Creeks and Channels Heritage Precinct

CREEKS AND RIVER CHANNELS HERITAGE PRECINCT.jpg

Municipality

Level of significance

Included in Heritage Overlay

Heritage Overlay Numbers

HO172

Heritage Listing

Ballarat City

Statement of Significance

Last updated on -

(AHC criteria D.2, G.1). The substantially intact network of many lineal kilometres of timber, bluestone, brick, and concrete lined channels, along with the associated bluestone and brick culverts, associated bridges with wrought iron or steel lattice girder balustrades and bluestone abutments, wing walls, piers and parapets, and the associated early concrete or steel lattice girder footbridges demonstrate important visual qualities that are integrally associated with the urban cultural landscape of Ballarat city. Views along, across, and/or adjacent to almost every part of this network can be gained from innumerable vantage points throughout the city, and are particularly noticeable as one traverses the many bridges that cross the channels. The conspicuous bluestone parapet walls to the many culverts also form notable features along the edges of many city streets. The distinctive brick ventilation shaft at the intersection of Creswick Road and Doveton Street North is also aesthetically significant and is an important urban landmark. The extensive network of channels and associated structures is also a cultural landscape within itself and as such is unique in the State of Victoria.

The Creek and River Channels Precinct is **historically** and **scientifically** significant at a **STATE** level (AHC criterion A4, B2, D2 and F1). The transformation from the 1860s to the 1930s of many natural waterways into the present network of channels and associated structures by the two municipalities of Ballaarat East and West was a direct result of gold mining activities, which formed the basis for the establishment and development of Ballarat from the early 1850s, as well as the impetus to the development and growth of Victoria in conjunction with other goldfields. The present courses of the channels demonstrate the urgent need at a very early date to repair the damage done by gold mining activities to the natural drainage lines of the creeks, which led to the formation of lined sludge channels. The subsequent permanent lining of the channels demonstrates the need of a growing city to establish an infrastructure of durable engineering works for sanitary and stormwater drainage requirements and to mitigate flooding. The variety of structural materials used also provide a rare example, over an extensive area, of the historical development in the use of materials and technology for this type of engineering infrastructure, and of the excellence of traditional craftsmanship.

Overall, the Creek and River Channels Precinct is of **STATE** significance.

Hermes Number 156831

Property Number

Physical Description 1

The Creek and River Channels Precinct is characterised by an important and extensive network of timber, bluestone, brick, and concrete lined channels, along with associated bluestone and brick culverts, associated bridges with wrought iron or steel lattice girder balustrades and bluestone abutments, wing walls, piers and parapets, associated early concrete or steel lattice girder footbridges, and the notable brick ventilation shaft at the intersection of Creswick Road and Doveton Street North.

The built form of the channels and associated structures today is the result of extensive engineering works undertaken throughout the mid to late 1800s and into the 1900s, which resulted in the permanent lining of the Yarrowee and its main tributaries (the Canadian Creek, Gnarr Creek, Redan Creek, Specimen Vale Creek and the waterway along Warrenheip Gully) within the Ballarat city area.

The first gold discoveries in the area centred on the Yarrowee and its tributaries. Initially, the formation of timber lined channels was needed to repair the considerable damage done in the early years to the natural drainage lines of the waterways, and also facilitate a flow of water to the gold diggings (and remove the build-up of sludge), as well as to try and decrease the impact of floods to the buildings erected along these watercourses as parts of Ballarat became more than a tent city. The channels were also increasingly used to dispose of stormwater and, for many years, of unsanitary and polluting effluent. Although some channels were lined quite early with bluestone, it was generally not until the still widespread gold mining activities began to wane in the early 20th

century, and Ballarat began its process of transformation into a 'modern' city, that the sections of channels that were not yet lined, or only timber lined, were formed with permanent materials such as bluestone, brick and concrete. The channels were also further extended as the city's population grew, and people began to settle permanently in former mining areas.

The precinct boundaries of the Creek and River Channels Precinct comprise the reserve of the Canadian Creek Channel from the south side of the Lal Lal Street Bridge to its junction with the Yarrowee Channel; the reserve of the Gnarr Creek Channel (and its tributary, the Bullock Gully Creek Channel) from their respective positions on the south side of Landsborough Street to the junction of the Gnarr Creek Channel with the Yarrowee Channel; the reserve of the Redan Creek Channel from the south side of Essex Street to the end of the formed channel east of Skipton Street; the reserve of the Warrenheip Gully Channel from its commencement as a formed structure between Rodier and Joseph Streets to its junction with the Canadian Creek Channel; the reserve of the Specimen Vale Creek Channel from the west side of Stawell Street to its junction with the Canadian Creek Channel; and the Yarrowee Channel from its commencement as a partially lined waterway east of Nicholson Street to its conclusion as a fully formed channel some distance to the south of Hill Street. The structures of all these channels are considered to be significant to the precinct, as are the early and associated structures and branch channels identified in the Description section.

Historical Overview

The first licence to formally prospect for gold at Golden Point (as the spur and flats alongside the Yarrowee where gold was first discovered became known) was issued on 20 September 1850 and, according to early historian, W.B. Withers, who arrived in the area in November 1852:

By the time the first week was over there had gathered near 100 diggers at the Point, the riches unearthed there quickly attracting not only all the other prospectors, but setting the colony on fire with excitement from end to end. The quiet Ballarat sheep run, with its grassy slopes and shadowy glades, and its green valley where the Yarrowee poured its limpid waters, became suddenly transformed by the wand of an enchanter. . . . The axe of the digger quickly made inroads upon the forest all round; the green banks of the Yarrowee were lined with tubs and cradles, its clear waters were changed to liquid, yellow as the yellowest Tiber flood, and its banks grew to be long shoals of tailings.15

The Yarrowee River and the other creeks that ran into it were of vital importance to the early settlement of Ballarat. Not only did they provide drinking and cooking water for the thousands who rushed the new goldfield, but they were also essential to the process of gold mining. By day the banks were crowded with men operating cradles, pans, dishes and barrels to wash the dirt brought from their claims in their search for gold. In a matter of months, the pristine water was cloudy and muddied and the banks eroded. Contemporary drawings of Golden Point show intense human activity with lines of men working shoulder to shoulder, washing their dirt for gold, along the course of the creek.**16**

In just a matter of months from the initial discovery of gold in 1851, the natural course of the Yarrowee was altered for the first time to facilitate the search for gold. According to historian Weston Bate:

*The demand for water was so great, that a channel was cut to bring the Yarrowee to deep pools on the flat. When mapped at the end of the year they measured several hundred yards across, and although a map could not convey the drama of what had happened to that once-beautiful terrain, a journalist could. In the Melbourne Daily News of 25 October [1851] Gibbons described Golden Point as a citadel thrown to the ground.***17**

In early December 1851, the Government Surveyor, W.S. Urquart, was instructed to lay out a township in the vicinity of these goldfields. Before deciding on its location, he first surveyed the general features of the land for a few miles around Golden Point, and proceeded to set out the nucleus of a township with a strictly gridded layout on the grassy plateau that rose above the diggings. In laying out the usual reserve around the town he avoided the land that had been vastly altered by the gold diggers to the east of the main river, which he named Yarrowee, although he did incorporate more than a mile of river frontage as the town's eastern boundary.**18**

The Ballarat Township was proclaimed in mid-1852 and it was in December 1852, according to Withers, that the first attempt was made at water supply. He noted that the Government Camp authorities at the time employed men to build a small dam across the Gnarr Creek at the spot where the creek ran on the northern side of Mair Street, close under what became the railway terminus hill. The little dam intercepted the overflow from Yuille's Swamp (Lake Wendouree) and the water that the Gnarr Creek brought from Soldiers' Hill and the ranges beyond,

and 'served mainly for the Camp use.'**19** Elsewhere, however, it seems that the diggers constantly polluted, as well as drank and bathed in, the waters of the Yarrowee and its tributaries.**20**

The municipality of West Ballarat, on the west side of the Yarrowee and incorporating the government-surveyed township, was proclaimed in 1855. It was first known as the Borough of Ballaarat, and became a City some years later. The municipality of East Ballarat, on the east side of the Yarrowee with its ad-hoc street layout, was proclaimed in 1857 and became known as the Town of Ballaarat East.

According to another historian, A.W. Strange:

The construction of main channels for the Yarrowee Creek and its tributaries was the greatest need in Ballarat in the early days of local government. The original course of the natural drainage system had long been obliterated by millions of tons of mining debris, and heavy rains . . . caused much flooding with the resultant costly damage. The level of Main road afterwards was often feet higher. . . . Below the Grant Street Bridge the creek spread over acres of ground which became an odorous cesspool in summer and a constant menace to public health. Similar conditions prevailed in many parts of Ballarat East.**21**

Until their amalgamation in 1921, the two councils were variously responsible for the engineering works required in the channelling of the creeks and rivers that ran through Ballaarat.

Before 1921, the City of Ballaarat was responsible for works on the Gnarr Creek, the Redan Creek, the Wendouree Creek and, jointly with the Town of Ballaarat East, the Yarrowee. The Town of Ballarat East was responsible for works on the Caledonian (now Canadian) Channel (sometimes as part of joint works with the City of Ballaarat), the No.4 (Specimen Vale Creek) Channel and the No.3 (Warrenheip Gully) Channel. The relevant Municipality also constructed various tributaries that ran into the various channels (such as the Wendouree Creek Channel, which is part of the Central Ballarat Precinct rather than this Precinct).

It appears that the first major engineering works involving the Yarrowee River and the Caledonian Channel (as the present Canadian Channel was then called) occurred in 1861 when the two Municipalities formed them as 'sludge channels'.**22** The construction works, shown in a series of historic engineering drawings held by the present City of Ballarat, involved the sinking of timber piles along the sides and bases of the channels, the laying of joists along the bases, and the sheeting of both the sides and bases with timber planks. The section between the railway culvert and the junction of the Yarrowee with the Caledonian was formed to a width of 25' at the base and a depth of some 6'. From the junction to the White Flat (or Grant Street) bridge, the Yarrowee channel was widened to 30' at the base, and made a little deeper to allow for the required fall. Beyond the bridge the Yarrowee was not to be lined but excavated only, for a length of 4 chains, to form a 30' wide channel. The course of the Yarrowee by that time had already been altered from its original line around the area of Sturt and Grenville Streets **23** and a straight reserve had also been laid out to run southwards from Market Street South (the present Curtis Street), to Bridge Street and onwards to Little Bridge. To this day, the line of this reserve and of length of the channel running from the reserve down to Grant Street is essentially the same.

The line of the Caledonian Channel, as formed in 1861, is also essentially the same as at present, running from the junction with the Yarrowee as far as Main Road. From Main Road to Barkly Street, the Caledonian Channel had a width at the base of 20', which increased to 25' from Barkly Street to the Yarrowee junction, and a depth of almost 6'. The engineering drawings also showed that sheeting the sides and bottoms of a number of inlets into the Caledonian Channel was also required. These inlets would appear to be in essentially the same location as those of the present day Specimen Vale and Warrenheip Gully channels.

Further channels that were to be constructed, according to the engineering drawings, included the No.6 channel that ran into the Yarrowee Channel from the intersection of Peel and Bridge Street and a secondary channel (No.7) that ran into No.6 from mid-way down Bridge Street. The original lines of these channels have also been retained to the present day.

All of these channels can be seen in a map compiled in October 1861 by Government Surveyor J. Brache, **24** and appear to have been used in part to drain large sludge reserves that had been formed on the eastern side of Main Road. Water, brought in by race lines from the forest, eventually swept the soil, as slime, into these two sludge dams from which drains had been dug to remove it to the newly channelled Yarrowee.**25**

In 1862 the Borough of Ballaarat began the work of forming the Gnarr Creek into a channel - a short length of the Gnarr Creek, where it met the Yarrowee, had its sides and base lined with planking and the course of the Gnarr

Creek was realigned in this area to its present position. (Originally it crossed Mair Street, below Lydiard Street, and met the Yarrowee some distance to the south in Grenville Street). Through the 1860s, culverts with bluestone arches, walls and bases were constructed along the course of the Gnarr Creek over Lydiard Street and Creswick Road. Timber bridges were erected over Armstrong Street and Doveton Street. In 1869 work began on forming a culvert through which the Gnarr Creek would run from the Creswick Road culvert to the Lydiard Street culvert, this included forming culverts under Armstrong and Doveton Streets. This underground channelling of the Gnarr Creek was also constructed fully of bluestone and was completed in 1870. The works straightened the line of the original creek, which was subsequently filled in, and were considered to have been the means 'by which a great nuisance and eyesore has been abated'.**26**

In the late 1860s, further engineering works were carried out along the Yarrowee and these included the piling and planking of some 466 lineal feet of the western bank opposite the Eastern Oval, and a further extension of the lining of the channel southwards beyond Grant Street by some 50'. A larger bridge was also constructed over the Yarrowee in line with Grant Street. Much further south, the first works in conjunction with the Redan Creek commenced with the construction in 1869 by the Borough of Ballaarat of a bluestone lined culvert in place of a timber bridge where Skipton Street crossed the creek.

Over the early years of Ballarat's establishment, devastating flash floods proved to be a regular occurrence along the lower reaches of the Yarrowee River and were particularly troublesome for storekeepers along the low-lying portions of Main Street and Bridge Street in Ballarat East. Flood waters rose to unusually high levels inOctober 1869, causing collateral damage to businesses in East Ballarat. **27** In the early 1870s joint Council work on the main channels in Ballarat continued, with most of the extensive works involved the deepening and widening of sections of the Yarrowee and Caledonian Channels, which included the laying of further timber planking and the placement of additional piles. The section of the Yarrowee that was widened extended from the south side of Grant Street Bridge northwards. The west side of the channel was widened 10' from the Grant Street Bridge to the Dana Street Bridge, while the east side was widened 10' from the Grant Street Bridge to the commencement of a new curve into the Caledonian Channel. These new widths generally correspond to the present day widths of these sections of the channels. The Caledonian Channel was initially widened from its junction with the Yarrowee by 5' on its north side with the 5' running out in the curve a short distance beyond the east side of the Humffray Street Bridge. A year or so later it appears that the channel was widened for a further distance eastward from beyond the same bridge.

The early 1870s also saw the forming of an earth channel, 6' wide at the base, for the Specimen Vale Creek between Chamberlain and Queen Streets, and a ford was created further downstream when Otway Street was formed from Victoria to Eureka Streets. It also appears that by the early 1870s, part of the present line of the No.3 (Warrenheip Gully) Channel - from its junction with the Caledonian Channel to the Main Road Bridge and straight on until it abruptly changes direction - had already been formed as an earth channel.

In the 1870s further work was also undertaken on the newly completed Gnarr Street culvert. From 1873 to 1878 the arch and walls of the culvert rebuilt section by section to enlarge it by some 4', bringing it up to its present height. In late 1878 it was reported that the 'long desired completion of the Gnarr Creek culvert [had been] effected by the expenditure of a Government Grant for that purpose'.**28**

By 1880, the need to further channel and line the Gnarr Creek had become of major concern to the City of Ballaarat. The Mayor reported in August 1880 that he hoped:

. . . *the Council will not allow the subject of the Gnarr Creek to rest until the Government is induced to take up the matter commensurate with its importance. Construction of sludge channels have always been recognised as State works and the necessities of the Gnarr Creek are analogous. It receives the watershed of an extensive area outside the municipal boundaries and the floods of successive years have worn a deep and tortuous course: if neglected any longer the [city's] health and safety will be endangered. With the exception of the culvert traversing the heart of the city, nothing has been done to this line of main drainage: in its present state it is a blot on the city which should be effaced without delay*.**29**

In 1881, work began on enclosing the still open Gnarr Creek between Lydiard Street and the Yarrowee by extending the bluestone culvert from the east end of the existing culvert (the east side of Lydiard Street) to the junction at the Yarrowee Channel. In August 1883, the Mayor reported that before the close of the Municipal year the Gnarr Creek Culvert would be completed between the eastern boundary and 'Laing's Mill' on the Creswick Road, a ventilating shaft, towards which the Government had promised grant money, being the only item yet to

be constructed.

The Mayor further noted that:

The finishing of the Culvert, and the rapid filling up of the unsightly hollow over its course, will soon enable completion of the direct communication between Webster Street and the Railway Station, and then the greatest improvement of which our City is capable will have been achieved.**30**

The present distinctive brick ventilation shaft over the line of the Gnarr Creek culvert near the junction of Creswick Road and Doveton Street was completed in 1884, and around the same time the culvert was extended a further 195' northwards from where it ended under Creswick Road. A small bluestone culvert was also constructed 10' along the line of the Wendouree Creek, leading towards Lake Wendouree. A few years later, in 1888, the present culvert over the Gnarr Creek at Holmes Street, with its bluestone arch, base, wing walls and parapets, was constructed. A year later, the present bluestone culvert at Macarthur Street was completed.

In the early 1880s, additional work to the Caledonian Channel comprised further cutting and embanking of the Channel from Main Road to Lal Lal Street, generally along its present line.

Improvements were also made to the No.4 (Specimen Vale) Channel in the early 1880s. Part of the works involved raising the roadway at the Main Road Bridge and erecting a new bridge, under which there appears to have already been constructed
a brick walled channel with a bluestone base extending a short distance downstream towards Barkly Street. Further works undertaken around that time appear to have included creating a more defined course to the channel for some distance to the east of the Main Road Bridge (upstream) and the construction of an additional length of permanent channelling with brick walls and a bluestone lined base. Some of this structure may still be in place. In 1886 a brick 'teardrop' shaped culvert with
bluestone wing walls was constructed at Princes Street, and in 1888 a broken down bridge at King Street South was replaced with a culvert with a bluestone arch and walls, and bluestone wing walls and base. (More recent works enclosing the Specimen Vale Channel up to King Street may have resulted in the destruction of all the wing walls but it would appear that the culverts are still in place.) In 1889 a road ford was formed over the Specimen Vale creek at Queen Street.

In the mid-1880s, some works were undertaken on the No.3 (Warrenheip Gully) Channel, which was widened by additional cutting of the straight earth channel from the east side of the Main Road Bridge for a distance of some 200'. The north side of
the channel was to be sheeted throughout to a height of 5' above the bed of the creek.

In 1888, a small amount of work was also undertaken in relation to the Redan Creek, with the construction of the present culvert at Darling Street comprising a bluestone arch, walls and base, and bluestone wing walls and parapets.

Works on the Yarrowee during the early 1880s were varied with one of them being the commencement of a thorough survey of the Yarrowee with the intention of forming a wide reserve in a more or less direct line from Grant Street to Hill Street (or
Sunny Corner as it was also known). This was the first step taken to enable the two Councils to form a permanent channel, which was considered to be 'a valuable sanitary work' since at the time it was the receptacle for the drainage of a large part
of Ballarat. **31** Around the same time a major joint Council undertaking was the rebuilding of the bridge at the junction of Wills and Mair Street, and the repairing and improving of the Yarrowee Channel from the south side of the arched railway culvert
to the south building line of Wills Street, which included constructing 12' of the Gnarr Creek culvert at its junction with the Yarrowee. The bridge was constructed with bluestone abutments (much of which are probably still there despite recent major
alteration to the roadway above) and a slight diversion in the line of the bridge was made to provide for the intended realignment of the channel to run alongside (instead of in) Grenville Street and enable this street to be opened to its full width. The base
of the channel section between the bridge was lined with bluestone pitchers, and the sides were also constructed

of bluestone, laid in courses of an even height.

Other structures erected along the Yarrowee in the 1880s through joint Council works included the erection of a bridge with bluestone abutments, wing walls and counterfoils over the Yarrowee at the junction of Nolan Street and Scotts Parade. By
that time the eastern side of the creek, alongside the Eastern Oval and up to Peel Street, appears to have already been sheeted with timber planks, which were taken down where required for construction of the bridge and wing walls with the rest made
good. (The later removal of the Nolan Street Bridge has unfortunately left only the bluestone abutments and a single curved parapet in evidence.) A bridge was also constructed much further downstream at Hill Street which, for the first time,
connected the South Ward of the town with the vicinity of Mount Pleasant. This bridge, with its stone abutments and wing walls was replaced in the early 1900s.

Another major work carried out in the 1880s in relation to the Yarrowee was the extension in 1887 of the twin tunnel viaduct under the railway embankment. Under Railway Department Contract No.2832, signed on 16 April 1887, the tunnels were
extended by 58' to the north with a bend at the north end. **32**

In 1890 the first substantial permanent improvements were made to the Caledonian Channel with the construction of two lengths of brick walling (with stone coping) on the eastern banks of the creek. Both of these walls appear to be extant and substantially intact. One wall runs in a curving line northwards from the west side of the Main Road bridge, finishing south of the present Clayton Road footbridge. The other wall runs in a north-western direction from the north side of the York Street bridge and was contracted to be 1180 links in length before being joined into the existing timber walling of the creek bank located further downstream.

Further permanent improvements were also made to the Gnarr Creek during the 1890s and involved extending the channel northwards - a work that the Mayor had identified in his 1889 report as having 'long been needed, but its magnitude naturally
causes it to be put off as long as possible'. **33** The works were undertaken in sections with the first in 1892 being an extension of the existing structure, part of this being a further length of culvert with the remainder being the first section of open
channel to be constructed. Around the same time, but further to the north, the present substantial bluestone culvert was erected at Brougham Street. This replaced an early wooden culvert, which was located further to the east. A few years later, in
1895, the present bluestone culvert at Howard Street was constructed, as well as a short length of open bluestone walled and lined channel running southwards. These structures also replaced an early wooden culvert, which was located some distance
to the west at the intersection of Howard and Crompton Streets (and over the original course of the Gnarr Creek), and contributed to the permanent straightening of the course of the creek in this area.

From 1897 onwards the open channel extension of the main Gnarr Creek Culvert that ran to the Yarrowee was further extended to the Holmes Street culvert, and permanent channels were constructed from the north side of the Macarthur Street
culvert as far as Gregory Street. These channels were constructed, as previously, with a bluestone base but for the first time, concrete (with a bluestone coping) was used for the walls. In August 1899, the Mayor noted that 'several very important
sanitary works [had] been completed chief among which being an impervious lining to the Gnarr Creek, to Gregory Street, excepting that portion from Holmes to Macarthur Streets'.**34** This latter section, however, was not left as open creek for long
and on 5 January 1901 this last length of was completed thereby permanently channelling the Gnarr Creek from Gregory Street to the Yarrowee 'leaving the culvert at Gregory Street yet to be completed'.**35**

In August 1890 the Mayor of the City of Ballaarat remarked that 'the South Ward can rejoice in the commencement of a work (to be continued by Government aid next year) which will constitute the main drainage of the Ward i.e. the channelling of the Redan Creek - a great work of sanitation.**'36** From 1890 to 1899 almost the entire length of the Redan Creek Channel was formed. Although the works were carried out in different, usually unconnected sections, by the end of the decade a permanent bluestone walled and lined channel had been

constructed from the south side of Essex Street to the north side of George Street (the present Cooke Street), and the original course of the Redan Creek had been substantially straightened. Along this length, the present arched bluestone culvert under the intersection of Bell and Ripon Streets was also constructed as well as flat decked culverts, with vertical bluestone walls, at Lonsdale Streets, and under the intersection of Leith and Talbot Streets, both of which have recently been replaced. Flat decks appear to have been laid over the open channels in the other streets, except Darling Street where a culvert had already been erected in 1888.

It appears that little work was carried out by the Town of Ballaarat East along either the Specimen Vale Creek or the No.3 (Warrenheip Gully) Channel during the 1890s. In 1891 the present bluestone culvert was constructed at Rodier Street over the Specimen Vale Creek, replacing an old timber footbridge and comprising part of the works to form Rodier Street. A few years later in 1895 part of the course of the same creek was straightened and gravelled. A drawing dated 17/01/1896 contains details for the construction of a brick walled culvert under Joseph Street, through which the Warrenheip Gully Creek would run, but it has not been established if any of this work was undertaken, or if it forms part of the present culvert, which was erected some years later.

In contrast, however, a great deal of work was undertaken during the 1890s along the Yarrowee by the Town of Ballaarat East, either singly or as joint works with the City of Ballaarat. Part of these works comprised the realignment and reconstruction of the channel in 1891 from the Mair/Wills Street Bridge to the Alfred Hall (formerly on the north side of Curtis Street). The course of the channel was moved over to its present line so that it no longer ran down part of Grenville Street and the walls were lined with rock faced bluestone laid in even courses to correspond with the abutments of the bridge. They finished at the existing brick walls under the Alfred Hall. The base of the channel was also lined with bluestone pitchers. The Mayor of the Town of Ballaarat East saw this as 'the most important work undertaken by the City and Town Councils for some time'.**37**

In the early 1890s the Town of Ballaarat East also began to erect permanent channel walls to replace the timber lining on the east side of the Yarrowee channel, north of the railway culvert. Bluestone walls, with bluestone coping, were constructed from the railway culvert to the abutments of the Nolan Street Bridge, and from the north side of the bridge to the abutment of the Peel and Rowe Street Bridge. This latter bluestone abutment was constructed in 1894, under the existing timber bridge, as the final part of the works to line the channel. The City of Ballaarat erected the northern abutment in 1896 but a new bridge was not erected until 1903. The base of the channel in this section remained unlined for some years but the bluestone pitching of the base of the Yarrowee, from the north end of Alfred Hall to a distance south of Little Bridge Street, continued through the 1890s. So did the lining of the channel walls - those from Little Bridge Street to a distance of 10 chains southwards were constructed with bricks from the old Powder Magazine. It was around this location (the area where Grenville Street once turned to meet the Yarrowee) that the permanent forming of the Yarrowee Channel ended in 1898. A little further downstream, however, bluestone abutments had been erected in 1897 to support a new box girder bridge that was erected at the intersection of Dana and Eastwood Streets, over the Yarrowee.

The early years of the 20th century saw a marked increase in the extent of works undertaken by both Municipalities in permanently lining the channels, most of whose courses had already been well-established over the years. The most substantial of these works was the construction of the present Yarrrowee Channel from just north of the Dana/Eastwood Street Bridge down to the Hill Street Bridge and the Woollen Mill. In the latter part of the year 1900, a Joint Committee of the City and Town Councils adopted the plans and specifications that had been prepared by the City of Ballaarat Engineer for this major improvement of the Yarrowee. In April 1901 the tenders of two contractors were accepted for the job, which had been divided into two sections, the division being in line with South Street. Part of the works in the northern section also included forming a short distance of channel up the Caledonian Channel, where it curved to meet the Yarrowee. The full works comprised the lining of the walls with concrete (with a bluestone coping) and the pitching of the channel base and invert with bluestone, along the course that had been surveyed and reserved in the early 1880s. The Mayor of the Town of Ballaarat noted in his 1901
Annual Report that 'when completed this will be the best sanitary improvement effected in Ballaarat for years'**38** and the Mayor of the City of Ballaarat was equally enthusiastic, remarking that 'this work means a very great improvement to the sanitation of the City and Town' in his Annual Report.**39** The two Councils contributed equally to the cost of the scheme, which was completed in 1903, while the Government bore half of the cost, altogether totalling some £25,000.

In 1903 and 1904 further work was undertaken in upgrading the bridges along the Yarrowee, the most notable being the construction of the present bridge at Grant Street, which was completed in April 1904. The bluestone abutments had been

constructed a little earlier in conjunction with the permanent forming of the Yarrowee Channel and the bridge was constructed with steel girders under the road deck. A decorative lattice girder was installed on each side as a balustrade between the
partly dressed bluestone parapets, which curve in line with the wing walls below. A footbridge comprising steel lattice girder sides with a timber deck (since replaced with metal plate) was also erected in 1904, connecting Gladstone and Sebastopol Streets; and the new bridge at the Peel and Rowe Street intersection was finally installed.

The City of Ballaarat also undertook some additional works to the Gnarr and Redan Creek Channels shortly after the turn of the century. Along the Gnarr Creek, the channel was further extended northwards with the construction in 1907 of a culvert
under Gregory Street and a channel with concrete walls and a bluestone base up to Howitt Street. A few years earlier the old bluestone invert lining of the oldest part of the Gnarr Creek Culvert (from a little to the north-west of Doveton Street North to the
junction with the Yarrowee) had been replaced with a moulded concrete invert. Along the Redan Creek, the channel was completed between Cooke and Skipton Streets in 1905, and a branch channel formed to Rubicon Street.

In 1903, the Town of Ballaarat East began the first of the works undertaken over the next few years to permanently form the No.3 (Warrenheip) Channel. This initial work comprised constructing a deep bluestone spoon channel from the Sth Brittannia
Mining Company (once located just east of King Street) to Otway Street and on to Joseph Street. A few years later, in 1908, the present substantial culvert under Joseph Street was constructed with a brick arch, bluestone sides and base, and bluestone abutments and wings. This culvert is particularly notable because it drops some distance to accommodate the fall in the land from one side of Joseph Street to the other. At the same time a further length of bluestone spoon drain was constructed eastwards from the culvert, towards Rodier Street.

Other works undertaken by the Town of Ballaarat East during these years comprised a major upgrade of the Caledonian (Canadian) Channel in conjunction with additional work on the No.3 (Warrenheip) Channel, and the erection of bridges with bluestone abutments at Lal Lal Street and York Street, both over the Caledonian Creek. The condition of this channel, from its junction with the Yarrowee to the Town Mission Reserve in the vicinity of Eureka Street, was now of great concern to the Council - it had originally been planked and lined many decades earlier in the 1860s. In his Annual Report of August 1906, the Mayor of the Town of Ballaarat East stated that:

The wooden lining of the watercourse has become decayed, and is falling to pieces in many parts, and the wooden bridges over it at the intersection of Peel and Humffray Streets are rapidly showing signs of dilapidation. . . . As to the creek itself, the work must now be completely saturated with the sewage from the town, and consequently from a sanitary point of view there is good reason for the construction of a stone channel. The state of the creek is also made worse by the accumulations of sand and sludge in it and this is another reason why alterations should be made. If a good stone channel be constructed the silt from the mines will flow away just as it does now in the main Yarrowee Creek. Indeed this is one of the sludge troubles of Ballaarat East. The advantage and necessity of having properly lined channels in a mining township, to keep the sewers clear and to prevent the accumulation of sludge, are forcibly shown by the Board in their report, where they stated:

'The Yarrowee channel itself, from the Caledonian junction down to the Woollen Mills being lined with dressed stone and having a fall of about 22 feet per mile is under practically all conditions self cleansing, so that the solids entering it from tributaries are carried through to the unlined portions. No complaint has been made about this channel as everything passes quickly through.'

The execution of a similar class of work therefore in the Caledonian channel would improve sanitation of the town, as well as cause a minimising of the sludge nuisance. The desirability of doing this work should be readily admitted, and the Council therefore approached the Government with a view of obtaining a monetary assistance. The Premier promised that if we submit a proposal to him he would consider the request in framing next year's estimates. **40**

The proposal was obviously successful and in 1908 the Caledonian Channel was lined with brick and pitched with bluestone from its junction with the No.3 Channel to the edge of the previously constructed section of the Caledonian Channel adjoining the Yarrowee. Bluestone abutments were also constructed under the intersection of Humffray and Peel Streets in preparation for the laying of a new wide bridge to replace the two separate

bridges already in place. As part of the works on the Caledonian Channel, a length of the Specimen Vale Channel was lined with brick and pitched with bluestone from its junction with the Caledonian to the edge of Steinfeld Street.

It also appears that the still-unlined downstream section of the No.3 Channel (adjoining the Caledonian Channel) was permanently formed at the same time, and with the same materials of brick and bluestone, to a little beyond its junction with the Pennyweight Gully Creek. A short stretch of channel up this creek was also constructed, probably at the same time.

The extent of all these works was praised by the Mayor in his August 1908 Annual Report **41** in which he stated that 'in regrading and relining the No. 3 and Caledonian channels the council is just completing the best sanitary work it has ever undertaken.' He went on further to pronounce that:

the good results of this class of work cannot be overestimated, for it must be a means of preventing the outbreak of infectious diseases. Where formerly existed a long series of stagnant pools the surface and household drainage now has free and unobstructed flow.

Interestingly, segments of the old timber base in the section between the end of the permanently lined channel (in the area of the junction with the Warrenheip Gully Channel) and Main Road were not replaced at this time, although there is a more recent length of concrete base can be seen north of the York Street Bridge. The historical value of these segments of timber base is highly significant and they represent possibly the oldest formed creek construction in the City of Ballarat. However, they are now in urgent need of restoration.

By the end of 1908 the Town of Ballaarat East had also carried out some work along the Specimen Vale Channel - the early Princes Street culvert was extended, and bluestone culverts with brick arches were erected at Chamberlain and Otway Streets. The culvert at Queen Street was probably also erected around this time. It seems, however, that work on this channel with egards to fully lining it (except for some short lengths around Main Road and adjoining the Caledonian Channel) was still some years off.

For the next few years further work by either of the Councils on the channels slowed dramatically as, by then, much of the infrastructure had already been substantially completed within the central area of town.

However, in August 1913 the Mayor of Ballaarat East reported that 'the No.4 Channel, one of the few main sewers that need relining with stone, was further extended in this manner, a notable sanitary improvement being the result'. **42** He also noted a few years later, in 1916, that 'another very useful sanitation work has been completed by the construction of the Specimen Vale Creek from Queen Street to a point west of the King Street culvert'.**43**

A few years earlier, the two Councils invited the Minister of Public Works to inspect two sections of the Yarrowee Creek that urgently required attention. A dry summer at the end of 1914 had created problems in the parts of the Yarrowee Creek between Nolan and Rowe Streets and below the Hill Street Bridge. The Councils felt 'that in the interests of public health something had to be done' **44** and requested financial assistance from the Government, which was forthcoming. By August 1916, the contractors had almost completed the work between the Nolan Street Bridge and the Rowe/Peel Street Bridge, which comprised pitching the base and lining the northwest side with concrete walls (with bluestone coping). The opposite bank had already been lined with bluestone over twenty years earlier. The same contractors were also responsible for pitching the base of the channel beyond the Hill Street Bridge, and lining both sides with concrete (with bluestone coping), and they completed this section a little later. They also rebuilt the Hill Street Bridge on a 'proper alignment'. The Mayor of Ballaarat West considered the new single span bridge with a reinforced concrete deck to be 'a great improvement on the old threespan bridge in wrong alignment'.**45** He also observed that 'by the carrying out of these works, the intolerable nuisances in the two localities have been removed, to the advantage of the health of the citizens generally, more particularly to those residing in the vicinity. It is a pity that a further section could not have been completed while the matter was in hand.'**46**

In the two decades following the end of World War I, the work on permanently lining the channels was essentially completed. After 1921, all additional works became the responsibility of the newly amalgamated Municipality.

Only a small amount of work appears to have been required along the Caledonian Channel and this mainly comprised the construction, in 1925, of a reinforced concrete footbridge, almost in line with Anderson Street. East of Main Road, the northern side of the Canadian Creek (as it seems to have been called in this area) was lined

for some distance with a concrete wall in 1922. In 1924, at Lal Lal Street a new reinforced concrete deck was laid over the existing bluestone abutments.

In 1920 a concrete channel for the Redan Creek was constructed on the east side of the Skipton Street culvert, extending the existing channel almost 400' further towards its junction with the Yarrowee River. Upstream, a new reinforced concrete deck was installed over the Redan Creek channel at Latrobe Street.

The most extensive amount of work undertaken on the channels during the 1920s concerned Specimen Vale. From August 1924 to February 1925, day labour was used to line the walls and base of the channel between King Street and Main Road with concrete. A little earlier concrete culverts were erected over Barkly, Eastwood and Steinfeld Streets across Specimen Vale.

The 1930s saw an unusual escalation in engineering works on a number of the channels due to the availability of 'relief' or 'sustenance' workers. During the Great Depression the unemployed were supported by programs funded jointly by the State Government and local councils and carried out under the auspices of the state Public Works Department. Eligible unemployed men worked for two days each week. Projects usually focussed on unskilled labour intensive work, with the unemployed joining existing council work gangs.

In 1930, the Mayor's Annual Report contained details of relief works. He explained that:

Owing to the prevailing depression an extensive Relief Works programme has been entered into. . . . The works to be done are in the main very suitable for unemployed, as they require a large proportion of unskilled labour. Particularly does this apply to the Stormwater Channel in Specimen Vale Creek, between Queen and Chamberlain Streets, which is built mainly of old flagstones taken up from the City streets from time to time. The sections of this Creek from Chamberlain Street to Stawell Street are being built in concrete, sufficient flagstones were not available. These jobs require a large amount of labouring work in excavating, filling and placing concrete .**47**

The Ballaarat City Council supervised these, and other, projects on behalf of the Public Works Department.**48** Along Specimen Vale, the forming of a large semicircular channel between Queen and Chamberlain Streets with flagstones, and the lining, with concrete, of the walls and base of the channel between Chamberlain and Rodier Streets, and Rodier and Stawell Streets was completed in early 1931. During 1930/1931, the relief workers also completed the last section of the Yarrowee Channel between Peel and Nicholson Streets. Part of the base upstream from the Rowe/Peel Street Bridge had already been lined with bluestone in 1916, and the remainder up to the Nicholson Street Bridge was finished with concrete, as were the walls for the entire length of this section. In 1931 the Mayor noted that 'the bottom of the Yarrowee Creek is the first large creek channel in Ballaarat to be constructed solely of concrete, though several smaller channels have been similarly constructed.**'49**

The year 1931 also saw the commencement of major works, undertaken under Relief Contracts, in extending the Gnarr Channel further northwards. During that year a concrete channel was constructed between Doveton Street North and Armstrong Street. From 1932 to 1933 this concrete channel was further extended to Lydiard Street North, then to Walker Street and up to Landsborough Street. A tributary called the Bullock Gully Creek was also lined with concrete from its junction with the Gnarr Creek, halfway between Walker and Landsborough Streets. It ran eastwards under Ligar Street and, in 1934, was completed up to Landsborough Street. Concrete culverts were also formed over most of the crossing streets, replacing old timber bridges, culverts or footbridges. In August 1933 the Mayor described the Gnarr Creek as 'now self-cleansing and sanitary throughout the greater portion of the populated area of Ballaarat North and . . . a great improvement to the locality'.**50**

Relief works continued to be carried out in Ballarat until the late 1930s, although the most severe years were during the early years of the decade. In 1936 the final section of the Specimen Vale Channel, between Barkly and Steinfeld Streets, was completed. The walls were lined with concrete, and the base with old tramway pitchers. Concrete culverts at Eastwood and Barkly Streets were also erected by Relief labour. In 1938, relief workers replaced the timber bridge over the Yarrowee Creek at Nicholson Street [near the Eastern Oval] with a new steel and concrete structure.**51**

The latter half of the 20th century generally saw few engineering works carried out on the channels other than the upgrade of the road decks for the various bridges. In many instances the early substructure (abutments and wing walls) and other elements such as piers and parapets have been retained. Unfortunately, however, the replacement and realignment of the bridge at Nolan Street in 1962 led to the removal of the original parapets, except for one partially intact curved section which sits hidden in the undergrowth on the north-west side of the

present bridge.

In the immediate post-war years some work was carried out along the Redan Creek channel with the extension of the last section of concrete channel further eastwards in 1948. A few years later, in the early 1950s, the concrete retaining walls alongside the Canadian Creek between Main Road and Lal Lal Street were extended. Additional walls in this area were constructed in the early 1960s to prevent further erosion and flooding of adjacent properties.

The most noticeable alteration to the visual impact of the network of channels throughout Ballarat in the latter half of the 20th century was the permanent decking of much of the Yarrowee from Mair Street to just north of the Dana/Eastwood Street Bridge.

From its earliest formation in the 1860s to its later realignment alongside Grenville Street (instead of down the middle) in the early 1890s, and after its permanent lining during the 1890s, the Channel was predominantly open to view. In 1904 the municipality of Ballaarat East first covered the Yarrowee Channel on both sides of Bridge Street with steel girders and red gum decking so that, according to the Mayor, the surface could be better 'utilized by the buildings and conveniences intended to be erected thereon.'52 The Mayor also noted that some of the business proprietors facing the new deck were erecting glass shop fronts and that it was the intention of the Council to turn this decked area into a 'resting place . beautified with ferns and pot plants in the summer time.' In 1908 *The Australasian* published a photograph of this decked and 'beautified' area, which shows long seats placed down the centre, street lamps hanging from the adjacent buildings, and numerous glass shop fronts.**53** The wooden deck appears to have been constructed a little like a pier - with gaps between the planks.

This semi-permanent structure was replaced decades later with the present reinforced concrete deck and other pavement treatments, and the formerly timber decked channel now lies beneath the Colosseum Walk and the walk-through area of Norwich Plaza. The early timber bridges at Little Bridge, Bridge and Curtis Streets were also replaced with permanent concrete decks from the 1950s onwards and, after the Alfred Hall was demolished in 1956, the area north of Curtis Street was turned into a carpark. Around the same time the present Elderly Citizens Club was erected over the line of the Yarrowee Channel, further covering it up. The later formation of the Eastwood Carpark completed the covering up of the Channel along this section.

The built form of the channels and associated structures today is thus the result of extensive engineering works undertaken throughout the mid to late 1800s and into the 1900s. From the beginning the intention was both to facilitate a flow of water to the gold diggings and to try and decrease the impact of floods along these watercourses. As gold mining waned in the early 20th century and Ballarat city developed, the need to control the water flow along the channels continued but by then they had also become a major network for the drainage of stormwater throughout the township and, unfortunately for many years, also of unsanitary and polluting effluent that was discharged from the hospital, as well as various factories and mills. Until 1883, when it was abolished, a drain carried raw sewage from the Hospital to the Yarrowee along Sturt Street. Waste from a soapworks, the woollen mill, the Chinese village, the gaol, the gasworks and other factories all flowed directly into the creek, adding to its polluted state.54 After the construction of a sewerage system throughout Ballarat from the early 1920s, the channel system became solely a network for the drainage of stormwater.

Important and significant elements of these early engineering works that remain along the Creek and River Channels Precinct include but are not limited to: the extensive network of bluestone, red brick and concrete lined channels, the associated bluestone and brick culverts, the associated bridges with bluestone abutments, wing walls, piers and parapets, the associated early concrete or steel lattice girder footbridges, and the notable brick chimney vent at the intersection of Creswick Road and Doveton Street North.

BIBLIOGRAPHY

. Weston Bate, *Lucky City. The First Generation at Ballarat: 1851-1901*
Carlton: Melbourne University Press, 1978. Reprinted 1979.
. Jacobs, Lewis, Vines, *Ballarat Conservation Study*, Part 1, 1978 & Part 2, 1980
. Peter Lumley, John Dyke, Roger Spencer, Eve Almond, *Ballarat Historic Landscapes, Trees and Gardens*, Royal Botanic Gardens, Melbourne & Department of Crown Lands & Survey, 1983
. Mayor's Annual Reports for the City of Ballaarat and the Town of Ballaarat East held in the Australian Collection, Central Highlands Library, Ballarat Branch.
. See also the notes taken from additional historical source material and chronologically listed according to the

channel name in the associated Appendix.

Physical Attributes

As the network of channels within the Creek and River Channels Precinct cover many lineal kilometres, and comprise a combination of various structural materials, the following approach to describing them has been used.

Firstly, there is a general descriptive section that gives an overview of the type of materials that have been used in constructing the channels, and some of the associated structures. Secondly, each channel is listed in alphabetical order and broadly described using the information accumulated by the Assets Department of the City of Ballarat, the information compiled from general and more specific historical research (and detailed in the Appendix to this document), and information gathered during extensive field survey by the consultants.

The most relevant descriptive information from the database produced by the Assets Department can be seen in the small table accompanying the relevant section of channel (also as identified by the Assets Department). The City of Ballarat Asset No. that has been attached to each channel section is also included but it should be noted that a number of sections or structures that make up some of the channels do not appear to have as yet been identified by the Assets Department. Any further notes pertaining to the description are appended under the table. The source material that supports the Date of Construction can be found in the Appendix to this document. The superscript number following the date provides a link to the relevant dated source in the Appendix.

Materials

Wood:

This was the earliest material used to line the creek beds and walls to form the early sludge channels. The only remaining evidence of this method can be seen in Canadian Creek upstream from its junction with the Warrenheip Gully Channel andfrom the York Street Bridge. The remaining structure comprises heavy timber planks, probably laid on transverse timber joists fixed to piles driven deep into the creek base. The planks are laid longitudinally with the flow of water and are generally in urgent need of restoration.

Bluestone:

Bluestone is used in a variety of ways within this precinct and can be found to varying degrees within every channel or as part of an associated structure.

Where bluestone forms the lining of the bottom of a channel it is generally arranged with:

- the side sections constructed of partly dressed bluestone pitchers laid perpendicular to the walls, and
- the central drain section (the invert) constructed of partly dressed bluestone pitchers laid parallel to the walls (longitudinal with flow of water), the centremost row being at the lowest point of the channel

Note: in some sections of the Gnarr Creek Channel, the bluestone pitchers of the side sections are also laid parallel to the walls (longitudinal with flow of water). In a few sections of the Warrenheip Gully Channel, bluestone pitchers have been used to form deep spoon drains. All these sections have been noted within their relevant description information.

Where bluestone forms the lining of the bottom of a culvert it is generally arranged with:

- the whole base constructed of partly dressed bluestone pitchers laid parallel to the walls (longitudinal with flow of water), the centremost row being at the lowest point of the channel

Where bluestone forms the lining of the channel walls, or makes up the main structure of abutments, wing walls, end walls, piers and parapets of bridges and culverts it is generally seen as:

blocks of rough faced bluestone laid in even courses, often finished with a coping of a single row of rough-faced blocks of bluestone

Brick:

Red face bricks can be found to varying degrees as part of almost every channel in the precinct or as part of an associated structure. They have either been used to line the walls of a number of the channels, or as the arched roof structure of many of the culverts. The tops of the walls generally feature a single row of projecting bricks finished on top with a rounded coping of cement render. In some instances the coping is a single row of rough-faced blocks of bluestone.

The most notable use of red face bricks within the precinct can be seen in the tapered octagonal ventilation shaft to the Gnarr Creek Culvert at the intersection of Creswick Road and Doveton Street North.

Concrete:

Poured concrete was used from the early 20th century onwards as a lining for a number of the channel walls, often in conjunction with a coping formed from a single row of rough-faced blocks of bluestone. Poured concrete was not generally used as the lining for the base of the channels until the 1920s and in the 1930s is the material most associated with the Relief Contract labour used during the Great Depression to complete the network of formed channels.

Other materials:

Large bluestone flags taken up, over the years, from streets in the centre of the city is a notable material used to line a section of the Specimen Vale Channel between Queen and Chamberlain Streets. They have been laid so that the flags form a contiguous semicircular channel .

Signficant Landmarks and Views

The important and extensive network of timber, bluestone, brick, and concrete lined channels, along with the associated bluestone and brick culverts, associated bridges with wrought iron or steel lattice girder balustrades and bluestone abutments, wing walls, piers and parapets, and the associated early concrete or steel lattice girder footbridges in themselves form a highly significant landmark element of the urban cultural landscape of Ballarat city.

Views along, across, and/or adjacent to almost every part of this network can be gained from innumerable vantage points throughout the city, and are particularly noticeable as one traverses the many bridges that cross the channels. The conspicuous bluestone parapet walls to the many culverts also form notable features along the edges of many city streets. The distinctive brick ventilation shaft at the intersection of Creswick Road and Doveton Street North is also an important urban landmark. The line of the Canadian Creek is further emphasised by the notable mature street plantings, predominantly elm and plane, along Steinfeld Street.

For further infromation on individual channel descriptions , refer to the *Ballarat* Heritage Study Stage 2, July 2003.

15 W.B. Withers, *History of Ballarat* (first published 1870) and *Some Ballarat Reminiscences* (first published 1895/96),combined facsimile edition published by Ballarat Heritage Services, 1999, pp.22 & 23.
16 For example, see the drawings of D Tulloch reproduced in Weston Bate, *Lucky City. The First Generation at Ballarat: 1851-1900,* Carlton: Melbourne University Press, 1978. Reprinted 1979, pp17-18.
17 Ibid., pp16-17.
18 W Bate, *Lucky City*, op.cit., p.25
19 W.B. Withers, *History of Ballarat*, op.cit, p.157 & 221.
20 W.Bate, *Lucky City*, op.cit., p.30
21 A.W.Strange, *Ballarat: the Formative Years*, 1982, p.39
22 Engineering Drawing 1861/009.01, 'Sludge Channels at Ballarat', dated September 1861; and Engineering Drawing 1862/003.
23 See Engineering Drawings 1862/006, 007, 008, and 022 for these early lines
24 'Surveyor General's Office by J Brache, 21st October 1861', Central Highlands Library, Australiana Collection, Ballarat Branch.
25 W.Bate, *Lucky City*, op cit, p.165
26 City Council of Ballaarat, *Mayor's Annual Report*, November 1870
27 W Bate, *Lucky City*, op cit, p174.
28 City Council of Ballaarat, *Mayor's Annual Report*, August 1878

29 City Council of Ballaarat, *Mayor's Annual Report*, August 1880, p.4.
30 City Council of Ballaarat, *Mayor's Annual Report*, August 1883, p.1.
31 City Council of Ballaarat, Mayor's Annual Report, August 1882, p.3
32 Andrew C. Ward and Associates, 'Review of Railway Sites of Cultural Significance within the City of Ballarat', February 1991, p.82
33 City Council of Ballaarat, Mayor's Annual Report, August 1889, p.1.
34 City Council of Ballaarat, Mayor's Annual Report, August 1899, p.3.
35 City Council of Ballaarat, Mayor's Annual Report, August 1901, p.7.
36 City Council of Ballaarat, *Mayor's Annual Report*, August 1890, p.1
37 Town of Ballaarat East, *Mayor's Annual Report*, August 1891, p.4
38 Town of Ballaarat East, Mayor's Annual Report, August 1901, p.12-13
39 City Council of Ballaarat, Mayor's Annual Report, August 1901, p.7
40 Town of Ballaarat East, *Mayor's Annual Report*, August 1906, p.22
41 Town of Ballaarat East, *Mayor's Annual Report*, August 1908, pp.14-15
42 Town of Ballaarat East, *Mayor's Annual Report*, August 1913, p.32. Unfortunately it has not yet been fullyestablished where these works were carried out.
43 Town of Ballaarat East, *Mayor's Annual Report*, August 1916, p.23
44 City Council of Ballaarat, *Mayor's Annual Report*, August 1915, p.9
45 City Council of Ballaarat, *Mayor's Annual Report*, August 1916, p.11
46 Ibid., p.7
47 City Council of Ballaarat, *Mayor's Annual Report*, August 1930, p30.
48 Ibid., pp14-15.
49 City Council of Ballaarat, *Mayor's Annual Report*, August 1931, p.13.
50 City Council of Ballaarat, *Mayor's Annual Report*, August 1933, p.12.
51 City Council of Ballaarat, *Mayor's Annual Report*, August 1938, p.20.
52 Town of Ballaarat East, *Mayor's Annual Report*, August 1904, p.12
53 *The Australasian*, 29 February 1908, p.523
54 W.Bate, *Lucky City*, op.cit., p.249.

This place/object may be included in the Victorian Heritage Register pursuant to the Heritage Act 2017. Check the Victorian Heritage Database, selecting 'Heritage Victoria' as the place source.

For further details about Heritage Overlay places, contact the relevant local council or go to Planning Schemes Online http://planningschemes.dpcd.vic.gov.au/