MALVERN TRAM DEPOT

TRAM DEPOT SOHE 2008

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1 tram depot coldblo road malvern tram entrance

south car shed

North car shed

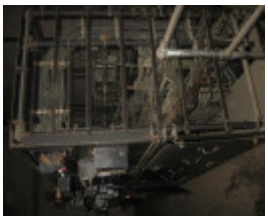
Garages

School building

substation equipment

Substation - Rotary converters

Substation - transformers



Substation equipment

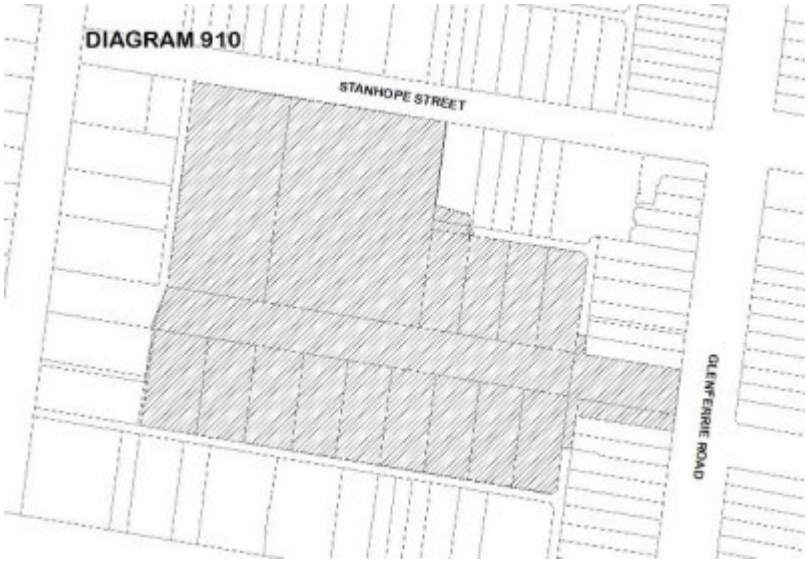


Diagram 910

Location

COLDBLO ROAD ARMADALE, STONNINGTON CITY

Municipality

STONNINGTON CITY

Level of significance

Registered

Victorian Heritage Register (VHR) Number

H0910

Heritage Overlay Numbers

HO23

VHR Registration

July 22, 1993

Amendment to Registration

August 13, 2020

Heritage Listing

Victorian Heritage Register

Statement of Significance

Last updated on - August 25, 2020

WHAT IS SIGNIFICANT?

The Malvern Tram Depot buildings, land and objects integral to the place including:

-The car sheds on both sides of Coldblo Road, the substation, the small office building in the southeast corner of the site, the brick garages in the north-east corner, the former school on Stanhope Street, the part of Coldblo Road between the two car sheds and the tram tracks leading into the car sheds from Glenferrie Road.

-Fixed and non-fixed objects as listed in the inventory dated January 2020, held by the Executive Director.

-All fixtures attached to the buildings at the time of registration.

HOW IS IT SIGNIFICANT?

The Malvern Tram Depot is of historical significance to the State of Victoria. It satisfies the following criterion

for inclusion in the Victorian Heritage Register:

Criterion A

Importance to the course, or pattern, of Victoria?s cultural history.

Criterion B

Possession of uncommon, rare or endangered aspects of Victoria?s cultural history.

Criterion D

Importance in demonstrating the principal characteristics of a class of cultural places and objects.

WHY IS IT SIGNIFICANT?

The Malvern Tram Depot is significant at the State level for the following reasons:

The Malvern Tram Depot is of historical significance for its association with the origins and expansion of Melbourne's tram network in the first half of the twentieth century. The original depot, commenced by the Prahran & Malvern Tramways Trust (P&MTT) in 1909, is significant as the first, and later became the largest, of the depots constructed by the municipal tramways trusts prior to the formation of the Melbourne & Metropolitan Tramways Board (M&MTB) in 1919. The P&MTT was the most significant and successful of all the municipal tramway networks, and its services played a key role in facilitating suburban expansion south of the Yarra River. The growth of the tramway system was one of the greatest municipal developments in Victoria during the first decade of the twentieth century, and the depot is associated with this period of Melbourne's transport history. The depot reflects the expansion and change of the tramway system in subsequent decades, with several major alterations and additions in the late 1920s. The second car shed and separate substation, erected in 1929 to designs by AG Monsbourgh, are an expression of the period of consolidation, expansion and modernisation of the tramway system by the M&MTB. The intactness of the structures from all periods of development makes the depot an important record of the evolution of Melbourne's tramway system. The school building and its rear addition is significant as a reflection of the recreational and support services provided by the M&MTB for its employees in the inter-war period. (Criterion A)

The Malvern Tram Depot is historically significant for its association with the first successful and later the largest electrical tram system in Victoria which was constructed by the P&MTT from 1909 to 1920. The tram systems in the area were constructed for electric operation and cable trams did not operate. The depot is also associated with the widespread construction of new electric tramways beyond the reach of the cable tramway system. The P&MTT operated trams in the Cities of Prahran, Malvern, St Kilda, Caulfield, Hawthorn, Kew and Camberwell. The electrification of the tram lines contributed to the development of the southeastern suburbs of Melbourne in the early twentieth century and the provision of the extensive, cheap and efficient electric tram system led to the growth of the commuter suburbs in this area, allowing the middle classes to live in a salubrious environment and commute to the city, resulting in the present characteristic appearance of these suburbs. (Criterion A)

The Malvern Tram Depot is significant for its substation which is one of only two substations in Victoria known to retain rotary converter equipment, and the only one which is complete. Almost all the equipment is present, in its original positions and mostly still connected. The rotary converters, their matching transformers and some other equipment were made overseas while the Control Panel which included automatic control equipment as well as the large DC Switchboard were assembled by the M&MTB. (Criterion B)

The Malvern Tram Depot is architecturally notable as a fine and intact example of an early twentieth century complex of tramways buildings. The earliest buildings are imposing examples of the application of Edwardian period architecture to utilitarian structures. The later buildings are fine and intact examples of the classical style buildings designed by M&MTB architect Alan Monsborough. The design of the depot buildings provides evidence of the pride with which Melbourne viewed its tramway system and of the importance of the system to the life of the city. (Criterion D)

The Malvern Tram Depot is significant because its substation is one of the few places which demonstrates the principal characteristics and functioning of a rotary converter tramway substation. The substation at the Malvern Tram Depot is a notable example of a tram substation as it contains all the original conversion equipment which demonstrates how electro-mechanical rotary converters together with their matching specialised transformers, switchgear, switchboards, circuit breakers, control gear and interconnecting cables converted AC power to DC power for the DC motors on trams. The location of the substation next to two engine sheds and its outgoing feeder cables to various locations on the tram routes, demonstrates how the DC motors in trams needed to be supplied by a 600 Volt DC source approximately every four kilometres in order to provide a stable power supply without excessive voltage drop limiting the tram's speed. (Criterion D)

Permit Exemptions

It should be noted that Permit Exemptions can be granted at the time of registration (under s.38 of the Heritage Act). Permit Exemptions can also be applied for and granted after registration (under s.92 of the Heritage Act). Under s.38 of the Heritage Act 2017 the Executive Director may include in his recommendation categories of works or activities which may be carried out in relation to the place or object without the need for a permit under Part 5 of the Act. The Executive Director must not make a recommendation for any categories of works or activities if he considers that the works or activities may harm the cultural heritage significance of the place or object. The following permit exemptions are not considered to cause harm to the cultural heritage significance of the Malvern Tram Depot. General Conditions . All exempted alterations are to be planned and carried out in a manner which prevents damage to the fabric of the registered place or object. . Should it become apparent during further inspection or the carrying out of works that original or previously hidden or inaccessible details of the place or object are revealed which relate to the significance of the place or object, then the exemption covering such works shall cease and Heritage Victoria shall be notified as soon as possible. . All works should ideally be informed by a Conservation Management Plan prepared for the place. The Executive Director is not bound by any Conservation Management Plan and permits still must be obtained for works suggested in any Conservation Management Plan. . Nothing in this determination prevents the Heritage Council from amending or rescinding all or any of the permit exemptions. . Nothing in this determination exempts owners or their agents from the responsibility to seek relevant planning or building permits from the relevant responsible authority, where applicable. Specific Permit Exemptions General . Minor patching, repair and maintenance of the building which replaces like with like. Repairs must maximise protection and retention of significant fabric and include the conservation of existing fabric, details or elements. Any new materials used for repair must not exacerbate the decay of significant fabric due to chemical incompatibility, obscure significant fabric or limit access to significant fabric for future maintenance. . Maintenance and replacement of existing contemporary fire services of the same size and in the same

location. . Repair to or removal of non-original items such as air conditioners, pipe work, ducting, wiring, antennae and aerials. . Painting of previously painted surfaces in the same colour, finish and product type provided that preparation or painting does not remove earlier paint finishes or schemes. Note: This exemption does not apply to decorative finishes or unpainted, oiled or varnished surfaces. . Cleaning including the removal of surface deposits by the use of low-pressure water (less than 300 psi at the surface being cleaned) and neutral detergents and mild brushing and scrubbing with plastic not wire brushes. Roads . Removal of, modifications and repairs to, and replacement of overhead power lines. Repairs to and replacement of tram tracks. . Modifications and repairs to, and replacement of, any electric or electronic signalling equipment outside the substation. . Repair and resurfacing of existing road surfaces. Safety and Security . The erection of temporary security fencing, scaffolding, hoardings or surveillance systems not attached to the building or equipment to prevent unauthorised access or secure public safety. . Works or activities, including emergency stabilisation, necessary to secure safety in an emergency where a structure or part of a structure has been irreparably damaged or destabilised and poses a safety risk to its users or the public. Note: The Executive Director must be notified within seven days of the commencement of these works or activities. Permit exemptions for interiors . Painting of previously painted surfaces in the same colour, finish and product type provided that preparation or painting does not remove, or damage earlier paint finishes or schemes. Note: This exemption does not apply to decorative finishes or unpainted, oiled or varnished surfaces. . Removal or replacement of post 1960s carpets and/or flexible floor coverings. . Removal or replacement of post 1960s light switches or power outlets. . Maintenance and repair of post 1960s light fixtures and tracks. . Removal or installation of notice boards and the like in a manner not detrimental to the cultural heritage significance of the place. . Demolition or removal of the following post 1960s features: stud/partition walls, suspended ceilings, or wall linings (including plasterboard, laminate and Masonite), glazed screens, flush panel or partglazed laminated doors, aluminium-framed windows, bathroom partitions and tiling, sanitary fixtures and fittings, kitchen wall tiling and equipment, built-in cupboards, cubicle partitions, computer and office fit out and the like. . Removal or replacement of post 1960s smoke and fire detectors, alarms and the like, of the same size and in existing locations. . Removal or replacement of post 1960s electric clocks, public address systems, emergency lights, exit signs, luminaires and the like. . Repair, removal or replacement of existing ducted, hydronic or concealed radiant type heating provided that the central plant is concealed, and that the work is done in a manner which does not alter building fabric. . Installation of plant within the roof space, providing that it does not impact on the external appearance of the building or involve structural changes. . Installation, removal or replacement of bulk insulation in the roof space. Landscape/ outdoor areas . The processes of gardening including mowing, pruning, mulching, bedding displays, removal of dead shrubs, planting and replanting of garden beds, disease and weed control and maintenance to care for existing plants. . Management and maintenance of trees including formative and remedial pruning, removal of deadwood and pest and disease control. . Maintenance and care of trees and removal or pruning of dead or dangerous trees to maintain safety. . Subsurface works involving the installation, removal or replacement of existing watering and drainage systems or other services provided there are no visible above ground elements. Existing lawns, gardens and hard landscaping, including paving, footpaths and roadways are to be returned to the original configuration on the completion of works. . Repair and maintenance of existing hard landscaping including paving, footpaths and roadways where fabric, design, scale, form and method of fixing is repaired or replaced like for like. . Removal or replacement of external directional signage provided the size, location and material remains the same. . Maintenance, repair and replacement of existing services such as plumbing, surveillance systems, pipes or fire services which does not involve changes in location or scale, or additional trenching

Theme

3. Connecting Victorians by transport and communications 6. Building towns cities and the garden state

Construction dates	1909, 1912, 1911, 1913, 1929,
Architect/Designer	Monsborough, Alan G, Flannagan, Leonard, Public Works Department,
Heritage Act Categories	Registered place, Registered object integral to a registered place,
Other Names	FORMER DE LA SALLE SCHOOL, MALVERN TRAMWAY DEPOT,
Hermes Number	2138

Property Number

History

Cable trams operated in Melbourne from 1885, but some of thefirstelectric tramways in Melbourne were built by groups of localmunicipalcouncils, which combined to form municipal tramways trusts.These wereinitially a response to the inadequacy of public transport,but alsopromoted commercial and residential development in themunicipalities.The first municipal tramway to commence operations wasthat run by thePrahran & Malvern Tramways Trust (P&MTT), whichwas formed in1907 and on 30 May 1910 opened its first lines. TheP&MTT was thelargest of the independent electric tramways formed inthe earlytwentieth century and had a dominant role in the Melbourne&Metropolitan Tramways Board (M&MTB) when it took over operationofMelbourne's tramways in 1920. Construction of the P&MTT depot in Coldblo Road at Armadale (which was called the Malvern Tram Depot) and of their electric tram lines began in 1909. By 1910 the P&MTT had built a line along High Street from Prahran to Tooronga Road, and a branch line south along Glenferrie Road to Wattletree Road, where it turned east to terminate at Burke Road. The depot with offices and a workshop were built on the south side of Coldblo Road, just off Glenferrie Road. The building was designed by the Trust's architect Leonard John Flannagan in conjunction with the Trust's electrical engineers, Noyes Bros Pty Ltd. It was built by W Sim and Co, who also laid the tracks. It was the first and the largest of the depots constructed by Melbourne's municipal tramway trusts prior to the formation of the M&MTB. Electricity was supplied by the privately-operated Melbourne Electrical Supply Company in Richmond and transmitted to the substation on the west end of the Coldblo Road Depot, where it was converted to 600 volt DC current to operate the trams. The immediate success of the Prahran-Malvern line led to the expansion of the Trust's operations and of the depot site. A separate, triangular-shaped three level office and amenities building, designed by Leonard Flannagan and built by Thomas Cockram, was constructed to the south-east of the original depot in 1911-1912. A tram car repair workshop (now demolished) was built in 1912 on the north side of Coldblo Road. A major expansion of the Trust lines to the south and north took place in 1913. To house the necessary trams and power supply equipment, the depot was doubled in size by an extension to the west. These extensions substantially altered the ground floor interiors of the original building. It is likely that Flannagan was also responsible for the design of this work. As the Trust's tram system expanded, a substation to power the new routes to the south was built in Rusden Street, Elsternwick (VHR H2322) in 1914, and a new depot was built at Kew in 1915. A number of adjoining municipalities were to join the scheme during the 1920s, and many new lines and extensions to existing lines were constructed by the Trust, including services along High Street, Dandenong Road, Wattletree Road, Balaclava Road, Cotham Road, High Street and Barkers Road in Kew, Glenhuntly Road, Waverley Road, St Kilda Road, Glenferrie Road, Malvern Road, Whitehorse Road and Burke Road. This became the largest independent electric tram network in Melbourne, consisting of almost all of the tram system which exists in the area today. Expansion slowed down during World War I, but following the takeover in 1920 of the existing tram lines by the Melbourne & Metropolitan Tramways Board (M&MTB), the Board undertook a major expansion and modernisation program at the Coldblo Road depot. In 1929 a new red brick, nine-track car shed was built on the north side of Coldblo Road. This type of wide clear-span structure, without interior columns, was a radical departure from earlier depot designs. According to Vines, 'Melbourne Metropolitan Tramway Heritage Study', p 189, this type of shed was first used at the M&MTB's Camberwell Depot. During the same year the M&MTB demolished the 1910 substation on the north-west corner of the depot and erected a new substation fronting Coldblo Road. The new car shed and substation were both designed by the M&MTB's architect A G Monsbourgh. In 1929 the M&MTB increased its land holdings by purchasing from the Roman Catholic Trusts Corporation the De La Salle School, fronting Stanhope Street to the north of the depot buildings. This had been the site of the large nineteenth century house, Coldblo (which gave its name to the street), which was built in 1855 and appears on the 1902 MMBW plan extending from Coldblo Road to Stanhope Street. The site had been purchased by the Catholic Church in 1905, and the single storey school, with four classrooms and a hall, was built in 1912 fronting Stanhope Street. It was designed by the architect A A Fritsch, Victoria's leading Catholic church architect at the time. Coldblo was demolished in 1926 and by 1929 the school moved to a new building on another site. The Board removed the ecclesiastical details from the gables and added a double storey rear wing on the west side of the south elevation. The building was used as a recreation hall for Board employees and later as a tram museum. In 2014 it continues to house the Tramway Museum. Electricity to power

Melbourne's tram lines was supplied from the public electricity supply. In Victoria both AC and DC electric power systems were used. [Electric current can be Direct Current (DC) or Alternating Current (AC).] In 1932 the State Electricity Commission of Victoria (SECV) decided to gradually phase out the DC system in favour of AC because it was easier to step up and step down its voltage - via static transformers - for transmission and end uses respectively. This resulted in AC supplanting DC for general electric lighting and power purposes. Using a high voltage for bulk electric energy transmission and distribution with commensurately lower currents materially reduced energy losses. In contrast DC transmission lost a lot of power over long distances, and DC could not be easily stepped down to safe voltages for domestic and commercial use. However, DC motors were well-suited to use on trams as they were compact and light and could easily be incorporated into the restricted space on the trams. Therefore, the M&MTB needed to convert the mains AC power to DC traction power to supply trams. Substations were constructed to hold the plant and equipment to do this conversion. DC voltage drops quickly with distance and tram performance therefore suffers if the tram is much more than four kilometres from the power source. This meant that substations had to be constructed approximately every four kilometres along a tram route. M&MTB substations were denoted by letters which related to their suburb, for example the Malvern Tram Depot substation is known as "M". Some substations were co-located within tram depots, and others were free standing buildings. By 1933 there were nineteen substations. In order to reduce labour costs, the M&MTB constructed remote supervisory equipment of its own design for its substations. Fifteen of its nineteen substations were fully automatic unattended stations. The main central control room was in Queensberry Street at Carlton. By 2013 there were fifty-five substations, with more planned. Since the 1960s new substations have been constructed behind or near some earlier substations. In other cases, new equipment has been installed in existing substations (for example Carlton Tram Substation VHR H2325). Superseded equipment was usually removed and destroyed as part of the decommissioning process. Rotary converter equipment. The rotary converter was invented in the United States in 1888 and is generally credited to Edison employee, C S Bradley. It was further developed and perfected in the following decade and commonly used to provide DC power for commercial, industrial, tram and railway applications. Rotary converters used electromechanical technology to produce DC power for trams. These were superior in terms of space and efficiency to the earlier motor-generators. Rotary converters were installed in Melbourne tram substations from 1916. These early substations were specifically designed to house the massive rotary converters. The last new rotary converter in Melbourne was installed at South Melbourne in 1931 and many were still in use in the 1970s. From 1930 to 1957 mercury arc rectifiers were preferred to rotary converters for the new more distant substations which had lower power requirements while rotary converters continued to operate in larger and earlier substations and in areas with large power requirements. The M&MTB progressively replaced rotary converters with silicone diode rectifiers from 1967 to the present day. Malvern Tram Depot substation. The original 1910 P&MTT Malvern Depot included a manual single-phase motor-generator substation which supplied 600 volts DC to electric trams running on Glenferrie Road and other tram lines. This substation was on the basement level beneath the office accommodation further to the east of the present substation. The P&MTT substation was operated by the Melbourne Electric Supply Co. and supplied with 4 kV single-phase AC from their Richmond power station. In 1929 the new substation building with its own roof and walls was constructed within the north-west corner of Car Shed number 1. It was known as Substation M. In 1930 two 1000 kW rotary converters and all their associated equipment were installed in the substation. The new substation was needed because the first-generation single truck electric tramcars, characteristically with 2 x 50HP motors, weighing about 11 tonnes empty, were being replaced with larger second-generation W class bogie tramcars, with 4 x 40HP motors and weighing about 17 tonnes empty. Maintaining the same schedules with the larger and heavier trams meant that overall DC power demand increased, requiring more powerful equipment. In addition, new routes created a higher level of demand by the community which meant that more trams were required - also increasing the demand for power. The number of trams allocated to the Malvern Depot increased from 71 cars in 1928, to 116 cars in 1934 (although this number reduced later due to redistribution of trams on the network). More tram cars led to the construction of Car Shed number 2, also in 1929. In addition, Substation M at the Malvern Tram Depot supplied DC power to approx. eleven sections of six tram lines (the 1984 route numbers of these six lines were 3, 5, 6, 16, 64 and 72). This meant that the two powerful 1000kW rotary converters were essential to provide enough power to the trams on these six lines. In comparison, the Brunswick Road Substation B was only required to supply DC power to two or three sections of two lines and contained two smaller 500kW rotary converters as a result. More powerful rotary converters also required more AC power. Three-phase, 6.6 kV AC electricity supplied to the Substation M was provided via two underground feeder cables from the Glenferrie-High St distribution substation by the State Electricity Commission of Victoria (SECV). The rotary converter plant at Malvern was set up for unattended operation, which was less usual for this equipment. Rotary converters in other substations such as Ascot Vale (VRH H2323) required attendants. The automatic control system used a time switch to operate the pre-selected the first or 'lead' machine which was started prior to the first scheduled tram and stopped after the last scheduled tram each day. The second or 'lag' rotary converter would then

automatically start up and shutdown based on the measured total DC demand with allowance for short-time variances. Substation M was remotely monitored with some over-ride control functions from a Power Control Centre first set up by the M&MTB adjoining its Carlton substation in Queensberry Street, Carlton, in the early 1930s. The control panel is still present in the substation. The Station Service Transformer that provided electricity for general lighting and power services in the substation building was more powerful than would have been needed for the substation and it is likely that it also supplied power to the rest of the Malvern tram depot. Substation M remained in service until the late 1990s.</p>

Assessment Against Criteria

Criterion
The Malvern Tram Depot is of historical significance to the State of Victoria. It satisfies the following criterion for inclusion in the Victorian Heritage Register:
Criterion A Importance to the course, or pattern, of Victoria's cultural history. Criterion B Possession of uncommon, rare or endangered aspects of Victoria's cultural history. Criterion D Importance in demonstrating the principal characteristics of a class of cultural places and objects.

Extent of Registration

Heritage Act 2017 NOTICE OF REGISTRATION As Executive Director for the purpose of the Heritage Act 2017, I give notice under section 53 that the Victorian Heritage Register is amended by modifying a place in the Heritage Register: Number: H0910 Category: Registered Place, Registered Objects Integral to a Registered Place Place: Malvern Tram Depot Location: Coldblo Road, Armadale Municipality: City of Stonnington All of the place shown hatched on Diagram 910 encompassing all of Lot 1 on Title Plan 906711, Lot 1 on Title Plan 844052, Lot 1 on Title Plan 854479, Lots 1 and 2 on Title Plan 841984, Lots 33-45, RES1 and R2 on Lodged Plan 4648, Lots 1 and 2 on Title Plan 903591 and part of Lot 46 on Lodged Plan 4648, part of the road reserve for Coldblo Road and parts of the rights of way behind Glenferrie Road and Stanhope Street, and all fixed and non-fixed objects integral to the place as listed in the inventory dated 20 January 2020 held by the Executive Director, Heritage Victoria 13 August 2020 STEVEN AVERY Executive Director