

IPENZ Engineering Heritage Registration Report

Alexandra Bridge Piers and Towers

Written by: Geoffrey Thornton and Karen Astwood
Date: 29 November 2010



Cyclists near the road bridge in Alexandra, photograph taken by J. H. Ingley, *circa* 1901. Alexander Turnbull Library Pictures (ATL), MNZ-1740-1/2-F

Contents

A. General information	3
B. Description	5
Summary	5
Historical narrative	6
Social narrative	8
Physical narrative	9
C. Assessment of significance	11
D. Supporting information	12
List of supporting documents	12
Bibliography	12

A. General information

Name: Alexandra Bridge Piers and Towers

Alternative names: Alexandra Suspension Bridge; Clutha River Bridge; Molyneux River Bridge

Location:

Between Rivers Street and Old Bridge Road

Clutha River

Alexandra

Otago

Geo-reference:

Legal description:

Access information: The abutments, piers and towers of the bridge formerly spanning the Clutha River are visible from the current State Highway 8 road bridge or from car parks on the north (River Street) and south (Old Bridge Road) banks of the river.



Location map courtesy of GoogleMaps

City/District Council: Central Otago District Council

IPENZ category: Engineering Work

IPENZ subcategory: Infrastructure – Bridge

IPENZ Engineering Heritage number: 2272

Date registered: 15 February 2011

Other IPENZ recognition: N/A

Other heritage recognition:

- *New Zealand Historic Places Trust:* Alexandra Bridge Piers, Category 1 historic place (Register no.349)
- *Local Authority District Plan:* Central Otago District Plan. Schedule 19.4: Register of Heritage Buildings, Places, Sites & Objects and Notable Trees (10 July 2010), reference no.21
- *Other:* N/A

B. Description

Summary

Across the Clutha River at Alexandra are impressive masonry piers, towers, and abutments – the remnants of Alexandra Bridge. This important landmark was constructed between 1879 and 1882, and the former suspension bridge components have withstood the force of the South Island's longest river for well over a century.

As a key junction town in Central Otago, in the late nineteenth century Alexandra people campaigned hard for a traffic bridge to replace their existing Clutha River punt service. This cause was strengthened when the closest bridge, at Clyde, failed as a result of the destructive Clutha flood of 1878. Consequently, Vincent County engineer, Leslie Duncan Macgeorge (1854-1939), designed a suspension bridge with two majestic masonry piers and towers which featured repeating arches and ornamentation. Robert Hay (1847-1928) was a consulting engineer on the project, and construction began in 1879 with local builder, Jeremiah Drummey (b.1833), winning the contract. After overcoming construction difficulties, the Alexandra Bridge was opened amidst much local fanfare in 1882. For over 70 years the structure was a key link in the road network of the area and State Highway 8. However, modern traffic flows were over and above the capacity of the single-lane structure, and it was replaced by a new highway bridge in 1958. At this time the suspension bridge's deck and cables were removed, leaving the monumental piers and towers as a memorial.

The Alexandra Bridge Piers and Towers have outstanding engineering significance as the legacy of the important late nineteenth century local engineer, Macgeorge. They are a lasting tribute to the technical skill of both Macgeorge and the bridge's contractor Drummey. These suspension bridge remnants also have landmark importance, are significant vestiges of a formerly vital Clutha River crossing and state highway bridge, as well as representing the peak of this late nineteenth century characteristic local bridge type.

Historical narrative

Initially part of the central Otago goldfields and therefore subject to special laws and regulation, Alexandra was later withdrawn from this and became a municipality in 1867.¹ Because Alexandra was located at the junction of the Clutha (formerly known as the Molyneux River) and Manuherikia Rivers it became a busy junction town for prospectors travelling inland in search of gold and using ferries to cross the rivers.² In 1868 a ferry punt service transported people and goods across the Clutha River because the closest bridge was 10 kilometres from Alexandra, at Clyde.³ This suspension bridge was only in use for three years before it was destroyed in the Clutha River flood of 1878 by the wreckage of another bridge, the Bannockburn Suspension Bridge, which had crossed a major tributary of the Clutha River, the Kawarau River.⁴

Earlier that year local people had begun lobbying for a bridge to be constructed at Alexandra. This campaign gained momentum after the 1878 flood which destroyed the Clyde bridge, three other Clutha River bridges, and also swept away the wires for the Alexandra punt.⁵ Despite the loss of his earlier bridge at Clyde, the Vincent County engineer, Leslie Duncan Macgeorge (1854-1939) went on to design the new suspension bridge at Alexandra, with construction beginning in 1879.⁶ Aside from the Clyde bridge, Macgeorge was experienced in designing other suspension bridges such as Shaky Suspension Bridge (1879) at Alexandra, and later the Daniel O'Connell Bridge in Ophir, Central Otago (1880). Both these bridges cross the Manuherikia River. Macgeorge was also responsible for the Taieri River Bridge (1885) which is another remaining example of this once regionally popular form of bridge characterised by schist masonry towers.

Robert Hay (1847-1928), a well known Dunedin consulting engineer, was also involved in the design of the Alexandra Bridge, as was the Public Works Department who administered the project's government subsidy and approved the plans. An initial round of tendering was begun; however, it was necessary for Macgeorge to reconsider the design because the lowest tender was too expensive at £20,000.⁷

¹ C. Moore, *The Dunstan*, Dunedin, 1953, pp.49-50

² J. McCraw, *The Golden Junction: episodes in Alexandra's history*, Dunedin, c.2002, pp.21-22

³ G. Thornton, *Bridging the Gap: Early Bridges in New Zealand, 1830-1939*, Auckland, 2001, p.186

⁴ Geoffrey Thornton to Karen Astwood, 27 November 2010. IPENZ File: Alexandra Bridge Piers and Towers

⁵ 'The Clutha Floods,' *Bruce Herald*, 11 March 1879, p.7

⁶ 'Up the Road,' *Tuapeka Times*, 19 July 1879, p.3

⁷ *Tuapeka Times*, 12 April 1879, p.2; Thornton, p.186

Fresh tenders were then called for in mid 1879 and a local builder of high regard, Jeremiah Drummey (b.1833), was awarded the contract with his tender of £16,111.⁸

There were several problems to overcome during the construction of the bridge, including further flooding in 1879, trouble with pump equipment, and Drummey had to avert the threat of strike action from his labourers.⁹

The official opening for the single lane suspension bridge was on 2 June 1882. The bridge functioned as the State Highway 8 crossing of the Clutha River at Alexandra until 1958 when, due to greater traffic demands, it was replaced by the current two-lane road bridge positioned next to the remnants of its 1882 counterpart.¹⁰

Despite the loss of their original function, the piers and towers are impressive and have been recognised as important to the heritage of the region through inclusion on the Central Otago District Plan heritage schedule, and also with registration as a Category I historic place by the New Zealand Historic Places Trust in 1983.

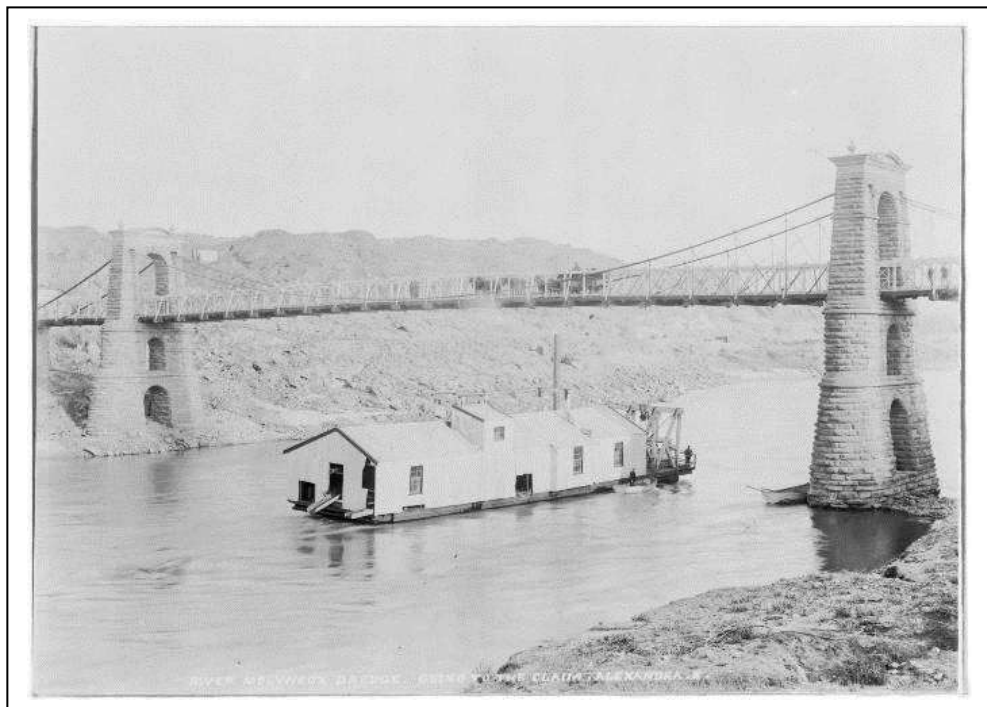


Figure 1: River Molyneux (Clutha River) Dredge, Alexandra, 189?. ATL, PA1-q-105-028

⁸Contemporary newspaper articles consistently spell Drummey's surname without an 'e.' However, the spelling in this report is based on that in other primary sources such as, Cyclopedia Company, *The Cyclopedia of New Zealand [Otago & Southland Provincial Districts]*, Christchurch, 1905, p.714; *Clutha Leader*, 6 June 1879, p.6

⁹ McCraw, p.57

¹⁰ Thornton, p.186

Social narrative

The completion of Alexandra Bridge in 1882 was the result of many years of campaigning by locals for a bridge over the Clutha River, the South Island's longest river.¹¹ Bridges were of great importance to settlements around New Zealand because they were a way to mitigate the high drowning death toll by eliminating the need to ford or ferry across potentially dangerous waterways, such as the fast flowing and powerful Clutha River.¹² For a community which had recently witnessed the disastrous flood of 1878, the monumental masonry piers and towers were no doubt a reassurance of the structure's strength and permanence. There was also a river level marker on the side of one of the piers which was frequently reported upon to inform communities along the Clutha River of the rise and fall of its water.¹³

The importance of the bridge to the community was demonstrated by the sustained campaign to have it built, including a petition containing 900 signatures, and the opening celebrations which were said to be attended "by the largest gathering that has been seen at Alexandra perhaps since the 'rush' in the early days."¹⁴ The bridge and many buildings in the town were decorated for the occasion, there was a long succession of speeches and toasts, and the celebrations continued into the evening with a dance.¹⁵

The Alexandra Bridge was constructed after a determined campaign by local people, and its remnants are likewise present due to public pressure. When the new road bridge was completed in 1958 the Alexandra Bridge had been a vital access point for the town for over 75 years, and was also a key link in State Highway 8. There was a public outcry when it was proposed that the structure be completely demolished. While residents wanted the bridge to remain as a pedestrian bridge, like nearby Shaky Bridge, a compromise was eventually reached with the piers and towers being left as a memorial to the structure which was described as one of the most beautiful bridges in New Zealand.¹⁶

¹¹ Malcolm McKinnon, 'Otago places - Clutha River/Mata-Au', Te Ara - the Encyclopedia of New Zealand, URL: <http://www.TeAra.govt.nz/en/otago-places/12> (updated 19 August 2009)

¹² Thornton, p.15

¹³ *Otago Witness*, 12 October 1904, p.46

¹⁴ 'Alexandra,' *Tuapeka Times*, 30 January 1878, p.3; 'Opening of the Alexandra Bridge,' *Otago Daily Times*, 5 June 1882, p.4

¹⁵ 'Opening of the Alexandra Bridge'

¹⁶ Ibid.; 'Impressive arched truss steel bridge at Alexandra,' *New Zealand Engineering*, Vol.13:12 (December 1958), p.453

Physical narrative

The remnants of the Alexandra Bridge, a former suspension bridge, include abutments, piers and towers. The two piers and towers are founded in the riverbed of the Clutha River. The former structure was the biggest of Macgeorge's series of Central Otago suspension bridges, and the size and form of the piers and towers contributed greatly to its elegant appearance. At the time of the bridge's construction it was said that Alexandra Bridge was "the largest of its kind in the Colony, and is a great undertaking for a young County to carry out."¹⁷

Construction began in 1879 and a major problem soon became apparent because of the Clutha River's inconsistent geology at the point where the bridge crossed it. The riverbed on the southeast side consisted of schist rock which was suitable to support the weight of the masonry pier. Although schist was also present in the opposing side of the river, it was discovered that this was only a crust over soft blue clay. This challenge was overcome by using a one-metre-thick concrete raft foundation for the town side pier. Both of the foundations for the piers are now approximately six metres below normal river level.¹⁸

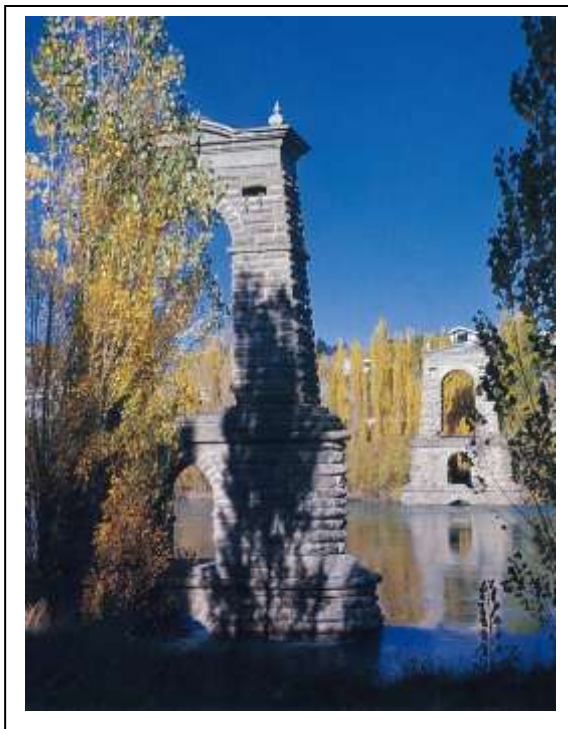


Figure 2: Alexandra Suspension Bridge Towers, Clutha River. Thornton, colour plates p.12

¹⁷ *Tuapeka Times*, 12 April 1879, p.2

¹⁸ Thornton, p.186

Schist masonry piers and towers were vernacular components of late nineteenth century bridges in Otago. At their core the Alexandra Bridge Piers and Towers have a rubble construction, which is then faced with ashlar stonework. Each individual course of this dressing masonry is uniform in height, with the external side of the stone left in a rough state, which is known as rusticated stonework, having a drafted or chiselled margin all round. All of the stone was quarried and prepared locally.¹⁹ One of the two special quarries in the town later became the south bank road cutting approach to the bridge.²⁰

The piers consist of two superimposed arches with rounded edges; the lower section of each pier is slightly larger at 5.4 metres by 3.6 metres, compared with the upper section which is 3.6 metres by 2.7 metres. It was through the tallest arches, those of the towers on top of the piers, that traffic once passed. Capping each tower is a shallow curved and plastered pediment flanked by ornamental urns.

Prior to 1958, when the structure still featured its decking and cables, the total length of Alexandra Bridge was 168.3 metres, and the main span between the two piers and towers was 79.9 metres. The cables supporting the former roadway passed through “tunnels” at the top and either side of the towers.

Key physical dates

- 1879 Construction begins
- 1882 Construction complete
- 1958 Deck and cables removed

¹⁹ ‘Up the Road’

²⁰ McCraw, p.54

C. Assessment of significance

Once claimed to be the largest suspension bridge in New Zealand, the Alexandra Bridge Piers and Towers has outstanding engineering heritage importance as a remnant of the most majestic of the five late nineteenth century suspension bridges that remain in Central Otago, most of which were designed by notable engineer Leslie Duncan MacGeorge. The schist masonry construction contributes to this significance because it is a legacy of a once regionally vernacular bridge building material which reached its pinnacle in this structure. As well as being visually appealing and an important landmark locally, the Alexandra Bridge Piers and Towers are a testimony to the technical knowledge and skill of MacGeorge and contractor Jeremiah Drummey, having survived several severe floods, as well the power of the fast flowing Clutha River for well over a century. These remnants also have engineering heritage value as a lasting tribute to a structure which, between 1882 and 1958, was an important asset within the national road network.

Therefore, Alexandra Bridge Piers and Towers is of sufficient engineering heritage significance to merit inclusion on the IPENZ Engineering Heritage Register.

D. Supporting information

List of supporting documents

Link to: Alexandra Bridge Piers, New Zealand Historic Places Trust,
<http://www.historic.org.nz/TheRegister/RegisterSearch/RegisterResults.aspx?RID=349>

Bibliography

'Impressive arched truss steel bridge at Alexandra,' *New Zealand Engineering*, Vol.13:12 (December 1958)

Cyclopedia Company, *The Cyclopedia of New Zealand [Otago & Southland Provincial Districts]*, Christchurch, 1905

McCraw, J., *The Golden Junction: episodes in Alexandra's history*, Dunedin, c.2002

Moore, C., *The Dunstan*, Dunedin, 1953

Thornton, G., *Bridging the Gap: Early Bridges in New Zealand, 1830-1939*, Auckland, 2001

Electronic sources

McKinnon, Malcolm, 'Otago places - Clutha River/Mata-Au', Te Ara - the Encyclopedia of New Zealand, URL: <http://www.TeAra.govt.nz/en/otago-places/12> (updated 19 August 2009)

Available from Papers Past, <http://paperspast.natlib.govt.nz/cgi-bin/paperspast>:

Bruce Herald, 11 March 1879

Clutha Leader, 6 June 1879

Otago Daily Times, 5 June 1882

Otago Witness, 12 October 1904

Tuapeka Times, 30 January 1878, 12 April 1879, 19 July 1879