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# THREE CONSTRUCTION CAMPS ON THE OTAGO CENTRAL RAILWAY

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A large part of the rail network in Aotearoa New Zealand was constructed during the late 19th century (Churchman and Hurst 1990: 14-23). Most railway construction took place far from any established settlement, meaning workers were often housed in temporary camps alongside or near the railway (Dangerfield and Emerson 1995, Hamel 1994, Mitchell 2012). Because they are relatively common and temporary in nature, such sites have the potential to be of use to historical archaeology in New Zealand. This study, adapted from a Masters thesis submitted to the University of Otago (Mitchell 2012), compares three railway construction camp sites associated with the Otago Central Railway.

The Otago Central Railway (OCR), which ran between Dunedin and Cromwell, was constructed from 1880 and 1917, a period bookended by the worldwide economic depression of the 1880s and World War I. Those employed on the construction of the OCR were housed in temporary camps established by the Public Works Department (PWD) or by private contractors. The PWD were responsible for forming the track bed, which included some cuttings and embankments, while private contractors undertook specialist tasks such as bridging and tunnelling. Due to the nature of the work being carried out, the PWD camps were located at intervals along the length of the OCR, wherever conditions were most favourable, while the contractors' camps were located as near as possible to the work at hand (Mitchell 2012).

Using a combination of the historical record, site location modelling and remote sensing, 30 camp sites associated with the construction of the OCR were identified, and eight were then selected for an archaeological survey of surface features (Mitchell 2012). Of these, the three with the most extant surface features were chosen for this study. The sites are: the Flat Steam PWD camp (recorded as archaeological sites I43/118, I43/119, I43/121), situated some three-quarters of the way through the Taieri Gorge and occupied from 1880 to 1887; the Nenthorn private contractors' camp (I43/153), located beside the

last embankment before Pukerangi station and in use from 1880 to 1888; and the Poolburn Gorge PWD camp (H41/234), located near the northern portal of Tunnel 13 in the Poolburn Gorge and occupied from 1901 to 1903 (Figure 1). No archaeological excavation was carried out at any of the sites.

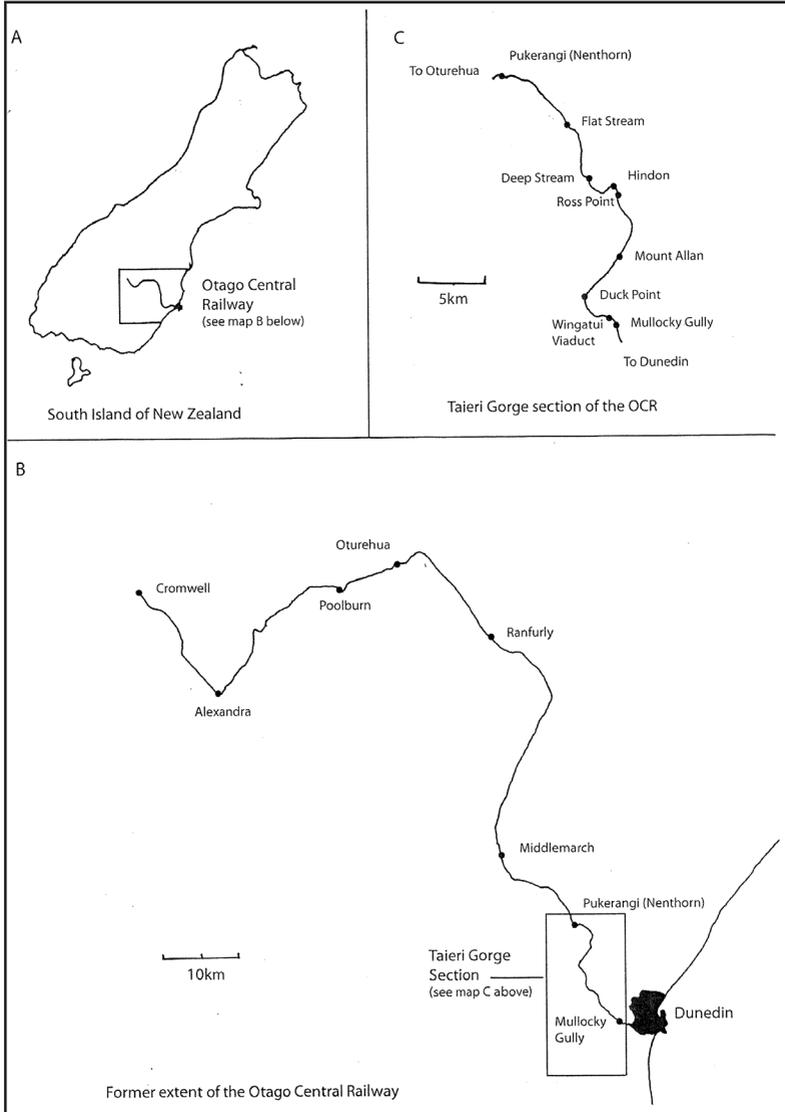


Figure 1. Map of the former extent of the Otago Central Railway.

## Camp components

Before comparing the sites it is important to establish what their component parts might be. Investigation of the historical record reveals that the Public Works Department camps each had a blacksmith's workshop and forge, a carpentry workshop, an engineer's office, stables, powder magazine, boarding house (or houses) and at least one supply store (Cowan 2009: 148). Workers and their families lived in tents or huts of mud and/or stone. The engineer's office was usually timber, while the workshops were clad in corrugated iron. The powder magazines were constructed of stone (Dangerfield and Emerson 1995: 15-16). After 1884 some camps had a police hut and jail. In addition to the government supply stores, private businesses also set up shop in or near the camps, and sly grog shanties were ubiquitous, though illegal enterprises (Dangerfield and Emerson 1995: 16). The make-up of contractors' camps varied depending on the work being carried out. Some were very similar to PWD camps, while others were significantly smaller, consisting only of a cluster of tents (Mitchell 2012: 38).

## Building materials

### *Schist*

As well as the standard issue tents of felt and canvas, workers involved in the construction of the Otago Central Railway utilised other approaches to the problem of housing themselves and their families. The most common construction material anywhere on the railway was the ubiquitous schist rock. Slabs of schist were used in everything from the construction of hearths, chimney stacks and walls, to walled enclosures and larger buildings whose walls were made entirely of stone. Many stone structures were constructed using the dry stone technique, while others merely had mud plastered on their interiors, and some were fully mortared with mud and clay.

Large schist boulders were also incorporated into structures, where they were used as walls. A suitable rock, usually one with a relatively vertical face, was selected and a fireplace and chimney would be constructed against it. The rest of the structure was simply built up around this and against the vertical face. This was then covered with a roof, usually of canvas.

Schist slabs were also used as floors and flag stones. It appears that some wooden or corrugated iron structures were erected on a base of schist slabs. These buildings could then be dismantled and removed to the next camp up the line.

## *Sod*

Photographs of camps associated with the OCR show that many huts and chimneys were at least partially constructed of earth. According to sources the most common method of earth construction used in the camps was sod (Dangerfield and Emerson 1995: 16). Sod is made by cutting blocks of turf and stacking them face down to form walls. Sod walls should not be confused with those constructed of mud brick or cob (stamped earth). Mud brick construction is a different technique, which involves combining earth with water and straw or animal dung, and pressing this mixture into moulds to harden. Stamped or rammed earth involves earth being stamped down between shutters or vertical supports, which leave distinct layers in the finished wall.

## *Timber and iron*

In the later stages of railway construction on the flatlands, entire camps were of timber, corrugated iron and canvas. The Dunstan Flat Public Works Department camp (1905) near Alexandra was this type of camp, as were earlier camps such as the Ranfurly Public Works Department camp (1899). These could be erected and dismantled with comparative ease, and moved on to the next site up the line (Cowan 2009: 149).

## **The sites**

### *Flat Stream*

Chimneys and other evidence of the large Public Works Department construction camp can still be seen on the hillside above the Flat Stream siding (Dangerfield and Emerson 1995: 92). In addition to the usual structures associated with Public Works Department camps, there was also a police camp, complete with lock-up, at Flat Stream. The jail was by the mouth of Tunnel 9, and was still partly standing in 1976 (Cowan 2009: 144). The police camp was set up after a murder occurred at the Nenthorn camp in 1884.

The Flat Stream site was the only railway construction-related camp on the Otago Central Railway that had been recorded archaeologically prior to this study. Jill Hamel identified the probable location of the police camp (I43/118), a terrace, hut sites, hut floors, chimneys and a sod wall/fence (I43/119), and the main Public Works Department camp site, which consists of a cluster of hut sites and chimneys (I43/121). The uppermost of the three terraces identified by Hamel (2000) was presumed to have been the site of the police station and cell block while those lower down the slope and nearer to the railway line were recorded as possible domestic dwellings. The middle terrace (I43/119) contained the remains of 12 huts, mainly only visible as chimneys. There are some walls, all of schist with construction styles ranging from well made to

“very rough construction” (ArchSite I43/119: 3). All features recorded were on the surface and no archaeological excavations have been undertaken at the Flat Stream site.

### *Nenthorn*

The Nenthorn contractors’ camp (I43/153) is described as a “sort of sly grog canvas township” to which “great quantities of beer and spirits were transported by wagon and train” (*Otago Witness* 13/12/1884: 8). There was at least one store associated with the camp at Nenthorn, which was run by the Mercer Brothers. A boarding house at Nenthorn, built by W. Mitchell and owned by John Wyatt, burnt down in 1885 (*Otago Witness* 26/9/1885: 12). After being largely abandoned by 1886, Nenthorn housed a police camp and lock-up, established in 1887 after a murder occurred in the main camp in 1884. (Cowan 2009: 144).

Nenthorn camp is the only railway construction-related site on this section of the OCR that is not presently overgrown with scrub or totally devoid of surface features. This site was occupied between 1880 and 1886. The Nenthorn site contains several extant surface features including a large enclosure wall of stacked schist, house platforms, hearths and partial walls of stacked schist. Artefacts relating to the occupation of the site are visible on the surface. These include metal storage and cooking vessels, a shovel head, blacksmith-related detritus and scatters of bottle glass and ceramics.

### *Poolburn (Blackstone, Blackstone Hills)*

The Public Works Department camp (H41/234) was situated on “a slight elevation just where the railway takes to the hills on the way down to the Poolburn Gorge” (*Otago Witness* 30/1/1901: 12). In addition to tents there were wooden buildings, one of which was the Public Works Department headquarters. Other wooden buildings housed the engineers. The blacksmith’s shop was clad in corrugated iron, and situated at the western portal of Tunnel 13, the last tunnel on the line (*Otago Witness* 30/1/1901: 12).

Poolburn Public Works Department camp has the most standing structures of the three railway construction camps in this study (Figure 2). There are nine standing chimneys and at least eight other platforms associated with housing or industry at the site. In addition to the chimneys and platforms there are also walls of stacked schist, some of which abut larger schist rocks.

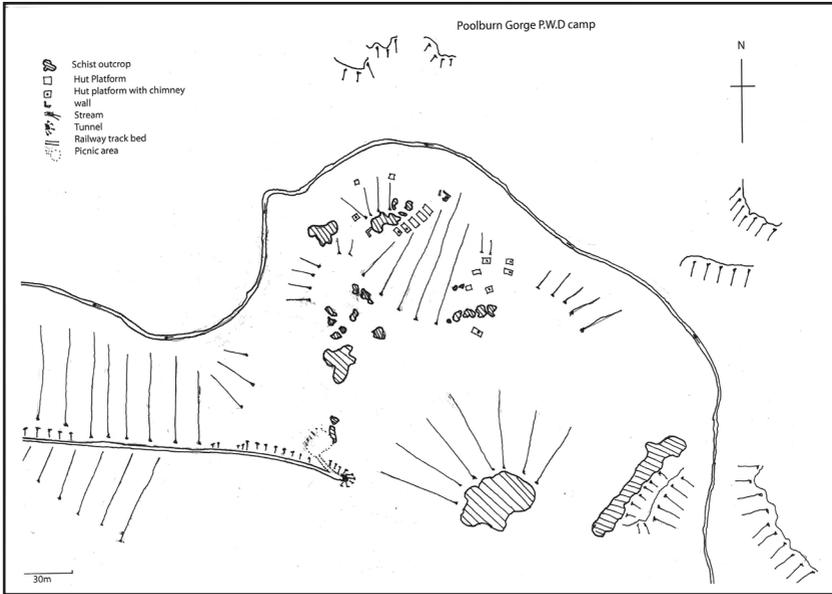


Figure 2. Map of the Poolburn PWD camp.

## Comparisons

The Flat Stream and Nenthorn camps were long-term sites, being occupied on and off between 1880 and 1886. Poolburn Gorge Public Works Camp, in contrast, was only in use for some two years, from 1901 until late 1903 (Dangerfield and Emerson 1995: 28). Both the Flat Stream and Nenthorn camps had a police hut and cells. The first, at Flat Stream, was set up after the murder of William Meldrum, the keeper of a sly grog shanty at the Nenthorn camp, by Thomas Crowley, Lawrence White and a man named only as Fitzgerald (*Otago Witness* 13/12/1884: 8). A police officer was stationed at the Nenthorn site in 1887, but by then it been otherwise abandoned (Robertson n.d.) Hamel (ArchSite 2000: I43/118) located the police building on the highest occupation terrace at the Flat Stream camp, but there is no clear candidate for such a structure at the Nenthorn site.

Flat Stream camp appears to be the largest site, laid out over three distinct levels and with at least 17 platforms, some of which were large enough to accommodate up to three huts or tents (ArchSite 2000: I43/119, I43/121). The Poolburn Gorge camp is only slightly smaller in size with some 15 platforms or terraces, most of which are single hut or tent sites. Stock damage and erosion at the Nenthorn site have made it difficult to discern the exact number of platforms, but there are at least 10.

All three sites feature stacked schist walls that have been built abutting existing schist outcrops. These average 1 m in height, and are between 600 mm and 1 m wide. The lack of height suggests that the upper walls and roof would have been canvas. Flat Stream and Nenthorn camps both have walled enclosures of stacked schist, the larger of which is at the Nenthorn site and is clearly visible on Google Earth. Hamel (ArchSite 2000: I43/119) interprets the Flat stream enclosure as possibly being a yard for a horse. The Nenthorn enclosure is open at its northern end, which makes it an unlikely candidate for a horse yard, though there may have been additional fencing that has since been removed.

There is evidence of sod or earth being used for walls and chimneys at the Flat Stream and Nenthorn sites. These are visible as low mounds around hut platforms at the Nenthorn camp and as mounds at the end of platforms at both sites. Earth does not appear to have been used for construction of walls or chimneys at the Poolburn Gorge Public Works Department camp, probably because there was plenty of stone available for building. It may also be that there was insufficient soil depth at the Poolburn site to allow for earth to be utilised in this way, or that the soil was of such low clay content that any earth structures have simply dissolved.

Chimneys at Flat Stream and Poolburn were predominately of stacked schist construction, many of which are mortared with earth. Hamel (ArchSite 2000: I43/121) recorded at least 10 such structures at the Flat Stream site, and nine were recorded at the Poolburn Gorge site. At the Nenthorn site only the hearths seem to have been constructed of stacked schist, and the chimneys themselves were sod. Railway iron was used to support some fireplace lintels at Flat Stream (ArchSite 2000: I43/121) and Nenthorn but not at Poolburn. This may only have been done in the larger fireplaces, and was perhaps not necessary at Poolburn due to the fireplaces being smaller.

Hamel (ArchSite 2000: I43/121) reported a small structure of stacked schist at some remove from the main body of the Flat Stream Public Works Department camp, which she interpreted as a possible powder store. All Public Works Department camps had these, and there is a similar structure at the Nenthorn contractors' camp. The possible powder store at the Nenthorn camp is also at some remove from the main body of the site, being built into an overhanging schist outcrop facing the railway track bed. This structure is of loose stacked schist construction, 1 m, in height and is divided into two cells by a partition wall. There are the remains of two structures below and to the side of the main body of the Poolburn Gorge site, but these are in too great a state of disrepair for their purpose to even be guessed at.

The only surface evidence for any type of on site workshop is the scatter of blacksmithing detritus on 'Blacksmith Rock' at the Nenthorn camp. At the Poolburn Gorge site the blacksmithing workshop was located on the track bed at the north end of the tunnel nearest the camp. There is no indication in Hamel's site record forms of where the smithy or carpentry workshops at the Flat Stream Public Works Department camp may have been.

*Table 1. A comparison of surface features from the Flat Stream PWD camp, the Nenthorn camp and the Poolburn Gorge PWD camp.*

	<b>Flat Stream P.W.D.</b>	<b>Nenthorn</b>	<b>Poolburn Gorge P.W.D.</b>
Long term site 3 years +	Y	Y	N
Short term site 3 years -	N	N	Y
Stone enclosure	Y	Y	N
Stone walls on schist outcrop	Y	Y	Y
Stone walls	Y	Y	Y
Sod walls	Y	Y	?
Stone hearths	Y	Y	Y
Stone chimneys	Y	N	Y
Sod chimneys	Y	Y	N
Powder store	Y	Y	?
Evidence of workshop	N	Y	N
Flagged floors	?	Y	?
Number of terraces	17+	10+	15+

## Conclusions

According to the historical record each camp consisted of workers' tents or huts, workshops, engineers' huts, boarding houses, stores and a powder magazine. The archaeological survey of these three sites shows that they had basically the same extant surface features, but without excavation it is impossible to establish their function. The University of Otago held its 2013 field school at the Nenthorn site (I43/153), but as yet no results of their archaeological investigations are available. It is likely, however, that small hut platforms supported single men's tents or huts, while larger platforms were more likely to have been associated with family accommodation or, in some cases, perhaps sly grog shanties. The largest platforms would have been the bases of the boarding houses, workshops and stores. Flagged floors would have supported wooden-

framed buildings such as engineers' huts. Further archaeological analysis of the surface and subsurface features and artefacts from these sites would provide a solid foundation for the study and comparison of other railway construction-related camp sites of the same era throughout New Zealand.

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