

## **IPENZ Engineering Heritage Register Report**

# **Skippers Canyon Suspension Bridge**

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Skippers Canyon Bridge, date unknown. Lake District Museum and Archive, Arrowtown

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## A. General information

**Name:** Skippers Canyon Suspension Bridge

**Alternative names:** Skippers Canyon Bridge

**Location:**

Skippers Road

Skippers

Otago

**Geo-reference:** Latitude: -44.844 Longitude: 168.686

**Legal description:** Part legal road

**Access information:**

Skippers Canyon is approximately 30 kilometres north of Queenstown. This bridge crosses the Upper Shotover River, just south of Skippers on Skippers Road. Four wheel drive vehicles are necessary for this road.





**City/District Council:** Queenstown-Lakes District Council.

**IPENZ category:** Engineering Work

**IPENZ subcategory:** Infrastructure – Bridge

**IPENZ Engineering Heritage number:** 2355

**Date registered:** 28 May 2013

**Other IPENZ recognition:** N/A

**Other heritage recognition:**

- *New Zealand Historic Places Trust:* Skippers Canyon Road (Category 1 historic place, Register no. 7684)
- *Local Authority District Plan:* Queenstown-Lakes District Plan, Inventory of Protected Features (Partially operative December 2008), Appendix 3, Ref 45
- *New Zealand Archaeological Association Site Recording Scheme:* E41/70



## B. Description

### Summary

Constructed between 1898 and 1901, the Skippers Canyon Suspension Bridge spans Central Otago's Shotover River, providing access to the remote former gold mining settlement of Skippers.

The Skippers Canyon Suspension Bridge was part of a project undertaken by the New Zealand Government and Lake County Council to open up the area surrounding the Shotover River to gold mining. Skippers Road was substantively finished by 1890. However, heavy quartz gold mining equipment required a bridge with greater capacity than the existing one. Therefore, County Engineer, John Black (1856–1914) designed a new bridge. Construction by Naseby's A.J. Fraser and Company began in 1898 but was hindered by having to tunnel deeper than expected for the anchorages, as well as the contractor's financial position meaning materials were delayed. The bridge was officially opened by the Minister for Mines, James McGowan (1841–1912) in March 1901. Even though the settlement at Skippers was abandoned by the 1940s, the bridge remained in use by local farmers, and following the creation of the Mount Aurum Recreation Reserve in 1985, it now provides access to the remains of the former settlement. As a visually impressive structure, it is also an iconic feature of the Shotover River and continues to play an important role in local tourism.

The bridge is 91.4 metres (m) above the river, making it the highest suspension bridge in New Zealand. This single lane traffic bridge is 2.2m-wide and its span is 96.3m. The deck and stiffening truss were constructed in timber. One of a group of late 19th century Central Otago suspension bridges, the Skippers Canyon structure's reinforced concrete towers are an interesting departure from the more typical masonry towers of its counterparts.

The Skippers Canyon Suspension Bridge is a special and dramatic structure of engineering and historic value. It is important because it is one of the highest and longest span late 19th and early 20th century New Zealand bridges. The use of reinforced concrete in the bridge's towers reflects this material's growing popularity in bridge building at the turn of the 20th century. The remote location posed considerable challenges for engineers and contractors, and therefore it is also a testament to their professional skill.

## Historical narrative

With its headwaters originating in the mountains to the north of Lake Wakatipu, the Shotover River swiftly descends along a 60-kilometre course before joining the Kawarau River. Human settlement in the Lake Wakatipu area began in the 12th century when the lake was first visited by the Waitaha people searching for pounamu (greenstone). By the 17th century Kāti Mamoe, who later intermarried with Kāi Tahu, were visiting the lake on a seasonal basis. There, at the junction of the Kimi Akau (Shotover River) and Kawarau, they established a settlement known as Tititea.<sup>1</sup>

However, because these settlements were mainly used on a seasonal basis, they had been deserted by the time the first Europeans arrived in the area in 1856. William Gilbert Rees (1827–1898) was a settler who had considerable influence on the area, establishing a sheep run on the eastern shores of Lake Wakatipu in 1860.<sup>2</sup> In that same year Rees gave Kimi Akau its English name, the Shotover River, in honour of his associate George Gammie Maitland's country estate, Shotover House, in Wheatley, England.<sup>3</sup> In 1862, two employees of Rees, Thomas Arthur and Henry Redfern, discovered gold in the Shotover River at a location now known as Arthurs Point.<sup>4</sup>

The two men's discovery was not kept secret and before long they were followed by multitudes of prospectors who dared to venture further upriver, staking out their claim on its banks and tributaries.<sup>5</sup> Access to these parts of the river was both gruelling and dangerous. Since prospectors could not wade upstream or follow the riverbanks, they were forced to climb the hills which surrounded the canyon and then descend the cliffs to the isolated river banks below. Many of these early mining sites were located in the middle section of the river canyon at points where tributaries entered the Shotover River.<sup>6</sup>

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<sup>1</sup> Ngāi Tahu Trust Board, *Ngāi Tahu in the Wakatipu* (Christchurch: Ngāi Tahu Māori Trust Board, 1995), pp.6, 8

<sup>2</sup> 'Queenstown,' from *An Encyclopaedia of New Zealand*, edited by A. H. McLintock, originally published in 1966. *Te Ara - the Encyclopedia of New Zealand*, URL: <http://www.TeAra.govt.nz/en/1966/queenstown/1> (updated 22 April 2009)

<sup>3</sup> Frederick Winston Craddock, *Golden Canyon: the story of Skippers Road and the Shotover Valley* (Christchurch: Pegasus, 1980), p.35

<sup>4</sup> Alan Joseph De La Mare, *The Shotover River, the richest river in the world: a history of gold mining on the Shotover River* (Arrowtown: Lakes District Museum, 1993), p. 11

<sup>5</sup> De La Mare, p.11

<sup>6</sup> Craddock, p.39

Some of these mining sites turned into permanent settlements. Indeed, a settlement soon appeared at Skippers Point, overlooking Skippers Creek, a tributary of the Shotover River. There are various explanations as to how the creek received its name. One is that it was named after a former sea captain, “Skipper” Duncan, who was the first to sight gold in the creek.<sup>7</sup> Regardless of how the settlement received its name, the amount of gold the location yielded became well-known. With reports of 100 ounces of gold per dish, it was considered among the richest creeks in the world at the time.<sup>8</sup>

In gold mining settlements, inhabitants initially brought their own supplies with them, and when these expired, they were forced to rely on others to bring them in by packhorse. Then stores and hotels began to develop at the diggings. Supply lines were difficult to maintain at the best of times but when the weather turned inhospitable many of the settlements were effectively cut off from any outside assistance. To solve this issue a permanent pack track, from Arthurs Point to Maori Point, was surveyed along the eastern length of the Shotover River in 1863. Construction began in 1864 after two contracts were awarded to John Braithwaite and John and Charles Mace. In 1866 the track was extended until it reached a point on the eastern bank opposite Londonderry Creek.<sup>9</sup> In 1868 a suspension bridge for horse and pedestrian traffic crossed the Shotover River and the track led up the hillside to the settlement at Skippers Point and Bullendale Reefs.<sup>10</sup>

Despite the pack track having opened up the route to Skippers Point, by 1864 the initial gold at Skippers Creek was already showing signs of depletion and as a result the settlement, like many others along the length of the Shotover River, started to decline. However, a small community at Skippers continued to exist well into the early decades of the 20th century, because of the Bullendale quartz mine further up Skippers Creek.<sup>11</sup> This mining required heavy machinery to be brought in but the old pack track was unsuitable. It was not until after 1876, when Lake County Council was formed, that the need for better roads began to be addressed.<sup>12</sup> At a Council meeting in 1882 the concerns of Skippers Point residents were highlighted by John Aspinall,

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<sup>7</sup> Frederick Walter Gascoyne Miller, *Golden Days of Lake County* (Christchurch: Whitcombe and Tombs, 1973), p.80. However in contrast to this, F.W. Craddock states that the appellation does not necessarily have any nautical connections and was probably the title given to the leader of a group of prospectors. See: Craddock, *Golden Canyon*, p. 31

<sup>8</sup> Miller, p.80

<sup>9</sup> De La Mare, pp.11-13

<sup>10</sup> De La Mare, p.13; Geoffrey Thornton, *Bridging the gap: early bridges in New Zealand 1830 – 1939* (Auckland: Reed, 2001), p.176

<sup>11</sup> De La Mare, pp.13-14

<sup>12</sup> Miller, p.275-76

the member for Shotover. Six weeks later he presented a petition to the Council requesting the construction of a dray road. His petition was supported by Frederick Evans, the manager of Phoenix Mine at Bullendale, whose concerns were heeded due to the mine's contribution to the local economy.<sup>13</sup>

In 1883 the route of a proposed road was surveyed and it was decided to split the length into four sections which would then be offered up for tender. In that same year work began on section one, stretching from Arthurs Point to an area known as "The Saddle", and was completed in September 1884. At the same time work began on constructing section three, a route which ran from Deep Creek to Maori Point. Following the completion of these two routes, work began from Maori Point to Fishers, a point on the eastern bank of the Shotover where the original pack track joined the bridge at Londonderry. This was completed in 1885. Section two was delayed because of the challenge posed by a difficult part of the route known as the zigzag. It was only in 1888 that construction finally started and the road was completed in 1890.<sup>14</sup>

Calls for a new bridge at Skippers Point, to replace the earlier bridge, began soon after the road's completion. This too was seen as necessary for the Phoenix Mine's continuance (now known as the Achilles Mine). In 1893 the Mines Department gave approval for the bridge's construction and also offered a £1,500 subsidy. Because the cost of construction would exceed this, the initial design of the bridge was reconsidered and changes were made to reduce its width to eight feet. The Government later upped its funding to £2,744.<sup>15</sup>

The bridge was designed by Lake County Engineer, John Black (1856–1914).<sup>16</sup> Black was a New Zealand-born engineer who joined the Public Works Department in 1872. Beginning as a draughtsman and office assistant, by 1878 Black had worked his way through the ranks to become the Assistant Engineer at Dunedin. He held the position of Engineer to the Lake County Council from 1886 until 1903 when he moved to Ohinemuri County. In 1914 he died suddenly of a stroke at which time he was in private practice in Paeroa.<sup>17</sup>

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<sup>13</sup> De La Mare, p.14

<sup>14</sup> Ibid., pp.15-16

<sup>15</sup> Ibid., p.17

<sup>16</sup> Thornton (2001), p.193

<sup>17</sup> F. W. Furkert, *Early New Zealand Engineers* (Wellington: Reed, 1953), p.114; 'A Sudden Passing,' *Ohinemuri Gazette*, 9 February 1914, p.3



Getting the Skippers Canyon Suspension Bridge constructed seems to have been anything but straightforward for Black, who also oversaw the construction contract on behalf of the Council. Of the tenders for its construction the lowest was from A.J. Fraser and Company of Naseby, at a cost of £3,244. When this was accepted construction on the bridge began in 1898.<sup>18</sup> The site for the bridge seems to have been a point of contention and, contrary to Black's recommendation, there was political pressure to choose the present site.<sup>19</sup> This caused problems and doubled the expense because the rock for the anchorages was not suitable, which meant tunnelling further into the ground than anticipated and longer lengths of suspension cable to compensate.<sup>20</sup> The delay this created was exacerbated because of the contractor's financial position. As such, "[i]ron-bark and other timber had been lying at the Bluff for nine months, but the contractor could not get money, and the council instructed him (Mr Black) to give guarantee for the money".<sup>21</sup> Therefore, the bridge took several years to complete instead of the expected 10 months.<sup>22</sup>

The bridge was eventually finished in 1901 and was opened on 29th March with an official ceremony.<sup>23</sup> Presiding over the ceremony was James McGowan (1841–1912), the Minister of Mines, who was acting on behalf of the Premier. The ceremony was attended by Skippers residents, but also those from neighbouring settlements such as Bullendale, Sandhills, Queenstown, Macetown and Millers Flat. The bridge was decorated with the Union and New Zealand flag, and the ribbon was ceremoniously cut by a local resident, Mrs Johnston, who then accompanied the Minister in making the first walk across the bridge.<sup>24</sup> The bridge opening was then followed by a celebratory dinner and ball held at the Otago Hotel in Skippers.<sup>25</sup>

Despite this accomplishment, the construction of the bridge came at a time when mining activity in the area surrounding Skippers Point was in decline. By the turn of the 20th century the population in the Skippers area had been greatly reduced.<sup>26</sup> In the same year that the bridge opened, the Achilles Mine had been forced to close due to financial difficulty.<sup>27</sup> The population at Skippers continued to decline and by 1927

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<sup>18</sup> Thornton (2001), p.193

<sup>19</sup> 'Lake County,' *Otago Witness*, 20 March 1901, p.29

<sup>20</sup> Ibid.; 'The Minister for Mines on Tour,' *Otago Daily Times*, 28 April 1900, p.8

<sup>21</sup> 'The Minister for Mines on Tour'

<sup>22</sup> 'Lake County,' *Otago Witness*, 20 March 1901

<sup>23</sup> De La Mare, p.17

<sup>24</sup> 'The Skippers Bridge,' *Otago Witness*, 3 April 1901, p.53

<sup>25</sup> De La Mare, p.18

<sup>26</sup> Craddock, p.31

<sup>27</sup> P.G. Petchey, 'Gold and electricity: archaeological survey of Bullendale, Otago,' (Department of Conservation, 2006), p.15. URL: <http://www.doc.govt.nz/documents/science-and-technical/sap237.pdf> (accessed 7 January 2013)

the school had closed.<sup>28</sup> By the 1940s the only occupants were the lessees at Mount Aurum Station homestead.<sup>29</sup>

With Mount Aurum Station proving to be unsuccessful and going through many leases, the Government eventually closed the station in 1977 and put aside 9,100 hectares of land for use as a reserve.<sup>30</sup> In 1985 the reserve became known as the Mount Aurum Recreation Reserve, managed by the Department of Conservation. The Department restored the old school building, which along with the former cemetery is now one of the reserve's main features.

The bridge is an iconic feature of the Queenstown area's tourism industry. In 1989 adventure tourism operator A.J. Hackett (b.1958) used the bridge as a bungee jumping site.<sup>31</sup> However in 1999 the market need for the Skippers Bridge operation gradually declined due to the opening of A.J. Hackett's Ben Nevis site, which was both higher and easier to access.<sup>32</sup> Despite this, tourists still visit the bridge as part of coach and 4WD tours. In recent years the bridge has also featured in Lord of the Rings movie tours, as it overlooks the location used to film the Ford of Bruinen scene in *The Fellowship of the Ring*.<sup>33</sup>

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<sup>28</sup> De La Mare, p.60

<sup>29</sup> 'Unforgettable Skippers Canyon,' Queenstown Heritage Tours, URL: <http://www.skipperscanyon.queenstown-heritage.co.nz/2009/10/little-bit-of-history-life-at-skippers.html> (accessed 7 January 2013)

<sup>30</sup> De La Mare, p.80

<sup>31</sup> Michael Kelly and Heather Bauchop, 'Skippers Road,' Historic Places Trust Register, URL: <http://www.historic.org.nz/TheRegister/RegisterSearch/RegisterResults.aspx?RID=7684> (accessed 7 January 2013)

<sup>32</sup> A J Hackett Bungee New Zealand, Pers Comm. to author, 7 January 2013

<sup>33</sup> Ian Brodie, *The Lord of the Rings Location Guidebook* (Auckland: Harper Collins, 2002), p.65

## Social narrative

As with many of the other settlements which once lined the length of the Shotover River, life at Skippers Point revolved around the gold mining industry. Founded in 1862, the settlement managed to survive long after the initial discoveries of gold had passed. One of the most successful miners to stake a claim on the area surrounding Skippers Creek was perhaps John Aspinall, whose family worked the claim from 1867 to 1922 and managed to build a two-storey house in its vicinity.<sup>34</sup> In 1882, as the member for the Shotover district, it was John Aspinall who petitioned the Lake County Council to construct a dray road from Arthurs Point to Skippers Point.<sup>35</sup> His efforts were rewarded with the completion of the road in 1890. However, it would be another 11 years before a suitable bridge was finally built at Skippers to replace the old one at Londonderry.

The opening of the Skippers Bridge in 1901 was a cause for celebration. Its construction was seen as evidence of the Government's continued support for the region's mining industry. During his speech at the celebratory dinner, the Minister of Mines referred to the Government as a "working man's government – a roads and bridges government."<sup>36</sup> In McGowan's view, the construction of further bridges would assist in further settlement and the development of industry, allowing New Zealand to prosper as a colony.<sup>37</sup>

Although the completion of the bridge allowed for heavy mining equipment to be brought in to the mines in the Skippers region, it also benefited the community in that they were now able to travel, with ease of access, to Queenstown and the surrounding settlements. It also made it easier for tourists to reach the settlement, and therefore businesses such as the Otago Hotel were able to sustain themselves long after the need to cater to miners had passed.

However, despite this, the construction of the bridge and the benefits it brought to the region were not enough to sustain the settlement and by the 1940s it had largely been abandoned. By then only the leaseholders at Mount Aurum Station remained and the bridge continued to provide them with access to the wider region and nearby amenities.

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<sup>34</sup> Craddock, p.33

<sup>35</sup> De La Mare, p.14

<sup>36</sup> 'The Skippers Bridge'

<sup>37</sup> Ibid.

Before construction began in 1897, one of the stated reasons for the Skippers Canyon Suspension Bridge was that "...it will afford tourists an opportunity of seeing the Shotover Valley in all its greatest grandeur and enable them to penetrate into the great mining heart of the district...."<sup>38</sup> This has remained so. Following the creation of the Mount Aurum Recreation Reserve in 1985 and the A.J. Hackett bungy jumping operation in 1989, the bridge became an iconic destination for tourists. Although the A.J. Hackett bungy has moved to a new location, the bridge still plays an important part in regional tourism. It provides access to the reserve for those who wish to use the walking trails which line the surrounding hills and as an interesting visual element in a picturesque location it offers many photographic opportunities.

Today the bridge stands as a reminder of the former Skippers settlement and the efforts undertaken by both the Government and the people of the region to open up the rugged and inhospitable terrain surrounding the Shotover River.

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<sup>38</sup> 'Lake County,' *Otago Witness*, 25 February 1891, p.25

## Physical narrative

The form, height, length and location of the Skippers Canyon Suspension Bridge make it “undoubtedly one of the most spectacular bridges in New Zealand”.<sup>39</sup>

Suspension bridges in New Zealand are often found in areas that were formerly, or still are, remote to access. The decision to use this form of bridge often came down to various factors. One factor was the topography of the landscape. When confronted with gorges which were deep and that possessed swift rivers, suspension bridges were often the most practical choice as they do not require midstream piers for support.<sup>40</sup> Another factor was economical, since suspension bridges were often cheaper to construct.<sup>41</sup>

For these reasons suspension bridges were particularly popular in Central Otago, spanning turbulent, flood prone rivers such as the Clutha and Kawarau, to provide access to settlements which grew rapidly in the late 19th century because of the gold rush. Some examples of these bridges include Shaky Suspension Bridge (1879) at Alexandra, the Daniel O’Connell Bridge in Ophir, Central Otago (1880), the Kawarau Gorge Suspension Bridge, Alexandra Bridge (1882) and the Taieri River Bridge (1885).

Therefore, a suspension bridge over the Shotover River at Skippers Canyon was an obvious choice of bridge type. The contract for the bridge was awarded to A.J. Fraser and Company of Naseby who started construction in 1898. After three years of working in what was a rugged and dangerous landscape, the bridge was finally completed in 1901.

The bridge is situated at 91.4m above the Shotover River, which makes it the highest suspension bridge in New Zealand. Few other forms of New Zealand bridge were subsequently built higher, such as the Mohaka Viaduct (1937), a steel girder trestle bridge, which was the fourth highest bridge in the world at the time of its completion, at 95m.<sup>42</sup>

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<sup>39</sup> Thornton (2001), p.193

<sup>40</sup> Geoffrey Thornton, ‘Heritage Assessment Programme: Horseshoe Bend Bridge Clutha River,’ unpublished report written for IPENZ (2007), p.1

<sup>41</sup> Thornton (2001), p.176

<sup>42</sup> Ibid., pp. 61, 193



The Skippers Canyon Suspension Bridge's span is also considerable. At a length of 96.3m it has one of the longest spans in the country behind structures such as the Clifden Suspension Bridge (1898–1899).<sup>43</sup> Developments in materials and engineering knowledge throughout the 20th century have led to significantly longer spans, such as the 243.8m long central span of Auckland's steel Harbour Bridge. However, even now the longest span in a railway bridge in New Zealand is 110m.<sup>44</sup> Therefore, the Skippers Canyon Suspension Bridge is special because it is among New Zealand's earliest surviving vehicle traffic bridges with the longest main spans.

The deck's width is 2.2m, which only allows for a single lane of traffic. The decking and stiffening trusses are both timber.<sup>45</sup> The bridge was designed with the use of traction engines in mind, as these were the heaviest forms of machinery in use at the time of its construction. Therefore, the live load weight at the time was 16 tonnes.<sup>46</sup> The bridge is suspended from 14 millimetre steel cables which are strung over the towers and possess a breaking strain of 76.2 tonnes.<sup>47</sup>

Although the basic form of the bridge follows that of the other single span Central Otago suspension bridges, the Skippers Canyon Suspension Bridge's towers demonstrate changing technologies. At each end of the bridge stand a pair of concrete towers on concrete abutments.<sup>48</sup> Standing at a height of 11.6m, the towers differ from earlier Central Otago suspension bridges whose towers were commonly masonry constructions.<sup>49</sup> The Clifden Suspension Bridge in Southland was started around the same time as its counterpart at Skippers, and also has concrete towers, albeit over four metres shorter. The decision to use concrete in these bridges demonstrates the material's growing popularity by the turn of the 20th century.<sup>50</sup>

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<sup>43</sup> Ibid., p.61

<sup>44</sup> 'Auckland Harbour Bridge,' IPENZ Engineering Heritage Record, URL: <http://www.ipenz.org.nz/heritage/itemdetail.cfm?itemid=117> (accessed 4 July 2012); The North Island Main Trunk railway's prestressed concrete North and South Rangitikei, and Kawhataui, Viaducts, completed between 1979 and 1981, all have the longest main span of a New Zealand railway bridge. Karen Astwood, 'North Island Main Trunk Historic Area, Vol. II,' NZHPT report, 27 May 2009, p.24

<sup>45</sup> Thornton (2001), p.193

<sup>46</sup> Craddock, p.32

<sup>47</sup> Thornton (2001), p.193

<sup>48</sup> Ibid.; 'The Skippers Bridge'

<sup>49</sup> Geoffrey Thornton, *Cast in concrete: concrete construction in New Zealand* (Auckland: Reed, 1996), p.98

<sup>50</sup> Ibid.

When the bridge was used as a site for bungy jumping a platform was constructed on the downstream side of the bridge. Later, repairs to the Skippers Canyon Suspension Bridge's towers were carried out in 2012 after cracks were discovered.<sup>51</sup>

*Key physical dates*

1898–1901	Constructed
2012	Repairs made to bridge towers

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<sup>51</sup> Grant Bryant, 'Skippers Bridge closes after cracks found,' *Stuff*, 7 July 2012, URL: <http://www.stuff.co.nz/southland-times/news/7358486/Skippers-Bridge-closes-after-cracks-found> (accessed 7 January 2013)

## C. Assessment of significance

Completed in 1901, the Skippers Canyon Suspension Bridge has social importance as it is one of the remaining physical reminders of the former gold mining settlement at Skippers. The bridge was the final component in the local and central governments' scheme to open up the region surrounding the Shotover River by creating infrastructure which facilitated gold mining. While mining declined in the early 20th century, the bridge allowed for tourism to continue. The Skippers Canyon Suspension Bridge is an impressive structure set within a dramatic landscape and continues to be a tourism highlight.

Situated in inhospitable and challenging terrain, the Skippers Canyon Suspension Bridge is a testament to the engineering skills of Lake County Council Engineer, John Black, and the men who built it. Building the structure was a momentous task. At a height of 91.4 m above the Shotover River, it is the highest suspension bridge in New Zealand, as well as one of the longest span vehicle bridges dating from the late 19th and early 20th centuries. This type of suspension bridge was very popular in Central Otago in the late 19th century. However, the structure's concrete towers set it apart from other local suspension bridges from the period which usually had masonry towers. The bridge also has engineering importance because its concrete towers demonstrate the beginnings of concrete's ascendancy in New Zealand bridge construction.

Therefore, Skippers Canyon Suspension Bridge is of sufficient engineering heritage significance to merit inclusion on the IPENZ Engineering Heritage Register.

## D. Supporting information

### List of supporting information

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