NOMINATION OF THE

The Victoria Pass Roadway
Mount Victoria NSW

Opened 1832

AS A

NATIONAL ENGINEERING LANDMARK

Prepared for the
Engineering Heritage Committee
Sydney Division. IEAust
by
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December 2001

Contents

1. Introduction

Victoria Pass is one of the oldest and most significant engineered works in Australia still in use today. Only Lennox's Bridge at Landsvale, which was built during the same period, would lay claim to similar circumstances in terms of heritage and road use (Lennox's Bridge was one of the earliest National Engineering Landmarks in 1986).

Victoria Pass, located on the western side of the Blue Mountains, NSW, on the Great Western Highway leading towards Lithgow and Bathurst, was constructed in 1830 – 1838 using convict labour to surmount a difficult decent off the ridge of the mountains.

Halfway down the descent of the pass is an elevated embankment between parallel stone walls. It is this 'Causeway', sometimes erroneously referred to as Mitchell's Bridge and the retaining walls leading up to it, that are perhaps one of Australia's finest examples of early colonial road engineering. "Built between 1830 and about 1838, after considerable administrative turmoil, it was intended to convey a sense of progress and civilization, for it was evidence of the colony's growing resources and sophistication, in spite of inauspicious beginnings. It was certainly successful in this aim, for travellers rarely failed to bestow lavish praise on it in their journals." (Karsen's Report 1988)

The Pass was a practical boon to travellers, since it obviated the extremely steep and dangerous section of the Bathurst Road down Mt. York to Hartley Vale. The Pass has been in almost continuous use since its construction, although from 1912 to about 1920 it was partly bypassed by the winding but less steep Berghofer's Pass to the north. However, when motor cars became powerful enough to scale the original ascent, Victoria Pass was fully reopened. (The two roads still exist side by side, a physical record of the road building of different periods, and of the development of road transport.)

The Pass was created by cutting into the escarpment on one side and building up with stone wall embankments on the other. All work was carried out by chain gang convict labour and built by hand. The stone wall embankments are still the major structural elements of the road today, with no upgrading to these structures having occurred after Sir Thomas Mitchell's original construction. The road has been widened and filled over in parts over the years to allow for the increase in traffic but a major portion of the original road is still intact, as built and functional.

The convict built roadway and more specifically the Causeway (Mitchell's Bridge) is still in use today as part of the major highway feeding the western areas of NSW from Sydney. This road is subject to extremely heavy traffic, including modern heavy semi trailers, far in excess of what it was originally intended. Unfortunately the Causeway has become a problem for the Roads and Traffic Authority (RTA) due to its heritage status preventing any alterations. It now creates a bottleneck in the western highway that will not easily be by-passed.

This nomination for a National Engineering Landmark confirms the significance of this engineering work of the early colonial period and outlines the importance of recognising historic road infrastructure, still being used for highway traffic over the Blue Mountains.

2. Statement of Significance

1. Victoria Pass is an excellent example of colonial road building and typifies the roads that spread out from Sydney in the early 1800s to improve the initial road efforts of the NSW colony. - *Representative*

2. The convict built roadway and more specifically "Mitchell's Bridge" are still in use, after 168 years, as a major highway feeding the western areas of NSW from Sydney. This road is subject to extremely heavy traffic, far in excess of what it was originally intended for in 1832. The road is an outstanding engineering achievement considering it was built by hand during convict times, yet can manage the traffic of the current times especially with the growing number of extra heavy vehicles. The Causeway (Mitchell's Bridge) has changed very little since its original construction. - *Scientific & Integrity*

3. The convict built roadway and structures are amongst the oldest surviving colonial roadways in New South Wales. - *Rarity*

4. Victoria Pass was constructed during the same period as the Great North Road to Newcastle, dedicated as a National Engineering Landmark in November 2001, using similar methods of construction. - *Associative*

5. The main structure, the Causeway, is also known as Mitchell's Bridge named after Major Thomas Mitchell, the Surveyor General of the day. He was well known for his topographical work and surveying of the then 'New South Wales' and surveyed the road through to Bathurst for its upgrade in 1827. The road was initially to pass down Mount York with a 1: 4 grade, but Mitchell insisted on having it redirected down Victoria Pass (1 : 15) after a land slide blocked the original route. - *Historical*

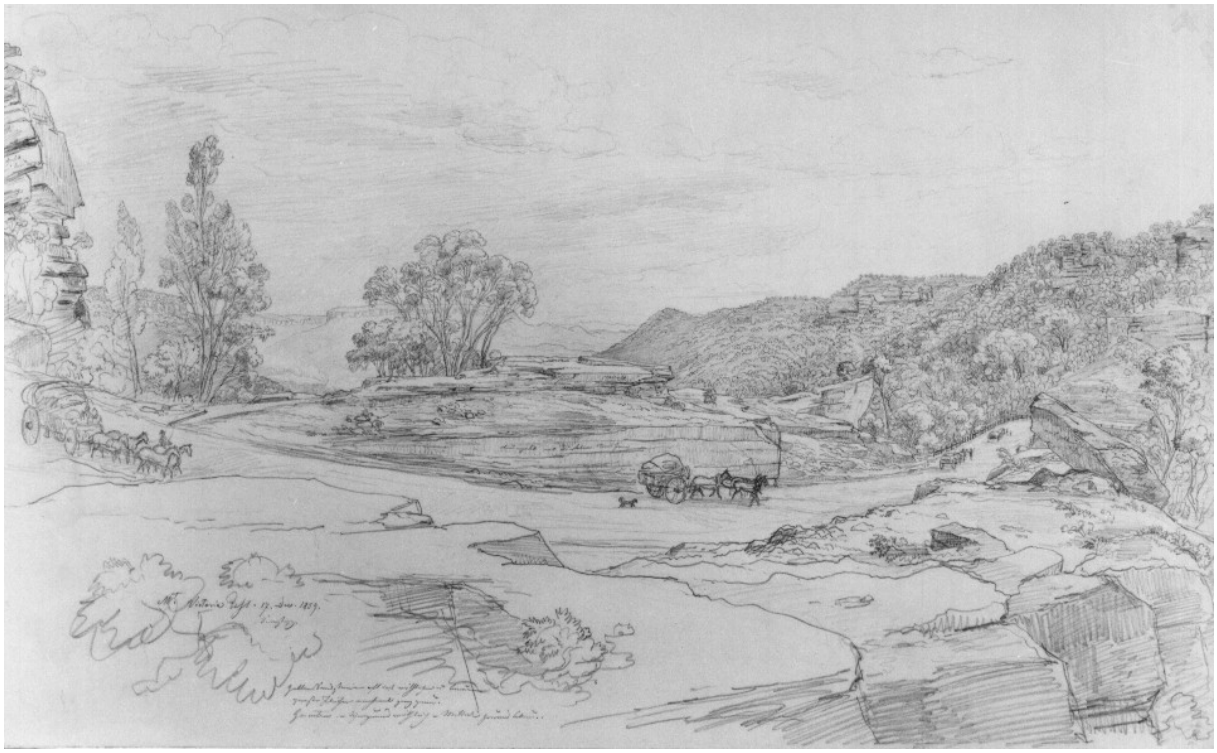
6. The Victoria Pass was a major item of infrastructure for the road link to Bathurst and the subsequent roads to the interior of NSW. Mitchell's roadwork was the first improvement since William Cox put through the initial road to Bathurst in 1815, which was completed through unknown country in 6 months using the services of 30 convict labourers. – *Social & Historical*

7. The road has always been of significant social importance to the Bathurst and Orange regions since its construction. The region has depended upon this road route as a major traffic route to Sydney and its ports for the export of rural produce. The road is of more significance today with the decline in railways and the growth of primary industries such as timber and coal in this western region. - *Social*

8. The Pass has engineering significance in that it represents engineering solutions to one of the most difficult sections on the Western Road – the descent from the Blue Mountains ridge. Victoria Pass demonstrates the development of road construction for the period within the severe topographical constraints of the site. *Scientific & Historic*

9. The Victoria Pass stone causeway has been recognised by other government and heritage organisations for its heritage significance. *Supportive*

10. Victoria Pass carries similar significance in roadway terms as does the Lithgow Zig Zag, located along the same escarpment, does for railways. (It was designated a National Engineering Landmark in 1992). - *Social & associative*



Victoria Pass Looking Down to Mitchell's Bridge
1859

3. Other Recognised Heritage Significance

Statements documented in other heritage investigation study reports are : -

- 1932 - Centenary celebrations held for the Victoria Pass
- 1982 – Celebration for the Sesquicentenary of the opening of the 'Pass of Victoria'.
- The Victoria Pass stone causeway has been recognised as an item of environmental heritage significance in the heritage schedule attached to the Greater Lithgow Local Environmental Plan 1993. As a recognised item of environmental significance, the causeway and the other relics and features associated with it are protected by the Heritage Act of NSW.
- Victoria Pass has been classified by the National Trust of Australia (NSW). The Pass is also included on the Trust's Hartley Valley Landscape Conservation Area.
- Heritage reports prepared for the RTA strongly recommend the preservation of items of Victoria Pass, most importantly the Causeway (Mitchell's Bridge), to the point of constructing a complete road bypass.

Statements of Significance from other Reports and Papers

<u>"Mt Victoria Environmental Impact Statement" RTA</u>

Cultural Significance
Victoria Pass is of fundamental importance in interpreting and documenting the development of the Blue Mountains both in the early colonial period and the later nineteenth century growth in tourism. Furthermore, it documents a process of convict management that was current throughout the colony and made the expansion of that colony possible. Victoria Pass is also seen as a prominent landmark, recorded by numerous photographers and artists.

The rock batter, although not of outstanding cultural significance in its own right, is an intrinsic part of a cultural landscape that is of both regional and state significance. This landscape, which encompasses both modifications to the natural forms (the rock batter) as well as introduced elements including the viaduct and cultural relics such as graffiti, documents and interprets major events and processes of historic significance to the colony of New South Wales. These processes include the settlement to the west, particularly in the economically buoyant period of the 1830's, and the system of management applied to convict labour that made these vast public works possible.

The causeway records a significant technical event in road construction and the results of that work became a landmark for both nineteenth and twentieth century visitors, artists and photographers. The magnitude of this work, its environment and cultural features, such as graffiti, provide testimony to the various privations, working lives and leisure times of the various people and groups who have used or created this landscape. The site has ongoing meaning to contemporary society for its historical and aesthetic values and its educational and interpretive opportunities. It remains a landmark symbolizing the 'gateway" between the mountains and the west.

STATEMENT OF SIGNIFICANCE

1. SIGNIFICANCE OF THE SITE AS A WHOLE

The causeway, its associated works and Berghofer's Pass in their dramatic natural setting of precipitous slopes and rocky outcrops are significant because:

- Historically the site is part of a larger and complex network of early mountain roads dating from the first European crossing in 1813 to the construction of Berghofer's Pass in 1912. Together, these roads physically represent the phases of colonial expansion, for they were conduits for the movement outwards from the Cumberland Plain. They record the constant attempts to ease the journey over the barrier of the Blue Mountains, and recall conditions of nineteenth century transport.

- The site has scientific value in that it represents engineering solutions to one of the most difficult sections on the Western Road - the descent from the ridge. Victoria Pass and Berghoferf's Pass demonstrate the development of road construction and its response to different types of vehicles and volumes of traffic within the severe topographical constraints of the site. The juxtaposition of the nineteenth and early twentieth century roads offer an opportunity to examine and compare alignments, grades, and structures from the two periods.

- The site has considerable aesthetic value, both historically and at present. The conjunction of spectacular views of valleys and ridges with the great curve of the stone walls inspired many nineteenth century writers, painters. sketchers and photographers who considered the site both sublime in the romantic sense, and a subject for reflection on the interaction of 'man' and nature.

- The site has modem cultural significance, both in terms of the well-known history of mountain exploration and road development and as a focus for the popular heroic/romantic interpretation invested in these early mountain roads.

2. *SIGNIFICANCE OF THE CAUSEWAY AND ASSOCIATED WALLS TO THE EAST.*

- The causeway has historic significance as a component in the series of five roads built between 1814 and 1912 all with the goal of achieving a manageable descent from the Blue Mountains ridge to the valleys below. It was a vital link in the highway joining the inland to the coast, and has borne traffic continuously for nearly 160 years.

- The causeway is closely associated with Major Sir Thomas Mitchell, the colony's Surveyor General between 1827 and 1856. The history of the pass's construction demonstrates Mitchell's ambition and determination to put his obsession with direct roads into practice. Victoria Pass is one of the few of his projects not to have fallen into disuse.

- The causeway has considerable historic/cultural significance as a powerful symbol of the colony's perceived place and role in the course of Empire. Impressive engineering feats such as this were most important, for they were taken as evidence of a progressive and civilised state.

- The causeway has scientific value in that it demonstrates the standards and practice of engineering in the colony during the 'Great Roads' period of the 1830s. It is a physical record of the skills of contemporary engineers at Mt Victoria, such as Assistance Surveyors Elliot, Lambie and John Nicholson.

- The causeway, along with the other early Blue Mountains roads and 'Great Roads' elsewhere, graphically demonstrates the work of convict road gangs assigned the difficult, dangerous and isolated road work.

- The causeway is significant for its rarity. There are very few examples of 1830s road engineering of this magnitude in Australia.

A Historical & Archaelogical Study of Victoria Pass - Grace Karskens 1988

STATEMENT OF SIGNIFICANCE

The statement of significance, defining the reasons for the cultural importance of Victoria Pass based on the foregoing analysis, is divided into four inter—related parts dealing with 1. the site as a whole; 2. Victoria Pass Causeway; 3. Berghofer's Pass and, 4. the inscriptions.

1. Significance of the Site as a Whole.

The significance of the site generally, including Victoria Pass causeway, Berghofer's Pass and the inscriptions in the setting of steep slopes and immense rocky outcrops, lies in the physical illustration it provides of several important historical themes. First, the site was an important link in the road, which allowed European expansion to the westward over the barrier of the Blue Mountains. Second, it mirrors the development of road transport in accordance with various requirements such as volume of traffic and nature of vehicles, set within the severe topographic constraints of the area. Third, it neatly encapsulates the similarities and differences between road engineering of the 1830s and 1910s, since a direct comparison of alignment, grades and structures of the two roads is possible.

2. Significance of Victoria Pass Causeway

Victoria Pass Causeway is important because:

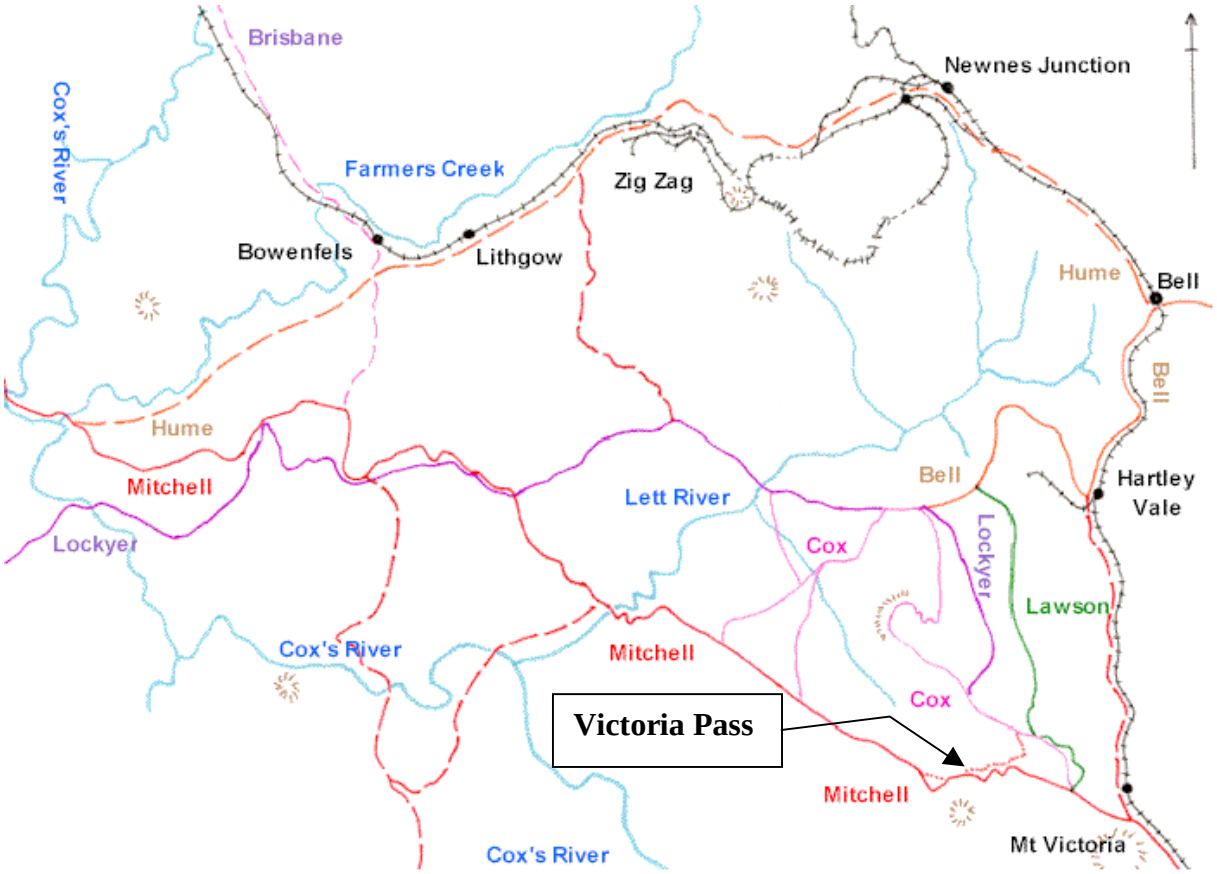
1. It is a component in the series of five roads made between 1814 and 1912 in order to achieve the descent from the mountains, arid is still the most impressively engineered of all. As such it was also a vital link in the early Western Highway and has borne traffic between the coast and the inland region for over 150 years.

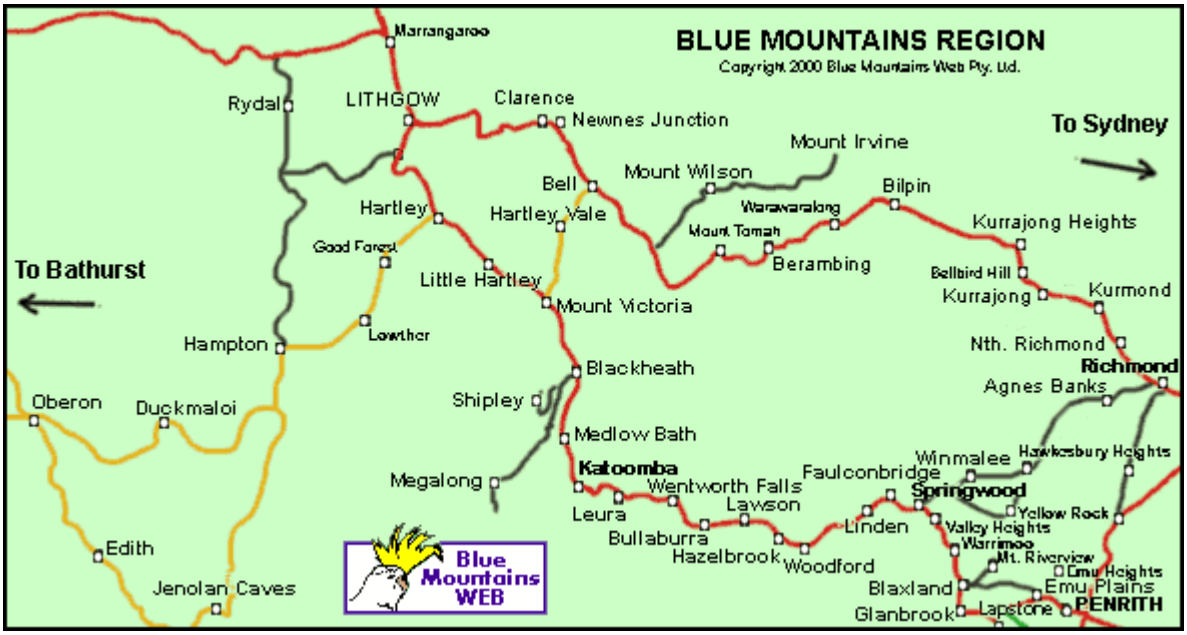
2. It has powerful symbolic significance. It was built specifically to convey and reinforce the impression that New South Wales during the 1830s had a glorious future as part of the Empire. Engineering feats such as this, defying and defeating natural obstacles as they did, were clear evidence of a progressive and civilized state.

3. It is important evidence of the advanced state of engineering in the colony during the Great Roads period, and of the skills and knowledge brought by men such as Assistant Surveyor Elliot.

4. It is a museum of convict work and achievements, arid still graphically illustrates the difficult, dangerous and laborious nature of their work on early roads.

4. Location Map





Commemorative Plaque Nomination Form

Date : 1st February 2002

To:

Commemorative Plaque Sub-Committee
The Institution of Engineers, Australia
Engineering House
11 National Circuit
BARTON ACT 2600

From : Heritage Committee
Sydney Division IEA
(Nominating Body)

The following work is nominated for a:-

- **National Engineering Landmark**

Name of work : **VICTORIA PASS ROADWAY**

Location : Great Western Highway
Mount Victoria
Blue Mountains NSW

Owner : Roads & Traffic Authority NSW

Owners Response to Nomination : Agreeable – See attached letter

Access to site : Partly visible from current Mitchell's Ridge Lookout.
Access by vehicle - but **NO** stopping on roadway.
Difficult Access by foot to 'Mitchell's Bridge' causeway.

Future care and maintenance of the work : Status to be monitored regularly by RTA

Name of sponsor :

Chairperson of Nominating Committee : Mr Ian Arthur

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Additional Supporting Information

Name of work :	**VICTORIA PASS ROADWAY**
Year of construction :	1830 – 1838(?)
Period of operation :	1832 to 2001 and the foreseeable future
Physical condition :	Reasonable - some minor maintenance required

Engineering Heritage Significance :-

Technological / scientific value :

- Represents engineering solutions to one of the most difficult sections of roadway built for that period.
- Victoria Pass demonstrates the development of road construction for the period within the severe topographical constraints of the site.
- The road is an outstanding engineering achievement considering it was built by hand during convict times, yet can manage the traffic of the current times especially with the growing number of extra heavy vehicles

Historical value :

- The site is part of a larger and complex network of early mountain roads dating from the first European crossing in 1813.
- It is a physical record of the skills of contemporary engineers such as Assistance Surveyors Elliot, Lambie and John Nicholson.
- Mitchell's causeway graphically demonstrates the work of convict road gangs assigned the difficult, dangerous and isolated road work.

Social value :

- The region has depended upon this road route as a major traffic route to Sydney and its ports for the export of rural produce. The road is of more significance today with the decline in railways and the growth of primary industry in the western region.
- The causeway was a symbol of the colony's perceived place and role in the course of Empire. Impressive engineering feats such as this were most important, for they were taken as evidence of a progressive and civilised state.

Landscape value :

- The site has ongoing meaning to contemporary society for its historical and aesthetic values and its educational and interpretive opportunities. It remains a landmark symbolizing the 'gateway" between the mountains and the west.
- The conjunction of spectacular views of valleys and ridges with the great curve of the stone walls inspired many writers, painters and photographers who considered the site both sublime in the romantic sense, and a subject for reflection on the interaction of 'man' and nature.

Rarity :

- There are very few examples of 1830s road engineering of this magnitude in Australia.
- The convict built roadway structure is amongst the oldest surviving colonial roadways in NSW.
- Victoria Pass is one of the few of Mitchell's road projects not to have fallen into disuse.

Representativeness :

- See 'Rarity'
- Similar to the Great North road to Newcastle

Contribution to the nation or region :

- Still the gateway to the Central NSW region for the movement of goods and produce to and from Sydney.
- Would have been a critical roadway during the Bathurst area gold rush period of 1850s.

Contribution to engineering :

- An excellent example of convict period engineering.
- The superior construction of a hand built stone causeway made it possible for traffic loads of today to be carried over a road constructed when such loads were not even imaginable.

Persons associated with the work :

- Sir Thomas Mitchell – Surveyor General NSW (1828 – 1855). He was also a noted explorer of the Riverina region in 1836.
- Assistance Surveyors Elliot, Lambie and John Nicholson.

Integrity :

- Mostly intact.
- The significant structure of Mitchell's causeway is whole and functional.

Authenticity :

- The road has been widened and filled over in parts over the years to allow for the increase in traffic but a major portion of the original road is still functional. The original stone embankments are intact and functional.
- Mitchell's causeway has had only cosmetic alterations, such as fencing, since when it was constructed in 1832.

Comparable works (a) in Australia

Great North Road to Newcastle

(b) overseas

unknown

Statement of significance : Refer to Document's Contents

Citation : Refer to Document's Contents

Attachments to submission : N/A

Proposed location of plaque (if not at site) :

- Mitchell's Ridge Monument & Lookout Area

a. Letter of Agreement from RTA

b. Plaque Wording

VICTORIA PASS

Surveyor-General Major Thomas Mitchell instigated this line of road to bypass the steeper descent at Mount York. This superb example of early colonial roadwork was constructed between 1830 and 1838 by successively, Assistant Surveyor P. Elliot, John Lambie and John Nicholson using convict labour. This work was a significant technical achievement in the early years of road technology development. The Pass with its stone-walled causeway has been the principal route since 1832 and opened up the Western Districts of New South Wales.

- 83 words

Dedicated by
Institution of Engineers Australia and the Roads and Traffic Authority NSW 2002.

It is proposed that the plaque be mounted on the existing monument as below beside the existing plaque but on another face of the monument.

Existing Monument at the top of Victoria Pass

7. Historical Review

Soon after the crossing of the Blue Mountains by Blaxland, Wentworth and Lawson, surveyor George Evans was dispatched by Governor Macquarie to investigate and survey the line of the crossing. Evans, on completing the survey, later returned with news of good, open land around Bathurst, the new land beyond the Blue Mountains.

Macquarie then commissioned William Cox in 1814 to take a band of selected convicts and build a rough narrow road along Evans traverse. This road linked, symbolically more than practically, the centre of Sydney with the new country, since it (the track) took only 6 months to construct.

Free settlers finally began to travel to Bathurst around 1818 and found the road built by Cox a difficult and dangerous passage. The pass down Mt York, with its 1:4 grades, especially presented awesome difficulties to travellers with heavy vehicles. The heavy drays were braked by dragging large logs behind them as they headed down hill.

William Lawson, then Commandant at Bathurst reported that he had found an alternative route to Cox's Pass. This alternative descent was built round 1824 and became known as Lawson's Long Alley.

In 1827 the explorer Hamilton Hume made a Journey over Bell's Line of Road and located a new line from Hartley Vale to Bathurst. The new Deputy Surveyor, Major Thomas Mitchell was subsequently sent to examine Hume's discovery and reported it to be "the most eligible that can be found" in terms of avoiding Mt York and Blaxland. However, he also pointed out that it was not accessible to the settlers at Fish River and O'Connell Plains, and that it avoided the grassy flats of Hartley Vale. He proposed a more direct route to Bathurst, descending from Mt York by an "inferior ridge or colline which falls gradually, advancing into the valley near Collit's Inn.'

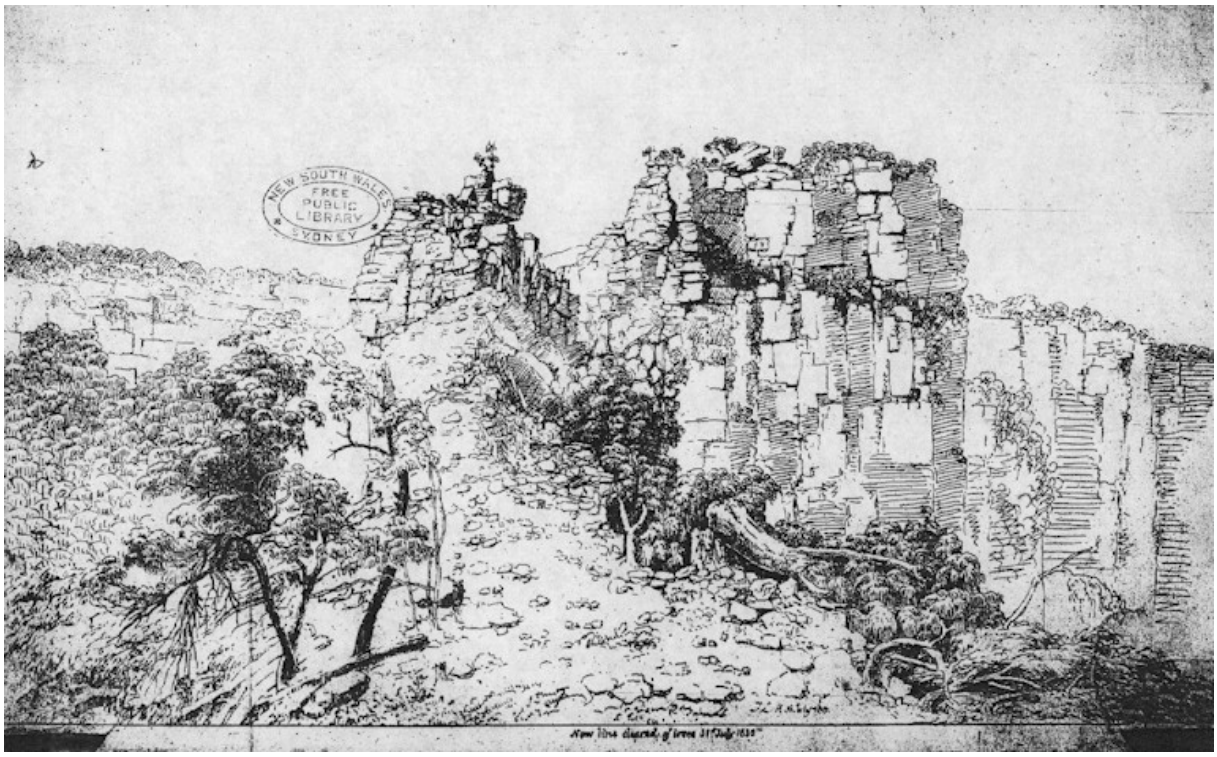
In January 1829 the Surveyor of the Roads and Bridges, Edmund Lockyer reported that this line, as proposed and recommended by Major Mitchell when completed would "make the descent comparatively nothing".

Major Thomas Livingston Mitchell
Surveyor-General 1828 - 1855

Work began on this new descent in 1829 under Lockyer's direction, the third in only fourteen years .This descent became known as Lockyer's Road. This road involved large scale works including extensive cuttings embankments and type 2b/3a retaining walls up to 2 metres high (refer Section 9).

Sometime in 1829, it occurred to Mitchell that a pass might be made over "a great abyss" at Mt Victoria. This would cut off the roundabout location of Lockyer's Road and the descent of Mt York. In1830, Mitchell suddenly removed the gangs from Lockyer's line to this new site. Mitchell reported that the new route down Mt Victoria simply required the "lowering of a narrow crest of rocks". He declined to mention the massive works required to fill and span the chasm in its path. A map was subsequently produced showing Lockyer's line from Mt York to Bathurst as a "road cleared by mistake". A great struggle between Mitchell and Governor Darling ensued over this action, as the line had been relocated without approval.

Mitchell's choice eventually prevailed, and by 24 September 1830 convict gangs were carrying out construction at Mt Victoria.



"Victoria Pass" - New Line Cleared of Trees
31st July 1830
by T.L. Mitchell – Report on Roads 1856

CONSTRUCTION OF THE PASS

Assistant Surveyor P. Elliot was assigned to the Western Road in 1830. Elliot had come from England with recommendations from Thomas Telford, who he had worked with. After official permission was finally given for work to commence, he reported that progress was rapid. At this stage he had about 124 men working on the pass. No detailed records exist of the construction although Karskens (1988) suggests that the techniques employed were similar to those used on the Great North Road that was being built at the same time. Clearing, blasting and excavating were carried out by convicts, using simple tools such as crosscut saws, hoes, spades and hatchets, hand-held drills, hammers and gunpowder. Stone brought down by blasting was broken down for road fill.

In January 1831, Elliot was replaced by Assistant Surveyor John Lambie whom it is reported had increased the pace of the work. He had 276 convicts working for him, 216 of them in irons, and guarded by about 67 soldiers from the 4th and 17th regiments.

John Lambie was in turn replaced by John Nicholson in July 1832, who in July that year estimated that the completion of the road between Mount Victoria and Bathurst would occupy another ten months, and reported that the pass would be "practicable for traffic" by the first week of August that year.

In November 1832, Nicholson sent a sketch of the causeway to Mitchell, evidently upon the latter's request:

> *I forward you with this a sketch of the pass of Victoria in its present state which I hope will be sufficient for you to form some idea from: I supposed you wanted it soon and having been confined two or three days by illness I found myself short of time as well as ability to do better.*

The sketch itself shows the wall still under construction with timber cribwork and sheet piling supporting the road fill and the ashlar masonry walls only begun at either end. Niclolson described the proposed work:

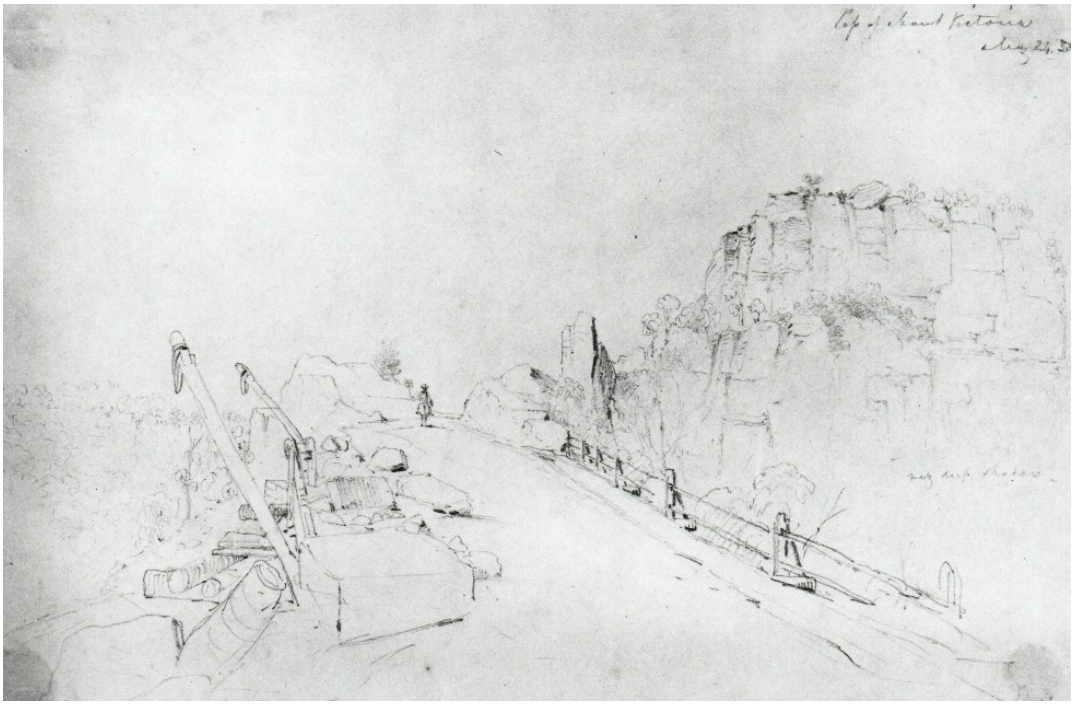
> *I presumed you will show (in your sketch) the part (secured by woodwork until the wall* is *rebuilt) but continue the wall, if so the wall should be sketched in with buttresses projecting* six *feet and about eleven feet wide ….. which is the way I propose to rebuilt it.*

Nicholson's sketch was possibly used by Mitchell to base his own well-known description of Victoria Pass. It is also clear that the pass was far from complete in November 1832, and this is reinforced by Conrad Marten's 1838 sketch of the site with primitive cranage and timber cribwork in situ. Both Nicholson's and Marten's sketches show the original post and rail fence. Nicholson's sketch is the only one known depicting the use of timber formwork as the initial wall support; on other parts of the Western Road and on other Great Roads, the fill was kept level with the walls as they rose. This depicted method may be an intermediary measure as documents have recently indicated that a part of the structure collapsed at some stage.

Mitchell was also anxious to hear from Nicholson the reaction of Governor Bourke to the new road. Nicholson described for him the procession of the Governor and his entourage over the pass on October 23rd, 1832, a ritual that officially opened it for public use, but did not denote its completion.

Over the next six years work continued on the fine ashlar masonry walls rising to form a ramp. The north wall was reinforced by the buttresses Nicholson described, whose course

beds were tilted to add to the batter and stability. Mitchell's sketches of the site showed a plain low parapet which is reiterated in Surveyor Govett's c1839 sketch 'Accident on the Road at Victoria Pass.' The present, more decorative, parapet is evidently a later addition.

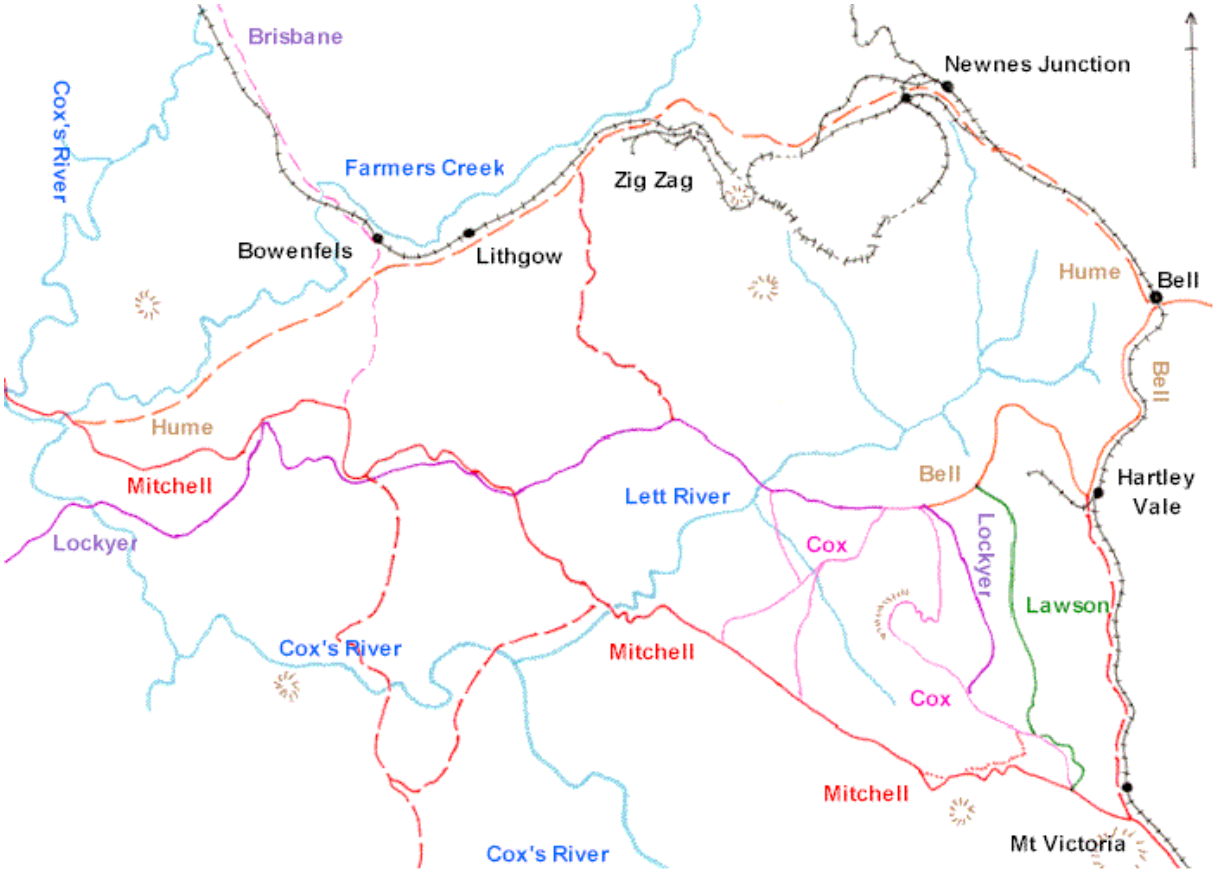


"Pass of Mt Victoria"
Final Stages of Construction of Mitchell's Bridge
by Conrad Martens - 1838

SUBSEQUENT HISTORY, AND RELATION TO EARLIER DESCENTS

Evidence exists in the Mt Victoria / Victoria Pass area of the evolution of the mountain crossings from the original Cox's Road (track) to the present day Great Western Highway descent.

The original Cox's Road continued northwest toward Mt. York and the termination of the ridge with views to Hartley Vale. The subsequent road descents of Lawson's Long Alley and Lockyer's Road run down the ridge before Cox's original descent. The 1830 line of Thomas Mitchell ran west over a gorge towards Hartley. In later years the railway swung to the north through the village of Mt Victoria towards Bell.



Road deviations in the Mt Victoria & Lithgow Areas

In the 1840's maintenance was carried out by convicts under the direction of Captain J E Bull, who was stationed at a stockade at Blackheath.

In its subsequent history, reported by Karskens (1988a) the pass was lavishly praised by travellers in their accounts. Charles Darwin described it in 1886 as "worthy of any line of road in England". Artists and photographers continued to be inspired by the magnitude of the work and its spectacular setting, and numerous sketches, paintings and later, photographs of it appeared.

After the extension of the railway over the Blue Mountains in the 1860's the mountain roads were used less and less and many parts fell into decay.

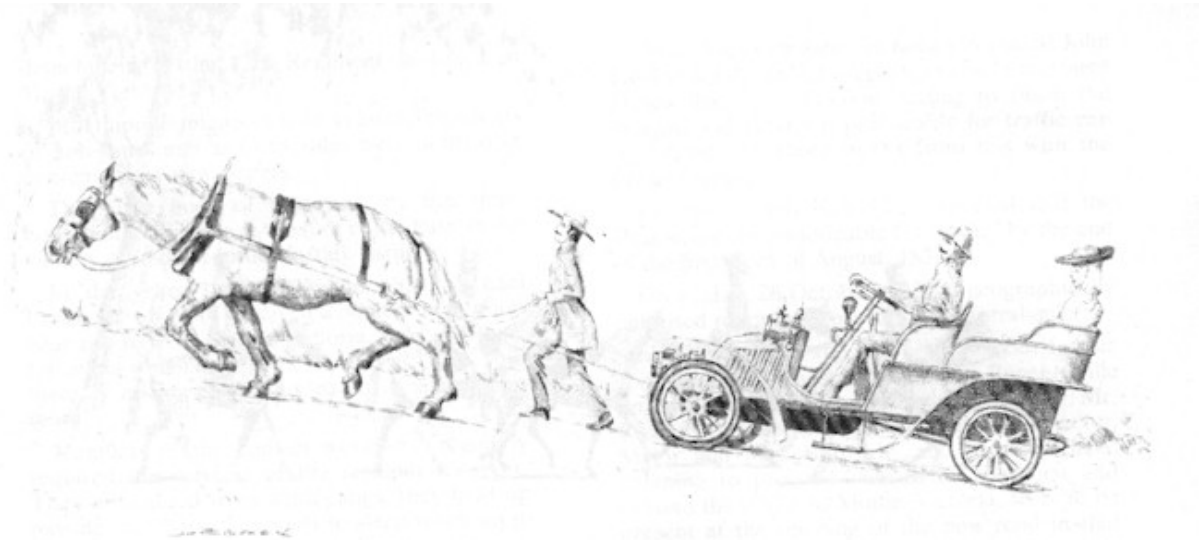
The introduction and spread of the motor car in Australia after 1905 brought roads back into importance, while at the same time, the Blue Mountains had become a favoured holiday location for people from the city. During the early stages of their use, the motor cars of the period were not powerful enough to scale the incline at Victoria Pass. A local Councilor J W Berghofer, the first president of Blaxland Shire, lobbied for the construction of an easier alternative.

An extensive deviation was subsequently constructed below the old causeway on the slopes facing north. This deviation, which became known as Berghofer's Pass, was constructed between 1907 and 1912. The pass featured rubble retaining walls, stone and pipe culverts and substantial cuttings. Berghofer's Pass curved sharply along the mountain's edge crossing the old road to Mt York near the junction with Lawson's Long Alley.

By 1920. motor cars had become powerful enough to negotiate the old causeway. For a time, both roads were used, however in 1933-34 the then Department of Main Roads improved Victoria Pass by widening it and reconstructing the gravel pavement. The deep loop at the base of the pass (still in use) was also constructed to replace the somewhat irregular alignment of Berghofer's Pass. Victoria Pass was later surfaced with bitumen.

Anecdotal evidence has revealed that Berghofer's Pass was still in use after Wold War II, when a charcoal burning truck used this route to transport bales of hay. This again emphasized the steep grade of the present alignment.

In 1979 Berghofer's Pass was included in a network of signposted walking tracks along historic early mountain crossings by the NSW Department of Lands.



A 1904 model Renault on an assisted passage up the Victoria Pass.

By courtesy of the family of J. Booker, artist.

8. Current Situation

Victoria Pass today is part of one of the major traffic routes of Australia, as well as an artery to the NSW rural regions of the west. The Great Western Highway, of which the Victoria Pass is part of, carries thousands of vehicles per day including heavy semi trailers. Most of the road appears to be of recent construction apart from Mitchell's causeway with its stone embankments and parapets which are partly hidden by the 'Armco' safety fencing. Hidden along side is the stone wall embankment, which still supports much of this modern road. Recent lower embankment stabilisation work has cut away much of the overhanging stone cliff on the lower portion of the pass reducing the formidable appearance of the ridge line which once dominated the mountain side. The dual lane bitumen carriageway which carries the endless stream of traffic only narrows at the causeway, slowing traffic behind the heavier vehicles in both directions. A new road upgrade through Hartley is proposed for the near future and will commence from the base of the pass.

Heritage studies have been carried out previously for the RTA, often as part of environmental impact statements when improvements to the road have been planned. One was to consider bypassing Mitchell's causeway, and the most recent for the embankment stabilisation works.

The heritage features are in reasonable repair, however minor work such as tree and vegetation removal is required to prevent damage to the stone walls (congruent with Karskens statement of 1988). Much of the view onto the stone causeway as one travels up the pass has been obscured over the past ten years by tree growth, some of it hard onto the base of the walls. Obscurity causing complacency would be the main concern for the heritage structure of the pass.

The maintenance recommendations of Grace Karskens report (June 1988) should be implemented.

Victoria Pass - November 2001

9. Engineering Method

Construction of the Pass – taken from Grace Karskens Study Report 1988

Construction of the Pass

"Although he was not an engineer himself, Mitchell had a sharp eye for engineering skills in others, and he was quick to apply them to his projects. Up to about 1820, men with such skills were few and far between, but by the end of the Napoleonic Wars, the growth of the colony had resulted in the arrival of a number of military men and civilians who were capable of the ambitious structures Mitchell had in mind. The works at Mt. Victoria may well have been inspired by the massive buttressed retaining walls built under the supervision of Lieutenant Percy Simpson on the Great North Road near Wiseman's Ferry from 1829. On both North and West roads Mitchell took credit for works designed and supervised by his subordinates, such as Assistant Surveyor Elliott (recommended by Thomas Telford) whose names thus sank into obscurity".

"From the floor of the steep sided valley, fine ashlar masonry walls rose to form a ramp over which the road was to pass. The north wall was reinforced by buttresses, whose course beds were tilted to add to the batter and stability. The structure originally had low simple parapet walls while the present more decorative parapet is evidently a later addition. The convicts cleared, blasted and excavated the line with simple tools such as cross-cut saws, hoes, spades and hatchets, hand held jumpers (drills), hammers and gunpowder. The rock brought down was broken down for road fill and stone blocks were formed with mauls, wedges and chisels. Earth and rock were moved by oxen drawing small carts. The causeway and embankments were filled at the same rate as the walls rose in stages to the necessary height."

The 1830s causeway and retaining walls are of Type 3b (ashlar) sandstone masonry work and extend for 107 metres on the north side and 67 metres on the south side of the road. Two heavy stone buttresses reinforce the north wall. The walls range in height from 2.5 to 10 metres.

North Wall of Mitchell's Bridge showing buttress

TYPOLOGY OF STONEWORK

This typology of stonework was devised by Grace Karskens for a study of the Great North Road in order to categorize in a simple and rapid fashion the wide range of stonework found there. The typology was based on the simple schemes outlined by nineteenth century writers who divided masonry into three categories : rubble, coursed and ashlar work. The disparate nature of colonial road work required that each of these categories be subdivided according to the standards of dressing, jointing and coursing as follows:

Type 1a: The most primitive standard of rubble work comprises field stones (sometimes broken), possibly sorted into roughly similar sizes, and simply stacked. These walls flank slight embankments and are usually no more than 30cm. in height.

Type 1b: This type comprises stones which are roughly faced or shaped with a stone axe or hammer and then stacked, with no attempt at coursing or jointing, though less haphazard than Type 1a.

Type 2a: The stones have been roughly squared with an axe or hammer and there are vague attempts at coursing and jointing.

Type 2b: Stones are better prepared allowing rough open jointing, and definite though inconsistent coursing. Sometimes the faces are tooled. This type can be employed in quite substantial walls.

Type 3a: These walls are rough approximations of ashlar work, the stones are evenly dressed, faced and matched, the coursing is consistent and of even height, though not always level; the joints are fairly tight. The walls are battered and usually laid in consistent random bonding.

Type 3b: The most sophisticated style answering the description of ashlar work. The stones are dressed to given dimensions, forming a perfectly smooth face with tight bedding and perpendicular joints, and even and consistently horizontal courses.

10. Other Drawings, Copies, Maps & Photos

1. Sketch of "New Line Cleared of Trees"

Sketch of the terrain that the pass would come down prior to work being commenced. This sketch was included in Mitchell's "Report on Roads in NSW" of 1856

2. Sketch of the completed "Victoria Pass"

Sketch of the completed road works. This is sketch is most likely dated after 1838 when the pass was finally completed but prior to 1856 where it was included in Mitchell's "Report on Roads in NSW" of 1856.

3. Extract from "Plan of Proposed Deviation in Main Western Road known as Berghofer's Pass" 1912

Lands Dept drawing showing the original road, the proposed Berghofer's deviation and land titles.

4. Sketch Map of the Road to Bathurst circa. 1830

showing Cox's, Lockyer's and Mitchell's line of road.

5. Sketch Map Showing the Different Line of Roads Descending the Blue Mountains

Drawn by Thomas Mitchell circa 1830

6. Copy of Letter to Governor Darling from Surveyor General Thomas Mitchell.

The letter indicates the difficulties with the original line of road down Lockyer's line and the request to finish the road down "Victoria Pass"

7. Photos of Victoria Pass and its Surrounds 2001

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