribution to society on Australia Day in 2011, the opportunity was gladly taken. The

public celebration for Australia Day with ambassador guest and other speeches, held in Cooma's Centennial Park, was an ideal opportunity in the tree shaded space for the crowd to be engaged with the rock bolting heritage display; a four-sided display under a beach umbrella plus an easel showed the engineering items and a copy of the interpretive sign!



Rock Bolting Development Engineering Heritage Landmark display 26 January 2011, Cooma Centennial Park manned by engineers Wally Mills (right), Hugh Darby, David Byrnes (left), and Alan Hall (not seen)

Exposure of the engineering achievement in tunnel rock bolting to improve reliability, personnel safety and reduce cost of construction was spoken about enthusiastically. It was something to be very proud of. Many good conversations were made with young and old on the heritage significance as well as the satisfaction in engineering as a career service to the well-being of society.

Because the rock bolting development site is located in a very striking rock gorge within the Cooma town's enclosed but undeveloped area, the site of the interpretive sign where there is evidence of rock bolting experiments has stimulated the provision of better access to it. Both the Cooma Rotary Club and the Cooma Lions Club have each found their individual way to make the 10 minute walk to Lambie Gorge easier and more interesting along the way. Extra signage, pathway grading and area maintenance has greatly enhanced the

Engineering Heritage Landmark site. Now a concrete pathway is being progressively laid from the Southern Cloud Memorial leading from the highway into Lambie Gorge.

The author of the booklet "The Snowy Men behind Tunnel Rock Bolting", Wally Mills, reports that a senior researcher at the WA School of Mines (Kalgoorlie) has recently picked up on his booklet. The researcher says the booklet is a foundational background reference to some present development research into rock bolting under earthquake effects – this is indeed a current and topical subject. Copies of the booklet also remain available from the author (millswb@snowy.net.au).

Wally Mills

Continued from page 4 - Protection of Australia's Movable Cultural Heritage

The Review of the Legislation

In early 2009 the Department announced a review of the legislation.

In total 100 submissions were received by the Department, of which 25 were from individuals and organisations primarily concerned with objects of Applied Science and Technology.

In June 2010 the Department released its Report following the Review.

EHA is extremely satisfied with the outcome of the review:

- the concerns of EHA and others have been heard;
- the Department has made 74 recommendations to improve the level of protection which address EHA's concerns;
- the Department has called for continued discussion and involvement.

Making it Happen

In order to turn recommendations into reality Engineering Heritage Australia has committed to provide resources in three main areas where we believe that we can assist:

- the development of a rigorous significance assessment process for Objects of Applied Science and Technology through the application of the "Significance 2.0" methodology;
- by providing subject matter expertise, primarily through Expert Examiners to ensure that all objects receive a thorough assessment of significance;
- by continuing to communicate with other organisations to ensure continuing dialogue to improve the level of protection for movable cultural heritage.

How You Can Help

EHA has demonstrated that it can work constructively to influence positive change to improve protection for Australia's Movable Cultural Heritage. EHA is highly regarded and seen as a leader, particularly by those "outside" the large institutional organisations.

Please:

- continue to raise the profile of movable cultural heritage within all heritage organisations;
- include MCH as an agenda item for your committee meetings;
- nominate yourself or qualified colleagues as Expert Examiners;
- stay informed and be prepared to let the Department know that protection of movable cultural heritage is important.

References

The Act, Regulations and the Report of the Review of Movable Cultural Heritage Legislation

<http://www.arts.gov.au/movable>

Full copy of the Significance 2.0 Document

<http://www.environment.gov.au/heritage/publications/significance2-0/index.html>

EHA Movable Cultural Heritage contact: Neil Hogg
neil.m.hogg@gmail.com

Neil Hogg

(Neil is a mechanical engineer who is an expert in movable heritage and is joining the EHA Board.)

Engineering Heritage Recognition for Rottnest Island Defence Facilities

On 10 November 2010, 40 guests travelled by ferry from Fremantle to Rottnest Island to take part in a ceremony to commemorate the award of an Engineering Heritage National Landmark to Fremantle Fortress – Rottnest Island WW2 Coastal Defence Facilities.



Restored 9.2 inch naval gun at Oliver Hill Battery, part of Fortress Fremantle

In the mid 1930s the Commonwealth Government commenced an upgrade of its fixed coastal defence artillery batteries. On the west coast priority was given to the defence of the Port of Fremantle. The most important component was the two 9.2 inch guns at Oliver Hill Battery and two 6 inch guns at Bickley Point Battery, with associated infrastructure, constructed on Rottnest Island. Significantly, being located 19 km off the coast, the 9.2 inch gun battery could engage enemy ships before they were in range of bombarding Fremantle.

On the mainland there were several batteries. The most important were at Swanbourne and Leighton, north of the mouth of the Swan River, each of which had two 6 inch guns.

Around Fremantle itself there were several batteries consisting of smaller calibre guns and also a battery at Point Peron near Rockingham. On Garden Island to the south of Fremantle there were two 9.2 inch, two 4 inch and two 155 mm guns.

Together these guns provided a comprehensive coverage of both the North Passage and the South Passage into Fremantle Harbour and the approaches to Garden Island and Cockburn Sound where naval facilities were located.

Responsibility for the design and construction of the facilities rested with Australian Army engineering and artillery units. Most of the work was done by private contractors. Modern earthmoving equipment and mobile cranes were not available so a lot of work had to be done by hand, including the construction of a railway from the wharf to the battery sites to allow transport of materials and equipment. On occasions, heavy gun components had to be winched and rolled into position using hand operated capstans.

When war broke out in 1939 the batteries were ready for action but fortunately did not have to fire a shot in anger for the duration of the war. The Port of Fremantle subsequently played an important role in Australia's involvement in the war, becoming a home port for American, British and Dutch submarines.

Admirably, a Rottnest 9.2 inch gun battery has been restored by the Rottnest Island Authority and a dedicated band of volunteers conduct tours of the installation. It is the only remaining one of the seven similar batteries erected around the Australian coastline prior to the war.

Don Young

Janevale Bridge Recognised

The Janevale Bridge at Laanecoorie, on the Loddon River west of Bendigo in central Victoria, was opened on 9 August 1911. One hundred years later to the day Engineering Heritage Victoria celebrated its 100th birthday by unveiling an Engineering Heritage Marker at the site. The co-hosts were the members and staff of the Loddon Shire Council which now owns the bridge. The ceremony was attended by 76 people from the local area and as far away as Melbourne and Horsham.

An interpretation panel and heritage recognition marker were unveiled by David Eltringham, Immediate Past President of Victoria Division and Councillor Allen Brownbill representing Loddon Shire Council.

A bevy of Country Roads Board (CRB) and VicRoads engineers and supervisors were present including Tom Glazebrook, who was in charge of the Bendigo branch of the Country Roads Board (CRB) at the time of the major "half life refit" given to the bridge in 1986, and Lindsay Clay who supervised that project. The bridge was built by John Monash's company after major floods had washed away the previous timber bridge in 1909. Monash told the local council of the day that the proposed concrete bridge would survive future flood events and it has lived up to that guarantee so far - including a large flood event early in 2011.

The Janevale Bridge is the longest reinforced concrete bridge designed by John (later General Sir John) Monash's Reinforced Concrete & Monier Pipe Construction Company. The Council accepted the Monash offer on 12 March 1910; work commenced in October and the bridge was tested satisfactorily in July 1911 using a steam traction engine as a test load.

The bridge consists of 10 spans of 12.8 metres each and the width between the handrails is 5.49 metres. The deck consists of four "T" shaped beams supporting a concrete slab deck. In the 1930s the CRB strengthened the bridge beams and in 1986 VicRoads gave it a major facelift. In most respects the bridge is very similar to modern concrete bridge construction. The "T" beams would be precast and prestressed these days, but their form has changed little. Perhaps the most unusual feature of this bridge is that it has "splayed" piers more characteristic of timber bridge design; however this form lends a degree of elegance to the structure.



The Janevale Bridge

The road which the bridge now carries is a minor country road between Tarnagulla, 10 km to the north west, and Laanecoorie. The route once carried the heavy gold escorts from the fields at Tarnagulla to Melbourne but by the time the current bridge was built Gold Fever had largely faded from the area.

Owen Peake

A fight for survival – the timber truss bridges of New South Wales



Hinton Bridge in the NSW Hunter Valley has been strengthened for modern loadings. The project was the recipient of the 2009 Colin Crisp Award.

Between 1861 and 1936 around 409 timber truss bridges were constructed in NSW, 62 of which remain, with 48 being under the care and control of NSW Transport, Roads and Marine Services (RMS, formerly RTA, DMR etc.) and 14 under the care and control of local councils.

As transport loadings increase RMS is faced with reconciling the conservation of these heritage structures, which were originally designed to carry a 16 ton traction engine, with the demands of modern road vehicles. Some routes are currently moving to at least 55

tonne semi-trailers, with large multi-combination trucks and road trains emerging on the western slopes and plains.

Apart from being faced with vastly increased loads, the bridges are vulnerable to a range of hazards – flood, fire, vandalism and damage from vehicles through overloading, excessive speed, braking and impact. Forty three of RMS's 48 bridges are narrow, single-lane structures; they are thus 'pinch points' on the road network. The bridges are also expensive to maintain, compared with more modern structures

On the other hand, the bridges are a significant part of the State's heritage with 29 being on the State Heritage Register. Their heritage significance predominately relates to:

- their demonstration of the part they played in the development of NSW;
- their demonstration of the development of timber truss bridge design and technology from 1861 until other materials became economical and available around 1936;
- their association with five eminent engineers— the colonial engineers, William C Bennett, John A McDonald, Percy Allan and Ernest Macartney de Burgh, and with Harvey Dare; and
- their place as significant features in the landscape.

Following negotiations with the NSW Heritage Council, the RMS proposed a strategy for the conservation of its timber truss bridges. This envisaged reducing its portfolio from 48 bridges to 25 and maintenance of the latter for around 10 to 15 years.

Comment on the strategy was sought from the Heritage Council, heritage organisations and the public, with that process being completed on 26 August 2011. RMS has since embarked on preparing a revised strategy for consideration by the Heritage Council, taking into consideration community comments, the report of the Heritage Council's Committee that reviewed the strategy and the Council's own comments.

Relevant documents can be found as follows:

- the RMS's proposed conservation strategy and its community update (a summary of its proposed conservation strategy that was used in the consultation process) at http://www.rta.nsw.gov.au/roadprojects/projects/maintenance/timber_truss_bridges/project_documents.html ;
- the report of the Heritage Council's review committee at http://www.heritage.nsw.gov.au/09_subnav_03.htm##Truss ; and
- the Heritage Council's resolution at 5.1.4 of its minutes of 3 August 2011, at <http://www.heritage.nsw.gov.au/docs/heritagecouncil/hcminutes2011August373.pdf>

Michael Clarke

Heritage Recognition for Humpybong Creek Culvert

Some 80 guests gathered on the bank of Humpybong Creek Redcliffe, north of Brisbane, on the afternoon of 29 June 2011 for the ceremony marking the award of an Engineering Heritage National Landmark to McKay's Minimum Energy Loss Culvert. Constructed in 1961 to provide the outlet of Humpybong Creek to Moreton Bay, this was the first structure built using Minimum Energy Loss principles, an approach developed by the late Professor Gordon McKay at the University of Queensland in the late 1950s.



The inlet end of the culvert looking downstream towards the sea

Her Excellency the Governor of Queensland, Ms Penelope Wensley AC, performed the Award ceremony and spoke highly of the innovative approach to hydraulic flow problems evidenced by McKay during his lengthy time at University of Queensland. Emeritus Professor Colin Apelt, a colleague of McKay, who performed and documented the tests on the model constructed to test McKay's concept, addressed the gathering on the background and development of the Minimum Energy Loss concept. Apelt listed many of the sites where this world-first in hydraulic engineering had been adopted since 1961.

Among the guests at the ceremony were some 30 delegates from a variety of countries in attendance at the World Congress of the International Association of Hydro-Environment Engineering Research (IAHR), then underway in Brisbane. As well, members of the McKay family and the Mayor, several Councillors and staff members of the Moreton Regional Council were in attendance.

Brian McGrath