



EVELEIGH CARRIAGEWORKS

CONSERVATION MANAGEMENT PLAN

VOLUME I



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I.0 EXECUTIVE SUMMARY



Figure I.0: View of the site from the south east in 1920. The large shed in the middle of the photograph is the Tarpaulin Shed which was demolished later that decade. Above the roof of the Tarpaulin Shed is the roof of Calder House which burnt down in 1923. To the right of the shed is the group of buildings which contained the Signals Workshop and later the Train Lighting Depot. Source: SRAO

1.0 EXECUTIVE SUMMARY

The Conservation Management Plan for the Eveleigh Carriageworks was commissioned by the State Rail Authority and prepared by Otto Cserhalmi + Partners in conjunction with specialist sub-consultants. A Master Plan was prepared for the redevelopment of the site concurrently and heritage advice was provided. While work from related studies was used in this report original research was carried out concentrating on the operational aspects of the site and including consultation with former workers. This report builds on the "Eveleigh Carriage Workshops Conservation Analysis 1999" produced by The Department of Public Works and Services, Heritage Group.

The report examines the history of the place and of carriage building, the construction and operation of the workshops, how they were run, what work was done and significant people associated with them. The building fabric and machinery are surveyed in an inventory of significant items, which identifies significant fabric and is a database. A comparative analysis has been undertaken in order to place the Eveleigh Carriageworks into a larger railway context. It should be noted that reliable information relating to the international railway workshops is not prolific. The report arrives at a statement of significance and policies which will form a basis for future planning. A strategy setting out development guidelines and implementation has also been provided in the report.

The Eveleigh Railway Workshops are of exceptional heritage significance to Australia. The Carriageworks and the Locomotive Workshops, when considered together, enhance the significance of each other. As a whole they are one of the best surviving combined 19th Century railway workshops in the world. The place is significant for its historic, aesthetic, social and scientific values at local, state, national and in some respects international levels.

The expansion and development of the sites reflect the development of the railways. The large-scale forms of the buildings, on both sides of the main line provide a significant gateway to the city viewed by thousands of train travellers every day.

The Eveleigh Carriageworks were in continuous operation for one hundred years maintaining and/or building carriages. The whole of the State's moving vehicles were controlled and managed from the Chief Mechanical Engineer's Office and stores were provided to the whole of the rail and tramways.

The high quality of the design and construction of the original buildings, carried out by John Whitton and George Cowdery demonstrate the importance of these functions in the 1880s. Later buildings indicate developments in the construction of industrial buildings, including expediency when funds were scarce. The place has been the site of technical innovation and development for the railways of NSW.

Physical evidence of most of the aspects of carriage maintenance and building remains on site. The remaining system for moving vehicles around the site is significant as it demonstrates the processes carried out. Only one traverser remains in a complete and operational condition and it is a part of this system that has been lost on the "down side". Significant remains of machinery survive within the main Carriage Workshops building, in particular line and countershafting and fly wheels (these have been removed from the Locomotive Workshop).

The place was a major employer of skilled engineers and tradesmen with a range of finishing trades not used elsewhere in the rail network. The place is held in high esteem by generations of former workers and their families and as a workplace producing the highest quality Australian craftsmanship.

1.1 HISTORICAL SUMMARY

The State's first rail line, built in 1855, divided Chisholm's farmland at Eveleigh in two. His residence, Calder House, was on the north. The station near it was named Eveleigh after a nearby house built by John Rose Holden. The congestion of Sydney's first railyards at Devonshire Street led to the purchase of the site of Chisholm's land for the Eveleigh Railway Workshops in 1879. In 1880 construction of a running shed was started as well as a locomotive workshop and goods yard on the south or 'down line' side. On the north or 'up line' side the project initially included a carriage and wagon repairing shop, railway stores and offices for the Locomotive Engineer. This is reflected in the division of the Carriageworks site into three precincts.

The development of the 'up line' side, now known as the Eveleigh Carriage Workshops progressed in stages. The first buildings were two of the large timber stores at the Macdonaldtown end of the site, completed in 1883. Between 1884 and 1887 the fan of rails was laid in and the Car and Wagon Workshops, the Paint Shop, the grand Locomotive (later Mechanical) Engineers Office on Wilson Street, and a Tender Shop near Redfern Station for painting locomotives (now demolished) were completed.

The site continued to expand and develop. First the internal traversers were removed and external ones installed giving a more efficient layout and ability to handle longer carriages. Then separate accommodation was built for the black trades as they outgrew the original facility and additional repair and painting shops were built to handle the State's expanding fleet of vehicles. Special facilities were built for signalling, lighting, driver training, laboratories and trimming at the east end of the site. Later the stores were expanded and then converted to a hostel. Staff amenities such as toilets, ambulance room, canteen and offices were added at various locations. The site reached its full development in the late 1980s and since this time buildings have been demolished at the east and west ends of the site.

The maintenance of the State's carriages and wagons was the main work carried out. This also involved major reconstruction projects such as the conversion of early non-corridor cars to corridor cars. New carriages were built including the Royal carriages, later handled in a special area by the 'Royal' car builder, the first Mann sleeping car, the first electric carriage, and the first air-conditioned train in Australia and the Silver City Comet were all built at the Eveleigh Carriageworks.

The works developed new technologies and maintained and finished vehicles to a high standard. Apprentices were trained to produce a highly specialised and skilled workforce. The workshops were served by rails, including head shunts, points and run-arounds and by traversers, and within the buildings by cranes, to enable movement of vehicles. Elevated rails and pits allowed work under vehicles.

The Eveleigh Railway Workshops were significant in the development of the surrounding suburbs and the workshops were a major employer of migrant labour. The oral histories incorporated into this report provide evidence of the significance the place had on the people that were employed there, as well as on their families and the surrounding community.

2.0 INTRODUCTION



Figure 2.0: Interior of the Fitting and Turning (Machine) Shop, Bay 21, Carriage and Wagon Workshops, undated. This shows the overhead travelling crane, line shafting and counter shafts and belt drives to the machinery along each side of the bay. The central area contains stored raw materials and finished items and the rear sets of wheels. There is a timber office, probably for a foreman, part way down the right hand side of the bay. Natural day light is provided by the skylights and no artificial supplementary lighting is evident. This photograph is looking south from the mezzanine which was over the steam, later gas, engine which provided power. Source: SRAO

2.1 AIMS OF THE REPORT

This Conservation Management Plan (CMP) has been commissioned by the State Rail Authority and has been prepared by Otto Cserhalmi + Partners PL.

The CMP aims to be a practical document for the Eveleigh Carriageworks to guide decisions which may affect the heritage value of the place. It will comprise one of the bases for future planning and provide a standard against which to assess the heritage impact of proposed developments. It should be used when planning developments of proposals and when carrying out activities in the place. During the preparation of this report, advice has been provided concurrently on heritage aspects of the Master Plan for the site.

The Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (Burra Charter 1999) provides the Australia-wide accepted guidelines for heritage conservation. Section 2 (Conservation and Management) of the charter states:

- 2.1 *Places of cultural significance should be conserved*
- 2.2 *The aim of conservation is to retain the cultural significance of a place*
- 2.3 *Conservation is an integral part of good management of places of cultural significance*
- 2.4 *Places of cultural significance should be safeguarded and not put at risk or left in a vulnerable state.*

The ICOMOS World Report 2001/2002 identifies industrial heritage as being at risk, particularly in urban areas where the pressures of re-development are high and the perception that their real estate values outweigh their heritage values.¹

The NSW Heritage Council requires a Conservation Management Plan to be prepared for each item listed on the State Heritage Register. Once endorsed by the Heritage Council, this document will form a basis of exemptions from requirements to obtain approvals under Section 60 of the Heritage Act 1977.

The aim of this Conservation Management Plan therefore, is to set out:

- the cultural significance of the place
- policies appropriate to enable the cultural significance of the place to be retained in any future development and conservation work
- strategies for implementing these policies

2.2 SITE AND OWNERSHIP

This report is concerned with the part of the Eveleigh Railway Workshops referred to in the previous draft master plan as 'Eveleigh North' and formerly used as the carriage workshops. The site is now known as the Eveleigh Carriageworks.

The Eveleigh Railway Workshops complex consisting of the Carriageworks and the Locomotive Workshops are located in the inner city immediately to the south of Sydney's CBD and Central Station. The workshops are situated on either side of the main southern and western rail lines, between Redfern, Erskineville and Macdonaldtown Stations and between Darlingtown to the north and Alexandria to the south. The immediate surroundings contain densely developed residential suburbs and mixed commercial and industrial areas.

Eveleigh Carriageworks is bounded on the north by Little Eveleigh and Wilson Streets, Redfern, and stretches along the northern side of the railway lines from Redfern station almost to Macdonaldtown station. The site is bounded on the west by Iverys Lane, on the east by Redfern Station and Little Eveleigh Street and on the south by the main railway lines leading out of Sydney. In railway terminology, the site is located adjacent to the 'up' railway line which are the tracks on which trains travel towards Sydney. This northern section of the Eveleigh Railway Workshops complex is known, therefore, as the 'up side'.

The site was in continuous use as Carriage (earlier Carriage and Wagon) Workshops until its closure in 1988. It was Government built and has been in continuous Government Ownership since the purchase of the land in 1879. The site is currently owned by the State Rail Authority of New South Wales.



Figure 2.1: Plan showing the location of the site.

KEY to photographs opposite

1. Former Carriage Shed
2. Gasworks
3. Former Engine Running Shed
4. Former Alexandria Goods Yard
5. Former Foundry
6. Locomotive Workshops
7. Paint Shop
8. Carriage Workshops
9. New Engine Workshops
10. Works Manager's Office
11. Large Erecting Shed

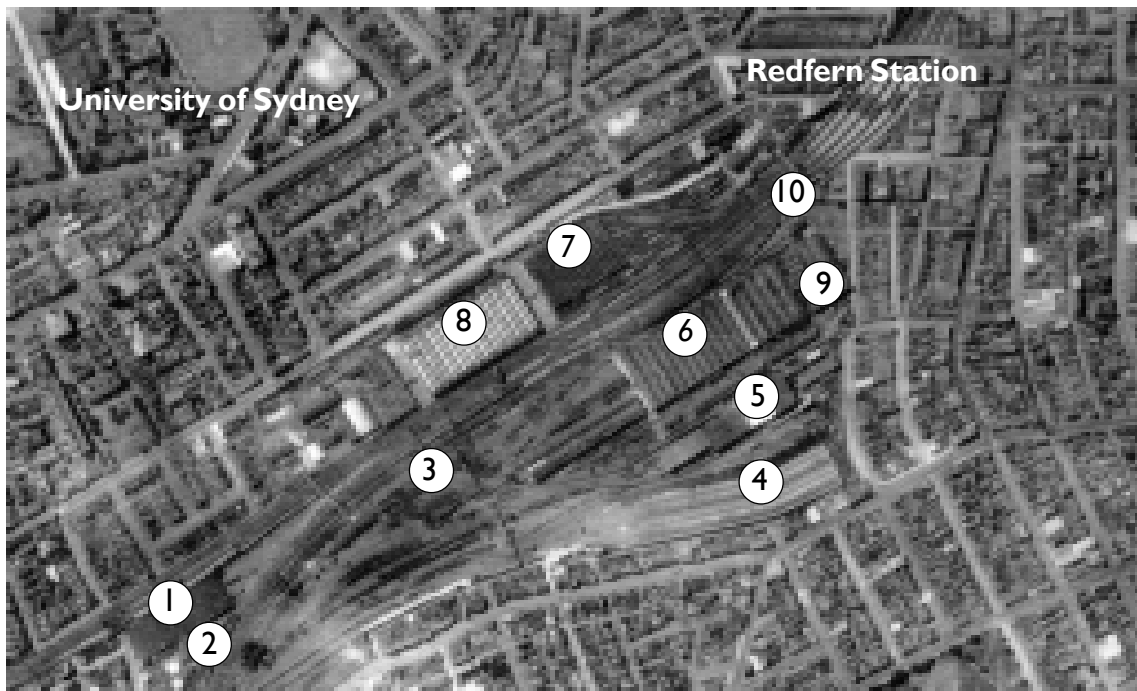


Figure 2.2: 1930 aerial photograph of the Eveleigh Railway Workshops showing items referred to in this report. Some items now demolished are shown in this photograph.



Figure 2.3: 2002 aerial photograph of the Eveleigh Railway Workshops complex showing items referred to in this report. Some items in the key have been demolished and are not shown.

2.3 SCOPE OF THE REPORT

This report sets out the cultural significance of the Carriage Workshops developed by researching and analysing the individual buildings and their history. The statement of significance is intended to be one of the bases of future planning on the site. General conservation policies have been developed for the site.

The detailed physical analysis of the buildings and remaining machinery has been carried out in the form of an inventory which, in its electronic form, is a database.

2.4 METHODOLOGY AND STRUCTURE

This report follows the general methodology set out in J.S. Kerr's *The Conservation Plan* and is consistent with the guidelines set out in the *Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (Burra Charter 1999)*.

Section 2.0 Introduction is followed by *Section 3.0 Historical Analysis*. The history is put into the context of the New South Wales Railways and the local area. The development is analysed in four phases and includes, where relevant, an analysis of the changes made to major buildings and of new functions, such as the scientific laboratory, which were introduced during these phases. The operation of the place as railway workshops is explained as well as the operation of each major workshop. Oral histories have been incorporated into the report as well as a brief analysis of the social history of the place.

Plans showing the various phases of development on the site are included within Sections 3.1.2 to 3.1.10 inclusive.

Section 3.5 Carriages and Wagons provides background to enable the operation of the site to be understood. In particular, how the development of carriage design impacted physically on the site.

Features of working at Eveleigh are covered in the following *Section 3.6 Working at Eveleigh Carriage and Wagon Workshops*. This, and the section on the operation of the place, includes oral history information supplementing the documentary research.

The Comparative Analysis follows in *Section 3.7* and includes international, mostly British, comparisons as well as interstate examples.

Section 4.0 Physical Analysis is a separate volume, however, an overview including a list of items covered by the inventory is provided in this section. The inventory includes a Statement of Significance for each item and identifies significant fabric.

Section 5.0 discusses the significance of the Eveleigh Carriageworks and concludes in a succinct Statement of Significance for the whole site.

Section 6.0 . The *Constraints and opportunities* are analysed and provide a basis for the development of a strategy for implementation of the conservation policies, which are in Section 7.

Section 8. The *implementation strategy* includes plans indicating the application of the policies and a table indicating when and who should implement the policies.

2.5 TERMINOLOGY AND ABBREVIATIONS

2.5.1 DESCRIBING THE BUILDING

The Eveleigh Railway Workshops, both Carriage and Locomotive have been the subject of a number of reports and studies, historically as well as recently. In order to retain consistency and for ease of cross referencing between historical and modern references the following system has been used in this CMP:

Eveleigh Railway Workshops complex - refers to both the original workshops sites on either side of the main line, that is, the Locomotive Workshops site as well as the Carriageworks . In other sources, the site has been referred to as the "Eveleigh Railyards" and the "Eveleigh Rail Yards". It is also referred to simply as the Eveleigh Railway Workshops.

Eveleigh Carriageworks - refers to the set of workshops concerned with carriage building. It is situated on the northern (or up) side of the main line. In some references it is referred to as the Eveleigh Carriage Workshops Site.

Carriage Workshops - refers to the former Carriage and Wagon workshop Bays 16-25 on the northern (or up) side of the main line.

Locomotive Workshops - refers to the entire building, original Bays 1-15, present Bays 1-16 on the southern (or down) side of the main line.

Bays - Structurally, the workshops are divided into transverse bays. The Carriage Workshops are numbered 16-25 on the historical plans, following on from the Locomotive Workshops historical numbering 1-15 (now 1-16). The Carriage Workshops are also occasionally referred to as Bays 1-10 by former employees.

Rows - The workshops are structurally divided longitudinally into rows. Some rows have rails (called "roads") and some do not.

2.5.2 CONSERVATION TERMINOLOGY

The terms *place*, *cultural significance*, *fabric*, *maintenance*, *compatible use*, *preservation*, *reconstruction*, *restoration*, *adaptation* and *conservation* used throughout this report are as defined in the *Australia ICOMOS Charter for the Conservation of Places of Cultural Significance* ("The Burra Charter") 1999, Article 1.1 to 1.17.

- 1.1 *Place means site, area, land, landscape, building or other works, group of buildings or other works, and may include components, contents, spaces and views.*
- 1.2 *Cultural Significance means aesthetic, historic, scientific, social or spiritual value for past, present or future generations. Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects. Places may have a range of values for different individuals or groups.*
- 1.3 *Fabric means all the physical material of the place including components, fixtures, contents and objects.*
- 1.4 *Conservation means all the processes of looking after a place so as to retain its cultural significance.*
- 1.5 *Maintenance means the continuous protective care of the fabric and setting of a place, and is to be distinguished from repair. Repair involves restoration or reconstruction.*
- 1.6 *Preservation means maintaining the fabric of a place in its existing state and retarding deterioration.*
- 1.7 *Restoration means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.*
- 1.8 *Reconstruction means returning a place to a known earlier state and is distinguished from restoration by the introduction of new materials into the fabric.*
- 1.9 *Adaptation means modifying a place to suit the existing use or a proposed use.*
- 1.10 *Use means the functions of a place, as well as the activities and practices that may occur at the place.*
- 1.11 *Compatible use means a use which respects the cultural significance of a place. Such use involves no, or minimal impact, on cultural significance.*
- 1.12 *Setting means the area around a place, which may include the visual catchment.*
- 1.13 *Related place means a place that contributes to the cultural significance of another place.*
- 1.14 *Related object means an object that contributes to the cultural significance of a place, but is not that place.*

- 1.15 Associations mean the special connections that exist between people and a place.
- 1.16 Meanings denote what a place signifies, indicates, evokes or expresses.
- 1.17 Interpretation means all the ways of presenting the cultural significance of a place.

2.5.3 RAILWAY TERMINOLOGY

The following terms and names particular to railways, railway workshops, carriages and wagons have been included to clarify the descriptions of the Carriage Workshops, their operation and functions. Refer also to Sections 3.5.1, 3.5.2 and 3.5.3.

'American' or 'End Platform' Carriages Timber bodied, central aisle, end platform carriages which were introduced to the NSW railway system in 1877. These carriages were based on American designs. 193 of these cars were converted for electric use from 1925 to 1927.

Bogie A device located towards each end of a carriage which can swivel independently to follow curves in the railway lines. It consists of a frame supported by wheels (in NSW either four or six) and carries sets of springs to soften and control the ride, ride control levers or springs, brake equipment linked to the brake cylinder and other equipment associated with the safe operation of the car.

Brake-Van A vehicle (originally the last on a train) which contained hand operated brakes and provided space for the guard. Before continuous air-brakes were fitted, the only brakes on a train were those on the engine and in the brake-van. These vans also carried luggage, parcels, newspapers, mail and other matter requiring passenger train transit. Sometimes, the brake equipment was included in a passenger carriage, in a separate part at one end.

Car or Carriage Synonymous for a vehicle which conveys passengers, their related baggage, mail and parcels.

Coaching Vehicles Railway vehicles designed to carry passengers and their related belongings, which are designed and built to be hauled at passenger train speeds. Including Mail Vans, Brake Vans (including Goods when used in passenger and mixed service), Hearses, Horse Boxes, Carriage and Motor Car vehicles, Bogie Refrigerator and Louvre Vans (when attached to passenger services. See "Composition and Marshalling Books".

Dive A short rail tunnel where one railway line passes under another so that the movement of trains in either direction is not impeded. An example is the 'Engine Dive' which runs from the locomotive side of the tracks at Redfern, passes under ten running railway lines and emerges on the opposite side of Redfern station where it joins the up main line.

'Express' Carriages Timber bodied non-corridor cars with separate compartments accessible from either side of the train. These carriages, originally without toilets, were built from the 1890s and many were converted to corridor cars in the 1930s. Their name derives from the 'express' routes on which they travelled. These carriages were actually used on Main Lines, replacing the older "Redferns" and 4 & 6 wheel cars and they were permitted to run at faster speeds.

Forge A furnace in which metal is heated before shaping by beating or hammering.

Foundry The workshop in which molten metal is poured into moulds.

Head Shunt A short siding, usually with a buffer stop at the end, where vehicles can be taken clear of the main line during a shunting operation to prevent shunting into other siding. The siding adjacent to the Telegraph Workshop is the main head shunt at Eveleigh allowing vehicles to be moved to different lines on the fan of rails, or apron, adjacent to the paint shop, without the necessity to encroach onto the adjacent main line.

Interlocking A system by which points, signals etc. coordinated, so that before a signal can be cleared the appropriate route must be set up. Conversely, once a route has been set up and the signals cleared, the route cannot be interfered with nor any conflicting movement in either direction be signalled.

Linnish A machine finish on metal.

'Main Line' Carriages were intended for long distance and/or overnight travel, as distinct to carriages used on short distances i.e. suburban operations.

Pattern Timber model or template of items to be cast in metal. The patterns were pressed into sand to form the shape of the item for casting.

Perway Also known as Permanent Way. The track of a railway line; the ballast, sleepers and rails. This term distinguished it from that laid temporarily during construction by the contractor for ferrying materials along the length of the works.

Rail Motor A specifically designed lightweight coaching vehicle which is propelled by an internal combustion engine.

Run Round Track A section of rail line parallel, or close to, a receiving or passing line and laid out so that an engine (with or without vehicles attached) can detach from one end of a set of vehicles and pass beside those vehicles and be attached to the opposite end of the vehicles usually to draw the vehicles back in the opposite direction to that in which they arrived.

'Suburban' Carriages This term refers to carriages which were mainly used in the Sydney, Newcastle and Wollongong suburban areas. The first carriages specifically intended for suburban use were the 'American' or 'End Platform' cars (*refer description on page 13*).

Traverser A platform or framework to which a length of rails are attached and which moves locomotives, wagons and carriages transversely along rails. Such a device is sometimes constructed outside a wide locomotive-shed so that a locomotive entering from a single approach track can move onto the traverser and then be moved sideways to line up with any one of the shed lines. Really intended for use in a confined space, where a fan of tracks cannot be incorporated.

Trimming The upholstery inside a carriage including head rests, squabs (seat backs), cushions (seats), armrests or any other item inside a carriage designed or required for passenger comfort.

'Tourist' Carriages These carriages were former 'American' cars which had been fitted with internal partitions and toilets in the 1930s. They were generally used on short distance 'tourist' routes such as those to the Blue Mountains, Newcastle and Wollongong. But in holiday times may be used on shorter overnight relief trains.

Wag(g)on Describes a vehicle designed for conveying freight or goods traffic, or related to that type of business. The spelling changed early this century. Wagons were overhauled at the Eveleigh Carriage and Wagon Shops until the 1909-13 period when a new works was built for wagon repairs at Clyde Sidings and they were removed from the Eveleigh site.

Works Vehicle A storage van, work or mess van, open truck or any other purpose which is related to construction or maintenance of the railway lines and haulage of supplies e.g. coal. Good examples are sets of redundant passenger cars which were gutted and used in installing and maintaining overhead wiring for new electrified lines.

Wrought Metal fashioned or formed by beating with a hammer.

When referring to the Eveleigh site, the term refers to a series of about 180 locally designed vestibule carriages, many of which were built at the Eveleigh Carriage and Wagon Workshops. These carriages were identified by the distinctive 72' 6" long wooden bodies, steel underframes, riding on twelve wheels. The first series of these cars was built from 1913-1915. They included the significant Commissioner's car built in 1919, the Premier's car built in 1920 and the last timber bodied deluxe sleepers, the KAMs, finished at Eveleigh in 1938. There were several other types of 'main line' carriages in use between 1891 to the 1890s. *Refer to Section 3.5.1*

2.5.4 ABBREVIATIONS

Abbreviations used throughout the text are as follows:

AO	Archives Office (no longer in existence -now NSW State Records)
ATPPM	Australian Technology Park Precinct Management Pty Ltd
ATPSL	Australian Technology Park Sydney Limited
CMP	Conservation Management Plan
DOP	PlanningNSW (formerly Department of Planning)
DPWS	Department of Public Works and Services
ELW	Eveleigh Locomotive Workshops
ECW	Eveleigh Carriage Workshops
EP	Eveleigh Precinct
HOFF	NSW Heritage Office
ICOMOS	International Council on Monument and Sites
LEP	Local Environmental Plan
MP	Master Plan
ML	Mitchell Library
NSWSR	NSW State Records (see AO)
SHFA	Sydney Harbour Foreshore Authority
REP	Regional Environmental Plan
SRA	State Rail Authority
SRAO	State Rail Archives Office (no longer in existence, records to NSWSR)
SSCC	South Sydney City Council
SSHS	South Sydney Heritage Study
UDP	Urban Development Plan

CARRIAGE AND WAGON WORKSHOPS

This name was used for the workshops from c. 1880 until the wagon repairing function was moved to Clyde between 1909 and 1913. After 1913, the site is therefore referred to as the Carriage Workshops although it never formally lost its original title.

NAMES OF BUILDINGS & OTHER FEATURES

Refer to Figures 2.2 and 2.3 for current names and locations of existing buildings and other major features of the site.

ANNUAL REPORTS

The term 'Annual Report' within this document refers to the annual report of the authority controlling the railways at the given date. Therefore, an annual report of 1888 refers to the Annual Report of the New South Wales Government Railway while the Annual Report of 1988 was produced by the State Rail Authority. All reports were held by the State Rail Authority Archive but have since been moved to NSW State Archives and some are held by the State Library of New South Wales.

2.6 CONTRIBUTORS AND ACKNOWLEDGEMENTS

This report was prepared by Otto Cserhalmi + Partners PL and builds on the Conservation Analysis of 1999 by the NSW Department of Public Works and Services, Heritage Group.

The project team consisted of:

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Barbary Henery	DPWS
Allen Madden	Cultural Education Officer with the Metropolitan Aboriginal Land Council
David Sheedy	Architect
Lucy Taksa	Historian, University of New South Wales

Commentary

Peter Neve of Weaving Rail Heritage, Stewart Sharpe, Richard Guenther and Mike Bogle on behalf of the SRA.

Several former employees of the Eveleigh Carriage Workshops were interviewed for the preceding Conservation Analysis and the information has been carried over into this report. Those interviewed include W. S. (Bill) Casley, former Director of Rail Safety, and David Kennedy, former car builder and planner in the Carriage Works Office. Mr. Ken Heard in particular provided much information about the operation of the site and working conditions there. Mr. Heard commenced work at Eveleigh Locomotive Workshops as an apprentice during the Second World War. He completed his training at the Water Supply Section, having spent time in the Chief Mechanical Engineer's drawing office. During the late 1970s Mr. Heard was the Works Manager of the Carriage Workshops, a position which had previously been named 'Carriage and Wagon Superintendent'.

Discussions for the 1999 report were also held with Paul Brown and Keith Audet the last and second last Carriage Works Managers (respectively). The State Rail Heritage Unit and the State Rail Authority Archives provided valuable information during the preparation. Neither of these departments exists any more.

2.7 CONSTRAINTS AND LIMITATIONS

The research was carried out within Australia. Limited information was available about workshops outside Australia.

Much of the historic material has been provided by Mr. Ian Brady from his knowledge of the history of the NSW railway system. A small part of Section 3 is therefore not fully referenced to documentary evidence.

One further constraint was the difficulty in accessing historical plans for the place which are currently being recatalogued after transferral from the State Rail Authority Archives Office to the NSW State Records.

2.8 FURTHER RESEARCH

The potential exists to undertake research overseas about comparable international workshops as limited information on this subject could be found in Australia. Contact was made with several institutions and individuals in India and South Africa but these produced little information. Historical Societies in Britain provided more information for this 2002 CMP.

There is also the potential for further research on the machinery which has now been removed from the Eveleigh Carriageworks.

Mr. Don Godden holds an inventory which lists some of this machinery. In order to establish the full significance of the Eveleigh site, further information on the condition and survival of machinery at the Newport Railway Workshops in Melbourne should be undertaken.

Further research is also recommended on the areas discussed in *Section 3.6 Working at Eveleigh Carriage and Wagon Workshops*. These include the functioning of the Stores, the Chief Mechanical Engineer's Office, the Train Lighting workshop, the Electrical and Signals sections and the driver training which took place on the site. Only limited information about these topics has been found.

Some oral histories which contain information about the Carriage and Locomotive Workshops have already been taken. Further interviews of former employees, particularly of migrants, women and Aborigines, as well as those of the other branches who worked at the Carriageworks, should be undertaken.

2.9 OTHER REPORTS

Numerous published books and unpublished reports relate to the New South Wales railways and the Eveleigh Workshops in particular. These are referenced in the Bibliography. In particular, the *Eveleigh Carriage Workshops Conservation Analysis 1999* by the DPWS Heritage Group, *Heritage Study of the Eveleigh Railway Workshops, Volume 2*, May 1986, by Don Godden and Associates and the *Eveleigh Railway Yards Locomotive Workshops Conservation Management Plan*, by State Projects, NSW Department of Public Works, June 1995 and the *Chief Mechanical Engineer's building, Conservation Management Plan*, by Paul Rappoport and the Caldis Cook Group, September 1997, were used as references for this document.

3.0 HISTORICAL ANALYSIS



Figure 3.0: Detail of contract drawing for the foundations and pits for Shops 16 to 25, drawn 1884. The drawing is signed by George Cowdery, the designer, and Harold Norris, the building contractor. Note the bays of transverse pits on either side of the traversers in both the wagon and carriage repairing areas. Brick walls separate the machine shop, which had to be cleaner than the other areas, and the smiths' shop, which was very noisy and dirty. A larger version of this plan is contained in the Appendix. The plans are reproduced here to make readers aware that they exist. It has been recommended that current and historical documentary material, including plans, is kept on site (Policy 1.1.14). Source: SRAO Drawing 39/79.

3.3 HISTORY & DEVELOPMENT OF THE SITE

3.1.1 GEOLOGY & GEOGRAPHY

The former Eveleigh Railway Workshops complex sits on Ashfield Shale, which is part of the Wianamatta Shale Group consisting of dark-grey to black siltstone, through to fine grained sandstone laminite. The shale ranges from 48 to 54 metres deep across the Sydney area and includes most of South Sydney. In some areas, layers of clay varying in depth from 1.5m to 7.0m top the shale.¹

The land comprising the Eveleigh Railway Workshops site was mostly on the Shea's Creek catchment to the south that drained into the low-lying Botany swamps via the Cooks River and thence to Botany Bay.² The higher land on the northern side of the main line, around Wilson Street drained in a north-easterly direction via Blackwattle Swamp Creek to Blackwattle Bay.³ The drainage patterns were a major influence on the area's early industrial development.⁴

Development has by now obliterated original land surfaces and their vegetation, but a picture can be reconstructed.⁵ An extensive sheet of wind-blown dune sands covers the sandstone between Moore Park and Bunnerong and there are estuarine silts and clays along Shea's Creek. Eastern Suburbs Banksia Scrub with its rich assemblage of species including plants much valued by Aborigines (e.g. Banksia species and grass trees), once covered much of the sand and provided habitats for small game. Between the dunes there were small fresh water soaks and areas of swamp forming wetlands with sedges, paperbarks and bottlebrushes. The area may not have been all that good for camping because of damp and mosquitoes, but it would have been an important resource to the local Aboriginal people and was probably much visited.⁶

The land developed for the Railway Workshops, Chisholm's grant, is shown on a detail of a pre 1855 parish map of Petersham. There is a low-lying swampy area on the southern boundary at the eastern end of Chisholm's grant. Other swampy areas are shown to the south of the King land grant, draining into Shea's Creek.



Figure 3.1: The swampy nature of the area is shown in this detail of a Parish Map of Petersham, pre 1855. Source: ISSN 1441-6352 Volume PMAPMNO4, Parish Maps CD, County of Cumberland, Parish of Petersham, 14062201, AO Map No. 341 is written on the image.

Etheridge⁵ examined excavations for “Shea’s Creek Canal” through a tidal swamp and described important observations of sections fifteen feet deep. He saw traces of a submerged forest (of genera not growing below high tide) interpreted as likely to derive from a period of lower sea level; bones of a dugong showing cut marks, apparently of human origin; and three “tomahawks” or ground-edged stone hatchet heads of undoubted Aboriginal origin. He argued his interpretations carefully and quoted detailed supporting evidence.

Kohen⁶ quotes William Dawes who recorded the Aboriginal names for food plants in the Sydney region. These plants included berries, e.g. geebung, native cherry, lilly pilli, five corners, native raspberry, native passionfruit, native grapes, native currents, native orange, native mulberry, figs and kangaroo apple; and flowers with much honey, e.g. some Banksia, Waratah, Grevillea and Melaleuca species. Seeds, shoots, stems, nectar and the leaves of some plants were also eaten. In addition, many plants were used for a variety of practical purposes: string could be made from kurrajong, but also from the bark of hibiscus and native figs. Other plants were used to make baskets. Paperbark was used for many things including wraps for children. Resin was used as an adhesive, particularly that from the grass tree (*Xanthorrhoea* sp.), which was once common in the area. The grass tree flower stalk could also be tipped with a hardwood point and used for a spear. Burls on three trunks were scooped out to form dishes.⁷

A starchy but bland component of the diet was derived from fern roots or various tubers and roots, which were roasted and pulped and at times flavoured with mashed ants or herbs.⁸

The foundation of Sydney Town, the rapid spread of British rule and smallpox drastically changed traditional patterns. Smallpox killed about half of the Aboriginal population around Port Jackson by 1791, within six months of its introduction to Australia.⁹ The virulence of this disease ensured that it travelled inland before Europeans ventured there, devastating Aboriginal populations. While some clans disappeared as a result and the Cadigal were at one stage, greatly reduced, Aborigines as a population, did not disappear.¹⁰ Names of past social groupings are remembered, as well as traditions about their organisation and territory.

3.1.3 EARLY DEVELOPMENT

The land to the north of the Eveleigh Railway Workshops drained to Blackwattle Swamp Creek, which was a major influence on its early development. The land to the south, and the site itself drained to the Shea's Creek catchment. Prior to closer settlement it was the province of escapees and runaways.

The geography of the area meant that the facilities for water supply and effluent output was sufficient for heavy industry, which the area attracted. After an Act was passed in 1848 banning some noxious trades within the city, many practices moved just outside the boundary to where a dam at Shea's Creek provided water for wool washers, tanneries and boiling down works. An abattoir operated in Blackwattle swamp from 1835 to 1860 towards the eastern end of the swamp, and was one of many industries that contributed to the overall polluted state of the local waterways. By 1877, Shea's Creek had been named by the Sydney City and Suburban Sewage and Health Board as one of the polluted waterways responsible for causing an "unusual amount of sickness and death"¹ and was eventually built into the Alexandra Canal.

The area to the north and east of Eveleigh was subdivided and developed for residences by the mid 1850s while Eveleigh was still farms. In the 1830s and 1840s grants were divided into middle class villa estates, gardens and farmyards.

Dr William Redfern was granted 100 acres to the east of Eveleigh in 1817, although he may not have lived here. In 1834, after his death, the land was offered for lease as 2-5 acre lots considered suitable for the erection of genteel cottages or for those occupied in gardening.

Early land grants near the Eveleigh site were to Hutchinson (1819), Chisholm (1835), King (1794), Chippendale (1819) and Shepherd (1827), but there was little development on any of these sites until the late 1870s.

Thomas Shepherd's grant of 28.5 acres was to the north west of Eveleigh and here he established his Darling Nursery which was later run by his widow and subdivided from 1855.



Figure 3.4: The Burrowes 1840s map of the Parish of Petersham showing the location of the Hutchinson (1), Chisholm (2) and King (3) estates, outlined. Source: ML ZM2 811.182/1840/1.

Hutchinson's grant was immediately north of Eveleigh. It was 52 acres and was granted in 1819. He was a convict who went on to become a public servant, prominent citizen, landowner and businessman. He died in 1846 and the area is said to have been leased for gardens. This continued until its subdivision into the Golden Grove Estate from 1881. This subdivision of the site into small lots was intended to attract the 'working man' and the major phase of building was between 1888 and 1893.²



Figure 3.5: Detail of Woolcott and Clark's 1854 map of the city of Sydney showing the location of Eveleigh House (centre).
Source: ML ZM2 811.17/1854/1.

The area further to the north of Eveleigh was granted to William Chippendale in 1819 but he sold it in 1821 to Levey. The southern part of this grant was purchased in 1844 by William Hutchinson and the area became known as Hutchinson's paddock. It was known for its watercress beds and was largely paddocks. The northern part of Chippendale's grant was named after him and the area was by the 1850s at the limits of the city of Sydney. It was occupied by the working class, living within walking distance of workplaces such as the breweries and distillery.

It was on part of the site acquired from Levey that one of Hutchinson's sons-in-law, John Rose Holden, built 'Everleigh House' (later written Eveleigh) after his mother's maiden name. It is believed that the Eveleigh House was constructed in about 1840 and was located in the area of the present Aboriginal Housing Company. The land was subdivided gradually through the 1860s and 1870s³ eventually giving its name to the surrounding area. Hutchinson also had very extensive holdings in Waterloo (1400 acres), to the south of Eveleigh.

King's grant to the south of Eveleigh was known as Kingsclear and its main occupant in the late 19th century was Henderson's plant nursery. Residential subdivision began in the late 1870s.



Figure 3.6: Woolcott & Clarke's map of the City of Sydney, 1854.
Source: ML ZM2 811.17/1854/1.

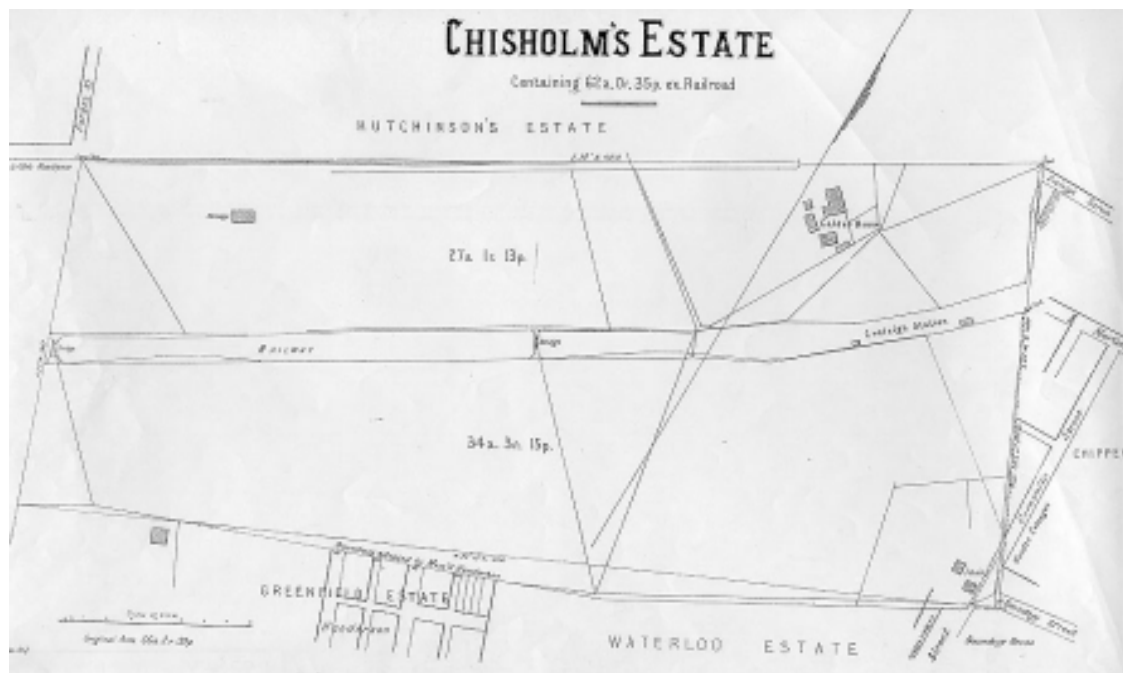


Figure 3.7: Chisholm's Estate. This plan shows Chisholm's land when it was resumed for the Eveleigh Railway Workshops including his house, the main line bisecting the property, Eveleigh Station and a bridge over the rail line linking the two parts of his property. Source: SRAO EL 1.

The Eveleigh site itself was originally granted to John Davis in 1794 but this was cancelled. In 1835 the site of 62 acres was granted to James Chisholm who was born at Calder, Midlothian, Scotland in 1770 and arrived in Sydney in 1790 with the NSW Corps.⁴ On his grant, Chisholm erected 'Calder House'. The date of the house is uncertain, with various sources suggesting it was built c. 1820, in 1823, 1824 and in the late 1830s.⁵ Chisholm died in 1837⁶ and the house was presumably complete by this date. His widow lived in the house until 1855. It is shown on the 1855 plan drawn when part of Chisholm's grant was resumed for the railway (Fig 3.7). At this time the construction of the new railway cut Chisholm's grant in half and the house was effectively cut off from the remainder of the land. It was leased as a school to Mr Castle and taken over in 1865 by Dr Sly who operated Dr Sly's Academy until the site was resumed by the railways in 1878.

Calder house was used for several years, at least between 1916 and 1921, as a residence for the Locomotive Works Manager of the Eveleigh Railway Workshops.⁷ In 1923, it burnt down and its remains were demolished in 1924.⁸ An SRA Plan Room index card, sighted in 1995, referred to Mr Howe's residence and is notated "formerly Calder House". The plan, however, could not be located.

The site for the Eveleigh railway workshops (Chisholm's grant) was chosen in 1875, and the estate, by this time reduced to 10 acres, was resumed in 1878 with the compensation price settled in 1880. Clearance began two years later and development continued into the 1890s.



Figure 3.8: Calder House in 1921. Etching by Sydney Ure Smith. It housed the managers of the Eveleigh Railway workshops and burnt down in 1921. The roof line in this etching matches the one identified as Calder House as seen in the 1920 photograph of the Tarpaulin Shed (see Fig. 3.31). Source: ML PXN 670, DC* D43.



Figure 3.9: Though published as Calder House, the authors of this report believe this is not correct. Source: Sharpe 1999: 78.

The first Eveleigh Railway Station was built in about 1876 in the approximate location of the existing Illawarra Drive. In c. 1886-87, the second Eveleigh Station (the current Redfern Station) was built further to the north east. It was re-named Redfern Station in 1906 when the new Sydney Terminal (the current Sydney/Central Station) was completed.⁹

Later improvements in rail and tram transport systems created a network as far as St. Peters and Marrickville in which working class residences were built within the vicinity of industry. When the same transport networks extended further south, the middle classes were able to move away from the city and the disease bearing *miasmas* therein.

The residential development of the area proceeded in the 1870s and 1880s around the railway workshop and was stimulated by the need for housing generated by the workshops. The names of many early settlers are continued in street names in the area, including Eveleigh, and many of the property boundaries and former watercourses are reflected in street patterns.



Figure 3.10: The 1855 rail line bisecting Chisholm's estate is shown on this detail of a Parish Map of Petersham, c. 1855-60. The property has not yet been purchased for the railyards. Source: ISSN 1441-6352 Volume PMAPMNO4, Parish Maps CD, County of Cumberland, Parish of Petersham, 14072901, written on the map is AO Map 262.

Figure 3.11: 1889 Higinbotham and Robinson map of Redfern in the Parishes of Alexandria and Petersham. The "Eveleigh Railway Yards" are shown. Eveleigh Railway Station, later to become Redfern, on the northeast of where the workshops are. Calder House is in the centre of the map. Source: ML ZM3 811.1819/1889/1 Sh 1(2).



At the time of the development of the railway workshops, Darlington School was also built as were other municipal buildings (now demolished for the University). The suburb of Darlington was named after the English town on the first steam railway in the world and a photo of the first locomotive on the Stockton Darlington railway hung in Darlington School until it was resumed by the University.

The site continued to develop and in c. 1917 additional land was resumed to the south-west and 230 houses were demolished to allow for the construction of the Alexandria Goods Yard. This land roughly approximates the land at the lower level of the ATP site bounded by Henderson Road to the south. Further land (and houses) were resumed for the Eastern Suburbs Railway in 1960.



Figure 3.12: The initial buildings of the Railways are shown at the top of this map. The lower part of the map shows the Shea's Creek (Alexandria) Canal. Detail of a Parish Map of Alexandria, c.1915. Source: ISSN 1441-6352 Volume PMAPMNO4, Parish Maps CD, County of Cumberland, Parish of Petersham, 14036802.



Figure 3.13: The initial buildings of the workshops are shown in this detail of the c. 1915 Parish Map, map including the now demolished running sheds. The land resumed for the Alexandria Goods Yard is shown shaded (in red on the original) over the existing housing development. The land later resumed for the eastern suburbs railway is between the red area and Henderson Road, immediately to the south. Detail of a Parish Map of Alexandria, c.1915. Source: ISSN 1441-6352 Volume PMAPMNO4, Parish Maps CD, County of Cumberland, Parish of Petersham, 14036802.

The archaeological report for the Carriage Workshops site concludes that, "The archaeological potential for Aboriginal sites or artefacts is therefore considered to be low" and for "historic sites or artefacts is therefore considered to be nil".¹⁰ Similarly, the archaeological report prepared for part of the ATP site concluded that the level of ground disturbance has left little evidence of the 1835-1880 phase of occupation. Calder House was spared because of its location at the north of the site and at a higher level. The residential occupation of the later nineteenth century and "the cutting and filling carried out for railway purposes is likely to have disturbed and/or destroyed that evidence leaving, at best, fragmentary features and deposits".¹¹ It may therefore be inferred also that little evidence of pre-contact Aboriginal occupation would remain on the site.

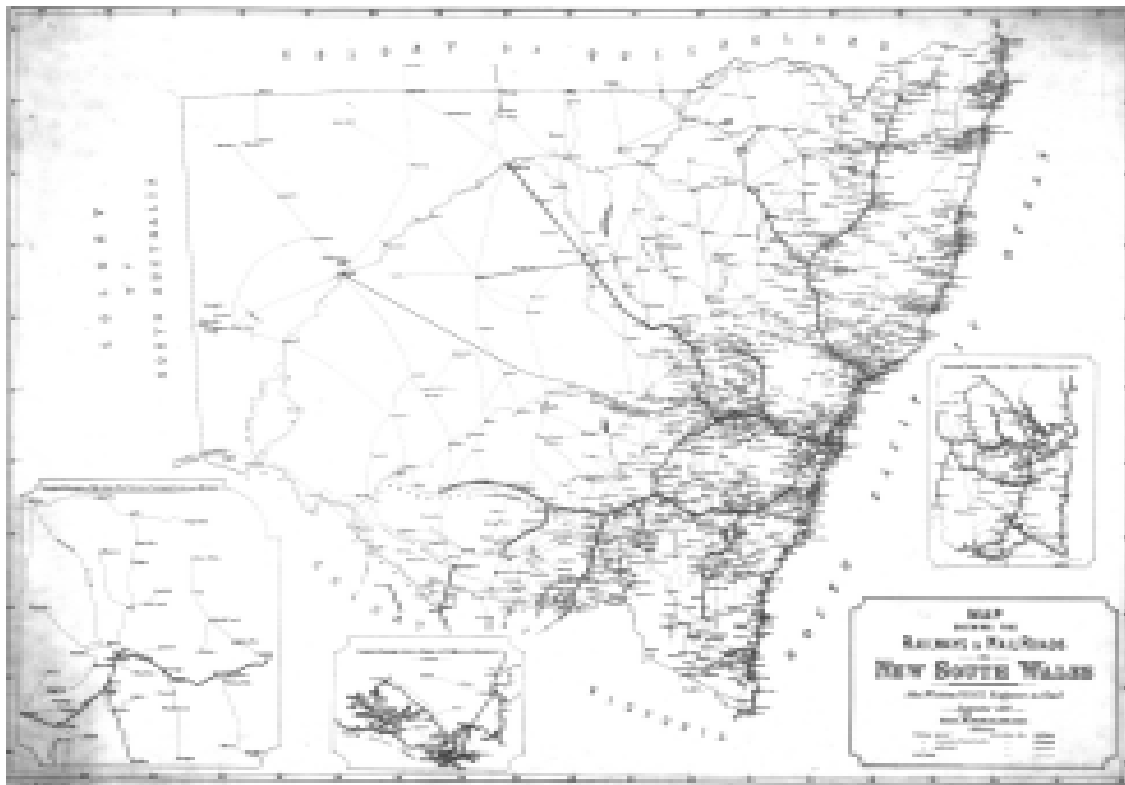
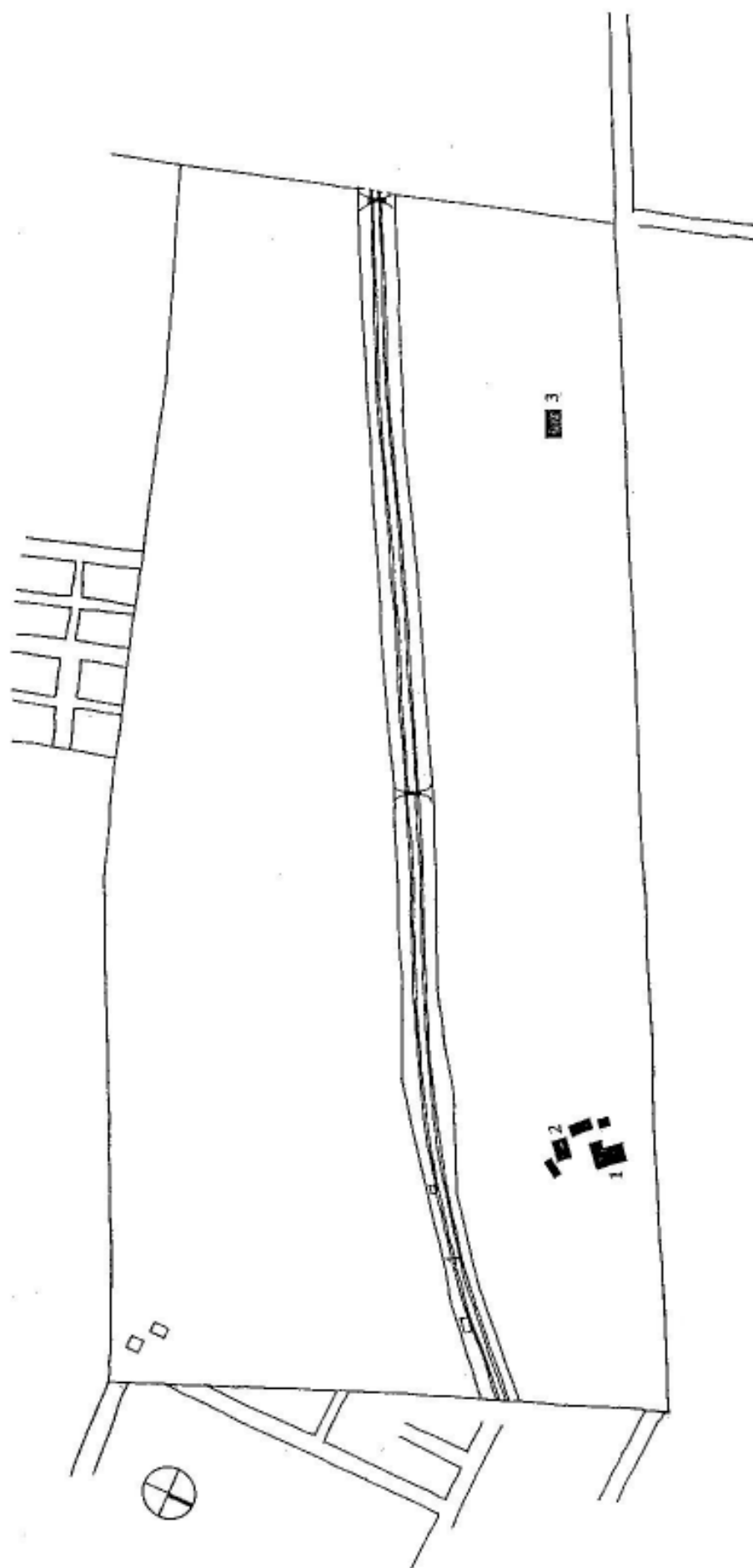


Figure 3.14: An 1887 map of Railways and Mail Roads of New South Wales during John Williams' time as CME. Source: ML ZM3 810GM/1887/1.



PHASES OF DEVELOPMENT PLAN, 1855
Source: DPWS, 1998

Plan 3.0

3.1.4 EARLY DEVELOPMENT OF THE NEW SOUTH WALES RAIL SYSTEM

The first steam-hauled public passenger railway in the world, England's Stockton to Darlington Railway, opened in 1825 and operated with steam locomotives on iron rails.¹ A boom in British railway construction followed the building of this railway and, in the five years to 1850, about 6,000 km of rail was laid in England by private railway operators.²

A huge volume of railway bills was put before the British Parliament in the years following 1845, including several proposing the laying of lines in Australia, but none of these bills led directly to any railway construction work in the colony. In 1846, however, some ultimately fruitful discussions commenced in Sydney³ and in October 1849 the Sydney Railway Act was passed. The Act authorised the Sydney Railway Company to build a railway from Sydney to Goulburn and towards Bathurst. Finally, on the 3rd of July 1850, the first turf for the Sydney Railway was turned in the Cleveland Paddock that lay near the end of Platform 3/4 at Sydney Central Station.⁴

Several disputes regarding gauge, engineering standards and rail type were to follow but, after borrowing extra capital from the Government, the Sydney Railway Company was able to send an order for rails and rolling stock to England in 1853. The 3,776 tons of Barlow patent rolled iron hollow rails, 4 locomotives, 8 first, 12 second and 12 third class passenger cars and 60 assorted goods wagons and vans subsequently arrived between October 1854 and January 1855.⁵

Following a series of further loans from the Government and its continuing failure to raise enough funds for completion, the Sydney Railway Company's shareholders accepted the Government's offer to take over their investment on 3rd January 1855. By the time Sydney's first Railway finally opened on 26th September it was a Government owned enterprise, the first Government owned railway in what was then the British Empire.⁶

Initially, a line between the original city terminus in Devonshire Street, which was at the time a street following the line of the present pedestrian subway under the Sydney Terminal (Central Station), and Parramatta was constructed. Although it was completed in August 1855, it was not opened until the end of September because of delays in the completion of the temporary corrugated iron and timber passenger stations. The Sydney Terminal replaced these structures in 1874.⁷

When the line opened (initially for passengers only) there were four trains, including first, second and third class carriages, each day except Sunday. The line was originally double-tracked as far as Newtown and single tracked beyond but it was duplicated soon after its opening. The line to Liverpool was completed a year later.⁸ In addition, a short branch line was built to Darling Harbour to allow goods to be transferred to waiting ships.

Once the benefits of railways had been appreciated, the people of NSW, and particularly their politicians, urged the building of more and more lines inland. In 1860 the Chief Mechanical Engineer, John Whitton, submitted plans for a new phase in Railway construction to extend lines to country areas. During the mid 1870s, rail lines were being pushed by political urgency to country grazing areas. Lines from Sydney extended south to Goulburn (1869) and west to Raglan (near Bathurst) in 1873 with a short north west branch to Richmond (1864).⁹ An Act enabling the construction of a Northern Railway was passed in 1881 and the line was opened in 1889. Long extensions were built to Hay in 1882 and Bourke in 1885 to tap competing river traffic and bring produce to Sydney for export.

Lines were extended to the borders of New South Wales to join with the railways of different gauges at Albury (for Melbourne) in 1881 and Wallangarra (for Brisbane) in 1888. The problem of the difference in rail gauge between NSW and the other colonies was recognised as early as 1855 but the possibility of linking Sydney directly with the other capitals by rail was considered remote because most interstate trade was still by sea and river.

Suburban traffic around Sydney was also increasing, requiring the construction of more stations and carriages to handle the greater and greater number of trains.

By 1879, when planning for new Eveleigh workshops commenced, the NSW Railway system had on its books 177 steam locomotives, 444 coaching vehicles and 3,867 goods wagons.¹⁰



Figure 3.15: The Railway Station Redfern, 1893, Sir Arthur Streeton. At this time, Central Station was called Redfern and modern Redfern Station was called Eveleigh. Source: Smith 1995: 97.

3.1.5 SYDNEY'S FIRST RAILWAY YARDS

The first railway workshop buildings in Sydney were located adjacent to the original 1855 Sydney railway terminal fronting Devonshire Street. Devonshire Street followed the same alignment as the current pedestrian subway under Railway Square and the Sydney Terminal. In the 1860s, a substantial, two-storey sandstone workshop building with a slate roof and arched openings to both floors was built on the site.

At the time, the area where the terminal was located was part of the suburb of Redfern. The complex was sometimes referred to as Redfern Station, for example in Streeton's painting. By 1864, the yards had expanded and a workshop, forge and engine shed were all connected by rail to a turntable. A carriage shed, goods shed and meat storage shed were also included in the complex.¹ By 1865 a timber extension had been constructed over a section of track to allow locomotives to be worked on under cover.²

To work the ever expanding rail system, an increasing number of goods and coaching vehicles was being built by firms such as Hudson Bros. at Redfern, and Russell & Co. in the CBD. In addition, some vehicles were imported from England. The number of locomotives, which were being imported from England and the United States, was also rising.

As the system grew, the whole of the area southwest of the Devonshire Street terminal became a maze of railway lines, buildings, sidings, workshops and offices and also included the stone goods shed. Competing for space were the functions of repairing and repainting rolling stock, carrying out everyday locomotive maintenance, storing carriages and collecting and distributing goods.

A panorama of Redfern Railway yard drawn in 1870 (figure 3.18) shows how the complex had expanded since 1855. A more substantial brick passenger station was erected c. 1874. The carriage shed and the engine shed (both pre 1865) and the elaborately detailed single storey goods shed (by 1870) have a characteristic gable form. None of the workshop buildings is more than two bays wide. The form of workshop buildings is similar to that employed in England, although stone was more widely used as a building material in Sydney.

By the 1870s buildings were being constructed in polychromatic brickwork as well as the traditional sandstone. The railways were one of the main users of brick, not only for their buildings but also for retaining walls, viaducts and bridges.



Figure 3.16: Redfern Railway Workshops in 1871. View looking to South West. Note the early carriage and wagons in the foreground. Source: NSWGR, 'Railways of NSW 1855-1955', p. 93.



Figure 3.17: Redfern Railway Yards in the 1870s. View to the North East. The design of these sheds is typical for the type and they are similar to contemporary English models. Source: Lee, 'The Greatest Public Work', p. 71.

In 1857, a separate railway line was opened linking Maitland with Newcastle. This line was extended allowing for the export of coal. Workshops were erected at Honeysuckle, Newcastle, to serve this line. A similar gable ended form to the Redfern yard, which generally enclosed two lines, was constructed. A separate workshop was required at Newcastle prior to the construction of the Great Northern Railway in 1889 as there was no rail link between the Sydney network and the Newcastle line.

John Whitton was responsible for the major restructuring of the rail system which resulted in the resumption of land at Eveleigh and the relocation of the old Redfern workshops to this site and the subsequent expansion of lines and building of Sydney Terminal (Central). George Cowdery, Engineer for Existing Lines, executed the detailed design at Eveleigh.

In 1874, Whitton's new, larger, Sydney Terminal building was completed, taking up more of the area. By the mid-1870s, the station building required extra platforms and by the early 1880s they were consuming even more of the limited space around the site. The place had become congested and dangerous to operate.

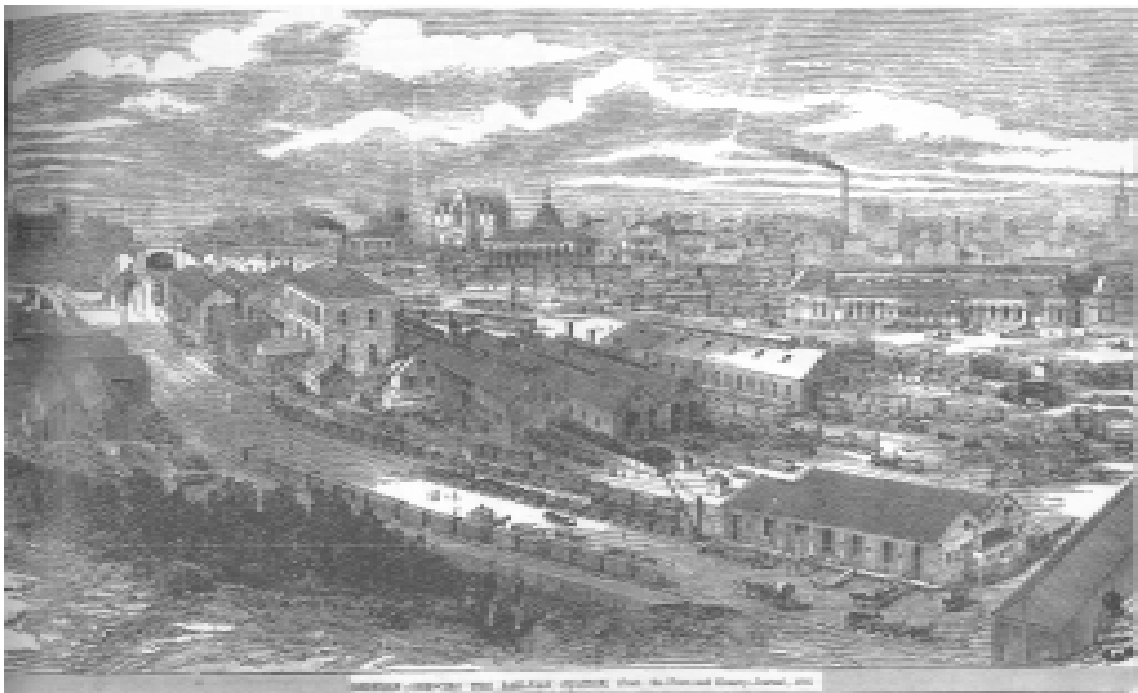


Figure 3.18: Panorama of the Redfern Railway Yards, 1870. The print at the bottom of the etching reads, "Redfern shewing the railway station, from the Town and Country Journal 1870". Source: Ashton et al 2000: 37.

3.1.6 INITIAL DEVELOPMENT OF THE EVELEIGH RAILWAY WORKSHOPS

NSW railway engineers of the 1870s and 1880s had all been trained on various British railway systems. They were therefore well aware of the British practice of private railway companies building and maintaining their own equipment in their own workshops. Some of the workshops with which they would have been familiar are Swindon (former Great Western Railway), Crewe (former London and North Western Railway), Doncaster (former Great Northern Railway), York and Darlington (former North Eastern Railway).

From 1874 to 1876, William Scott, New South Wales' Locomotive Foreman, was complaining about the inadequacy of the small and congested existing workshops for maintaining the growing number of vehicles in the New South Wales Government Railway's fleet.

The Chief Engineer of the NSW Railways, Mr John Whitton, concurred with Scott's numerous requests for improved workshop accommodation. Clearly he agreed that new facilities were a most pressing requirement, writing on 21st April 1876 'I again call the Commissioner's attention to my minute ...with reference to the increased accommodation ... urgently required at the Sydney Station. Urgent and important'.¹ On 25th November 1875, Whitton wrote to his Commissioner to propose the purchase of the Chisholm Estate, just beyond the Redfern tunnel, as the site for the new workshops.²

Further similar representations from Whitton to the Commissioner³ followed in August 1876 but the Minister for Public Works, John Lackey, supported a plan placed before Cabinet to purchase land at Duck River (near Auburn) adjoining both sides of the Sydney-Parramatta railway line. This 83 acres (34 hectares) of land was bought on 27th November 1876.⁴ The land was cheap but Whitton and Mason (the Engineer for Existing Lines) were agreed in condemning it as unsuitable.⁵

Other proposals were investigated and the Commissioner, Charles Goodchap, considered moving the workshops to Penrith, Picton or Liverpool. Several country towns, Murrurundi, Blayney, Orange and Dubbo, proposed themselves as suitable sites and P.N. Russell and Company, who manufactured rolling stock at Darling Harbour, also offered their site.⁶

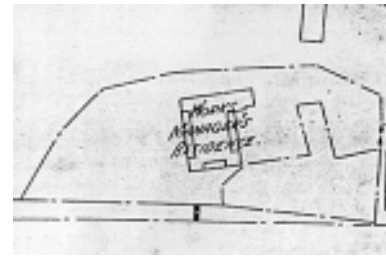


Figure 3.19: Detail of a plan of the Signal Engineer's Workshops, Redfern, 1921, showing Calder House in use as the Works Manager's Residence. Source: SRAO Drawing FO 1360 N55.

Mr R. H. Burnett was appointed as Locomotive Engineer on 1st September, 1878, and almost immediately wrote to his Commissioner of the need for improved workshops to take up a serious backlog of maintenance on engines and vehicles.⁷ In the Annual Report of 1879, Burnett *"pointed to the disadvantages he [laboured] under...from the want of adequate workshop accommodation"* and advised that *"additional workshop accommodation [was being built] at Newcastle, Penrith, Bathurst and Goulburn"*.⁸ This proved to be a short-sighted move as by 1889 it was recommended that surplus woodworking machines at country locations be transferred to the then new Eveleigh Workshops.⁹ E.M.G Eddy had become Commissioner in October 1888 and undertaken a major review in order to overcome obvious shortcomings.

Burnett also advised of a *"pressing matter [which] requires notice, viz - the need for proper sheds, impervious to dust, in which the painting of the engines and carriages can be properly done. No suitable accommodation exists at present, and to attempt to carry on, in the open air, any but the most pressing work, is merely a waste of time and material. In the event of a dust storm arising while the paint or varnish is wet the work is spoiled."*¹⁰

He agreed with Scott, Whitton and Mason that the Duck River land was unsuitable and also supported the purchase of the Chisholm Estate for the purpose.

Finally, in July 1879, Parliament voted 100,000 pounds to purchase and level the Chisholm Estate, a 62 ¼ acre (23.2 hectare) undeveloped piece of land just to the west of the present Redfern station. This land stretched along both sides of the then Sydney to Parramatta rail line, extending from Wilson Street, Erskineville on the north to Henderson Road on the south and from the present Redfern to the present Macdonaldtown stations.¹¹

The Duck River land was later put to use for goods marshalling yards and, from about 1909, a new workshops for goods wagons was built there and this work was removed from the Eveleigh Carriage and Wagon Workshops.

In 1880, Parliament voted 250,000 pounds to build and equip the workshops and the work approved was described as follows in the Railways Annual Report of 1881.¹²

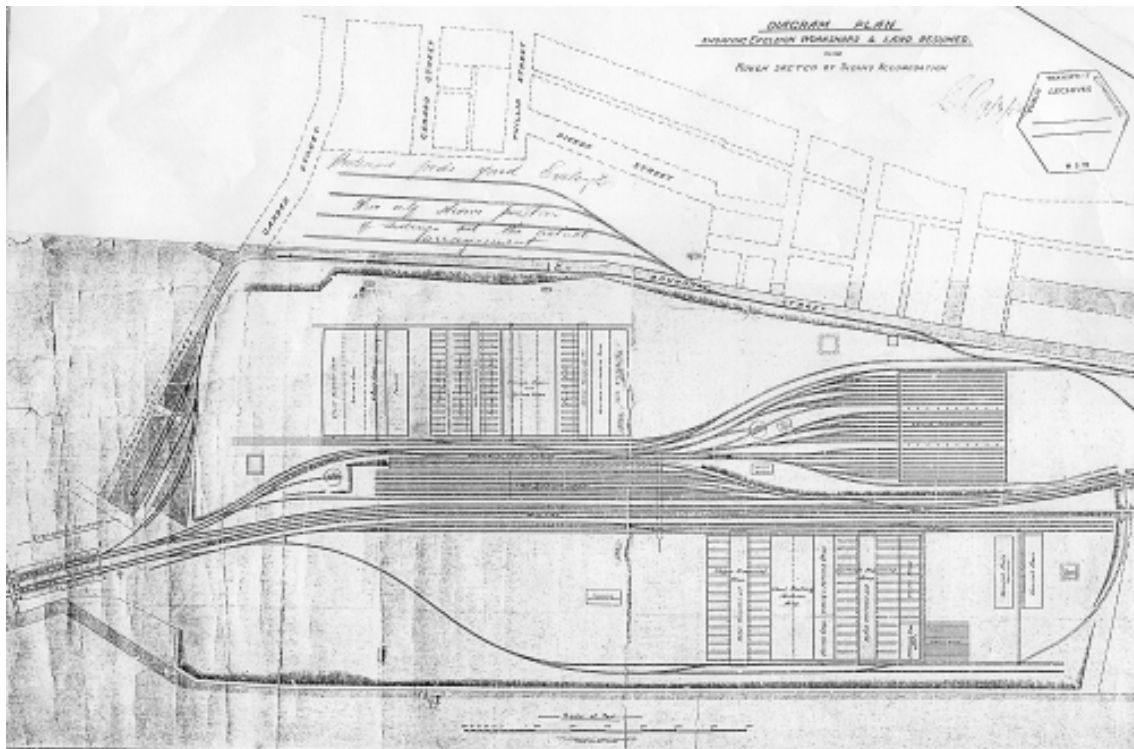


Figure 3.20: Plan of the Proposed Eveleigh Workshops, probably taken from the Railways Annual Report of 1881. At the bottom of the plan is the main Carriage and Wagon Workshops building with, to the west, the two stores and, to the east, the Locomotive Engineer's Office. This office was never built and, instead, the Paint Shop was constructed in this location. The plan also shows a wheel store to the west of the main workshops building, the stores buildings further west and a rail underpass at the far western end of the site. Source: SRAO EW 2.

On the south side of the railway line (the 'down line' side) the following were to be built:

- (a) a running shed (a depot to service, coal, water and prepare engines for every day operation)
- (b) workshops to repair all the engines, boilers, tenders utilising the related 'black' (i.e. ironworking) trades associated with working on iron and steel in machines
- (c) a shunting yard for placing goods wagons for loading and unloading south of the above two areas closer to Henderson Road, and on the north side of the railway line (the 'up line' side)
- (d) 'Carriage and waggon repairing shops in a block of buildings 600 x 350 feet, containing waggon repairing shops, wood working machine shop, fitting and turning shop, smiths' shop, carriage repairing shop, paint shop, trimming shop, and stores. The whole of these shops will be amply fitted and provided with all the necessary machinery and appliances that may be required for the description of work to be performed. Communication of the shops with sidings and main lines will be effected by means of two steam travellers, by which the carriages and waggons can be deposited where required'¹³

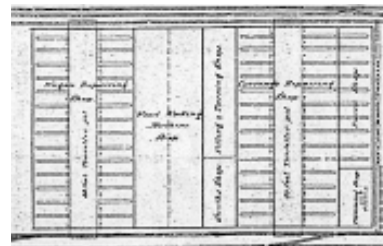


Figure 3.21: Detail of the above drawing showing the ten bays of the main workshop building.

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- (e) *"The general Railway Stores, which are now being constructed, will consist of one main building 200 feet x 50 feet, and one open shed also 200 feet x 50 feet, also detached office buildings for the storekeeper and his staff. The stores will be fitted up in the most convenient manner, and will communicate with the main lines and workshops by means of sidings and turn-tables"*¹⁴
- (f) Space for expansion: *"It will be noticed from the plan of general arrangement that ample space is still available on the western side for extension of, or additional workshops, when required"*¹⁵
- (g) Locomotive Engineer's Offices, a two-storey building 100 feet x 50 feet, containing offices for the Locomotive Engineer, Locomotive Overseer, Locomotive Inspector and the professional and clerical staff, etc., in connection with the department. From the position of the building it commands a good view of the whole of the yard.¹⁶ In the plan accompanying the report, the building is shown as being located in the centre of the original portion of the Paint Shop, some distance from its eventual location on the Wilson Street boundary.

The 1881 Annual Report also described the general arrangement of the features listed above:

*"The workshops will be situated on both sides of the line between Eveleigh [now Redfern station] and Macdonald Town [sic], the area set apart for them being about 60 acres ... The locomotive works, running sheds and shunting yard, etc., will be situated on the eastern side of the main lines, while the carriage and waggon shops, and the general railway stores will be situated on the western side."*¹⁷

*"The main point aimed at in planning the general scheme has been to arrange the different shops and branches in such a way that while the communication of the whole with the main lines will be free and unobstructed, the access to the several divisions will be effected without interfering with each other. Thus it will be seen from the plan that the several workshops, running sheds, shunting yards and general stores, etc., can separately communicate with the main lines, without in any way interfering with the traffic on those, or interfere with the traffic to or from each other."*¹⁸

3.1.7 CONSTRUCTION OF THE EVELEIGH CARRIAGE AND WAGON SHOPS

INITIAL PHASE OF DEVELOPMENT C. 1881 TO C. 1895.

The workshops detailed in the Annual Report for 1881 were soon started in stages, but even in the 1882 Annual Report¹, comment was still being made by the acting Locomotive Engineer, Thomas Middleton, about the 'great inconvenience suffered by this branch owing to the want of room at the workshops'.² Middleton was obviously doing his best to instill more urgency into his masters.

During 1882, excavations and levelling for the workshops were carried out and the office and stores buildings at the far end of the site, near Macdonaldtown station were "nearly completed".³ Three new sidings were linked to the up main line, presumably, so that the delivery of materials and removal of spoil would be easier.⁴

In addition, the report notes that a new carriage shed with asphalted floor and "water laid on" had been erected. Presumably the construction of this shed was an interim measure to solve the space problems at the Sydney Yards but is unclear which building this refers to. It was certainly not the current Carriage Workshops building on which construction commenced in 1885. It is possible, however, that it was the building which on various plans was named 'Tender Shed' and 'Old Paint Shop'. This building, now demolished, was located at the western end of Redfern Station Platform 1 and appears on some of the earliest plans of the site. There were three other sheds in this area at the time, but none of these others had tracks running into it to allow carriages or wagons to be repaired under cover.

During 1883 and 1884, the appendices to the annual reports made references to wagons and carriages being repaired at Eveleigh. In 1883, the "recent removal of the work of repairing waggons from the Redfern yard to Eveleigh was not at first productive of any beneficial result ... as the transfer had to be made before the necessary preparations at Eveleigh were complete, the removal being necessitated by the urgent demands of the Traffic Branch for more accommodation at Redfern".⁵ The report also cited the expense of having to contract out the repair of 100 'D' wagons because the workshops had insufficient space to handle the task.⁶

In 1884, it was remarked that the "considerable quantity of repairs to our rolling stock to be done at Eveleigh has been a source of great expense and inconvenience owing to the distance from our workshops [i.e. at the Redfern yards]". The report did note some progress in carriage work, however, recording that 56 carriages had been thoroughly renovated during the year.⁷

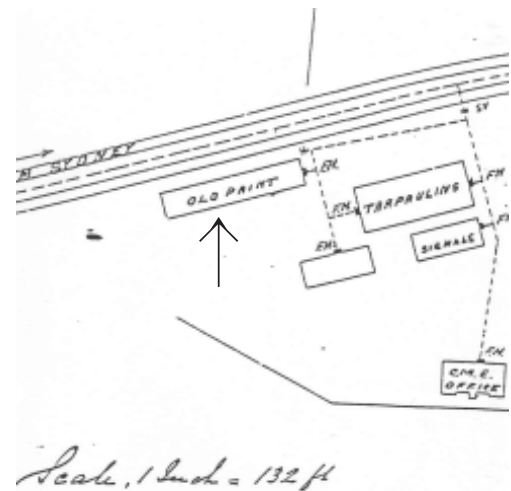


Figure 3.22: Detail from a plan of 1893 showing the 'Old Paint' workshop (indicated by arrow). This may have been the carriage shed referred to in the Annual Report for 1881 and hence one of the earliest buildings on the site. Other plans show tracks running into this building. Source: SRAO Drawing 4224.

The new office and stores were completed during 1883 and they were supplied with water and gas. Three water closets and urinals were also erected for the Stores Branch. The stores were fitted with a 3 ton and a 10 ton crane and a box was erected for the 'store watchman'. A new oil store and platform were completed, as well as some further temporary platforms.⁸ These were all timber buildings.

Sidings were also laid in to the stores and two small wagon turntables fixed. Further sidings were laid along almost the entire length of the site and new turntables, cranes and platforms were also erected. All of these would have been provided to handle the loading and unloading of wagons.⁹

A particular point of interest in the 1884 report was the completion of "*a subway at Eveleigh*"¹⁰ although no details are given. This is the only subway in the area, so one can assume that this refers to the tunnel which, although out of use is still in place under the lines. It was originally built to enable small goods wagons, carrying material and goods from the stores, to be moved from one side of the line to the other. A wagon turntable was provided at each end of the tunnel to allow the direction of travel of the wagons to move through 90 degrees.



Figure 3.23: Photograph of the wagon turntable located at the southern (Locomotive Works) side of the access tunnel under the main lines with the Running Shed (now demolished) in the background. c. 1884. Source: ML Videodisc GPO 1.

The plan attached to the 1881 Annual Report shows that this tunnel was not proposed as part of the original scheme. Instead, the Stores were to be made accessible to the Locomotive Workshops via a cutting, tunnel, track and turntable at the far western end of the Carriage and Wagon side of the yards.

A contract for erection of the foundations and pits of the Car and Wagon Workshops was let in January 1885 to Harold Norris¹¹ who completed the work during that year.¹²

Work on the Carriage and Wagon Workshops continued in 1886 with the laying in of access lines to the two internal traversers in bays 17 and 23.¹³

The drawings entitled 'Contract 9a, Details of Columns, Crane and Flooring Girders'¹⁴ and 'Roofs Columns and Crane Girders Shops 16 to 25'¹⁵ were signed in February 1886. Contract No. 9b Drawings 1, 2 and 3, for the 'Superstructure Shops 16 to 25' (Fig 3.26) and 'Details of Superstructure' were signed on 8th August 1887. Tenders had been called for this part of the project on 20th April 1887.¹⁶

It was reported that the main building enclosing bays 16 to 25 of the Carriage and Wagon Workshops was completed by October 1888¹⁷ at a cost of £ 77,013. The new building had the capacity to handle 40 carriages and 56 wagons.¹⁸

Figure 3.24 is the 1889 diagram of the Workshops.¹⁹ It shows the original configuration and broadly how the workshops and yards operated. In the main Carriage and Wagon Workshops building, below the main railway lines, are Bays 16-25 (later called Bays 1-10). The Paint Shop is located to its left and Stores 1 and 2, the Timber Shed and the Stores Office to its right. The Locomotive Engineer's Office, Calder House and the Locomotive water tanks are shown on the plan and could be seen from Wilson Street. The site is bisected by the main lines with the Paint Shop and Carriage Shops to the north and the Locomotive Shop and Engine Running Shed to the south.²⁰

During 1884, the majority of the fan of sidings to serve the Paint Shop had been laid in.²¹ As were the sidings on both sides of the main Carriage and Wagon Workshops building. More sidings were laid in to the Paint Shop during 1885-86.²²

The completion date of the Paint Shop itself is unclear and it seems that it was not part of the original scheme for the site. The 1880 Annual Report, which lists the buildings for which Parliament had voted £ 250,000, does not mention the Paint Shop. In addition, both the 1881²³ and 1884²⁴ drawings of the Carriage and Wagon Workshops mark Bay 25 of the main building as an area for painting and trimming and show no further area for painting.

By the time the superstructure drawing for the Carriage and Wagon Workshops (Figures 3.25 & 3.26) was completed in about April 1887, Bay 25 was named 'Store and Trimming Shop', suggesting that the decision had been taken to move the painting function elsewhere.²⁵ The 1887 drawing²⁶ shows a building in the location of the Paint Shop although it is named 'Engine Shed'. It appears that by this time the decision to build a separate, larger facility for painting had been taken.

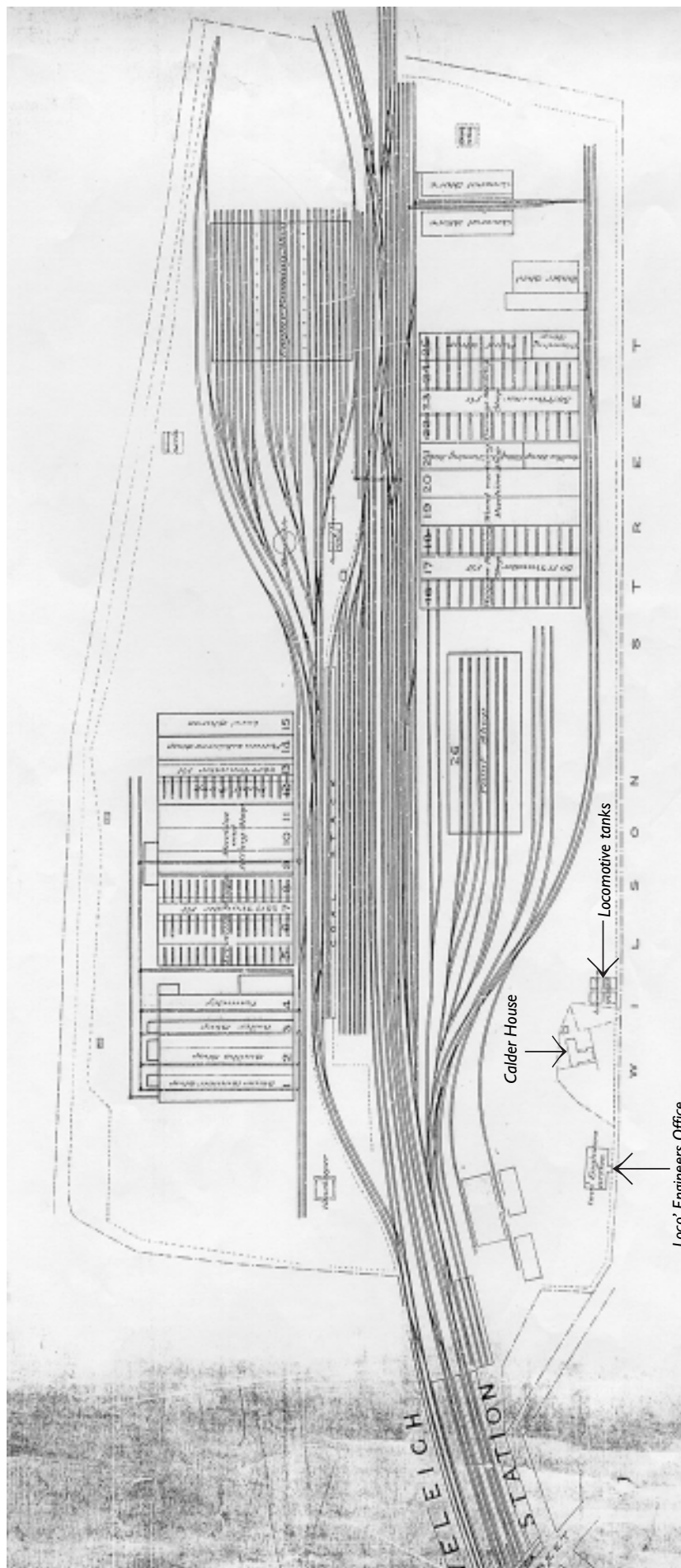


Figure 3.24: Plan of the Eveleigh Carriage and Wagon Workshops dated c. 1889. Note that the bays in the Locomotive Workshop (above the main lines) are numbered 1-15 and those of the Carriage and Wagon Workshops (below the main lines) are numbered 16-25. This numbering system remained in the Locomotive Workshop but was later changed at the Carriage and Wagon Workshops so that the bays were numbered 1-10. This plan shows the Paint Shop as built, and the Chief Engineer's office. Note that two rail lines feed directly into the east end of the Carriage Works Building. Source: SRAO EW 7.

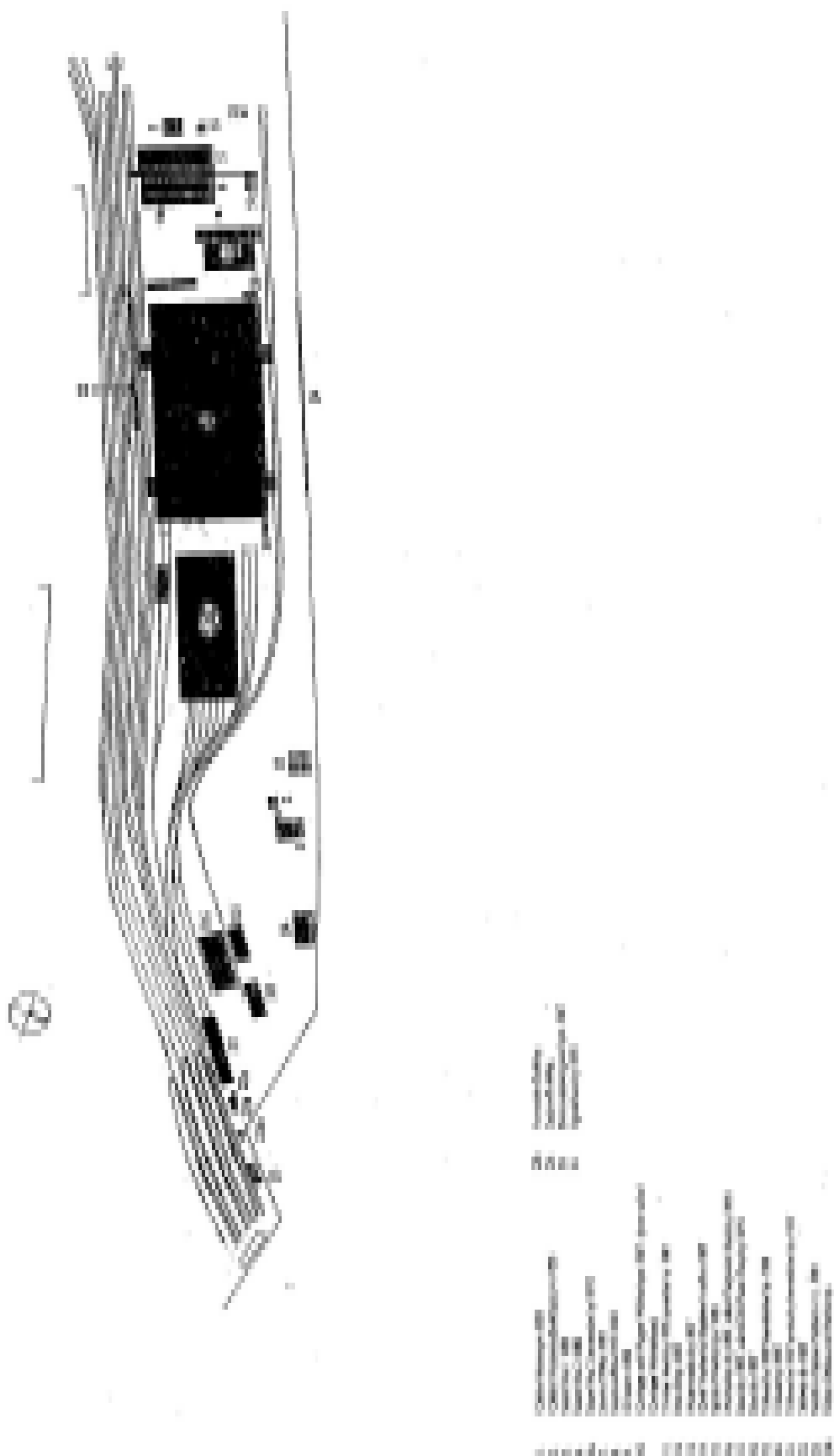
- b) A building beside and behind Platform 1 at Redfern Station, known as the Tender Shop, probably used for painting locomotives and their tenders. There was not yet any other accommodation on the site for that work so the major painting work for the entire system had to be carried out on the carriage and wagon side of the works. This building may have been used for carriage repair work before the main workshops were completed (*Refer to Initial Phase of Development c. 1881 to c. 1895 above*),
- c) Three 'Iron Sheds' (two of which by 1893 housed Tarpaulins and Signals) at the eastern end of the site near the Tender Shop, pre 1887,
- d) Calder House pre 1855,
- e) Water Tanks adjacent to Calder House probably by 1887,
- f) The Paint Shop probably by 1888 or early 1889,
- g) The Carriage and Wagon Workshops bays 1 – 10 (16 – 25) including the two traversers, completed 1888,
- h) Stores 1 and 2 at the western end of the site and their separate office building completed by 1883,
- i) An oil store near Stores 1 and 2 completed 1883,
- j) The tunnel and turntables connecting the Carriage and Wagon Workshops and Stores with the Locomotive Workshops on the southern side of the railway lines, completed 1884,
- k) Signal box at the south western corner of the Carriage and Wagon Workshops completed by 1895,
- l) Redfern Station Platform 1 and its buildings, probably c. 1884.

Sometime during the 1880s the Workshops were fitted out with machinery, although no specific documentary evidence for this, apart from the more general construction drawings, has been found.

The machinery would have included the overhead travelling cranes, woodworking and smiths' machinery driven by steam power from steam engines via line shafts and belt drives.

The railway lines were then added to and altered. The two lines running from Sydney terminal to Parramatta were duplicated from the west of Redfern Station (then still called Eveleigh Station) when the Illawarra line to Hurstville was opened in August 1884.

Plan 3.1: PHASES OF DEVELOPMENT PLAN,
1895 Heritage Group DPWS, 1998.



These two new lines were extended from Redfern to Sydney Terminal in 1888-89 and the two lines to Parramatta were then quadrupled as far as Homebush in 1892. Subsequently, in 1891 another two running lines were constructed from near Sydney Terminal to the Illawarra Junction, located between the two major workshops at Eveleigh. The main line was finally increased to 10 tracks in 1927 to allow the divergence of the Illawarra line.

As carriages and wagons had timber bodies, the Carriage and Wagon Workshops were primarily woodworking shops and continued as such throughout their life. Iron, and then steel, underframes were introduced in 1869 and 1890 respectively and the number of metal as opposed to timber components in carriages rose over time. It will be explained in later sections that this technological change affected the viability of the Eveleigh Carriage Workshops and contributed to their closure.

THE CHARACTER OF THE ORIGINAL BUILDINGS

This collection of buildings demonstrated the pinnacle of design and construction quality on the Carriage and Wagon Workshops side of the Eveleigh site. The Carriage and Wagon Workshops and Paint Shop not only demonstrated the most up-to-date iron and steel technology but were given brick facades of a high quality, both in aesthetic and technical terms. The timber structures of the Stores Buildings were comparably well detailed. The Chief Mechanical Engineer's building, which still commands the site from the hill adjacent to Wilson Street, was perhaps the grandest of the group and is a fine example of a late Victorian railway office building.

Perhaps the fact that the Government was able to justify the substantial expense for these carefully detailed and solidly constructed buildings reflected the fascination of the public with this still new and developing technology. In addition, the project was highly visible to commuters and it seems likely that the Government wished to provide a showcase for its investment in this new technology. At the time, the project may have had the glamorous image that the Olympics site does today. There certainly seems to be no evidence of public complaint about the sums being spent on the railways. On the contrary, politicians were lobbied regularly for new lines and services during this period.

The quality of the buildings probably also reflects that they were designed and built during the boom period of the 1880s when obtaining funding for construction was presumably relatively easy.

The esteem in which the railway was held and the sentiment with which it was regarded is evident in the report of the opening day of the railway, which referred to it as the 'great agent of civilization, the best and most effective servant of progress' and *'the liveried vassal of civilized Europe'*.²⁸



Plan 3.2

"Railway Yards Eveleigh", Sheets Nos 1-4,
Note that at the top centre of this drawing the brick retaining
wall is shown.
Original Drawing c.1888, updated 1895.
Source: SRAO 5/3.



Figure 3.27: Chief Mechanical Engineer's Offices, Wilson Street. Undated (post 1900) view from North East. Source: SRAO.

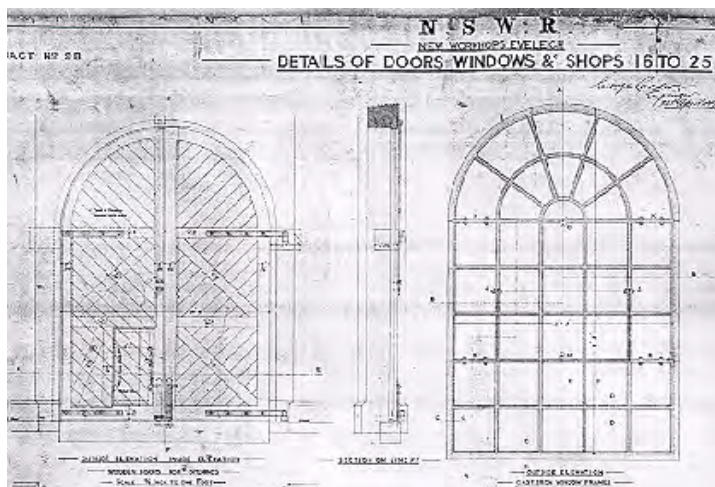


Figure 3.28: Detail of Doors and Windows, Shops 16 to 25. Source: SRAO Drawing 39/73.

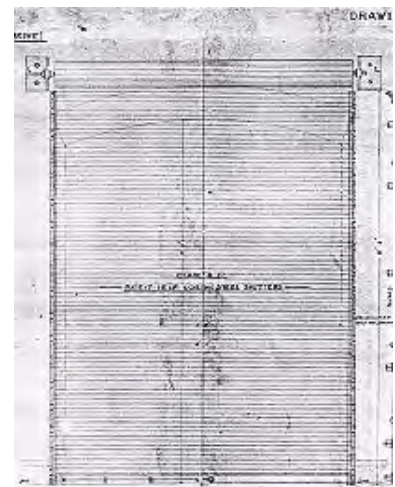


Figure 3.29: 'Clark and Co. Patent Self Coiling Steel Shutter', from drawing titled 'Details of Doors, Windows & Shops 16 to 25' drawn 1887. Source: SRAO Drawing 39/73.

3.1.8 CARRIAGEWORKS EXPANSION 1895 TO 1927

Further developments at the Eveleigh Carriage and Wagon Workshops continued right through the life of the site but the bulk of the major alterations and additions were completed in the years up to about 1927.

In contrast to the first phase of development, later developments were, with a few exceptions, characterised by smaller scale, cheaper or more temporary solutions to the space problems that inevitably arose as the fleet of carriages and wagons continued to grow and change. This also suggests that railways management favoured the development of newer workshop sites, such as those at Chullora and Cardiff (near Newcastle and which were steam locomotive workshops).

The General Store (now called the Clothing Store), Telegraph Workshop (now called the Telecommunications Equipment Store) and the southern facade of the Carriage Shop Paddock extension (now called the Cable Store), are the only buildings from this second phase of development which came close to matching the quality of the earlier buildings on the site. The reasons for the more substantial construction of the General Store and Telegraph Workshop are not clear. Possibly they were built in masonry because their functions determined that they needed to be more secure than the other buildings erected during the period. Alternatively, it may have been because they were smaller, were perceived as less industrial in nature or were constructed by the Signalling Branch instead of the major occupier of the site, the Mechanical Branch.

Figure 3.30: Early photograph of the site taken from the southeast in about 1912. The sawtooth roof of the Paint Shop can clearly be seen, as can the 1912 Paint Shop Extension (called Suburban Car Workshops) to its right. Note the wagons awaiting attention in the yard in front of the Paint Shop. The photo was taken before all wagon repair work had been transferred to Clyde. Source: SRAO

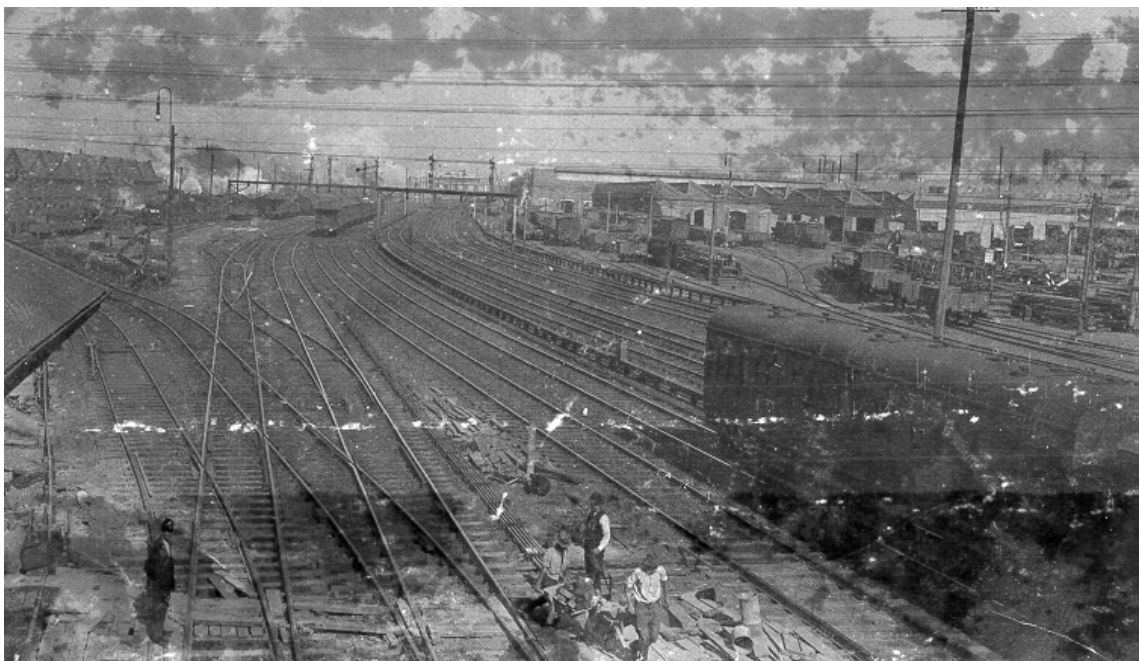


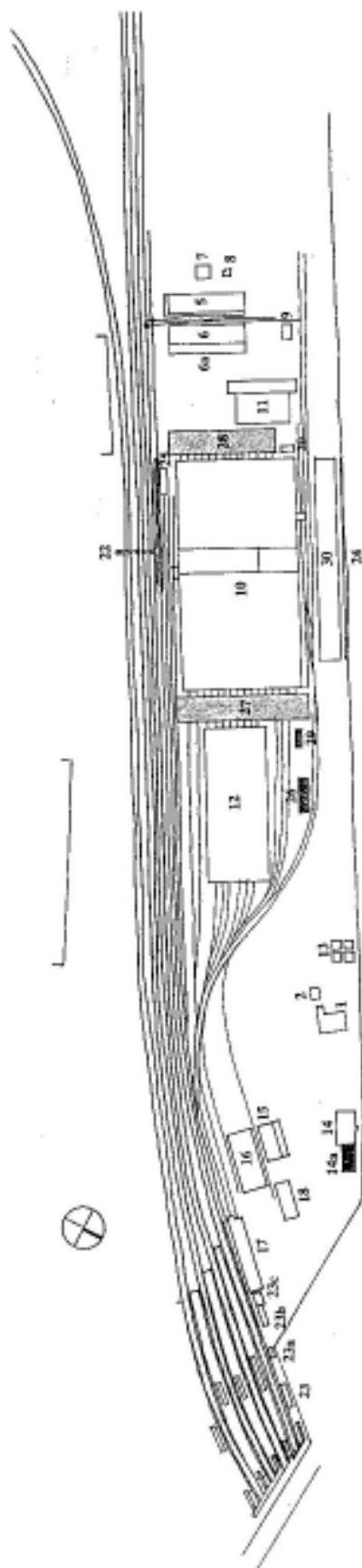


Figure 3.31: Photograph of the site from the south east taken in 1920. In the centre is the Tarpaulin Shed which was probably in place by 1895 and was demolished for the construction of the Engine Drivers Instruction School later in the 1920s. Above the roof is the roof of Calder House, which burnt down in 1923 (see also Fig 3.8). To the right of the Tarpaulin Shed are the buildings which, at this time, contained the Signals Workshop. Source: SRAO

It is clearer, however, why the well-detailed brick facade of the Carriage Shop Paddock was built in this way. Unlike the other elevations of the building, it was highly visible to passing passengers and was obviously intended to preserve and augment the aspect of the site when it was viewed from the main line. In contrast, the interior of the building was constructed in steel and corrugated iron, probably reflecting cost pressures on the railway system. Its other elevations appear originally to have been open-sided.

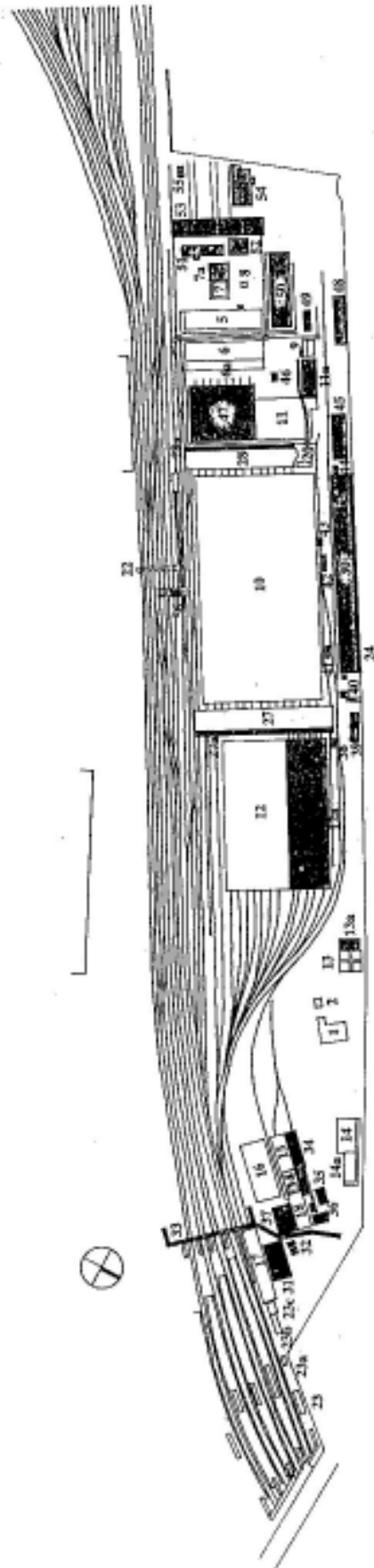
Passenger numbers carried and goods tonnage hauled by the system rose dramatically in the years preceding the First World War and this increase in business stretched the resources of the railways to their limit. In the years between 1887 and 1914, the number of vehicles in the Railways' carriage fleet had almost doubled. The size and capacity of the carriages had also risen dramatically during this period because, from 1890 onwards, all new cars were delivered as bogie types instead of four wheeled or radial, which meant that the cars were longer. The first bogie carriages however, were delivered in the mid 1870s.

From the very beginning of the workshops' operation, there were many more wagons than carriages being repaired at Eveleigh (about 11,000 wagons compared to about 1,000 carriages in 1906 for example) and as vehicle numbers rose, space for the more intensive work of vehicle building and repair in the Carriage and Wagon Shops became limited. Plans therefore began to be made at the Eveleigh Carriage and Wagon Workshops for extra facilities.



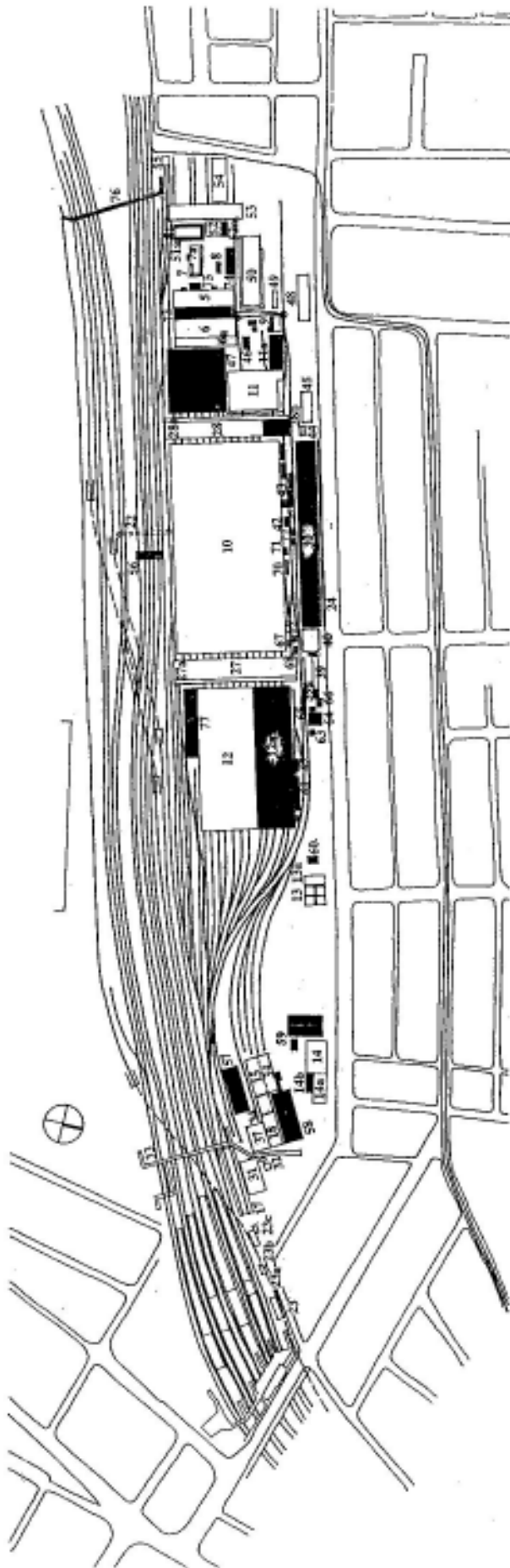
Plan 3.3 PHASES OF DEVELOPMENT PLAN, 1907
Source: DPWS, 1998

1.	Culter House (c. 1853)	219.	American Building
2.	Culter House (rebuildings) (c. 1858)	220.	South Station
3.	House demolished (c. 1867)	221.	South Station (c. 1867)
4.	Store No. 1 (1863)	222.	South Station (c. 1867)
5.	Store No. 2 (1863)	223.	South Station (c. 1867)
6.	Store No. 3 (rebuildings) (1867)	224.	South Station (c. 1867)
7.	Store No. 4 (1867)	225.	South Station (c. 1867)
8.	Store No. 5 (1867)	226.	South Station (c. 1867)
9.	Store No. 6 (1867)	227.	South Station (c. 1867)
10.	Store No. 7 (1867)	228.	South Station (c. 1867)
11.	Store No. 8 (1867)	229.	South Station (c. 1867)
12.	Store No. 9 (1867)	230.	South Station (c. 1867)
13.	Store No. 10 (1867)	231.	South Station (c. 1867)
14.	Store No. 11 (1867)	232.	South Station (c. 1867)
15.	Store No. 12 (1867)	233.	South Station (c. 1867)
16.	Store No. 13 (1867)	234.	South Station (c. 1867)
17.	Store No. 14 (1867)	235.	South Station (c. 1867)
18.	Store No. 15 (1867)	236.	South Station (c. 1867)
19.	Store No. 16 (1867)	237.	South Station (c. 1867)
20.	Store No. 17 (1867)	238.	South Station (c. 1867)
21.	Store No. 18 (1867)	239.	South Station (c. 1867)
22.	Store No. 19 (1867)	240.	South Station (c. 1867)
23.	Store No. 20 (1867)	241.	South Station (c. 1867)
24.	Store No. 21 (1867)	242.	South Station (c. 1867)
25.	Store No. 22 (1867)	243.	South Station (c. 1867)
26.	Store No. 23 (1867)	244.	South Station (c. 1867)
27.	Store No. 24 (1867)	245.	South Station (c. 1867)
28.	Store No. 25 (1867)	246.	South Station (c. 1867)
29.	Store No. 26 (1867)	247.	South Station (c. 1867)
30.	Store No. 27 (1867)	248.	South Station (c. 1867)
31.	Store No. 28 (1867)	249.	South Station (c. 1867)
32.	Store No. 29 (1867)	250.	South Station (c. 1867)
33.	Store No. 30 (1867)	251.	South Station (c. 1867)
34.	Store No. 31 (1867)	252.	South Station (c. 1867)
35.	Store No. 32 (1867)	253.	South Station (c. 1867)
36.	Store No. 33 (1867)	254.	South Station (c. 1867)
37.	Store No. 34 (1867)	255.	South Station (c. 1867)
38.	Store No. 35 (1867)	256.	South Station (c. 1867)
39.	Store No. 36 (1867)	257.	South Station (c. 1867)
40.	Store No. 37 (1867)	258.	South Station (c. 1867)
41.	Store No. 38 (1867)	259.	South Station (c. 1867)
42.	Store No. 39 (1867)	260.	South Station (c. 1867)
43.	Store No. 40 (1867)	261.	South Station (c. 1867)
44.	Store No. 41 (1867)	262.	South Station (c. 1867)
45.	Store No. 42 (1867)	263.	South Station (c. 1867)
46.	Store No. 43 (1867)	264.	South Station (c. 1867)
47.	Store No. 44 (1867)	265.	South Station (c. 1867)
48.	Store No. 45 (1867)	266.	South Station (c. 1867)
49.	Store No. 46 (1867)	267.	South Station (c. 1867)
50.	Store No. 47 (1867)	268.	South Station (c. 1867)
51.	Store No. 48 (1867)	269.	South Station (c. 1867)
52.	Store No. 49 (1867)	270.	South Station (c. 1867)
53.	Store No. 50 (1867)	271.	South Station (c. 1867)
54.	Store No. 51 (1867)	272.	South Station (c. 1867)
55.	Store No. 52 (1867)	273.	South Station (c. 1867)
56.	Store No. 53 (1867)	274.	South Station (c. 1867)
57.	Store No. 54 (1867)	275.	South Station (c. 1867)
58.	Store No. 55 (1867)	276.	South Station (c. 1867)
59.	Store No. 56 (1867)	277.	South Station (c. 1867)
60.	Store No. 57 (1867)	278.	South Station (c. 1867)
61.	Store No. 58 (1867)	279.	South Station (c. 1867)
62.	Store No. 59 (1867)	280.	South Station (c. 1867)
63.	Store No. 60 (1867)	281.	South Station (c. 1867)
64.	Store No. 61 (1867)	282.	South Station (c. 1867)
65.	Store No. 62 (1867)	283.	South Station (c. 1867)
66.	Store No. 63 (1867)	284.	South Station (c. 1867)
67.	Store No. 64 (1867)	285.	South Station (c. 1867)
68.	Store No. 65 (1867)	286.	South Station (c. 1867)
69.	Store No. 66 (1867)	287.	South Station (c. 1867)
70.	Store No. 67 (1867)	288.	South Station (c. 1867)
71.	Store No. 68 (1867)	289.	South Station (c. 1867)
72.	Store No. 69 (1867)	290.	South Station (c. 1867)
73.			



Plan 3.4 PHASES OF DEVELOPMENT PLAN, 1916
Source: DPWS, 1998

- | | | | |
|-----|---|-----|--|
| 1. | Calder House pre 1855 demolished 1914 | 12. | Staid by 1887, called Old Print Shop by 1870 |
| 2. | Calder House (later Staid) pre 1855 demolished 1924 | 13. | Staid by 1887 |
| 3. | Staircase 1881 | 14. | Staid by 1887, demolished by 1904 |
| 4. | Staircase 1881 | 15. | Staid by 1887 |
| 5. | Staircase 1881 | 16. | Staircase 1887 |
| 6. | Staircase 1881 | 17. | Staircase 1887 |
| 7. | Staircase 1881 | 18. | Staircase 1887 |
| 8. | Staircase 1881 | 19. | Staircase 1887 |
| 9. | Staircase 1881 | 20. | Staircase 1887 |
| 10. | Staircase 1881 | 21. | Staircase 1887 |
| 11. | Staircase 1881 | 22. | Staircase 1887 |
| 12. | Staircase 1881 | 23. | Staircase 1887 |
| 13. | Staircase 1881 | 24. | Staircase 1887 |
| 14. | Staircase 1881 | 25. | Staircase 1887 |
| 15. | Staircase 1881 | 26. | Staircase 1887 |
| 16. | Staircase 1881 | 27. | Staircase 1887 |
| 17. | Staircase 1881 | 28. | Staircase 1887 |
| 18. | Staircase 1881 | 29. | Staircase 1887 |
| 19. | Staircase 1881 | 30. | Staircase 1887 |
| 20. | Staircase 1881 | 31. | Staircase 1887 |
| 21. | Staircase 1881 | 32. | Staircase 1887 |
| 22. | Staircase 1881 | 33. | Staircase 1887 |
| 23. | Staircase 1881 | 34. | Staircase 1887 |
| 24. | Staircase 1881 | 35. | Staircase 1887 |
| 25. | Staircase 1881 | 36. | Staircase 1887 |
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| 27. | Staircase 1881 | 38. | Staircase 1887 |
| 28. | Staircase 1881 | 39. | Staircase 1887 |
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| 30. | Staircase 1881 | 41. | Staircase 1887 |
| 31. | Staircase 1881 | 42. | Staircase 1887 |
| 32. | Staircase 1881 | 43. | Staircase 1887 |
| 33. | Staircase 1881 | 44. | Staircase 1887 |
| 34. | Staircase 1881 | 45. | Staircase 1887 |
| 35. | Staircase 1881 | 46. | Staircase 1887 |
| 36. | Staircase 1881 | 47. | Staircase 1887 |
| 37. | Staircase 1881 | 48. | Staircase 1887 |
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| 59. | Staircase 1881 | 70. | Staircase 1887 |
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| 61. | Staircase 1881 | 72. | Staircase 1887 |
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| 72. | Staircase 1881 | 83. | Staircase 1887 |
| 73. | Staircase 1881 | 84. | Staircase 1887 |
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| 75. | Staircase 1881 | 86. | Staircase 1887 |
| 76. | Staircase 1881 | 87. | Staircase 1887 |
| 77. | Staircase 1881 | 88. | Staircase 1887 |
| 78. | Staircase 1881 | 89. | Staircase 1887 |
| 79. | Staircase 1881 | 90. | Staircase 1887 |
| 80. | Staircase 1881 | 91. | |



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|-----------------------|--|---|
| 1. Store No. 1 1887 | 12. Shed by 1887 called Old Post Shop by 1893 and | 40. Gas plant 1916 demolished by 1942 |
| 2. Store No. 2 1887 | 13. Trailer Shop in 1926, demolished by 1942 | 41. Acid House. Also later 1916 plan. |
| 3. Store No. 3 1887 | 14. Shed by 1887, part of Train Lighting Depot by 1927 | 42. Near Training Shed 1926, possibly 1916. |
| 4. Store No. 4 1887 | 15. Shed by 1887, part of Train Lighting Depot by 1927 | 43. Railer 1916 plan. |
| 5. Store No. 5 1887 | 16. Shed by 1887, part of Train Lighting Depot by 1927 | 44. Office 1916 plan. |
| 6. Store No. 6 1887 | 17. Shed by 1887, part of Train Lighting Depot by 1927 | 45. Office 1916 plan. |
| 7. Store No. 7 1887 | 18. Shed by 1887, part of Train Lighting Depot by 1927 | 46. Low Rail 1926, possibly 1916 |
| 8. Store No. 8 1887 | 19. Shed by 1887, part of Train Lighting Depot by 1927 | 47. Carriage Shop extension c. 1913 including |
| 9. Store No. 9 1887 | 20. Shed by 1887, part of Train Lighting Depot by 1927 | 48. additional 1916 plan |
| 10. Store No. 10 1887 | 21. Shed by 1887, part of Train Lighting Depot by 1927 | 49. Spring house 1916 |
| 11. Store No. 11 1887 | 22. Shed by 1887, part of Train Lighting Depot by 1927 | 50. Store 1916 plan |
| 12. Store No. 12 1887 | 23. Shed by 1887, part of Train Lighting Depot by 1927 | 51. Store 1916 plan |
| 13. Store No. 13 1887 | 24. Shed by 1887, part of Train Lighting Depot by 1927 | 52. Store 1916 plan |
| 14. Store No. 14 1887 | 25. Shed by 1887, part of Train Lighting Depot by 1927 | 53. Store 1916 plan |
| 15. Store No. 15 1887 | 26. Shed by 1887, part of Train Lighting Depot by 1927 | 54. Store 1916 plan |
| 16. Store No. 16 1887 | 27. Shed by 1887, part of Train Lighting Depot by 1927 | 55. Store 1916 plan |
| 17. Store No. 17 1887 | 28. Shed by 1887, part of Train Lighting Depot by 1927 | 56. Store 1916 plan |
| 18. Store No. 18 1887 | 29. Shed by 1887, part of Train Lighting Depot by 1927 | 57. Store 1916 plan |
| 19. Store No. 19 1887 | 30. Shed by 1887, part of Train Lighting Depot by 1927 | 58. Store 1916 plan |
| 20. Store No. 20 1887 | 31. Shed by 1887, part of Train Lighting Depot by 1927 | 59. Store 1916 plan |
| 21. Store No. 21 1887 | 32. Shed by 1887, part of Train Lighting Depot by 1927 | 60. Store 1916 plan |
| 22. Store No. 22 1887 | 33. Shed by 1887, part of Train Lighting Depot by 1927 | 61. Store 1916 plan |
| 23. Store No. 23 1887 | 34. Shed by 1887, part of Train Lighting Depot by 1927 | 62. Store 1916 plan |
| 24. Store No. 24 1887 | 35. Shed by 1887, part of Train Lighting Depot by 1927 | 63. Store 1916 plan |
| 25. Store No. 25 1887 | 36. Shed by 1887, part of Train Lighting Depot by 1927 | 64. Store 1916 plan |
| 26. Store No. 26 1887 | 37. Shed by 1887, part of Train Lighting Depot by 1927 | 65. Store 1916 plan |
| 27. Store No. 27 1887 | 38. Shed by 1887, part of Train Lighting Depot by 1927 | 66. Store 1916 plan |
| 28. Store No. 28 1887 | 39. Shed by 1887, part of Train Lighting Depot by 1927 | 67. Store 1916 plan |
| 29. Store No. 29 1887 | 40. Shed by 1887, part of Train Lighting Depot by 1927 | 68. Store 1916 plan |
| 30. Store No. 30 1887 | 41. Shed by 1887, part of Train Lighting Depot by 1927 | 69. Store 1916 plan |
| 31. Store No. 31 1887 | 42. Shed by 1887, part of Train Lighting Depot by 1927 | 70. Store 1916 plan |
| 32. Store No. 32 1887 | 43. Shed by 1887, part of Train Lighting Depot by 1927 | 71. Store 1916 plan |
| 33. Store No. 33 1887 | 44. Shed by 1887, part of Train Lighting Depot by 1927 | 72. Store 1916 plan |
| 34. Store No. 34 1887 | 45. Shed by 1887, part of Train Lighting Depot by 1927 | 73. Store 1916 plan |
| 35. Store No. 35 1887 | 46. Shed by 1887, part of Train Lighting Depot by 1927 | 74. Store 1916 plan |
| 36. Store No. 36 1887 | 47. Shed by 1887, part of Train Lighting Depot by 1927 | 75. Store 1916 plan |
| 37. Store No. 37 1887 | 48. Shed by 1887, part of Train Lighting Depot by 1927 | 76. Store 1916 plan |
| 38. Store No. 38 1887 | 49. Shed by 1887, part of Train Lighting Depot by 1927 | 77. Store 1916 plan |
| 39. Store No. 39 1887 | 50. Shed by 1887, part of Train Lighting Depot by 1927 | 78. Store 1916 plan |
| 40. Store No. 40 1887 | 51. Shed by 1887, part of Train Lighting Depot by 1927 | 79. Store 1916 plan |
| 41. Store No. 41 1887 | 52. Shed by 1887, part of Train Lighting Depot by 1927 | 80. Store 1916 plan |
| 42. Store No. 42 1887 | 53. Shed by 1887, part of Train Lighting Depot by 1927 | 81. Store 1916 plan |
| 43. Store No. 43 1887 | 54. Shed by 1887, part of Train Lighting Depot by 1927 | 82. Store 1916 plan |
| 44. Store No. 44 1887 | 55. Shed by 1887, part of Train Lighting Depot by 1927 | 83. Store 1916 plan |
| 45. Store No. 45 1887 | 56. Shed by 1887, part of Train Lighting Depot by 1927 | 84. Store 1916 plan |
| 46. Store No. 46 1887 | 57. Shed by 1887, part of Train Lighting Depot by 1927 | 85. Store 1916 plan |
| 47. Store No. 47 1887 | 58. Shed by 1887, part of Train Lighting Depot by 1927 | 86. Store 1916 plan |
| 48. Store No. 48 1887 | 59. Shed by 1887, part of Train Lighting Depot by 1927 | 87. Store 1916 plan |
| 49. Store No. 49 1887 | 60. Shed by 1887, part of Train Lighting Depot by 1927 | 88. Store 1916 plan |
| 50. Store No. 50 1887 | 61. Shed by 1887, part of Train Lighting Depot by 1927 | 89. Store 1916 plan |
| 51. Store No. 51 1887 | 62. Shed by 1887, part of Train Lighting Depot by 1927 | 90. Store 1916 plan |
| 52. Store No. 52 1887 | 63. Shed by 1887, part of Train Lighting Depot by 1927 | 91. Store 1916 plan |
| 53. Store No. 53 1887 | 64. Shed by 1887, part of Train Lighting Depot by 1927 | 92. Store 1916 plan |
| 54. Store No. 54 1887 | 65. Shed by 1887, part of Train Lighting Depot by 1927 | 93. Store 1916 plan |
| 55. Store No. 55 1887 | 66. Shed by 1887, part of Train Lighting Depot by 1927 | 94. Store 1916 plan |
| 56. Store No. 56 1887 | 67. Shed by 1887, part of Train Lighting Depot by 1927 | 95. Store 1916 plan |
| 57. Store No. 57 1887 | 68. Shed by 1887, part of Train Lighting Depot by 1927 | 96. Store 1916 plan |
| 58. Store No. 58 1887 | 69. Shed by 1887, part of Train Lighting Depot by 1927 | 97. Store 1916 plan |
| 59. Store No. 59 1887 | 70. Shed by 1887, part of Train Lighting Depot by 1927 | 98. Store 1916 plan |
| 60. Store No. 60 1887 | 71. Shed by 1887, part of Train Lighting Depot by 1927 | 99. Store 1916 plan |
| 61. Store No. 61 1887 | 72. Shed by 1887, part of Train Lighting Depot by 1927 | 100. Store 1916 plan |
| 62. Store No. 62 1887 | 73. Shed by 1887, part of Train Lighting Depot by 1927 | 101. Store 1916 plan |
| 63. Store No. 63 1887 | 74. Shed by 1887, part of Train Lighting Depot by 1927 | 102. Store 1916 plan |
| 64. Store No. 64 1887 | 75. Shed by 1887, part of Train Lighting Depot by 1927 | 103. Store 1916 plan |
| 65. Store No. 65 1887 | 76. Shed by 1887, part of Train Lighting Depot by 1927 | 104. Store 1916 plan |
| 66. Store No. 66 1887 | 77. Shed by 1887, part of Train Lighting Depot by 1927 | 105. Store 1916 plan |
| 67. Store No. 67 1887 | 78. Shed by 1887, part of Train Lighting Depot by 1927 | 106. Store 1916 plan |
| 68. Store No. 68 1887 | 79. Shed by 1887, part of Train Lighting Depot by 1927 | 107. Store 1916 plan |
| 69. Store No. 69 1887 | 80. Shed by 1887, part of Train Lighting Depot by 1927 | 108. Store 1916 plan |
| 70. Store No. 70 1887 | 81. Shed by 1887, part of Train Lighting Depot by 1927 | 109. Store 1916 plan |
| 71. Store No. 71 1887 | 82. Shed by 1887, part of Train Lighting Depot by 1927 | 110. Store 1916 plan |
| 72. Store No. 72 1887 | 83. Shed by 1887, part of Train Lighting Depot by 1927 | 111. Store 1916 plan |
| 73. Store No. 73 1887 | 84. Shed by 1887, part of Train Lighting Depot by 1927 | 112. Store 1916 plan |
| 74. Store No. 74 1887 | 85. Shed by 1887, part of Train Lighting Depot by 1927 | 113. Store 1916 plan |
| 75. Store No. 75 1887 | 86. Shed by 1887, part of Train Lighting Depot by 1927 | 114. Store 1916 plan |
| 76. Store No. 76 1887 | 87. Shed by 1887, part of Train Lighting Depot by 1927 | 115. Store 1916 plan |
| 77. Store No. 77 1887 | 88. Shed by 1887, part of Train Lighting Depot by 1927 | 116. Store 1916 plan |

Plan 3.5
PHASES OF DEVELOPMENT PLAN, 1927
Source: DPWS, 1998

The first step to ease the congestion was moving the wagon repairing function from Eveleigh to a new site at Clyde. This change of site took place gradually between 1909 and 1913 as new buildings at the Clyde site were completed. Once the wagon repairing function had been moved from the Carriage and Wagon Workshops at Eveleigh, the word "Wagon" was dropped from the name.

Many extra buildings were then erected on the site to cater for the hundreds of new carriages which were introduced to the railway system between 1907 and 1914. These buildings are listed and described briefly below. The George Street to Erskineville tramway, which ran adjacent to the western end of the workshops in Wilson Street, was opened on 23rd January 1909 and some afternoon tram trips catered for the Eveleigh Car and Wagon Works staff.

A tramway siding, 4½ chains long, was built into the Carriage and Wagon Workshops in 1911 to allow the tramway system's freight cars to pick up and deliver goods at the stores at Eveleigh. The tramways and railways, which were part of the same organisation at this time, were separated in 1932 and the siding abolished. The main tramway closed on 6th January 1940 but the siding remained on Railway land until the mid 1950s when it was removed for an employee car park.

The 1920s also heralded the commencement of the slow decline of the Eveleigh site. Pressure on the railway system had begun to increase from the mid 1920s as motor cars and lorries became more and more common and passenger numbers began to decrease. The 1930 Annual Report notes that there were 74,000 registered motor vehicles in New South Wales in 1924 but by 1930 this number had increased to 213,000. Another factor contributing to the decline in the number of rail customers was that year's opening of the Sydney to Newcastle direct road, an event also noted in the Annual Report.

A further restriction on the railways was the inability of the New South Wales Government to provide funds to finance enough new wagons, engine and carriages to meet the remaining demand. The eventual result was that some goods and passenger traffic soon took to the roads and the air and became business that was lost to the railways forever.

In the mid 1920s, work started on new workshops at Chullora, and it was the recommendation of the 1924 Royal Commission of Inquiry into the Railway and Tramway Services that the Eveleigh Workshops should be removed to this new site.¹ Rail Motors were constructed and subsequently overhauled at Eveleigh from 1923.

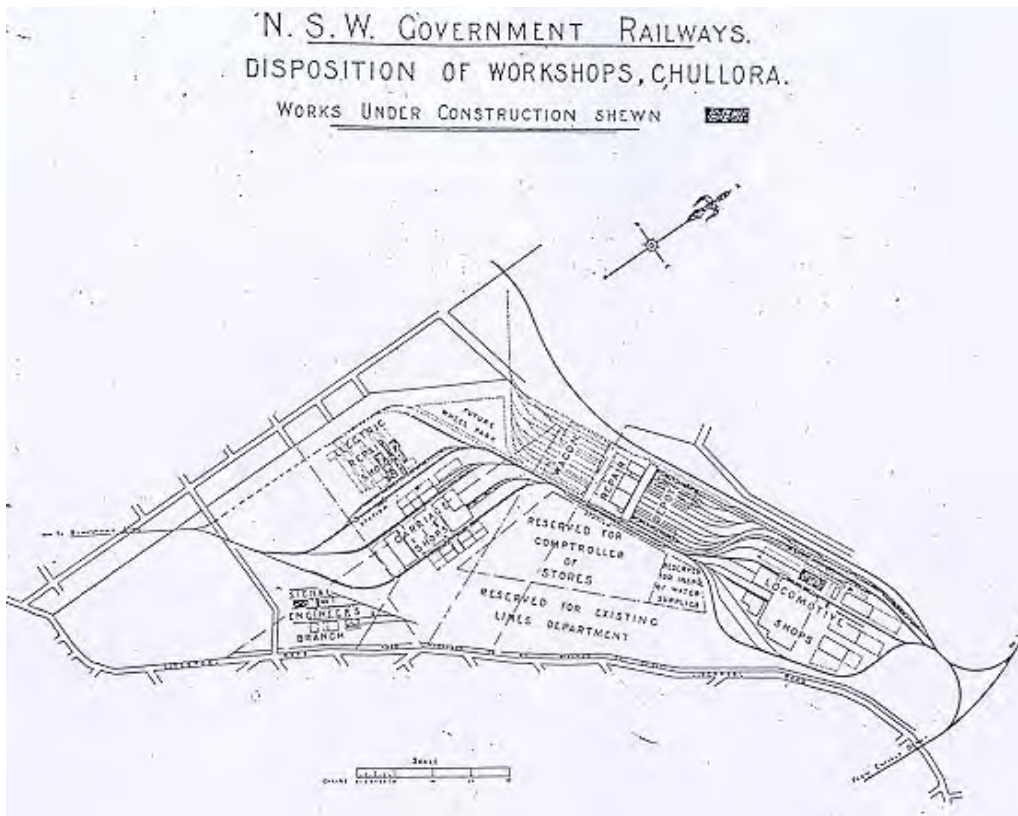


Figure 3.32: Plan of the Workshops at Chullora in 1924. Source: Report of the Royal Commission of Inquiry into the Railway and Tramway Services, 1924.

A plan of the Chullora site, taken from the report of the Royal Commission, shows a proposed new carriage workshop beside the locomotive workshop then under construction. This carriage workshop was never built but a new workshop for electric trains was constructed on the site. This new shop was named 'Elcar' and was used solely for the repair and maintenance of the new, suburban electric trains introduced to the system from 1926. Many of these carriages were steel-bodied but the remainder were timber-bodied on steel underframes.

When 'Elcar' was opened in 1926, it began to handle the repairs for around 900 of these cars, of which 300 wooden cars had previously been repaired at the Eveleigh Carriage Workshops. In the short term, this eased congestion at the Eveleigh shops considerably. Over the longer term, however, the proportion of carriages sent to Chullora increased, and the proportion sent to Eveleigh decreased, because 'Elcar' had ample space and more up-to-date technology. Simultaneously, the timber carriages which were Eveleigh's speciality were being phased out of the system, reducing the amount of work sent there even further. A considerable amount of new work involving the conversion of older carriages to more acceptable types for 1930s travellers was, however, introduced to Eveleigh during this period.

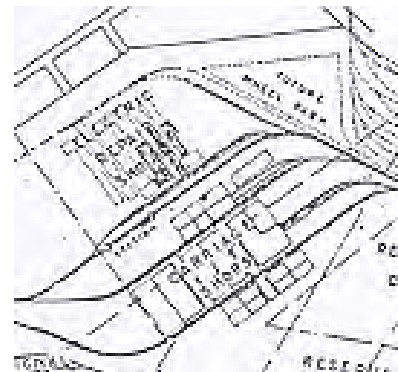


Figure 3.33: Detail of the above plan showing the proposed new carriage works building next to the new 'Elcar' facility.

The report of the 1924 Royal Commission did little to prevent the beginnings of the site's decline. The English Commissioners, Sir Sam Fay and Sir Vincent Raven, noted in their report that the "carriage shops ... at Eveleigh ... are congested and laid out in a way which makes it difficult to pass a large number of vehicles through with the speed desirable. When the alterations to the railway in conjunction with the electrical service are completed, the difficulties in the carriage works will largely be increased".² Although "no exception [could] be taken to the work done", the Commissioners commented that the "up-to-date and useful machines" were congested and "consequently not laid out so as to deal with the work in sequence and in the most approved way, thus causing a certain amount of delay and expense which would otherwise be avoided".³

There was, however, much development on the site between c. 1895 and c. 1927. Some specific developments are described in the following text. The inventory sheets for the individual buildings (refer Section 4.0) provide further information.

BUILDING ALTERATIONS AND ADDITIONS

The buildings discussed below are still extant unless otherwise noted.

Carriage and Wagon Workshops Alterations

The Carriage and Wagon Workshops continued to be used generally as originally designed and work was carried out within the existing spaces. During this time, the uses of particular bays changed and this is described in detail in Section 3.3 'The Operation of the Main Shops'.

Chief Mechanical Engineer's Office Extension by 1906

The Chief Mechanical Engineer's Office had been extended to the east in 1900 and was almost double its original size. No drawings have been found for this extension although a further extension which was not carried out was proposed in 1913.⁵ Another small extension was made to the southern side of the building in c. 1920.

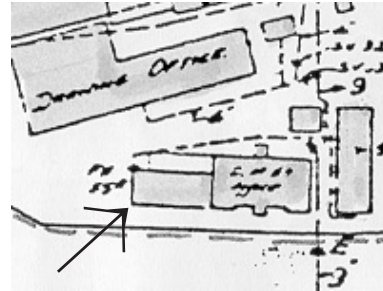
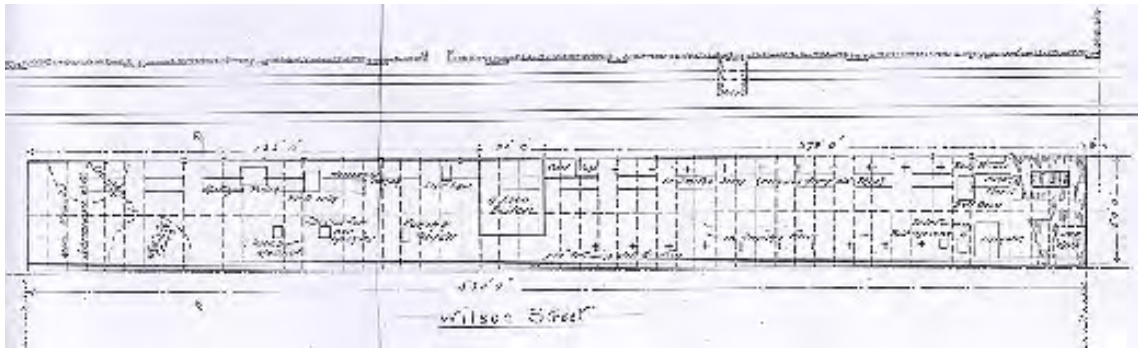


Figure 3.34: Detail of 1917 drawing showing the extension made to the east of the Chief Mechanical Engineer's building. Source: SRAO Drawing 10420.



Blacksmiths' Shop 1909⁶

Figure 3.35: 'Blacksmiths' Shop at Eveleigh' drawn 1907. Source: SRA Plan Room Drawing 875/15 105

In 1909⁷ the new Blacksmiths' Shop was erected along the Wilson Street boundary. It appears that this new building was required both because of the amount of extra work necessitated by the increasing size of the fleet and the projected use of steel underframes on all new carriages from 1912.

The new shop was noted in the Annual Report in 1910 when it is referred to as a "shop 529 feet by 50 feet wide ... erected at Eveleigh, near the present Carriage and Wagon repair shops, and fitted with forges, etc., for carriage and wagon work".⁸

The substantial existing brick retaining wall along Wilson Street was used as the northern wall of this building and extra brickwork was added on top of the wall to achieve the required height. The remainder of the shop was steel framed and clad in corrugated iron. The 10 smiths' fires shown on the plan were noted as being removed from the "old shop".

Paint Shop Extension (later called the Suburban Car Workshops) completed c. 1913⁹.

The Annual Report for 1911 notes that 'additions to the Paint Shop are now in hand'¹⁰ and in 1912 the Paint Shop addition was completed, almost doubling the size of the existing building.

The extension was simply constructed of cast iron columns, cast iron riveted web trusses and corrugated iron clad sawtooth roof bays. It was named 'Suburban Car Workshops' in 1987 when it began to be used for the repair and upgrading of the remaining early suburban electric carriages (the 'red rattlers'), a use which continued until its closure in 1989.



Figure 3.36: The Paint Shop Extension (later called Suburban Car Workshops) today. Source: Otto Cserhalmi.

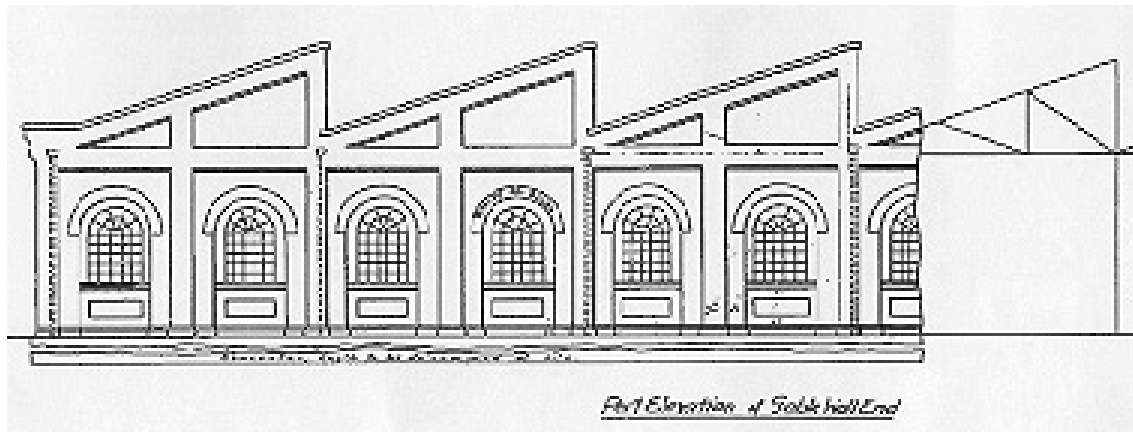


Figure 3.37: Part elevation of the Carriage Shop Extension dated 1901. Source: SRA Plan Room Drawing 875/15 162.

Carriage Shop Extension (now called Cable Store) c. 1911¹¹

In 1911, a drawing for an additional Carriage Workshop¹² to the west of the existing building was completed. The building was to be used 'for light repairs'¹³ and originally consisted of five bays running north-south with a 'sawtooth' roof profile. The corrugated ironclad roof includes vertical glazed panels and louvres for ventilation. The building appears originally to have been open-sided except for the southern facade which, apart from the 'sawtooth' gable end profile, was detailed and built in brick to match exactly the design of the Carriage and Wagon Workshops adjacent. This facade treatment improved the aspect of the building for the passengers travelling past but not necessarily for the workers inside. Similar was done at Chullora Locomotive Workshops.

In December 1916, a drawing for a one bay extension to the building was completed and this bay was added to the Newtown end of the building soon afterwards in 1917.¹⁴ The extra bay was given a brick southern facade to match the rest of the elevation and it was detailed to allow for future extensions to the west. It appears from a general plan of the site in 1916¹⁵ that the tracks contained within this extension were in place before it was built.



Figure 3.38: Interior of the General Store, undated. Source: SRAO.

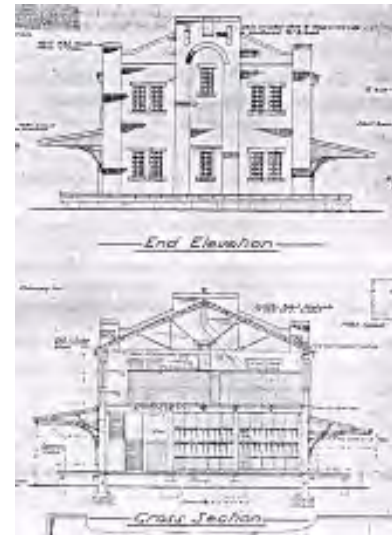


Figure 3.39: Detail of construction drawing for the General Store, dated December 1911. Source: SRA Plan Room Drawing39-25.

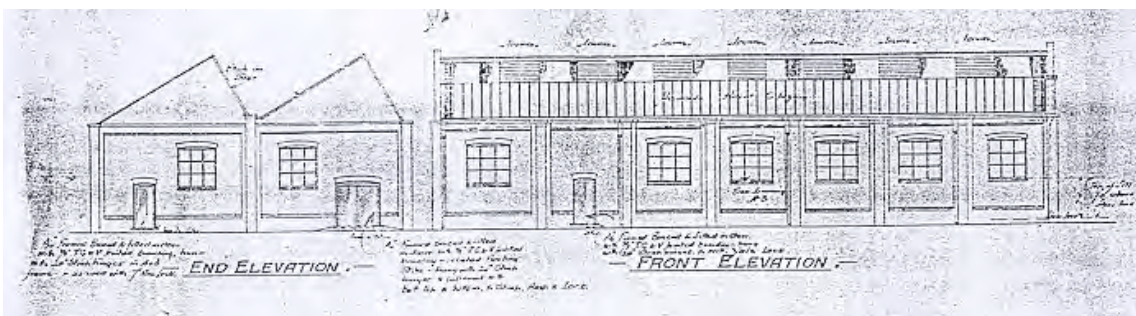
General Store 1913¹⁶ (now called Clothing Store)

From 1912, administration of the Stores was separated from the Mechanical Branch and in 1913, the General Store was erected to the north of Stores 1 and 2 which had been completed in 1883. It is a substantial and well detailed brick building which has not been much altered. The changes have been the replacement of the original cast iron windows, the addition of a hoist and stair to the eastern facade and some alterations to the form of some of the building's openings, apparently at the time of its conversion to a hostel.¹⁷ Refer Section 3.6.1 Working Conditions and Standards.

Telegraph Workshop c. 1912¹⁸ (now called Telecommunications Equipment Centre)

The brick electrical workshop at the eastern end of the site was also built about 1912. This building was initially known as the Interlocking Store and handled all aspects of the signalling and associated communications. Work undertaken there was for the railway system generally, not for the workshops. The building has an unusual structural system with composite steel and timber trusses and included two storeys of timber construction housing offices at its west end.

Figure 3.40: Construction Drawing for the Telegraph Workshop, dated 1912. Source: SRAO.



Spring Store 1911

The Spring Store appears, adjacent to the Wilson Street boundary, on plans from 1916 onwards and appears to have been built in 1911.¹⁹ The function of the building is not always noted however and probably changed several times. No drawings of the building have been found. Refer to Figure 3.37.

Store No. 3 c.1926²⁰

Store No. 3 was built in the space between Stores 1 and 2 in 1926. The building of the store necessitated the removal of a platform to the eastern side of Store No. 1 and the removal of tracks between the two stores buildings.

Stores 1 and 2 were shortened at their southern ends to allow for the laying of one of a pair of new tracks connecting the Sydney terminal with Homebush.

New Illawarra Signal Box and Subway Alterations

In conjunction with the opening of the two extra running lines from Sydney to Sydenham, a new signal box known as 'Illawarra Junction' was opened adjacent to the tunnel under the main lines on 4th May 1913. The Illawarra line was diverted at Illawarra junction until it was extended to the "new" Central station in 1926. An additional pair of running lines (making six in total) was opened from Redfern to Ashfield on 29th May 1927. This was later extended to Homebush. This work necessitated the appropriation of two sidings on the southern side of the Carriageworks, the filling in of the entrance to the subway, its extension and the replacement of its ramped access with a set of steps closer to the main building.²¹ The subway had already been extended in 1912 to allow for track widening.²² The signal box has now been demolished.

Drawing Office for the Chief Mechanical Engineer's Office, 1923

This building was erected behind the Chief Mechanical Engineer's Offices at the eastern end of the site and was built on the sites of various earlier sheds. It was timber framed and clad externally in a combination of fibre cement and weather boards. The building housed the drawing office of the Chief Mechanical Engineer's section and, by 1986, was known as the Train Equipment Section. It has now been demolished.

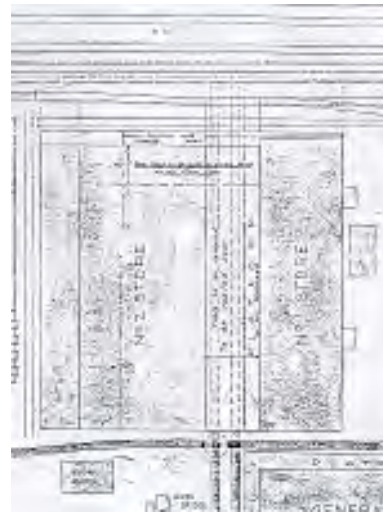


Figure 3.41: 1926 drawing showing the location of the proposed Store No. 3 between Stores 1 and 2 and the proposed shortening of Stores Nos 1 and 2 at the top of the plan. Source: SRA Plan Room Drawing 1041/22 034

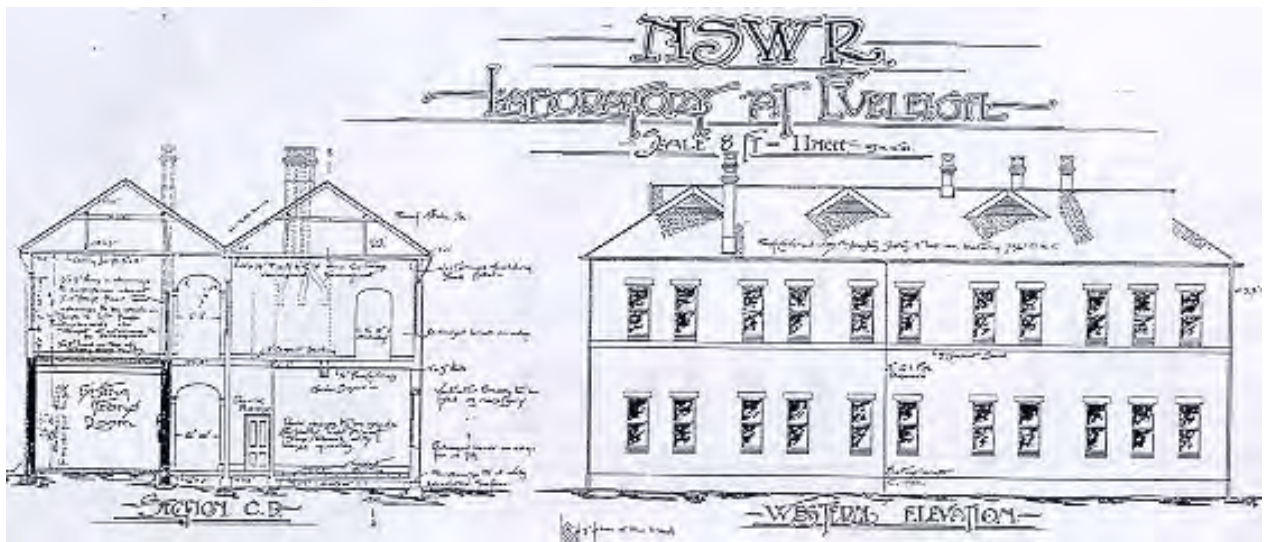


Figure 3.42: Construction drawing for the new laboratory at Eveleigh. Detail. Source: SRA Plan Room

Materials Testing Laboratory (now called Scientific Services Building 1) 1922²³

A new laboratory was designed in 1921 and completed in 1922.²⁴ It replaced the original laboratory at the western end of the site and incorporated an 'Existing Physical Laboratory' which was shown on the plan. This existing building had apparently been built before 1914.²⁵ However, the date is uncertain and it did not appear on the 1916 plan.

Electric Train Drivers' Instruction School, 1926

This building, which was used for training the drivers of the new electric trains and is now demolished, appears to have been built on the site of the Tarpaulin Shed which dated from c. 1889. Its construction was similar to that of the Drawing Office above.

Train Lighting Depot

By 1916, the Signals Workshop and adjacent shed at the eastern end of the site had been combined into one building which was named 'Workshops'. By 1926, this building, now sandwiched between the Engine Drivers' Instruction School and the Chief Mechanical Engineer's Drawing Office, was the Train Lighting Depot. It is now demolished but appears to have been another timber framed building clad in a combination of fibre cement and weatherboards.



Figure 3.42: The original chemical laboratory on the site, drawing dated 1909. It has now been demolished. Source: SRA Plan Room Drawing 47-36

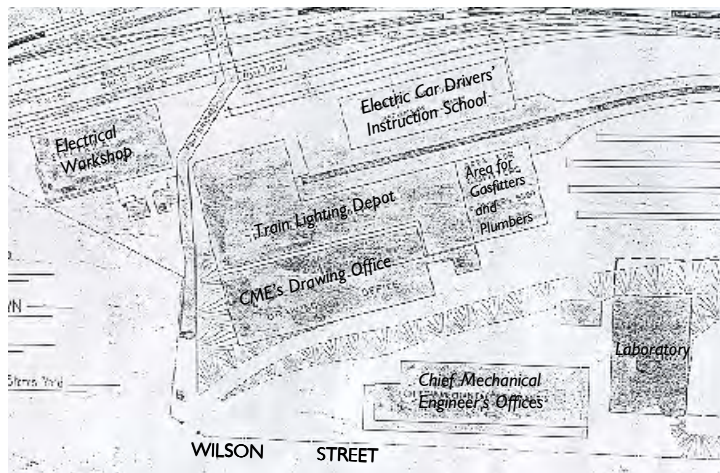


Figure 3.44: The eastern end of the site in 1926. The Train Lighting Depot, Laboratory, Drawing Office, Engine Drivers' School and Electrical Workshop were all new during this period. In addition, the Chief Mechanical Engineer's Offices were extended. Source: SRA Plan Room Drawing 1041/22 034.

Miscellaneous Works

Other extensions, now demolished, were to the Stores Office and the Timber Shed at the western end of the site. Several additional, smaller buildings were also erected at the western end of the site during this period. These included a new oil store, the original chemical laboratory, a stationery store, Traverser No. 3 and two small stores to the north and south of the General Store. The southern store was identified as a Mess Room after 1937 and was used later as a cafeteria.

There had been an awning to the eastern side of Store No. 2 from c. 1895 and a 1926 drawing²⁶ provides some evidence that a further extension was made to this side of the building. It does not appear, however, that this extension could have coexisted with the one bay addition to the Carriage Shop extension discussed above.

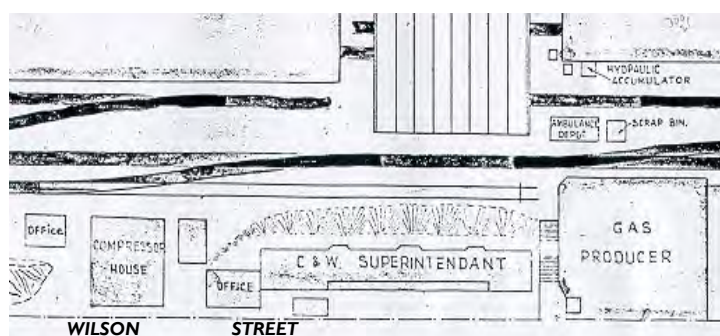


Figure 3.45: The 'middle' section of the site along the Wilson Street boundary in 1926. Source: SRA Plan Room Drawing 1041/22, 034.

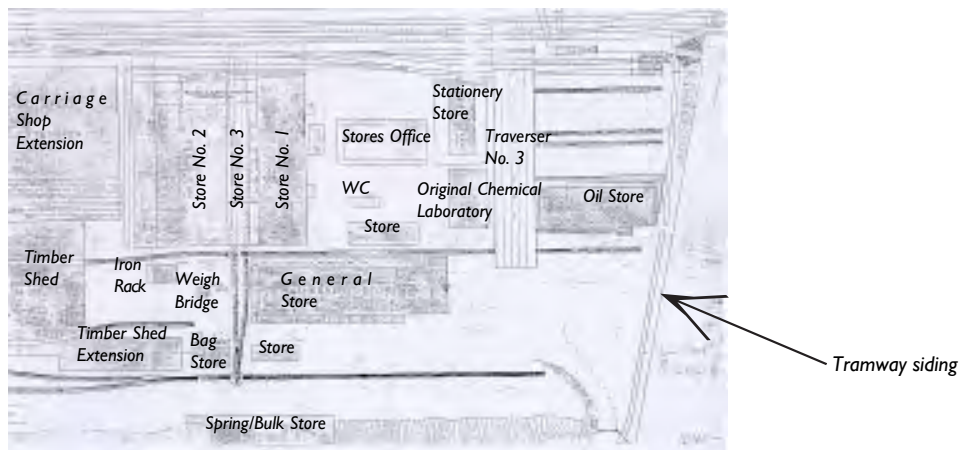


Figure 3.46: The western end of the site in 1926 showing the locations of buildings and additions added during the phase of development from c.1895 to c. 1927. Also depicted on this plan is the tramway sidings (1911 - 1932) shown running perpendicular to the right of the oil store. Source: SRA Plan Room Drawing 1041/22, 034.

By 1914, a bridge over the tracks at the western end of Redfern station had been built to allow access to platforms and for workmen to cross the tracks more safely. Although the bridge itself has now been demolished, the supports are still *in situ*. Also notable was that Calder House burnt down in 1923.

In the middle of the site, the Carriage and Wagon Superintendent's office, now demolished, was built near the Wilson Street boundary. It was later replaced by a 2 storey brick staff amenities building (upper) and workshop (below) which is still in place in 2002. A gas plant adjacent to the Blacksmiths' Shop was also built by 1916, possibly to provide gas for the 'Mond' engine in Bay 21 or possibly to replace it. The gas plant was later demolished for the construction of the Ambulance Room in 1937. The compressor house nearby was also completed, probably in 1913 although it was not shown on the 1916 plan.

Probably in 1917, a second bridge over the tracks at the far western end of the site was erected to allow a further safe access across the tracks for workmen. It went over both suburban lines and gave direct access to Macdonaldtown station.

With the exception of the small chemical laboratory at the western end of the site, the above buildings and extensions appear to have been framed structures clad in corrugated iron or weatherboard. Refer to Section 3.6 Working at Eveleigh Carriage



Figure 3.47: Compressor House built c.1913. Source: Otto Cserhalmi, 1998.



Figure 3.48: The Organic Laboratory in 1955. The building in which this photograph was taken is now Scientific Services Building No. 1. Source: 'The Railways of New South Wales 1855-1955', p 243.

and Wagon Workshops.

Scientific Laboratories

The role of the railways' scientific laboratories came into prominence during the period 1895-1927 and culminated in the construction of the new laboratory building discussed above. The laboratories' role continued to be important throughout the life of the Carriageworks and continues today and this section explains their origins and development.

A chemist was appointed on the staff of the Controller of Stores in 1906, marking the first step in the establishment of a *chemical laboratory* to be used in connection with railway work. Initially, a room was set aside on the ground floor of the Chief Mechanical Engineer's building in Wilson Street and the laboratory's work involved checking of stores. Analysis of oil, for example, was an important part of the work done by the laboratory in its early stages – it was necessary to keep the year's supply to the standard of the tender samples provided by the various companies.²⁷

By 1910, a new laboratory building provided for a general inorganic laboratory, organic laboratory and water room, photographic dark room and store, an office and balance room.²⁸

From the outbreak of WWI onwards, the activities of the laboratory began to diversify and expand. Chemical work increased, especially on the metallurgical side. The production of Australian steel was also increasing, and therefore so did the checking of steel deliveries to other States and overseas. An additional laboratory was built on to the northern side of the existing building and assistant chemists with wartime experience



Figure 3.49: The Tensile Testing Machine in the Engineering Division of the Laboratories in 1955. The building in which this photograph was taken is now Scientific Services Building No. 1. Source: 'The Railways of New South Wales 1855-1955', p. 243.

of steel analysis were appointed to cope with this work.²⁹

Some *physical testing* had been carried out by the Mechanical Branch from early times on the site and a brick strongroom, adjacent to the Chief Mechanical Engineer's building, was built prior to 1916. This room housed the Mechanical Branch drawings. An adjoining room to accommodate a tensile testing machine and other equipment was also built about this time. After the close of WWI, the physical testing carried out by the Mechanical Branch increased in relation to the stores checking work. The introduction of control work on the water softeners erected for the Locomotive Branch in the Newcastle-Maitland area also led to an increase in the chemical work undertaken on the site.

The increases in work in both the chemical and physical areas led to the construction of a large new laboratory incorporating the existing Mechanical Branch building. The new laboratory was to accommodate physical and microscopic testing on the ground floor and increased chemical capacity on the second floor. The building was completed in 1922.

The volume and complexity of work carried out by the laboratory increased with the commencement of WWII. Some railway personnel were sent to England in 1939 for instruction and training in the aircraft industry and they returned to set up the Aircraft Factory at Chullora. A very large volume of work was put through the laboratory for testing and shift work and overtime became necessary.³⁰

A close association with industry developed and continued after the end of the war when the laboratory began to provide a chemical and advisory service to manufacturers and engineers. Water treatment advice was also provided and the laboratory was registered under the National Association of Testing Authorities in 1954.

The *engineering section* of the laboratory was established in 1921 and moved into the new building in Wilson Street two years later. The scope of this laboratory's activities widened rapidly. The services of the section, which performed mechanical testing, were primarily intended for checking railway components. In addition the chemical testing of water quality from rural supplies was a traditional long term function of the laboratory. In 1933 their services were made available to other Government departments and then to private industry in general, for a small fee. In 1955, it was stated that "*a large proportion of New South Wales industry looks to this laboratory for routine testing, technical advice and specific investigations*"³¹ and it carried out testing on pressure gauges, metals, rubber, fabric and other similar materials.

Early metallurgical work had been concerned with the investigation of service failures, the heat treatment of metals and the development and manufacture of bearing metals. The activities of the metallurgical section were later extended to the products of the Eveleigh Foundry and an advisory service was also instituted for the Chullora and Newcastle Foundries of the Ways and Works Branch.

One of the notable features of the laboratory was the length of time many employees remained there. J. K. Cogle, Assistant Chief Chemist, retired in 1952 after 44 years service. Mr Sidney Simpson transferred to the laboratory from a clerical position in the Stores Branch in 1920, became Laboratory Officer and remained there until he retired in 1956.³² Mr I. Samuels was appointed to the staff as a metallurgist in 1924 and remained until his retirement in 1954, having achieved the position of Works Metallurgist.

3.1.9 DEVELOPMENT ON THE SITE 1927 TO 1945

Refer to Plans 3.3, 3.4, 3.5 and 3.6 Phases of Development Plans

During this period, the electrification of the Sydney suburban lines and the construction of the City Railway (both of which commenced in the 1920s) as well as the opening of the Harbour Bridge and its new rail lines contributed to the amount of work being undertaken by the railways' workshops. Nearly 600 new electric carriages were delivered to the system from 1925 to 1930. Until the opening of 'Elcar' workshop, this dramatically increased the number of vehicles being handled at the Eveleigh Carriageworks, even though many pre 1890s vehicles were simultaneously withdrawn or relegated to works use. During this period, the Eveleigh Carriageworks converted many existing carriages to use electric power and lighting. *Refer to Section 3.5.1 Carriage Types and History.*

The depression of the early 1930s had a serious impact on railway business and finances and not until the mid 1930s did passenger numbers begin to rise above the 1929 levels. From 1930 onwards, the Annual Reports note the changes the depression brought about at Eveleigh. *Refer to Section 3.6.1 Working Conditions and Standards.*

Although the number of motor cars and lorries was continuing to increase, reducing the railways' passenger numbers, the railway system handled record passenger volumes during WWII with virtually no increases in vehicle numbers. A small number of vehicles were built at Eveleigh at this time, but repairs, overhauls and conversions formed the bulk of the Carriage Shops work.



Plan 3.6

While most railway workshops were engaged in war work during WWII, and guns and ammunition were manufactured on the Locomotive side, the Carriageworks did not take part in this exercise. Instead, the Carriageworks carried on with railway business around the clock and under blackout conditions. The gradual decline of the Eveleigh Carriageworks continued during this period.

The wartime construction activity which had the most significant effect on carriage building was the manufacturing of the Beaufort bombers at Chullora. The leading metal bodywork technology used to build these planes was adapted directly to the new, lightweight, diesel trains which were built at Chullora from the late 1940s for country branch lines. About 140 of these cars were ultimately delivered and all were maintained at Chullora. The steel and aluminium cars replaced many of the wooden carriages which had been repaired there, so Eveleigh's workload decreased. Nevertheless, Eveleigh undertook the major rebuilds and conversions of wooden stock up until the 1970s and 80s.

The numbers of locomotive-hauled carriages which were repaired at Eveleigh continued to decline over the 1927 to 1945 period while the number of electric cars, which were repaired at Chullora, continued to increase. *Refer to Table 1.*

During this period, Eveleigh Carriageworks continued to build rail vehicles propelled by internal combustion engines. These 'Rail Motors' were produced from 1919 until World War II and were maintained at Eveleigh for much of their lives. The Chullora workshops, however, were given the task of building and maintaining the later rail motors because the newer workshops there had been equipped with more advanced technology. Again, this took work away from the Eveleigh Workshops. *Refer to Section 3.5.1 Carriage Types and History.*

By this time, most of the major work at Eveleigh, other than repair and maintenance of cars, was in converting older vehicles (mostly those built in timber) to more modern types.

The exception was the five power vans built for the 'Silver City Comet', which were constructed at Eveleigh. Twenty passenger carriages were built by Ritchie Brothers but these and the power vans were overhauled at the Eveleigh Carriageworks. Day to day maintenance was undertaken at the local depot the vehicles were attached to (usually Parkes). *Refer to Section 3.5.3 Carriage Conversions.*

The only other metal cars handled at Eveleigh were 35 BS type and 86 FS type side door corridor compartment cars constructed at Clyde Engineering between 1935 and 1937. Another 35 "N" type centre aisle tourist type cars were built by Waddington Ltd., later Commonwealth Engineering. In total, 156 carriages were delivered to the Eveleigh Carriageworks for maintenance in the years 1935 - 1939.

By 1942, only a few further buildings had been added to the site. The character of the Advertising Branch building is unknown, but the remainder of these additions to the site were generally simply built corrugated iron or timber clad structures with little of the imposing nature of the original or even some of the slightly earlier buildings on the site. These buildings are still *in situ* unless otherwise noted.

New buildings from this period are shown on Plan 3.6 and include:

Radar Annexe c. 1942¹

In 1942, the erection of a building 'for scientific and industrial research' was noted in the Annual Report.² It seems likely that this building was the 'Radar Annexe', a large timber-framed, corrugated iron clad shed (now demolished) which was used for military purposes. A contemporary drawing, apparently of this building, is called 'Proposed Workshops for Chief Electrical Engineer',³ perhaps to disguise the military nature of the project. The Radar Annexe was located at the western side of the Materials Testing Laboratory, (now the site of the No. 78. See Figure 3.6). It appears that the building was altered at its southeastern corner to provide offices for Naval and Military Inspectors in early 1944.⁴ The building was used as a Trimming Shed after the war and was demolished to allow the construction of the present block of flats.

Reclamation Shed 1937⁵

This shed was built to the east of the Spring Store at the western end of the site. It was used to store components that could be reused. Later it was used for potash cleaning. It remains on site in 2002.

Air Raid Shelters, WWII.

The reinforced concrete air-raid shelters, built partly into the slope behind the Reclamation Store, were completed during World War II and, although altered later to provide storage space, are still extant in 2002.

Store No. 4 c. 1937⁶

This store, also known later as the 'CME's Paint Spray' was added to the western side of Store Nos. 1 and 2, probably in the late 1930s. Its construction necessitated the demolition of the 1883 Stores Office and several additional small buildings adjacent to it. See Figure 3.6, item number 82.

Advertising Branch

A small building for the making of signs was also erected adjacent to the Radar Annexe.⁷ See Figure 3.6, item number 79. The building is now demolished and its former character is unknown. Refer to Section 3.6 Working at Eveleigh Carriage and Wagon Workshops and Section 4.0 Physical Evidence (Inventory Sheets).



Figure 3.50: The 'Radar Annexe', later used as the Trimming Shed. Detail of undated photograph of the site taken from the northeast. Source: SRAO



Figure 3.51: The Reclamation Shed, view facing east. Source: Otto Cserhalmi, 1998.



Figure 3.52: Air Raid Shelters. Source: Otto Cserhalmi, 1998.



Figure 3.53: Interior of Store No. 4, 1998. Source: Otto Cserhalmi.

3.1.10 THE DECLINE OF THE WORKSHOPS 1945 TO THE PRESENT

Refer Plan 3.7, 3.8 & 3.9 *Phases of Development Plans*

Although the huge increase in business before World War I stretched the railway system to the limits of its resources, the combined effects of World War II, the postwar boom and the opening up of new Sydney suburbs to satisfy housing needs were to place an even greater pressure on the system. Refer to Section 3.6.1 *Working Conditions and Standards*.

By this time, motor vehicle sales had entered a boom period, which had a significant effect on railway traffic and results. Another problem was the acute shortage of capital to finance rolling stock and equipment. From 1948 to 1954, 92 new air-conditioned cars were delivered to the NSW system from a private contractor. Although built with steel bodies, they were still fitted out with timber interiors and were overhauled at Carriage Works at Eveleigh. The table opposite shows the numbers of vehicles in the NSW Railway fleet at ten yearly intervals from 1886 to 1996. Until 1913 wagons and works vehicles were also repaired at Eveleigh.

The number of carriages handled on the rail system increased from 1032 in 1896 to a peak of 2070 in 1916. After this, however, numbers gradually began to fall for several reasons. By 1996, only one-twentieth of the number in 1916 was being handled. Abolition of branch line services and the electrification of main lines to Lithgow, Newcastle and Dapto had displaced locomotive hauled rolling stock by multiple unit electric stock, maintained and overhauled elsewhere. It was from 1945 that the dramatic decline of the Eveleigh site took place.

Firstly, electric carriages were introduced to the system in the early 1920s. New carriages were built of steel rather than timber and, after the construction of 'Elcar' at Chullora in 1926, the numbers of cars repaired at Eveleigh decreased. This was because Eveleigh was essentially a timber workshop and Chullora had more appropriate technology for steel carriage repair.

Secondly, as workshop and materials technologies improved, the time needed to repair carriages was reduced so fewer spare carriages were required in the system. In addition, higher traffic needs meant that they ran more kilometres and their turnarounds improved. Productivity per carriage increased and this also led to reduced numbers of vehicles passing through the Eveleigh workshops.

In addition, Eveleigh had been designed for relatively small, timber carriages and wagons of the 1880s and had been set out to cater for them. As carriage construction techniques improved and vehicle lengths increased the shops became less and less efficient for their purpose.

The gradual decline of the Eveleigh Carriageworks can also be gauged from the Annual Reports. In the years from 1910 to 1947 the reports listed the production outputs at Eveleigh. Simultaneously, they document considerable amounts of work on the conversion and upgrading of about 600 carriages of out-of-date and unsuitable design during this period. From the immediate post-War years onwards however, the Eveleigh Workshops are mentioned much less. During the 1970s, work was concentrated only on overhauls and painting.¹ From 1987 to 1989, for example, the 1912 extension to the Paint Shop was renamed 'Suburban Car Workshops' and was used for the overhaul of the remaining electric 'red rattlers' after the Tangara carriages were introduced.

Following World War II, the New South Wales railways resumed a large tract of land at Yennora for a new workshops, including a carriage workshops. It was proposed that the carriage repairing function would be moved there from Eveleigh and the Eveleigh site would be converted for the storage and servicing of trains between trips.

A paint shop and traverser were installed at Yennora but the site was little used and funding was instead diverted to the manufacturing of new equipment, in particular diesel engines and goods wagons, in the 1960s. The Yennora site was leased and subsequently sold off and the Eveleigh Carriageworks therefore continued to function.

Date	Carriages		Wagons	Works Vehicles
	<i>Loco Hauled</i>	<i>Electric (Other workshops)</i>		
1886	940		8364	*
1896	1032		9525	1060
1906	1143		11522	1058
1916	2070		19972	1763
1926	2020	247	22367	1601
1936	1822	882	21915	1425
1946	1880	926	24444	1271
1956	1778	1063	26534	1051
1966	1369	1107	21016	2307
1976	752	1108	16364	n/a
1986	350	1233	9352	n/a
1996	106	1137	6108	n/a

* Works vehicles were included in the Carriages and Wagons numbers at this date.

Table 1: showing numbers of carriages and wagons on the NSW railway system. Source: Annual Reports of the various Railway Authorities

In 1973, poor productivity at the Eveleigh Workshops led to a decision by the newly formed Workshops Branch of the State Rail Authority to “quit the Eveleigh site”. Eveleigh Carriageworks’ low productivity resulted partly from the limited throughput which could be achieved in the by now inefficient older buildings. In addition, restrictive work practices (known as the ‘darg’) were put in place by the unions to maintain jobs and preserve union membership.

In December 1986, the Combined Unions Shop Committee at Eveleigh accused the State Rail Authority of ‘deliberately running down foundry work and making workers idle to justify closure plans’.² The Committee’s president, Vince Russo, stated that ‘The SRA followed the same procedure last year at Carriage Works, Eveleigh. Work disappeared, the workers were left idle and finally were demoralised into accepting transfers’.³ The response of the management, at least at the Eveleigh foundry, was that unsuccessful negotiations over the removal of restrictive work practices (the ‘dargs’) had led to the decision to close the foundry. Workers were also accused of maintaining a ‘steam-era’ mentality and refusing to accept new technology.

In his book ‘Working Lives’ Mark Hearn notes that plans to close Eveleigh Workshops “were long preceded by a management willingness to send workshop tasks to private contractors, much to the anger of staff ... the workshops would be judged by their ability to compete with private industry” which became “an end in itself – a management assumption that work performed by private contractors is naturally more efficient than work performed in the railway’s own shops.”⁴

Although the Locomotive Works were closed by the end of 1987, the Suburban Car Workshop of the Carriageworks were retained until its final closure in 1989.⁵

Today the functions formerly carried out at Eveleigh are no longer carried out by government enterprises or are no longer carried out in Australia.⁶ Some maintenance is now performed at decentralised fleet locations on the railways by the State Rail Authority in NSW and by various other operating authorities in the rest of Australia. Maintenance is also carried out by external contractors in SRA or their own workshops. With some exceptions, carriage construction in NSW is now usually undertaken by private contractors, sometimes on a design and construct basis through a tenders system.

Although the Carriage Workshops, and the entire Eveleigh site, were declining during this period, several more additions were made to the site:

Boilermakers' Shop 1964⁷

This was the most significant addition on the site during this period. It is located to the north of the Carriage Shop extension (now called Cable Store) which was reduced in size to allow the new building to be constructed.

Although the steel-bodied suburban electric cars were mostly repaired at Chullora, work on some metal cars did take place at Eveleigh. These cars included the 1935-1939 S and N main line and tourist cars and the 92 HUB/RUB air-conditioned cars mentioned above. From 1960, the Southern Aurora and Brisbane Express cars, which were made of stainless steel, were overhauled at Eveleigh.

Much of the boilermaking work on the cars had been deferred for some years due to the lack of suitable workshop space. As the Eveleigh Carriageworks was essentially a timber shop, there was no adequate space for repairing these cars in the existing buildings. It therefore became necessary to construct this additional facility which provided additional space and the latest floor operated overhead cranes (which are still extant) to take up a decade long backlog of steel bodies cars.

Asbestos Removal Shed

This large shed was built in 1982-3 for the removal of asbestos from the single-deck electric carriages built between 1940 and 1954 as well as the post-War air-conditioned cars. It still exists as at 2002 with rail connection, but is now leased for storage. The last major work was the removal of asbestos from 46 class electrical locomotives and steam locomotives 3830 in mid 1990s.

Carpenters, Plumbers and Food Distribution Building

This building replaced the c.1916 Car and Wagon Superintendent's office building which had been located on the Wilson Street boundary, just behind the Paint Shop extension. It is of reinforced concrete and brick construction and was built as a cafeteria and meal room in 1981.⁸

Fire Protection and Drug Analysis Building

This building, also located adjacent to the Wilson Street boundary, was built at about the same time and using the same materials as the building above. The top floor was originally the Carriage Works Timekeeping Office, but was extensively remodelled for use by SRA Fire Protection when it relocated from elsewhere. It is still in use for this purpose as at 2002.

Fire Protection Brigade Shed

No drawings have been found of this building which was constructed between 1970 and 1991.

Refer to Section 3.6 Working at Eveleigh Carriage and Wagon Workshops and Section 4.0 Physical Evidence (Inventory Sheets).



Figure 3.54: Boilermakers' Shop, 1998. Source: Otto Cserhamli.



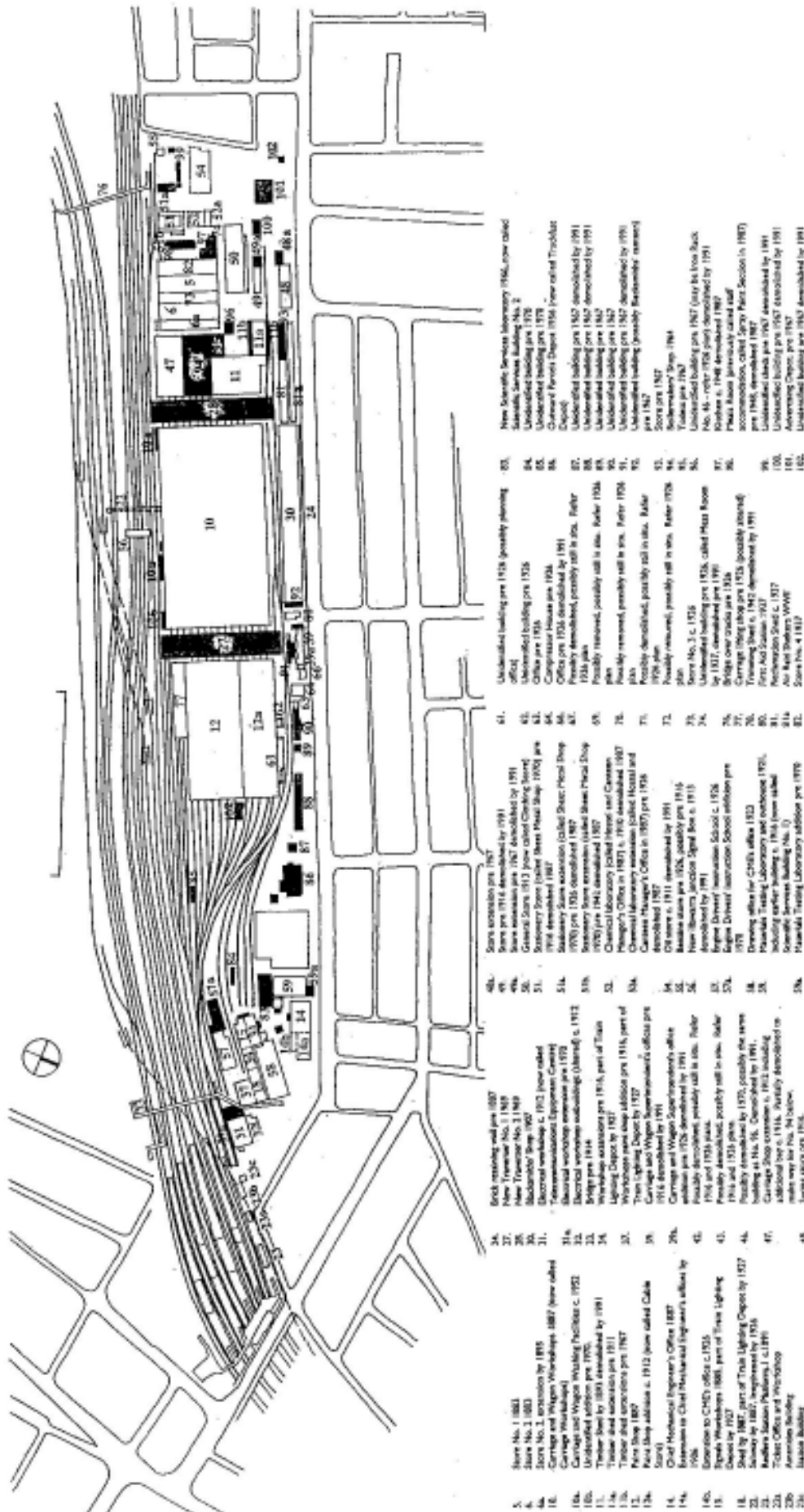
Figure 3.55: Asbestos Removal Shed, 1998. Source: Otto Cserhamli.



Figure 3.56: Fire Protection and Drug Analysis Building 1998. Source: Otto Cserhamli.

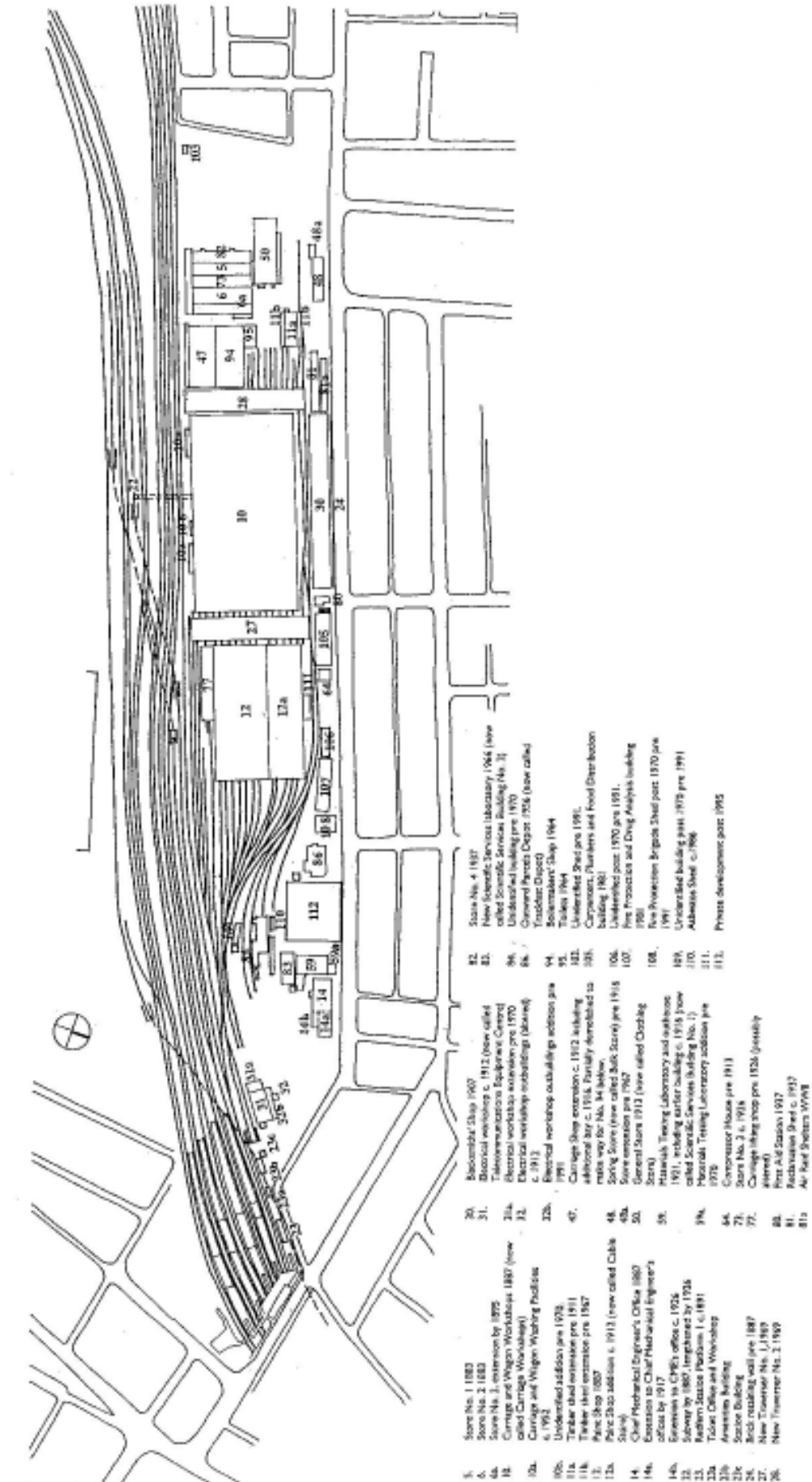


Figure 3.57: Fire Protection Brigade Shed 1998. Source: Otto Cserhamli.



PHASES OF DEVELOPMENT PLAN, 1970
Source: DPWS, 1998

Plan 3.7



PHASES OF DEVELOPMENT PLAN, 1998
Source: DPWS, 1998

Plan 3.9

3.1.11 ASSOCIATIONS

'SEND IT TO ELSTON'S'

The name Elston and the term 'Elston's Sidings' have long been associated with the Carriageworks at Eveleigh and it is no surprise to find that two former employees named Elston became Car and Wagon Superintendent there. 'Send it to Elston's' was a common instruction among railway operators for many years when they wished a coaching vehicle to be sent to the Eveleigh Carriageworks for attention. The comment would undoubtedly have arisen from a need to distinguish the Car and Wagon Workshops at Eveleigh from those on the locomotive side of the main lines and to ensure that coaching vehicles arrived at their intended destination. A carriage sent wrongly to the locomotive side might go missing for days and suffer damage if not found quickly.

In the New South Wales Railways Locomotive (later Mechanical) Branch, the Locomotive Engineer, later called the Chief Mechanical Engineer, was in charge and he appointed subordinates to manage the various divisions of his branch. One of these Divisions was the Carriage and Wagon Workshops at Eveleigh.

Soon after the Eveleigh Railway Workshops were opened, the then Locomotive Engineer, Mr Thow, appointed Mr William Henry Elston to manage the Carriage and Wagon Workshops. Elston's recruitment at the age of 38 suggests that he had previous experience in this line of work in either another Australian railway or, as is more likely, in the United Kingdom.



Figure 3.58: Administrative Officers, the Commissioner and Mr George Elston, Works Manager, in restored 1855 Carriage No. 1, February 1938. Source: SRAO

Elston was born on 17th September, 1851 and entered the service of the NSW Railways on 12th December, 1889, as Superintendent of Rolling Stock, on a salary of £ 375 per year. In 1891, the Illustrated Sydney News described him as 'kindly'.² Elston's position was changed to Superintendent of Carriage and Wagon Shops from 1st July, 1901 and his salary was adjusted to 500 pounds per year. He remained in this position until his retirement on 1st July 1917 aged 65, with a salary of £675 per year. According to his NSW Railways record card,³ his foot was scalded by hot water from an engine at Clyde on 28th July, 1911 and he was apparently not in good health for a time, being off work until November. Elston enjoyed a long retirement at his homes in Ashfield and Haberfield and he died on January 9th, 1939, aged 87.⁴ Elston's normal office would probably have been at the Eveleigh site in Calder House.

The second Mr Elston, named George (see photo caption on previous page), apparently the son of William Henry, was born on 28th August, 1886. He joined the NSW Railways at Eveleigh as an apprentice mechanical fitter on 25th August, 1902 with a wage of 16 pence a day. He continued this apprenticeship until appointed as a fitter on 6th December, 1907 with a wage of ten shillings per day, still at Eveleigh. In 1909, aged 22, he was appointed as a junior draftsman, also at Eveleigh, but at a lower salary. In 1926, he was appointed Senior Class Draftsman at a salary of £ 508 per year. Elston was appointed Assistant Works Manager at the Wagon works at Clyde on 27th June 1933 with a salary of £ 550 and moved to the position of Works Manager there on 2nd January 1939, his salary then being £ 655.

On 20th July 1942, Elston Junior was also appointed Car and Wagon Superintendent, Eveleigh, at a salary of £ 850 per year. He remained in this position until his retirement on 1st September 1951, aged 65. He also had a long retirement and died on 14th June 1976, aged 89 years.⁵

THE SENIOR ENGINEERS OF THE LOCOMOTIVE (LATER MECHANICAL) BRANCH

When the Eveleigh workshops were being planned, the Locomotive Engineer of the NSW Railways, as the title was then named, was Mr R Burnett, who had been in the position from 1878. He was followed by Mr W Scott, who held the position until 1888, and Mr T Middleton who was then in charge until 1889.

After the 1888 Railway Act was passed, the whole of the fleet of engines and carriages was reported on by Mr William Thow, who had been Locomotive Engineer of the South Australian Railways for over ten years. Thow's report was rather damning, showing up many weaknesses, and was sufficiently forthright to gain him the position of Chief Mechanical Engineer in NSW from 1889 until 1911. In this position, Thow would have had much influence on the direction of carriage design and manufacture and the workshops themselves.

Thow's successor was Mr Edward Lucy who was recruited as Thow's assistant from the British Great Western Railway in 1905. On 1st July, 1911, Lucy assumed Thow's position as Chief Mechanical Engineer. He remained in the role until retirement on 29th March 1932, aged 71.

Lucy's initial changes to carriage design were significant but he was soon overtaken by events. The Bradfield influenced all-steel electric carriages were imported into NSW in 1925 for the newly electrified lines. This obvious improvement was not adopted for locomotive hauled carriages generally until 1935, despite having been pioneered in the USA and Germany before World War I. Apart from his Main Line carriages of 1913, Lucy made only small contributions to carriage design in New South Wales.

JOHN WHITTON

ENGINEER-IN-CHIEF, NEW SOUTH WALES RAILWAYS 1857-1890.

John Whitton was born on December 21, 1819 in Foulby, Yorkshire. Whitton's mother, Elizabeth Billinton, was from a well-established and wealthy family, but his father's lineage is obscure - at the wedding of Elizabeth Billinton to James Whitton, James' parents are listed on the marriage register as "unknown".⁶ It was a slightly unusual arrangement in that James Whitton, a "groom" (as listed in the Parish records), married a woman from the middle-classes but the most obvious reason for such a match is not evident - Elizabeth's first child was born almost two years after their wedding.⁷

By the time John was born, almost three years after his brother Thomas, James Whitton had become a land agent, indicating that he had experienced a rapid rise in his social and financial status.

Whitton's older cousin, William Billinton, first took him on as an engineering apprentice in 1835. William had entered the fledgling profession a few years earlier and records show that by 1832 his professional occupation as a civil engineer was well established. John began his career at the age of 15 and by sixteen years of age had travelled to London to work with Billinton on the Wakefield Waterworks and Parliamentary plans, a move that suggests that he was a talented draftsman and surveyor.⁸ William Billinton also worked as a civil engineer for a number of railway companies and as his apprentice, John Whitton had many opportunities to experience not only the engineering aspect of his work, but also the political.

John Whitton then moved to the Lancashire and Yorkshire Railway under the employ of the then John Hawkshaw (later Sir John) in 1847. Hawkshaw was undertaking the massive job of laying a railway through the Pennines and it was during this work that Whitton became a firm proponent of consistent gauges with a preference for the narrow type. Later in New South Wales, the issue of gauge size would create friction between Whitton and his Governor and government. It was during this time with the Lancashire and Yorkshire Railway that the locomotive superintendent of the rival Manchester, Sheffield and Lincolnshire Railway, Richard Peacock, became known to Whitton, even if only on the basis of reputation.

The issue of gauge sizes was a pivotal one in Britain and Australia. In Britain, the "battle of the gauges"⁹ fought in the mid 1840s was between the smaller type championed by George and Robert Stephenson and the larger 7 ¼ foot gauge adopted by Isambard Kingdom Brunel. The smaller "Stephensonian" gauge won out because it was more widely used, thus universality of gauges would be easier to achieve.¹⁰ This "battle" would be fought in Sydney as well with John Whitton pushing for a universal gauge of the smaller variety.

Whitton's next move two years later, was to John Fowler at the East Lincolnshire Railway 1848. Fowler was to eventually move his work to London where he was to become famous as the "builder of London's Metropolitan Railway" in the late 1800s as well as receive a baronetcy for that work. In 1852 Whitton went on to work for the Oxford, Worcester and Wolverhampton Railway Company (OWW) with Fowler where he was appointed Resident Engineer to Fowler's Chief Engineer. Both men earned great respect in their professions and were called upon to work and comment on many railway construction jobs.



Figure 3.59: John Whitton, Engineer-in-Chief of the Railways of New South Wales, 1857 to 1890. Source: 'The Greatest Public Work' p 30.

Thus, Whitton's professional associations and his experiences in railway construction in Britain put him in an excellent position when the Engineer-in-Chief's job for the Great Northern Railway became available in 1855. Whitton applied and was short-listed but lost the job to Walter Brydone who had worked for the Great Northern Railway previously. Three months later he was offered a job as Engineer-in-Chief on the railway in the colony of New South Wales.

In July 1856, John Whitton married Elizabeth Fowler, sister of his colleague and friend. Two months later the Whittons were on their way to Sydney where John would begin his work and go on to become responsible for the laying of over 1,000 miles of new railway track across the state.

The idea of a railway made a great deal of sense in a colony the size of New South Wales that by British standards, was sparsely populated and had distant outposts. Whitton was in charge of connecting these outposts and transporting the, up until now, unexploited reserves of coal and shale to their next destination. While in Britain, Whitton had enjoyed a high degree of prestige and authority, but that authority and judgement came into question after the fatal head-on collision at Emu Plains in January 1878 even though he was a designer and not responsible for traffic management.

The Emu Plains accident marked the start of Whitton's subsequent political battles and in particular, the fight to preserve the reputation he had made for himself in Britain and in New South Wales before the railway system outgrew it. The issue of the smaller "Stephensonian" gauge was questioned and found to be inadequate for the increasing load from primary industry. What followed was a reshuffle in the Railways that saw Whitton's supporters demoted or sacked.¹¹ The political aftermath of the Emu Plains crash created the perfect climate to use Whitton as a scapegoat for many of the ills of the NSW Railways – a role that Whitton unwittingly reinforced with his refusal to compromise his vision for the railway of NSW.

Whitton's vision for the NSW railways was as an integrated system – "a radial network centred on Sydney".¹² Henry Parkes, leader of the opposition, had Whitton speak in parliament against creating new and competing rail lines – the motion was defeated. His ideas failed to progress with the increase in railway traffic to the point where the existing components such as rails, were not adequate to service the growing usage of the railways, particularly by heavy industry. In this sense, Whitton can be seen to be the architect of his own demise because he refused to budge on principle. John Fowler also had a connection with Australia, acting as adviser on some projects and visiting in 1886 where he stayed with Whitton.

While in Sydney, Fowler sketched a bridge over Sydney Harbour and showed that it could indeed be bridged, although that idea was not taken seriously for some decades to come (Fowler was then working on the Forth Bridge in Edinburgh). Fowler's involvement in NSW Railways was seen by some as exploitation of his relationship with Whitton.¹³

Throughout Whitton's career as CME he faced a great deal of criticism but also much support, particularly from the politician Henry Parkes. In 1887, Parkes offered Whitton a Knighthood for his contribution to the State's railways, which Whitton declined.¹⁴

Whitton's health began to deteriorate and in 1889 he asked for 12 months leave in order to go back to England to recuperate. Before he left, 1 week of torrential rains brought the railway system to a standstill - another opportunity to criticise his work as inadequate. The railways recovered from the weeklong downpour as Whitton left Australia on his way back to his homeland. In February 1890, Whitton tendered his resignation, nominating Henry Deane the next Engineer-in-Chief.¹⁵

John Whitton died in Sydney on February 20, 1898 aged 77 years. He outlasted his friend and peer, John Fowler by three months.

GEORGE COWDERY¹⁶

CHIEF ENGINEER FOR EXISTING LINES AND TRAMWAYS 1880-1890

George Cowdery, born in 1830, was the son of an English railway engineer who worked for private contractors Betts & Macintosh. As a child, he travelled extensively around England as his father moved from site to site. Cowdery started work at the age of 14, for Sir Samuel Moreton Peto, of Brassey, Peto & Betts, a construction company, which specialised in the building of bridges and railways. He worked in the drawing office and went out on the lines with the Engineer measuring up and setting out.

When working in North Wales on the Chester and Holyhead Railway, Cowdery met Robert Stephenson who was building the tubular Britannia Bridge over the Menai Straits.

Cowdery next worked on the Oxford, Worcester and Wolverhampton railway for Brassey, Peto & Betts. It was here, during work on timber piles for large timber truss bridges, which were experimental designs by Brunel, that he met John Whitton and John Fowler, both of whom employed him later in New South Wales.

Cowdery also worked on tunnels, stone viaducts, sea walls, lighthouses and pier heads. Cowdery would have been familiar with an earlier, 1819-26, suspension bridge over the Menai Straits designed by Telford and regarded as a masterpiece of elegance and design with brilliantly detailed iron work. Both bridges are regarded as landmarks in the development of iron structures.¹⁷

Work became slow in England because of the Crimean War and Cowdery came to Australia in 1856 with letters of introduction to the Governor of Victoria. Cowdery first found regular employment constructing roads and surveying new railway lines in Victoria and travelled to NSW following the awarding of the contract for the Menangle to Picton line to his former employers, Brassey, Peto and Betts. He worked on the Great Southern Railway at Douglas Park and John Whitton appointed him District Engineer of the Great Southern Railway in 1863.

Cowdery built the first two long railway tunnels in the colony as well as six large viaducts on the Great Southern Line. In 1868 he was transferred to work on the Great Western line and supervised the completion of the famous Zig-Zag line at Lithgow. In the early 1870s railway work almost ceased and the lure of gold at Hill End caused Cowdery to abandon the railways temporarily. He worked for a time as a mining engineer and also surveyed the mines and published a plan. He returned to the railways working on the lines beyond Goulburn then Grafton to Glen Innes, then Orange to Narromine.

In 1878 Cowdery was appointed the Deputy Engineer for Existing Lines in New South Wales and in 1880 he was appointed Chief Engineer for Existing Lines and Tramways. In the late 1880s he began to plan the Eveleigh Railway Workshops and it is Cowdery's signature that appears on the contract drawings for the Carriage and Wagon Workshops.

George Cowdery retired in 1890 and died in 1913. His son George Robert, later became Engineer for Tramways, a post he held for 37 years.

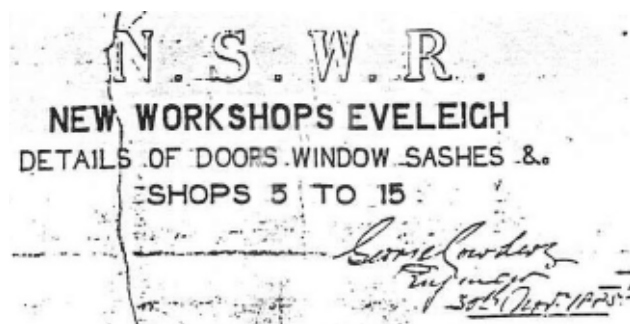


Figure 3.59: George Cowdery's signature appears on the plans for the Eveleigh Workshops. Source: Detail of SRAO ELW 22).

WHITTON & COWDERY AT EVELEIGH

After the 1878 re-structuring when Whitton witnessed the demotion of his men, his own responsibilities were diverted to new construction and Cowdery became the Engineer for Existing Lines, replacing William Mason. The Existing Lines Branch looked after everything to do with the permanent way including design and construction of new lines and all new buildings. The separate Locomotive Branch was responsible for all aspects of rolling stock.

Funds for various projects were obtained from different sources: Cowdery's budget came out of rail revenue while Whitton had to rely on parliamentary decisions for his projects. Although the Eveleigh workshops were technically New Construction, they were going to be built on existing lines as a replacement for the existing Sydney Yard, and the responsibility that Whitton thought would be his, fell to Cowdery. In 1881, construction on the new Eveleigh workshops began. Whitton and Cowdery began as friends who respected each other professionally and ended as rivals with Whitton increasingly critical of Cowdery's plans for Eveleigh, and Cowdery critical of everything that Whitton undertook from then on.¹⁸

There was conflict between Whitton and Cowdery over the cost of the Eveleigh complex, Cowdery's choice of a Whipple truss bridge at Lewisham, the design of Whitton's iron girder bridges and his timber viaduct over the Murrumbidgee flood plain at Wagga Wagga. Whitton considered the running sheds extravagant but comparison by Goodchap with the costs of inferior American sheds vindicated Cowdery. In April 1884 a Royal Commission was established to "investigate the rival claims of the Engineers". The commission could not fault Whitton's designs but it was Cowdery's plans that were implemented. Cowdery appears to have retained his position despite his obvious, and very public, difference of opinion with Whitton.

3.1.12 COMMUNITY ESTEEM AND VALUES

One aspect of the significance of a heritage site is the role the place played in forming cultures within the confines of its walls and the effect outside the strict boundaries of work. By nature of the size of the place, the people who made the Eveleigh Workshops function – from the Blacksmiths to the Electricians – became part of a sub-culture that had its own rules beyond those dictated by official working conditions. In volume II “Social and Oral History” of the *Eveleigh Workshops Management Plan for Moveable Items and Social History*, Lucy Taksa defines “social history” as “the history of ordinary people”,¹ the significance of which is the collective and often profound influence of a place on people and in turn, their effect on the place. The experiences at Eveleigh, as told by the workers themselves, augments the functional analysis of the site, as it is the workers who operated and maintained the machinery that manufactured and maintained the carriages and engines. Likewise it was the workers, represented by unions, who took action to improve health and safety and pay and other conditions of work. Eveleigh “provided the ground for struggle, as well as a contested terrain where workers used their community networks and their class identity to negotiate the power of the state and railway management as well as differences amongst themselves. In doing so, they remapped the ground on which they toiled and lived”.²

ORAL HISTORY

The information required to obtain an understanding of the “history of ordinary people” is often found within the memories of people with experiences of the site. Volumes II and V, “Social and Oral History” and “Oral History Transcripts” respectively, of the 1996 GML reports on Eveleigh, are concerned with presenting and analysing the oral histories collected during the course of “Back to Eveleigh” days and subsequent interviews. The stories in the transcripts communicate the feel of the place and give a perspective of the space and the activities therein. Conventional history gives an account of procedures and processes, while the oral histories present first impressions of the place as “overwhelming...a huge place, so noisy, so much activity, so many people around” (Jack Bruce v.V). Note that page numbers are not given in this report. Unless otherwise stated the quotes are from the relevant interviews in v.V of the Godden Mackay Logan (1996). The following oral histories are from people who worked either on the Carriage or Locomotive side. Histories from the Locomotive side are included where they provide general information about the place and its work culture.



Figure 3.61: Lucy Taksa on the left, collecting oral history from a former employee at a “Back to Eveleigh” Day. Photo: Jean Rice 1998.

John Willis recounts that he'd wanted to go and see the steam engines since he was a little boy and when he did gain employment at Eveleigh he remembers: *"I looked at the place, my first real look at it and I ran away. Yes, really. It frightened me...No, no. It was frightening because there was so much going on. So much movement. Straight away you thought 'Oh, I'm going to get run over' "(John Willis v.V).*

The impression of the workshops for the uninitiated - the noise, the heat, the perceived mayhem that is not apparent in the documented sequence of events at Eveleigh, is conveyed in the words of the interviewees. Long after they became accustomed to their working environment, the men remember the impact of their introduction to Eveleigh.

The old Locomotive Workshops, now the Australian Technology Park (ATP) has been regularly hosting "Back to Eveleigh" days. The event attracts people outside the railway profession for a number of reasons, some of which are mentioned in the Statement of Significance. However, as unpleasant as some of the events and working conditions were, the popularity of Back to Eveleigh Day with former employees from the Locomotive and Carriage Workshops and their relatives, and their willingness to reminisce is a testament to the impact the place had on their lives. Workers identified predominantly with the workshop that they were employed in, social events were organised along the same lines as were the regular union and political meetings. When required, such as for industrial action, both sides of the Eveleigh Workshops would unite. Hal Alexander, former employee and member of the Communist Party at the Carriage workshops mentions that *"there was a bit of jealousy about the loco side and the carriage side. There was a dozen train tracks in between but it could have been a mile wide. I only mean that in a peripheral sense. In the real sense there was unity between the workers"* (Hal Alexander v.V).

The transcripts of the interviews provide evidence of the importance that the place had in people's lives in many areas including politics, careers and apprenticeships. It becomes clear that working for the Railways was a way of life with workers setting family career trends: *"...anyone who worked in the Railways who had that idea about permanency or when their sons grew up they also would become Railway workers because it was a guarantee of some sort of permanency in life were called Railway Dans"* (Hal Alexander v.V).

Brian Dunnet started with the Railways in the 1950s and comments that his career decision was based largely on his familiarity with the Railways. In his interview with Joan Kent, Mr. Dunnet begins with an explanation for his decision to apply for work with the Railways:

Well, I came from a Railway family but at that time there were general applications for jobs and I made a few at that stage...but the Railways was made a consideration because I came from a Railway family background, both my father, a number of uncles and grandfather, people like that, had worked at various stages with the Railways – had been long careers in some cases (v.V).

Bob Matthews who worked at the Eveleigh Locomotive Workshops from 1940 to 1966 also followed in his father's footsteps:

I was born in Condoblin [sic] on 19.6.1919...My dad was working on the railway and that's where I was born. When the line was completed he was then moved to Parkes where I attended school and also started my railway career as an apprentice at the workshops at Parkes...In 1966 I then went into the New South Wales Government Railways Ambulance Corps and I worked in there until my retirement and I ended up as the General Secretary of the Railway Ambulance Corps (v.V).

John Willis was another "Railway Dan" starting at age 16 in 1949. Mr. Willis' father started at the Eveleigh Locomotive Works and stayed for forty years, followed by four of his sons, one of whom was John. During the 1940s the Railways was seen as one of the more stable employment options that had better working conditions than other jobs so it was not uncommon for sons to follow their fathers into the job. Conditions at the Eveleigh workshops were difficult and there is no doubt the work was exhausting, but the work was perceived to be stable and the hours were set. Families could organise their day's routine around the job. John Willis says:

Yes, I think she [mother] was happy because she knew what time he'd be home because with the wool wash they'd work anything up to fourteen hours a days [sic], so this way it was just a straight eight hour shift and she knew what time he'd be home, what time to get the tea ready and what time the boys had to be in for tea and to line you up for your bath. She liked it (v.V).

Eveleigh was the starting point for many workers as young men undertook apprenticeships, often before they finished school. Not surprisingly, as many people who began with the railways lived out their working lives with the railways, also centred their social activities on the workplace. John Robert Bruce joined in 1940 as an apprentice coppersmith and spent his working life with the Railways, most of it at Eveleigh. He describes social aspects of working in his later years at Eveleigh:

When I first went back to Eveleigh I was invited to join an officers social club...we used to have marvellous harbour functions twice a year. We would get a ferry and load it up with kegs of grog, buckets of prawns and meat prawns and all these sorts of things. We'd have one close to Christmas which was a family one with wives and husbands, and a bucks one in the middle of the year, on these ferries....[The Picnic Days] were different from these one [sic] that were personally organised. The annual picnic was more management inspired. We had volunteers who worked practically the year round doing bits and pieces to organise the annual picnic. And there were two of those. There was the workshop picnic was for everybody, all grades. And then there was the officers [sic] picnic. And that didn't just entail Eveleigh workshops it was all salaried staff right though. Both good functions. Both very well run. Very good for the children and the employees (v. V)

Eveleigh has been credited as being pivotal in the Australian Labour Movement, with the formation of the Amalgamated Railway and Tramway Service Association (ARTSA) in 1886. ARTSA was the first union relevant to the Railways that represented a large proportion of the unskilled labour. It was conceived by two porters, William Schey and J. Cavanagh, who realised that many of the unskilled workers such as the Signalmen and Guards all had similar work issues that could be resolved with a more unified approach (Hearn 1990: 18). Until the formation of ARTSA, the only successful unions were those that represented specialist groups with large membership like the Boilermakers' Society.³

Although Australia's involvement in WWI was initially supported by the workers at the Eveleigh Workshops, the heavy casualties suffered by the ANZACS created a more critical atmosphere within the working classes. Combined with, and as a consequence of, the horrors of the war, working conditions at Eveleigh were deteriorating. "The brutal war of attrition being fought in France demanded a constant supply of men, and Australia's Labor Prime Minister, Billy Hughes, believed that conscription was the only way to maintain adequate numbers of recruits",⁴ the effects of which were felt at Eveleigh as in other places. ARTSA instigated a "no conscription" campaign which resulted in a "no" response to two referenda.

With the working class community increasingly questioning Australia's involvement in the war, perhaps 1917 was not the ideal time to introduce the Taylor Card System to measure efficiency and cost. James Fraser, the Acting Chief Commissioner introduced the Taylor system into Eveleigh in an attempt to 'streamline' production and measure workers' performances. ARTSA reacted to this by claiming the system would act to dehumanise workers and make a monotonous job worse. The system was introduced at Randwick Tram Shops, followed swiftly by a failed attempt at arbitration. On August 2, 1917, 1100 workers at Randwick downed tools and walked off the job.

Three thousand workers followed suit at Eveleigh on the same day. The strike spread to other railway workshops at Clyde, Newcastle, and Goulburn and by the end of the strike 82 days later, an estimated 98000 workers had walked off the job, over 70000 of them in NSW.⁵

One of the effects of the strike was to consolidate the feelings of solidarity amongst many of the workers' families. Stan Jones, the son, cousin and nephew of Eveleigh workers:

...the families of the strikers became closer to each other and the families of those who didn't go on strike correspondingly became closer too. One had a feeling of being in the fight and the others had to some degree feelings of guilt...Not that there were too many who belonged to families whose men did not take part in the strike.⁶



Figure 3.62: Photo taken in 1915 of workshop employees showing their support for the ANZACS. It was sent by Ms Elaine Ward in response to a "Back to Eveleigh" day and is evidence of the significance that the place has for not only workers, but their families also. It reads: ...Enclosed is a photograph taken at Everleigh [sic] in 1915. My grandfather & uncle are in the photo. Their names were William Samuel Farrell & Lesley William Charles Farrell. I hope that you can find some use for the photo. I still have the original. Thanking you.... Source: Elaine Ward.

While the duration of the strike and the numbers involved is impressive, the ultimatum issued by the government that workers return to work or lose their jobs resulted in 1,300 workers picking up their tools again. In order to bolster worker numbers, the government brought in schoolboys from SCEGS (Shore) and Newington College as well as volunteer labour from rural areas. The strikebreakers became known as Loyalists and the strikers, Lily-whites. As powerful a message as the strike may have sent, the result was that the card system was retained and returning strikers were stripped of any seniority they may have had as well as their superannuation rights. Many unions were deregistered and working conditions became harsher than they were before the strike and remained that way until 1925 when the NSW Premier Jack Lang, upheld his pledge to restore strikers' positions.⁷

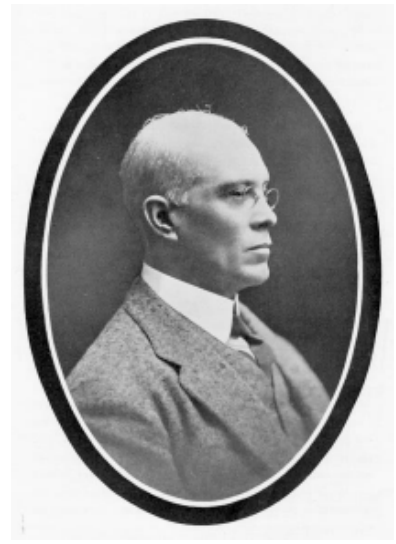


Figure 3.63: James Fraser, the Acting Chief Commissioner introduced the “Taylor Card System” in 1917. The result was a statewide general strike that lasted over two months and supported by almost ninety-eight thousand workers who walked off the job. Nevertheless, when work resumed, conditions did not improve and strikers were stripped of seniority and privileges. Source: Dept. Railways New South Wales 1955, p. 217.

The reverberations of the 1917 industrial action were felt by generations of railway workers whose fathers or grandfathers had been involved:

...part of the industrial muscle of the Eveleigh area was the fact that they could put on a demonstration outside of Parliament in half an hour or so, which they could do very effectively. ...A lot of the major forces that were involved at that strike, whilst it started at Randwick, it very quickly spread into the Eveleigh shops. But the ghosts of that, and the aftermaths of that, were still very much alive in 50s and the early 60s. By that I mean, as a young worker, people would point out to you people who had scabbed during 1917, were still being ostracised. ... In fact, there were still people who had joined the National Union of Railwaymen – the scab union that was formed – was still alive, very much so, in the 1950s and those people and those members of that particular union would be made known to people coming in to the Railways and there were a lot of grievances of 1917 were still being carried on the early 50s (Brian Dunnet v.V).

Peter Neve remembers the History Card of a senior clerical officer in the Legal Estates Branch in the 1960s being endorsed “Remained Loyal - 1917”.

Finally in 1932, the Lang Government abolished the Taylor Card System. However, the abolished system was replaced with time sheets, which were overseen by “Irregularity Clerks”. If time could not be accounted for, a “bung” was administered:

Bungs came down through administration. Bungs were issued for all types of misdemeanours. A bung was a ‘please explain’ and they had the great technique of being able to fit you with a huge number of charges for the one offence (Jack Bruce v.V).

Once called on a ‘bung’, an employee had to provide a written explanation for the time wasted and more than likely get their pay docked and the ‘bung’ recorded. An article from a 1954 edition of the Eveleigh News took on the issue of ‘bungs’:

The number & nature of Bungs being served on employees is growing daily. One would think that the Department wants to get rid of employees instead of urgently needing them. In the Machine Shop a Driller was Bunged for early washing. He answered the Bung & clearly showed that he was innocent of the charge. This reply just spurred the Bung merchants on to greater efforts, they issued him with another – Bung – Charging him with Idling his time from 3.55pm to 4.5pm [sic]... In the Boiler Repair Shop an employee, who cuts the ends of Tubes, was away from his machine. The employee explained that it had been a practice [sic] for the past 30 to 40 years for the operator of the machine to take the blade & have it sharpened when necessary... The following day he received a Bung. Charges were (1) Idling his time & (2) Being away from his working location. Another two employees, working in the same Shop received similar Bungs. Their reason for being away from the job was that unusual and apparently unnecessary – according to some people – human function which makes it necessary to go to the Lavatory.⁸

With working conditions being what they were, along with its strong history of unionism, it is not surprising that the Communist Party recruited a large following from the Eveleigh ranks. Shop committees, the first being formed in the late 1920s were a platform for communism at Eveleigh. They were formed in order to create links between the different unions and to “physically bring together the members and officials of the twelve unions that operated at Eveleigh”.⁹ “As communists, these people also saw the shop committees as the best tool for minimising other divisions that existed among the different religious, occupational, union and administrative grouping, which prevented concerted industrial activism”.¹⁰

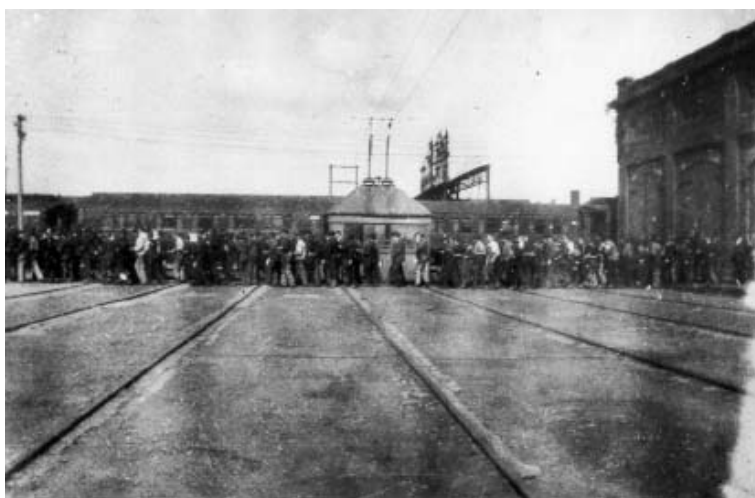


Figure 3.64: "The corned beef rush during the 1917 railway strike". This photograph was taken along the Traverser no. 1 pit. The queue is lined up in front of the Traveser control box. Possibly the union provided food handouts to striking workers or, alternatively, it is possible that meals were provided by volunteers. Source: ML Videodisk "At Work and Play", the Sam Hood Collection.

Even as late as the 1940s, management was viewed by some of the workers as the “ruling classes”. In the words of Hal Alexander:

It meant that we had some illusions that one day the Shop Committee movement would turn into workers Soviets [sic] where the workers would seize control of power and operate the industries for themselves and not for the ruling classes. That sounds funny now, but now when I think about it I didn't think it was funny at all. I think it was very serious and very noble to think that workers could control their own lives and to help to set up the necessary apparatus in the form of the Shop Committee movement which in time could become a source of real power so that the [sic] administered things on their own behalf and on behalf of people generally, or on behalf of all people like Aborigines and so on. (v.V).

Personal issues facing strikers are often overlooked when the inconvenience of industrial action is faced by members of the public, such as public transport commuters. Mr. Alexander provides insight into the potential jeopardy that affected, and still affects many strikers:

...invariably at some stage or other in a worker's life, either once or more times, he's faced with a decision: shall I work or will I scab will I scab [sic] or will I strike when you're a married worker with a family it's a big decision to go into a strike action not knowing how it might end. That sort of courage, on principle, is the thing that really typifies the working class of this country...the benefits such as might be now that Railway workers enjoy throughout the length and breadth of this country have been based on the early struggles of people like Ted Walsham and the Railway Shop Committee movement, to create a set of standards that the boss couldn't get over the top of...[?] (Hal Alexander v.V).

As noted in Volume II “Social and Oral History” of the Godden Mackay Logan report, 1996, time constraints precluded interviews with “marginalised workers” that is, Aborigines, women and migrants. One Aboriginal resident was interviewed, but no women or migrants. The recommendations of the Godden Mackay Logan report are that people representing these groups be contacted and interviewed as their experiences at Eveleigh are essential to the overall social interpretation of the site.¹¹ Nevertheless, some information regarding individual attitudes and perceived collective attitudes about the marginalised workers can be gathered from the existing interviews.

Based on the interviews of seven male former employees who are Anglo-Australian and one local resident who is Aboriginal, the perception was, and still is, that Eveleigh did not employ many Aborigines. Various reasons are given by the interviewees for this, including the notion that the jobs at Eveleigh did not suit the Aboriginal people in the local area. *"If they've been involved in the Railways, and a lot of them have been, to sort of work in country areas"* (Brian Dunnet v.V). Most men can recall only "two or three" Aborigines who were employed at Eveleigh at one time. Allen Madden, the one interviewee who is Aboriginal, remembers the same proportion of Aboriginal employees. Mr Madden is a local resident and a member of the Metropolitan Local Aboriginal Land Council.

The Railways employed a large number of skilled and unskilled migrant labour in the post WWII period of the major immigration phases. Comments were made about "deep seated resentment of all migrant workers because they were coming there to break down conditions" (Hal Alexander v.V) that had been earned by the workers after years of struggle and strikes. The deep-seated resentment showed itself in more blatant ways as well – *"What do we want to go on strike for him for, he's only a bloody wog". But, "You don't understand, comrade, you don't understand. He was sacked because he couldn't talk [he was a Greek fellow, Steve Stavros], couldn't speak the language properly and he couldn't explain why he'd had the day off"* (Hal Alexander v.V) – ultimately the communist ideals dominated because as Mr. Alexander says, a multicultural society is *"based on the working class resolving its problems and seeing the class factor as the unifying factor and racial origins, religion or something, is a secondary question"* (v.V).

The general perceptions of the migrant workers at Eveleigh however, are of initial problems that were sorted out promptly. Many people had left their own country for various reasons, either as refugees from oppressive regimes, or in order to make a better life for themselves and their families or even to make some money with the intention of taking it back to their homeland. John Willis recalls that the *"Baulks (sic)"* (another euphemism for migrant) were *"very good people, very, very good people those who came out in those days and they got on with the Aborigines like nobody's business"* (v.V). The term is sometimes written Baulks as here but more commonly as "Balts", from the Baltic states, or "Balks", from the Balkans. Another former worker recalls the first post 1950s migrant workforce:

We actually saw the first influx of the Italian and Greek people as migrants to Australia. They were very good really. In a very short time they became part and parcel of the workshop, got on very well. Most of them, after a couple of years, they were able to pass the likes of me. They seemed to be able to settle to saving and building businesses and all the rest of it while the average Aussie went to the trots or the pub. They put their back to the wall and they really did it. (John Bruce v.V).

Mr. Bruce appears to have been struck by the “European style” of dress the migrants brought with them, in particular, the Italians who in those days it was pointy shoes and tapered trousers – small cuffed trousers. So they stood out a little bit that way [but] they assimilated very well (John Bruce v.V).

Allen Madden comments that the Maltese, Greeks and Italians and Kooris who lived in the same area did so without incident and that ...it was just the white fellas that caused all the problems (Allen Madden v.V).

Another under represented group at Eveleigh is the women. The primary reason for what appears to be an androcentric characterisation of the workshops is that the workforce at the shops was made up almost entirely of men, particularly up until the 1970s when gender played a larger part in employment choices than it does now.

...[T]here was only a woman engineer who started. The place wasn't designed for women in there. I mean, urinals – they had urinals out there and there was one where you walked in ... - I don't know how she ever got on. You walked into the large erecting shop and you walked straight in pass [sic] the urinal. Well, I mean those were the old days. It wasn't designed [for women], the workshops (Keith Johnson v.V).

Some women were remembered for working in the canteen, as cleaners (Hal Alexander v.V) or in administrative positions (John Bruce v.V) and in the munitions department during WWII on the Locomotive side. Women also worked in carriage cleaning and in trimming. This was located in the upper level of the Carriage Workshop (north west corner) and in the south west corner of the Paint Shop then later in the Trimming Shop at the upper level on Wilson Street (close to the former site of Calder House).



Figure 3.65: Cricket played between the lines, presumably at the Carriageworks or the Alexandria Goods Yard south of the Locomotive Workshops. Source: ML Picman Citation no.: NCY40/289 Frame no.: Home and Away - 17156.

First aid is another area that was occasionally occupied by women and where a series of nursing sisters were employed. The attitude apparent in the interviews is that the nursing sisters were somewhat authoritarian and difficult to deal with. One sister in particular, nicknamed “the Beast of Belsen”, amongst other things, (Bill Leach & Bob Matthews v.V) was feared for her approach to minor injuries. Bill Leach describes her as *“rather a big, fat lady. A horror to deal with. If she had splinters or anything in your fingers she got them out, no worries at all...you dreaded getting anything wrong with you so you didn't have to go and see her. She was particularly vicious on apprentices...that's right the 'Beat [sic] of Belsen', I'd forgotten about that, but she had a few other names too, I can tell you”* (v.V).

The “Beast of Belsen” was Agnes Mary Lyons,¹² an ex-army sister and who, according to John Bruce was *“not terribly popular because of her attitude and regimentation”* (John Bruce GML 1996: v.V). Sister Lyons is remembered for her exemplary handling of a serious accident in the foundry that claimed two lives and injured many. With Sister Lyons *“you stood to attention...I'm given to understand that her work with those fellows was absolutely unbelievable. Her ability to cope was what was needed at the time and she sure did it [?]”* (John Bruce v.V).

The value of the interviewees' reflections of the “marginalised” employees lies in the balance that they provide. On first impressions the “dirty” and heavy nature of the work precludes the employment of women on site – clearly this is not the case. The conventional Anglo-Australian excludes the input of indigenous Australians and workers from non-English speaking backgrounds, which in turn hinders a fuller appreciation of the culture and politics that developed in and around the Eveleigh Railway Workshops.

Further interviews with Aboriginal workers, women and migrants are required to augment the social history of Eveleigh.



Figure 3.66: The caption in the photo reads: Workers down tools to attend the unveiling of the Roll of Honour at the Eveleigh Workshops after World War I. (Noel Butlin Archives, ANU Archives of Business and Labour). Source: Sharpe 1999: 81.

As a consequence of a micro-culture developing in the workshops, social hierarchies developed also. More established workers initiated apprentices into the job, just like they themselves had been when they first started. The "initiation rites" experienced by new recruits were not only a reminder of their status in the place but added some humour into an often serious and consuming job.

Ted Turner returned to Eveleigh at a recent "Back to Eveleigh" day. He wrote the following note (in capitals) recalling some of his experiences as an apprentice Fitter & Turner at Eveleigh. Mr. Turner's reminiscences describe a cultural order within the Workshops. Some of the activities that he describes were part of the employment conditions, but others were standard jokes older employees played on the new recruits:

BILL FITTER & TED TURNER WERE BOTH APPRENTICE FITTERS & TURNERS IN THE YEAR 1936. GREAT DIFFICULTY WAS OFTEN EXPERIENCED WITH WORKSHOP CORRESPONDENCE. IE. MR. FITTER OR MR. TURNER, APP. FITTER & TURNER.

I HAVE ALSO BEEN CAUSED TO TAKE THE WHEEL BARROW ALONG TO THE DAVEY [SIC] PRESS & I WAS TOLD TO COME BACK LATER AS IT WAS BEING USED, BUT IN THE MEANTIME IT WAS SUGGESTED I TAKE A LONG WEIGHT (WAIT) BACK TO THE ORGINASORS [sic] OF SUCH STUNTS. IN THE MEANTIME THERE WAS I STANDING IN FRONT OF STORE DEPT. WAITING FOR A LONG WEIGHT (WAIT) CAUGHT BY THE MANAGER.ON THE MAIN DOOR OF THE ERECTING SHOP NORTHERN END (ON FACING WORKSHOP LEFT SIDE). THERE WAS A SIGN WHICH READ SOMETHING LIKE THIS:

-CIGARETTES-

NO EMPLOYEE IS TO ROLL HIS OWN CIGARETTES WHILST ON DUTY

(THIS WAS A TIME SAVER)

ALSO WHEN AN EMPLOYEE VISITED THE TOILET HE SUBMITTED A BRASS TOKEN ON ENTERING & WAS GIVEN 4 MINUTES GRACE IF OVER THIS TIME HE WOULD BE DOCKED 15 MINUTES PAY, YES AN ATTENDANT WAS PAID TO SUPERVISE SUCH ANTICS. AN ENVELOPE WAS PLACED ON MY MACHINE ADDRESSED AS SUCH PLEASE DELIVER BY HAND TO THE SUB FOREMAN MACHINE SHOP EVELEIGH SENDER ALL THE APPRENTICES CONTENTS WE BELIEVE YOU HAVE CHANGED YOUR NAME TO YOUR ANCESTRAL TYPE MR. LERGMON GOD

TRY THIS

TO READ

MONGREL DOG

WELDERS WOULD REPAIR CRACKED CAST IRON PARTS. DURING THIS PROCESS THE WELDER WOULD SOMETIMES HAVE TO WAIT LONG PERIODS FOR PARTS TO COOL SUFFICIENTLY PREVENTING CRACKING DUE TO SHRINKAGE.

THE WELDERS WOULD PLAY CARDS DURING THIS WAITING PERIOD THIS WAS OFFICIALLY ALLOWED, PARTICULARLY AT THE ERECTING WORKSHOPS CHULLORA, WHILST WELDING OF DIESEL ENGINE CYLINDERS.

GOOD LUCK I HOPE THIS INFO WILL HELP

TED TURNER

I HAVE LOST TRACK OF MY MATE BILL FITTER.

Other initiation rites are relayed in Volume V of the Godden Mackay Logan Oral History Transcripts:

...Another one was the funnel trick. You were required to put a funnel in the top of your trousers, I'd say about a six inch funnel and it was supported in the belt at the front of your trousers. And you'd put a penny on your forehead like that [indicates] and you'd have to drop the penny into the funnel and while the penny was located on your forehead a fellow came along with a bucket of water and pours it down the front [laughs].¹³

The Statement of Significance (Part 5) defines the value of the Eveleigh Carriage Workshops on a number of levels including the high standard of construction, the development of the labour movements and the potential for research in railway workshop function to name only three. Another significant aspect of the workshops is that the place was used continuously as railway workshops for 100 years. Inherent in the duration of the workshops is the high standard of craft that was required to supply and or maintain most of the state's rolling stock. Interviews with employees, who worked in the shops until their closure, clearly communicate the level of pride that the men took in their work. *"Eveleigh is the last true great railway workshop. Although you see a few cracks here and there, it has been standing a hundred years, and I think that speaks very highly for the craftsmen and their skills. They created this place".¹⁴*



Figure 3.67: This photo was taken on the Carriage side of the railway workshops. The two grey-bearded men, 2nd row from the front, third and fourth from the left, also appear in group portraits taken in the Locomotive workshops, presumably because they had some type of overseeing position. Note the child in the second row. Source: Hearn M, 1990, *Working Lives: A History of the Australian Railways Union (NSW Branch)*, Hale and Iremonger, Sydney :15.

The Eveleigh workshops in turn occupied a meaningful place in the lives of many of the workers and their families. Following is an excerpt from a letter in response to an ABC Radio interview and an article in the *Herald* newspaper. The letter is from Mr. John Sawkins and is dated 30 April, 1997.

My father worked at Eveleigh from approx. 1938 – 1947. He did his apprenticeship there, as an electrician, and often reminisced about the place, about some of the other men whom he ‘served’ with there – and I went there with him a couple of times when it was the site for Paddy’s market. He was amazed that much of the wiring (on which he had worked) was still in place.

He had a number of friends from those times with whom he kept in touch. His name was Ron Sawkins – in died in 1991, so is not able to participate in your project, in which he would have been very interested, I’m sure. I’m gradually piecing together stories, which I recall, that he told me about life at Eveleigh. It was quite an institution, I think, and the Herald photo of the lottery tickets certainly spurred my memory a little – and also that of my mother. She’s sure Dad would have been in some of the ‘syndicates’ at Eveleigh.

...The ABC Radio program mentioned the fact that Eveleigh had served as a site for assembling weapons during WWII, but that there were no records of the women who worked there.

As it happens, after my parents were married, they moved to a flat in Cremorne and two doors down were three sisters whom Dad had known at Eveleigh during the war...just what they did in the assembly plant at Eveleigh, I’m not sure. After the war they left Eveleigh, and Alison + Min continued with the railways – my memories of them are that they worked as ticket-collectors at Wynyard.

In more recent times, some individuals have initiated changes that have either affected working conditions or individual workers lives. Following are the stories of only two of these people.

LOUIS CAVALIERE

Louie Cavaliere is one of the last workers at Eveleigh and his story is significant for a number of reasons. As a migrant from Italy, Mr. Cavaliere fell into the category of “Balt”, an indiscriminate term used for migrants before the term “New Australian” was coined.¹⁵ Migrant labour made up a significant proportion of the workforce, with Aboriginal labour contributing to a lesser extent, and which in turn impacted on the residential demography.

Mr. Cavaliere emigrated to Australia from Italy in 1952 on an assisted package of £15 with the intention of finding work as quickly as possible. Within three months he had landed a job at the railways as an “office boy” and moved from Bonegilla near Albury to Redfern to begin work. In an interview Mr. Cavaliere describes his ascent into the labourer’s hierarchy at Eveleigh:

I started as an office boy then went in as a shop boy. A shop boy used to sweep the floor, pick up the lunches for the men. I went as a workshop labourer, then ... I went to a fitter assistant then a third-class machinist then to a second-class, then to acting first-class, then as a crane driver because an overhead crane driver clears more money than anyone else in the workshops.¹⁶

During the 1950s one of the Australian Railway Union’s (ARU) objectives was to target migrant workers to join the union, which in theory should have benefited them the most because of the language barrier. Even so, the work environment at Eveleigh was not conducive to the enhancement of language skills. The non-English speaking migrants continued to communicate with each other in their own language and only picked up enough English to do their job. There was neither the time nor the services available for an unskilled labourer to attend English language classes.

Needless to say, many of these workers started at a lower-skilled level and remained there because they did not possess enough English to be trained for a job of a more complex nature. Mr. Cavaliere pushed for English language classes and in 1969 the first half-hour class was held. Management suggested Mr. Cavaliere teach the classes, a suggestion he resisted, and soon the migrant workers were being taught English by a small group of management clerks.¹⁷



Figure 3.68: Louis Cavaliere stands in front of a photographic exhibition by Monika Allan at a “Back to Eveleigh” day. Photo: Jean Rice c.1998.

In 1981 Mr. Cavaliere's role in the ARU shifted towards managing the union's responses to cost cutting measures being implemented by the State Rail Authority (SRA). In October of 1982, David Hill, the SRA Chief Executive, declared that in order to save money the workshops had to be downsized or workers would be sacked. The function of the workshops went into decline from then until their closure in 1988. In 1999, Mr. Cavaliere received a Scroll of Honour from the Rail Bus and Tram Union for his "outstanding contribution to the trade union movement".¹⁸

MONIKA ALLAN¹⁹

Monika Allan was the last "English in the Workplace" teacher for the Adult Migrant Education Service (AMES) at Eveleigh Carriage Workshops in Wilson Street. Ms. Allan taught there from September 1983 until the classes were cancelled in December 1985. In addition to teaching, Ms. Allen used the workshop and employees as subjects for a photographic assignment, which was later exhibited at the "Back to Eveleigh Day" in 1997.

The classes began in a louse-infected Union Shed a "dingy, cramped and dirty shack just across from the Bogie Shops" (Allan pers. comm.) and consisted of four, 2-hour classes a week – an Intermediate class for those more advanced in English and an Elementary class.

One of the most apparent effects of the language barrier was that many of the men and some of the foremen remained in the same job, long-term, with little hope of professional advancement. Some of the men had emigrated 20 years previously but for various reasons failed to learn the language of their adopted home. Indeed, it is likely that many of these men attained a low level of education in their birth country which made it all the more difficult to learn a new language and cultural idiom while working, particularly when surrounded by colleagues of the same or similar cultural background. Although many of the men struggled with the lessons, according to Ms. Allan, the desire to learn was there and much of the learning was completed as "homework".

The first two terms of AMES in 1985 were held in the modern conference room under the Administration block. The promotion in resources was short-lived however, and the classes were moved back to the Union Shed after being contracted into one. All the levels were amalgamated, which made teaching and learning even more difficult, but as the work was being wound down, so the number of staff decreased. The last move back to the Union Shed heralded the demise of the AMES project and sixteen years after they began, English language classes at Eveleigh ended.

Monika Allan was born in Denmark and raised in Australia from the age of five. Formerly an ESL high school teacher and school counsellor, her move to Eveleigh enabled her to document daily work-related activities. She had the advantage of being such a familiar sight around the Bogie Shops when liaising with foremen and migrant men for assessment and recruitment, that Ms. Allan was able to photograph freely with very little self-consciousness on the part of the subjects.

3.2 THE OPERATION OF THE SITE

3.2.1 GENERAL OPERATION OF THE SITE

The Eveleigh Carriage and Wagon Workshops were built as a carriage and wagon repairing facility although new carriages were also built there, in particular prototypes of new designs. Wagon repairing was moved to the Clyde siding between 1909 and 1913 and from that time on the site concentrated on carriages. The description below explains how the site operated for carriage repairs in the latter part of its life. During the life of the Workshops, however, there would have been many slightly different versions of the process outlined here. More detail of these changes is provided in *Section 3.3 The Operation of the Main Shops*.

Although several new buildings were constructed and various functions were moved between buildings and within the main workshops building, the way the site worked remained relatively constant from the time the wagon repairing function was moved from the site to the Clyde Siding in 1913 until the Workshops' closure in 1989.

Processing Vehicles Through the Workshops

Passenger vehicles, (and goods wagons up until 1912), would be processed through the Carriage Workshops in one of several ways depending upon what repair work was required and why the vehicle had been delivered to the workshops.

Arrival and Departure from the Carriageworks

The two sidings behind Platform 1 at Redfern Station, parallel to the up main line, and called by some 'Elston's sidings', were the delivery and receipt point for carriages arriving at and leaving the workshops.

Vehicles scheduled for workshops overhaul or for repair or attention for any other reason would be placed into the sidings during the night for the workshop shunting engine to take them into the Carriage and Wagon Workshops during the next morning.

Conversely, completed and overhauled carriages would be placed in 'Elston's Sidings' at the end of each day for collection by a shunting engine which would take them into either the Western or Eastern carriage sheds in Sydney yard. There, they would be prepared for their entry or re-entry into revenue service.

Mr Ken Heard, a former Carriage and Wagon Workshop Manager, remembers that one could pass 'Elston's Sidings' after a day's work and note with pleasure the scheduled delivery of completed vehicles ready to return to traffic. He also recalls, however, that often on returning the next morning, one would often see the siding filled with more carriages which, although not scheduled for attention that day, had developed a fault or had been damaged in an incident overnight and would require attention.

Reception at the site

Carriages from 'Elston's sidings', behind Redfern Platform 1, would be hauled by the Works shunting locomotive into the reception sidings which were adjacent to the up main line on the southern side of the Paint Shop. Here, skilled examiners would look over each car to determine what work was required and whether the carriage needed to be sent into the workshops for an overhaul or for minor work which could be repaired outside the Paint Shop.

Carriages were sent into the workshops for one of three reasons:

1) The wheels and bogie had travelled further than the distance designed for and the workshops, which maintained bogie repair records, would advise the operating authorities that the bogie was required for checking and attention. This work was likely to involve the replacement of an over-distance set of bogies with an overhauled set of the same type.

Any other defects found by spot check would also be attended to unless the vehicle was urgently required for traffic, in which case some work might be scheduled to be performed in Sydney yard by the carbuilders located there.

2) The carriage had been examined in a storage siding near Sydney Yard by a Car and Wagon Examiner and had been found to have a defect which prevented its further use in traffic. The examiner would place a red 'For Attention' card on the car, and the shunter would deliver it to 'Elston's Sidings' as soon as possible. Carriage and Wagon Examiners were regularly engaged in checking carriages in the sidings in both Sydney and Macdonaldtown, to the chagrin of "traffic".

3) A vehicle had reached its scheduled heavy, or light, overhaul time (this was determined by a set of standards established by the Carriage and Wagon Shops) and the workshops requested that it be delivered to them for full inspection and overhaul. These types of overhaul were separate from bogie attention, and often meant that the car spent the next three to four months in the Carriage and Wagon Shops being overhauled and, usually, painted.

Entering the Carriage and Wagon Shops

Once a carriage had been inspected and required work noted it was scheduled for the attention of the programming staff.

The programming section was a valuable adjunct to the smooth flow of vehicles or work through the workshops. Programmers, who were often former tradesmen, had an intimate knowledge of the different sorts of vehicles and the types of repair work that each vehicle was likely to require. They knew how long particular work ought to take, what methods were required to complete the work and in what order the work ought to be performed. The programmers scheduled work for each section of the shops sufficient to keep it busy, but allowed also for the out-of-course jobs which are part of any working railway.

Cars scheduled for bogie inspection or exchange, or for minor repairs, would receive some preference due to the minor nature of the work. Minor work could often be handled on the 'apron' beside the Redfern end of the Paint Shops without the car having to enter the main workshops.

On the apron was once a wooden building known as the 'Traffic Section'. This held a store of frequently used carriage parts so that the carbuilders could carry out repairs in a much quicker time than if the car entered the main workshops. This way, the car could be returned to traffic almost immediately.

A pit for a steam crane was also located in this area, close to the yard foreman's office. The crane was fitted on a 4-wheeled shunting engine and, because it was steam fired, it was necessary for it to be 'de-ashed' and have its boiler cleaned out at regular intervals. The pit enabled this cleaning to be carried out and also made inspections of the underside of the crane easy¹. This would have been replaced in the 20th Century.

Steel jacking rails, which permitted jacks to be slid along them, were located in front of the doorway to Track 2 of the Paint Shop, as well as on the apron. These jacking rails were actually worn railway tracks which were inverted and set in concrete and they are still *in situ*.

It was not unknown for a car coupled within a set of similar cars to develop a defect yet be required for service on an Express in the evening. It would be delivered to the Traffic Section, attended to and returned to traffic via 'Elston's Sidings' as soon as possible. Sometimes, a special engine was sent to collect it for service as soon as it was ready.

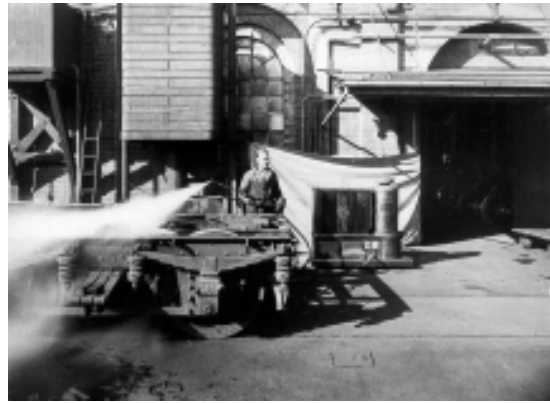


Figure 3.69: Two views of bogies being cleaned at the Eveleigh Carriage and Wagon Workshops. The view on the left is taken adjacent to the main lines, probably on the apron outside the Paint Shop. The view on the right is on the northern side of the Carriage Workshops near the Blacksmiths' Shed. Undated. Source: SRAO

Carriages which required more substantial work or overhaul were received, inspected and programmed in the same manner but the next step would be to remove the bogies under the car and place it on temporary 'works' bogies. For large carriages, this took place in the Carriage Lifting Shop. Smaller carriages had their bogies removed inside the main workshops building. The body of the car would then be moved along the long siding parallel to the main workshops, to the cleaning area on the Wilson Street side of the workshop building. Here, at the northern end of Traverser No. 2, steam cleaning would be carried out before any further work was undertaken.

The bogies themselves were also steam-cleaned. This activity appears to have taken place in a few locations on the site. Once cleaned, they were repaired, if required, at the eastern end of the main workshops building in Bays 16 and 17. They were then stored outside until required to be reunited with the correct carriage as the various classes of carriage required different bogies. Still *in situ* on either side of Traverser No. 1 are the many short lengths of rail which were used to store bogies.

After cleaning, carriages were moved to the particular areas of the workshops allocated to their types. The traversers played an essential role in moving vehicles into and out of the work bays in the main building and the Paint Shop. Carriages were moved on and off the traverser using tractors, steam engines and powered capstans with ropes.

Main line, express and sleeping carriages would be handled in the 'D1' section at the western end of the main workshops building, adjacent to Traverser No. 2. Suburban (end-platform) carriages would be received into the 'D2' section, next to 'D1'. Rail motors would be sent to the Sydney end of the building, adjacent to Traverser No. 1. Lightweight tourist carriages received attention in the Paint Shop annex to the north of the main Paint Shop. The Carriage Shop extension (now called the Cable Store) on the western side of Traverser No. 2 was also used for carriage repair work.



Figure 3.70 : Carriage Lifting at York Carriage Works, England, undated. Carriages were lifted in a similar way at the Carriage Lifting Area at Eveleigh. Source: 'An Illustrated History of British Railways' Workshops' p 127.

The areas where various activities were carried out varied during the life of the workshops. Plan 3.11 shows how the main functions were moved about the site.

Once inside the appropriate area, car-building teams would overhaul, repair or alter the carriage as required by the programme. In addition to repair work, new carriage building and conversion of existing carriages to new types was undertaken in the area set aside for the particular vehicle type.

New timber introduced into the body, as well as the existing bodywork, would be rubbed down and prepared ready for painting (this activity was not permitted inside the Paint Shop because of the dust it generated). On major overhauls, most of the interior fittings such as seats, doors, fittings, windows and shutters would be removed and repaired. The fittings were then replaced by a set of brand new or overhauled fittings in the fit out area west of the Paint Shop.

Royal and special carriages, such as the Governor General's car, were attended to by a special staff headed by a 'Royal' carbuilder. The carriages were stored in the first (southernmost) track inside the Paint Shop and were enclosed by a secure fence. They were not usually shifted into the general workshop but their bogies, if requiring attention, were moved about as necessary.



Figure 3.71: View of the Timber Shed extension 1953. In this building and the main Timber Shed were stored the sections of timber which would be used in carriage repair, overhaul and construction work. During World War II, the Annual Reports note that timber was difficult to obtain and that several carriages were therefore built from timber which was already in stock. This building is there as of 2002. Source: SRAO

The finishing work carried out was the painting of the exterior and the varnishing and polishing of the interior of the carriage. This work was carried out in the Paint Shop or later in the Paint Shop Extension (now called Suburban Car Workshops). Many of the top-of-the-line express carriages, such as those on the Melbourne and Brisbane Expresses, were finished inside by French polishing, a much finer finish which was quite durable, even in railway service.

Once repair or overhaul work was complete, the carriage, without fittings, would be moved to a point outside the Redfern end of the Paint Shop extension for 'fitting-out'. Here, specialist staff known as 'trimmers' could fit all the interior items removed prior to overhaul. Previously, trimming had taken place in Bays 24 and 25 of the main workshops building as well as in the original Paint Shop.

Various trades which supported the carriage repair, conversion and building activity (for example the plumbers and millwrights) occupied particular bays of the main workshops building for their work. The blacksmiths, who had originally worked at the northern end of Bay 21, moved from the long shop directly behind the main workshops building in c. 1909. The Carriage Shop Paddock extension, where the Cable Store is now, provided more working space, as did the Boilermakers' Shop and, after the construction of the extension in 1912, the original Paint Shop.

In summary, the handling of a carriage inside the Carriage and Wagon Workshops was as follows:

1. Reception into 'Elston's Sidings', or one of the longer reception tracks beside the main lines.
2. Inspect body for work, send details to programmers for scheduling.
3. Move to crane area where bogies were removed to be sent to bogie section for separate overhaul; replace with temporary works bogies.
4. Move to northern end Traverser No. 2, Wilson Street side for cleaning - in particular the underfloor equipment, coupling pockets etc.

5. Once cleaned, move car to workshop appropriate to its type, and overhaul as programmed and scheduled. Exceptions to this were brake and mail vans and collision damage carriages which were handled in the Carriage Shop Extension (now called Cable Store). After 1964, cars requiring boilermaking (i.e. metal trades) work were moved to the Boilermakers' shop adjacent to the Carriage Shop Extension.
6. When repairs were completed, all surfaces were rubbed down ready for painting.
7. The car was then moved to the Paint Shop (or the Paint Shop Extension) for painting and interior varnishing or polishing as required.
8. 'Fitout' and trimming was then performed either inside or outside the Paint Shop depending upon available space in the Paint shop, the weather, or a combination of both.
9. Return carriage to crane area to reunite it with a pair of overhauled bogies, either its original pair or a like set.
10. If major work has been carried out, schedule the carriage for a trial trip to Penrith or Campbelltown.
11. Place into 'Elston's Sidings' for return to revenue traffic work.

It is unlikely the Royal or Special carriages passed through this programme as listed as they tended to remain on Track 0 on the southern side of the Paint Shop and all necessary work was carried out there.

During the time that the Carriage and Wagon Shops handled goods wagons (until 1912), it is conceivable that a similar set of procedures would have been carried out for these vehicles. Due to their much smaller size and lighter weight, many wagons did not last as long as heavy passenger carriages. Wagons were often scrapped or 'rebuilt' after 15 or 20 years, returning to traffic under their original codes. Sometimes, a wagon reappeared with a new code but to a design similar to that of the original vehicle. This procedure was also performed on some passenger carriages until early last century.

3.2.2 MANAGEMENT OF THE SITE

The management of the Eveleigh Carriageworks fell mainly under the control of the Mechanical Branch (originally the Locomotive Branch). This Branch was separated from the other engineering sections of the railways from January, 1878¹ and the numbers of qualified engineers and other staff were boosted to handle the increasingly technical needs of the railway. Initially, the branch was headed by Locomotive Engineer, Robert Burnett, whose name is associated with requests by railway engineers for the building of the Eveleigh Workshops (*Refer Section 3.1.4 Early Development of the Eveleigh Railway complex*).

The title of Locomotive Engineer was later changed first to Mechanical Engineer and then to Chief Mechanical Engineer (CME). The position held total responsibility for the design, building, maintenance and care of all of the operating rolling stock on the railway. This included not just the engines, carriages and wagons but also the machines which maintained them and the buildings they were built and maintained in. These buildings included the design office, the workshops for building and maintaining equipment and the 'running sheds'.

Until 1912, it appears that the CME controlled the stores section of the railway system in addition to the above. At this date, however, Stores became a separate branch of the railways under the Comptroller of Stores. Other sections were Train Lighting and Equipment and the CME's office itself. Driver training also took place on the site, probably in the Engine Drivers' Instruction School although Mr Ken Heard remembers also that this took place in a carriage on one of the sidings. All of these sections coexisted on the Eveleigh Carriageworks side of the site although the main user of the site was the Mechanical Branch which controlled the workshop activities.

Positions reporting directly to the CME were the Design Engineer, the various Works Managers (for example for locomotives and for carriages and wagons), a Laboratory Superintendent, 'Running' or Operations Superintendents (who oversaw day-to-day operations), and some lesser positions covering a multitude of various activities.

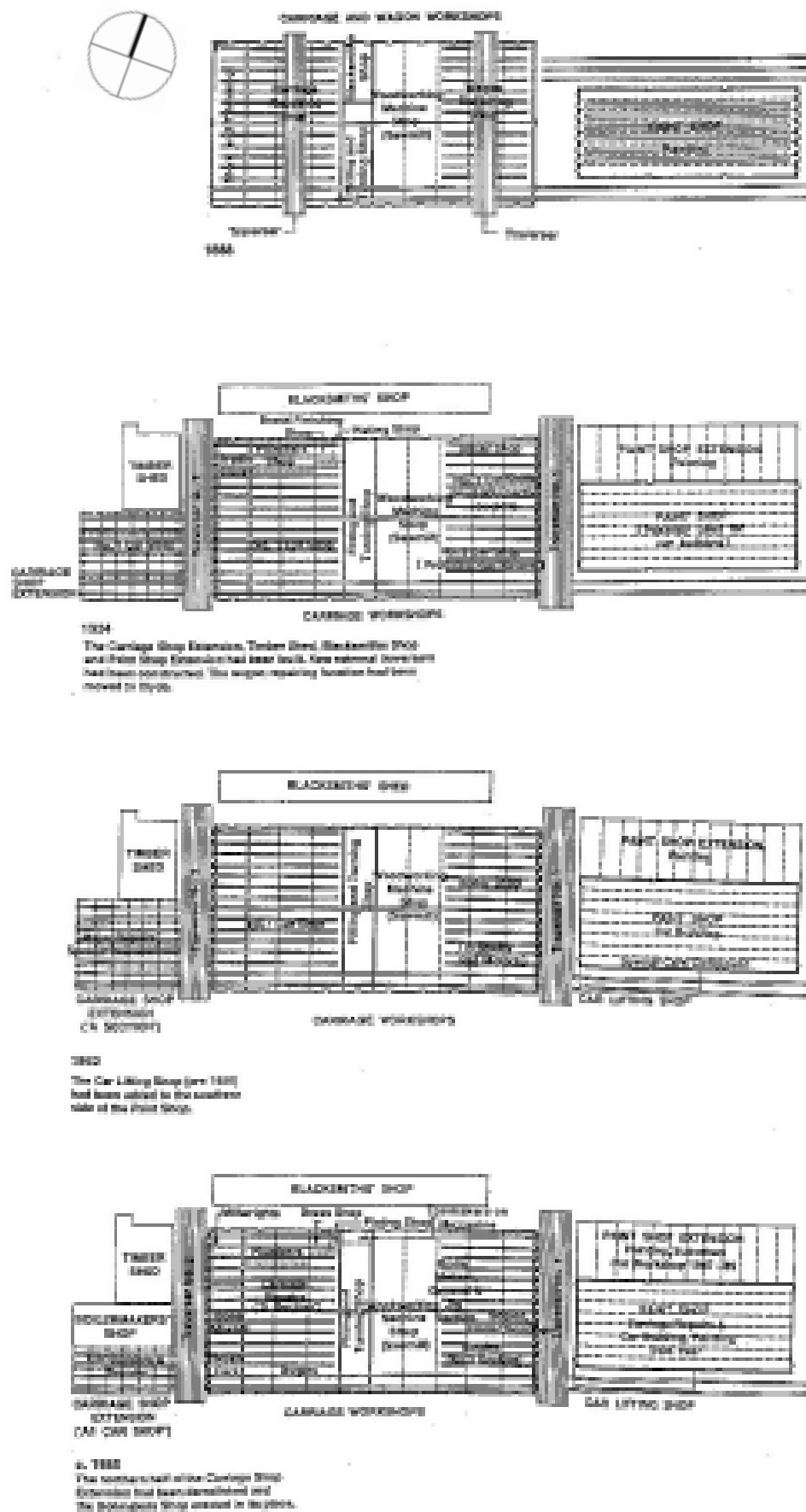
The position in charge of the Carriage and Wagon Workshops at Eveleigh was the Car and Wagon Superintendent (later called Works Manager), whose office was located in a building adjacent to the Wilson Street boundary. The Car and Wagon Superintendent was responsible not just for Eveleigh Workshops but for the other workshop facilities around the city and the state. During 1980, a new manager's office was built in the location of the c. 1916 Car and Wagon Superintendent's office. While this was under construction, carriages were set up on the northernmost road of the Paint Shop Extension (now known as the Suburban Car Workshops) to provide offices for the administration staff and Works Manager.

Mr Heard has explained that there was an unwritten policy of the Car and Wagon Superintendent often walking around the site, not just to check on the progress of work but to develop a rapport with the staff and ask if they had any problems. This approach meant that managers knew exactly how the shops should work and, therefore, when questions needed to be asked about performance.

Each section of the Carriageworks had its own foreman's office, for example, that of the Yard Foreman who controlled all the activities that took place outside the particular workshops buildings. His office was located on the apron to the east of the Paint Shop.²

From 1974, the newly formed Public Transport Commission moved workshop operations away from the control of the Mechanical Branch to the control of the director of a new section named 'Engineering'. Soon afterwards, work commenced to modernise and upgrade workshops including the Eveleigh Carriageworks, to bring in new training methods and to comply with environmental standards. The workshops were then placed under the control of a statutory corporation known as 'Railway Workshops Board' from 1980.

Poor performance and productivity became an issue from the 1970s when all workshops began to be measured against each other and against a mean. The Eveleigh Workshops initially received low scores but productivity did increase on site before decision to close all the workshops at Eveleigh was taken in mid 1987.



Plan 3.11: OPERATION OF THE CARRIAGE WORKSHOPS 1888-1985 Source: DPWS 1998

3.3 THE OPERATION OF THE MAIN SHOPS

3.3.1 CARRIAGE WORKSHOPS

From the time the workshops opened until about 1913, the eastern end of the main building was allocated to wagon construction and repair while the western end was allocated to carriage construction and repair. In the centre were located the sawmill and fitting and turning (machine) shops which serviced both areas. Between 1909 and 1913, the construction and repairing of wagons was moved to the new workshops at Clyde and the entire main workshops building was given over to the repair and construction of carriages. From the time of this major change until closure, operations in the Carriage and Wagon Workshops appear to have proceeded with few major changes or alterations to either the buildings or equipment. Many small scale modifications were made to the buildings over time, however, depending on the changing requirements.

Refer to Plan 3.11 which shows the organisation of functions in the Carriage and Wagon Shops.

The NSW Railway 'Budget' of 21st August 1900 described the operation of the Carriage and Wagon Workshops during the first phase of the workshops' life, when wagons and a few carriages were being built and repaired at Eveleigh. The descriptions correspond to the layout shown on the c. 1889 plan of the building suggesting that the 1900 description was correct for the entire first decade of the workshops' operation.

At the time, the Carriage and Wagon Workshops provided employment for over 520 men and the buildings were 'necessarily extensive in view of the large stock of carriages and wagons required to conduct the traffic of such a large concern as the New South Wales Railways'.¹

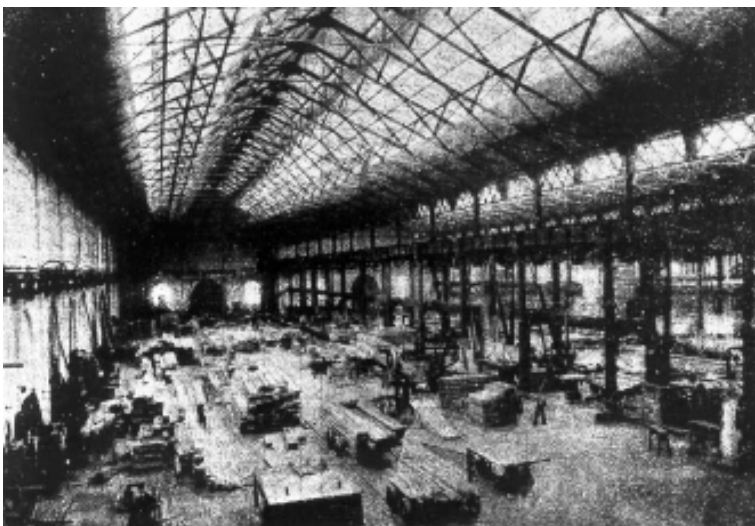


Figure 3.72: Interior of the sawmill in 1891.
Source: *The Illustrated Sydney News*, 18th July 1891



Figure 3.73: Interior of Bay 17 entitled 'Bogie Shop', 1943. Source: SRAO

Bays 16, 17 and 18

In Bays (Shops) 16, 17 and 18, wagon repairing and building was carried out. The 'Budget' reported that there "are 15 roads, each providing sufficient accommodation for 70 4-wheel vehicles. A ground traverser is used for taking the wagons in and out of the shops from roads outside the main building. There are two 12-ton overhead rope-driven cranes, each running the full length of shops No. 2 and 3."² In fact, the cranes were installed in Bays 16 and 18.

Bays 17 and 23

Internal traversers were located in these bays which projected to the exterior at the north and the south. These enabled carriages to be transversed from the lines outside the building, into the building on the traverser and onto the transverse rails within the building, located on either side of the traverser. The size of carriages was limited by traverser and bay width. New external traversers were installed in 1901 and the internal pits filled.

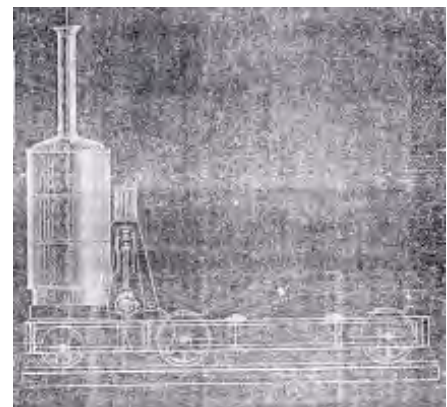


Figure 3.74 & 3.75: Detail of drawing of the original traversers for Bays 17 and 23 of the Carriage and Wagon Workshops, c. 1887. During 1900, these traversers were removed and replaced with external traversers, freeing up space in the workshops and allowing easier access for the longer carriages which had begun to enter the building. Source: SRAO



Figure 3.76 : Interior of Bay 17, where the original traverser had been located, showing the building of the 42' rail motors. Undated but probably in the mid 1920s. Source: SRAO



Figure 3.77: Interior of Bay 17, showing construction of timber carriage floor of the 42' rail motors. Undated but probably in the mid 1920s. Source: SRAO

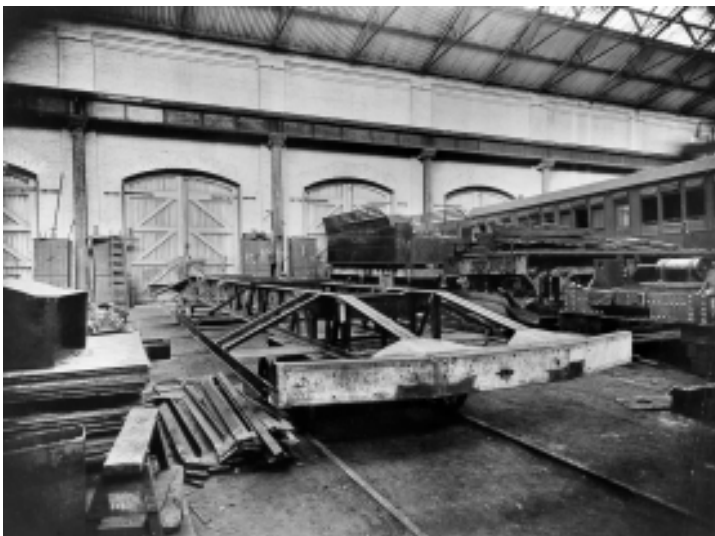


Figure 3.78: Bay 16 of the Carriage Workshops showing a steel rail motor underframe being constructed upside down. The photograph was taken in the 1920s, after the functions of wagon repairing and construction had been moved to Clyde. Source: SRAO.

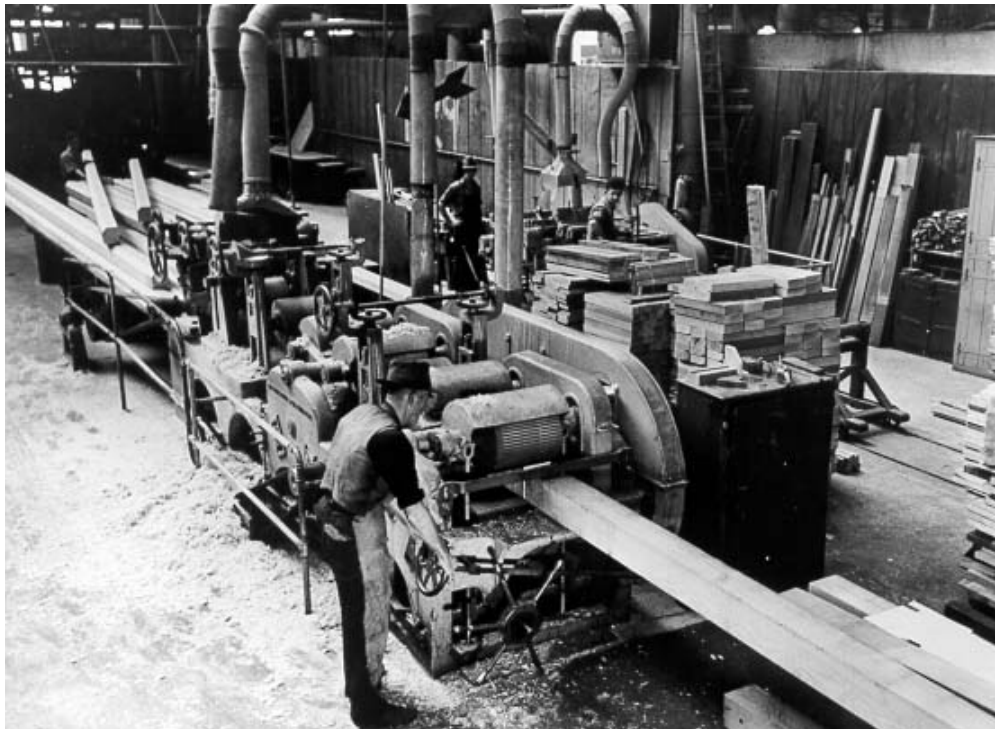


Figure 3.79: Interior of the sawmill. Undated. Source: SRAO.

Bays 19 and 20

The woodworking machine shop, or sawmill, was located in Bays 19 and 20 which, the 'Budget' noted, "are equipped with modern machinery for dealing expeditiously with the preparation of all timber required in these shops. The machines consist of saws, planing, moulding, tenoning, boring and shaping machines, a chain saw mortiser, sandpapering machines, saw sharpeners, grinding machines &c. In all, there are 47 machines in the mill. No. 5 shop [Bay 20] also contains the boilers and two pairs of 50 h.p. wall engines which drive the whole of the machinery in these shops".³ In 1910, a sawdust exhaust system was installed in the sawmill.⁴

Rails for the trolleys which were used to support large bits of timber while they were being sized are still *in situ* on the floor of these shops. The sawmill remained in this location until the workshops closed in 1989.

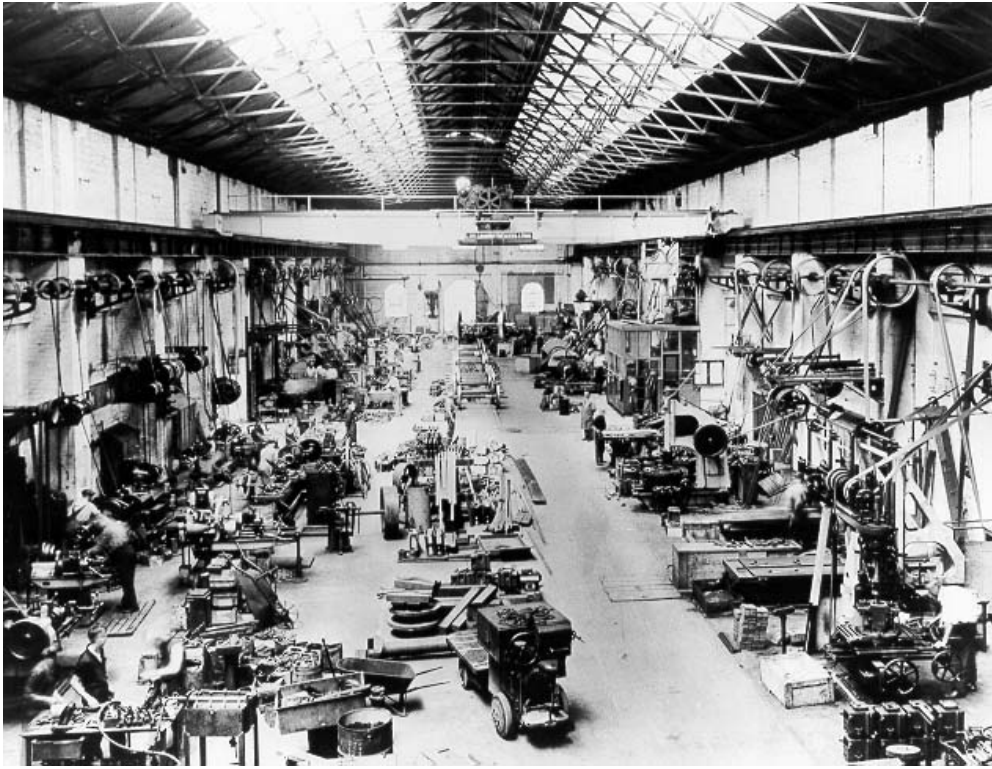


Figure 3.80: Fitting and Turning (Machine) Shop, Bay 21. Undated. This shows the overhead travelling crane, line shafting, counter shafts and belt drives to the machinery along each side of the bay. The central area contains stored raw materials and finished items and, at the rear, sets of wheels. There is a timber office, probably for a foreman, part way down the right hand side of the bay. Light is provided by the skylights and no other lighting is evident.; This photograph was probably taken looking south from the mezzanine which was over the steam, later gas, engine which provided power. Source: SRAO

Bay 21

Bay 21 is isolated by brick walls separating it from Bays 22 and 20 to prevent noise and dust affecting work in the adjacent shops. In 1900, the southern three quarters of the bay were occupied by the fitting and turning shop and the northern quarter of the bay was occupied by the blacksmiths' shop. The latter contained "11 smith's fires, two small steam hammers, a punching and shearing machine, and a bolt making machine with furnace, also lathes for wheel turning and general work, shaping, drilling and screwing machines, and a duplex automatic screwing machine."⁵

The bay was also equipped with a 5 ton overhead rope-driven travelling crane, which ran the full length of the shop. Outside the shop, at one end (presumed to be the northern end, away from the main lines), was placed "a plant for cleaning axle-boxes, by boiling them".⁶



Figure 3.81: Interior of Bay 21 entitled 'Production Control Shop'. Probably 1943. Source: SRAO

Bays 22, 23, 24 and 25

Bays 22, 23, 24 and 25 were occupied by the Carriage Repairing Shop. The 'Budget' reported that, in the Carriage Shop, "there are 13 roads, with accommodation for 29 bogie cars. For facilitating the lifting and removal of vehicles, two 12-ton overhead rope-driven travelling cranes are used; they run the full length of shops No. 7 [22] and 9 [24]. A ground traverser is used for taking the vehicles in and out of the shops from the roads outside the main building ... Compressed air is laid on throughout the shops, and is used for the purpose of testing brakes, cleaning carriages, and for working portable tools, such as drills, dust ejectors, &c"⁷.

"A portion of No. 9 [24] shop is used by the trimming staff where the whole of the interior trimming material used in carriages is dealt with. Two pairs of hair teasing machines are at work, also machines for dealing with the felt used in making axle-box lubricators. A plant has recently been installed in No. 7 [22] shop for electroplating all the metal work fittings used in the interior of carriages. It comprises dynamo, plating vats, and vats for stripping the old silver and nickel from the fittings; also buffing and polishing lathes."⁸ The plating room was still in the same location in 1985.⁹ Adjoining the plating room were the carriage finishers' benches, where the whole of the interior woodwork for carriages is prepared ready for fixing in the vehicles.¹⁰

A store is located in No. 10 shop [25], which is a branch of the general store, and is conveniently placed for the supply of materials for daily use in the Carriage and Wagon Shops'.¹¹ The northern end of Bay 25 had a mezzanine and it appears that, at this stage (1900) it was used for storage. By 1924, the mezzanine was being used for trimming.¹²

3.3.2 ALTERATIONS TO THE WORKSHOPS AND THEIR OPERATION

While the carriages of the early 1880s were no longer than 52ft, in 1884 new 68ft 'American' cars began to be introduced to the system. The length of these cars prohibited them being taken in through the original traverser openings in the northern and southern walls of Bays 17 and 23 of the Carriage and Wagon Workshops as these openings were less than 60' wide. The only way for the longer cars to enter the building would have been through the roller door openings at the eastern ends of Tracks 1 and 2 in Bay 16. Both of these tracks, as well as track 8, had originally been designed as 'through' tracks which allowed continuous access right along the building.

This method of bringing carriages into the building must have become extremely inefficient by the 1890s, when an increasing number of the carriages repaired at Eveleigh were longer than 52 feet and couldn't be brought into the building through the existing traverser openings. Refer to Section 3.5.1 *Carriage Types and History*.

In 1900, the New South Wales Railway Budget noted that two new 60 ft traversers had been ordered for the Carriage and Wagon shops and stated that "they will be driven by electricity generated at the Ultimo Power House, and will be installed outside at each end of the main building, and the space now occupied by the present traversers will be filled up, thus giving increased accommodation for the repairs of carriage and wagons."¹ The work was completed in 1901.²

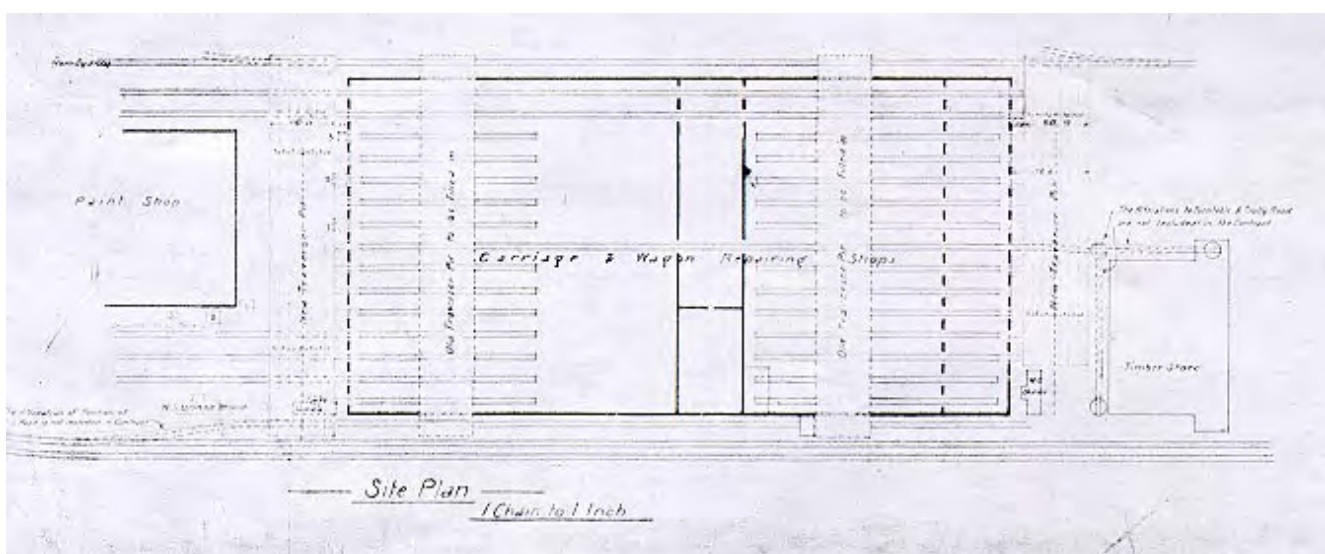


Figure 3.82: 1900 drawing showing proposed removal of the original traversers and construction of the new external traversers.
Source: SRA Plan Room Drawing D2424

As well as providing extra working space inside the building, these new, wider traversers were able to fit and transport the newer, longer carriages. Openings were made at the ends of all 15 tracks along both the eastern and western elevations of the building to allow the carriages to be shunted from these new traversers into the building. Hinged, timber doors were hung in all of the new openings and in place of the roller doors which had originally been fitted to the openings at each end of Tracks 1 and 2. The openings for the hinged doors at each end of track 8 were raised and new doors fitted to match. The original traverser openings in the northern and southern walls were then filled in with brickwork and windows to match the existing facade detailing.

Both of the new traversers were widened by one bay in 1913,³ possibly to cater for the even longer carriages, some of 75ft, now coming into the workshops. They were not wide enough, however, to hold the '*Indian Pacific*' carriages which were brought to the Carriageworks for repair and maintenance from the early 1960s. Mr Ken Heard recollects that these carriages were so long that, similarly to the situation in the 1890s, they could be moved into the Carriage Workshops only through the openings at the end of Tracks 1 and 2.

As carriages lengthened, they also became wider (refer to Section 3.5.1 *Carriage Types and History*). An 1880 carriage of 52ft long was only 8' 5" wide but by 1903, the Eveleigh Carriage and Wagon Workshops were constructing Mann sleeping cars of 9' 6" wide. It is possibly for this reason that the brick openings in the wall between Bays 24 and 25 were widened from floor level to approx. 3000mm above. The carriages, which were by now 75ft long, longer than the 60ft bay width, would have extended through the openings between the bays when placed in this section of the building for repair.

If the carriages were too wide, they would almost have filled the openings, making access around them difficult for the workmen. The widening of the openings would, however, have permitted clear access all around a carriage. The date of this widening is unclear although the Eveleigh Carriage Workshops Repair Card for 1948 notes the widening of some of the archways (over tracks 3, 4, 11 and 12) in the No. 1 Car Shop (which had been the name for this section of the building since at least 1924).⁴



Figure 3.83: 1998 photograph showing widening of one of the openings between Bays 24 and 25. Source: Otto Cserhalmi

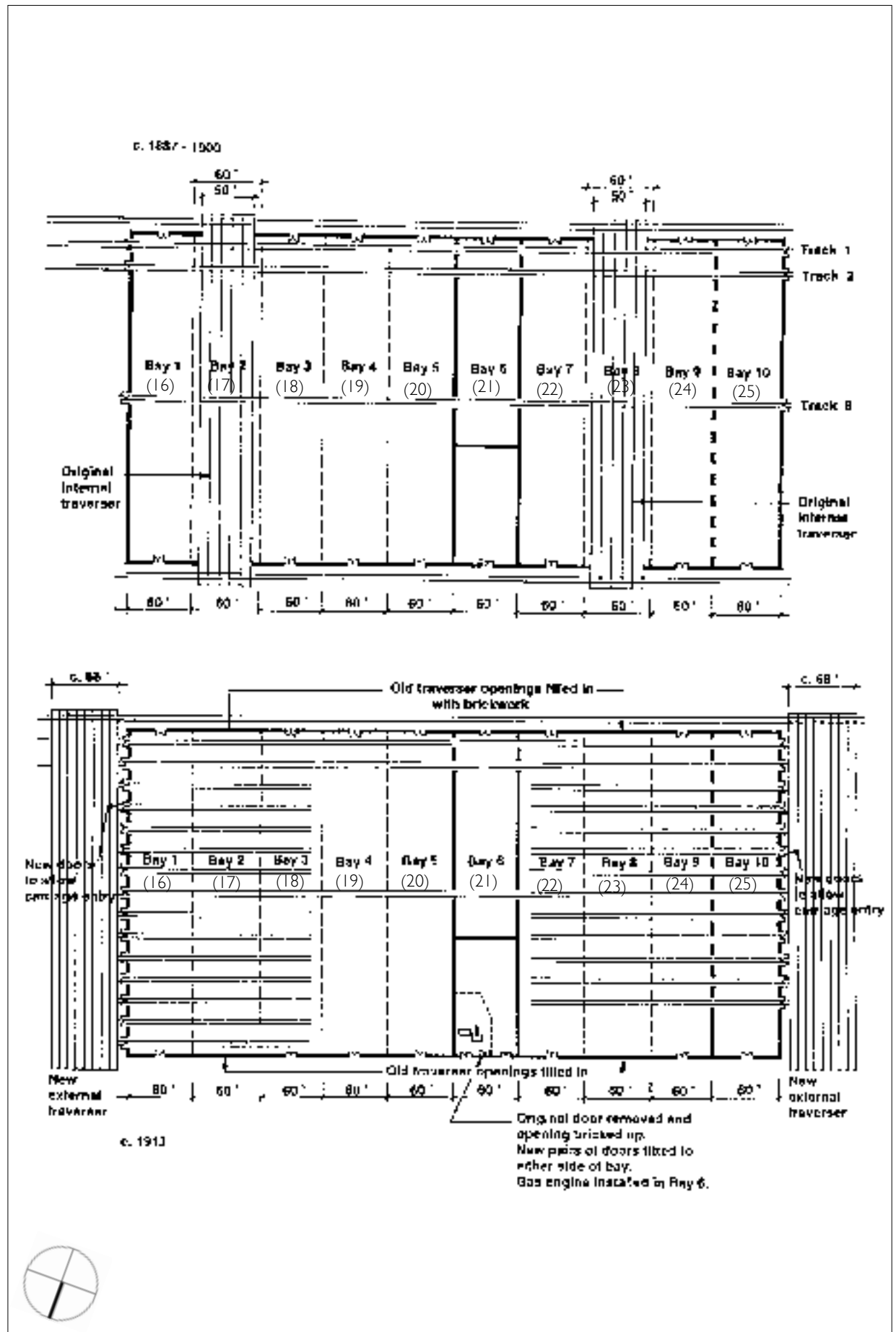


Figure 3.84: Carriage Workshop: changes associated with the removal of the internal traversers and the installation of external traversers.
Source: Heritage Group.

An additional alteration during this period was the raising of the roof over the mezzanine level of the northern end of Bay 25. The Annual Report for 1913 notes that additional accommodation for the trimming staff (who already occupied part of the bay) was provided, that the roof was raised and a lift installed⁵. A handwritten note, apparently dated 1912, on one of the construction drawings for the Carriage and Wagon Workshops states that the roof was raised.⁶

Further space for the repair, construction and conversion of carriages was provided when, in 1912, extra accommodation for these functions was provided by a new building in the former 'Carriage Shop Paddock' (referred to above as the Carriage Shop Extension). By 1924, this section was known as the 'No. 1 Car Shop' and by 1952 as 'A Section'.⁷ Today, it is known as the 'Cable Store'.

In 1964, the northern half of the Carriage Shop Extension was demolished and the new Boilermakers' Shop erected (refer Section 3.1.8). This enabled the boilermakers, who by this stage were working on mild steel and stainless steel carriages such as those of the '*Southern Aurora*', to move from cramped and restricted conditions in the main workshops (probably in part of Bays 16, 17 and 18)⁸ to a purpose designed and more efficient building. The function of this shop remained unchanged until the Carriageworks' closure.

By 1985, the remaining section of the Carriage Shop Extension (now called the Cable Store) was known as the 'A1 Carshop' and it was used by the car builders and for carriage repairs⁹ and special conversions.

After the wagons had been moved from the eastern end of the building (Bays 16, 17 and 18) in 1913, the area formerly used for their repair was given over to the repair of carriages. By 1924, the southern ends of these bays were known as the 'No. 2 Car Shop' and were known to have been used for the construction and repair of Rail Motors from the 1920s, an activity which was certainly located in this area of the workshop by the time Mr Heard worked at the site. The centre portions of these three bays were used as the 'No. 3 Car Shop', while the northern section of bays 16, 17 and 18 had become the 'Boiler Shop'. The metalworkers in this Boiler Shop were likely to have been working on the steel-bodied electric carriages which were introduced to the system from the 1920s. In addition, "S" type steel country cars built at Clyde in 1935/37, and "N" type cars from Waddington in 1939, were periodically overhauled at Eveleigh (see Plan 3.11 p.116).

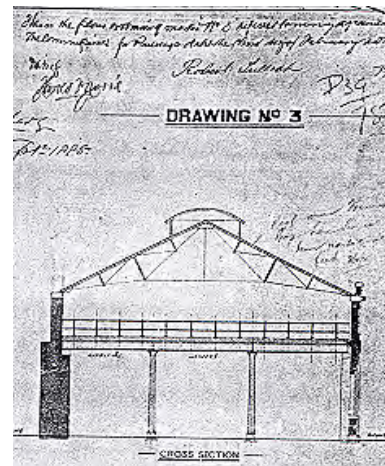


Figure 3.85: Detail from the original drawing entitled 'New Workshops Eveleigh. Columns, Cranes and Flooring Girders'. The note to the right of the section reads "Roof over Trimming Shop has since been raised several feet" and appears to be dated 1912. Source: SRA Archives Drawing 39-75.

Bogie repair also began to be carried out in these bays, certainly by 1943 but probably before this. In 1985, bogie repair was still carried out at the southern ends of Bays 16, 17 and 18. Bogies often remained in pairs during repairs and were put back under a carriage together. Finding space for storage of bogies was difficult and, during Mr Heard's time, they were stored immediately next to the western facade of the Paint Shop on the short lengths of rail still remaining beside Traverser No. 1.

Elevated toilet blocks were erected over Track 1 in 1915 and were supported by curved steel brackets.¹⁰ The brickwork openings which permitted access through Bay 21 along Tracks 1 and 2 were filled in at a later date, probably pre- WWI, preventing access along Tracks 1 and 2 from then on.

In 1952, "improved washing facilities" to replace the 1915 amenities above were built along the southern ends of Bays 24 and 25, 18 and 19 and these are still *in situ*.¹¹ It appears that these facilities were constructed at a time when there were considerable staff shortages and facilities were improved in an attempt to attract workers. Similar facilities were built at the same time in the Paint Shop and the Carriage Shop Extension. Refer Section 3.6 Working at Eveleigh Carriage and Wagon Workshops.

A further alteration was to the openings at the northern end of Bay 21. The Blacksmiths' Shop, which had originally been located at this end of the bay, was moved in about 1910 on completion of the large, new Blacksmiths' Shop adjacent to the Wilson Street boundary.¹² This provided extra space for the fitting and turning (machine) shop which remained in this location until the Eveleigh Carriageworks were closed in 1989.

The Annual Report for 1910 noted that 'additional power has been provided at the Carriage and Wagon Shops by the installation of a 'Mond' gas plant and engine'. This engine was fitted in the former Blacksmiths' Shop and its space requirements meant that the bay's original central doors were unsuitable. They were filled in and two new openings were made on either side of the original opening. Accompanying pairs of doors were fitted to these openings.

The structural columns which separated the bays appear to have defined the major work areas from the time the site commenced operation. By the time Mr Heard was managing the Carriage Workshops, signs with letters and numbers to define individual work areas had been painted on the walls and columns.



Figure 3.86: 1998 photograph showing the elevated toilet block in the south western corner of Bay 25. Source: Otto Cserhalmi.



Figure 3.87: 1998 photograph of the northern external wall of Bay 21 showing the doors fitted to either side of the original opening which had been filled in. Source: Jean Rice.

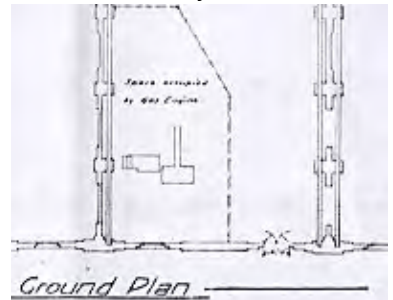
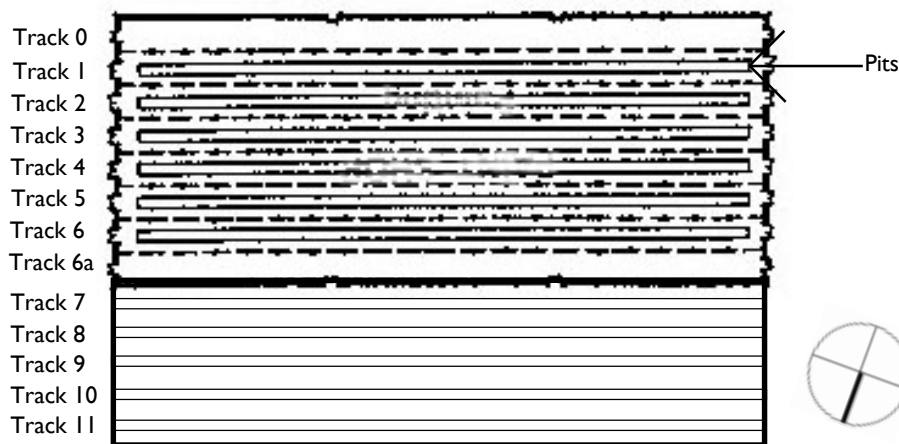


Figure 3.88: Detail of a drawing of the Carriage Workshops in c.1913 showing the Mond gas engine in the north eastern corner of Bay 21.



Figures 3.89 & 3.91: Lettering and numbering used to identify particular bays within the Carriage Workshops. Source: Otto Cserhalmi 1998.



The layout of the Paint shop showing the position of the tracks (called roads in some cases) and pits.

3.3.3 PAINT SHOP

The Paint Shop was also described in the New South Wales Railway Budget in 1900. Its six roads ran the full length of the shop and these provided accommodation for 42 bogie vehicles. The Budget explained that 'on one side of the shop is a paint store and mixing room, fitted with paint mills and mixer, which are driven by a small engine. A room in which women are engaged in upholstering work is placed one side of the shop, and contains four sewing machines. All the cloth and leather used for cushions and carriages is dealt with there. Compressed air is also conducted outside by pneumatic painting machines. The paint shop is heated by steam passing through suitable coils.'¹ On either side of the six roads were Oregon wood block floored bays without pits and it is presumably in these bays that the upholstering, store and paint mixing areas, referred to above, were located.

By 1927, the 'Carriage Lifting Shop' had been built on the southern side of the Paint Shop. This addition contained a crane which could lift the carriages off their bogies so that temporary works bogies could be fitted. The function of this building also appears not to have changed between its construction and the closure of the workshops.

It appears that the painting function was moved into the new paint shop extension (now called the Suburban Car Workshops) soon after the completion of the building in about 1912. It is unclear if the old building also continued to be used entirely for painting at this time but it was still known as the 'Paint Shop' in 1924.²

During the time Mr Ken Heard worked at the Carriage Workshops, the 1912 extension was still being used for painting although other areas of the original Paint Shop had been taken over for other functions. Tracks 0 and 1, on the southern side of the original Paint Shop were, for example, being used for the storage of the 'Royal Cars' (the Governor General's Car, State Cars, Premier's Car and Commissioner's Car). The date at which these cars began to be stored in this location, however, is unclear. By the time Mr Heard worked at the Carriage Workshops, security for these valuable carriages had become a problem and the two roads were enclosed by an 8 ft high wire fence. Mr Heard remembers that tours through these carriages were taken and, in particular, that women were not allowed to take their handbags inside, the concern being that they might scratch the highly polished internal varnish.

During the same period, the timber floored area to the north of Track 6 (called Track 6a for the purposes of this report) was used for fit out. Once they were painted in the adjacent building, carriages were moved to this section for the installation of all interior fitments such as linoleum, lights and trimming. Items such as seats, cushions and armrests were brought down from the large trimming shed on Wilson Street to be fitted and assembled. Fit out was also carried out on the apron to the eastern end of the Paint Shop. Once completed, the carriages were moved out onto the apron to the east of the original Paint Shop building.³

Bay 6a, next to the wall of the Paint Shop now has a mezzanine. Mr. Heard described that there was a paint store on the ground floor in the centre of the bay (lengthwise) and the signwriters on the platform above. He noted that rubbing back was done either in the Carriage Workshops so dust didn't fly around the Paint Shop or at allotted times to limit the amount of time that dust flew about. Locomotives were also brought over for finishing and painting here in special cases.

From 1933, the NSWGR had a policy of painting passenger type locomotives green, with a few painted other colours, usually either moroon or blue. Coloured locomotives and rolling stock went out of vogue during WWII due to staff shortages, but painting was reintroduced only for the 38 Class locomotives after the war.

On locomotives, paint was put on in up to 8 – 10 coats and then varnished and waxed in order to stabilise the surface or the paints would "bloom" as it got older. Locomotives were coloured red, green or blue. Main Line carriages were varnished on clear timber – again 8 – 10 coats (KH).



Figure 3.92: Interior of the Paint Shop in 1891, facing west. The large south-facing skylights appear to have been the only light source at the time. Source: ML, *The Illustrated Sydney News*, 18th July 1891



Figure 3.93 : Undated photograph of the interior of the Paint Shop, facing east. The Bay in the foreground is probably Bay 6a which did not have a pit. Note the electric lights which had probably been installed in the 1920s. Source: SRAO

3.4 MACHINERY

Very little detailed documentation remains on the machinery, equipment and operations of the Carriageworks at Eveleigh Railway Workshops complex. Much of the available information deals with broader issues concerning manufacture and building, rather than with the equipment and its use. There is, for example, no document which provides a summary of the equipment to be found within the Workshops at any particular time.

Perhaps the most valuable document concerning the machinery and equipment is the Inventory of Machinery and Plant - Mechanical Branch, Eveleigh Carriageworks. It consists of several hundred entries on the various machines, their manufacturer, date of purchase, operating expenses, location and where appropriate, approved condemnation. A copy of this document is held by Godden Mackay Logan but the location of the original is not known. However, many of the entries are incomplete and often there is no indication of the precise location of the item or when it was removed. In many instances, a form of shorthand, known only to the compiler of the inventory was used. Nevertheless, the document is valuable for giving at least some indication of the machinery used in the Workshops.

Little physical evidence of the machinery or plant remain in the Workshops for interpretation. The only items which survive are the overhead cranes, various elements of the line shafts and the countershaft beams. About eleven items remain in the Blacksmiths' Shop and unlike the Locomotive Workshops, no machinery was purposely conserved. It is obvious from the inventory that when the Carriageworks closed in 1989, some items were transferred to the Locomotive Workshop site or to other depots, such as Chullora. Some went to workshops outside of the control of the SRA, while the majority appears to have been scrapped (Figs 3.94 to 3.96). The equipment in the Workshops still being used prior to the close down in 1986 was mostly consistent for a workshop of this size, but much of it was antiquated and required skilled operators, such as a 1905 Robinson planer (Fig 3.97). There were several other pieces still in use by 1986 that were installed prior to World War I, and others which had been installed between the wars.

Figure 3.94: (Left) Carriage Workshops, 1989. The large four head moulding machine awaits transport to the scrap merchants.

Figure 3.95 (Below) Carriage Workshops, 1989. One small, metal shaper and one medium size metal shaper in the foreground with the Tangye wheel lathe and a milling machine in the background, all from the Machine Shop, await removal to another workshop or scrapping.





Figure 3.96: Carriage workshops 1989. The pedestal hydraulic press and belt driven bandsaw await removal to another site or scrapping.

The machinery and equipment in the Carriage Workshops were concerned with woodworking and painting. The Locomotive Workshops, on the other hand specialised in metalworking and engineering, both of which had a relatively minor position in the processes undertaken in the Carriage Workshops.

It is apparent that after 1920 with the introduction of steel underframes or chassis for carriages, metalworking received a boost. This was especially so when the manufacture of steel-sided carriages commenced. However, it would appear that items which required the heavy work, such as axle wheel assemblies, were brought to the Carriage Workshops from outside sources including the Locomotive Workshops. The maintenance of the wheel assemblies, including the turning of the tyres, could have been done in the Machine Shop at the Carriageworks, however, there is no evidence that the Carriageworks were equipped with wheel presses, tyre presses, flanging machines or indeed, a wheel furnace.

There is insufficient information to determine whether the Spring Shop which appears on some diagrams, in fact manufactured all the springs needed by the Carriage Workshops. Although the Carriage Workshops were equipped with heat treating units, it is probable that some of the springs required were sent from the Locomotive Workshops and stored in the Carriage Workshops.

The history of the operation of the various bays or groups of bays is given in an earlier section of this document. For example, Bays 16, 17 and 18 were originally dedicated to the manufacture and repair of wagons. Later the area was used for the construction and repair of carriages. It then became the Bogie Shop and remained so for some time. The following sections will deal only with plant and equipment which is known to have been used within the various sections of the Workshops at particular times.

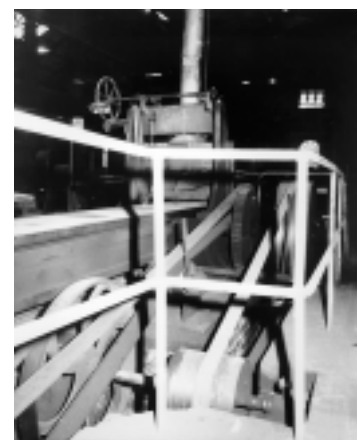


Figure 3.97: The massive Robinson 18 inch (450mm) thicknesser in situ in Bay 20 in 1989. By this time the thicknesser was powered though belts driven from a stand alone electric motor.

Carriage Workshops - Bays 16, 17 and 18

From 1890 to 1913 the first three bays were used for the assembly of components for wagon construction and wagon repair. Components were made in the adjacent woodworking machine shop, located in Bays 19 and 20. The components were moved to Bays 16 and 18 by hand trolleys pushed along dedicated longitudinal tracks. Ken Heard remembers that four wheel trolleys were pushed by labourers along number 8 road (the central road) to transfer materials between traversers and all bays in the workshops – they moved such items as machined timber.

In 1901 the traverser which was located in Bay 17, was moved to its present location outside the building east of Bay 16. The traversers moved vehicles transversely across the inside of the building pre 1901 and then between the Carriage Workshops and the Paint Shop after that, allowing carriages and wagons to be transferred from one of the 14 tracks to another. It should be noted that the tracks in the Paint Shop did not line up with those in the workshop but this did not pose a problem for transferring. There is no visible evidence of the internal traverser but its pit presumably remains as an archaeological feature. The manufacture of wagons continued in Bays 16 to 18 only until 1913 when wagon manufacture and repair was transferred to Chullora. Bays 16 to 18 were then converted to carriage manufacture and repair.

Around this time, the longitudinal (eastwest) line shaft, which ran along the north wall of Bays 16 to 18, was installed. It could not have been installed prior to the transfer of the traverser, as it ran completely through the traverser bay. The line shaft appears to have been powered by the steam engines located in Bays 19 and 20 and later the Mond gas engine, which was located in Bay 21. No evidence remains of any of these engines, although a curved recess in the wall of Bay 21 was probably for a drive or fly wheel associated with the one of the engines.

Some 25 metres of the 100mm diameter line shaft is still extant in five lengths, joined by flexible couplings and supported on superbly designed cast-iron brackets and plummer blocks which held the bearings on which the shaft ran. A single cast-iron pulley wheel (in two sections) is all that remains attached to the shaft and this is located around the centre line of Bay 17.

It is not known what machines were powered from the line shaft but it is likely that machine tools used for fabricating would have included presses, punches, drills and bandsaws and finishing operations would have included belt finishers and disc sanders. Most other operations, especially the initial ones of conversion, planing, jointing and shaping, would have been completed in Bays 19 to 20.

Bay 16 still retains the two overhead cranes which were used from 1885 for moving completed and partially completed wagons, carriages and machines throughout the length of the bay. The cranes are from Craven Bros. of Manchester and the original structure of both had twin crane beams which were in the form of riveted, tapering box girders. They were originally powered by a rope drive, probably driven from a wall mounted steam engine at the north end of the workshops and were converted to electric power around 1910 and modified to increase their lifting capacity in the 1930s. This involved adding a third crane beam in the form of a riveted lattice girder to each crane. The original nameplates of the makers were removed, and the Newcastle firm of Goninan and Company placed their name on the cranes, claiming to be the makers. In other bays, both nameplates remain. In the Inventory of Machinery and Plant - Mechanical Branch the date of installation of L50 (the north crane) is given as 1930, while L54 (the south crane) is given as 1931. The makers' name is given as Goninan so it would appear that Goninans carried out the modification at this time. The cranes clearly date from the 19th Century.

Bay 18 has a riveted lattice girder overhead crane by Babcock and Wilcox of Renfrew and London. This crane, L52, has a capacity of seven tons and was installed in 1924 as an electric rather than a rope driven crane and appears to be original in most respects.

Carriage Workshop - Bays 19 and 20

Bays 19 and 20 was the site of the timber mill and all wooden components were prepared here, initially for the manufacture of wagons and carriages and later, exclusively for the repair and manufacture of carriages. It is believed that the timber was purchased in large sections, stored in outdoor sheds for further seasoning and then sawn to specific dimensions in the mill. The mill was probably one of the best equipped in Sydney when it was constructed. The equipment in the mill ranged from breast bench saws and docking saws through to morticing machines (both the chain and chisel type), spindle routers, thicknessers, jointers, profile mills, lathes and face-plate lathes to fine drills and finishers. Every timber component for all carriages used on the rail system could be manufactured in this mill.



Figure 3.98 Timber broken down and dressed in the timber mill was stacked in the now demolished timber store prior to use.

Originally, all the equipment in the mill was powered from the line shafts which ran the length of the bays. The line shafts were 75mm in diameter and were initially powered by steam engines probably located within the mill itself.

The only remnants of this collection of machinery and equipment are three line shafts, or sections of line shafts, still attached to their original plummer blocks and brackets. The first is located between the cast-iron columns, between Bays 18 and 19. The shaft runs from the north end of the Workshops to the end of sub-bay 6, close to the central aisle. The shaft has nine belt wheels intact, all of which are of the single take-off type, with all brackets and plummer blocks intact. Each of the brackets has a driptray usually in the form of a kerosene tin, which has been cut in two either longitudinally or transversely and held to the bracket with four lengths of wire. There is no indication of the type of machinery powered from the line shaft.

A second line shaft is still partially intact between the cast iron columns between Bays 19 and 20. This shaft has V-brackets with plummer blocks similar to those found between Bays 18 and 19. The shaft has been shortened by two sub-bays at both the south and north ends to allow the installation of two relatively new amenities blocks on especially constructed mezzanines. There are ten belt wheels of a variety of sizes, still remaining on this shaft, with the largest being about 1.2 metres in diameter, in cast iron, with C-spokes.

The third shaft, which served the timber mill, was attached to the wall on the west side of Bay 20. This is supported by massive cast-iron brackets and now runs only from sub-bay 8 to sub-bay 12. There are four wheels on the shaft, one of which is a combination free and fixed wheel, with a facility for deleting power to a counter-shaft or machine. On this shaft there are two belt restraints or brackets which are installed to prevent belts from running along the shaft if they fall loose from a wheel. This is done to prevent damage to a machine located below the belt and as a personnel safety measure. There is evidence that in sub-bay 8, a belt protruded through the wall into Bay 21, to power either a counter-shaft in that bay or for this lineshaft to receive power from Bay 21. This would have been done at a time when only a small number of machines were being powered from either shaft, and would most likely have been between the wars when a changeover was beginning from line shaft powered machines to electrically powered machines.

A service platform is attached to the twin columns in sub-bay 8 of Bay 20. The service platform has a steel ladder from the ground to the platform and from the platform to the crane service walkway above. The timber, and one of the cast-iron brackets of the platform, have been removed. The service platform is extremely important as it is one of the few remaining in the Workshops complex which indicate the way maintenance was carried out and also the importance of maintenance to the whole of the operational system.

Carriage Workshop - Bay 21

Bay 21 was the Machine Shop. A heavy line shaft ran down both walls. In both walls, riveted iron or steel, boxed section counter-shaft girders were set into the brick crane piers to operate a larger number of machines, which were powered from a single line-shaft. The counter shafts also allowed the various sections of machinery to be brought on line in sequence, rather than simultaneously, therefore avoiding the overloading of the system.

Initially, the line shaft was powered by a dedicated boiler and steam engine. In 1910 this was replaced by a 'Mond' gas plant and engine. At the same time the Machine (Metal) Shop was enlarged by moving the Blacksmiths' Shop to its present location adjacent to Wilson Street. The machinery within the Blacksmiths' Shop also received power from line shafts. These line shafts were in turn powered by an underground shaft which was linked to the Carriage Workshops. This may still exist underground.

By 1943 machinery with either stand-alone electric motors or integrated electric motors was introduced. This machinery had the advantage of being operated independently of a belt and was far more efficient and convenient. Until this time, the line shafting had been powered by 25 cycle power which was peculiar to the railways' own power stations. In 1953 power was provided from Elcom Central and it began to be changed to 415 volt. Ken Heard remembers that from that time onwards, the line shafting progressively became disused although some was still used in the early 1950s.

Machinery in the Machine Shop appears to be of the light engineering type, with shears, slotters, presses, lathes, guillotines, pan brakes (for forming sheet metal), shapers and wheel lathes (although wheel lathes may have been located in Bays 16, 17 and 18 when it became the Bogie Shop in the 1940s). Lathes in the Machine Shop included machine lathes, turret lathes, centre lathes, swing lathes and journal lathes. The plant and machinery in the Carriage Workshops' Machine Shop was far smaller and more specialised than that in the Locomotive Workshops. The Carriage Workshops were relatively independent, except for the large fabricated steel items or cast ferrous pieces.

The only remnants in Bay 21 are thirteen sections of countershaft beams set in the wall piers and the bolts which formerly held the overhead line shafts. The location of each set of bracket and plummer block is marked by grease and oil stains on the surrounding wall surface. The plummer block supported the line shaft bearing, which allows the shaft to spin. The need to lubricate the bearing has led to the grease and oil stains. Ken Heard remembers that there was a special group who looked after the shafts and lubricators and they worked in the millwrights area (then in Bay 25).

A short 50mm line shaft or counter shaft is attached to a dedicated RSJ (rolled steel joist) in the northeast end of the bay with a belt to a short wall-mounted line shaft. This shaft is much more recent than the original shafting but is still an important interpretative item demonstrating how the Workshops functioned.

The electric overhead travelling crane, L53, from Craven Bros. Manchester, 1885, with a five ton capacity, has tapered and riveted box section girders, and still remains in 2002. Typical of rope-driven cranes converted to electric drive, it is fitted with longitudinal travel, transverse travel and hoisting motors, all operated independently through motor controllers located in the underslung operator's cabin. This is the only Craven crane still in its 1910, or pre-electrification condition, as it was not modified in the 1930s in order to increase its lifting capacity.

Also remaining at the north end of Bay 21, on the western side, is a small overhead crane with the markings LC658. It has an inverted crane rail beam which runs on two RSJs. The plummer block has been removed and there is no hoisting equipment. The capacity of this crane would certainly not have exceeded half a ton. It appears to have been used for the loading and unloading of motor lorries.

Carriage Workshop - Bay 22

Bay 22 is one of the Carriage Manufacturing Shops that operated from the time that the Workshops opened and appears to have remained relatively unchanged. There is a short countershaft in the bay which was belt-powered from the line shaft in Bay 21. The countershaft is fitted with a fixed and free wheel with a belt shifter and a single wheel at its south end. The countershaft is only 1.2 metres long and its purpose is unknown.

Bay 22 also has an electric overhead travelling crane (L55 from Craven Bros.) which was originally a five ton crane modified and strengthened by having a third crane beam added to the original two beams which increased its capacity to six ton. This modification was carried out by Goninans of Newcastle. Crane L55 appears to have been modified in the same way and at around the same time as the two cranes in Bay 16.

Carriage Workshop - Bays 23, 24 and 25

Bays 23, 24 and 25 were also used for the manufacture and repair of carriages. Bay 23 has no equipment remaining, while Bay 24 has the electric overhead travelling crane with the markings LC834 by Moore, with a capacity of twenty tons. This crane was installed in 1965 and is therefore the most recent of the cranes in the Workshops. Other than this crane, Bays 24 and 25 are free of all machinery and equipment.

The Blacksmiths' Shop

The Blacksmiths' Shop is a long narrow building with its rear, or north, wall formed by the battered retaining wall of Wilson Street. The shop was once well equipped with two steam hammers, two Davis and Primrose electropneumatic hammers, three pneumatic hammers by Pilkington and at least one Allen striker or Oliver hammer. It was equipped for most of its working life, with a heavy guillotine, a set of electric shears, numerous hand tools, as well as several frazes (a toothed steel wheel for final shaping of hot steel forged items) and grinders. The Shop was also equipped with at least eleven forges and at one stage, had two 50 class boilers mounted immediately inside the south wall. It is presumed that the boilers generated steam which was fed to Roots blowers which produced high volume, low pressure air for the forges and for the high pressure air compressors. It is also presumed that the steam from these boilers was used for heating throughout the Paint Shop and was used to power engines which drove machinery located in the timber mill. Drawings show the installation of heating apparatus in the Paint Shop.

At one stage the Blacksmiths' Shop had three welding bays and at least one swage block for relatively heavy work.

A photograph looking east, taken in 1986 when the shop closed, shows a heavy set of electric shears, three grinding benches, one floor jib crane and several wall jib cranes which were probably used for transferring hot steel sections from furnaces to forging equipment. This cannot be ascertained from remaining documentation.



Figure 3.99 The Blacksmiths' Shop in 1986. The two heavy pedestal grinders are against the Wilson Street retaining wall with the K15 metal shears and punch and metal rack to the south of the centre line of the building

In 1998 the Blacksmiths' Shop contained two 7.5 cwt Pilkington pneumatic hammers and one 5 cwt (250kg) weight hammer. These hammers operated in the same way as the steam hammers, but were somewhat slower and could be powered from an electric powered air compressor and hence were easier to operate and maintain. There were also six small forges of the tunnel type, all cast iron and steel framed, standing about 1.5 metres high with a fire box about 1 metre long, 300mm high and 500mm wide.

The Blacksmiths' Shop also contains the remnants of the exhaust system which was used to remove the forge fumes from the shop. The south wall of the Blacksmiths' Shop was unusual in that it had a series of louvres which could be opened for ventilation. The lower section of the louvres was comprised of glass with wooden frames, while the upper section consisted of panels clad in corrugated iron.

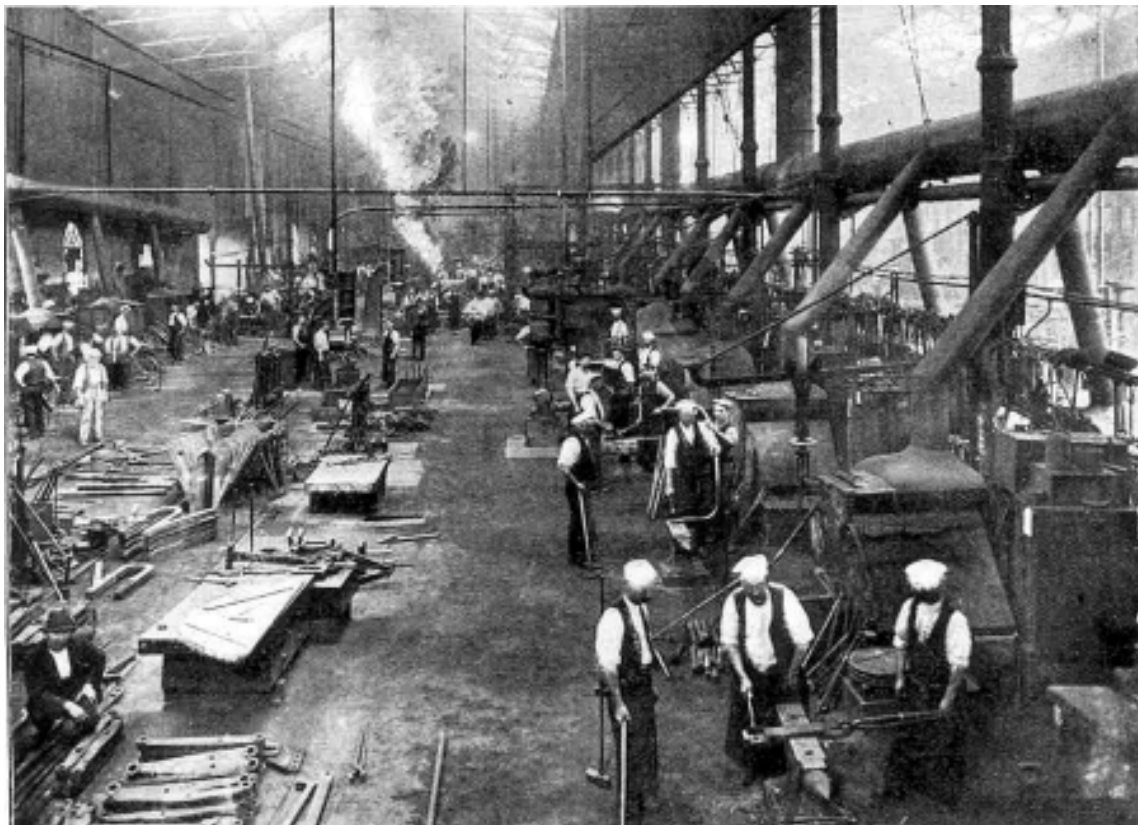


Figure 3.100: The Blacksmiths workshop c.1900. The Wilson Street retaining wall can be seen to the left of the photo. Source: Sydney Harbour Foreshore Authority.

The Compressor House

The Compressor House contains only one compressor. It is a 1963 Atlas Copco, angle compound type, of 125 pounds per square inch delivered at the rate of 2,225 cubic feet per minute. The compressor was installed in 1963 and in 1968 an Atlas Copco aftercooler was added to it. The air compressor sits in its Compressor House with the adjacent electrical switch gear and substation. Compressed air was reticulated throughout the site through high pressure air lines which usually terminated in an air receiver. From the air receiver it went directly or indirectly to the point of use e.g. cleaning, pneumatic tools and painting.

There are three air receivers located on the site: one outside the Compressor house, one to the north of Bay 23 and one to the south of Bay 22.

Traversers

Traverser No. 1, located between the Paint Shop and the Carriage Workshops and Traverser No. 2, located between the Carriage Workshops and the Former Wood Store, moved vehicles transversely across the site. This allowed carriages and wagons to be transferred from one of the 14 tracks to another, and from one building to another.

The traversers run on six rails and have one rear axle which is connected to the driving mechanism. The six wheels at the front run on stub axles which are supported with massive brackets on either side. The flanges are all towards the centre line of the traversers.

The traverser motor is a Crompton Parkinson, 400-440 volts, which operates at 950 revs and is 50 horsepower. The motor operates through a gear train with the spur wheel being attached to the main driving shaft. The driving shaft is connected to the driving wheels, again via a pinion and spur wheel. The spur wheel then acts on a cog on the main axle. Between the two gear trains there is a brake drum and this can be applied electrically via an emergency switch or it can be applied manually.

On Traverser No. 1 the control lever is a variant on the motor controller normally found on the SRA traversers. There is a pair of dog clutches that can engage either the drive system or a capstan which is mounted almost on the centre line of the traverser. The capstan was used for towing train carriages to the traverser via a cable, which ran from the capstan around pedestal rollers set immediately in front of it. Traverser No. 2 featured a capstan and appears not to have the vertical pedestal rollers for hauling carriages onto the traverser bed.

Both traversers have two cabins, one on either side of the centre line with a covered section in between. The operator's cabin is to the east and a small store room is mounted to the west. The operator's cabin is about 3 by 1.5 metres and the store room is about 1.5 by 1.5 metres. The central section between the two cabins is roofed with corrugated iron on a timber frame. On Traverser No. 2, the two cabins are supported by a timber and steel frame with an internal cladding of hardboard while the external cladding appears to have been a heavy duty fly.

The traverser was altered when it was relocated from Yennora. Wings on each side are supported on their inner face by being attached directly to the main section and on its outer face there are four small unflanged wheels, two wheels on either side of the two rails.

Traverser No. 1 runs on three overhead wires and is connected to these via three trolley poles with wheels. It is possible to disconnect the wiring, simply by winding short lengths of rope which would disconnect the wheel of the pantograph from the overhead wires.

Traverser No. 2 is in a derelict condition and is inoperable. Many of the electrical items have been removed as have the covers, and those elements that remain are exposed to the elements.

Sequence of Carriage Development

DETAILS	TIMELINE
Hauled Carriages	
Rail Motors	
Electric Trains	
Diesel Trains e.g. Silver City Comet	
Self Propelled Diesels	
Explorer / Endeavor	
XPT	

Figure 3.101: Table showing the sequence of development of Carriages in NSW.

3.5 CARRIAGES AND WAGONS

3.5.1 CARRIAGE TYPES AND HISTORY

Refer section 2.5 Terminology and Abbreviations

Railway vehicles designed to carry passengers, or to be hauled on a passenger train at passenger train speeds, are known in railway terms as coaching vehicles. In addition to normal passenger carrying carriages, early coaching vehicles included the Royal and Inspection Saloons, sleeping cars, dining cars, brake and mail vans, horse-boxes and Carriage Trucks. Carriage Trucks were those vehicles that, in the late 19th and early 20th centuries, were used to carry road vehicles such as horse-drawn carriages and early motor vehicles. Often, carriages were designed to fulfil two of these roles at once: for example a passenger car with a small brake-compartment at one end is a type used in XPT trains.

Passenger cars of obsolete design were rebuilt to more modern designs. For instance, side door compartment stock was converted to the tourist R&L types in the 1930s and in the 1970s-80s surplus country stock was converted into high capacity "supplementary inter-urban" cars. Other passenger cars were converted for use as stores vans, mess rooms, sleeping accommodation for itinerant railway workmen and so on and could once be seen standing in railway yards painted white or yellow. Those vehicles rebuilt from passenger carriages and still riding on passenger type bogies, were sometimes repaired and maintained by the Carriage & Wagon Shops throughout their often much longer lives. For example, a third class carriage dating from the first days of the system in 1855 was converted to a works van in about 1910, and rebuilt in its 1855 style in 1938 for the Sesqui-Centenary Celebrations of New South Wales.

Vehicles which were used only for the carriage of goods such as coal, wheat and wool, livestock and perishable commodities are known as goods vehicles, freight vehicles or wagons. In order to carry the guard and minor freight items on these trains, goods brake-vans similar to, but more austere than, passenger brake-vans were also built. Many former goods wagons also saw a long life after revenue traffic, hauling coal for engines or material to repair the lines. All works vehicles were identified by the letter 'L' or 'W' before their numbers and were kept in a separate series of numbers to revenue vehicles.

The whole of New South Wales' original rolling stock, including steam locomotives, carriages, goods wagons and ancillary vehicles, was purchased from some of the more significant vehicle builders in England. These carriages and wagons were typical of any English railway of the time; short and narrow and riding on two axles fixed to the body through axle guides and springs.

As the colony of New South Wales was part of the British Empire, it was natural for English industrial developments to be closely followed initially. In the urge to push railways inland, the cost of construction was kept low by means of heavily graded and sharply curved lines unlike anything encountered so far in the United Kingdom. It was not a surprise therefore that the rolling-stock which had been designed for more carefully engineered tracks was not successful.

In an attempt to provide longer and smoother riding vehicles, the New South Wales Railways imported British six and eight-wheeled carriages in 1868 and 1869. These were failures because of their long, fixed wheel bases. New South Wales railway engineers then looked to the United States where the 'bogie' system had been adopted successfully where carriages ran on lines similar to the steep and curved tracks of New South Wales. The introduction of the bogie-type car eventually made other designs obsolete, as the bogies meant that cars ran round curves and generally rode much more smoothly than fixed wheel cars.

American, rather than British, technology then began to be imported to New South Wales and local railway engineers followed the overall design of the practical American carriages. As a result, NSW cars became much longer, larger and heavier than British equivalents.

The American designers were also responsible for railway carriage innovations such as continuous air brakes, automatic knuckle couplers, dining carriages and vestibules so that passengers could walk between carriages and sleeping carriages.

Development of Timber Main Line Carriages

For the opening of the New South Wales railways in 1855, Wright & Son of England supplied eight first-class cars with three compartments each. One of these was used as a 'state' car although it was not originally designed as such. Twelve second-class with four compartments each and twelve semi-open third-class cars were also purchased. The body length of these cars varied from 19 to 22 feet, they were no more than 8 feet wide and they rode on axles set 11 to 12 feet apart. These carriages would have given a rough trip on lines which then could only have been considered to be of average quality. Refer Section 3.1.4 *Early Development of the New South Wales Rail System*.

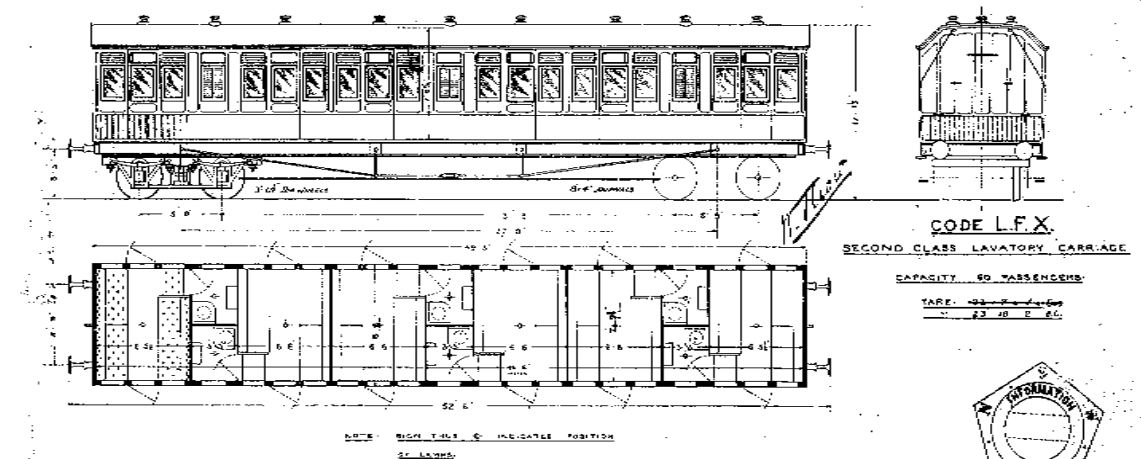


Figure 3.102: 52'6" First Class Lavatory Carriage Code LFX had a capacity of 60 passengers and was known as an 'Express Lavatory' Car built between 1897 and 1915. These carriages had no corridors and passenger entered from doors on either side of individual compartments. To allow someone to enter the lavatory cubicle, the unfortunate person sitting on the fold-down seat in front of the cubicle door had to stand up. These carriages were understandably unpopular and many were later converted to corridor cars.

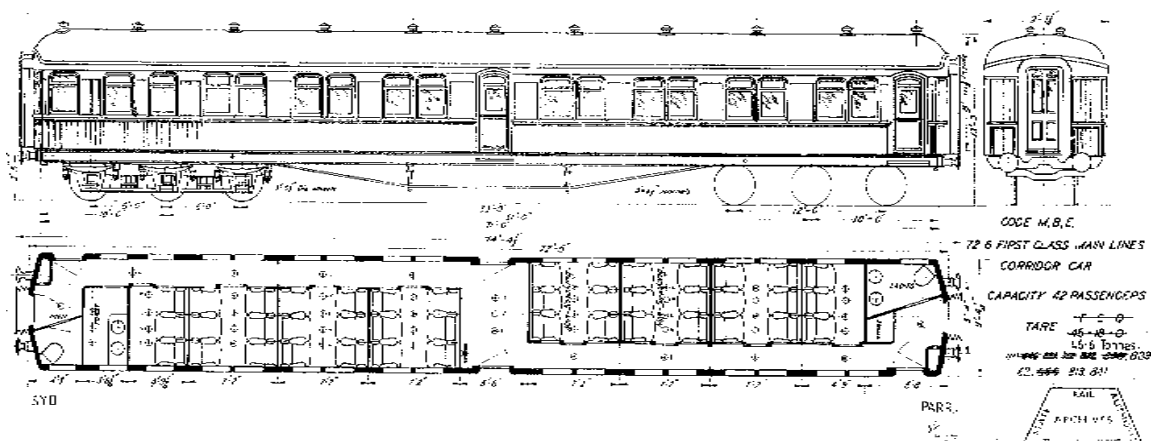


Figure 3.103: The 1939 72'6" First Class Main Lines Corridor Car Code MBE had a capacity of 42 passengers. Passengers could move freely from one car to the next and the lavatory arrangements were vastly superior to the example above. This carriage type was finished externally in timber. These were converted from carriages built between 1913 and 1929.

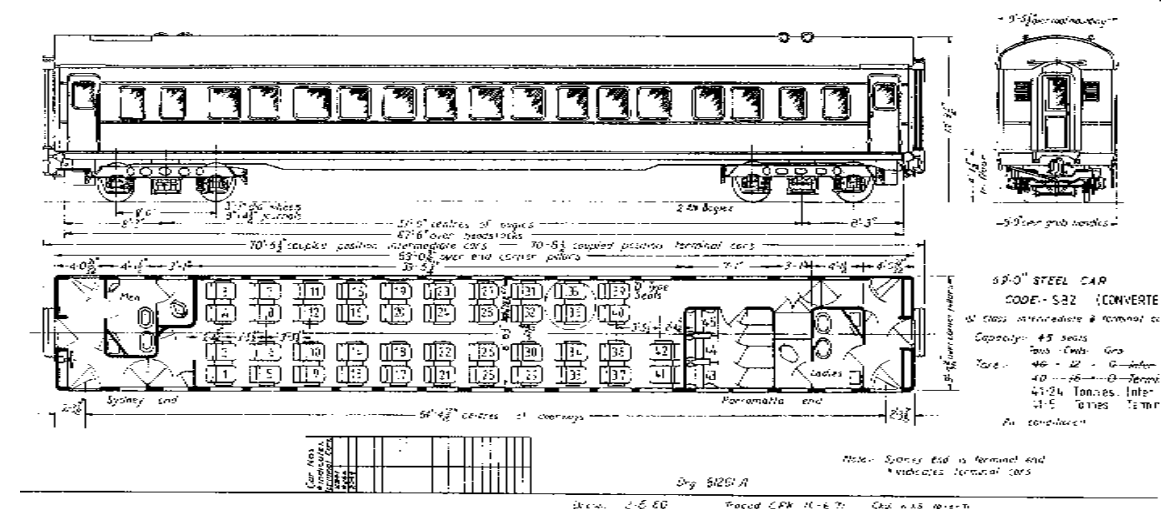


Figure 3.104: The 69' Steel Carriage Code SBZ had a capacity of 45 seats, was an air conditioned first class saloon carriage, built between 1948 and 1952 for express train services. These cars had a central corridor, large bathrooms and enclosed vestibules at either end.

In about the mid-1860s, local manufacturers set up factories to build rolling-stock for the NSW Railways and the first four American influenced bogie carriages built in New South Wales were constructed by the Sydney firm of Peter Nicoll Russell & Co. in 1871. Three 'American' end-platform carriages were imported in 1877 and these open end-platform carriages provided the pattern for building of over 900 similar bogie carriages up to 1916, mainly for Sydney suburban traffic.

The next trend was again American. Two 70ft sleeping carriages were imported in 1884 for trials and were followed by eight vestibuled Pullman sleeping carriages imported for the inter-state expresses in 1891. The Carriage and Wagon Shops at Eveleigh built seven sleeping and eighteen sitting carriages based on Pullman exterior designs. From 1903 to 1912, sixteen sleeping cars with side-corridors, end-platforms and two-berth cabins (unlike the semi-open Pullman bunks enclosed by only curtains) were built. All these carriages were built with timber bodies and timber underframes.

Eight twelve-wheel bogie carriages made by the British Ashbury Company had also been imported in the 1870s. These were possibly the finest vehicles which had been seen so far in New South Wales and they had a big effect on future carriage development in the colony. The style of these carriages was copied here for many years, although the original design, which provided compartments without toilets, was outdated by 1890. The first of these local copies, which became known as 'Redfern' cars, were short with very cramped interiors and no toilets. About 186 'Redferns' were built followed by the construction of another fleet of 90 similar, but bigger, cars from 1890. These larger cars called 'Express' cars and colloquially known as "dog boxes" were built by local manufacturers but not at Eveleigh Carriage and Wagon Shops. They were intensely disliked by the public and probably gave a very rough ride.

By 1930 the 'Redfern' cars had almost all disappeared, while the later, larger 'Express' models, which had been built on steel underframes (the first in NSW), were converted from side-door compartments to corridor designs in a mass programme by the Carriage and Wagon Shops in the 1930s. In this case, the roofs, underframes and bogies remained, but the whole of the centre section of the body, which carried the passengers, was newly built.

Another series of over 400 'Express' compartment carriages followed the 1890s fleet and they were used for country trains. This time they were fitted with lavatories serving all compartments but still had no corridors. When the carriage was almost empty, passengers could stretch out comfortably but crowded it was cramped thus unpopular. Many of these carriages ended up being converted at Eveleigh to corridor designs in the 1930s.



Figure 3.105: Interior of a “new luxury main line carriage” built by the Eveleigh Carriageworks in 1938. Source: ML Videodisk GPO 1.

There was also a small number constructed without toilets for suburban use. The net result of building these approximately 600 carriages over 20 years was that the travelling public was alienated by their cramped, restricted designs. Consequently, New South Wales Railways ended up completely rebuilding nearly 200 of them at great cost, to virtually new designs. Some remained as side-door compartment cars and the last two were withdrawn in the early 1970s.

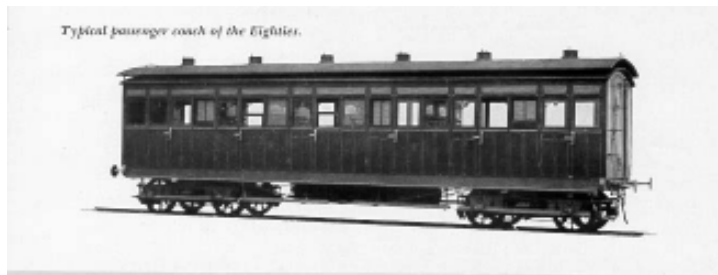
A more forward move for express trains was the introduction of the first 72ft 6ins, ‘Main Line’ vestibuled, twelve-wheeled carriages in 1913. These luxury sleeping and sitting carriages were built with fine wooden bodies on steel underframes and rode on two six-wheel bogies. This car type provided sleeping accommodation in compartments served by a side aisle. The lower berth provided seating accommodation during the day. These cars became known as ‘Mann’ cars and various types were introduced. In 1914, the two-berth cabin type car known as the TAM became standard.

The Mann cars were to be found on the best trains in NSW for the greater part of 40 years. In the years up to 1938, about 180 of these 45-tonne carriages were built, 82 of them at the Carriageworks at Eveleigh. They lasted until the late 1980s and were still fine vehicles.

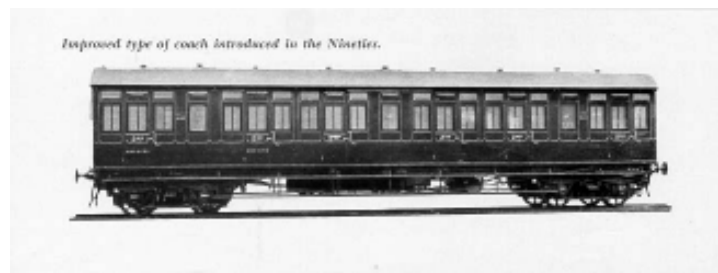
All of the above carriage types were, with the exception of steel underframes in the later types, built of timber. The Eveleigh Carriage and Wagon Workshops had been specially designed to suit this type of construction.



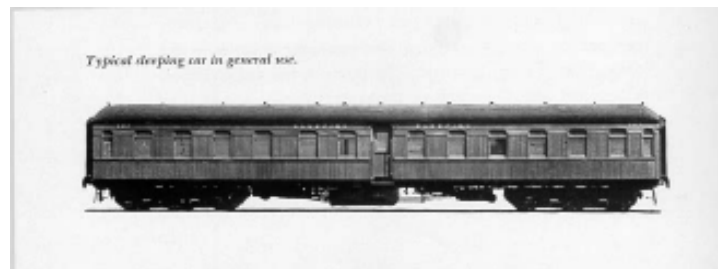
Imported 1855



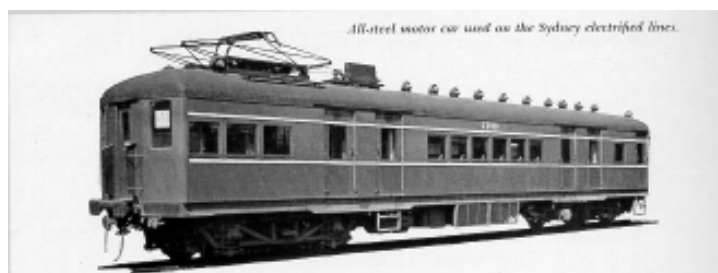
Typical passenger coach of the Eighties.



Express type of coach introduced in the Nineties.

Express Lavatory side-door compartment car
1890s

Typical sleeping car in general use.

Luxury sleeping car for the Melbourne Express,
1938

All-steel motor car used on the Sydney electrified lines.

Built 1940



All-steel, air-conditioned coach, used on country day services.

1948

Figure 3.106: The development of carriages over the first hundred years of the railways in New South Wales as portrayed in "The Railways of New South Wales 1855-1955", pp 163, 166. Note that the sleeping car shown immediately above is of timber construction while the suburban electric car 'coach' used for country day services have steel bodies. All of these carriages, except the electric car, would have been maintained at Eveleigh.



Figure 3.107: Timber composite Second/Sleeping/First branch line car ACS 692 on the apron on the east of the Paint Shop in 1959. The sawtooth roof of the Paint shop is visible in the background. Source: SRAO

The Introduction of Steel

The steel era came slowly upon the New South Wales Railways. Correspondence records reveal that the Chief Mechanical Engineer, Mr. E. Lucy, had drawn the notice of the Chief Commissioner for Railways and Tramways to the building of all-steel carriages in the United States in about 1914, some years after the first steel car was built for the New York subway in 1904.

The impetus for all-steel fireproof carriages had originated in New York, when the city administration saw the fire hazards inherent in using timber carriages on an underground system. This considerable change in direction required car-building firms to completely change their workshops over from wood to steel. To secure the New York Subway's business, the Pullman Company moved from wood to steel construction in only 3 years between 1907 to 1910. In contrast the Carriage & Wagon Shops at Eveleigh was still substantially a wood shop when it closed in 1989, one of the reasons for its gradual decline. Refer to Section 3.1.10 *The Decline of the Workshops 1945 to the Present*.

The move to all-steel carriages was also under way in Europe in 1912 when the Prussian Railway introduced their first steel vehicles on express trains. By contrast, in the United Kingdom steel was introduced into carriages only gradually, as rear-end collisions brought the danger of timber carriages vividly to the public attention. Not until the twenties did British manufacturers start building steel carriages for European services and even when they commenced steel construction for home services they attached steel plates to a wooden frame.



Figure 3.108: A 400 class Rail Motor on Traverser No. 1 at the Eveleigh Carriageworks c.1937. This traverser was originally located inside the main workshop but was moved outside between the Carriage Workshop and the Paint Shop in 1901. It ran on 600v DC power with two overhead wires. This traverser was replaced by a more modern one that was relocated from Yennora in 1971. Source: SRAO.

For main-line country and express services in NSW, 165 steel bodied cars on steel underframes (but still with wooden interiors) were built by Clyde Engineering and Waddingtons between 1936 to 1939. The 92 post World War II air-conditioned carriages from Tullochs and ComEng were built the same way. These cars were maintained at Eveleigh.

The first all-steel carriages in NSW were the single-deck suburban electric carriages built from 1925 onwards. These were maintained and serviced at a specially constructed workshop, known as 'Elcar' at Chullora. Refer Section 3.1.8 'Carriageworks Expansion 1895 to 1927.

A significant further development was the building at Eveleigh Carriageworks of five all-steel Power Vans to run the new "Silver City Comet" from Parkes to Broken Hill. The first train was completed in September 1937 and was the first fully air-conditioned train in Australia. The twelve trailer carriages were built by a contractor, Ritchie Brothers of Auburn.

After World War II, following experience from building Beaufort Bombers for the RAAF, the Chullora Workshops pioneered the construction of rail cars with stressed aluminium bodies and sheathing for work on country lines. None of these were built or maintained at Carriage & Wagon Shops, Eveleigh but their introduction replaced the older wooden carriages maintained at Eveleigh.

Stainless-steel Carriages

Stainless-steel carriages entered service on the NSW Railways after Commonwealth Engineering Ltd at Granville ('ComEng') obtained a patent for building them from the Budd Company of the United States in the 1950s. ComEng's first order was for 80 stainless-steel, multiple-unit electric carriages which were delivered in 1956-60 and used for services to the Blue Mountains and Gosford. These vehicles were electrically powered and were maintained at 'Elcar' rather than Eveleigh Carriageworks.

Another major change in carriage building was the move to the use of stainless-steel in the bodies of inter-express trains. This was seen in the delivery from ComEng in 1961-62 of 57 carriages (including sleeping, dining, lounge, and brake and power vans) for the "Southern Aurora" Sydney to Melbourne. The Brisbane Expresses, which were 1949 RUB type sitting cars were supplemented by four or five stainless steel sleeping cars. These replaced the older 'Main-Line' carriages and were maintained at Eveleigh.

The stainless-steel carriages of the "Indian Pacific" service which started in February, 1970, were jointly owned by the railways using them, but the Carriageworks at Eveleigh did repair work on them as they were very similar to the stainless-steel vehicles built for the Melbourne and Brisbane overnight trains as discussed above. *Refer to Section 3.1.10 Decline of the Workshops 1945 to the Present - Boilermakers' Shop.*

Commencing in the mid-1970s, there was a major rationalisation of country main lines, mail trains and branch line services, along with the extension of outer-suburban electrification to Newcastle and Wollongong/Port Kembla, thus rendering hundreds of carriages surplus to requirements. The number of older cars displaced did not usually equal the number of new cars introduced and a big increase in commuter business in the 1970s caught the system out. As a result of the shortage of carriages about 35 former 'Main Line' carriages were converted at the Eveleigh Carriageworks to a 'commuter' style of seating. This involved the complete gutting of the car, and construction of a new body, in a similar style to the conversions of the 1930s. Again the roof, underframe and bogies were about all that survived the work.

Suburban Carriages

As commuter traffic developed in Sydney, Newcastle and Wollongong, a fleet of over 900 'American' or 'End Platform' carriages based on the 1879 American imported carriages was built locally for suburban use. Their interior design barely changed from the time of construction of the first local cars in 1880 until the last in 1916. These carriages seated 60 passengers and had 15 windows per side with open end platforms. They were initially operated as individual carriages, but later most were made into permanently coupled up car-sets varying in length from 3 to 10 cars. They could only be separated from each other with some difficulty, or at the Carriageworks at Eveleigh for overhaul.

These carriages were part of the NSW Railway scene until the 1970s when the last withdrawals occurred. A set of nine of these carriages built by Clyde Engineering in 1910 has been preserved and is operated at the NSW Rail Transport Museum at Thirlmere. Until 1913, these cars were built completely of timber. The last 195 were built with traditional timber bodies on steel underframes, and fitted with automatic couplers inside the sets, the first installation of this device on passenger carriages on the system. Of these 195 cars, one was rebuilt as a prototype electric carriage for the eventual rebuilding of the remainder, while another was converted to early Rail Motor and later to a loco-hauled carriage.

The Single-Deck Electric Fleet

The electrification of Sydney's suburban lines from 1926-32 brought many changes to the number and types of carriages maintained by the Carriageworks at Eveleigh.

The first 'electric' carriage was built at Eveleigh between 1921 and 1923 as a prototype. Local contractors built 100 production cars to the same design, all of which entered service *prior* to the prototype. These cars had traditional wooden bodies carried on steel underframes and were initially coupled up with existing 'American' cars and hauled by steam engines. Later, when converted to electric use in 1926-7, they were sheathed in steel to resemble the all-steel cars. Some of these lasted until the 1980s. The prototype carriage built at Eveleigh has been preserved in the NSW Rail Transport Museum at Thirlmere.

193 of the 'American' cars mentioned above were used in steam-hauled services until 1926-7 when they were converted for electric use. This conversion, undertaken by Clyde Engineering, involved a complete rebuild of the carriages, widening the body from its original 9ft 6in to 10ft 4in, thus allowing five seats across instead of four.



Figure 3.109: New South Wales first Rail Motor which was converted from a motor lorry at the Eveleigh Carriageworks in 1919. Source: "The Railways of New South Wales 1855-1955", p171.

The first all-steel electric carriages for New South Wales were built by the pioneer British 'all-steel' firm, the Leeds Forge Co. The first fifty electric cars were sent to Sydney in a knocked down condition for assembly here. The first ten were assembled at the Carriageworks at Eveleigh, and the balance at Clyde Engineering Co., who along with other local companies have built the whole of Sydney's all-steel electric carriages since.

The major fleet of electric cars was composed of 591 vehicles built totally of steel. These later became the 'red-rattlers' of the 1970-80 period.

Rail Motors

In the field of self-propelled petrol or diesel powered Rail Motors there was some pioneering work at the Carriageworks at Eveleigh. Refer Section 2.5 *Terminology and Abbreviations*.

The first Rail Motor was put into service between Grafton and Lismore in 1919 and was built up by utilising a 5 ton Moreland truck, with a body not unlike a box and which had been lying out of use for several years. The Rail Motor was petrol driven with a single end control. Soon afterwards, another, which used a motor in the body of an 'American' or 'end platform' carriage, was tested.

From the mid 1920s, the internal combustion engine had reached a sufficient degree of reliability to enable it to be fitted to rail vehicles. A series of 37 newly designed 'tin hares' together with five trailers, were built at the Carriageworks at Eveleigh for service throughout the State. They were generally used on country branch lines where steam trains were expensive and uneconomical due to the limited amount of traffic. Their advantage was that they were light and fast with a limited seating capacity. They were also able to carry a small amount of light or perishable goods.

"New" Rail Motors of various types were constructed at the Carriageworks between 1923 and 1938. Overhauls and collision rebuilds continued at Eveleigh until the 1980s.

Although steam self-propelled cars date back to 1883 in South Australia and 1880 in Victoria, the first successful internal combustion rail car was in South Australia in 1913. However, Eveleigh was a large producer of Rail Motors and by the 1930s there were more of these vehicles in NSW than in the United Kingdom.

Brake-vans and Brakes

Until as recently as 1987, all NSW freight trains were required to include a brake-van. Initially the brake-van had to be the rear vehicle, but after air brakes were fitted to trains, this was no longer strictly necessary except on very steep grades such as the Blue Mountains line. The change to airbrakes on passenger trains occurred in 1877 and on goods trains in 1891.

The brake-van on "mixed" trains accommodated the guard, carried minor goods traffic, accommodated passengers and people accompanying animals. A passenger train fully equipped with air brakes did not necessarily need to have its brake-van marshalled at the rear. On freight trains, the brake van always trailed - except under special circumstances where one or two vehicles picked up *en route* could be attached behind. Accommodation for the guard was built in some cars, usually at the ends, or he was provided later with a separate compartment from the passengers anywhere in the train.

Since the introduction of air brakes, in NSW the term 'brake-van' has been replaced with 'guard's van'. The guard could also be accommodated within a passenger car or a set of cars such as tourist R&L sets. The guard's compartment was fitted with an internal hand brake in case of an emergency as, up until this point, hand brakes had been fitted to the outside of vehicles to be used by shunters and other train crew. The guard's compartments was also fitted with an air gauge, to show the air pressure in the train brake pipe line, and an air tap. The tap could be operated by the guard to enable a brake continuity test to be undertaken in conjunction with the driver of the train to test the braking performance of a train, which was required before every journey. In the case of an emergency, the guard could operate the emergency brake by "opening the tap", thereby releasing the train pipe air which holds the brakes off the wheels. The reduction of train pipe pressure would be indicated in the driver's cab who would then close the regulator (or throttle), bringing the train to a halt.

Continuous air-brakes were pioneered by the American inventor George Westinghouse in the 1860s. A non-automatic system was imported for trial by the New South Wales Railways on the American passenger cars in 1877. An automatic, fail-safe design was soon fitted to all new passenger cars, and to many of the older cars in good condition. From 1891, a decision was made to fit air brakes to goods trains as well, and initially much of this work would have been carried out at the Carriage & Wagon Shops at Eveleigh.

As the speed of passenger trains increased with bigger engines, better built lines, improved bogie carriages and the public's need for faster travel times, brake vans had to be built specially for passenger trains. This commenced in the early 1880s. Older four-wheel brake-vans and radial designs which had become unsuitable, were relegated to slower goods trains. Brake-vans continued to be hauled at the rear of goods trains until the 1980s. Following a protracted industrial dispute, the position of guard with his van, was almost eliminated. A few remain in use for special cases.

The State Car

The State Car, was "built in the railway workshops at Eveleigh in 1891 for the [NSW] Governor, the Earl of Jersey. It was specially designed to convey the Governor and his party to his country residence at Sutton Forest [Hill View], (now known as Moss Vale) and continued to be used in service until 1913. The car was also used by the Duchess of Cornwall and York (later Queen Mary) for trips from Sydney to National Park and Katoomba during the visit of her husband and herself to Australia for the opening of the first Federal Parliament in 1901.

This car, which is 46' 2" long ... and weighs 22 1/2 tons, is mounted on two four-wheel bogies and has an iron underframe. It was constructed as far as possible of Australian materials, great care being taken in the selection of ornamental timbers. The outside panels framed in Tasmanian Blackwood were originally painted in white and crimson lake and lined with gold stripes, the Royal Coat of Arms being in the centre on each side of the car. Interiors were finished with carved native timbers. The roof and floor have two layers of timber to deaden the sound and to keep out the heat and dust.

Originally the car was lit with oil gas in ornate lamps, but in 1908 electric lights were installed. Throughout the car the plate glass windows set in cedar frames are fitted with huon pine louvre blinds. The floor is carpeted in axminster, the colour being mainly terra cotta and blue. The three compartments - the main saloon in the centre, a ladies boudoir at one end and the gentlemen's smoking room at the other, are decorated in the elaborate style of the Victorian period.

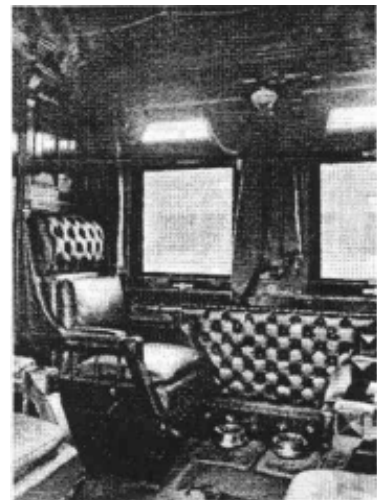


Figure 3.110: The boudoir chair. Source: NSW Railways Pamphlet, Vintage Train State Car.



Figure 3.111: The smoking room section. Source: NSW Railways Pamphlet, Vintage Train State Car.

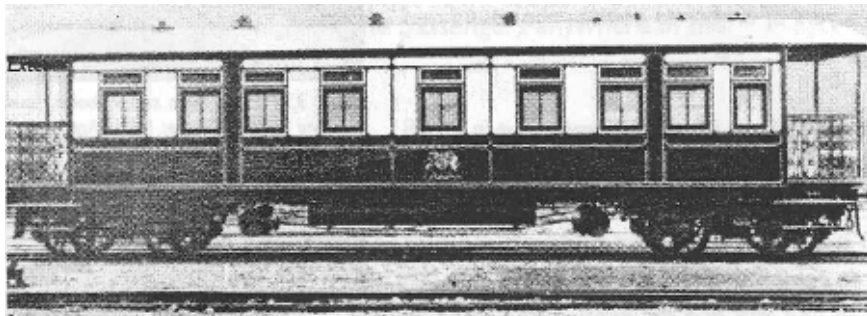


Figure 3.112: External view of the car in 1891. Source: NSW Railways Pamphlet, Vintage Train State Car.

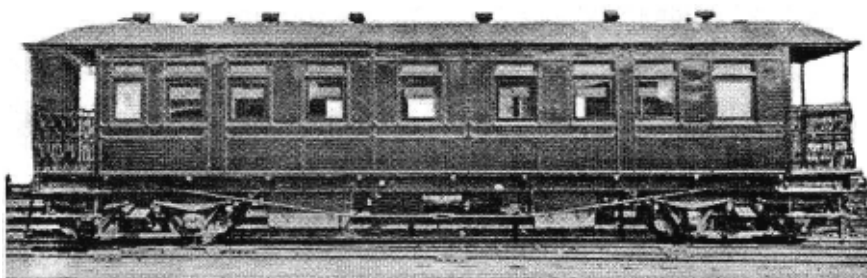


Figure 3.113: External view of the car in 19??. Source: NSW Railways Pamphlet, Vintage Train State Car.

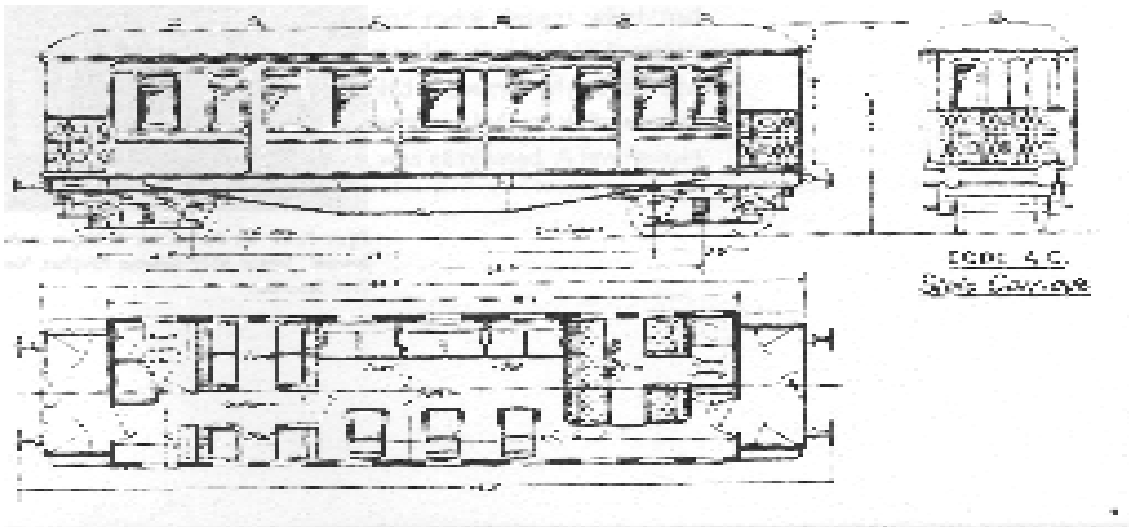


Figure 3.114: Outline drawings of the car. Source: NSW Railways Pamphlet, Vintage Train State Car.

3.5.2 WAGON TYPES AND THEIR HISTORY

Although the amount of goods traffic was small in the early days of the railways, it did not take the businesses of New South Wales long to start to make use of rail transport when the only other option was horse and dray.

The first goods wagons used in NSW were built by Wright and Co. of Birmingham who produced twenty low-sided open 'A' wagons, twenty open 'B' wagons and some covered vans, known as 'C' class for the NSW Railways. They were all about 20ft long by 8ft wide, and weighed no more than a few tonnes. In addition, Wright and Co. built six brake-vans and a horsebox, which could be used in either passenger or goods traffic. These first fifty goods wagons imported from Great Britain were all four wheeled.

Increasing traffic meant that further wagons were soon needed and while firms including Wright and Co. continued to deliver them, the simpler tasks involved in building wagons rather than carriages meant that local contractors were soon involved in the business.

The Railway Workshops at the Sydney (Redfern) Yards started building higher-sided open wagons, known as the 'D' class, and bolster trucks, known as 'E' Class in 1858. These wagons worked in pairs and were used for carrying timber.

In addition to the above, English and local firms built special types of goods vehicles including carriage-trucks, cattle-vans, meat vans, ballast wagons and sheep vans. The Sydney Railway Workshops converted some second-class carriages into mail vans, and also built new meat vans.

Initially, most wagons were four-wheel types, which were short and light-weight. In 1883, however, the first bogie wagons were imported from the United States. These wagons had 'side-tipping' bodies which were designed for fast unloading and they were used for transportation of coal and other materials. Other special types of van, such as refrigerator, milk wagons, tank wagons were added to the fleet as goods traffic expanded and diversified.

When the Carriage & Wagon Shops at Eveleigh were opened, most goods wagons were built, repaired or converted there until the transfer of wagon repairs to Clyde from about 1909. The major changes to goods vehicles over this century were that they began to be made of steel instead of timber and that they increased in size. A lighter, steel wagon was able to carry the same load as a heavier, earlier timber. Some country depots such as Honeysuckle (Newcastle), Goulburn and Bathurst, repaired goods wagons in addition to the work done at Eveleigh.

Types of Wagons:

Early wagons handled at Eveleigh were all built of timber unless noted:

- a) Low-sided timber wagons, one of the original types in the railway system. They had largely disappeared by 1895 and a new series was built from 1895 to 1912. Many were then converted for non-revenue works or 'loco' traffic.
- b) Built until 1880 but from about 1895 many continued in works or 'loco' use until wagon repair work was transferred to Clyde.
- c) Covered vans which were built until about 1885. After this date, many similar sized wagons with louvred sides to accommodate the local climate were built. The later versions with steel underframes lasted until after World War II.
- d) Various timber versions of this useful wagon built from 1858 until 1904 were in service until the wagon repairs were moved to Clyde. Many were built by the Carriage & Wagon Shops at Eveleigh and they remained in use for many years in revenue as well as works and 'loco' traffic. A version with a steel underframe was built from 1910.
- e) These short bolster wagons were built from 1858 to about 1880 and had mostly disappeared by 1915.
- f) A small class of flat wagon which was withdrawn by 1915.
- g) 'Gondola' wagons which were originally built between 1882 and 1889. The originals did not last long but a later fleet, built between 1895 and 1910 were converted to flat wagons and lasted until after World War II.
- h) Wagons with tipping bodies which were built to dump spoil for railway track or building work. 212 were built in about 1884 and lasted until after World War II.

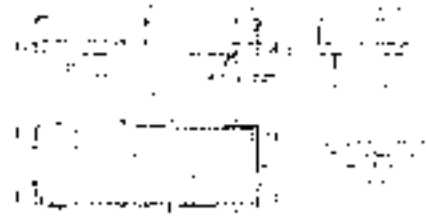


Figure 3.115: 'A' Class wagon. Undated Drawing. Source SRAO

Sheep and Cattle vans

Four-wheeled versions were built and in use until the 1970s, but bogie versions, introduced from the 1890s, continued in use after this. The last 4-wheel stock wagons were used between Wollongong and Tenterfield. Steel underframes would have been used on these wagons after about 1910.

Powder Vans (for explosives)

By 1890, 40 of these vans were in use, the first being converted from C vans. They were in use until after 1915.

S Wagons

A very popular later version of the large open D truck, but built almost totally in steel. The first 'S' class wagons had pressed steel bodies and were imported from the UK and US from about 1900. By 1912, these wagons were being built at Eveleigh and remained in use until the 1980s.

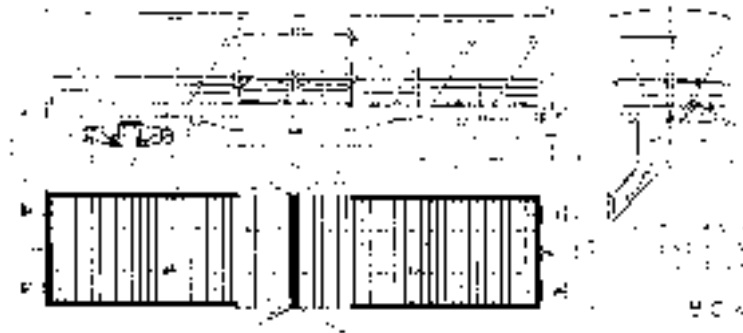


Figure 3.116: Bogie Cattle Van. Undated Drawing. Source: SRAO.



Figure 3.117: 'D' Class Wagon which was similar to the 'A' Class but with higher sides. Undated Drawing. Source: SRAO.

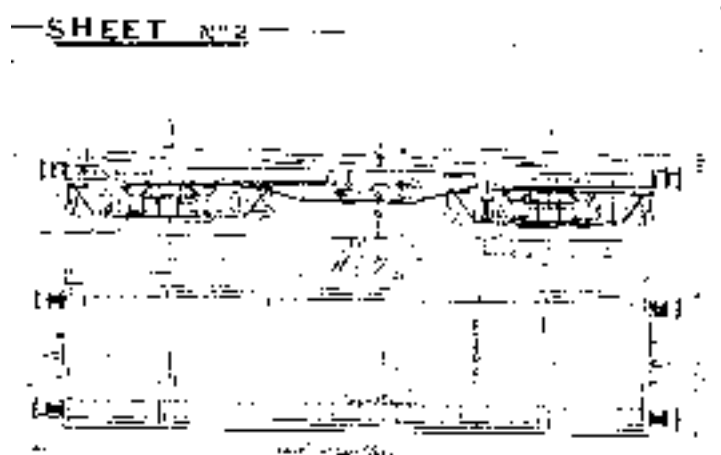


Figure 3.118: Flat Wagon, Code E Undated Drawing. Source: SRAO

3.5.3 CARRIAGE CONVERSIONS

Refer Section 2.5 Terminology and Abbreviations.

A major part of the work carried out at the Eveleigh Carriage and Wagon Workshops was that of carriage conversion and overhaul. Carriage bodies were converted to new designs when the old had become obsolete, or were overhauled when their condition had deteriorated. In addition, carriages were converted for special uses, particularly during World Wars I and II. The amount of this type of work grew over the century of the workshops' operation as the timber carriages, which had been Eveleigh's specialty, were gradually replaced by newer non-timber carriages, which were repaired at other shops. *Refer Sections 3.1.8, 3.1.9 and 3.1.10.*

Some of the earliest conversion works at Eveleigh involved the turn-of-the-century re-building of the 1880s fleet of 'Redfern' cars. Some of these cars, which had been built with separate compartments but without toilets, were converted to include corridors and toilet cubicles (*for more detail on 'Redfern' cars see page 44*).

During World War I, the Annual Reports note that 25 suburban cars were converted to ambulance cars.¹ The production of Rail Motors at Eveleigh commenced soon after the end of the war (See *Figure 3.109*). In later years, rail motors continued to be overhauled at the site until the early 1980s.

Between 1929 and 1939, the workshops converted a further but slightly later fleet of 'box' cars, which had been built from the 1890s, to corridor cars. *Refer Section 3.5.2 Carriage Types and their History.*



Figure 3.119: Converting 'box' or 'express' cars to corridor type cars in the Carriage Shops Extension (now called the Cable Store) probably in the 1930s. Source: SRAO.

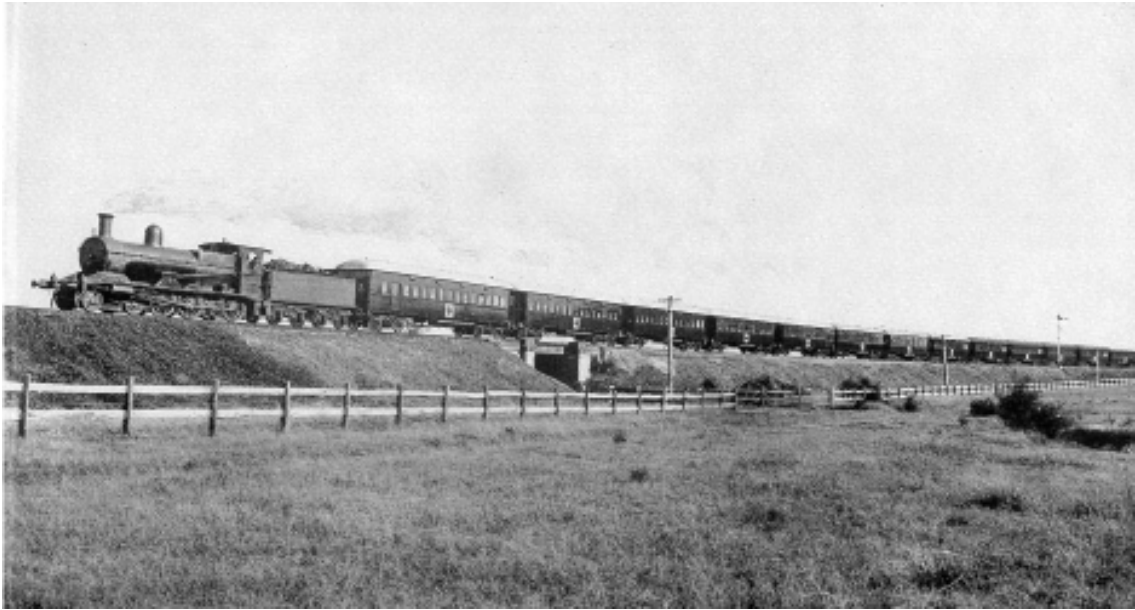


Figure 3.120: An Ambulance train with carriages converted by the Eveleigh Carriageworks during World War I. Source: 'The Railways of New South Wales 1855-1955', p195.

Between 1930 and 1934 three Far West Children's Health Scheme cars, which included accommodation for a travelling sister as well as interviewing rooms, were converted at Eveleigh and put into service.² Some 25 years later, these cars, which operated between Bourke and Cobar, were replaced with another pair which was also converted from older carriages at Eveleigh. These cars were equipped with a clinic section, waiting room, small library with toys and a private cubicle for nursing mothers. In addition, they were provided with self contained living quarters for the nursing sister in attendance. The general secretary of the Far West Children's Scheme, Matron Hill, was clearly delighted with these custom produced carriages, stating that the *"planning foresight and standard of workmanship which had gone into this project were plainly evident, and all those little individual touches introduced by the men responsible stamped it a real labour of love"*.³

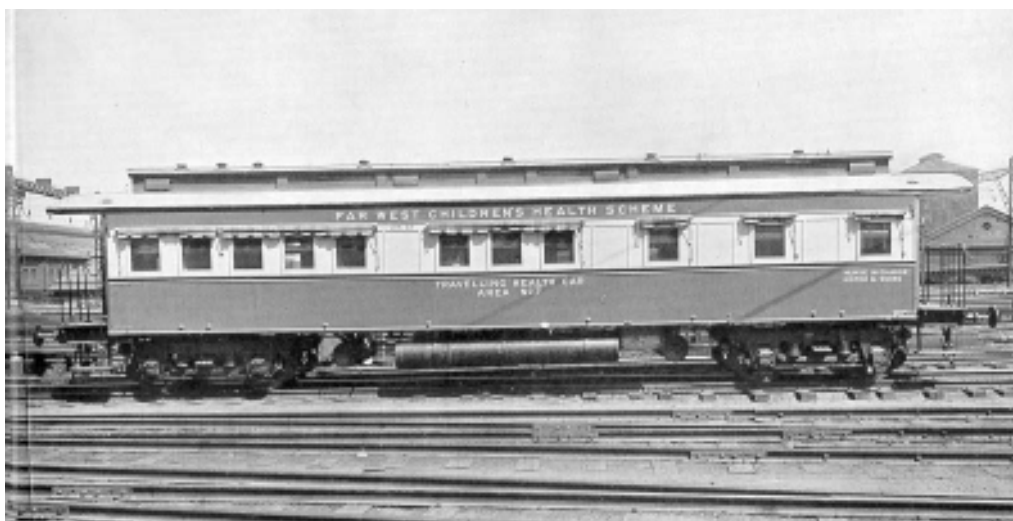


Figure 3.121: Far West Children's Health Scheme car photographed c.1955 outside the Eveleigh Carriageworks where it was converted. Source: 'The Railways of New South Wales 1855-1955' p291.

Similarly, two old four-wheel bogie Pullman sleeping cars were converted into mobile dental clinics in 1935 and 1938⁴. Later versions of these carriages provided 6 sleeping berths, a surgery with two dental chairs and all necessary equipment, an x-ray developing room, an office, workroom, kitchenette and power plant.⁵

In the period between the wars, 'suburban' cars were converted to 'tourist' cars in great numbers. This procedure involved the removal of the rows of reversible seats, the construction of partitions to divide seats into a bay and the installation of toilets.

During World War II, many carriages were converted for special purposes. In 1940, for example, 'suburban' cars were converted to RAAF recruiting cars for use in country towns.⁶ Two trains were equipped for the Commander-in-Chief, General MacArthur, in readiness for any emergency. In 1943, 32 'suburban' cars were fitted with bunks for sick troops. Each of these 'ambulance' trains accommodated 354 patients, a train staff of 6 and 47 medical personnel. They were also provided with hot and cold water and a dispensary, a medical store, office, linen store and kit room. An operating car was later provided for one train. In 1944, 8 centre aisle cars were converted for military use.⁷ After the war, these cars were returned to normal use, the 1946 Annual Report noting that 48 military and ambulance cars had been converted back during the year.

During the immediate post-war period, there were further programs of conversions of corridor cars to sleeping cars, 'box' or 'express' cars to motor car carriage trucks and 'main line' cars to other types of main line cars.



Figure 3.122: Interior of the Dental Car converted at the Eveleigh Carriageworks c.1955. Source: 'The Railways of New South Wales 1855-1955', p 291. Also referred to as "Squeals on Wheels" (SMH Column 8, 22/07/02).



Figure 3.123: World War II ambulance train at Rosehill, also with carriages converted at the Eveleigh Carriageworks. Source: 'The Railways of New South Wales 1855-1955', p 205.



Figure 3.124: RAAF Recruiting Train photographed outside the Eveleigh Carriageworks during WWII. Again, the carriages were converted by the Eveleigh Carriageworks. In the background is the Locomotive Workshops building. Source: 'The Railways of New South Wales 1855-1955' p 204.

Older vehicles were also converted in many cases for use as works vehicles. In the 1950s, for example, electrification began to reach further out from metropolitan Sydney and the Eveleigh workshops converted older vehicles for use as wiring trains. During the 1970s, the number of commuters coming to Sydney from the Blue Mountains and Gosford was rising and the number of carriages required for these services increased. Although the capital available for new carriages was limited at the time, there was a big budget for maintenance work. This budget covered the work of overhauling and modifying old cars for these commuter services and this job was given to the Eveleigh Carriageworks.

ROYAL CARS⁸

The Governor General's Car had originally been built at the Eveleigh Carriage and Wagon Workshops in 1901 for use by Lord Hopetoun, the first Governor General of Australia. It was first used by royalty when the Duke and Duchess of Cornwall and York visited Australia for the opening of the first Federal Parliament in 1901. The car was also used by the Royal Family in 1920 when the Prince of Wales travelled from Sydney to Canberra. The bedsteads were plated in gold from melted down sovereigns. In 1934, Prince Henry travelled in the car from Albury to Wagga Wagga and it was also used on a number of occasions by the Duke and Duchess of Gloucester when the Duke was Governor of Australia.

The Carriageworks at Eveleigh altered the Royal Coach for Queen Elizabeth's visit in 1954. As no night travelling was required during the Royal visit, the two-bed stateroom had all its interior furnishings removed and was fitted up as a small sitting room. An electric refrigerator was fitted in the kitchen and three special air-conditioners were installed in the car. The beds have since been returned to the car.

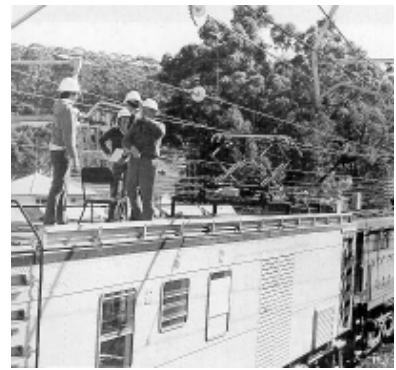


Figure 3.125: A carriage converted at Eveleigh for use on a wiring train, probably 1980s. Source: 'With Iron Rails', p 199.



Figure 3.126: H.M. Queen Elizabeth and the Duke of Edinburgh on the platform of the Royal Train in February 1954. The Royal Train was altered at the Eveleigh Carriageworks for their tour.

3.5.4 COMPONENTS OF CARRIAGES AND WAGONS

Refer also to Section 2.5 and Sections 3.5.1 and 3.5.2.

Many parts of these vehicles are common to each other, and their development has often depended upon factors which vary between the uses for the two types of vehicle.

Early carriages and wagons were simply boxes on wheels and were basically adaptations of horse-drawn coaches to railway operation. The main difference was that the wheels were flanged and guided along by rails, thus one locomotive could haul a number of vehicles in a line.

The various basic parts of an early railway vehicle included a solid underframe which supported the floor and the body of the vehicle. Below the underframe was the mechanism with which the wheels and springs were attached. At each end of the underframe, are the headstocks, to which were attached the buffers and couplings.

The couplings between adjacent carriages or wagons and the engine permitted the vehicles to be pulled as a train. They also included springs which smoothed out the pulling effort of the engine, thus limiting damage to the underframe when it was hauled or coupled to another car. Buffers ensured a smoother ride in the cars by holding adjacent vehicles tight in a relatively straight line behind each other so that pulling and pushing forces were evenly distributed to the vehicle underframe.

In later years the headstocks also carried connections for air-brakes, train heating, lighting and air-conditioning, and in electric trains, for passing electrical connections from the front carriage to the various other cars in a train so that it could accelerate and brake evenly.

On the underframe was fixed the body. In goods wagons, this was simply a flat tray or often a very basic box open to the weather. The body was timber framed and in early carriages was laid out in separate compartments. In later carriages, corridors and covered external vestibules were provided so that passengers could walk from their carriages to the dining, lounge, observation or other service carriages. Before vestibules began to be incorporated in carriage design in 1887, car bodies were covered at their ends with flat boards.

The body was clad externally with timber and later steel or aluminium sheets to protect the frame from the weather and present an attractive appearance to customers. On the inside, the finishing depended much on the class of the car - the higher the class, the better the finish. Examples were the wooden 'Main Line' cars of the 1920s, which were fitted out with Australian Cedar and the best chromed fittings, and the 'KAM' cars of the 1930s.

The earliest roof designs incorporated a curved arc which later developed into the semi-elliptical shape almost universal in carriages throughout the world today. Some late Victorian carriage roofs included elegant clerestories.

The wheels, spring-gear and other mechanisms have changed over the years. Early carriages and wagons were carried on a simple pair of axles secured to the underframe by guides and tamped by spring gear which became more sophisticated over time. Each axle carried a wheel on each side and this was known as a wheel-set. This fitted into 'W'-guards which restricted the wheel-set to up and down motion only. A slight allowance was made in these guards so that wheel-sets could negotiate curves but this depended greatly on the radius of the curve and the distance between the rigid wheel-sets on the vehicle. When it became obvious that longer carriages were required, a third wheel set began to be fitted under the car and then a fourth began to be included. All the wheel sets were rigidly fixed together on a long and inflexible wheel-base.

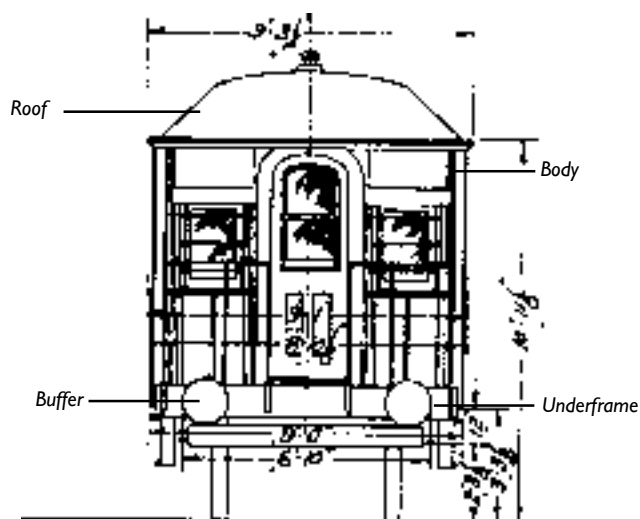


Figure 3.127: End Elevation of an 'American' or 'end Platform' Carriage showing its major structural components. Source: SRAO

In America, as in New South Wales, developing the country was a political aim for all of the history of the railway and many lines were pushed into new areas at the lowest cost. These lines were steeply graded and contained many more curves than the finely engineered English railways. The vehicles of the time needed to negotiate these lines more easily and a consequent development of these cheap railways was the bogie. This was designed so that cars could more easily travel along tight curves than they could do on a rigid wheelbase as each pivoted bogie acted as an independent set of four wheels so it could negotiate a sharper curve than a rigid wheelbase car.

Bogies permitted the building of much longer vehicles under which space was available for equipment such as air-brakes, supply of water and gas cylinders to light the car. Between 1910 and 1927, this gas lighting gear was replaced with batteries and electrical equipment. Later, such items as air-conditioning began to be fitted into this space under the carriage.

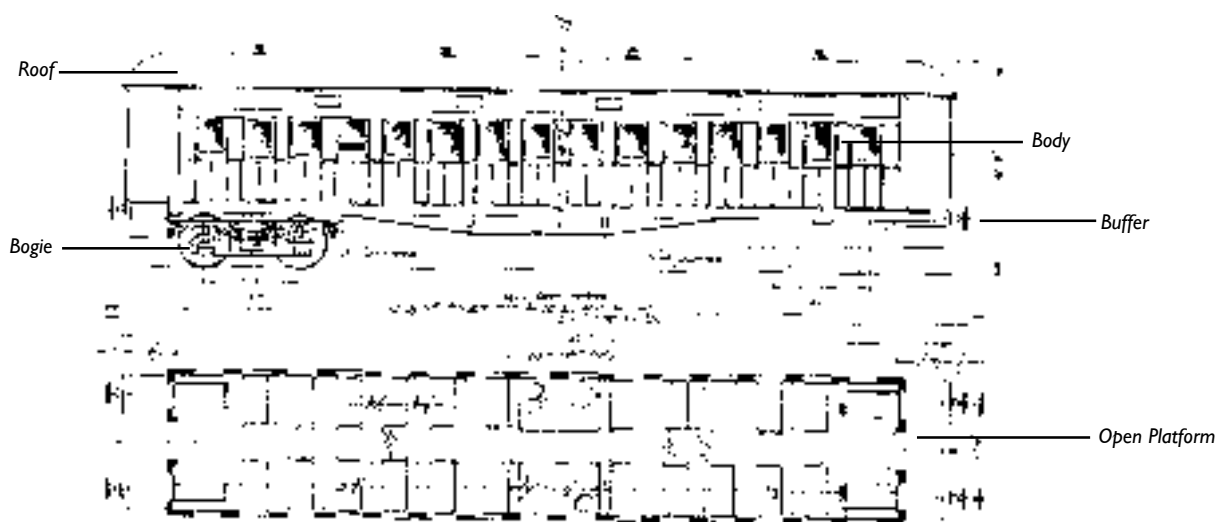


Figure 3.128: Side Elevation and Plan of an 'American' or 'end platform' car showing the major structural components common to all types of carriages. These particular carriages had bogies, open vestibules at each end, central lavatory compartments and central corridors. The first of these cars were imported from America in 1877 and these were used as models for the approximately 900 local copies made in the years up to 1916. All of these would have been maintained at Eveleigh Carriagesworks. Source: SRAO.

3.6 WORKING AT EVELEIGH CARRIAGE AND WAGON WORKSHOPS

This section discusses the nature of and changes to working conditions at the Eveleigh Carriage and Wagon Workshops. The dates used in *Section 3.1, History and Development of the Site* to define the periods of development at Eveleigh are again used in *Section 3.6.1* which provides an overview of working conditions on the site as it developed. *Section 3.6.2* explains in detail the system of apprenticeships and the different trades, which were employed there.

3.6.1 WORKING CONDITIONS AND STANDARDS

From the Opening of the Workshops to c. 1895

Before 1886, the workers in the NSW railways and tramways belonged to small, narrowly based unions which reflected their particular trades. In 1886, William Francis Schey and J. Cavanagh, both railway porters, issued a circular supporting the idea of a broadly based trade union which covered all workers in the NSW rail and tram industry. They arranged a well attended meeting in Redfern and the ARTSA (Amalgamated Railway and Tramway Service Association) was formed.

The aim of ARTSA was to fulfil the needs of its members - better wages, a safer working environment and protection against sudden retrenchment. It was also its intention to unite its members in the face of a 'divide and rule' strategy that was employed by management and assisted by the structure of the railways and the existence of the separate unions. The early union was content to make slow and steady progress, using the tactics of negotiation, to achieve better conditions.

Improvements in conditions continued to be made until the appointment of Commissioner Eddy in 1888, the year the Carriage and Wagon Workshops at Eveleigh were completed. Eddy began retrenchments, replaced adult workers with boys and introduced the subcontracting of work to private firms.¹ ARTSA did not, however, contemplate strike action, preferring to attempt negotiation.

Following a serious rail accident in 1890, the union began to become more vocal, displeasing Commissioner Eddy who removed the president of ARTSA from the railway service. A subsequent Royal Commission initiated by the union failed to find Eddy guilty of patronage and corruption. A combination of the failed strike in 1890 and employer attacks on the spread of unionism during the depression led to the collapse of the union in 1892.



Figure 3.129: Mr E.M.G. Eddy, Commissioner from 1888 until 1897. Source: 'The Railways of New South Wales 1855-1955', p 213.

The Annual Reports from the depression years of the early 1890s note both the small amount of work which was carried out by the workshops and the changes to work hours which were instigated as a result of the depression. In 1895, for example, '*financial stringency*' meant that only 6 carriage '*renewals*' could be carried out. Full time work was, however, reinstated the same year, the Annual Report noting that staff were working 5 ½ days per week instead of the 5 they had been working "*for some months past*".² In 1896, it was reported that the workshops had again been working full time throughout the year. The number of hours the staff worked per day at the Carriage and Wagon Workshops is not clear, although it was at least 48 per week.

From 1895 to c. 1927

This period was one of expansion at the Carriage and Wagon Workshops (refer Section 3.1.8) and it coincided with a rise of union activity in the railways. In addition, the period encompassed the difficult years of the World War I.

The employment of women at the Carriage and Wagon Workshops is first documented during this period. In 1900, the Paint Shop was described in the New South Wales Railway 'Budget'. As well as detailing the shop's layout and function (refer Section 3.3.2), it explained that a "*room in which women are engaged in upholstering work is placed one side of the shop, and contains four sewing machines. All the cloth and leather used for cushions and carriages is there dealt with.*"³

ARTSA was re-registered in 1902 and began to pursue claims for wages, reduced working hours and promotion by seniority rather than merit. The union's preference for arbitration rather than striking persisted although elements of the 'rank and file' were beginning to get restless. The first major industrial action on the railways took place in 1913 when 500 poorly paid employees at the Darling Harbour Yards walked off the job demanding a 9 shilling wage and a drop in weekly hours from 51 to 48.

There are several references in the Annual Reports to electric lighting being provided during this period beginning in 1924 when "*a scheme for more adequate lighting of the whole of the workshops [was] in hand*".⁴ In 1927, further electric lighting was being installed.

Soon after the outbreak of World War I, the Chief Commissioner announced that special provisions would be made for railway staff who enlisted. All permanent employees who had been called up or had volunteered for the Defence Forces were granted leave and were paid the difference between their wages and the military allowance. Their positions in the railways were kept open for them and their seniority was maintained.⁵ Enlistments from the 45,000 railway workforce totalled 8,500 men, 1,210 of whom lost their lives in service⁶.

During the war years carriages were converted at the Eveleigh Carriage Workshops for special wartime uses. Refer Section 3.5.3 *Carriage Conversions*. For example, a total of 25 suburban cars were converted into ambulance cars for “*the most comfortable conveyance of wounded troops*”. These carriages were fitted with tiered bunks, running water and first aid equipment.⁷

Special plants were also set up at Eveleigh for the manufacture of tools,⁸ which had previously been purchased outside the workshops, and munitions.⁹ It is not clear, however, if or where this work was undertaken on the Carriage Workshops side of the site.

During World War I, working conditions deteriorated as the railways strained to meet the demands of war. Revenue from freight haulage fell, labour was in short supply and management sought methods of containing costs and increasing productivity.¹⁰ Real wages declined, conditions continued to worsen and, in combination with the stresses brought about by the war, this led to localised strikes. At Eveleigh Workshops there were at least 8 strikes in the two years between July 1915 and July 1917.

In 1916, Acting Chief Commissioner James Fraser (see Figure 3.63) attempted to introduce schemes to measure individual workers' performances at the tramway and railway workshops. Fraser's ideas were influenced by American 'Scientific Management' principles and his aim was to get a “*proper, fair and right record of the work done and the exact cost of every article*”.¹¹ The unions, however, were not happy.

On 29th July 1917, Fraser introduced the card system at the Randwick Railway Workshops. Unimpressed with the new system and feeling the strain of war, 1100 men walked out and were followed almost immediately by 3000 from Eveleigh. The strike spread to Newcastle and Goulburn and to workers outside the industry.

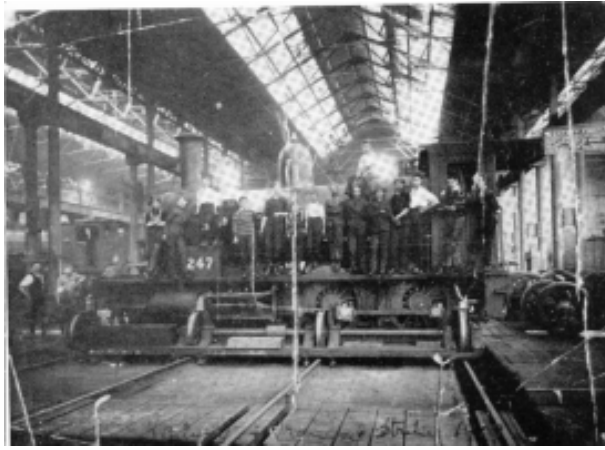


Figure 3.130: The strike was supported by workers on both sides of the railyards. In this photo, schoolboy "scabs" pose on a Loco on the traverser in the Locomotive Workshops. Source: Macmillan 1963: 89. See also figure 3.65.

Volunteers were able to keep the system running, however, and the strike eventually lost its momentum. The union leaders were arrested, the union was deregistered and the strikers returned to work on the Government's terms (which included the retention of the card system) on the 10th September. The strikers' seniority rights had however been disrupted with the promotion of those 'loyalists' who had not gone on strike and those who had returned from strike early. These resulting workplace divisions lasted for decades.

Outside the union structure, but coexisting with it, were the railway workshops shop committees, which were established at Eveleigh and Enfield in 1926. These committees waged campaigns for the improved working conditions which workers felt they deserved after the sacrifices of wartime. Their intention was to use arbitration with strike action employed only as a last resort.

c. 1927 to c. 1945

This period included the Great Depression and the Second World War, both periods of difficult working conditions at Eveleigh Carriageworks. Not surprisingly, there was much less development of the site during this period. Refer Section 3.1.9.

The *Great Depression* of the 1930s was the worst so far experienced in Australia. Between January 1929 and March 1930 there were 1600 retrenchments throughout the railways and wages were reduced by 8 1/3 %.¹² Some rail workers were subjected to arbitrary dismissal, severe pay cuts and sudden transfers.¹³

The 1930 Annual Report noted that additional pressure was being applied to the railways by the rise of motor car and lorry use. In the same year, Railway Commissioner W. J. Cleary introduced work rationing in order to cut wage bills and prevent dismissals. The rail workers' 44 hour week was repealed and a 48 hour week reinstated and federal award rates of pay were cut by 10%. Although it disapproved of these measures, the union had little choice but to accept the conditions. In mid-1934, work rationing finally ceased.¹⁴

Perhaps in an attempt to raise workers' spirits during the difficult times, the Australian Railway Union Cricket Association was formed in 1933 and the Eveleigh Workshops finished first in the inaugural competition. It is not known if any team members worked at the Carriage Workshops side of the site.¹⁵

The Annual Report for 1929 notes that a 'retiring' room for female staff had been provided at the Stores, suggesting that by this time women also worked in this branch. In 1931, lighting was again increased at the workshops, with 48 high candlepower lamps being installed in a further section of the Carriage and Wagon Shops.¹⁶

During the World War I there were serious staff shortages in the railways as 16,000 men had enlisted, 3,000 had been diverted to defence works and 500 executives had been 'loaned' to other Commonwealth and State Departments.¹⁷

While staff numbers decreased, passenger journeys increased. At the beginning of the war, approximately 186 million passengers were carried per year while at the end this figure had grown to 254 million. In addition, 1.8 million military personnel were carried and freight traffic increased from 14 to 17 million tonnes.

The large increase in the amount of transport work undertaken during the war was the result of the extra demands made on the system by industry and the defence authorities. In addition, the proportion of the State's transport work undertaken by the railways increased dramatically because of wartime restrictions placed upon the use of road and sea transport. The railways' satisfactory undertaking of this increased transport work was an important contribution to the country's war effort and the many special transport jobs carried out demonstrated the great flexibility of the department's organisation.¹⁸

A description of the railways during the war described them as “the backbone of land transport. They pump[ed] out troop trains, supply trains and Red Cross trains. Straining twenty-four hours a day, bedevilled by the border break-of-gauge, staff work[ed] around the clock” and rolling stock was “run into the ground”.¹⁹ Troop and supply movements around Australia imposed an enormous strain on railway services, and the Priority Pass system was established for ordinary civilians wanting to travel interstate.²⁰ Industrial plants were also mobilised for defence and the railway workshops produced such items as tanks, guns, shells, bombers and fighters.²¹ Some of this work was certainly undertaken at Eveleigh, but it is not clear where at the Carriage Workshops this work was carried out.

Public holidays were not granted to the workshops’ staff during the war and normal hours were from 7.30 am to 5.00 pm with a half-hour lunch break. Apprentices over 18, who did not usually work on Saturdays, began to do so from 7.30 am to midday to contribute to the war effort. One week’s annual leave had been standard up to this time but extra days of leave, one per year served, were earned for years of work during the war.²²

Women were employed in the workshops from at least 1900 and it is likely that more women were employed there during the World War I. During the Second World War, however, 1000 new female employees were brought into the railway system to overcome staff shortages and some worked as workshop labourers.²³ It is very likely that some of these worked at the Eveleigh Carriageworks. By 1944, the employment of women at Eveleigh was noted in the Annual Report, which also mentioned the considerable overtime being undertaken in the workshops, undoubtedly a result of wartime staff shortages.

Although working conditions were not ideal during World War II, the Union continued to represent members over personal matters but largely set aside its industrial struggles.²⁴ In 1941, conditions were improved in the sawmill and machine shop when better lighting was installed.²⁵ At the Carriage Workshops many railway vehicles were converted into special types required for defence traffic. Refer Section 3.5.3 *Carriage Conversions*.

Security at the Eveleigh Workshops was very strict during the war because of the value of the work being carried out there. Watchmen were stationed around the yards and on the gates. In addition, windows and roof lights were blackened and evacuation exercises were carried out in the air raid shelters.

The individual workshops erected boards showing who had

enlisted, and further boards were made later naming those workers killed in action. Some of these memorials were made at the Carriageworks and the Pattern Shop by Eveleigh signwriters.²⁶ A number of these boards are now located at Central Station.²⁷

During the war, the Department of Railways cooperated closely with the Radio Physics Laboratory and the National Standards Laboratory in the design and manufacture of radar equipment 'then a highly secret and valuable war job'.²⁸ In 1942, the erection of a building 'for scientific and industrial research' was noted in the Annual report.²⁹ It seems likely that this building was the '*Radar Annexe*', a large timber framed, corrugated ironclad shed (now demolished) which was erected on the Wilson Street boundary, adjacent to the Chief Mechanical Engineer's offices. This building appears to have been constructed during 1942 and the drawings were titled 'Proposed Workshops for Chief Electrical Engineer',³⁰ possibly to conceal their function for security reasons.

The building appears to have been altered at its southeastern corner to provide offices for Naval and Military Inspectors in early 1944.³¹ The '*Radar Annexe*' was purchased from Munitions in 1948.³² After the war the building was used as a trimming shed.

The Annual Report from 1943 notes that the railways were a 'protected undertaking' under National Security (Manpower) regulations from 3rd March 1943. The report also stated that working hours had been extended and leave restricted as well as listing the names of the 63 employees who had so far been killed. It was also during 1943 that concrete air-raid shelters were built.³³

During the war years, fund-raisers were held at the workshops and one day a month began to be set aside as the '*concert*' day, a tradition which continued until Mr Ken Heard's time in management at the Carriageworks. On the allotted day, a stage was set up in the sawmill and the lunch break extended to one hour rather than half an hour.

c. 1945 to the Closure of the Workshops

The end of the war unleashed potential competitors for the railways in the form of road and air transport. Cheap, redundant military trucks and planes became available and faster, more flexible services were developed to use them. Improved technology in motor transport meant that trucks could compete with trains for long distance haulage for the first time and in 1946, the commonwealth government owned airline, TAA, commenced operation.³⁴ Despite state government initiatives, railway business continued to be lost and disruptions to coal electricity supply because of industrial action also led to inefficiencies.

Normal passenger services increased again after the war but workers began to worry about the increased hours being imposed upon them. Holiday rosters were cancelled in some cases and it was commented that 'the tragic truth that present-day domestic economy is based on overtime working, without which the worker and his family would not be able to live'.³⁵

The post war years were characterised by staff shortages in the railways and between 1946 and 1948, solutions were constantly sought for the lack of new staff. Chief Staff Superintendent Reg Winsor reported to the staff conference in March 1946 that there had been an exodus of staff following the lifting of the Federal Government's 'manpower' regulations. 7960 of the railways' 56,558 employees had left in the six months beforehand. At the Railway Staff Conference in 1948, the officers again lamented the difficulty of attracting and retaining staff but pointed out that the Railways offered security.³⁶

Low pay and poor conditions were seen to be aggravating the shortage, and women were employed in some areas, such as carriage cleaning, to alleviate the situation.³⁷ A letter of 1947 discussed the request of women employed in the workshops wanting a radio.³⁸ Previously, the staff officers had supported the termination of women's services at the end of the war.³⁹

The first migrants to be employed by the railways also began to move into the system to fill vacancies in the seriously understaffed system. In January 1948 the railways turned to a new source of employees, the 'Balts', a nickname used to describe Polish and other European migrants or displaced persons before the term 'New Australian', began to be employed. By 1950, migrant employees numbered 4000 out of a railway system total of 60,000 employees. It is unclear how many migrants worked at Eveleigh, although Mark Hearn, in his book 'Working Lives', draws attention to several individuals who were employed there.



Figure 3.131: Safety sign from the Carriageworks in 1985. Source: Photographic Study, Eveleigh Carriage Workshops.

In 1948, the Commonwealth Arbitration Court approved the 40 hour week, which provided a standard five day week with overtime to be paid for weekend work. In 1948, the NSW Labor Government legislated for an extra week's leave for all New South Wales Government employees, including those in the Railways, so that they would be entitled to three weeks annual leave after two years' service.

During 1948 and 1949, plans were drawn up for some substantial conversions of the existing Stationery Store and General Store for sleeping accommodation for staff.⁴⁰ The small building to the south of the General Store, identified as a Mess Room c. 1937,⁴¹ was proposed to be converted and extended to form a meals area in mid 1948.⁴² It appears that the Stationery Store and General Store were to be used for male staff as a further building in the centre of the area was noted to be "*Female Staff Accommodation*".⁴³

At the same time, the old chemical laboratory adjacent was to be converted for the "*Submanager's Quarters*".⁴⁴ It is not known why this work was undertaken at this time although it seems likely that the provision of accommodation and improved conditions was intended to attract staff. The Annual Report for 1951, however, still noted that there was a 'severe' shortage of tradesmen and a backlog of maintenance which needed to be carried out.

In 1951, an amendment to the New South Wales Industrial Arbitration Act provided for long service leave of three months for those who had worked for 20 years or more for the Government. A week's sick leave a year was also included, previously this had only been a half-pay entitlement.

Further improvements to working conditions were made during 1953 when four separate new staff amenities blocks for washing and bathing were completed. They were located at the end of Bays 18 and 25 of the Carriage Workshops and at the southwestern corner of the Paint Shop and the southeastern corner of the Carriage Shop extension (now called the Cable Store).⁴⁵ The Annual Report for that year also notes that new meal facilities had been provided for staff. In 1962, washing facilities were provided in the sawmill and machine shop.⁴⁶



Figure 3.132: Various safety signs from the Carriage Workshops in 1985. Source: Photographic Study, Eveleigh Carriage Workshops.S



Figure 3.133: Flower Show at the Carriageworks at Eveleigh, probably in the Carriage Shop Extension (now called Cable Store). Undated. Source: ML Videodisk 'Home and Away', The Sam Hood Collection.



Figure 3.134: Art Show in the Paint Shop at the Eveleigh Carriageworks. Undated. Source: SRAO.

Joint leisure activities continued to be arranged at the workshops and although employees at the Stores, for example, were employed by a different branch, workers from these areas often joined in the workshops' leisure activities. Mr Heard recalls that each workshop had a nominated, paid picnic day and a picnic committee to organise it. To attend, staff had to buy a 'picnic ticket'. Flower shows and art shows were held at the Carriage Workshops and the staff provided entries.

At the Eveleigh Carriageworks in the 1970s, different trades had different unions and each union provided a representative for the combined unions committee.⁴⁷ This committee had regular meetings to discuss union concerns, which were most often involved with issues of safety and provision of amenities. Mr Ken Heard recalls that a safety officer made regular inspections of the shops, having been informed of problem areas by the union representatives.

Mr Heard has described the '*darg*' system, which was in place at Eveleigh Carriageworks during his time in management in the late 1970s. This system of restrictive work practices was instigated by the unions and aimed, through procedures limiting throughput, to preserve jobs and prevent work running out. One of the strongest unions involved in the '*darg*' was the Boilermakers' which could "*hold the place to ransom*".⁴⁸ After the closure of the Eveleigh Railway Yards in 1989, management claimed that unsuccessful negotiations over the removal of these restrictive practices had contributed to the decision to close the shops.

Evidently, by the early 1970s there were enough migrants working at the Carriage Workshops to justify the provision of English classes there. The classes were eventually started in about 1969, having been initiated by Louie Cavaliere at the Eveleigh Foundry on the other side of the main lines. By 1990, language classes within the Railways catered for 3000 people annually and management acknowledged that the better skills resulted in fewer job related accidents and disruptions to railway schedules.

When the Eveleigh Workshops began to close in the late 1980s, staff began to be relocated to other positions in the rail system. In '*Working Lives*', Heard notes that "*unfortunately, the majority of workers [were] migrant workers and they couldn't pass the test to be a station assistant*". These workers were subsequently forced to take up labouring or lower grade positions such as car cleaners and some chose instead to retire or resign.⁴⁹

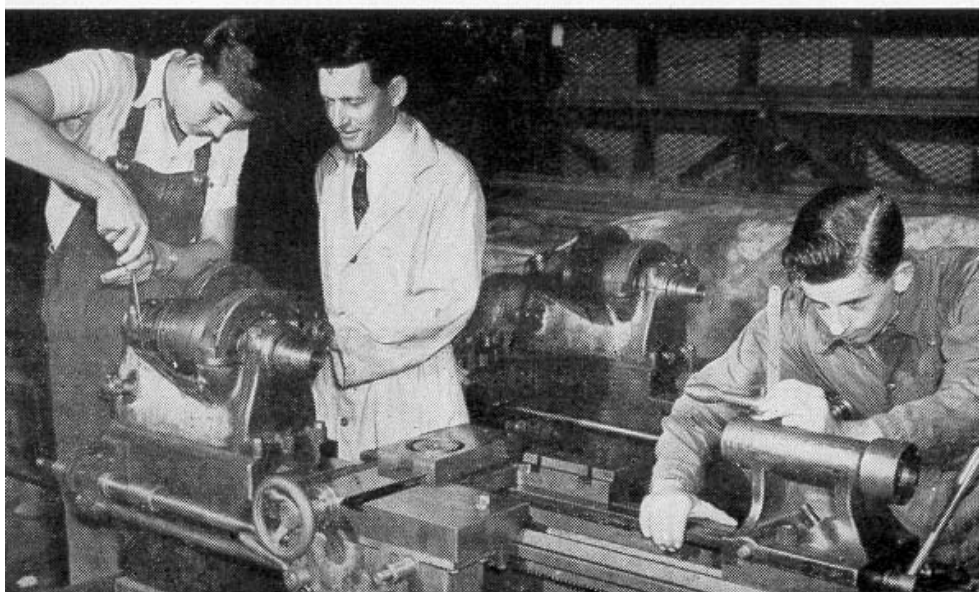
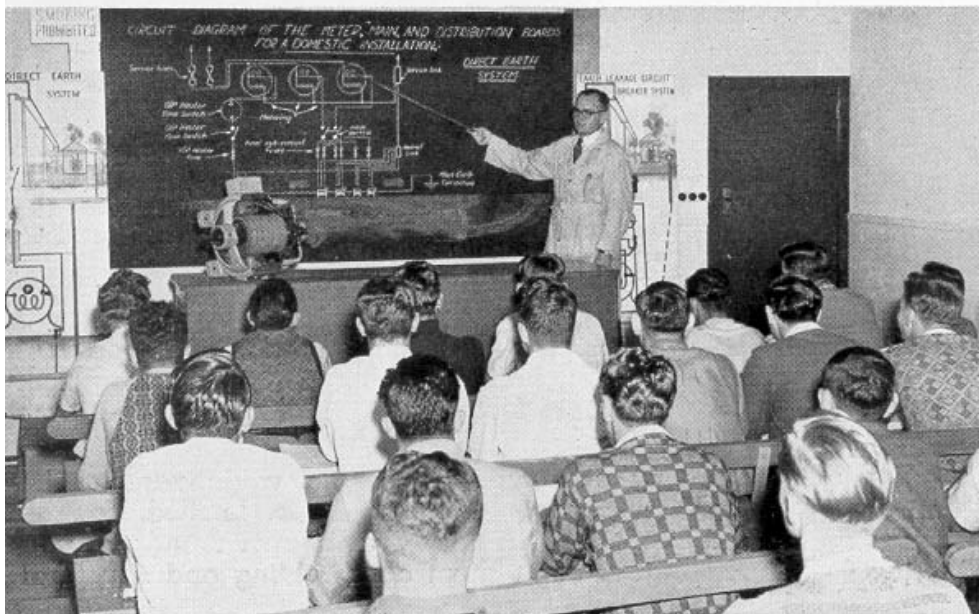
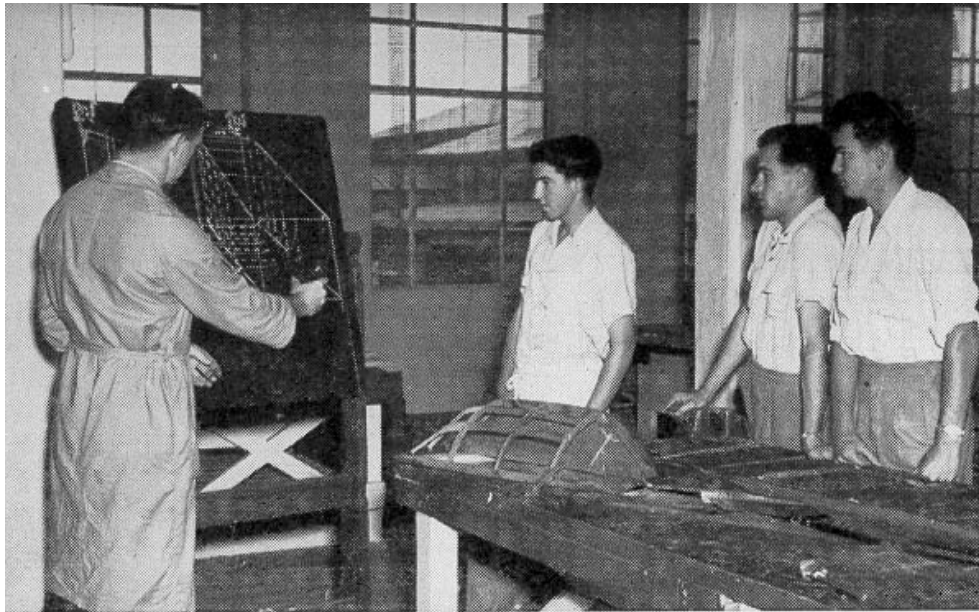


Figure 3.135: Three views of apprentices under instruction in 1955. Source: *The Railways of New South Wales 1855-1955*, p. 259.



Figure 3.136: Apprentices at work in Bay 22 of the Carriage Workshops. Undated. Source: SRAO

3.6.2 APPRENTICESHIPS AND TRADES

Traditionally, there were four different ways of gaining formal qualifications in order to enter railway service. These were:

- a) *As a graduate.* From the late 1940s, graduates could be offered cadetships, for example as a graduate engineer. Many graduates eventually became senior managers, senior engineers or heads of branches.
- b) *By studying for a diploma.* Similarly to above, top level apprentices often commenced studying for a diploma and completed their studies at Technical College after the completion of their apprenticeships. This was also a path to top management.
- c) *As a clerk.* Clerical staff often had a better knowledge of mathematics and English than the average employee and had as good a chance of promotion as any other railway employees. From the 1890s, clerks were able to study accountancy and other subjects relevant to railway operation at the Railway Institute.
- d) *As an apprentice.* Dating from the mid 19th century, the traditional way of entering the railway service was at the trade level.

The vast majority of workshops employees were tradesmen who had undertaken apprenticeships in the railways.

Apprenticeships¹

Individuals were apprenticed not just to the railways but to a particular trade and from their first day were allocated to a particular tradesman. Generally, each tradesman was allocated one apprentice. In some cases, for example in the Machine Shop, there could be more than one apprentice per tradesman. Railway apprenticeships were initially 5 years long but they were reduced to 4 years duration during World War II.

Apprentices worked in various locations so they could experience the railway service as well as learning their trades. Mr Ken Heard, for example, started his apprenticeship as a fitter and turner during the Second World War at the Eveleigh Locomotive Workshops. He then moved to both the Chullora and Clyde workshops and the Mechanical Branch drawing office before completing his training in the Water Service. Spending time in the drawing office was a useful step for an apprentice who wished eventually to be promoted beyond tradesman level, as the ability to read drawings was a valuable extra skill.

During the 1940s, apprentices spent their first week of training at the Railway Institute in Strathfield learning such basic skills as tool identification. They then commenced their practical training in the workshops. In addition to this, apprentices attended Technical Colleges and undertook trade certificate exams.

Until 1945, all notes and sketches had to be made by hand and apprentices' workbooks were marked on their correctness, including their correctness of grammar. Safety training was considered to be extremely important and was incorporated throughout the apprenticeship period.

Once an apprentice had "*done his time*", he became a tradesman and was given his own apprentice or apprentices to train. In addition, he would often be assigned one or two labourers who would assist in the workshops but were not studying to become tradesmen.

A tradesman's aim was often to proceed through the hierarchy, becoming a '*leading*' hand, a sub-foreman and then a foreman. Initially, this progression was determined by seniority. In later years, however, extra training, exams and the self-motivation to learn more than just the basic job were required for promotion to be granted. Dependant on their skills and overall knowledge, tradesmen could progress to middle management. As they rose in responsibility, their skills in employee relations also became important.

Railway apprentices' training and study equipped them to work generally in industry, not just to complete a specific range of tasks. As a result, they were valuable as employees and were also able to find jobs outside the railways.

In 1955, 500 apprentices were being appointed per year in the Sydney, Newcastle and country centres² and they received both practical and technical training. The technical training was run by the Department of Technical Education in technical colleges, at the Railway Institute and at the Railway School in Homebush. The latter provided practical and theoretical training for apprentice boilermakers, blacksmiths, car and wagon builders, fitters and machinists, electrical fitters and mechanics and signal electricians. Classes were often conducted during working hours and apprentices were paid for attending them.

At the time of writing this report the number of apprenticeships have dwindled, while the number of traineeships have increased. The difference between the two types of training is that employment is not guaranteed at the end of an apprenticeship while an individual undertaking a traineeship is employed by the State Rail Authority regardless of whether he or she completes the course.³

Trades Working at the Eveleigh Carriage Workshops

There were many different trades employed at the Carriage Workshops at Eveleigh. Below are brief summaries describing the different trades and where they worked within the workshops.

Car Builders

The 'top' trade at the workshops. A car builder thought himself equal in skill to a cabinet maker and to any other trade in the service and considered himself to be 'above' a carpenter. Car builders' work was highly visible to passengers both inside and outside a carriage.

Carpenters

Other woodworkers who were not involved in fine detailed or quality work on carriages.

Wood Machinists

Worked the machines in the sawmill and ran timber through the variety of machines and wood lathes to create the multitude of shapes which made up a carriage body.

Painters

Much of the painters' work at the Carriage Workshops involved painting woodwork. Painters considered themselves to be 'elite' and equal to the car builders because they were a 'clean' trade.

Metal Trades

Were also known as '*black trades*' because of the dirt involved in handling iron and steel. These include:

Fitters

Fitters dismantled metal parts, checked them and reassembled them. Fitters also supervised other metal trades and they had the final say in the method of assembly of parts.

Turners

Were similar to fitters, but specialised in lathe and fine machine work. Turners made parts which varied from fine screws or bolts to major components such as crank shafts for diesel engines. Their trade was very important because a small mistake on a major component could cause either damage which was expensive to repair or a fault which led to an accident.

Machinists

Came from the same background as fitters and turners, but specialised in particular types of machine work, such as milling, planing and grinding.

Boilermakers

Boilermaking was seen as the dirtiest of the trades and the conditions in the workshop were noisy and at times uncomfortable. Boilermakers made not just steam locomotive high-pressure boilers but also pressure vessels for air brakes and water supply. Boilermakers were also expert riveters and they assembled and repaired steel underframes and, later, steel carriage bodies. Skill in the area was vital as boilermakers' work had to be able to withstand high pressures.

Blacksmiths

A similar trade to boilermaking but blacksmiths specialised in making items of iron or steel rather than brass. Blacksmiths worked the steam hammers and other machines in the blacksmiths' shed at the carriage works.

Tinsmiths

Handled sheet metal as distinct from parts made of castings from heavy steel sheets or blooms. In later years, their work on carriages involved sheeting in stainless steel.

Car and Wagon Examiner

This position could be filled by almost any of the trades above, so long as the tradesman had an overall knowledge of the whole of a carriage and its parts and how they worked. Although an examiner might not have known how to fix a problem, he found it and recorded it for repair. These examiners were very knowledgeable in brakes, wheel wear, overall bogie condition, couplings and the equipment which was hung under a carriage and might break loose and cause an accident. Much of the examiners' knowledge would come from experience after learning the appropriate trade.

Gas-Fitters

Fitted gas pipes for lighting, and later heating, to carriages. Their work had to meet quite stringent standards due to the fact that the gases used on trains were invariably flammable. Standards for assembly were therefore very high.

Plumbers

Could come from any of the 'higher' metal trades but were seen as a little lower down the scale than the above trades. Carriages had water and compressed air-brake pipes which needed plumbing skills to keep them in repair. Experience in pressure vessels was essential for railway work in both brakes and water supply.

Crane Drivers

Crane driving was sometimes an unpleasant job as it involved being above the floor and at the beck and call of everybody on the shop floor. Crane drivers had to be experienced as one mistake could quite easily lead to the destruction of a wooden carriage body. When a crane driver was away from the box, the workshop had no way to perform lift work, and the workshop had to cease operation for a time.

Trimmers

The people who made and repaired the upholstery in carriages. Items they made included headrests, squabs (seat backs), cushions, arm rests and sleeping cars' beds and curtains.

Electricians

Electricians had to be good at mathematics and as a consequence were often good at a lot of other things. A separate trade known as an '*electrical fitter*' worked on complicated electric trains which were introduced in the 1920s. All carriages were fitted with electric lights from 1921-27.

Who worked where?

Main Workshops

Car builders, plumbers, fitters, gas fitters and crane drivers as well as foreman and supervisors drawn from all of these trades.

Paint Shop

Painters and their assistants and some car builders.

Yard

Examiners and car builders.

Blacksmiths' Shop

All the metal trades but particularly blacksmiths, boilermakers and fitters.

Stores

Clerks and labourers and possibly some tradesmen.

Spring Shed

Manufacturing of springs would mostly have been done across the lines in the Locomotive shops and the springs brought over for fitting in bogies.

Timber, Oil and Other Stores

Storemen, clerks and labourers.

Advertising

Carpenters and labourers

Potash

Tradesmen and labourers

Machine Shop

Wood turners, fitters and machinists

Interlocking Store

Fitters, turners and others who specialised in signalling equipment. Later, electricians also.

Train Lighting

Electricians and electrical fitters.

Telegraph Shop

Electricians and electrical fitters.

By 1912, the number of engineers, draftsmen, tradesmen and assistants employed at Eveleigh Workshops totalled 3270.⁴

3.7 COMPARATIVE ANALYSIS

3.7.1 BACKGROUND TO INDUSTRIAL AND RAILWAY BUILDINGS

Although iron was used in the construction of buildings in the Greek and Roman Empires, it was not in large-scale structural use until the Industrial Revolution. During the nineteenth century, engineers developed a good understanding of the material and designed structures in which the use of exposed iron was acceptable.

Initially, buildings of the Industrial Revolution were constructed of load bearing brickwork. At the beginning of the nineteenth century, however, the coming of the “iron age” and the need for free floor space combined to make the use of cast iron pillars for internal supports more common. External walls were still commonly of masonry and roof lighting was used. The use of large span roofs, first in wood and then in iron, developed from the railways requirements. Banister Fletcher¹ attributes the technical advances in the use of iron to the early railway engineers and mentions, amongst others, Robert Stephenson and Brunel, both of whom were known to Whitton and Cowdery. Refer Section 3.1.11 Associations.

“... Engineers who built the iron locomotives and rolling stock designed also the road beds, the locomotive shelters, the repairs shops and the passenger halls”² and this led to the transfer of technology from engineered railway structures to buildings, particularly as these new types of buildings had no precedents. Cast iron was combined with wrought iron to accommodate tension stresses as wrought iron performs better than cast iron in tension. The great era for iron construction was the mid-Victorian period which culminated in structures in London such as the Paddington Station building (1852-54) by Brunel and Wyatt and the huge single arc of St. Pancras Station (1867) designed by Barlow.

IRON AND STEEL

Cast and wrought iron are difficult materials. Early use of iron in building was predominantly cast iron. The use of wrought iron in building developed when new processes were discovered for producing it economically. Cast iron contains about 3.0 - 5.0% carbon (and is more resistant to rust) and wrought iron contains about 0.02 - 1.0% carbon. The removal of carbon gives wrought iron its strength in tension and makes it easier to shape. In comparison cast iron has high compressive strength but is brittle. Wrought iron's malleability enabled it to be rolled into plates and rods and later other shapes that could be riveted. From 1830 to 1850 many efforts were made to combine cast and wrought iron to exploit the characteristics of both materials.

Processes for the manufacture of steel were not developed until the late 19th century, steel was not generally available until the 1890s and was not produced in Australia until 1915. Steel is produced by heating iron to high temperatures and adding carbon (up to 2%) in a controlled process. Steel supplanted wrought iron because it cast, rolled or forged and could be welded and was more economically made in a mass production process.

The development of the stationary steam engine and the rope driven crane, along with iron construction technology, led to the development of an international construction idiom for heavy industrial workshops. The use of gantry cranes required long bays. Double columns were used to support crane rails with single columns above to support the roof. Iron columns increased floor space while iron trusses allowed wide bays which could be created side by side. Top lighting was used to admit light to the large workshops thus created. This format was common in railway workshops but also in a range of other workshops, for example those for the manufacture of ships and large engines.⁴ Later, developments of the idiom (from 1900 to 1910 in Australia) saw the use of riveted steel plate members replacing cast iron. These were eventually supplanted, for smaller members at least, by rolled steel sections. At around the same time, power sources were changed from steam to electricity.

Railway station halls developed differently from railway workshops. As the railways prospered and expanded, stations had to be enlarged to meet the growing crowds. Halls therefore spread horizontally to cover more and more tracks and the engineers attempted to design systems with as few columns and as wide spans as possible. Their designs took on a unique spaciousness which had not been known since Roman times, and a lightness through the use of iron which had never before been structurally possible.⁵

Railway workshops did not generally use the wide spans that the new iron technology made possible because at least some of their bays had to be narrow to provide columns which supported travelling cranes. The bay layout also suited the division of the space into units reflecting works divisions. The English models, essentially generated by needs and contemporary technology, were repeated and developed throughout England and in other countries. Australia followed British precedents which are illustrated by the small two-bay wide sheds in the Redfern Railway Yards (refer Section 3.1.4 *Early Development of the New South Wales Rail System*) and the bigger, ten-bay version at Eveleigh Carriage and Wagon Workshops.

The authors of *'Railway Architecture'* estimated there were in excess of 4,000 'engine sheds' built in Great Britain in the 19th and 20th centuries. The use of the term 'engine sheds' overlaps with the term 'workshop'. The term 'sheds' refers specifically to sheds where engines were maintained but was also used generally to apply to entire railway workshop complexes.



Figure 3.137: Interior of St. Pancras Station, London, a spacious hall made possible by the use of new iron technology. Source: Kate Mountstephens, 1998.



Figure 3.138: Interior of the Erecting Shop at Bow Locomotive Works in 1898. The 'Craven' crane is similar to those in the Eveleigh Carriage Works main building. In railway workshops, bay width, and therefore roof span, was limited by the need to support the crane. Source: 'An Illustrated History of British Railways' Workshops' p 31.

Some early sheds in the United Kingdom were roundhouses with a turntable in the centre, but these were expensive to build and were soon replaced in the UK by straight sheds with bays. The design of sheds was often the responsibility of the Chief Mechanical Engineer and various railway companies developed their own standardised design, which was then repeated. The development of these buildings paralleled railway expansion and the industrial era, with its accompanying iron and steel technology that came to many countries with the railways. In many countries, railway workshops were amongst the first and largest heavy engineering developments.

Conventional stylistic features were used in nineteenth century engineering structures and their development paralleled the development of stylistic features in architecture generally. Thus, as architects applied and adapted classical or other themes, so did engineers. Industrial buildings were designed to conform to nineteenth century taste and thus often retained masonry external walls.

Another structural type which utilised the possibilities of iron was the greenhouse which required large span, open buildings. This type developed in England and in Europe in the 1830s and 1840s. Cast iron was advantageous for these structures as it was easily produced in curved pieces so curved glass surfaces could be created.⁶



Figure 3.139: Northern elevation of the Eveleigh Carriage Workshops, 1998. The building is typical of Victorian industrial buildings and demonstrates masonry exteriors designed to conform to nineteenth century taste. Source: Jean Rice

Exhibition buildings and exposition halls were another type where the use of iron was particularly suited and was aesthetically acceptable - particularly when the products displayed included machinery. Market buildings of various sorts also exploited iron structurally. London's Convent Garden Fruit Market of 1826 as well as many late nineteenth century examples in France are examples. In the late 1800s, iron was also applied to department stores such as Bon Marché in Paris which dates from the 1870s.

In Australia, surviving examples of these types of buildings include a green house in the Adelaide Botanic Gardens, railway workshops such as Eveleigh and railway halls such as Sydney Terminal (Central Station). The large exhibition buildings in Australia, such as the Garden Palace in Sydney and the Melbourne Exhibition Building, tended to be timber and iron examples are not known. Iron market buildings were, however, built and examples include the now demolished Darling Harbour Meat Market and the George Street Markets (now the site of the Queen Victoria Building) in Sydney.

Examples in other states are not known but may exist. By the time department stores came to be built in Australia the 'Iron Age' was ending and they tended to be built of steel and/or concrete. The Mark Foy's building in Sydney was modelled on Bon Marché, Paris, but used an innovative concrete structure. The Dowling Street Tram Depot of 1908 was a late cast iron columned structure designed by George Cowdery's son but this has been demolished. The Macleay Museum at Sydney University utilises cast iron structurally and as box gutters – all within Gothic Revival style stone walls.

In the period 1900-1910 the structural use of cast and wrought iron was overtaken by the use of riveted steel construction and then by rolled steel construction. Subsequently, cast and wrought iron were mostly used for decorative elements such as balustrading, gates and ventilators.



Figure 3.140: George Street Markets, 1870, was an example of another type of iron building in Australia. It was replaced by the QVB. Source: Sharkey Collection 776, PWD.



Figure 3.141: Meat Markets, Darling Harbour. Interior view. The photograph shows round cast iron columns, wrought iron trusses and iron roofs. Source: Sharkey Collection, PWD.

3.7.2 BACKGROUND TO NATIONAL AND INTERNATIONAL COMPARISONS

Throughout the late nineteenth and early twentieth centuries steam railways developed throughout the world. No definitive worldwide study has been carried out and the brief comments that follow are based on published sources and on the personal experiences of the authors of this report and others consulted.

The railways in Australia are based strongly on the English precedents both because of Australia's origins as a British colony and the leading role taken by Britain in the development of railways. New South Wales' original rolling stock and rails were all imported from England and it was not until much later that American vehicles started to be imported or used as models. *Refer Section 3.5.1 Carriage Types and History.*

One of the unusual features of the Australian Railways is that from soon after their construction they were government owned and run and all the major developments were initiated by the government. In Britain and in the United States, the early railways were run by a multitude of small private companies. In Britain, the railways only became government owned in 1948.

The early engineers and managers on the New South Wales railways were trained, and gained their initial experience, in the British system. It was often not until this century that senior positions came to be held by Australian born and trained staff. The leading early role played by the British railways also led to strong influences over the development of railways in the rest of the world, especially in other British colonies. The influence of the British railways on Australian systems can be seen in the use of English names for Workshops such as Newport (in Melbourne) and Midland (in Perth). In Sydney, the suburb of Darlington, adjacent to the Eveleigh Railyards, was named after the destination of the first British railway.

This analysis concentrates on British comparisons because of the importance of their influence but also because of the limited information which was able to be gained on railway workshops elsewhere in the world. Though there is considerable information on railway lines, trains and grand railway buildings there is little published material on railway workshops.

The first railways ran with wooden wheels and track in the sixteenth century in mines in Central Europe. Power for these early systems would have been provided by people or horses. Mining railways were introduced into England from Germany.

Iron rails first appeared at Coalbrookdale, England in 1767 but it was not until the 19th century that the great railway systems developed.¹ The dates of opening of some steam railways around the world are listed below.

1825	Stockton to Darlington, England
1830	Liverpool to Manchester, England
1831	South Carolina Railroad, USA
1834	Dublin to Kingstown, Ireland
1835	Brussels to Malines, Belgian (Government run as part of a national system, the first in the world to be designed as such)
1835	The Ludwigsbahn, Nuremburg to Furth, Germany,
1836	Champlain and St. Lawrence Railroad, Canada
	Quebec to St. John
1837	St. Petersburg to Tsarskoye Selo & Pavlovsk, Russia
1838	Vienna to Florisdorf, Austria
1839	Amsterdam to Haarlem, Netherlands
1839	Naples to Portici, Italy
1844	Basle to St. Louis, Switzerland
1844	St. Etienne to Andrezieux, France
1846	Pest to Vacz, Hungary
1847	Copenhagen-Roskilde Railway, Denmark, (Altona-Kiel opened 1844, annexed by Prussia)
1848	Barcelona to Mataro, Spain
1851	Chile, the first in South America
1853	Bombay to Thana, India
1854	Brazil
1854	Oslo to Eidsvoll, Norway
1854	Flinders Street to Port Melbourne, Victoria, Australia
1855	Sydney to Parramatta, NSW, Australia
1856	Gothenburg to Jonsered, Sweden
1857	Parque to Floresta, Argentina
1857	First steel rail (previously iron)
1859	First Pullman sleeping car in USA.
1860	Durban to the Point, South Africa
1863	First underground, London, England
1863	Christchurch to Ferrymead, New Zealand
1869	Bucharest to Giurgiu, Roumania
1872	Yokohama-Shinagawa, Japan
1874	Pullman cars introduced to England
1876	Shanghai to Woosung, China
1881	First public electric railway in the world, Berlin
1884	Belgrade to Nish, Serbia
1931	Turkestan to Siberia, Russia
1948	Nationalisation of the British Railways

Most of the world's major railway systems were established in the mid nineteenth century. Countries with similar size rail networks to Australia, in terms of length of rail line, include Argentina, Brazil, China, France, Germany, Great Britain, Japan, Mexico, Poland, and South Africa. The Indian and Canadian networks are twice the size of Australia's, while the former USSR has a network four times the size of Australia's, and the United States a network ten times its size and the largest in the world by far.

There are still operating steam railways in India, China and South America which must have operating workshops. Little is known about these nor those in Eastern European countries or Russia which also must have had similar facilities. A published example in Pakistan, the erecting shop of a locomotive works at Moghulpura, uses riveted plate construction, a later form of construction than the buildings at Eveleigh.



Figure 3.142: The erecting shop of the Locomotive Works at Moghulpura. This photograph is undated but was taken before Independence in 1947, when the works belonged to the North Western Railway. They became part of the Pakistan Western Railway on formation of Pakistan. Source: 'Encyclopedia of Railways' p 78.

3.7.3 NORTH AMERICAN AND EUROPEAN RAILWAY WORKSHOPS

The following notes are taken from the 1914-1915 New South Wales Public Works Department Annual Report: 'Report on Locomotive Manufactories and Locomotive Repairing Establishments' prepared by A.D.J. Forster, Designing Engineer of the Metropolitan Railway Construction Branch. Forster's report is based on an extensive visit to railway workshops and concentrated on locomotive workshops although it also included plans of many other workshops around the world. It is not known which of these workshops still exist today.

Comments are made on the layout of works including whether rails are transverse or longitudinal in the workshops. At Eveleigh Carriage Workshops, the Paint Shop has longitudinal rails and the Carriage Shop has predominately transverse rails.

This comparison summarises Forster's report but is not supplemented with modern information about these works. Forster's comments are particularly directed as to whether repair works should be concentrated at one large site and whether rail layouts are transverse or longitudinal. Presumably these were important issues in the NSW system in 1914/15 in view of the development of the Chullora and Elcar sites in the early 1920s. The American works were all 20th century and the buildings quite different in cross section with much flatter roofs.

NORTH AMERICAN WORKSHOPS

The following notes on American Locomotive workshops are taken from the Forster report. Although the works discussed were not built for carriage and wagon work, it is worthwhile examining their form and layout to compare with the Eveleigh Carriageworks. It is not known how many of the following Works are still in operation or existence although recent comments of experts in the United States suggest that they are not.

As a preface to his comments on the American railway works, Forster explains that his selection of works has been based on those which were "comparatively new, and have been carefully designed to take care of the repairs arising from a definite number of ... locomotives, and to provide for a definite limited extension. The case is quite different with British repairing works, most of which have been reorganised from time to time to the detriment of the overall efficiency of the works".



Figure 3.143: The Eveleigh Carriage and Wagon Workshops building, top, has transverse rails which run across the structural bays while the Paint Shop, bottom, has longitudinally arranged rails and pits which run parallel to the structural bays. Source: SRAO Drawing EW7

BATTLE CREEK LOCOMOTIVE WORKS, 1909

These works comprised a main building which housed both the erecting and machine shops as well as several other buildings, all of which were served by a shared crane. The erecting shop had transverse pits but, instead of using a traverser as at Eveleigh Carriageworks, locomotives were transported to the appropriate track by an overhead crane.

BEECH GROVE CAR AND LOCOMOTIVE WORKS, 'BIG FOUR' SYSTEM 1909/10

In this example, the individual shops had transverse pits and an external traverser was fitted between the coach and paint shops to serve them both (similar to Traverser No. 1 at Eveleigh). A rail line and an external overhead travelling crane link the shops and traverser. The structure was of steel and had slate roofs. Forster described Beech Grove as a "splendid example".

BILLERICA LOCOMOTIVE AND CAR SHOPS, BOSTON AND MAINE RAILROAD 1914

These works occupied 100 acres. They were described as 'particularly well laid out' and included an 80 foot traverser between the carriage and paint shops and a built-in scaffolding system in the paint shop (similar system also in Springfield). There are fans of rails adjacent to both the carriage and paint shops. In the locomotive area the provision of scrap bins and of an overhead travelling crane controlled from the ground was noted.

LOCOMOTIVE WORKS FOR THE CHICAGO, ROCK ISLAND AND PACIFIC RAILWAY, EAST MOLINE, ILLINOIS, 1903

This site covered 700 acres and maintained 800 locomotives. The pits were laid out in a herringbone arrangement rather than longitudinally or transversely. Locomotives were conveyed within the shop by overhead cranes rather than by a traverser.

LOCOMOTIVE, CAR AND WAGON (REPAIR) SHOPS FOR THE LAKE SHORE AND MICHIGAN SOUTHERN RAIL, COLLINGWOOD, OHIO, 1902

The car paint shop, car repairs and freight car repair shops were built parallel to each other and had transverser rails. They were served by 'transfer tables' (traversers) laid out between them. These transfer tables were linked to lines in the coach yard, at one end of which was a fan of rails.

LOCOMOTIVE, CARRIAGE AND WAGON SHOPS, LOUISVILLE & NASHVILLE RAILWAY, 1905/06

The site was adjacent to the main line and the workshops were laid out on either side of an external 'transfer table' (traverser). As at Beech Grove, the works had a common store yard with an overhead crane.

LOCOMOTIVE WORKS, READING, PHILADELPHIA, 1902

These works had transverse erecting pits. Their construction allowed the closure of various older, smaller works.

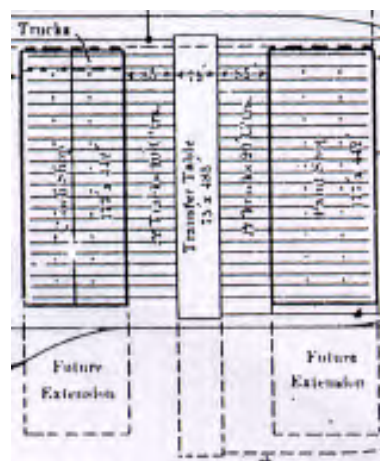


Figure 3.144: The Coach (Carriage) and Paint Shops at Beech Grove were connected and served by an external traverser. Source: 'Report on Locomotive Manufactories and Locomotive Repairing Establishments' Fig 24a.

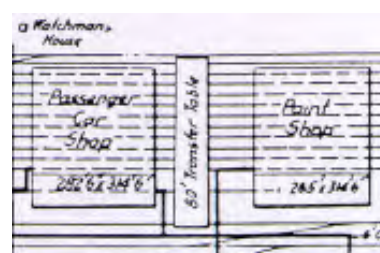


Figure 3.145: Detail of plan of the passenger car shop and paint shop at Billerica. Note the external traverser, similar to Eveleigh. Source: 'Report on Locomotive Manufactories and Locomotive Repairing Establishments' Fig. 37.

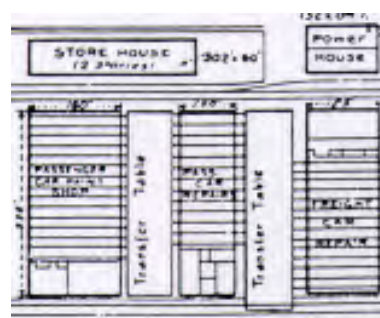


Figure 3.146: Diagram Plan of the Passenger and Freight Car (Carriage and Wagon) shops at Collingwood. External traversers serve the workshops in an arrangement similar to that at the Eveleigh Carriage Workshops. Source: 'Report on Locomotive Manufactories and Locomotive Repairing Establishments' Fig. 31.

LOCOMOTIVE REPAIR SHOPS, SAYRE, PHILADELPHIA, 1904

Forster commented that these were 'one of the best and largest locomotive repair shops in the United States of America'. The works occupied about 100 acres and had a similar layout in the carriage and wagon area to Collingwood and Billerica. Again, the pits were arranged transversely. The elevations provided in the report suggest that the exteriors of these shops were masonry and the interior structures of steel.



Figure 3.147: Elevation of the Main Locomotive Shop, Lehigh Valley Railroad, Sayre, Pa. Source: 'Report on Locomotive Manufactories and Locomotive Repairing Establishments' Fig. 34.

LOCOMOTIVE AND CAR SHOPS, WINNIPEG, MANITOBA, CANADA, 1910

These works are laid out on either side of an external overhead travelling crane runway, which also has a rail line along the centre. At the other ends of the buildings, which are perpendicular to the runway, are fans of rail lines, which presumably link to the main lines. The rails are arranged longitudinally within the shops. From the drawing provided in Forster's report, it appears that the shops themselves are similar to Eveleigh Carriageworks in that they have masonry exteriors and steel structures.

THE MONTREAL LOCOMOTIVE CO.

Forster commented that the arrangement of the works follows American practice very closely. The shops were arranged in bays which were served by overhead cranes, rather than traversers and rails were arranged longitudinally.

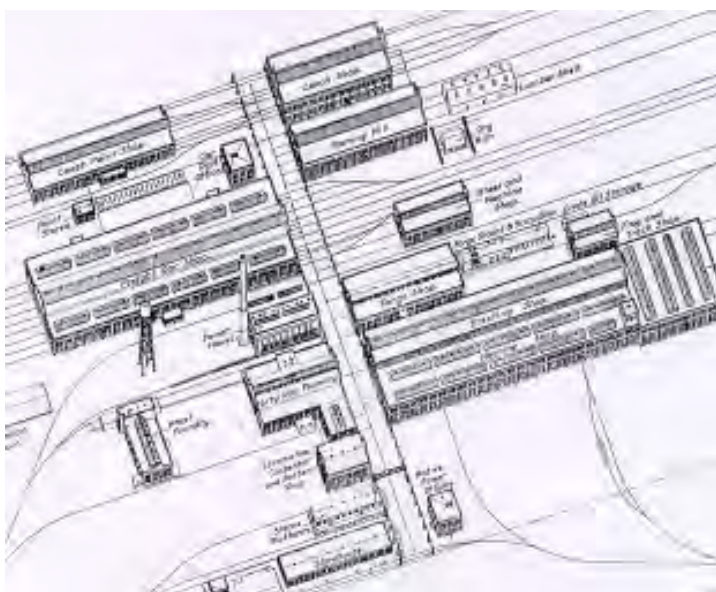


Figure 3.149: View of the Winnipeg Works. The Coach (Carriage) Shop and Paint Shop are at the top of the drawing. Their rails are arranged longitudinally. Source: 'Report on Locomotive Manufactories and Locomotive Repairing Establishments' Fig. 35.

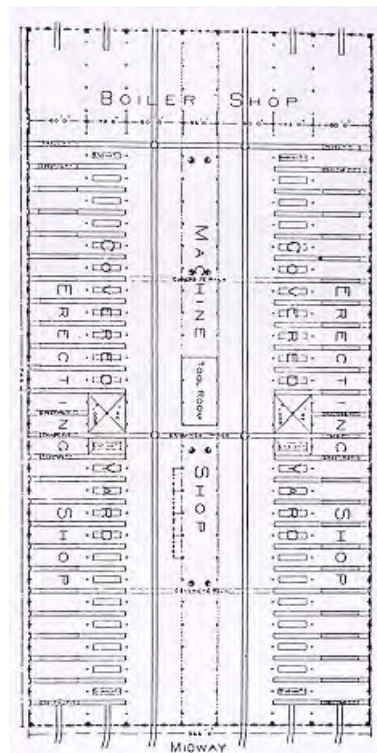


Figure 3.148: Plan of Main Locomotive Shop, Sayre, Pa. Note the transverse pits similar to those at Eveleigh. Source: 'Report on Locomotive Manufactories and Locomotive Repairing Establishments' Fig. 33.

In addition to these North American examples, a 1906 photograph shows the turntable and sheds at Salida on the narrow gauge Denver and Rio Grande railroad in 1906.¹ With their masonry walls, repeating gables and hinged timber doors, these sheds share some of the characteristics of the Eveleigh Carriage Workshop and Paint Shop but are much smaller.

A 1911 photograph of the running sheds and workshops at Paraiso, taken in about 1911, shows the timber sheds used by the Panama Canal Railroad.² Although these sheds appear to have been of a timber structure with iron cladding, the repetitive gable form is similar to the Eveleigh Carriage Workshop building.



Figure 3.150: Turntable and Workshops at Salida on the Denver and Rio Grande Railroad, 1906. Source: 'Railways Then and Now' p 101.



Figure 3.151: The Running Sheds and Workshops at Paraiso on the Panama Canal Railroad, c. 1911. Source: 'Railways Then and Now' p 151.

EUROPEAN WORKSHOPS

Again, these notes are taken from Forster's 'Report on Locomotive Manufactories and Locomotive Repairing Establishments'.

BORSIG'S LOCOMOTIVE (CONSTRUCTION) WORKS, BERLIN (TEGEL)

The third largest continental locomotive factory at the time. Each department was in an entirely different shop, an arrangement which 'could not be commended' as it led to sidings being congested. The erecting shop had central internal traversers with transverse pits.

KASSEL, LOCOMOTIVE AND VEHICLE CONSTRUCTION

From steel making to fabrication, the largest and best-organised works in Europe. A section of the building shows flat trusses, steel construction and brick external walls.

COMPARISON

The American works noted tend to use more transverse than longitudinal pits, particularly in association with the use of external overhead travelling crane runways. This may be related to the later dates of these works when compared to the British examples, to advances in technology or this may be a particular feature of American systems. There is insufficient information to draw conclusions about the European works.

In their report on the Newport Railway Workshops, Carl and Margaret Doring note that "The Curator of Mechanical Engineering at the Smithsonian Institute and the Director of the Historic American Buildings Survey/Historic American Engineering Record could think of only two remotely comparable workshops [to Newport and Eveleigh] in the United States. One is a much smaller but fairly intact workshops for a small private narrow-gauge railroad. The other is a large workshops which had been stripped of all machinery, and which [was then] being restored and re-equipped at great expense for museum purposes".³

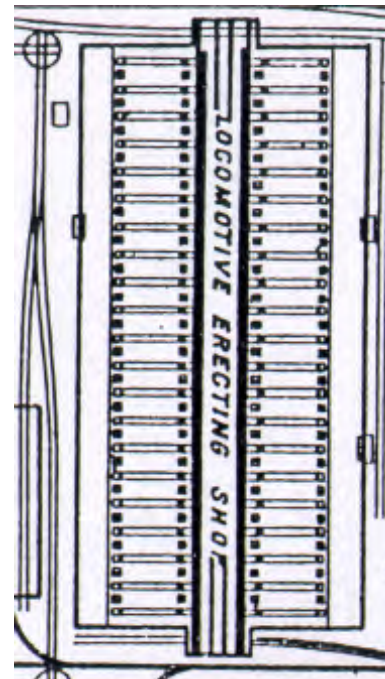


Figure 3.152 : Detail of plan of the Locomotive Erecting Shop at Tegel, Berlin, in about 1914. Note the transversely arranged pits and the central traverser, similar to the Eveleigh Carriage Workshops. Source: 'Report on Locomotive Manufactories and Locomotive Repairing Establishments' Fig 12.

3.7.4 BRITISH RAILWAY WORKSHOPS

The first ever steam train to run on a public railway ran in England in 1825 and by 1923 there were 120 independent railway companies in Britain.

The technology of railways and the engines, carriages and rails themselves were exported all over the world, particularly to the British Empire. British railway engineers also worked all over the world designing railway systems.

In 1923 the 120 British companies were amalgamated into four, the Great Western Railway, the London, Midland and Scottish Railway, the London and North Eastern Railway and the Southern Railway.

In 1948, these companies were nationalised and organised into the six regions (and subsequently five) which comprised British Rail. In 1986, manufacture and maintenance were rationalised. This process resulted in British Rail retaining control over maintenance depots because of their close connection with the railway while heavy repair and new manufacture began to be contracted out.

British Rail retained works at Glasgow, Doncaster and Wolverton, all on a reduced scale, and Eastleigh. Other main works have been sold or closed. Some works are being operated by private owners (refer below) but England no longer has the heavy engineering capacity it formerly did, demonstrated by the necessity to send large wheels to India to be turned.

The following notes provide a brief description of the major British railway workshops and relates them to Eveleigh as did the American and European workshops mentioned previously. The information has generally been taken from Edgar Larkin's "*An Illustrated History of British Railways' Workshops*" and from A.D.J. Forster's "*Report on Locomotive Manufactories and Locomotive Repairing Establishments*" appended to the NSW Public Works Department Annual Report in 1914/15. The most recent information has been obtained via email or from historical societies and interest groups on the World Wide Web.

BRITISH RAILWAY WORKSHOPS

ASHFORD LOCOMOTIVE AND WAGON WORKS, ENGLAND 1847 - 1850

The complex included the Locomotive Works of 26.5 acres and the Wagon Works of 32 acres. The Loco Works included a longitudinal internal traverser with transverse rails in the erecting shop. Similarly to Eveleigh, the building contained internal brick arched walls. The Wagon Works was similar to the Loco Works in design and also had an external traverser. Both construction and repair of freight vehicles were undertaken there. In 1962 the Wagon Works was amalgamated into the Locomotive Works.

Both parts of the works were closed by 1982 except for some crane repair which was still being carried out at the Loco Works in 1992.

BOW LOCOMOTIVE AND WAGON WORKS, ENGLAND 1853

This was the smallest of the main works in Britain with a site of 10 acres. Each bay of the Erecting Shop contained three rails which ran longitudinally. The Erecting Shop also contained a Craven Bros. crane similar to those at Eveleigh Carriageworks.

The site was closed in 1960 and its workload transferred to Derby. A wagon shop had been included in the complex but it had been demolished by 1992.

BRIGHTON LOCOMOTIVE WORKS, ENGLAND 1840

This 9 acre site was located adjacent to the main railway station in Brighton. During the Second World War, the Works produced component parts for tanks and anti-aircraft defence as well as freight locomotives for the war office.

A fan of rails led into the Compressor House and erecting shops which both contained longitudinal rails and exits at the opposite end. The Works was closed in 1964.

CAERPHILLY LOCOMOTIVE, CARRIAGE AND WAGON WORKS, WALES 1899 -1901

The 9 acre Locomotive Works was built to undertake locomotive repair, rather than construction, work. The Carriage and Wagon Works were constructed on a site of 6.5 acres and repairs, new construction work and conversions to carriages and wagons were carried out there. In 1930, wagon work was transferred to other sites. Conversion work ceased soon afterwards and this was followed by the gradual phasing out of carriage and wagon work. From 1939, only carriage repair work was undertaken at Caerphilly. A new carriage repair shop was later constructed but wagon work was no longer undertaken.

The Caerphilly carriage workshops were closed in 1962 and their workload was transferred to Swindon with the exception of some diesel railcar work. The Locomotive Works was closed in 1963 and converted into an industrial estate. A fan of rails led into the carriage shops which contain rails arranged longitudinally. The erecting shop had an internal traverser and transverse rails. The Carriage Workshops have been demolished due to structural instability.

(<http://members.tripod.com/~BDAugherty/railways/glamorgan.html#Caerphilly>).

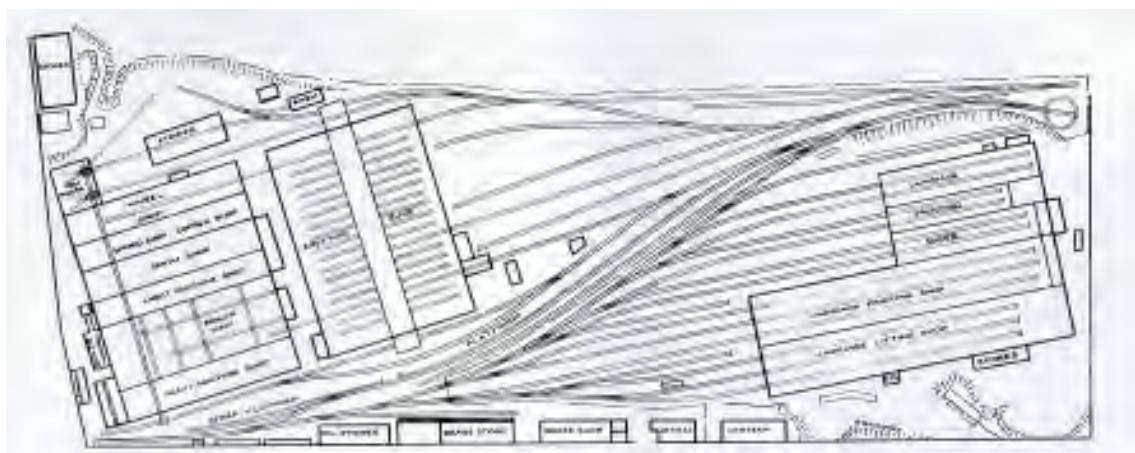


Figure 3.153: Caerphilly Locomotive, Carriage and Wagon Works. A fan of rails led into the Carriage Shops in which the rails were arranged longitudinally, similar to the Paint Shop at Eveleigh Carriageworks. Source: 'An Illustrated History of British Railways' Workshops' p 36.

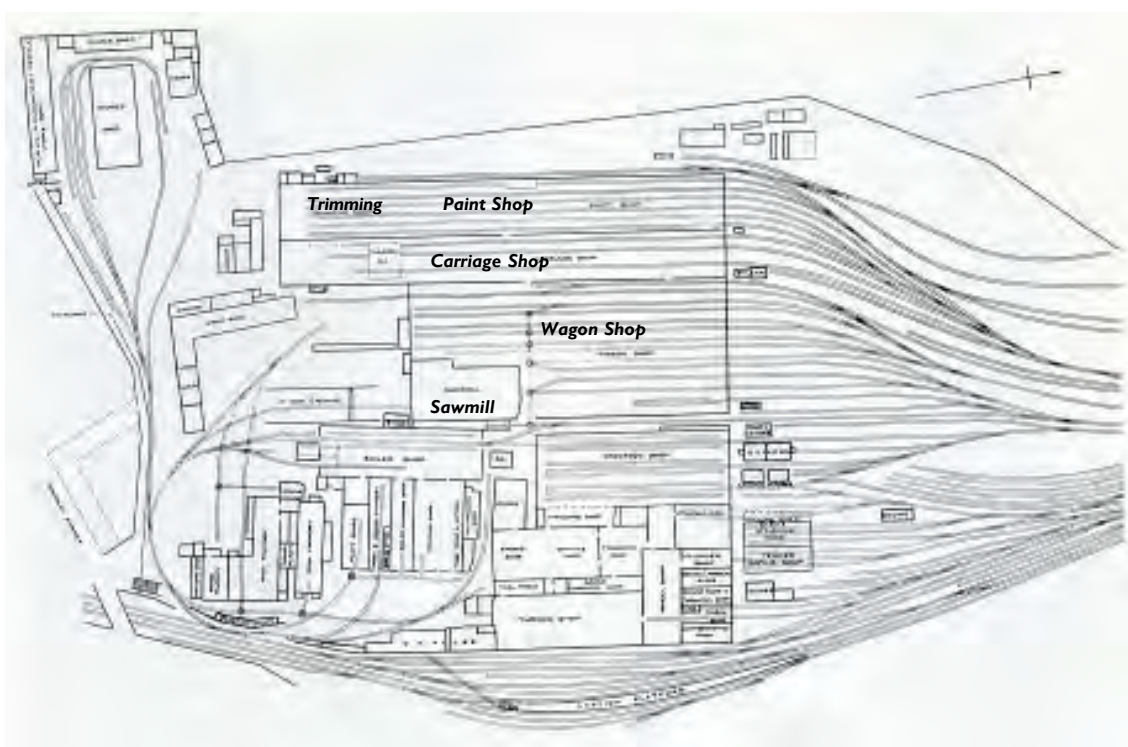


Figure 3.154: Cowlaers Works. The Paint Shop/Trimming Shed, Carriage Shop and Wagon Shop are at the top of the plan. They all have longitudinally arranged rails. A fan of rails similar to that at Eveleigh Carriage Works provides access to the shops. Source: 'An Illustrated History of British Railways' Workshops' p 38.

COWLAIRS LOCOMOTIVE, CARRIAGE AND WAGON WORKS, SCOTLAND 1841-1843

This locomotive and carriage works was located on a 167 acre site. The Wagon Works undertook both heavy and light repairs to wagons but was not involved in new construction. The Locomotive Works was involved in constructing sections for gliders during the Second World War.

Large fans of rails next to the main line led into each of the paint, trimming, car and wagon shops. The shops contained longitudinal rails with dead ends and there was an internal traverser in the carriage shop only. Railways industry was transferred to St. Rollox Works in 1968 and the site is now an industrial estate:

(http://www.railscot.co.uk/Edinburgh_and_Glasgow_Railway/body.htm).

CREWE LOCOMOTIVE WORKS, WALES 1843

This 137 acre locomotive works was still operating and manufacturing electric locomotives in 1992. During the Second World War, Crewe manufactured tanks and parts for heavy guns.

A fan of rails leads to the locomotive paint shop which contains longitudinal rails with dead ends. Various other shops contain internal traversers. Similarly to Eveleigh, the external walls are brick and have windows with arched heads. Internally, the bays are divided by iron columns. Typically, the bays have three sets of longitudinal rails. Parts of the works are still in use.

DARLINGTON LOCOMOTIVE WORKS, ENGLAND 1863

These works covered a site of 27 acres. The Paint Shop has an external traverser and fan of rails leading to longitudinal internal rails. The Erecting Shop had transverse rails in each bay. 18 pounder shrapnel shells were manufactured at Darlington during World War II. In his 1915 report, Forster considered this the best British example of the transverse pit arrangement.

The site was closed in 1966 and the workshops are now used by the Darlington Railway Preservation Society for locomotive restoration work.
<http://www.drcm.org.uk/Frames/DMDrps.htm>).

DERBY LOCOMOTIVE WORKS, ENGLAND 1840

The site eventually covered an area of 47 acres adjacent to the station. There is a fan of rails to the Diesel Engine Shop and Paint Shop, which contain longitudinal rails. The complex has a range of building styles and arrangements. It is understood that the site is still operating although the nature of the work undertaken there is not known.

DERBY LITCHURCH LANE CARRIAGE AND WAGON WORKS, 1876

These works, which were built on a site of 128 acres, look physically similar to Eveleigh and include brick gable ends, lattice girders and round columns. No plan has been found. Photographs show both transverse and longitudinal rail layouts, an external traverser and Craven Bros. cranes similar to those at Eveleigh.

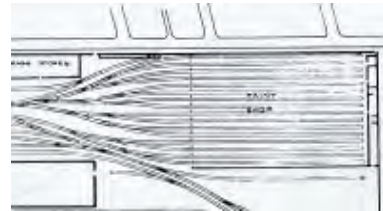


Figure 3.155: The Paint Shop at Crewe Works - a very similar arrangement to that at Eveleigh. Source: 'An Illustrated History of British Railways' Workshops' p 47.

The site had a major wood working shop which handled timber from raw logs, and the works later produced steel and aluminium carriages. By 1948, it was the principal Carriage and Wagon works of the Midland Region. Wagon work was discontinued at the site in 1962 and it then catered for carriage works, which continue today in two of the original 9 sheds. The rest of the site is being developed into a "Pride Park" and contains some of the original workshop buildings, including a Roundhouse used for overhauling cranes (<http://www.typpetwo.freeserve.co.uk/brel>).

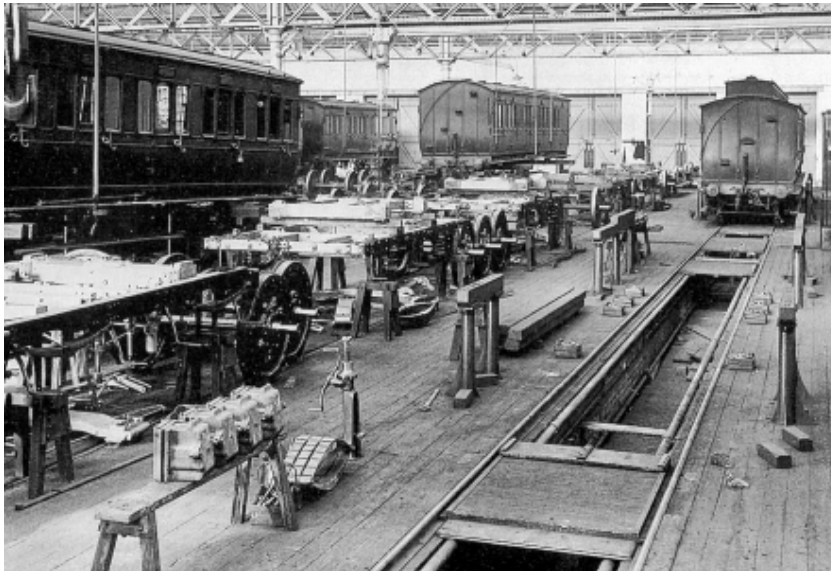


Figure 3.156: Early photograph of the Carriage Lifting Shop in Derby Carriage Works at Litchurch Lane. The works was built in 1876 for the Midland Railway on a site of 128 acres. They were designed to handle carriage construction from raw materials to finished stock. By 1948, the site was the principal carriage and wagon works of the railway and employed over 5000 staff. In 1962, new wagon work ceased, repairs were drastically cut and the works was adapted to cater solely for carriage work which was still continuing at the site in 1992. Source: 'An Illustrated History of British Railways' Workshops' p 109.



Figure 3.157: The sawmill of the above works in 1922. The arrangement is very similar to Eveleigh Carriage Workshops with cast iron columns separating the bays. Unlike at Eveleigh, a separate structure appears to support the crane girders in the adjacent bay. Source: 'An Illustrated History of British Railways' Workshops' p 109.

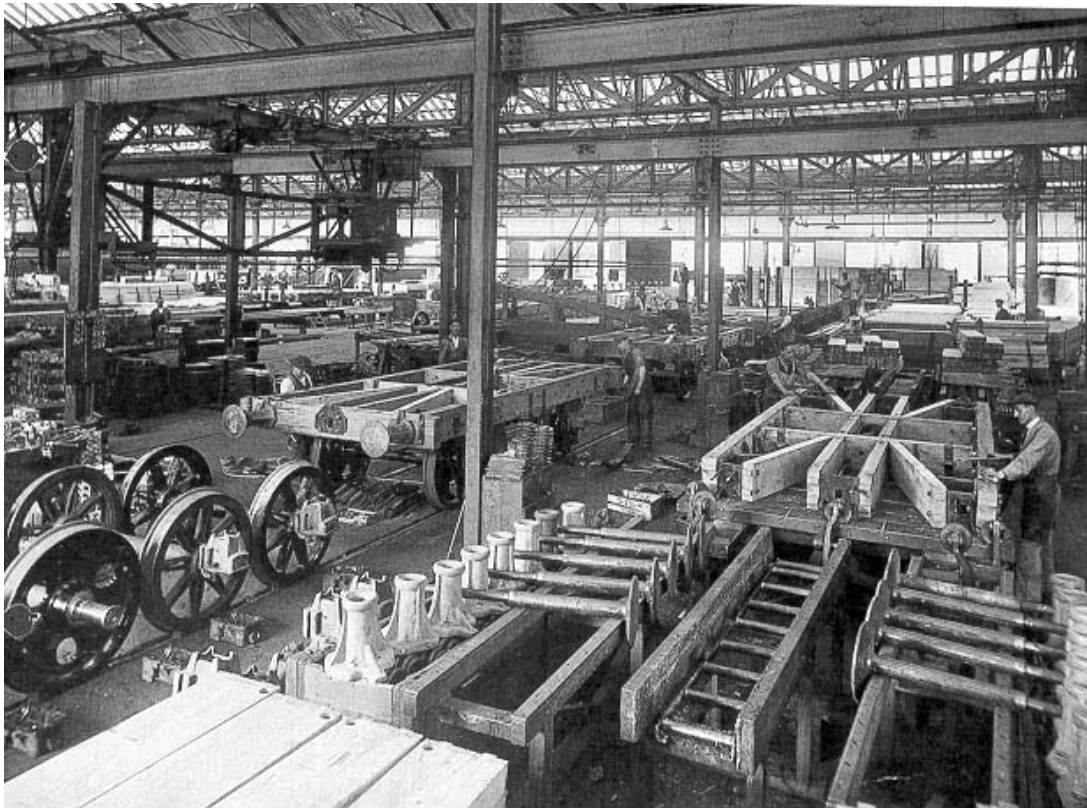


Figure 3.158: Building wooden wagons of 12 ton capacity at Derby Litchurch Lane Carriage and Wagon Works during the period 1924-1930. Source: 'An Illustrated History of British Railway Workshops' p 138.

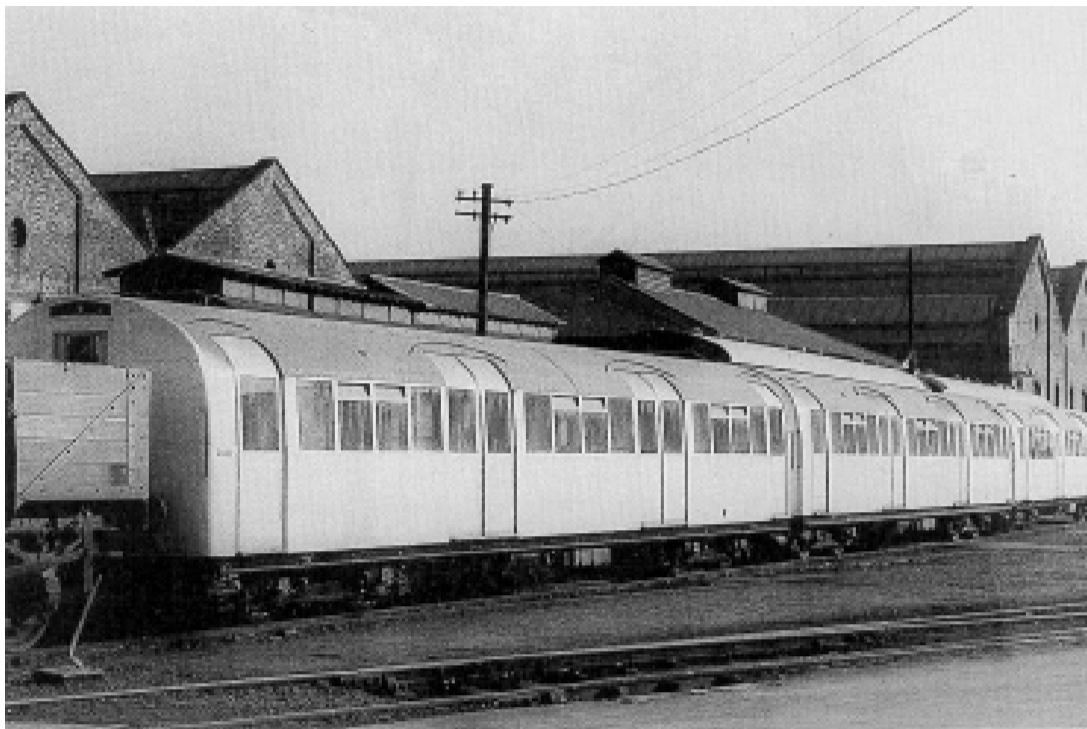


Figure 3.159: Carriages built for London Transport at Derby Litchurch Lane Carriage Works in 1962. Note the similarity of the gable ended workshop buildings behind to the Eveleigh Carriage Workshops main building. Source: 'An Illustrated History of British Railways' Workshops' p 113.

DONCASTER LOCOMOTIVE, CARRIAGE AND WAGON WORKS, ENGLAND 1853 - 1889

This works was constructed on a site of 61 acres and provided facilities for locomotives, carriages and wagons. The carriage shop was originally built for repairs but was later reorganised to cater for carriage construction only. The locomotive shop was involved in construction of tank hulls and anti-aircraft projectiles during World War II.

The locomotive area has an external traverser between the engine shops, which contain longitudinal rails. A plan of the carriage workshops has not been found but photos show 3 sets of longitudinally arranged rails per bay.

In 1960, carriage construction was discontinued but repair work on carriages and wagons was continued until at least 1987 when the site was sold to the private sector.

EASTLEIGH LOCOMOTIVE, CARRIAGE AND WAGON WORKS, ENGLAND 1891-1909

The Locomotive Works was built in 1909 and covered an area of 41 acres. Locomotive repair work from Ashford was transferred there in 1962.

The Carriage and Wagon Works covered an area of 54 acres and built and repaired carriages, wagons and containers. New carriage building was suspended during World War II when work concentrated on conversions of carriages for ambulance trains and construction of other military vehicles. Carriage work was transferred to the Locomotive Works in 1962 and the carriage site closed.

A fan of rails provided access to the erecting shop which contained longitudinal through rails. No plan has been found for the Carriage and Wagon Shops.

The Locomotive Works was still engaged in the repair of locomotives in 1992 although it is not known whether this still continues.



Figure 3.160: Eastleigh Carriage and Wagon Works was built in 1891 by the London and South Western Railway Company on a 54 acre site. The works constructed new carriages and repaired carriages, wagons and containers. By 1968, the repair work had been transferred to the Locomotive Works and the site was sold. Note the traverser, very similar to those at the Eveleigh Carriageworks, transporting a carriage in the foreground. Source: 'An Illustrated History of British Railways' Workshops' p 141.

GORTON LOCOMOTIVE, CARRIAGE AND WAGON WORKS 1848, 1881

NEAR MANCHESTER

The Locomotive Works was built in 1848 on a site of 30 acres and built locomotives for the War Department during the First World War. The 6 acre Carriage Works was built on an adjacent site in 1881. Only light repairs were undertaken at the site as the facilities were not large enough for heavy repairs.

The site included large fans of rails to the wagon, engine and erecting shops which all contained longitudinal rails. The wagon repairing shop had both external and internal traversers. This site is different from the Gorton Foundry surveyed by Forster. The Locomotive Works were closed in 1962 and a supermarket now stands on the site. The Carriage and Wagon Works were closed in 1965.

HORWICH LOCOMOTIVE AND WAGON WORKS, ENGLAND 1887

The Locomotive Works were built in 1887 on a site of 81 acres and undertook tank construction during the Second World War. One of the buildings includes paired circular columns similar to the Eveleigh Carriage Workshops. A fan of rails runs to the Paint Shop which contains longitudinal rails - an arrangement similar to Eveleigh. The Erecting and Repair Shops have very long plans with internal traversers and longitudinal rails.

Locomotive repairs ceased in the 1960s but wagon repairs continued at the site. In 1982, the works closed but the Iron Foundry continued operation and was sold as a going concern in 1987. In 1915, Forster considered this one of the best laid out English repair shops.

INVERURIE LOCOMOTIVE, CARRIAGE AND WAGON WORKS, SCOTLAND 1903

This combined works was built in 1903 on a 15 acre site. Longitudinal rails continue through the Carriage and Wagon Shop building to a turntable at the end. The Paint Shop has a fan of rails leading to longitudinal internal rails with dead ends. The works mainly undertook repairs. The site closed in 1969 because of a decrease in traffic.

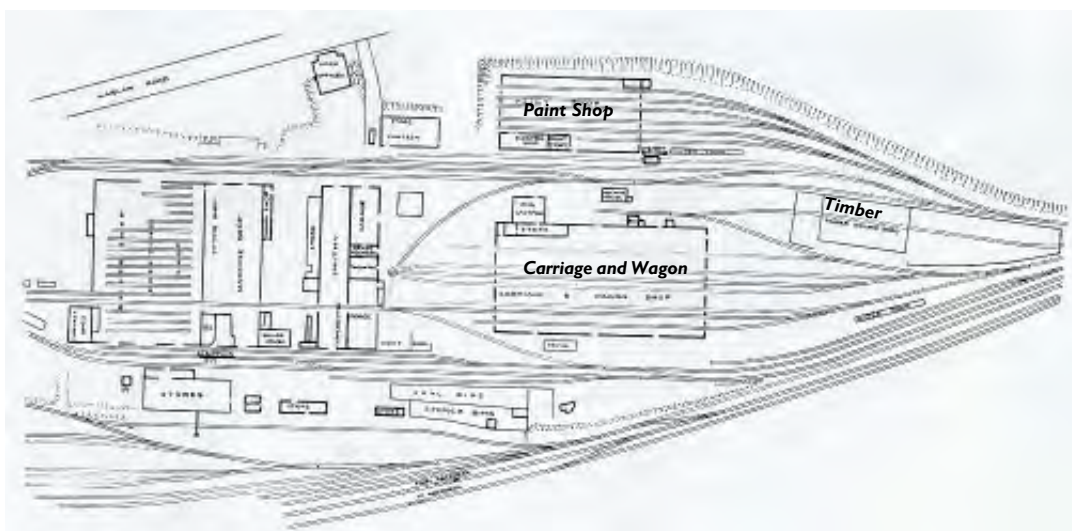


Figure 3.161: Inverurie Works. The Paint Shop and the Carriage and Wagon Shop both have longitudinal rails and have access provided by fans of rails similar to that leading into the Paint Shop at Eveleigh. Source: 'An Illustrated History of British Railways' Workshops' p 82.

ST. ROLLOX LOCOMOTIVE, CARRIAGE AND WAGON WORKS 1853-1856

A combined works which covered a site of 15 acres and was built to undertake the repair of carriages, wagons and locomotives.

The site contained fans of rails leading into the Machine, Paint and Carriage Shops which also contained longitudinal rails. An external traverser was located outside the Carriage Shop. Sections and elevations in Forster's report show similar buildings to Eveleigh.

St. Rollox was, in 1992, the only main repair works in Scotland. It was gutted and modified in 1964 and a new 7 ton internal traverser installed. The Carriage Works were amalgamated with the Locomotive Works in 1962 and, from 1972, they have been known as Glasgow Works or "Caley" after the original owners, The Caledonian Railway. Although still in use as a railway workshop, operations at St. Rollox have been significantly downsized.



Figure 3.162: St. Rollox (Glasgow) Railway Workshops. Source: 'Railway Architecture' p 170.

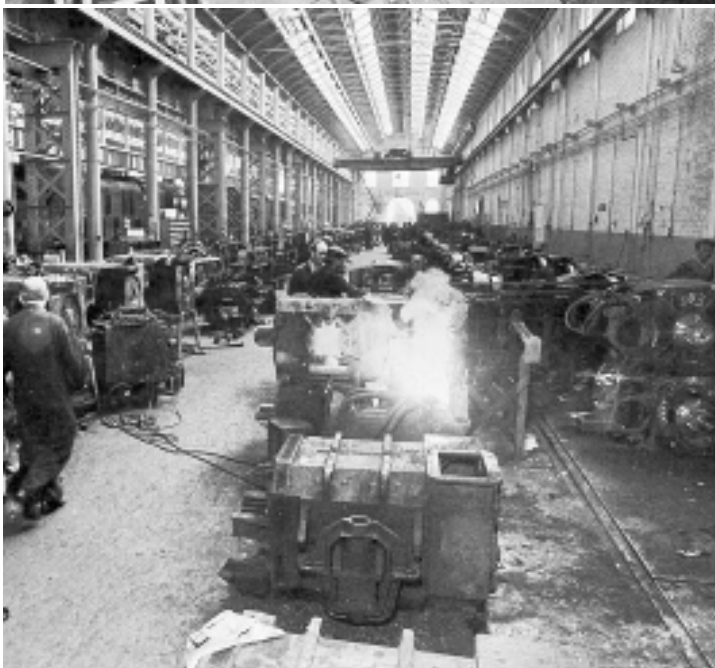


Figure 3.163: St. Rollox (Glasgow) Railway Workshops.. Source: 'Railway Architecture' p 171.

STRATFORD LOCOMOTIVE AND CARRIAGE WORKS, 1847

These combined works which cover 31 acres were laid out on either side of the main line. A variety of light and heavy carriage repairs were undertaken.

The Carriage Works had long buildings with no traversers and, presumably, longitudinal rails. The carriage lifting shop, body shop and sawmill on the other side of the lines had longitudinal rails with external traversers. One building at the Carriage Works is constructed of brick walls and timber roof trusses and has arched headed windows similar to those at Eveleigh.

The works was closed in 1963 but the running shed was used after this time for various works.

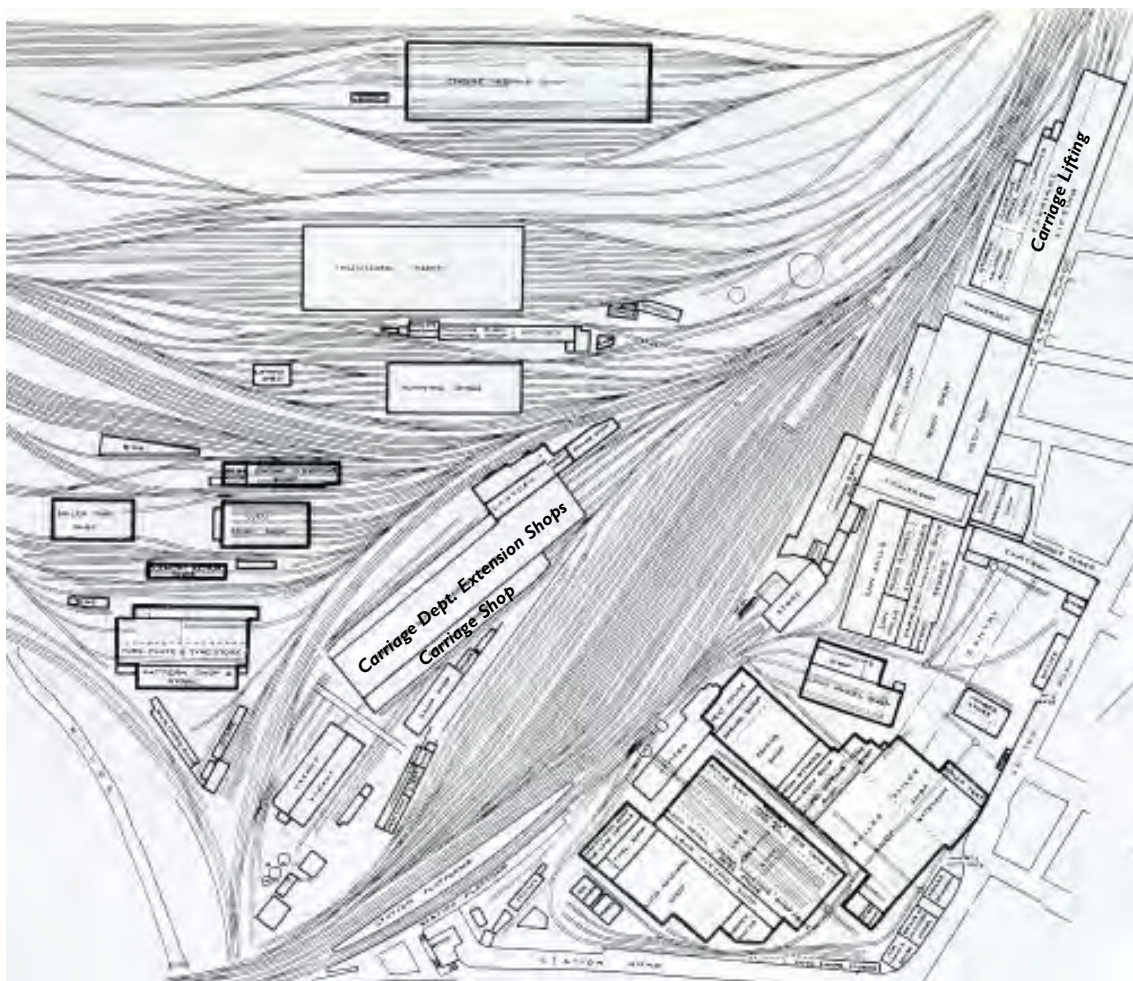


Figure 3.164: Stratford Works. Main lines separate various areas of the works although they do not separate the locomotive and carriage departments as at Eveleigh. Source: 'An Illustrated History of British Railways' Workshops' p 90.



Figure 3.165: Aerial view of the original wagon shops at Swindon taken in 1922. This was the largest concentrated repair unit in the United Kingdom but its activities were transferred to the Locomotive Works in 1967. Note the fan of rails which is similar to, but larger than, the fan to the east of the Paint Shop at the Eveleigh Carriage Workshops and it appears not to feed into a shed. Source: 'An Illustrated History of British Railways' Workshops' p 145.

SWINDON LOCOMOTIVE, CARRIAGE AND WAGON WORKS, 1842, 1869

The Locomotive Works was very large and covered a site of 140 acres. The Carriage and Wagon Works were built in 1869 and were separated from the Locomotive Works by the Paddington to Gloucester Line. The construction and repair functions of the Carriage and Wagon Works were themselves separated by the Paddington to Bristol Line.

The Erecting Shop and Tender Shop included internal traversers and transverse rails. At Swindon, the traversers also extend outside. The CME and Works Manager's offices were also on site.

The Carriage and Wagon Works closed in 1962 and their work was transferred to the Locomotive Works. After 1962, almost all new locomotive building work had been transferred to other works and repairs only were being carried out at the Locomotive Works. In 1986, the entire works was closed. Some overhaul work was re-established and railway museum approved 1992.

The former Swindon Railway Works have been converted into a major railway museum, STEAM, featuring educational and corporate facilities (<http://www.steam-museum.org.uk>). (See also article from *Swindon Today*, later in this section).

WOLVERHAMPTON LOCOMOTIVE WORKS, ENGLAND 1855

Wolverhampton Locomotive Works was built in 1855 on a site of 14 acres and carried out locomotive building and repair.

During the Second World War, the works manufactured components as well as repairing locomotives. Repair and rebuilding work continued until 1964 when the works was closed. It is not known if any buildings survive on the site.

WOLVERTON CARRIAGE WORKS, ENGLAND 1838

This Carriage and Wagon Works was built in 1838 on a site of 39 acres. It was originally constructed for locomotive repair but the locomotive work ceased in 1877 and the site began to be used for carriage construction and repair.

During World War II, the works was used for the manufacture of glider sections, assault boats, bridge pontoons, dinghies, boilers and rafts. In addition, conversion of 700 vans to armoured vehicles was undertaken. General construction work ceased at the site in 1962, except for the saloons for the Royal train. It was noted in 1992 that, since 1977, some other new construction work had been undertaken at the site. The earliest buildings have been demolished and replaced with a supermarket and car park but the remaining workshops are operating to a decreased workload. The Wolverton workshops employ approximately 1000 staff who mainly work in coach refurbishment for private operators. The workshops are in private ownership under Railcare (<http://www.ianrod.clara.co.uk?Commun.htm>).

YORK WAGON WORKS, ENGLAND 1865

These works were built on a 17 acre site and were used for repairing wagons and horseboxes. By 1949, a mix of light and heavy repairs was being carried out at the site. Container repairs were also undertaken. The works closed in the 1960s and many staff moved to the York Carriage Works.

YORK CARRIAGE WORKS, 1884

These works were built on a 45 acre site nearly twenty years after the Wagon Works. From 1958, multiple unit electric stock was built at the site. By 1992, the works was one of only two works manufacturing new carriage stock for British Rail. It is unknown if the site is still operating.



Figure 3.166: Lifting carriages at York Carriage Works - the general practice for lifting coaches on and off their bogies by means of two cranes. A similar technique would have been used in the Carriage Lifting area adjacent to the Paint Shop at Eveleigh Carriage Workshops.

2002

English examples demonstrate several types of buildings. The London and North-Western Railway (which owned the Crewe Workshops) developed some of the largest straight sheds seen, with multi-road buildings like the twenty five track example at Rugby. This shed, which was not a workshop, covered a large area but since the elimination of steam, has disappeared completely. The sheds at Crewe North covered a huge expanse of land in the town centre, and were demolished and cleared in the mid 1960s, to remain “an empty waste of bulldozed rubble”.¹ Such sheds are comparable with the now demolished running shed at Eveleigh.

Another main type was the Roundhouse. These could be arranged in a group, for example at Hull Dairycoates. This was perhaps the largest shed ever built and included six roundhouses arranged in line, each accessible to the other. The most famous is perhaps the pair at York, now converted for the National Railway Museum. Relatively few British roundhouses remain that serve any useful purpose. Some, such as those at Kentish Town, North London, and Battersea Park are still in industrial, although not railway, use. Eveleigh never had a roundhouse though there are examples elsewhere in the NSW railway system such as at Goulburn and Junee.

*“Alongside the engine sheds the companies also developed their own rolling stock construction factories, always known simply as ‘works’. Except in the very early days each private company built its own rails and sleepers and maintained its own civil engineering structures such as bridges and tunnels. New buildings like sheds, for example, regularly went to outside tender”.*²

New railway buildings and sites became redundant from the 1920s when the railways were grouped into four main companies. The depression of the 1930s also led to the closure of many sites and to work being taken away from many others. In the 1950s, decreasing traffic and new forms of traction meant that further cutbacks were inevitable. Many of the great engineering establishments of the nineteenth and twentieth centuries were wound down. According to Binney and Pearce virtually all British Rail's needs are now met by the plants at Derby, Crewe and Doncaster and work is tendered out. Many sheds did remain for a long time and new uses were found for only a relatively small number and the majority have been demolished.³

In England personal experience of the authors and comments of experts at the Ironbridge Archaeology Institute indicate that most of the once extensive number of workshops equivalent to Eveleigh have been demolished.

Swindon was similar to, albeit larger than Eveleigh, with a layout on either side of a main line. There was a locomotive works and a separate carriage and wagon works with stores and CME and Works Manager's offices. Much of Swindon is now demolished but the remainder has been redeveloped to retain its industrial character. A newspaper article opposite describes the redevelopment of the site.

An aerial view shows the fan of rails and the saw toothed roofs in the wagon works which are very similar to the Eveleigh Paint Shop. Swindon would possibly have been a model for Eveleigh as it would have been well known to Eveleigh's designers.

Some of the workshops at Crewe and Derby are still in use but have virtually all modern machinery. The Crewe and Derby workshops resemble Eveleigh in their architectural style and in the comparably random layout of the yards. In particular the illustration of a bay of the Crewe Loco Works shows details such as the arched headed cast iron windows, light fittings and the Craven Bros. crane. The buildings had round cast iron columns and lattice girders and the roof trusses are also similar to Eveleigh except that they are composite with the top chord being timber. Crewe however had a layout with three longitudinal rails along each bay which seems to have been much more common than the transverse layout of the Eveleigh Locomotive and Carriage Workshops buildings.

Derby was one of the major nineteenth century railway towns, the 'capital city' of the Midland Railway Empire. Locomotives and rolling stock were built there, along with signalling and other equipment. Each of the three companies using the station had its own engine shed by the station. The North Midland's Railway had a roundhouse later incorporated into the locomotive works established in 1851. The works expanded to include the nearby Litchurch Lane Carriage and Wagon works, built in 1876. By 1900, about 12,000 men were in railway employment in Derby.⁴

The Locomotive Paint Shop was very similar to the Eveleigh Paint Shop in layout and it seems that the longitudinal layout with a fan of rails was typical for Paint Shops, sometimes supplemented by traversers or with through rails as at Eastleigh. The use of pits in the Eveleigh Paint Shop is unusual and suggests that it was designed to be adaptable for other uses, it was common in railways works to rearrange functions over time. Photographs of the Derby, Litchurch Lane, Works show similarities with Eveleigh. The Carriage Lifting and Waggon Works had transverse rails and sets of timber doors. There was a timber floor however and the superstructure appears lighter and more modern. Externally the works had brick gables with bulls eye vents and arched heads to three openings per bay.

Swindon Today, 19 February 1997

FACTORY SHOPPING REVIVAL FOR FAMOUS RAILWORKS

Historic railway workshops in Swindon are being transformed into a £40 million factory shopping outlet, the largest retail regeneration project in the country. The Great Western Designer Outlet Village will accommodate around 100 shops and create up to 1,000 jobs.

The impressive development for BAA McArthur/Glen is set to open on March 13 following a 48-week fast-track construction contract by Tarmac Building.

"With this project we have created one of the best retailing environments in Europe," says J.W. Kaempfer, chief executive of BAA McArthur/Glen. "We anticipate around four million visitors being attracted to the Great Western during the coming year."

The Swindon site is within a conservation area where railway pioneer Isambard Kingdom Brunel founded the massive GWR locomotive works 150 years ago. Listed Victorian buildings including the old Compressor House, tank shop, brass shop and smithy have been sympathetically converted into nearly 200,000 sq ft of attractive shopping malls adorned with railway memorabilia.

One of the workshops houses a food court modelled on a 1920s railway station. The "booking hall" becomes a Harry Ramsdens fish restaurant and other food outlets will operate from beneath replica railway arches.

Visitors will also be able to see one of Britain's illustrious steam locomotives, the Swindon-built City of Truro, which in 1904 became the first train to exceed 100mph.

Shoppers strolling through the malls can combine a modern retailing experience with a taste of railway history. Some of the original cranes, presses and other machinery have been retained as features within the malls so that shoppers can form a mental picture of the site's rich railway heritage.

The external appearance of the workshops remains largely unaltered but new structures have been erected to link them together. The most dominant is a fully glazed link connecting the food court with the shopping malls. A tented structure links two other buildings and provides cover for a children's play area.

Tarmac Building's project manager, Martin Nash, said: "We were not allowed to drill, cut, weld or screw anything to the original structure. Everything had to be reversible, so it was all clamped on to the existing steelwork or brickwork for ease of removal if necessary."

Coincidentally Martin, a Swindon man, was employed at the railworks as a coach builder before its closure. "In its heyday, 14,000 people worked here," he recalled. "By the time it closed in 1986, only 1,500 were left. It's given me immense pleasure to be involved in its rebirth and see jobs coming back again."

Parking for 2,000 cars and 24 coaches has been provided within the scheme and a refurbished pedestrian tunnel links the site with the main railway station and town centre. Future plans for the Great Western include a Railway Heritage Centre which would be a major tourist attraction in its own right.

These works also show many similarities with Eveleigh and were likely to have influenced the design, particularly the transverse layout. This works was known for handling the complete timber carriage construction process starting with the breaking down of whole logs. An illustration (not shown here) of the sawmill in 1922 shows a workshop that would have been very similar to Eveleigh. In the photo, machines are individually powered and presumably have been converted from the original drive from line shafts. The building has a similar overall form but note that in the adjacent bay the crane girders are not integral with the structure but supported on separate columns.

Other smaller works also show similarities with Eveleigh. The small Bow Locomotive Works, illustrated by Larkin, show a building with round columns, crane girders, countershafting and a Craven Bros. crane. The end wall is brick with three bulls eye windows and a central top hung sliding door. The trusses are similar but are composite with the top chords being timber and there are roof lights. The layout however is longitudinal and there is a wood block floor.

Wolverton Carriage Works appears similar but also has a longitudinal layout. The floor appears to be bitumen with no pits and the columns are rectangular. It also has a brick gabled end and trussed roof with roof lights.

Carriage lifting was done by the same method as at Eveleigh although it was performed inside a building. The external arrangement at Eveleigh is unusual and the reason for it is not known. A traverser very similar to those at Eveleigh was used at the now closed Horwich Works.



Figure 3.167: Running Sheds at Hasland, near Chesterfield, built for the Midland Railway. This two-bay example is similar to the sheds at the Redfern Railway Yards (refer Section 3.1.2) and is of an earlier date than the Eveleigh Carriage Workshops. Source: 'Railway Architecture' p 169.

3.7.5 INTERSTATE RAILWAY WORKSHOPS

Railways and their associated buildings developed in Sydney, Melbourne and Newcastle from the early 1850s, in the mid 1850s in South Australia, in the mid 1860s in Queensland, in 1870 in Tasmania and in 1880 in Western Australia. All States had railway workshops and in some cases, there has been a succession of workshops, for example Newcastle and Sydney. The construction of large-scale workshops coincided with the period of greatest expansion in the rail networks in the 1880s in NSW and Victoria but not until the first decade of the 1900s in Western Australia. Thus though the west Australian works (Midland Railway Workshops) are comparable in function and size they are a twentieth century complex.

The workshops in Melbourne, Newcastle and Perth have been assessed in detail by C & M Doring, and those at Launceston have been inspected by the authors of this report and are compared to Eveleigh in this report. The facilities at Ipswich, Queensland and Islington in Adelaide are not known to the authors and are not commented on in detail. An illustration of the Queensland Government Railway running shed in Brisbane in the steam age shows corrugated ironclad, timber-framed sheds with repetitive gabled profile.¹ Neither the Queensland nor South Australian works are of the scale or substantial character of the other major workshops.

Carl and Margaret Doring state that *"few 19th century Railway Workshops still survive anywhere, but it so happens that two of the biggest and best in the world have survived in Australia, one at Eveleigh NSW and the other at Newport Victoria. Both were established c. 1888. Both are outstanding examples of industrial heritage ... Enquires made to overseas experts ... revealed that the combination of buildings and equipment at Eveleigh was superior to that of any known surviving 19th century workshops in USA and probably superior to those in UK with the possible exception of the Crewe Workshops."*²

Newport Workshops, Melbourne

The Newport Workshops in Melbourne are comparable in nature and scale to Eveleigh and were built at the same time. *'The layout and building design was based on the best British railway workshops and the high quality of architectural design and building craftsmanship reflect the time of booming prosperity and confidence in Victoria'*.³ They were designed by architects Brereton & Lewis and reputedly based on British Workshops. As an integrated complex and in their design they are considered by some to be superior to Eveleigh.

Carl and Margaret Doring write that *"Newport is superior to Eveleigh in the quality of its buildings, in the range and completeness of its machinery groups, and in the importance of some outstanding individual items of equipment"*. One of the major differences is that the locomotive and carriage sections are on the same site, uninterrupted by running lines. At Eveleigh the main lines separate the Locomotive and Carriage Workshops. These differences are deliberate design features of each complex with the Eveleigh layout intended to maximise access to the main line. The two complexes serve as examples of different design approaches to railway workshops. Refer Section 3.1.4.

The Newport Workshops are arranged differently from the Eveleigh complex. The sheds are located at the end of a large fan of rails which extends to the southwest of the Williamstown line. Central to the complex is an administrative building with a clock tower. The Locomotive and Carriage Workshops, or the West Block and East Block respectively, are on either side of central administrative and power facilities. A *'road'* ran across the centre of the complex linking all sections of the operations. The West Block included the ironworking shops and the East Block the woodworking shops. It is the East Block's function that is most similar to that of the Eveleigh Carriage and Wagon Shops. It included the areas for carriage and wagon repairs, the paint shop, upholsterers and the saw mill. Close by were the timber shed, timber store and the plating shop.

Doring states that for many years of the century 1888 to 1988 Newport Workshops was one of Victoria's largest and best equipped engineering establishments with up to 5000 employees on site building and maintaining steam locomotives and other rolling stock and also making nuts, bolts, dog-spikes, pick handles, tarpaulins and other basic stores for railway use. Newport Workshops even made many of its own machine tools. This is similar to Eveleigh in its role in the NSW railways. The Victorian and NSW railways followed the same trend in building rail motors in their workshops from about the early 1920s. The Victorian Railways' carriages were ahead of NSW in quality starting from the 1937 *Spirit of Progress* (which was built and maintained at Newport).

The Newport Workshops are similar in overall form to Eveleigh and in fact to the building 'type' described previously. They have a series of bays with brick external walls, double pitched roof with top lights, each bay with a central door and cast-iron windows on each side. The composition of the brick walls is similar to Eveleigh with pediments and semicircular arches to the doors. The windows however have segmental arched heads and there are no stone dressings.

Internally, the columns in the East block, which has no cranes, are single and round in section. In the West block the columns are twin H sections which at first give the appearance of the later rolled steel joists. Remarkably, they are cast iron and the twin columns are in fact part of one casting.

At Eveleigh the columns are round and are much more classically derived. The designers at Newport were possibly attempting to achieve a more 'modern' appearance with their columns. The trusses were not analysed in the Doring report on Newport, but from photos appear to be riveted angles with a flat bottom chord (i.e. at level of column tops) and span 45 or 47 feet. As at Eveleigh there were many later buildings but they were of varying quality and value. At the time of the Doring's study of 1988 much machinery was intact, showing the whole range of functions. Since then the complex has largely been stripped with much machinery sold for scrap. The main buildings are being conserved, while ancillary buildings have been removed leaving equipment of world significance, e.g. the 1860 Kirkstall steam hammer and mechanical crane, exposed to the weather. Difficulty has been experienced in finding new uses because of the high level of contamination of the site.

Today the workshop site of the former Victorian Railways at Newport is still used for a number of rail activities. On the eastern side, some modern buildings dating from the 1920s are used as a maintenance workshop for Melbourne suburban electric trains, and one is equipped with state of the art jacking equipment (ability to lift a three car train 3m high with jacks under each of six bogies). The building was recently extensively upgraded and modernised for this purpose and could be in this use for many years.

Another building in the area is leased to Goninans for train maintenance, another used for bogie repairs of all types. An extensive area on the east side is now set aside as a secure area for storage of electric trains between trips for cleaning, etc. The former foundry is closed down and used for storage.

The East Block, the former wood working shop, is completely full as storage for out-of-use Melbourne electric trams, a few unique cable trams and a Sydney tram. They are standard gauge, 4ft 8 1/2in (1435 mm) while the rails inside are 5 ft 3 ins, (1530 mm), so some wheels sit on rails and some on concrete.

Part of the centre office block containing the clock tower has subsided slightly and has to be restored. It is empty but not derelict and the clock works and is maintained. The West Block is entirely used by rail heritage groups who are building and installing an engine turntable outside the building for turning steam (and any other) vehicles. This turntable (note this is not a traverser) was once used for electric carriages at Jolimont near Melbourne (since closed). There are no traversers on the site, despite its much broader layout, three or four times the width of Eveleigh Carriage Works Paint Shop. The Eveleigh fan of tracks and the two access tracks along both sides of the main shop, are a feature not repeated at Newport.

There are also similarities between the character of original buildings/extensions/machinery at Eveleigh and Newport - original structures from the 1880s are brick, extensions of 1910-15 are steel but there is also much timber and corrugated iron; later buildings from the 1920s-30s are all steel.



Figure 3.168: Newport Railway Workshops, Melbourne. The composition of the building is less formal than Eveleigh. At Newport the gable is expressed as a pediment and the windows are semicircular arches. Generally the buildings are similar with face brickwork divided into bays and forming a parapet, polychrome work around openings, the bulls eye window and the central opening, Doring, Newport.

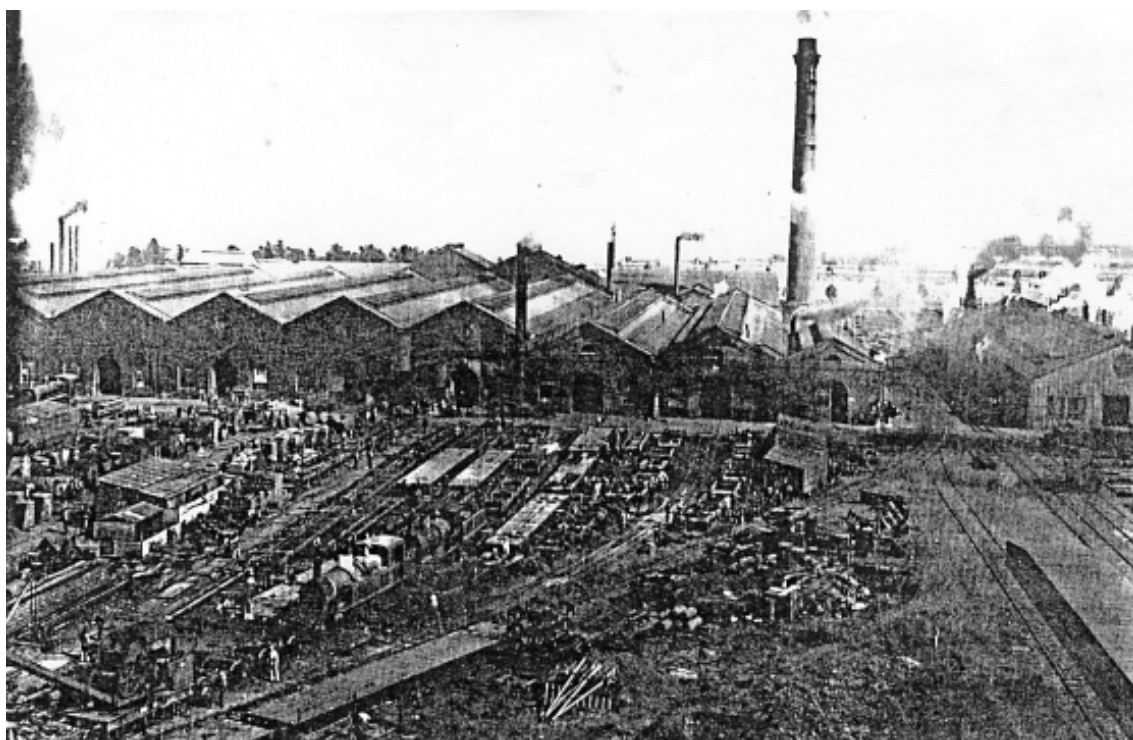


Figure 3.169: Newport Railway Workshops, Melbourne. Historical view of half of the complex which is repeated to the left of this photo. Note the configuration of the building in bays and how the fan of rail lines serve each bay, Doring, Newport.

Midland Workshops, Perth

The Midland Workshops in Perth were constructed between 1904 and 1912, with continuing additions. They were in operation in 1993 when surveyed by C and M Doring but are now closed. The main building has a structural steel frame of rolled steel sections riveted together in lattice style. It has a saw tooth roof and the external walls are brick divided simply into bays with a straight parapet. The window frames are cast iron. As dictated by their function, the workshops have long wide span bays with overhead cranes, the bays arranged side by side. This is common with Eveleigh and Newport but the character of the buildings is substantially different from Eveleigh because of their later construction date.

Though not as large as Eveleigh or Newport, Midland has a more comprehensive collection of workshops and its machinery and plant were all in working order in 1993. The functional layout is more sophisticated at Midland reflecting the later date of construction. The future of the workshops is uncertain and plans for complete demolition and redevelopment have been abandoned because of the prohibitive cost of decontamination.

Launceston Railway Workshops

The Launceston Railway Workshops are closed and are subject to redevelopment. They are a smaller scale complex and though the buildings represent a range of functions much of the machinery has been stripped. The buildings are generally of timber and iron with some recent major concrete framed buildings. Here the buildings are arranged around a central external traverser more similar to some of the American yard layouts than the British.

Mile End Railyards, Adelaide

These workshops, located close to the Adelaide Central Business District, were built in the early 1900s. It appears that they undertook day to day maintenance of steam engines until the 1950s and diesel engine maintenance until 1990.

The character of the early buildings on the site is not known but a number of buildings on the site were demolished in July 1994. In a 1995 report (*refer Bibliography*) it was noted that the 1950s Diesel Depot was also proposed for demolition. A turntable was proposed to be relocated from its original position to a different area of the site.

The site has now been redeveloped and an Athletics stadium has been built in the centre of the site. A netball stadium was proposed at the southern end of the site, and residential development was proposed along its western boundary. The authors have been informed that the netball stadium is now under construction.

It therefore appears that most of the railway workshops buildings have been demolished.

3.7.6 OTHER NEW SOUTH WALES WORKSHOPS

When it was constructed, Eveleigh was the major railway workshop in NSW but it was supplemented by some smaller workshops at regional centres where running repairs were carried out. All major repairs were carried out at Eveleigh until Cardiff opened in 1928 and Chullora in the 1950s.

The Honeysuckle Workshops at Newcastle were established in 1875 separately from Eveleigh because at that time there was no rail link between Sydney and Newcastle. These works are described below but the other, smaller, regional workshops are not described in detail. The workshops at centres such as Bathurst, Goulburn and Lismore were generally corrugated iron sheds, the early examples with pitched roofs.

A New South Wales Royal Commission into the Railway and Tramway Services in 1924 reported on the number of staff 'engaged in the repairing of carriages' and the findings are listed in the table below.

Workshop or Running Shed	Officers Staff	Clerical Staff	Wages	Total
Eveleigh Carriage Shops	39	27	1213	1279
Honeysuckle	-	-	46	46
Lismore	-	-	13	13
Sydney	3	4	90	97

Figure 3.170: Table from the 1924 Royal Commission showing the numbers of staff employed in repairing carriages at various workshops in New South Wales. Source: Report of the Royal Commission of Inquiry into the Railway and Tramway Services, 1924, p 175.

Eveleigh was obviously the largest employer in NSW.

This century Eveleigh was also supplemented by the construction of major new works in the Sydney suburban area. The works at Chullora took over the role of rail motor manufacture in 1949 and later repairs, particularly of the electric carriages. By 1910 the Clyde Engineering Company was the major private locomotive builder in NSW and it changed from steam to diesel-electric production in the 1950s. A few locomotives were also built at the Railway's Cardiff Workshop, which replaced Honeysuckle in 1928.

Cardiff became a major overhauler of steam locomotive. The 12/C38 and 2/D58 were built at Cardiff and the 1/AD60 built for spare parts. The new Workshops of the 1980s at Goulburn and Bathurst were intended only for major overhauls but ended up restoring the carriages for the Broken Hill/Griffin services of the later 1990s.



Figure 3.171: (Above) Honeysuckle Point. Detail of former Loco Compressor House, showing brickwork detailing, store sills and cast iron windows. Doring, Honeysuckle.



Figure 3.172: (above) Honeysuckle Point Workshops, NSW, exterior view. Note the double columns and lattice girders, identical to Eveleigh. The roof trusses are timber. Doring, Honeysuckle.

Honeysuckle Point Workshops

The Honeysuckle Point workshops are contemporary with Eveleigh and the former Locomotive Compressor House was designed by Cowdery and has the same double columns and lattice girders as Eveleigh. They support an 1884 Craven rope drive crane which has now been restored and is the only known example in Australia with an intact rope drive. The buildings however are much smaller (2 bays wide) and the bays are much narrower and are spanned with timber trusses. Recent works have stripped many of the relics associated with the railways but the building has been restored as part of the upgrading of the Newcastle waterfront. The workshop functions moved to Cardiff in 1928.

4.0 PHYSICAL EVIDENCE



Figure 4.0: View of the Carriage and Wagon Workshops in 1910. Source: Mitchell Library Videodisk GPO I Still No. 12020.

4.0 PHYSICAL EVIDENCE

4.1 OVERALL SITE

The Eveleigh Carriageworks is a long, thin rectangular site running generally east/west and parallel to the main railway line on the north of the site. Most of the site is on rail level with some buildings at a high level fronting Wilson Street. Rails and rail levels are significant throughout the site and are essential to understanding how the site functioned. Buildings at the high Wilson Street level obviously did not handle rail vehicles, but were administrative buildings that accommodated supervising, controlling roles.

The site can be divided into three areas. The westernmost is the Stores area, which served this site as well as the rest of the railways. It was accessed by both rail and road (and for a period by train).

The central area was the main Carriage Workshops where carriages were built and maintained. It was accessible functionally by rail and includes traversers, pits and elaborate rail systems to move vehicles. The third easternmost area was the Chief Mechanical Engineer's (CME) area including the main design office and laboratories on Wilson Street and various ancillary rail functions, controlled by the CME, at rail level. These included the electrical lighting buildings, the signalling/interlocking workshop, the train drivers instructions school and various other functions. This part of the site had both road and rail access.

Each of these areas was, for much of the site's history, a separate section under separate management with overall control by the CME. Thus there was a Stores Manager and a Carriage and Waggon Superintendent.

These administrative and functional relationships are evident in the physical fabric of the site including the two main levels, Wilson Street and rail level, and the three east/west zones. These aspects are of considerable significance.

Throughout the site there are rail lines, including features such as runarounds, head shunts and traversers. They are important in understanding the site and demonstrate how the place functioned. The ability to move vehicles around the site on rails is essential for any future railway related use of the site. The rail lines and associated features are of considerable significance.

During this survey some significant items were noted outside the area of the site surveyed. These are the Engine Dive, Illawarra Dive and the Subway. They are noted in the inventory but have not been inspected or analysed in detail.

4.2 LEVELS OF SIGNIFICANCE

Detailed levels of significance have been ascribed in the inventory (Volume 2 of this study) and are similar to those used for the Locomotive Workshops (OC+P 2002).

The sites of the Locomotive & Carriageworks are intimately related and features of each enhance the understanding of the other. Thus the surviving line shafting and traversers in the Carriageworks demonstrate features lost in the Locomotive Works. Similarly the surviving machinery in the Locomotive Works demonstrates equipment missing on the Carriageworks site.

This report addresses the Carriageworks only, but it should be noted that the combined sites have a higher level of significance than either on its own. The combined sites have exceptional significance.

The detailed analysis uses the levels of significance below, which are explained in detail in *Section 5.2 Assessment of Significance*.

- International / National
- State
- Local
- Neutral
- Intrusive

4.3 SUMMARY OF EXTANT FABRIC

The following section provides a brief summary of the surviving physical fabric at the Eveleigh Carriageworks. More detailed descriptions of each item can be found in the inventory (Volume 2 of this study). The items have been arranged roughly in chronological order, with the principle buildings discussed first. Schedules of significant fabric are included on the inventory sheets. Summaries of the fabric of considerable significance only have been included in this section. Refer to the inventory for more detail of significant fabric. This section also includes an overall level of significance for each item. This may differ from the levels attributed to the fabric.

Carriage Workshops

1884-1887

International / National

Similar to the Locomotive Workshops opposite, the Carriage Workshops are virtually intact and contain much of their original fabric.

The masonry load-bearing walls are laid in English bond with semi-circular arches of white brick and sandstone sills and ridge capping. The workshop is roofed by iron and steel roof trusses and clad with corrugated iron. The regularly spaced skylight panels were originally glass. The floors are either bitumen, concrete and/or dirt.

The Carriage and Wagon Workshops building is about 90m wide and 180m long and is divided into 10 bays. Each bay had a door and two windows surmounted by semi-circular arches in its gabled end except for bays 17 and 23 that originally housed the traversers. The window frames were cast iron with several pieces being bolted together. The side doors, like the windows, had semi-circular wrought iron handles, clasps, barrel bolts and hinges. The end doors were of the patent self-coiling shutter type by Clarke and Co. and are thought to be an early example of this technology.

The double columns that support the roof trusses are cast iron and carry rainwater from the roof box gutters to the sub-floor drains (all of which still survive). In one pattern, one column held the crane girder while the other supported the roof truss. In a second pattern both columns held crane girders while a higher separate centre section held the roof truss.



FABRIC OF CONSIDERABLE SIGNIFICANCE INCLUDES:

Face and polychromatic brickwork,
external and internal walls forming the bays

Sandstone dressings

Foundations and pits

Cast iron column system including box
girders supporting crane rails etc.

Wrought iron roof trusses

Timber doors and their hardware

Cast iron windows, ripple glass and
window hardware

Timber highlight windows

Cast iron box gutters and internal
downpipes

Remnants of the early twentieth century
lighting system

Mezzanines including original handrail,
balustrading and timber flooring

Riveted box girders to the former
traverser bays

Roof monitors with cast iron louvres,
timber gable ends and surviving mechanism

Early externally mounted electrical, steam
and gas lines and hydrant services

Signage from the Railways period of
occupation

Railway tracks to the bays

Cranes

Line shafting

Former Paint Shops

1887

International/National

The eastern facade, with its sawtooth roof, polychromatic arches and face brickwork to the bays is largely intact when compared with the 1887 drawings. The form has not been altered and all fabric, such as the original brickwork, stone cornices and plinths has survived. The southern elevation is the most intact of all the elevations. The roof monitors, face brickwork, cast iron windows and timber doorways all survive. The majority of the windows to the western facade have been converted to doorways, however, evidence of the original polychromatic brickwork to the arches survives at row 0 and row 7. The northern facade has been incorporated into the adjacent paint shop. This facade, although now internal, has been well preserved, including most of the original cast iron windows. Some of the windows have been altered to create doorways and the entire wall, including the glazing, has been painted.

The cast iron columns are spaced in an approximately 6 metre grid. The columns are hollow and act as internal downpipes. The columns are connected in an east/west direction by a system of cast iron riveted web trusses. Sawtooth wrought iron roofs, with southern facing skylights, sit on top of the web trusses (one on top of the cast iron columns and another sitting in mid span of the web trusses).

Internally the building has survived well, with all of its main elements intact including the perimeter load-bearing brick walls, the cast iron windows (north and south walls), original doors, the cast iron columns at approximately 6 metre centres, the cast iron riveted brackets (at centres of web trusses) supporting intermediate trusses, the wrought iron trusses with riveted plate connectors, and the vertical skylight wrought iron structure.

Other significant fabric includes the remains of the original Clark & Co. roller door mechanisms, the hardwood 120 x 75 mm timber wood block flooring in track 6A, the early 20th century electrical lines, and enamelled metal pendant lights, and early cold water lines including wrought iron brackets, railway tracks and pits.



FABRIC OF CONSIDERABLE SIGNIFICANCE INCLUDES:

Stone cornices and plinths and brickwork of main walls and saw tooth gables including polychrome brickwork to window and door heads and panels below windows.

Ledged and braced doors, some diagonally boarded and others clad in corrugated metal.

Cast iron columns, riveted web trusses, wrought iron trusses and wrought iron roof monitors.

Cast iron gutter and internal downpipe system.

Cast iron windows, hardware and ripple glass.

Timber block flooring and early concrete floors.

1918 lifting crane columns and box girders.

Remains of Clark and Co. roller door mechanism.

Signage such as row numbers.

Early 20th Century white ceramic insulators.

Chief Mechanical Engineer's Building

1887

State

The Chief Mechanical Engineer's building is constructed of masonry, with cavity brick walls laid in stretcher bond with a bagged and/or painted finish. Externally, the building is almost unaltered since the 1920s. It includes the original 1887, 1900 and 1920 stages, all of which stylistically harmonise to create one overall composition.

The building is approximately 55 metres long (running east west) and 12 metres wide. The entire building is two storey and features sandstone window sills and timber sash windows. The main entrance (to the original part of the building) fronting Wilson Street is articulated by a projecting bay with a triangular neoclassical pediment. This motif is also used above the doorway and the frieze bears the initials N.S.W.G.R. The main pediment is inscribed with the date 1887.

Internally the building has significant surviving fabric from the 1887, 1900 and 1920 periods. Some of these include ceilings (lath and plaster, pressed metal, central ceiling rose, plaster and timber cornices); wall types and coverings; a variety of skirtings, architraves; original staircase from 1887; intact bathroom from 1900; intact Chief Engineer's Office from 1900; floors (including timber, tessellated tiles).

Part of the top floor was renovated and modernised in the 1980s/90s.



FABRIC OF CONSIDERABLE SIGNIFICANCE INCLUDES:

The surviving 1887, 1900 and 1920 building, including overall form (roofing, walls and verandahs).

The detailed internal fabric from the 1887, 1900 and 1920 sections of the building, including:

- Skirtings,
- Architraves,
- Ceilings, cornices, ceiling roses,
- Doors & windows,
- Fireplaces,
- Flooring,
- Tiling (floor, wall and fireplaces),
- Staircases,
- Decorative finishes.

The detailed external fabric from the 1887, 1900 and 1920 sections of the building, including:

- Roof elements such as skylights, chimneys, lead flashings, ventilators, eaves linings, lead box gutters (including lead lined gutters through roof spaces),
- Double hung windows & hardware, panelled doors, hardware and furniture,
- Verandahs and elements (cast iron columns, verandah balustrade lacework, lace valances and brackets),
- Timber floor structure and decoration, bullnosed ironwork and early colour schemes,
- Early solid brick walls,
- Mortar and colour schemes and wall vents.

No. 1 Store**1883****State**

This store is a timber-framed structure, clad in corrugated iron sheet. The roofs are sheeted with corrugated asbestos cement, with fixed timber roof ventilators at each gable end. It is approximately 60-65 metres long running north south. The interior of Store 1, like Store 2, has very early surviving fabric. The roof is King post timber trussed. The raised timber floor has 150mm hardwood boards. The walls are of 200 x 200mm hardwood principal posts at approximately 4 metre centres and with infill stud walls, within which multi-paned cast iron windows survive.

The building has been subject to severe termite damage and though significant may not be possible to retain.


**FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:**

All 19th century and early 20th century fabric, including:

Timber King post trusses,
Hardwood columns and wall framing,
Cast iron windows,
Ledged, braced and sheeted doors,
Hardwood floor boards and floor structure,
Cast iron brackets under trusses.

All WWI to WWII extant fabric, including:
corrugated asbestos roof sheeting and skylights.

Timber louvred sashes

No. 2 Store**1883****State**

This store is a timber-framed structure, clad with corrugated iron sheets. The roof has been sheeted with corrugated asbestos cement. Fixed timber roof ventilators occur at each gable end. It is approximately 60-65 metres long running north south. The building's original fabric is, on the whole, remarkably intact with original King post trusses, wall framing, cast iron windows, louvred gable ventilators and ledged and braced and diagonal sheeted doors.

The building has been subject to severe termite damage and though significant may not be possible to retain.


**FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:**

All 19th century and early 20th century fabric including:

King post trusses
hardwood columns and wall framing
cast iron windows
ledged, braced, sash doors
louvred gable sashes
morticed and pegged former doorheads.

Subway**1887****State**

The oldest sections of the subway have English-bonded brick walls, dirt/tar floors and vaulted brick roofing. Subsequent sections have been constructed in concrete. The subway is approximately 85m long, approximately 3m wide and 2.2m high. The rectangular section subway is on two levels to allow for the Illawarra Dive.



Not surveyed in detail

Retaining Walls

1900

State

The Carriage Works site is delineated by a high bank running from the western end of Wilson Street to the former pedestrian entry (opposite Ivy Street and east of Chief Mechanical Engineer's building). Sections of this bank have brick retaining walls from the western end of Wilson Street, going east to the boundary adjacent to the former pedestrian overpass and then further east towards Platform 1.

The wall is extremely well built, consisting of mostly English bonded brickwork, with height variances and, in some cases, is over 4 metres in height. The retaining wall in many cases forms the northern wall of structures along Wilson Street, e.g. Blacksmiths' Shop.



FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:

All brick retaining walls along Wilson Street and continuing to (and including) Platform One.

Ticket Office - Platform 1 (adjacent to precinct)

1885

State

A substantially intact early railway building, consisting of Flemish bonded brick walls and gable end with a corrugated iron roof. The building form and fabric have survived well, with most of the significant elements intact including exterior wall, windows and roof and interiors, especially the fine stop-chamfered roof trusses and beaded boarded ceiling linings.



FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:

Flemish bonded brick walls
Timber barge boards
Timber sash windows
Sandstone window sills
Doorways to east and west, including skillion
Louvred sash on eastern gables.

Amenities Building - Platform 1 (adjacent to precinct)

1885

State

A substantially intact simple brick structure consisting of Flemish bonded brick walls with sandstone parapet capping and sandstone window sills. The building is currently painted but may originally have been face brickwork. The original timber double hung windows survive.



FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:

Flemish bonded brickwork of walls.
Sandstone parapet cappings.
Sandstone window sills.
Shaped brick window and door arches.

Station Building - Platform 1 (adjacent to precinct)

1885

State

The current building is substantially intact with its 19th century form and detailing surviving. The building is of a simple Italianate mid Victorian style, with galvanised iron hipped roof and with painted Flemish bonded brick walls. The central open "Waiting Room" retains its early timber bench joinery. Also noteworthy is the survival of early doors. Until 2000, the tradition of railway gardens survived on Platform 1.



FABRIC OF CONSIDERABLE SIGNIFICANCE INCLUDES:

Original chimneys (east and west ends of building),
Eaves soffit and fascia,
Flemish bonded brickwork of walls,
Rendered base (plinth) of walls, decorative bracketed window sills and label moulds above windows,
Stop chamfered timber column in Waiting Room area,
Timber doors in Writing Room,
Timber bench seating in Waiting Room,
Sandstone window sills.

Wilson Street Stairs

c. 1916-26

Local

Three metre wide stair linking Wilson Street and centre of site, opposite transverser 1 and Carriage and Wagon Shop area. The stair is early concrete with side concrete upstands and galvanised water pipe handrails. A stair is first shown in this location in 1916 but the stair appears to conform to the 1926 site plan. Though the fabric is recent this has been a major pedestrian access point to the site since at least 1916 and probably before.



No fabric of considerable significance identified.

Timber Shed Extension

1901

State

The timber store is rectilinear in plan, single storeyed with gable ended roof on east and west ends. It has wide 4 metre overlaps on the east and south. The structure is supported on 300 x 300 mm hardwood posts resting on hardwood sole plates. The posts in turn support large hardwood lay post trusses.



FABRIC OF CONSIDERABLE SIGNIFICANCE INCLUDES:

Hardwood structure including sole plates, posts, King post trusses, cantilevered awning structure.

Blacksmiths' Shop

1907

State

This one storey building is approximately 160 metres long and 20 metres wide with a steel framed structure supporting steel roof trusses. The roof is corrugated steel. The floor is concrete/dirt. The building is open completely to the south but protected by a 3 metre wide awning for much of its length. The roof is skylight with alsynite panels and is ventilated with a double-sided monitor along the gabled ridge. Most of the northern wall consists of a retaining wall to Wilson Street.



FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:

Original 1907 wrought iron, riveted plate truss system including "main principal", "intermediate" trusses and monitor roofing.

Northern brick wall including former 1890s retaining wall, extension above retaining wall 1907, and return of brick walls at southern and western ends.

The early pivoting horizontal sashes on west and north walls, including cast iron, hand turned wheel mechanisms.

Cable Store

1911

State

This rectangular building, measuring approximately 50 by 28 metres, has a sawtooth roof supported on a system of steel trusses and columns set in concrete foundations. A well articulated brick wall facing south (towards the tracks displays similar characteristics to the main workshop facades with arched, recessed window reveals and multi paned windows with sandstone sills. Copings to the sawtoothed gables are also of sandstone. In detail and materials, this wall maintains the appearance of the Carriage and Wagon shop facade adjacent, although it has a sawtooth rather than a gable profile.

Internally, the well lit space reveals exposed steel trusses. The vertical (west facing) faces of the trusses are clad with galvanised louvres and glazed panels. The building appears relatively unchanged in form, although there are alterations to doors and windows on the east elevation.



FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:

Original (1911 and 1916) brickwork walls on south elevation.

Original (1911 and 1916) cast iron windows, hardware and ripple glass on south elevation.

Original (1911 and 1916) RSJ columns, cast iron downpipes, roof trusses, skylight windows including louvres, Eastern wall timberwork, Concrete floor.

Telecommunications Equipment Centre 1912

State

The current building's fabric has changed little since its construction. The building is rectangular, 32 by 15 metres, with two asymmetrical sawtooth roofs running east west. The southern facade return is articulated by 7 bays, six with windows and one with a door.

Most of the materials appear to be intact: the walls with their solid English bonded brickwork, window sills and arched window heads. The roof material retains its corrugated iron but modern translucent sheets have replaced the "patent glazing" shown on the plans.

The interior of this building is incredibly intact. The plan layout is almost exactly like the 1912 plan with only minor changes such as the removal of the central walls in the Test Room and the Foreman's Office and a new opening in the south wall to provide undercover access to the original external toilet block. The original two bayed truss roofs survive, the only modification has been the infilling of the southern skylights in the 1970s with rippled aluminium sheets. The trusses are supported on 150 by 175mm RSJ columns, which have cast iron downpipes adjacent to them. The trusses are an unusual composite timber and steel design.

The original external perimeter walls survive and remnants of early colour schemes with dado lines are visible. The interior original workshop area is still open planned as per the 1912 drawing and the western and south/western original room layout is intact. These include very fine joinery walls.

The building has many surviving contributory fixtures and fittings, including the early glazed cabinets, WWI and WWII Roll of Honour, fine polished timber Supervisor's desk, including its original buzzer system under its tabletop.

Interlocking Store, Southern Store, Northern Store and Brick Toilet 1912

Local

Four rudimentary structures abut each other. The Interlocking Store is on a site where simple rectangular buildings are shown as early as 1912 (as Interlocking Store) and in 1921 (as "Timber rack"). This building is simple, gabled roofed with corrugated iron roof and wall sheeting. The southern gable end retains early paired timber louvres. The interiors of the structures have modern cladding on walls and ceilings. The southern store is again a utilitarian rectangular galvanised iron roof and wall sheeted structure. The toilet block to the west of the southern store is a modern face brick structure.



FABRIC OF CONSIDERABLE SIGNIFICANCE INCLUDES:

All 1912 fabric, including:
 Face brickwork and posts on all four facades.
 Brick window arches.
 Brick window sills.
 Timber windows, east and west facades main building (further research recommended).
 Sawtooth roof form.
 Toilet block (brickwork, window openings, roof form).



No fabric of considerable significance identified

Former Suburban Car Workshops

1912

State/Local

The Paint Shop Extension is a large, rectangular building, approximately 130 metres long (east west) and 45 metres wide (north south). The building is regularly articulated with sawtooth roof bays running east west. It is naturally lit with translucent skylight panels mounted in each sawtooth.

The steel-framed structure is generally clad and roofed with corrugated iron sheets. It has a concrete slab floor and foundations and timber framed windows to the northern facade. The southern wall of the building is shared with the original Paint Shop immediately adjacent, it is the original northern wall of this building.

Both the eastern and western facades have five openings, corresponding to five tracks running through the building from the fan of rails on the eastern side to Traverser No. 1 on the western side. The doors to these openings appear to be timber framed, clad in corrugated steel and hinged. Apart from the small office extensions to the north little has changed from the original structure.

The structural system in Stage 2 of the extended Paint Shop was attempting to span much larger spaces. North-south it has only one column in the building with 3 tracks on the north and 2 tracks to the south side. On the north/west directions the columns are at 10 metre centres. (Note the original paint shops required columns at 6 metre two way grid.) The exterior walls were also light framed in steel, contrary to all the earlier buildings' masonry walls.

The structure has imported "Dorman Long & Co. Ld Middlesborough England" stamped steel columns on the interiors and as part of the exterior walls. To take the heavy loads, the columns used a system of composite sections, in this case an "I" beam with riveted flat plates. The roof system, contrary to the earlier practice of skylights (as in Stage 1 of Paint Shops), being supported on web trusses, became a stronger truss itself resting on a relatively thin steel riveted beam. At right angles to the skylight, light trusses are used; however, steel seems to have displaced the earlier wrought iron.

The skylights have permanent steel louvres incorporated above the original glass areas (now polycarbonate). Downpipes, contrary to the earlier use of hollow cast iron columns, become separate elements in steel pipes with heavier cast iron bottom sections. Note the early "1903" markings, while others are marked "1902". The building internally has survived well, with only minor alterations.



FABRIC OF CONSIDERABLE SIGNIFICANCE INCLUDES:

Exterior:

Wrought iron louvres of skylight

Exterior wall columns and framing, and skylight framing (Dorman Long & Co., Middlesborough, England)

Signage

Cast iron riveted rainwater heads

Timber framed casement windows

Interior:

Original steel riveted columns

Original steel roof trusses

Cast iron downpipes

Steel skylight louvres

1920s steel enamelled light pendants

Note:

The Suburban Car Workshops are important in showing the expansion and development of the place and in accommodating wider bodied cars. However the fabric can tolerate a higher degree of intervention while still retaining these elements of significance. Thus the building has been ascribed a level of significance as State / Local.

Clothing Store

1913

Local

The rectangular, two-storey, gable ended building is of masonry construction with brickwork laid in English Bond. It is approximately 65 metres long and 12 metres wide and roofed in corrugated steel.

The gable-ended facades are articulated by recessed panels of brickwork, the central one topped with a semi-circular arch, and are topped by high parapets. The window sills and heads and the copings to the gable ends are sandstone. The long elevations are more utilitarian, with no decoration. The original multi-paned cast iron windows have been replaced with aluminium windows.

The Clothing Store's interiors on both the ground and first floors have, remarkably, changed very little in general arrangement since its construction in 1911. Both floors retain their open plan nature. The original office areas on the western side retain the same size, though the wall fabric is largely relatively recent. The eastern end of the building has introduced wash area facilities with walls from WW II period and fittings from about 1979/80. The building retains the original riveted metal open roof trusses on the first floor. The floor structures to both floors are original concrete floors.

This building may have social value related to its use as a hostel but this has not been able to be established by this study.



FABRIC OF CONSIDERABLE SIGNIFICANCE INCLUDES:

External:

Original English bond face brickwork of facades

Original stonework of facades: (coping stones not the modern sills and lintels)

Awning, including riveted metal brackets, brick and stone attached

Timber floor structure of verandah

Interior:

Original riveted metal trusses on first floor

Original brick and stone perimeter walls

South/western early stair

Concrete floor structures (first and ground floors) including beam structure, proposed hoist positions and suspended timber plate system

Original cast iron columns on ground floor

Remnants of early roller door shutters

War Memorial (WWI and II) plaque

Overhead Footbridge

1914

Local

Parts of early pedestrian footbridge that linked Wilson Street to Carriage Works site and across the main line to the Locomotive Workshop site survives, including: early cobble stones at Wilson Street entry; sandstone retaining walls and brick wall of the ramp area; railway sleeper balustrade posts; and fine brick pylons adjacent to and between the main railway tracks.



FABRIC OF CONSIDERABLE SIGNIFICANCE INCLUDES:

Early granite cobblestones on Wilson Street footpath (opposite Ivy Lane)

**Engine Dive
(adjacent to precinct)**

1915

State

Above ground is a series of face brick stacks located at the eastern end of Platform 1, continuing west along Platform 1 and traversing from the 'up side' (Carriageworks side) to 'down side' (Locomotive Workshop side). The stacks consist of well burnt government bricks laid in English bond with off-white jointing. The tops of the stacks have corbelled brickwork and bullnose-edged capping. The stacks vary in size, typically 2.5 metres wide, 1 metre deep and 2 metres high. The subterranean portion of the dive was not inspected.

Illawarra Dive - not covered in the inventory.



**FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:**

All vent stacks, including face brickwork, mortar joints, corbelled brickwork and bullnosed capping

Not surveyed in detail

Wilson Street Bulk Store

1916

Local

This rectangular steel and timber framed structure, approximately 10m x 40m, is clad in corrugated steel. Its southern face is open sided while the northern wall (to Wilson Street) is brickwork (possibly retaining wall to Wilson Street). The eastern side is partially enclosed by a brick wall. The western side is enclosed with corrugated steel.



**FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:**

Retaining wall at rear

Compressor House

1920

State

The compressor substation is a simple, single storeyed structure with four large King post timber roof trusses. The walls and roof are sheeted with corrugated metal. The louvred paned sashes in the eastern gable are early while the large timber hopper windows are likely to date from the 1950s. The wall framing is constructed of recycled materials including rail stanchions, stamped "Cansell Sheffield Toughened Steel 1885". Between the truss bottom chords are early timber and later steel beams designed for lifting equipment in the compressor house. The surviving fabric would indicate that it is the building denoted on the 1926 plans.

The machinery in this building provided compressed air which was reticulated around the site for various functions including cleaning and powering tools. For machinery in this building, see separate inventory sheet.



No building fabric of considerable
significance identified

Machinery identified separately

Scientific Services Building I**1921****State**

This two storey building is constructed of cavity face brickwork. It is rectangular in plan and measures approximately 26m north south and 17m east west. The roof has a hipped, gabled form with a double gable along the north-south axis terminating in a similar transverse gable at the northern facade. It is clad in terracotta tiles. The external elevations are of dark face brickwork, unadorned except for contrasting white painted lintels and an encircling band at first floor window sill level. The windows are timber, double hung, each sash with a single pane of glass. An external steel staircase on the western facade to first floor level appears to be a later addition. The current two storeyed, face bricked building has virtually not changed since the 1920s.

The interiors of this building, due to the continuing original laboratory use, have preserved not only the layout but its many detailed fixtures and fittings. The original 1916 section is clearly visible, with preservation of once external western windows together with its early ceiling linings.

The building has mostly original doors, original ceilings and arches and original darkrooms. A remarkable survival has been the internal glazed walls. The interiors contain evidence of original colour schemes. The staircase is as per 1921/22 drawing. The fixtures and fittings include beautifully crafted and preserved polished timber bench work in many rooms, many have original benchtops of slate and early purpose made exhaust cabinets.

It was and is the site of highly regarded scientific research and development throughout the railways and industry generally, including materials testing.


**FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:**

All 1916 fabric, including: brickwork, mortar joints. Strong Room door, ceilings, windows, doors, colour schemes.

All 1921/22 fabric, including:

Exterior:

face brickwork and mortar window sills and heads, window sashes and furniture doors and hardware
roof structure, ventilated gables, chimneys, eaves, fascias and soffits

Interiors:

all walls, plaster and early paintwork
all boarded ceilings, cornices
all panelled and sash doors, including hardware
all 1921/22 glazed walls and boarding
all floor structures and boarding
all fixtures and fittings including polished timber benches, exhaust cabinets, slate bench tops, glazed timber cabinets.
surviving early gas, water, electrical services
polished timber stairs including cupboard under stair
all early archive records, including photographs

Store 3**1926****Local**

This infill bay (as described in 1926 drawing) enclosed an open area between two earlier stores. The roof has timber King post trusses, which are slightly offset from the original timber posts of Store 1. The eastern side is open to Store 1, while the western side is the original exterior wall of Store 2, which preserved its external fabric such as cast iron windows and ledged, braced and diagonally boarded doors.


**FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:**

Western wall (originally external wall of Store 1), including:
cast iron windows
ledged, braced, sheeted doors
corrugated iron
brick base wall

Former First Aid Station

1937

Local

The single storey former Ambulance Station is approximately 5 metres wide and 8 metres deep and is constructed of cavity face brickwork on concrete foundations with a concrete slab floor. The roof is of terracotta Marseilles tiles with boxed eaves supporting the gutters. The windows are timber framed and glass paned with brick sills. The building is simple but strongly executed, with dark stretcher bond face brickwork (government bricks) and terracotta hipped roof.



No fabric of considerable significance identified but the use is significant and needs interpretation

Store 4

1937

Local

Store No. 4 is a steel-framed structure clad in corrugated iron and measuring approximately 60 metres north-south and 18 metres east-west. The gable roof is clad in corrugated asbestos cement sheets with timber-framed glass skylights and with various ventilators and extractors. Timber-framed eaves/high level windows are located on the three external walls. Swivelling openings on some elevations allow ventilation.



No fabric of considerable significance identified

Reclamation Shed

1937

Local

The existing structure conforms to the 1937 drawing (a shed approximately 54 m long x 6.5 m wide, housing a class 3 1.5 ton crane). The structure is supported on 10" x 6" Port Kembla RSJ columns and has riveted triangular trusses at 9 metre centres and the trusses are tied together with a horizontal girder truss. The roof is corrugated steel sheeted. The floor is concrete. The northern side is open (note structure is only 1 metre away from concrete air raid shelters). The southern side has been filled with timber stud work and sheeted with 'easy clad' profiled Colorbond.



No fabric of considerable significance identified

First Aid Shed**1939****Local**

Remnant of once typical common utility sheds and offices. The walls are clad with rusticated weatherboard with fine timber french doors and large multipaned view window and timber sliding sashes are on metal tracks. This structure was used as a First Aid Room, servicing the Electrical Workshop end of the site. Such buildings were often moved around the site and are designed to do so.



No fabric of considerable significance identified

Air Raid Shelters**1942****State**

A WWII 70 metre long concrete shelter built into the embankment adjacent to Wilson Street (currently behind the Reclamation Building). The structure consists of approximately 5 metre wide x 3 metre deep x 2.1 metre high rooms, interspersed with narrow 600 mm wide access hallways. The walls are reinforced concrete approximately 200 mm thick, floors concrete and roof 600 mm deep concrete. Some of the southern walls have been opened up since the war and used for storage purposes.



No fabric of considerable significance identified

Brick Toilet Block**1948****Neutral**

Small brick walled and skillion roofed toilet block.



No fabric of considerable significance identified

Former Trackfast Depot**1956****Neutral**

A simple painted corrugated iron walled building with modern awnings to eastern and northern facade. The building is set back 12 metres from Wilson Street, providing delivery access. The raised floor level projecting on the east and the north provides ease of access for truck deliveries. The building has changed little since the original 1956 drawings.



No fabric of considerable significance identified

Boilermakers' Shop

1964

Neutral

The current building's form and details conform with the 1964 drawings. The building is a simple portal framed structure, with shallow pitched roof. The roof is sheeted with corrugated metal sheeting. The facade has four large symmetrical roller doors and two small timber access doors.



FABRIC OF CONSIDERABLE SIGNIFICANCE INCLUDES:

Infilled ends of the earlier Cable Store (south elevation) including: metal stanchions, sawtooth roof members, brackets.

Scientific Services Building Addition

1969

Neutral

A two storey brown face brick building with a gable roof and boxed eaves. A smaller scale skillion addition has been constructed at the eastern end of the building with a similar brick detailing.



No fabric of significance identified

Fire Protection Brigade Shed

c. 1990

Neutral

A recent modern 'off the shelf' type structure (*Ezyframe*), consisting of low pitched metal gable roof and modern steel *pan* sheeted walls. The northern side has three large roller doors.



No fabric of significance identified

Flammable Store Shed

1970

Neutral

Small utilitarian storage shed with modern profiled steel wall and roof sheeting. Walls and roof structure are of timber and the floor is concrete. Site demolished pre-2002.



No fabric of significance identified

Demountable Offices**1980****Neutral**

Prefabricated, demountable buildings, with makeshift awning added.



No fabric of significance identified

Covered Storage Area**1980****Neutral**

Modern utilitarian covered area, adjacent to main up-line, consisting of *Clip-Lock* flat style roof on square galvanised steel posts and modern web-style trusses.



No fabric of significance identified

Fire Protection & Drug Analysis Building**1981****Neutral**

A modern, two-storey, concrete framed building with face brick infill walls and corrugated metal sheeted gable roof. The eastern wall has a covered link to Fire Protection Brigade Shed. Originally it was an administration building for the Carriageworks with the timekeeper on top floor.



No fabric of significance identified

Carpenters, Plumbers & Food Distribution**1981****Neutral**

A rectangular building approximately 48 metres east-west and 10 metres north-south. It has an exposed reinforced concrete frame and infill panels of face brickwork. There are high level aluminium framed awning windows to the street. The yard side has a full length verandah with concrete stairs at both ends.



No fabric of significance identified

Asbestos Removal Unit

1983

Neutral

The building has an external galvanised steel portal frame. The metal deck roof and pressed aluminium wall panels are supported with secondary C-channel girts hung from the frame. There are steel roller-doors at each end. The floor is concrete. Air conditioning ductwork and bracing are also expressed and supported from the outside.



No fabric of significance identified

Traverser No. 1

1901 & 1971

International / National

The original traverser in this location was installed in 1901/1902. After various alterations it was replaced in 1971 by the current traverser. Traverser No. 1 runs on six rails between the Paint Shop and the Carriage Shops. The rear axle drives six wheels at the front. The traverser motor is a Crompton Parkinson, 400-440 volts, which operates at 950 revs and is 50 horsepower. A dog clutch can engage either the drive system or a capstan, which is mounted on the centre line of the traverser. The capstan can be used for towing train carriages to the traverser via cable, which runs from the capstan around pedestal wheels, set immediately in front of it. The pedestal wheels are frozen.

There are two cabins mounted on the traverser, one on either side of the centre line. The operator's cabin is to the east and a small store room is mounted to the west. The central section between the two cabins is roofed with corrugated iron on a timber and steel frame. The traverser is operable and it appears to be in poor condition structurally.

The traverser was altered when relocated from Yennora. Wings each side are supported on their inner face by being attached directly to the main section and on its outer face there are four small unflanged wheels, two wheels on either side of the two rails.

The traverser runs on three overhead wires and is connected to these via three trolley poles with wheels. It is possible to disconnect the wiring, simply by winding short lengths of rope which would disconnect the wheel of the pantograph from the overhead wires.



FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:

Rails
Traverser Chassis
Wheels
Driving Mechanism
Motor
Capstan
Operator's Cabin and Store
Pantographs

Traverser No. 2**1901 & 1971****International / National**

The history of this traverser is similar to No.1 traverser. Traverser No. 2 runs on six rails between the Carriage Shops and the Former Wood Store. It has one axle at the rear which is connected to the driving mechanism and the six wheels at the front run on stub axles which are supported with massive brackets either side of the wheel. The motor has been removed but the other elements remain similar to No. 1 traverser. The traverser is in derelict condition and much of the fabric of the traverser has been removed thus its ability to be restored is questionable. To understand the operations of the place it is important to interpret how this traverser worked in its bed at the west of the site though the fabric of the machine is missing and it is not operable.



FABRIC OF CONSIDERABLE SIGNIFICANCE INCLUDES:

Rails
Traverser Chassis
Wheels
Driving Mechanism
Capstan
Operator's Cabin and Store
Pantographs

Rails**1882 to present****International/National**

The first rail lines on the Carriageworks site were installed to the stores during 1882. Rails were laid at the eastern end of the site during 1883 and 1884 including the majority of the fan of sidings to serve the Paint Shop and the sidings on both sides of the main Carriage and Wagon Workshops. Further sidings were laid to the Paint Shop in 1885 to 1886 presumably including the lines within the building. The internal pits and associated lines and internal traversers were part of the initial construction.

The rail lines, sleepers and points were added to and altered with the construction of additional buildings, changes in function and changes in the main lines throughout the site's history. Old rails have also been used in constructing buildings and fences throughout the site and are evidence of the then common practice of recycling on the site. These reused rails are both within and outside buildings and are also in association with pits allowing access to the underside of vehicles or to collect waste from cleaning operations. They emphasise the railway character of the site. Replacement should continue where tracks are kept operable.

The various aspects of the rail network in the site and 'rail level' are vital to the significance of the site. They demonstrate how vehicles were moved about the site, operating in conjunction with the traversers and cranes, and allow interpretation of the operation of the Carriageworks generally. 'Rail level' is a key generator of the character of the site.

FABRIC OF CONSIDERABLE SIGNIFICANCE INCLUDES:

Head shunt
Fan of rails
Run-around
Rails on the long sides of the Carriage and Paint Shops
Rails and pits in the Paint Shop, Carriage Shop and the Carriage Lifting Shop
Associated points and buffers

Air Compressor and Receivers

State

A great number of the tools throughout the site were powered by compressed air. Though the building is earlier, the present compressor in the Compressor House was installed in 1963 and was modified by the addition of an aftercooler in 1968. The air receivers are located immediately outside the Compressor House, the north side of the Carriage Workshops and the south side of the Carriage Workshops outside Bay 19, and may also have been fed from an earlier generation of compressors.

A single air compressor by Atlas Copco, its motor, the control board and a small substation are located in the Compressor House. It appears to be in fair condition although some of the items are missing. The air receiver east of the Compressor House appears to be a converted boiler or boiler parts which have been joined together. The air receiver north of the Workshops, between Bays 8 and 9, is a vertical, three section boiler and the horizontal air receiver on the south side of the Workshops, near Bay 7, is in five sections.



FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:

Compressor House
Air compressor and motor
Aftercooler
Electrical equipment and switchboard
Reticulation pipework
Air receiver outside Compressor House
Air receiver to the north of the Carriage Workshops
Air receiver to the south of the Carriage Workshops

Tanks over Air raid Shelters

State

Two sets of tanks, former boilers, are mounted in tandem above the air raid shelters. They probably supplied oil to the oil fired furnaces in the Blacksmiths' Shop and are interconnected though a lot of the pipe work is missing. Each is surrounded by bund or wall, to contain the total volume of the two tanks, should they fail.

There is a pressure gauge on top of the west set of tanks and the system may have been under low pressure. The tanks are beautifully formed from riveted 5/8in steel plate. The longer bottom tanks have the typical rounded rivet, while the top tanks have the older conical rivet.

There are two tanks west of these of thinner gauge material and mounted on steel platforms. The larger tank may be the 'mother' tank for the easternmost tanks. It is welded and has no distinguishing features. The smaller tank, which is connected to the water supply, probably held water for minor fire-fighting purposes. These are less significant than the eastmost tanks.



FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:

Tanks
Pipes
Gauges
Ladders
Inspection Platforms

Blacksmiths' Furnaces

State

The Blacksmiths' Shop was removed from the Machine Shop (Bay 21) to its present location in 1910 though these furnaces were installed more recently. Iron and steel could be heated and hence softened in the furnaces, prior to being forged. These furnaces are made of welded plate, bar and angle iron and some cast elements around a brick heating chamber. Four of the furnaces situated along the north-east wall of the Blacksmiths' Shop are relatively small. The counterbalanced doors have all been removed.

A further two furnaces, located to the south of the centre line of the building, were slightly larger and heavier. They were mounted on concrete plinths, do not feature the door counterweighting system and have a heating chamber some 200mm longer.

The furnaces are not in good condition with many having their counter weights removed and some having bricks dislodged. All show some signs of corrosion on the outer frame and wear in the fire bricks near the entrance to the chamber.



FABRIC OF CONSIDERABLE SIGNIFICANCE INCLUDES:

- Frame
- Fire bricks
- Doors
- Counterweights

Blacksmiths' Pneumatic Hammers

1910

International / National

The Pilkington pneumatic hammers were probably introduced when the Blacksmiths' Shop was relocated in 1910. They are powered by compressed air which is far safer than steam. They were used for forging a complete range of spring mountings, coupling bars and a range of smaller items forged from wrought iron or mild steel. The smaller Oliver hammers or Allen strikers have been removed. Two of the hammers were rated at 7.5CWT (320kg) and one was rated at 5CWT (250kg). They stand about three metres high with the pneumatic cylinder directly above the striker.

The compressed air entered through the air chamber at the top of the cylinder. The strength and frequency of the blow is controlled through a lever attached to the side of the hammer. The hammer is set on a heavy timber footing and the anvil which bears the weight of the striking piston is mounted immediately in front of the hammer on its own timber footing. This precludes the cracking of the frame of the hammer by its operation. The hammers appear to be in excellent condition.



FABRIC OF CONSIDERABLE SIGNIFICANCE INCLUDES:

- Frame
- Strikers
- Anvil
- Compressed air boxes
- Compressed air supply

Blacksmiths' Exhaust System

post WWII

Local

The present exhaust system was probably introduced some time after World War II replacing an earlier system which removed fumes, dust and smoke from the forges. The overhead exhaust unit consists of an H - shaped series of 800mm diameter steel pipe which runs down both sides of the Shop. On the northern side, the section is about 60 metres long, and on the southern side the section is about 18 metres long. Both continue across to a central raiser which is about 1.2 metres in diameter and is supported on a steel column. The riser, which passes out through the roof, once had an exhaust fan located above it. The whole of the exhaust pipe is attached by straps to the lower chord of the roof trusses. It is believed that there were hoods above the doors of each of the furnaces, except for the small Blacksmiths' furnaces against the southern wall which have their stacks directly connected to the exhaust system. The southern furnaces were all coke fired and they produced far more objectionable fumes than the relatively clean gas fired furnaces located on the northern side.



FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:

The total exhaust system as it presently exists.

Overhead Travelling Cranes

1887-1970

Cranes in Bays 16, 21, 22 - International / National
Cranes in Bay 18, 24, Reclamation Store - State
Crane in Bay 21 vestibule - Local

Both Eveleigh Locomotive Workshops and Carriage Workshops were equipped with overhead cranes from their inception. Initially they were powered by a continuous rope driven by steam engines. In 1910 the Workshops Cranes were converted to electric power with three electric motors mounted on each crane. The cranes were controlled from driver cabins slung beneath the beams. Despite alterations the original cranes contain most of their original fabric. The electric motors have been in place on these cranes for over eighty years and are an integral part of each crane. The crane in Bay 24 has been replaced with a twenty ton Moore electric overhead travelling crane, sometime around 1965.

The two cranes in Bay 16 and that in Bay 22 were manufactured by Craven Bros. of Manchester, probably in 1885. They were converted to electric drive around 1910 and strengthened and modified by A Goninan and Co. Ltd. of Newcastle, New South Wales, in the early 1930s. A third crane beam in the form of a riveted lattice girder has been integrated with the original structure. The crane in Bay 18 is by Babcock & Wilcox and is presumed, from its design, to have been installed between the wars.



FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:

Cranes, crane rails, crane rail beams, motors, hoisting gear

Cables, associated brackets, bolts and insulators on the end walls

Cables, insulators, signage, ducting on crane rail beams

Maker's nameplates on cranes and girders

Surface finish

The crane in Bay 21 was originally driven by a continuous rope and is now powered by electricity. It is one of the original 1885 Craven Bros. of Manchester cranes. The crane beams and the maintenance catwalk or walkway, including the balusters and railings, are original. The cabin was probably added around 1910. The crane was a single speed rather than dual speed and is the most original of the cranes on the carriage workshop site. It retains evidence of its original colours, grey brown with a red trim. Bay 21 Vestibule has a remnant small overhead crane which was used for unloading trucks.

The small overhead electric crane in the Reclamation Store was operated by a hand panel at ground level and consists of two RSJs bolted together with short longitudinal steel brackets. It appears to have been constructed in the 1960s.

Carriage Lifting Crane

Recent

State

This crane was used for lifting carriages, one end at a time, to remove them from their existing bogies onto temporary bogies, so that they could be serviced in the adjacent workshops. Though the function is early the small crane, in the annexe on the south side of the Paint Shop, is of relatively recent origin and consists of twin crane beams in the form of RSJs. It is typical of its type with three motors, one for longitudinal movement, one for transverse movement and one for hoisting. This particular crane is fitted with two hoists, the auxiliary hoist being suitable for a five ton lift with the main hoist being suitable for 25 ton. The crane is by Desman and because of the restricted space within this annexe, was controlled from the ground with a hand panel. Although the crane has been stripped of all electrical elements and controls, it is still repairable/restorable.

FABRIC OF CONSIDERABLE SIGNIFICANCE INCLUDES:

- Crane
- Crane rail beams
- Cables
- Hoists
- Operating gear

Line Shafting

1887

International / National

Prior to electric power all machinery at the Eveleigh Carriageworks was powered by overhead line shafts or counter shafts driven by steam engines. In 1910 a Mond gas plant, including engine, was introduced into Bay 21 to power some of the line shafts. By 1919 most new machines had their own stand-alone motor thus line shafting slowly became redundant. Some earlier machines were still powered from line shafts as late as 1966. The line shaft was one of the principle items to emerge from the industrial revolution and it allowed many items and pieces of equipment to be powered from a single large engine.

The remnant line shaft on the North Wall of Bays 16, 17 and 18 is 75mm diameter, 25 metres long, in four sections and joined by flanged couplings. It has a single cast-iron driving wheel in the centre of Bay 17. Heavy cast iron brackets are attached to the masonry wall and to the box girder above the former traverser door. The brackets are A-shaped, attached by bolts to the wall, and have plummer blocks.

The line shaft between Bays 18 and 19 is about 30 metres long and supported by V-shaped brackets between the twin cast iron columns. The shaft is in four sections and is joined by flanged couplings. Attached to the shafts are an S-spoked cast iron wheel, four pressed metal wheels, twin (fixed and free) cast iron wheels, and two C-spoked cast iron wheels. Beneath each plummer block there is a drip tray made from half a kerosene tin.

The shaft between Bay 19 and Bay 20 has been reduced to allow the construction of amenities blocks. The line shaft now commences in sub-bay 4 and runs to sub-bay 12. Attached to the shaft are five cast iron pulleys or wheels, a smaller cast iron wheel with C-section spokes, a massive 1.8 metre diameter wheel with C-section spokes, two small pressed metal wheels and two pulleys.

The west wall in Bay 20 is original, constructed to protect the workshop to the west from noise generated in this bay. The line shaft attached to the masonry wall is extant in the south half of the building. It is 22 metres long in four sections, joined by flanged couplings. It is supported on plummer blocks mounted on cast iron brackets, attached to the west wall. On the shaft is a cast iron C-spoked wheel, a pressed metal wheel, the remnants of the forks and lever of a belt change, a single S-section cast iron wheel and a pressed metal wheel. There are steel belt retaining brackets attached to the wall in sub-bay 8 and sub-bay 12.



FABRIC OF CONSIDERABLE SIGNIFICANCE INCLUDES:

Bay 16, 17, 18 north wall (east/west shaft), lineshaft, wheel, brackets, plummer blocks and existing surface finish

Bay 18, 19 (north/south shaft), lineshaft, wheels, brackets, plummer blocks, grease trays and existing surface finish

Bay 19, 20 (north/south shaft), lineshaft, wheel, brackets, plummer blocks, grease trays and existing surface finish

Bay 20 (north/south shaft), lineshaft, wheel, brackets, plummer blocks, grease trays and existing surface finish

Bay 21 countershaft beams, bolts and existing paint finish

Bay 21 small shaft

Bay 22 countershaft, shaft and wheels

A relatively new shaft located in the northeast corner of Bay 21, introduced to power a small number of small machines. The shaft is about 50mm in diameter and about 6 metres long. The shaft now carries a single C-section, cast iron wheel and a single pressed metal wheel.

There are a series of bolts set in the west wall of Bay 21 to which the line shaft brackets were formerly attached. Associated with each set of four bolts is a large oil stain on the wall which is a result of the operation of the line shaft. Below the former line shaft are the remains of a series of box section counter shaft beams set into the brickwork. The beam is made of plate and C-section riveted pieces and supported brackets for the counter shafts which were driven from the line shaft above.

A remnant length of shaft in Bay 22 was driven from the line shaft which ran along the west wall of Bay 21. The penetration between Bays 21 and 22 has now been bricked in but the short length of shaft and its free and fixed wheel with the remnant fork and lever belt change are still evident.

Blacksmiths' Louvre Windows

1907

State

The Blacksmiths' Shop was moved from the machine shop in Bay 21 to a new building adjacent to Wilson Street in 1910. The south wall of the Blacksmiths' Shop, at its west end, has a series of louvres which are made partially from glazed panels and partially from horizontal sheets of corrugated iron. The louvres extend from 1.2 metres above ground level to the top plate of the building and operated as adjacent pairs. There is also evidence of louvres in the west wall. The louvres were *in situ* by 1913 and may be part of the original construction.

The wall can be opened by turning a wheel at the base of the louvres. As the wheel was turned, a screw thread pushed the wishbone, to which this shaft was attached, up or down causing the louvres to open or close. When the windows were in operation, the louvres consisted of two lower rows of glass surmounted by another six rows of horizontal sheets of iron. The upper four panels of louvres, which were of horizontal sheets of corrugated iron, have now been sheathed over completely on the outside by vertical sheets of corrugated iron. This stops the louvres from being opened.



FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:

Louvres

Sheathing fabric

Operating mechanisms

Drill in Telegraph Workshop

Local

The Telegraph Workshop was a small electro-mechanical shop with a variety of tools consisting of drills, shapers, lathes, small milling machines, cutters and slotters. The present drill appears to date from the earliest phase of this workshops development.

It is a small pedestal drill typical of the turn of the century. It has a nameplate marked with "W.F. and J.B. Barnes Co., Rockford, Illinois, USA". It has a cast iron pedestal and has three arms, two arms point forward and hold the shaft/chuck assembly while the rear one holds the driving pulley. The simple machine represents late nineteenth-century technology. It is driven by a stand-alone wall mounted electric motor. The drill appears to be in very good condition and is currently being used. There is no obvious sign of deterioration and there is no rust on the machine.



FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:

Pedestal drill
Motor
Driving belt
Spare chucks
Drills
Vice
Guards

Furnace

Date Unknown

Local

Little is known about this furnace located in bay 18 of the Carriage Workshops. This is a relatively large gas-fired furnace, about four metres long and almost 3 metres wide. The heating chamber is about 1 metre wide, 500mm high and almost 3 metres long with an arched roof. The interior fire brick section is contained by a frame which is constructed from cast iron as well as welded steel sections. There are a series of stays on both sides of the furnace which are joined with long bolts which can be gradually tightened or loosened as the cyclic heating and cooling of the furnace results in the general overall expansion and contraction.

There is a foundation nearby for a machine to which this furnace was dedicated. Immediately outside the furnace door and adjacent to the foundation is a series of checker-plate floor tiles, which indicate that this was the working area. The furnace was formerly served by a jib crane attached to the column closer to the north wall. It appears that the furnace was most likely associated with a forge of some type located on the adjacent foundation. There are no maker's nameplates located on the furnace.



FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:

Furnace
Immediate surroundings

MISCELLANEOUS ITEMS

Carriage Workshop - Roller Door Shaft

State

At several locations around the site and in Doors 1 and 2 from the south end of Bay 16, there are the shafts for the roller shutters, which were installed when the building was constructed in 1885. The shafts now consist of a single steel shaft bolted to two very large cast-iron brackets and contain seven timber and steel wheels on which the steel shutter was placed.



Carriage Workshop - Site of the Former Hydraulic Power Accumulator

Local

The Hydraulic Power Accumulator was located immediately outside Bay 16 on the northern end. It produced hydraulic power for use throughout the workshops. It is not known where the pump was or the items that the hydraulic system serviced. However, the hydraulic line, with some offshoots, does run down the internal space of Bay 16.

Blacksmiths' Workshop - Typical Small, Wall-Mounted Jib Crane

State

The jib crane is marked SWL500kg and is typical of the double-ended rail type, which is found throughout the workshops. It has a horizontal jib and a stay attached to the toe of the jib, returning to the wall at about 30°. There is the typical roller plate which held the block and tackle, obviously hand-operated, attached to the jib.



Carriage Workshop - Remnants of a Former Service Platform

State

This was a service platform attached between the two twin columns on Bay 23. A steel ladder leads to the platform, and from this a ladder leads to the crane wheel above. However, one of the brackets which held the timber platform has been broken. The item is damaged but it is a very important element which indicated the operations of the Machine Shops and should be reinstated.



**FABRIC OF CONSIDERABLE
SIGNIFICANCE INCLUDES:**

Roller door shaft - shaft and chain furniture
Site of hydraulic accumulator - site only
Wall-mounted jib crane - crane only
Service platform - platform and associated steps and fabric

5.0 ANALYSIS AND STATEMENT OF SIGNIFICANCE



Figure 5.0 : 'Girls Going To Sydney for Holidays, Cootamundra, 26th December 1940. Eve Windrim and her daughters Noreen Conkey and Nancy Brogan. Trip took 8 hours'. The carriage is a timber 'main line' car which would have been repaired at Eveleigh Carriageworks. Source: Mitchell Library, Videodisk 'At Work and Play', Still No. 01192.



Figure 5.1: View of the Carriage Workshops taken from the southeast. Undated. Source: SRAO.

5.0 ANALYSIS AND STATEMENT OF SIGNIFICANCE

The basis of assessment used in this report is the methodology and terminology of the *Burra Charter* 1999, *The Conservation Plan* and the criteria of the NSW Heritage Office.

Article 26.1 of the Burra Charter states that:

"Work on a *place* should be preceded by studies to understand the place which should include analysis of physical, documentary, oral and other evidence, drawing on appropriate knowledge, skills and disciplines."

Once the place has been studied, the cultural significance can be assessed. Article 1.2 of the Burra Charter defines *cultural significance as the aesthetic, historic, scientific, or social or spiritual value for past, present or future generations.*

The significance of the place is determined by the analysis and assessment of the documentary, oral and physical evidence presented in the previous sections of this document. Understanding significance enables decisions on the future management of the place. It is important that the future decisions do not jeopardise the cultural significance of the place.

The sites of the Locomotive Workshops & the Carriageworks are intimately related and features of each enhance the understanding of the other. Thus the surviving line shafting and traversers in the Carriageworks demonstrate features lost in the Locomotive Works. Similarly the surviving machinery in the Locomotive works demonstrates equipment missing on the Carriage Works site.

This report addresses the Carriageworks only but it should be noted that the combined sites have a higher level of significance than either on its own. The combined sites have exceptional significance.

5.1 SUMMARY STATEMENT OF SIGNIFICANCE

The Eveleigh Carriageworks are of national significance. In combination with the Eveleigh Locomotive Workshops, on the south side of the main rail line, the Carriageworks form the Eveleigh Railway Complex, which is of international significance. The Eveleigh Carriageworks are of national cultural significance as:

The largest intact, high quality workshops site that survive from the steam era in Australia. The Carriageworks represent the prestige of the New South Wales Railways at its peak and its fabric tracks the changes and eventual decline of the industry until its closure in 1988. In contrast to the railways of other nations, the NSW Railways, hence Eveleigh, were a government enterprise rather than privately owned. The main workshops building is a rare surviving example of the work of George Cowdery and the high level of technological innovation and design undertaken by local industries and builders. It is also associated with John Whitton, who was instrumental in establishing the NSW Railways. Many of the buildings retain a high level of integrity and authenticity along with some of their ancillary structures, including the line shafting that powered machinery, rails and cranes.

An historical landmark in the area. Viewed from the train line, with the Locomotive Workshops on the other side, the Eveleigh Railway Complex is a gateway into and out of the southern end of the city. It is also from the main line that the industrial scale and proportions of the site can be appreciated.

A place of high potential for industrial archaeology and interpretability. Underfloor components include rails and pits exist in some bays. The high retention many of the site's buildings and systems have the potential to demonstrate the former industrial processes.

The contribution that the place made to the development of the surrounding suburbs and associated community, state and nation is immense. Eveleigh was seminal in many major industrial strikes, the ramifications of which were felt throughout the nation. It is of national significance for its part as one of the biggest employers of migrant labour and for its history in the employment of women starting with World War II. The place is held in high esteem by former workers and the surrounding community, confirmed by the their reminiscences and community interest in the place.

5.2 ANALYSIS OF SIGNIFICANCE

Historical Significance

The Eveleigh Locomotive Workshops and Carriageworks are the major Australian 19th Century railway manufacturing establishment (see *also later comments about Newport*). They were planned and built as a combined facility at a similar date to many of the major English establishments. They were built by the Government rather than by a private company, as was the case in England, Europe and the USA.

As such they are integrally linked with the history and development of NSW as well as with Sydney and the local area which grew up around the workshops. The impact on the surrounding area is indicated in the suburb and street names such as the suburb of Darlington, Golden Grove Street and Shepherd Street.

The history of the site parallels and demonstrates the history of the NSW Government Railways. The first phase being construction in 1880-1895, expansion in 1895-1927, change of direction and technological change from 1927-1945 and the gradual decline and finally closure from 1945 to the present. This pattern also reflects and demonstrates world trends. Evidence of the place's continual development is visible in the buildings on the site and alterations to them. Alterations and additions were made to handle increasing numbers, to construct new types of vehicles, to install new technologies such as electricity.

The removal of the wood working and other machinery from the Carriageworks in recent years has reduced the value of the place. It is no longer possible to see the machinery that made the wooden components. The place does have surviving buildings and elements, which demonstrate key aspects of the manufacturing process not available elsewhere. Within the Carriage Workshop itself line shafting survives. This is missing from the Locomotive Workshop and completes the picture of how power was historically provided to machinery. The physical evidence is enhanced by historical photographs of the machinery and other documentary evidence, which would allow interpretation. Similarly the survival of the movement system, traverser, rails and cranes is unique in NSW and is also backed up by documentary evidence.

The place was in continuous operation for one hundred years, one of the longest in the world (see *International Comparisons, this section*). Over this period it was associated with significant events and figures. The place as a whole was a key site in many union activities such as the great strike of 1917. There is physical evidence of improved working conditions gained by the unions such as the addition of toilet facilities and lighting. There are strong associations with the original design engineers, John Whitton and George Cowdery. Over the life of the Carriageworks there were significant figures and families, many working on the site for most of their lives and from generation to generation. People such as Burnett, Lucy and Elston senior and junior were associated with the place. It has also been the subject of various inquiries and commissions which provide material for future research when viewed with the physical evidence of the place.

There is considerable potential for future research into the place. The NSW State Records hold extensive collections of photographs, plans, written material and site records relating to the site. However, these records have only recently been obtained by State Records from State Rail Archives and are yet to be indexed fully. Extensive searches have proved fruitful in many cases although some original plans could not be accessed because they have not yet been archived expediently. The potential to interpret the site is high because of the high level of visibility of the site and the closeness to transport.

Aesthetic and Technological Significance

The whole of the Eveleigh Railway Workshops has landmark quality as a major Sydney site. It forms a gateway to the city to train travellers entering and leaving the city from and to the south and west. Every day thousands of commuters pass the extensive brick facades that were deliberately designed to address the rail lines. Their character, with long horizontal facades and repetitive bays, is particularly suited to making an impact on the viewers as they pass the site. The brick facades on each side of the lines are vital to the impression of a gateway, of passing through or entering, which would not exist if either was removed. The repetition of detailed elements on both sides is also important in the impact on the viewer and their perception of the site as a whole.

In detail, the quality of the buildings, particularly the early brick structures is high, demonstrating creative and technical excellence in both design and construction. The facade design is proportionally sophisticated and carefully composed with pediments, columns and panels formed by the use of fine brickwork detailing. The arched headed cast iron windows are carefully placed within recessed panels and emphasised by brickwork detailing such as white brick arches and spandrel panels.

Particularly extraordinary is the length of the brickwork facades unrelieved by expansion joints. These facades show no evidence of cracking from structural movement or expansion. This would not be possible to reproduce today. Similarly the cast iron window frames, which are typical of railway buildings of the period, are carefully proportioned and finely made and remain today in excellent condition. The lightweight iron and steel trusses are elegant examples of design using the minimum of materials for maximum spans. These and others features are evidence of the high standards of the NSW Government Railways in the late 19th Century, including the high standards of craftsmanship.

The site is also distinguished by its consistent railway industrial character, which makes it distinctive and gives a high degree of unity. Key elements in this character are the rails and traversers, the brick buildings, the corrugated iron buildings and the use of rails in all sorts of structures such as fences and lean-to additions. Rails are a key unifying element in the design of the place; for example architectural drawings for buildings are designed to 'rail level' rather than the usual 'finished floor level'. Buildings are unpretentious and expose structural elements. This is particularly difficult to achieve elegantly and in the major buildings on the site the complex integration of the structure, cranes and stormwater drainage through the cast iron gutters and columns demonstrates excellence in design.

Another aspect of technical excellence is in the work that was and is carried out. The Carriage Works was a timber workshop, as opposed to the Locomotive Works, which was primarily a metal workshop and as such, an entirely different range of trades was practised on either side the site. Car building was a trade utilising the highest level of joinery skills. The pre-WWII timber carriages exhibited superb joinery and timber finishes, which are evident in some of the recently restored carriages and in the 'Royal Cars', considered to be the finest carriages built in Australia. The highest quality and most prestigious carriages in NSW were built, stored and/or restored at Eveleigh. Car builders were in high demand in the building industry and the railways are reputed to have supplied private industry with skilled tradesmen. The work of the tradesmen can be viewed in museums and at Eveleigh we can see where they were made.

Social Significance

Since the DPWS CMP 1999, research has been undertaken into the social history of the site. Oral histories have been analysed and have contributed to a better understanding of the social value of the place and it is clear that the place is held in high esteem by many as a former workplace and for the quality of its work. Even so, the extent of the social value of the place has not yet been fully established. A major study is currently being undertaken by Dr. Lucy Taksa, which will provide more detailed information.

When the place was in full operation there were approximately 3,000 workers on the site, later 1,000. Over its one hundred years of operation, substantial numbers of the community have had contact with the place. There was also a strong identification with the place expressed through social committees and unions. Many young men started as apprentices here, thus their introduction into working life began at the Eveleigh Workshops. There were also a considerable number of new migrants, post WWII, whose first jobs were in the railways, many in the workshops.

Contact with some former workers indicates a strong sense of pride in the place and strong identification with it. This was reinforced by combined unions committees and works picnic days at Gunnamatta Bay and flower and art shows in the workshops. Vivid descriptions were given of working at night during the war, in blackout conditions using a candle set in a nut for light. There was a strong union involvement on the site and peculiar work practices. Former workers explained the 'Darg' where unofficial limits were set on productivity. The closure of the works generally was seen as the end of a micro-community and many see the works as standing for a past approach to work and life. Some see it as an example of union 'bloody mindedness' and restrictive work practices, others as a place of excellence and service and a symbol of Australia's ability to compete and excel on a world scale.

It was normal for senior managers to have been former tradesmen who rose through the ranks. The Chief Mechanical Engineer, who controlled all moving vehicles on the rail network, was on site, the only senior manager in the railways not located in head office. The management hierarchy is indicated by the type and layout of the buildings.

The impact on the local community appears to have been largely in the historic development of the housing around the workshop and in the inter-relationship with the site as a major workplace. Some locals worked at the place but most travelled to the site, often by train. Their custom supported local businesses and hotels and there are now several closed shops along Wilson Street that were probably supported by the staff of the Carriageworks.

Physical Significance

Although some of the buildings on the Eveleigh Carriageworks have been demolished, all the major early ones are still *in situ*. These include the Chief Mechanical Engineer's Offices, the Carriage Workshops (formerly the Carriage and Wagon Workshops), the Paint Shop, Cable Store (formerly Carriage Shop Extension), the Blacksmiths' Shop, Stores 1-4, Telecommunications Equipment Centre, the Clothing Store (formerly General Store) and Scientific Services Building 1 (formerly called the laboratory). As a result, it is still possible to interpret the way the site functioned.

Throughout the site many other buildings of diverse function, which show high degrees of intactness, are still *in situ*. They can provide an understanding of the place's overall operation and the various facets of this (e.g. Electrical Workshop, First Aid Room, Footbridge remnants, Compressor House) as well as the main buildings on the site. On a smaller scale, the internal layouts of these buildings are generally intact, even if some of the machinery has been removed from them. This also provides the possibility of interpreting the way they worked individually.

The inventory sheets highlight the significant remaining external and internal fabric for each of the remaining buildings. Section 3.4 highlights the significant machinery, which is left in particular locations. Although much of the machinery has been removed, many cranes are still *in situ*, as are the 1969 traversers, which were in operation until the site's closure. Refer Section 4.0, Volume II, *Physical Evidence – Inventory Sheets*. These are the only intact traversers in the whole Eveleigh Workshops and the No. 1 traverser is still operable. Similarly line shafts remain in the Carriage Workshop but have been removed from the Locomotive Workshop. This line shafting, when considered with the machinery of the Locomotive Workshop, demonstrates the early operating system.

The buildings are also significant in that they demonstrate a progression in iron and steel technology and in the design of industrial buildings. The earliest buildings are representative of a phase of construction and character of industrial buildings – showing the up-to-date technology of the period. The Carriage Workshops building has a cast iron structure, the Paint Shop extension has riveted plate construction while the Blacksmiths' Shop is of steel. The 1964 Boilermakers' shop demonstrates the latest steel technology and the 1986 Asbestos Shed is similarly up-to-the-minute. (Refer Section 4.0 *Physical Evidence – Inventory Sheets* and Section 3.7 *Comparative Analysis*)

The growth and development shows the physical changes needed to maintain and construct specific types of vehicles and increasing numbers of vehicles, to accommodate technological change and to respond to financial constraints. Changes include the increasing length of vehicles, the change from timber to metal construction, the electrification of the system and increasing standards of passenger comfort. The nature of work carried out changed with time, with the period up to the depression focusing on high quality timber carriages. During the depression and afterwards, as capital funding reduced, was an era of conversions funded from revenue vote. The change in character of later buildings indicates changing priorities within the rail system and in the status of the railways generally and difficulties in keeping up with increasing demand. The expansion from 1900 – WWI reflects the increasing numbers of vehicles. Post WWI the rail system's emphasis was on the City Railway underground, the Sydney Harbour Bridge and Metropolitan Railway electrification and increasing passenger volumes. The major Elcar workshops at Chullora were built in this period. At Eveleigh, it was an era of conversions, which is reflected in the buildings. Prestige accommodation was provided for laboratories. The construction of the paddock demonstrates typical expediency by maintaining the brick facade to the rails as a front to the lightweight structure.

In terms of the planning of the Carriage Workshops themselves the building originally had transverse pits served by an internal, later external traverser. Transverse pits are not extraordinary although they appear more often in the American Locomotive Works examples than in either the Locomotive or Carriage and Wagon Works in the British examples. Where longitudinal arrangements of pits or tracks are used, traversers are less common although they are sometimes located half way along a long run of tracks. It is not clear if the use of transverse pits is more typically American or if it is because the American workshops were constructed later and may have been using more 'up-to-date' technology.

The Eveleigh Carriage Workshops building generally used transverse pits although 1 and 2 roads ran the length of the building, albeit at right angles to the bays and the rows of columns. The Paint Shop has longitudinal bays, similar to many of the British examples. In 1924 the Royal Commissioners said that the Carriage Workshops were 'laid out in a way which makes it difficult to pass a large number of vehicles through with the speed desirable' and 'quite unfit' to deal with the maintenance and renewals required 'at present'. This may have been a comment on the transverse pit arrangement at the Carriage Workshops.

The surviving fan of rails, the operating traverser, the run-arounds and head shunts and the cranes within the buildings are elements of the system that moved rail vehicles throughout the site. This system has lost key elements at the Eveleigh Locomotive Works. At the Carriageworks the movement system demonstrates clearly how the site operated and relates individual buildings and parts of the site as well as demonstrating the connection to the rail network. It gives the site a dynamic character and interpretability no longer possible at the Locomotive Works.

In general terms, the Eveleigh Carriageworks demonstrates many characteristics typical of coeval Carriage and Wagon and Locomotive Workshops around the world. In their intactness, both on the large and the small scale (the only major buildings having been demolished being the running shed), compared with other examples in the world, they stand out.

Australian Comparisons

The Eveleigh Railway Workshops are one of only two major complexes of 19th Century combined locomotive and carriage workshops in Australia, the other being the Newport Railway Workshops in Melbourne (Refer Sections 3.7.5, 3.7.6). One of the other interstate workshops is at Launceston in Tasmania. This example comprises buildings of timber and iron construction which are not of as high construction quality as those at Eveleigh. The other example is the Midland Railway Workshops in Perth. Although they are of high quality masonry and iron construction, they were thus a much later example than Eveleigh, having been built in 1902.

The early 1900s Mile End Railyards in Adelaide appear to have been almost completely demolished by 1996. In Australia, the Newport Workshops are the closest in size, quality of construction and age to those at Eveleigh Railway Workshops. Their layout differs, however, from that at Eveleigh. In their 1988 Heritage Study of the Newport site, Carl and Margaret Doring state that Newport was 'based on the best British workshops'. Comparison with several British examples confirms that Newport's layout is more similar to the majority of these examples than is Eveleigh's. Newport is arranged as a single complex centred on an office building, which contained management for both the locomotive and carriage and wagon sections of the site. The Eveleigh complex is divided into two sections, one originally for locomotives and one for carriages and wagons. The two sections are separated by the main lines leading out of Sydney. Each section had its own works managers' office building.

The Doring report goes on to say that 'it is a fine point as to whether Newport or Eveleigh is the better example overall. Eveleigh has the larger buildings, and some very large steam-powered machinery. However, Newport is superior to Eveleigh in the quality of its buildings, in the range and completeness of its machinery groups, and in the importance of some outstanding individual items of equipment'. It is not known how much of the machinery at Newport is still *in situ* and it appears that this assessment of its superiority to Eveleigh was largely based on this.

Another important difference is that many of the Newport buildings are still in railway use. The east block is used for storage of trains and trams, the west block is entirely used by railway heritage groups and some of the 1920s buildings have been upgraded and modernised for maintaining Melbourne's suburban electric trains. The centre office block is empty but not derelict, similarly to the Chief Mechanical Engineer's building at the Eveleigh Carriageworks.

The railways are currently using some areas of the Eveleigh Carriageworks, but the long-term plan is to cease railway use of the site. At present, the Chief Mechanical Engineer's building is being used by various railway tenants and the Mechanical Branch Testing Laboratory. The adjacent Scientific Services Building No. 1 is still used by the Mechanical Branch as a Testing Laboratory. Stores 1 to 4 inclusive are used by the Rail Services Authority for storage and the Clothing Store (formerly General Store) is also being used for storage, as are the Boilermakers' Store and the Cable Store (formerly Carriage Shop Extension). The Telecommunications Equipment Centre is still used by the Rail Services Authority Telecommunications Group, as are the Interlocking Store and the adjacent Southern and Northern Stores. The Fire Protection and Drug Analysis Building is still used by the unit for which it was designed, as is the Fire Protection Brigade Shed. The Rail Services Authority uses the Carpenters, Plumbers and Food Distribution building. The Paint Shop is used as a depot for unused carriages.

At Redfern Station Platform 1, the Platform Building and Ticket Office are still used as part of the station, while the Amenities building is used as a State Rail Lunchroom. The Carriage Workshops building itself is used by Belvoir Street Theatre and the east end is leased to others. The Paint Shop and Suburban Car workshop are used for rail heritage purposes. The Timber Shed extension is leased to Chubb and the Trackfast building is also leased to private enterprise. There are several currently unused buildings on the site, these are: the Blacksmiths' Shop, Compressor House, Spring Store, Reclamation Shed, Air Raid Shelters, First Aid Station, Flammable Store, Demountable Offices and the First Aid Room.

The Doring report concludes, however, that both Eveleigh and Newport 'are outstanding examples of industrial heritage and of international significance'. The report also notes that in 1988, 'Enquires made to overseas experts... revealed that the combination of buildings and equipment at Eveleigh was superior to that of any known surviving 19th Century railway workshops in USA, and probably superior to those in UK, with the possible exception of the Crewe Workshops'. Since then much of the machinery in the Carriage Workshop has been removed from the site. Don Godden has an inventory
Refer Section 3.4 Machinery.

International Comparisons

It has been difficult to obtain information about many overseas examples. Much information about British workshops, up to 1992, has been gained from 'An Illustrated History of British Railways' Workshops' and via email correspondence with heritage organisations. This document has allowed some direct comparisons to be made between Eveleigh and the workshops, which were known to New South Wales' railway engineers and influenced their design. Comparisons with North American examples were not as direct. A 1915 report provided some information on Locomotive workshops at the time but this gave little information about carriage facilities although it did inform about layout and contemporary construction of American railway buildings. Information provided in Carl and Margaret Doring's Heritage Study of Newport suggests that these workshops have been closed down and/or demolished: 'The Curator of Mechanical Engineering at the Smithsonian Institute and the Director of HABS/HAER (Historic American Buildings Survey/Historic American Engineering Record) could think of only two remotely comparable workshops in USA. One is a much smaller, but fairly intact, workshop for a small private narrow-gauge railroad. The other is a large workshop which had been stripped of all machinery, and which is now being restored and re-equipped at great expense for museum purposes.' This gives some idea of Eveleigh's significance when related to these examples in the United States.

When compared with the international examples, Eveleigh's layout on either side of the main line is significant. Of the British examples, only Stratford and Swindon approximated this arrangement, the other examples being grouped together in a manner more similar to the arrangement at Newport. British examples are generally adjacent to main lines and many are near stations. The American examples studied for the 1915 Public Works report do not show such a split arrangement (*Refer Sections 3.7.2 and 3.7.3*).

Separating the Eveleigh workshops with the main line was deliberate. 'The main point in planning the general scheme has been to arrange the different shops and branches in such a way that while the communication of the whole with the main lines will be free and unobstructed, the access to the several divisions will be effected without interfering with each other. Thus it will be seen from the plan that the several workshops, running sheds, shunting yards and general stores etc., can separately communicate with the main lines, without in any way interfering with the traffic on those, or interfere with the traffic to or from each other' (Annual Report 1881). *Refer Section 3.7 Comparative Analysis*.

Several are relatively contemporary with Eveleigh (York Carriage Works 1884, Horwich Locomotive and Wagon Works 1887, Gorton Carriage and Wagon Works 1881). Of these, Gorton has been demolished and replaced by a shopping centre, Horwich has been closed except for the foundry since 1982 and the state of the buildings is unknown and the situation at York is not known. The National Railway Museum uses some of the site but it is not known if the buildings of the carriage works survive.

Of the older examples, Ashford Locomotive and Wagon Works was closed by 1982, Bow Locomotive and Wagon Works was closed by 1960 and its wagon shop demolished by 1992. Brighton Locomotive Works was closed in 1964, the Caerphilly site closed by 1963, Cowlairs by 1968, Darlington 1966, Doncaster in 1960, Inverurie in 1969, Stratford in 1963, Swindon in 1986, York Wagon Works in the 1960s and Crewe in the 1960s. The St. Rollox works ceased construction in the early 1980s but still perform limited maintenance on rolling stock. Wolverton is now in private ownership and is only concerned with small-scale refurbishment. It is unknown whether the works at Eastleigh, Doncaster, Derby Litchurch Lane and Ashford are operating in any capacity today.

In February 1997, a newspaper article promoted the decision to create the 'Great Western Designer Outlet Village' at the former railway workshops at Swindon. They were to be 'converted into nearly 200,000 sq. ft. of attractive shopping malls adorned with railway memorabilia' and their external appearance was to remain largely unchanged. Since then, STEAM - Museum of the Great Western Railway has been built on the premises (see <http://www.swindon.gov.uk/steam>).

Eveleigh's one hundred years of operation was therefore as long or longer than many of the British examples. Compared to these examples, it closed late – in 1989 rather than the 1960s as for many of the British examples.

Eveleigh's total size is approximately 60 acres (including the Locomotive Workshops and Carriageworks) which is similar to Doncaster. This is relatively large compared to many of the British examples and which may partly be due to the later construction date – greater numbers of carriages and larger carriage requiring more space.

The quality of the construction of the original buildings at Eveleigh is similar to many of the British masonry and cast iron examples. Newport and Midland appear to be of similar quality but sheds in Queensland, and possibly others not now known or demolished, were of lesser quality, smaller size and later construction date.

Many British examples were involved in war work, as was Eveleigh. In particular, Eastleigh is noted to have performed conversions of carriages for ambulance trains as Eveleigh did during World Wars I and II. Similarly to almost all of the British examples, Eveleigh was designed as a combined works with the Locomotive and Carriage Workshops in close proximity. Few British examples were built simultaneously like Eveleigh, however. For example, Swindon, Doncaster, Gorton and York had carriage or wagon workshops, which were built later or earlier than the locomotive shops. Many of the British shops were designed to undertake repairs only. Typically, the mix of work changed over the years, as it did at Eveleigh, some sections were removed to other sites and some carriage construction began to be undertaken in shops not originally designed for this. The concentration on repair and conversion work with a smaller amount of construction work at Eveleigh Carriageworks seems to be quite typical.

5.3 ASSESSMENT OF SIGNIFICANCE

THE EVELEIGH CARRIAGE WORKSHOP SITE

The Assessment of Significance is based on the criteria of the NSW Heritage Office.

The current assessment criteria are:

- A Course or pattern of history
- B Association with life or works
- C Aesthetic characteristics
- D Cultural, social or spiritual associations
- E Contribute to an understanding
- F Uncommon, rare or endangered
- G Demonstrating characteristics

CRITERION A

The item is important in the course, pattern, of NSW's cultural or natural history (or the cultural history of a local area).

The Eveleigh Carriageworks demonstrates the history of the NSW Government Railways, in components of the initial construction phase 1880-1895, the subsequent layers and modifications evidence expansion in 1895-1927, change of direction and technological change from 1927-1945 and the gradual decline and finally closure from 1945 to the present.

The site and its components are evidence of nations and in particular Australia and NSW, embracing 19th century railway technology and rail as a major transportation mode.

The Eveleigh Carriageworks parallel world trends in the establishment and development of railways.

The Eveleigh Carriageworks and its components as part of the Eveleigh Railway Workshops complex are part of a colonial phenomenon where British railway technology was 'exported' to the colonies.

The site is associated with the phenomenon of railway networks that allowed the unprecedented development of rural NSW and Sydney suburbs at the end of the nineteenth century and the early twentieth century.

The large-scale infrastructure on the site demonstrates Government confidence in establishing and expanding rail networks in the late nineteenth century. The establishment of railway infrastructure by Government differs from overseas railway development by private industry, as was the case in Britain and America.

CRITERION B

The item has strong and special associations with the life and work of a person or groups of persons of importance to NSW's cultural or natural history (or the cultural or natural history of a local area).

The Eveleigh Carriageworks and its infrastructure as part of the Eveleigh Railway Workshop complex are associated with the life and work of the early railway engineers Whitton and Cowdery, and with Elston, Thow, Lucy, Burnett - individuals whose life and work made significant contributions to the establishment, development and operation of railways in Australia and NSW.

The place as a whole was a key site in many union activities such as the great strike of 1917. There is physical evidence of improved working conditions gained by the unions, such as the addition of toilet facilities and lighting.

CRITERION C

The item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or local area).

The main workshop buildings at Eveleigh Carriageworks are among the finest industrial buildings to be built in Sydney in the late Victorian period. The buildings show innovative use of materials and structure and are finely crafted. The main workshop buildings at Eveleigh have a finely developed aesthetic arising from their scale, their sophisticated proportions and the rhythm of the classically derived facade treatment which are carefully composed with pediments, columns and panels and brick detailing.

The design and the materials of the Eveleigh Carriageworks combine to produce a pure functionalist aesthetic expressed by design, materials and detail which evolved from the late Victorian period through to 20th century. Traditional railway architecture and building is demonstrated in key elements including rails and traversers, the brick buildings and the corrugated iron buildings. Unpretentious, exposed structural elements in the design of the buildings at rail level and the use of rails in all sorts of structures such as fences and lean-to additions are also part of the railway architecture genre.

The site has landmark qualities experienced in the views and vistas to the site, particularly from the railway line, where the size of the complex, the scale of the facades the spatial arrangement of the buildings and elements on the site distinguish it from other sites in Sydney.

The site and its components are iconographic symbolising the past phenomenon of the greatness of railways.

The site and its components are a recognisable image, a gateway that visually defines a point on a journey to or from the city.

CRITERION D

An item has strong or special associations with a particular community or cultural group in NSW (or local area).

The site was integral to the development of the surrounding suburbs and has an important physical and social association with these areas.

Over its one hundred years of operation substantial numbers of the community including post-WWII migrants and apprentices worked at the Eveleigh Railway Workshop site and are many former workers have a strong identification and a sense of pride in the place.

The site has associated perceptions as a place of excellence and service and a symbol of Australia's ability to compete and excel on a world scale.

For some former workers the site evokes memories of the trade unions and work practices.

The closure of the works generally was seen as the end of a micro-community and is perceived by many to represent a past approach to work and life.

CRITERION E

An item has the potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of a local area).

The Eveleigh Carriageworks together with the Eveleigh Locomotive Workshop site form the Eveleigh Railway Workshop complex demonstrates the evolving process of how engines and carriages were built and maintained during more than 100 years of railway history in NSW.

Alterations, additions and modifications on the site show the phases of railway building, running and expansion and more recent contraction of rail services in NSW. Much of the infrastructure, components and occupation of the site represent changes in technology spanning more than a hundred years of railways in Australia.

The building design of the main workshops exhibit technical innovation in the large runs of brickwork without construction joints, and metal framed windows show the way traditional architecture was translated into large industrial scale buildings.

CRITERION F

An item processes uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of a local area).

The Eveleigh Carriageworks site together with the Eveleigh Locomotive Workshop site form the Eveleigh Railway Workshop complex and is of exceptional heritage significance nationally and internationally as one of the best surviving examples of a 19th century Railway Workshop. Interrelated items and components demonstrate the evolving process of how engines and carriages were built and maintained during more than 100 years of railway history in NSW.

CRITERION G

An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or cultural or natural environments.

The current physical form of the Eveleigh Carriageworks, the buildings, the spatial arrangement, artefacts including machinery and services, open space and circulation patterns demonstrate a process of both railway manufacture and maintenance, and management functions originating in the 19th century and continuing with modification through the twentieth century.

The Eveleigh Carriageworks together with the Eveleigh Locomotive workshop form the Eveleigh Railway Workshops complex and is one of the best surviving examples of railway workshop complexes on a national and international scale.

5.4 STATEMENT OF SIGNIFICANCE - THE EVELEIGH CARRIAGEWORKS SITE

The Eveleigh Carriageworks together with the Eveleigh Locomotive Workshop site forms the Eveleigh Railway Workshops complex, which is of exceptional significance nationally and internationally as one of the best surviving examples of railway workshop complexes. Buildings, open spaces, circulation, rails, machinery, moveable items and services demonstrate the processes of railway manufacture, as well as the maintenance of engines and carriages and the evolution of these processes to technological and operational change between 1887 to the present day. The site layout divided by the main railway line is rare in comparison to other railway workshop complexes.

The site and its fabric demonstrates the history and operation of the NSW Government Railways, as well as reflecting world trends, in the phases of establishment, expansion, and decline and closure. It is associated with the life and work of the early railway engineers, Whitton, Cowdery, Elston, Thow, Lucy, and Burnett all of whom were individuals whose life and work made significant contribution to these phases. The site evidences Australia and NSW embracing 19th century railway technology and Government confidence in rail as a major future transportation mode, which is associated with unprecedented development of rural NSW and Sydney suburbs at the end of the nineteenth century and the early twentieth century. In contrast to international railway systems, the site is part of a railway infrastructure developed by Government rather than private companies and evidences the practice of colonial exportation of British railway technology and models.

The main workshop buildings at Eveleigh are among the finest industrial buildings to be built in Sydney in the late Victorian period. This is because of the innovative use of materials and structure, finely developed aesthetic arising from their scale, sophisticated proportions and the rhythm of the classically derived facade treatment, their carefully composed with pediments, columns and panels and brick detailing. The design of the main workshop buildings exhibits technical innovation in the large runs of brickwork without construction joints, and metal-framed windows. The site elements combine to produce a pure functionalist aesthetic which is expressed by design, materials and detail evolving from the late Victorian railway architecture through to 20th century. The aesthetic is evident in key elements including the rails and traversers, the unpretentious brick and the corrugated iron buildings with exposed structural elements, the situation of buildings at rail level and the use of rails in all sorts of structures including fences and lean-to additions.

The Eveleigh Carriageworks has landmark qualities experienced in the views and vistas to the site, particularly from the railway line, where the size of the complex, the scale of the facades the spatial arrangement of the buildings and elements on the site distinguish it from other sites. Viewed from a passing train, the Carriage Workshops on one side and the old Locomotive Workshops on the other, it is one half of a gateway that visually defines a point on a journey to or from the city. The site is iconographic, symbolising the past phenomenon of the greatness of railways.

The workshops were integral to the development of the surrounding suburbs and have an important physical and social association with these areas. The place has strong cultural, social or spiritual associations for substantial numbers of the community, including post WW II migrants and apprentices who worked on the site. Many former employees retain a strong sense of pride and identification with the place as one of excellence, service and a symbol of Australia's ability to compete and excel on a world scale. The yard as a whole was a key site in many union activities such as the great strike of 1917 and is expressed in the physical evidence of improved working conditions gained by the unions. The closure of the works was seen by many as the end of a micro-community and is perceived by many as representing a past approach to work and life.



Figure 5.1: The CME's Building on Wilson Street was the headquarters of the only senior manager located on site and not at the head office in Sydney (Central). The centre of the garden is grassed and has a flagpole. The plantings around the edges of the large trees are modern and not historically significant. Photo: Jean Rice 2002.



Figure 5.2: Views of the former Locomotive Workshops from the CME's garden today. A visual connection between both sites is important to maintain at some level, to remind and inform of the historical link between the two sides. This view shows the repetitive facade and the three higher towers added to accommodate industrial processes in the building. Photo: Jean Rice 2002.

5.5 LEVELS OF SIGNIFICANCE

Detailed levels of significance were ascribed in the inventory (Volume 2 of the Conservation Analysis DPWS 1999-revised 2002). The titles of the categories of significance have since been revised to reflect significance at International, National and State levels. The term interpretation or interpretability is used in the sense of the ability to explain the meaning of the place/item, of making the significance of the place understood. It is also used when a component is of slight or no significance, meaning it is difficult to interpret or unable to be interpreted, not an important function, often subject to alteration, detracting from significance and/or significant fabric.

As previously stated, this report addresses the Carriageworks only but it should be noted that the combined sites have a higher level of significance than either on its own. The combined sites have exceptional significance.

5.4.1 LEVELS OF SIGNIFICANCE - DEFINITIONS

INTERNATIONAL / NATIONAL

Of international or national significance, exhibiting a high degree of interpretability as together the Eveleigh Railway Workshops complex have a greater value than individual items.

STATE

Of considerable significance, original or early fabric. Can be easily interpreted and understood providing information about the changing patterns of use of the place. They are often of a high level of design and workmanship and are crucial elements of the place's operation.

LOCAL

Of significance, significant changes, relating to function and development, but are not crucial to the functional or aesthetic value of the place and are capable of being interpreted.

NEUTRAL

Are items that do not impact on the significance of the place or may be unsympathetically altered early fabric or additions. This includes modifications where, although they indicate the changes in use over time, the actual fabric is not significant. Some items may be difficult to interpret or may be detracting from the significance of the place and fabric of greater significance.

INTRUSIVE

Those items that, in their present form, adversely affect the significance of the place have been assessed as "intrusive". This category includes introduced fabric that may have resulted in damage to significant fabric. It also includes visually intrusive fabric, which obscures the reading of the significant uses and periods of development.

5.5.2 RECOMMENDED TREATMENT OF EACH LEVEL OF SIGNIFICANCE

INTERNATIONAL / NATIONAL

Retain all fabric. Preserve, restore, reconstruct in accordance with the Burra Charter. If adaptation is necessary for the continued use of the place, minimise changes, do not remove or obscure significant fabric. Design changes so they are reversible.

STATE

Aim to retain all fabric as above. Preserve, restore, reconstruct in accord with the Burra Charter. If adaptation is necessary for the continued use of the place, minimise changes, do not remove or obscure significant fabric. Design changes so they are reversible. In this case the condition of some of the buildings will affect the feasibility of conserving them.

LOCAL

Aim to retain most of the significant fabric. Conservation of the overall form and configuration is desirable. Some of these items are already substantially altered internally and can accommodate further major changes. Compatible new construction can be added and fabric may be removed in part as necessary to accommodate new uses. If adaptation is necessary, more changes can be made than would be possible for fabric of state significance, but the same principles apply. Where possible additions should be reversible. Retention may depend on issues other than heritage value, such as financial viability.

NEUTRAL

Fabric of neutral significance may be retained, modified or removed as required for the future use of the place, provided that its removal causes no damage to more significant fabric.

INTRUSIVE

Remove or alter intrusive fabric to reduce the adverse impact when the opportunity arises, whilst minimising damage to adjacent fabric of significance.

5.5.3 LEVELS OF SIGNIFICANCE

INTERNATIONAL / NATIONAL

The place as a whole has been ascribed a level of international and national significance. Specific elements of this level of significance include:

- 1884-7 Carriage Workshops
- 1884-7 Paint Workshops
- Traversers No. 1 & 2.
- overhead travelling cranes Bays 16, 21 & 22
- remaining line shafting
- rails
- pneumatic hammers in Blacksmiths' Shop

STATE

Items of State significance are significant additions or modifications to the workshop. Items of considerable significance can be easily interpreted and understood providing information about the changing patterns of use of the place. They are often of a high level of design and workmanship and are crucial elements of the place's operation. Some elements of State Significance include:

- Chief Mechanical Engineer's Building
- No. 1 and No. 2 Stores
- Blacksmiths' Shop, louvres and furnaces
- Air Compressors and Air Receivers
- Compressor House
- brick retaining wall
- Timber Shed Extension
- subway
- Cable Store
- Telecommunication Equipment Centre
- Scientific Services Building
- Air Raid Shelters
- Tanks over the Air Raid Shelters
- Ticket Office Redfern Station Platform 1 (adjacent to precinct)
- former Suburban Car Workshops
- Carriage Lifting Crane
- Cranes in Bays 17 & 24
- Jib Crane
- Roller Door Shaft
- remnants of former Services Platform
- Engine Dive
- Amenities Building
- Station Building

LOCAL

Items of local significance are those that perform a secondary function in relation to the use and development of the place. It includes significant changes that are not crucial to the functional or aesthetic value of the place but relate to the function and development of the place generally and which are capable of interpretation. Examples of fabric of some significance includes:

- Wilson Street Stairs
- former Suburban Car Workshops (fabric)
- Clothing Store
- Drill in the Telegraph Workshop
- Interlocking Store Southern Store, Northern Store and Brick Toilet
- Remaining piers of the 1914 footbridge
- Wilson Street Bulk Store
- Store 3
- Store 4
- Former First Aid Station
- Reclamation Shed
- First Aid Shed
- Blacksmiths' exhaust system
- Scientific Services Building Addition
- Crane in Bay 21 vestibule
- Furnace in Bay 18
- Hydraulic Power Accumulator outside Bay 16

NEUTRAL

'Neutral' items are those that do not impact on the significance of the place or may be early fabric, which has been subject to unsympathetic alteration, or additions. This fabric includes modifications where, although they indicate the changes in use over time, the actual fabric is not significant. Some items may be difficult or impossible to interpret or may be detracting from the significance of the place and fabric of greater significance.

Neutral elements include:

- Trackfast Depot 1956
- Fire Brigade Shed
- brick toilet block 1948
- flammable Store Shed 1970
- demountable offices 1980
- covered storage area 1980
- Fire Protection and Drug Analysis Building 1981
- Carpenters and Plumbers & Food Distribution 1981
- Asbestos removal Unit 1983
- Boilermakers' Shop

INTRUSIVE

Those items that, in their present form, adversely affect the significance of the place have been assessed as “intrusive”. This category includes fabric whose introduction may have resulted in damage to significant fabric. It also includes visually intrusive fabric that obscures the reading of the significant uses and periods of development.

Intrusive elements include:

- stanchions to the south of the Carriage Workshop
- the private residential development on Wilson Street

A3 COLOUR PLAN SHOWING LEVELS OF SIGNIFICANCE INSERTED HERE

6.0 CONSTRAINTS AND OPPORTUNITIES



Figure 6.0 : The south wall of the Paint shop. Here the carriages were lifted off their bogies and onto workshop bogies. The worn bogies were then moved to the bogie repair shop and the carriage to the carriage repair shop. When the repairs were complete each carriage was reunited with its bogie before return to service.



Figure 6.0: The Wilson street side of the retaining wall. On the other side is the Blacksmiths' Workshop. Photo: OC+P.

6.0 CONSTRAINT & OPPORTUNITIES

6.1 IMPLICATIONS OF HERITAGE SIGNIFICANCE

In order to formulate conservation policies and an implementation strategy for Eveleigh Carriageworks, as part of the Eveleigh Railway Workshops site, it is necessary to take into account a number of factors and constraints, which are raised in this section of the document.

As noted in the Statement of Cultural Significance, the site of the Eveleigh Carriageworks has historic, aesthetic, social and scientific/technical significance, and is rare at the national and international level, demonstrating the characteristics of railway workshop sites to a high degree. The exceptional value of the place as a whole and the level of significance above other similar places rest on the assemblage value and the operational capability of the systems and machinery. To maintain this level of significance it is important that the systems and machinery be operational which creates both constraints and opportunities for reuse. The highest value is attained when the operational machinery is used for production and/or interpretation. Operating machinery will also impact on how the space can be used and on adjoining areas with noise, dust and vibration.

The aesthetic significance of the place and the technological significance of the structure offer opportunities for interpretation and suggest directions for the future design elements and future use. The recovery or enhancement of aesthetic value is sometimes at odds with the retention of evidence of the history of the development of the place and these conflicting requirements are further considered in policy development. The studied composition of the facades and careful detailing are important to the value of the place and would be enhanced by the reconstruction of missing elements. Adjacent and attached development should have regard to this value. The industrial character is an important element of the aesthetic significance and should constrain the tendency to 'clean up' the place as has happened at Honeysuckle Point. The large, internal open spaces and exposed structure should preferably be retained.

The social value of the place implies that it should be accessible to those who hold it in high esteem and the scientific value implies that it should be available for research and educational purposes. This imposes a responsibility to provide a degree of public accessibility to the place in any development.

6.2 EXTERNAL REQUIREMENTS

Eveleigh Carriageworks, as part of the Eveleigh Railway Workshops complex, is the subject of various statutory instruments, which have an impact on the future uses, and management of the site. These are set out in the sections below.

HERITAGE LISTINGS

Eveleigh Railway Workshops, in their entirety, are listed on the following statutory and non-statutory registers:

- Listed as the Eveleigh Railway Workshops under the Heritage Act 1977, on the *State Heritage Register (SHR No 01140)*.
- Listed on the *State Rail Authority's Section 170 Heritage and Conservation Register*.
- Listed as the Eveleigh Railway Workshops on the *Register of the National Estate (RNE No 15903 & 5045103)*.
- Listed on the *National Trust Register*.

In addition, a number of heritage items in the Eveleigh Carriageworks have been individually listed as follows:

- The Eveleigh Chief Mechanical Engineer's Office and Chief Mechanical Engineer's Office Moveable Relics are separately listed under the Heritage Act 1977, on the *State Heritage Register (SHR Nos 01139 & 01230)*.
- The Administration Building, Former Chief Mechanical Engineer's office is listed under Schedule 4 Part 2 of *Sydney Regional Environmental Plan No 26 – City West* gazetted on 16 October 1992.
- As well as the general listing of the Eveleigh Railway Workshops machinery on the State Heritage Register, the individual items of machinery have been separately listed by the SRA as part of its *Section 170 Heritage and Conservation Register*.
- Various items of machinery have been included as part of the listing of the Eveleigh Railway Workshops on the *Register of the National Estate (RNE No 15903)*. The Eveleigh Chief Mechanical Engineer's Office and Chief Mechanical Engineer's Office Moveable Relics are also listed separately on the Register (RNE Nos 5014147 & 5012069).

Copies of the inventory sheets for the above items, except for the SRA Section 170, are in Appendix A.

The Eveleigh Railway Workshops complex has been the subject of four major studies, as follows:

- Eveleigh Railway Workshops Heritage Study Volumes I- IV – Don Godden and Associates 1996.
- White Bay to Blackwattle Bay - Central to Eveleigh Heritage Study Volume I Final Report and Volumes 2-4 Inventory - Godden MacKay 1990.
- Eveleigh Carriage Workshops Conservation Analysis - DPWS 1999.
- Eveleigh Carriage Workshops Site Inventory – DPWS 1999.

6.2.1 THE NSW HERITAGE ACT

THE STATE HERITAGE REGISTER

Items on the State Heritage Register are those items that have been identified as being of particular importance to the people of New South Wales, items that are of state significance or greater.

The Eveleigh Railway Workshops complex as a whole has been listed on the State Heritage Register. The following individual items are also listed on the State Heritage Register:

- Eveleigh Railway Workshop Machinery
- Eveleigh Chief Mechanical Engineer's Office
- Eveleigh Chief Mechanical Engineer's Office Moveable Relics

Copies of the State Heritage Register Listings are included in Appendix A.

APPROVALS UNDER THE HERITAGE ACT

Proposals that involve modifications to heritage items or places must be referred to the Heritage Council unless the works proposed fall within the type of work covered by the Standard Exemptions (under Section 57 of the Heritage Act) or Specific Exemptions, also under Section 57. The Minister for Planning can approve site specific exemptions, on the recommendation of the Heritage Council.

The standard exemptions relate to *maintenance works, repairs, painting, excavation, restoration and conservation*. They are primarily intended to cover routine and periodic maintenance works rather than the adaptive re-use of buildings. The complete standard exemptions prepared by the Heritage Office are included in the Appendices and can be found on the Heritage Office website.

The preparation of a Conservation Management Plan for items on the State Heritage Register is recommended best practice. It is of particular importance for a site of this significance and complexity to guide the long term conservation and management of the site as a whole and of its individual elements.

A Conservation Management Plan (following endorsement by the Heritage Council) can form the basis of a Specific Exemption under Section 57 of the Heritage Act (Exemption 6: Conservation Works). Conservation works undertaken in accordance with the Conservation Management Plan do not need to be referred to the Heritage Office. Approval of the Heritage Council, including the preparation of a Statement of Heritage Impact is still required. The Statement should demonstrate how the proposed works are consistent with the significance of the item or place and indicate how they meet the requirements of the Conservation Management Plan.

The documents, *Eveleigh Carriage Workshops Conservation Analysis* and *Eveleigh Carriage Workshops Conservation Policies and Site Inventory*, were prepared by Otto Cserhalmi and Partners in 1999. The information in these documents has now been updated and augmented by this 2002 Conservation Management Plan. Following acceptance by the SRA, it will be forwarded to the Heritage Office for endorsement by the Heritage Council as the basis and guide for the appropriate uses and development of the Eveleigh Carriageworks as a whole and its various component parts.

SECTION 170 REGISTER

Under Section 170 of the Heritage Act, each government instrumentality is required to establish and keep a *Heritage and Conservation Register* that details each item of the environmental heritage the agency owns or occupies.

The Eveleigh Railway Workshops have been on the SRA Register since it was established in the 1980s. Individual items of machinery were listed in detail separately by Godden Mackay in the mid 1980s. The majority of items of State Significance from individual Section 170 Registers have been included on the State Heritage Register. The overall listing and the listings for the Eveleigh Railway Workshops Machinery, the Eveleigh Chief Mechanical Engineer's Office and Chief Mechanical Engineer's Office Moveable Relics were updated for listing on the State Heritage Register on April 2, 1999.

Heritage Council approval is required for modifications to items of State Significance such as the Eveleigh Railway Workshops, unless the conservation works are in accordance with an endorsed Conservation Plan or Conservation Management Plan.

Following Heritage Council endorsement of the Eveleigh Carriageworks Conservation Management Plan, the SRA will not need to refer proposed conservation works to the buildings at the Eveleigh Carriageworks to the Heritage Office unless the proposal is contrary to the policies contained within this Conservation Management Plan.

In the recent amendments to the Heritage Act a new section has been added to Section 170: *Section 170A Heritage Management by Government Instrumentalities* that deals with management obligations of individual agencies.

If an agency intends to undertake any of the following actions regarding items listed on their Section 170 Register, they must give the Heritage Council 14 days notice regarding:

- removal of an item from the Section 170 Register
- transfer of Ownership
- ceasing to occupy an item currently on the Register
- demolishing an item.

Government agencies are obliged to ensure that heritage items on their registers are maintained with due diligence in accordance with State Owned Heritage Management Principles approved by the Minister, and with heritage asset management guidelines issued by the Heritage Council. The Principles and guidelines are in preparation and will be finalised later in 2002, and will be consistent with the State Government's Total Asset Management (TAM) Policy.

The current *Guidelines for the Preparation of Section 170 Registers*, issued by the Heritage Council of NSW, recommend that proposals involving alteration, disposal or demolition (in part or in whole) of items of state significance be referred to the Heritage Council through the Heritage Office. The Heritage Office is currently preparing updated guidelines for Section 170 Registers to reflect recent changes to the Heritage Act.

The updated guidelines will include:

- maintenance
- strategic Planning
- approvals Process (DA's &c)
- modifications
- disposal of properties

NSW GOVERNMENT TOTAL ASSET MANAGEMENT PROCESS

Heritage assets form part of the NSW government's resources to be managed under its Total Asset Management (TAM) process, within a NSW Government Planning Framework. The Department of Public Works and Services (DPWS) developed a Total Asset Management Manual, first released by the government in 1993, and most recently updated as TAM 2000.

As part of the assessment and decision tools in the TAM process, the DPWS has recently produced a *Heritage Asset Management Guideline* (DPWS Report No 01051 of January 2001). This document is available on the DPWS website at www.gamc.nsw.gov.au and gives guidance to government agencies on the integration of heritage into Asset Management at all levels from the strategic level through to routine maintenance.

The Guideline advises that *sustainable management of heritage items should be treated by an agency as part of its core business*. It also points out that problems and costs attributed to the use of heritage buildings are mostly due to backlog maintenance and past neglect rather than poor performance of the asset.

It gives guidance to agencies on the heritage management process, including identification of the assets, strategic planning, detailed planning, implementation and monitoring.

RELICS/OBJECTS

The Heritage Act affords automatic statutory protection to relics that form part of archaeological deposits. The Act defines a "relic" as "any deposit or material evidence relating to the settlement of the area that comprised New South Wales, not being Aboriginal settlement, and which is fifty or more years old".

Sections 139-145 of the Act prevents the excavation or disturbance of land from the purpose of discovering, exposing or moving a relic, except in accordance with an excavation permit issued by the Heritage Council of NSW.

However, as the site as a whole is listed on the State Heritage Register, an approval under Section 60 is required for any work, which includes archaeological requirements.

The terminology for Aboriginal cultural material is currently undergoing some changes. Please refer to "Aboriginal Sites and Relics/Objects" p 280 - 281.

ARCHAEOLOGY

An archaeological report was prepared by Austral Archaeology for the NSW Department of Public Works and Services in November 2000, entitled *Archaeological Assessment of the Eveleigh Carriage Workshops Site*. The report stated that the site clearly varied in height prior to the construction of the place and that changes were made to site levels due to the cutting into the hillslope below Wilson Street (p 12). It concluded that:

- the cutting and levelling that had taken place militate against the likelihood of any Aboriginal artefacts or site surviving below the historic phase developments. The archaeological potential for Aboriginal sites or artefacts is therefore considered to be low (p 15);
- due to subsequent development, the archaeological potential for early historic sites (Calder House and outbuildings) is therefore considered to be nil (p15);
- varying demolition practices over the years mean that the archaeological potential for railway-era building sites is therefore considered to range from nil to high (pp15-16);
- due to the industrial nature of the site and reuse of machinery, the archaeological potential for railway-era artefacts is therefore considered to be low (p16);
- below ground features (drainage, inspection pits) are likely to have survived, and the archaeological potential for railway-era below ground services is therefore considered to be high (p16).

MINIMUM STANDARDS FOR MAINTENANCE AND REPAIR

Section 118 of the Act enables the Regulations to the Act to impose minimum standards for maintenance and repair of a building, work or relic that is listed or is within a precinct that is listed on the State Heritage Register in relation to the following matters:

- the protection of the item from the weather
- the protection of the item from damage or destruction by fire
- security
- essential maintenance and repair.

Section 119 of the Act sets out penalties in relation to the failure of owners to comply with Section 118.

The minimum standards imposed under Section 118 of the Act are set out in the Heritage Regulation 1999 entitled *Part 3 Minimum standards of maintenance and repair*. Clause 11 of the Regulation requires regular inspections to be undertaken to ensure that the standards are met. Clauses 12, 13, 15 and 17 set out standards in relation to weather and fire protection, security and essential maintenance and repair, while clauses 14 and 16 set out additional measures that are required in relation to fire protection and security for unoccupied buildings.

Clause 18 provides that a conservation plan endorsed by the Heritage Council may vary these standards in relation to a particular item by providing that a standard does not apply, or by imposing additional standards.

STATE HERITAGE INVENTORY

The State Heritage Inventory lists some 20,000 heritage items which have been identified on statutory heritage schedules such as those contained in LEP's and REP's. It is an electronic database that can be accessed via the NSW Heritage Office homepage <http://www.heritage.nsw.gov.au> to check heritage listings throughout the State.

6.2.3 THE NATIONAL PARKS AND WILDLIFE ACT, 1974

ABORIGINAL SITES AND RELICS (OBJECTS)

In addition to other environmental and land management matters, the National Parks and Wildlife Act also includes provisions that apply to Aboriginal sites and objects. If Aboriginal cultural material is found during excavation activity, the National Parks and Wildlife Service must be informed under section 91 of the Act. Excavation would then require a permit issued under section 90 of the Act. An Aboriginal Archaeological Survey has not been undertaken for this site.

The report on historical archaeology prepared by Austral Archaeology however, stated that the site clearly varied in height prior to the construction of the place and that changes were made to site levels due to the cutting into the hillslope below Wilson Street (p 12). It concluded that evidence of Aboriginal occupation would be low (see "Archaeology" previous page).

The National Parks and Wildlife Act has recently been amended. The new provisions come into effect in June 2002 although the printing of the amendments has not been finalised. Two changes are relevant. The first is that the word *knowingly* has been removed and the word *desecrate* added. Additionally, *relic* has been replaced with *object*.

Thus Section 90 (1) now reads: *A person must not destroy, deface, damage or desecrate or cause or permit the destruction, defacement, damage or desecration of an Aboriginal object or Aboriginal place.*

The other change is that *cultural heritage*, which includes Aboriginal heritage, will form one of the grounds for a Stop Work order issued under the Act.

Section 90(1) pre 2002 amendment: A person who, without first obtaining the consent of the Director-General, knowingly destroys, defaces or damages, or knowingly causes or permits the destruction or defacement of or damage to, a relic or Aboriginal place is guilty of an offence against this Act.

6.2.4 AUSTRALIAN HERITAGE COMMISSION

The Australian Heritage Commission is a Commonwealth Government Agency that compiles and maintains the *Register of the National Estate*, an inventory of places of natural and cultural significance in Australia. The basis for assessment of significance is the methodology and terminology of the Burra Charter.

The Eveleigh Railway Workshops complex was added to the Register of the National Estate in 1988.

A copy of the Register of the National Estate database entry for Eveleigh Railway Workshops is included in Appendix A.

Whilst inclusion on the *Register of the National Estate* imposes obligations on Federal Government bodies and federally funded projects, there is no obligation on State Government agencies. The inclusion of a place on the *Register of the National Estate* however, draws the attention of heritage authorities to its significance.

6.2.5 THE NATIONAL TRUST OF AUSTRALIA (NSW)

The National Trust of Australia is a non-government community based organisation, established in 1945, and incorporated by an Act of Parliament in 1960, dedicated to the conservation of Australia's heritage.

Although the National Trust has no statutory power it has a strong influence on community support, particularly with regard to a possible threat to a structure or place from insensitive development or the destruction of items of cultural or natural heritage significance.

The National Trust actively lists buildings, conservation areas and landscape elements on its register. Other statutory registers, particularly the Register of the National Estate, have used the National Trust listing as a basis of information for compiling their inventory sheets.

A listing for the Eveleigh Railway Workshops was approved by the trust in March 1986. The listing card specifies the Locomotive Workshops, the Works Managers Office, the General Manager's Office, the Carriage Workshops Building, the Paint Shop, the Trimming Shop, and various items of equipment as significant.

Proposals for the sale, leasing or adaptive re-use of any part of the site and/or buildings will be closely scrutinised by the National Trust who will seek to ensure proposals do not impact on the cultural significance of the place.

6.3 PLANNING ISSUES

6.3.1 DEPARTMENT OF PLANNING

The Eveleigh Railway Workshops site was identified as being of regional significance in the early 1990s and was one of four precincts included in Sydney Regional Environmental Plan No 26 – City West (SREP 26) – the Eveleigh precinct. Under this plan, the precinct is zoned as *Special Purposes – Railways*.

Clause 14 identifies South Sydney Council as the consent authority for development in the precinct. However, where a Master Plan is required, the Minister is the consent authority for land that he has not been declared a completed Master Plan site, or where the development proposed is not a “strata or neighbourhood scheme subdivision”. Clauses 40 – 48A of SREP 26 set out the requirements for a Master Plan.

In April, 2000 the Director General of the Department of Urban Affairs and Planning wrote to South Sydney Council advising that it would be appropriate for the Council to prepare a new Local Environmental Plan for the site. The letter further advised that the LEP should generally comply with SREP 26, especially clauses 11 and 15, which articulate planning principles for City West generally and for the Eveleigh Precinct in particular. It further advised that *a Master Plan or Development Control Plan could be prepared detailing the planning, urban design, public domain, traffic management and infrastructure solutions for the site*. While general support was indicated for the option E *Master Concept Plan* prepared by DPWS in 1998, it recognised that a number of issues required further examination, including *thorough heritage assessments, contamination and remediation, traffic issues, urban design details and thorough community consultation*.

On behalf of the State Rail Authority who own the site, the Department of Public Works and Services has engaged JBA to prepare a Master Plan for the site.

A draft report, dated November 2000, *Eveleigh Works – Rezoning and Master Plan Submission* has been prepared, which includes a draft local environmental plan (LEP) and development control plan (DCP), and was recently informally exhibited. Heritage Office and South Sydney Council comments on these documents are currently under consideration and it is anticipated that revised Master Plan, DLEP and DCP will be submitted in the near future, with a formal exhibition later in 2002.

The site is proposed to be rezoned from *Railways* under SREP 26 Amendment No 1 – Eveleigh Precinct to *Zone No 10 – the Mixed Uses Zone* as an amendment to South Sydney LEP 1998. A copy of the zoning controls for this zone is attached in Appendix 1.

NOTE: The objectives and identified uses for the zone do not refer to any of the cultural uses currently envisaged for the reuse of the major heritage buildings on the site, nor does it include any heritage objectives. Review?

DRAFT STATE ENVIRONMENTAL PLANNING POLICY

NO 66 – INTEGRATING LAND USE AND TRANSPORT

The Draft State Environmental Planning Policy (SEPP) and the accompanying information – *Guidelines for planning and development* – form part of a State government strategy to direct growth and change in ways that are economically, socially and environmentally sustainable. The SEPP aims to influence the travel and transport patterns in this regard, and applies to all stages of planning and development in urban areas in NSW.

The general objectives of the draft SEPP are to:

- better integrate land use and transport planning and development
- provide transport choice and manage travel demand to improve the environment, accessibility and liveability.

Specifically, the draft SEPP will help to:

- reduce growth in the number and length of private car journeys
- make walking, cycling and public transport use more attractive.

The guidelines set out principles and criteria to assist in achieving the above aims, and expand on various issues in relation to their implementation.

Some aspects of the guidelines, which are particularly relevant to the Eveleigh Carriageworks, are set out below:

- Studies of land capability and opportunity should consider accessibility as a major criterion for assessment, especially access by public transport
- DAs and proposals need to be accompanied by sufficient information for councils or other consent authorities to make informed decisions on likely transport outcomes
- public transport access should be designed and managed to provide lighting, shelter and safety
- good use should be made of existing public transport infrastructure
- parking policies should support location and urban design policies that seek to improve access by walking, cycling and public transport, and be explicit in their desire to moderate the growth in car use
- parking requirements should seek a balance between satisfying a proportion of demand, on-site parking, addressing car reduction objectives and minimising the spread of parking into surrounding areas.

6.3.2 SOUTH SYDNEY COUNCIL

Development in South Sydney Council area is controlled under South Sydney LEP 1998. This plan has been updated and amended to include the heritage LEP made in July 2000. The Eveleigh Railway Workshops complex is excluded from the operation of the plan.

Following acceptance of the Master Plan DLEP and DCP for the site and the gazettal of the LEP, South Sydney Council will be the consent authority for the Eveleigh Carriageworks site.

The LEP will repeal SREP 26 as it applies to the site and will amend South Sydney LEP 1998, inserting any special provisions for the site into the plan as required. Likewise, the DCP for the site will take the place of the Eveleigh UDP when gazetted.

SOUTH SYDNEY LEP 1998

Clauses 22-27 are the heritage clauses in the LEP. They are standard heritage provisions based on those applying at the time the plan was prepared, except for clause 22B, which provides that Council may require a *Statement of Heritage Impact* for buildings over 50 years old.

Development consent is required under clause 23(1) for a heritage item and clause 23 A1 for development in a conservation area.

Schedules 2 Heritage Items, 2A Heritage Conservation Areas and 2B Heritage Streetscapes list the heritage of the council area protected under the LEP. The Eveleigh Railway Workshops complex is currently excluded from the provisions of the plan. However, *Clause 24, development in the vicinity of heritage items and heritage conservation areas*, will apply to development proposals in Eveleigh, as heritage conservation areas surround the Eveleigh Carriageworks to the west, north and north east, namely Darlington, Golden Grove and the Pines Estate Heritage Conservation Areas. These are listed in Schedule 2A of LEP 1998 and shown on Sheet 2 of the LEP maps entitled Heritage Conservation. There are no individually listed heritage items on the streets facing the site.

There is no provision for buildings newly added to the South Sydney LEP 1998 Heritage Schedule to discount floor space to encourage their retention. Clause 26(3) only applies to items listed in the LEP prior to the heritage amendment to the plan made on 28 July 2000.

SOUTH SYDNEY DCP 1997 – URBAN DESIGN

South Sydney Development Control Plan 1997 – Urban Design aims “to provide detailed design and environmental standards, to illustrate the urban development objectives embodied in South Sydney LEP 1998 to achieve a high quality built environment with a proper balance between development, conservation and environmental sustainability”.

The plan is divided into 7 parts:

- Part A – General information
- Part B – Urban design principles
- Part C – Public domain
- Part D – Design criteria for social planning
- Part E – Environmental design criteria
- Part F – Design criteria for specific developments types
- Part G – Special precincts

In Part B, Eveleigh is identified as a “new growth area around railway stations and on large redevelopment sites” on *Map 2 Development Context*, and as a landmark site in *Map 3 Settings* which also identifies ridges and vantage points and views from the surrounding areas.

Part C sets out requirements for the Public Domain “the shared urban areas and spaces, the structures that relate to those spaces and the infrastructure that supports and serves them” (p 23). It identifies through-site links required into and through Eveleigh from the surrounding areas in the *Map 6 Erskineville – Alexandria Public Domain Plan*. This plan also identifies buffer zones – “densely landscaped open space setback along the edge of the railway yard and rail lines” which is shown around the whole perimeter of the Eveleigh site.

Part G – Special Precincts identifies more detailed controls for areas of particular quality/type. These include Rosebery, Ultimo, Alexandra Canal, and the Former Royal Alexandra Hospital for Children, Camperdown. More recently, special area controls have been developed for Chippendale and William Street.

The DCP being developed for Eveleigh could be inserted into this section of the South Sydney Urban Design DCP when it is finalised.

EXEMPT AND COMPLYING DEVELOPMENT

South Sydney Council has adopted the *South Sydney Development Control Plan 1999 - Exempt and Complying Development*, which sets out criteria for exempt and complying development under the Environmental Planning and Assessment Act 1979, and contains Council's development standards and requirements for exempt and complying development.

Exempt Development – Part B of the DCP sets out the criteria for development which can be carried out without development consent and also identifies development that is not exempt development. On page 2 it states that development is NOT exempt development if it is carried out on land that is a heritage item identified in an EPI or to which an order under the Heritage Act applies. Thus, under South Sydney Council's controls, exempt development would not be able to be carried out on the Eveleigh Carriageworks.

Complying Development – Section 76(3) of the Environmental Planning and Assessment Act 1979 identifies land on which complying development cannot be carried out. This includes *land that comprises, or on which there is, an item of environmental heritage to which an order under the Heritage Act 1997 applies or that is identified as such in an environmental planning instrument.*

Thus, complying development cannot be carried out on the Eveleigh Carriageworks.

Part C of Council's DCP sets out criteria for development that may be carried out if a complying Development Certificate is obtained from either council or an accredited certifier. This includes development that *is located behind the front building alignment of any building on the site on which it is proposed to be carried out, if that site is located in a heritage conservation area or heritage streetscape identified in an environmental planning instrument.*

Thus, complying development may be carried out behind the front building alignment in the heritage conservation areas listed in Schedule 2A in the South Sydney LEP 1998 in the areas surrounding the Eveleigh Carriageworks. There are no heritage streetscapes identified in these areas.

SOUTH SYDNEY DEVELOPMENT CONTROL PLAN 11 - TRANSPORT GUIDELINES FOR DEVELOPMENT 1996

The document, South Sydney City Council DCP 11 Transport Guidelines for Development 1996, identifies council's transport planning objectives including:

- To encourage a reduction in the level of vehicular travel in South Sydney by reducing parking requirements and improving facilities for pedestrians, cyclists and public transport users
- To ensure that an acceptable level of parking is provided in-site to minimise the unreasonable overflow of parking onto surrounding streets
- To ensure that all modes of transport are adequately considered for new developments and needs of pedestrians, cyclists and public transport users are met.

This is in line with the draft SEPP 66 – Integrating Land Use and Transport outlined above.

SOUTH SYDNEY (HERITAGE CONSERVATION) DEVELOPMENT CONTROL PLAN 1998

The DCP supplements the heritage controls in South Sydney LEP 1996 and establishes the framework for detailed conservation planning. It sets out council's requirements for a Statement of Heritage Impact, which is required for all work on heritage items except if a minor change is involved (pp 19-22), for Conservation Plans (pp 23-24), for Demolition Reports (pp 24-25) and for Archaeological Assessments (p 26).

6.3.3 BUILDING HEALTH AND SAFETY REQUIREMENTS

BUILDING CODE OF AUSTRALIA

Development on the site should confirm to the relevant sections of the BCA, according to the proposed future use of the site. The site contains numerous buildings, which would require the addition of services to upgrade them to BCA standards to enable future public use and access.

The requirements for compliance with the BCA are based on the Class of the building. The classification of the building is determined by the purpose for which it is adapted to be used. Where parts of the building have different purposes, each part of the building must be classified separately.

Where compliance with the BCA may compromise the architectural integrity of the building and diminish its cultural significance, dispensation may be sought through the Fire Advisory Panel of the Heritage Council. The BCA does not necessarily apply to existing buildings and discretion may be used in its application to existing buildings.

OTHER RELEVANT LEGISLATION

Proposed uses may require conformity with other legislation, depending on the activities, the type and scale of uses and the level and type of public access proposed. This could include requirements relating to occupational health and safety, to places of public entertainment, provision for disabled access and services and commercial catering.

6.4 CLIENT REQUIREMENTS

State Rail is the owner of the site and all the buildings. State Rail has declared the majority of the Eveleigh Carriageworks as surplus to its operating needs. State Rail has an overall brief from the State Government to reduce operating costs and dispose of sites that are no longer required.

PROPOSED USES OF THE HERITAGE BUILDINGS

The future use of the site has recently been under consideration by the State Government. A decision has been made to transfer the Carriage Workshops and the Blacksmiths' Shop from State Rail to the Arts portfolio after the site has been remediated. State Rail will undertake the remediation of the whole site. It is proposed The Ministry for the Arts will contribute to the remediation costs of the Carriage Workshops, and Blacksmiths' Shop.

The Carriageworks is proposed to become a new inner city performing arts hub providing a permanent home for a number of small companies specialising in physical theatre. In addition to offices and rehearsal studios, a contemporary performance space is also planned for the site. The proposal will bolster the work and future of arts companies that have either had to make do with inadequate accommodation or have felt isolated from the arts community.

The Paint Shop and Suburban Car Workshops will be upgraded to house key heritage rollingstock and associated rail moveable heritage. Display in an "open day" arrangement will be available to the public and to railway enthusiasts in a limited way.

The other parts of the site will be developed for residential and some commercial use.

6.4.1 CURRENT USES OF THE SITE

Part of the site and existing buildings are required for continued State Rail use as follows:

- Access to operational rail lines which require a 10 metres set back for safety and acoustic isolation reasons.
- Continued use of the Telecommunications Equipment Centre buildings (former Electrical Workshop).
- Continued use of Scientific Services Building No. 1 (former Materials Testing Laboratory).
- Paint Shop – State Rail Heritage Unit Store houses moveable rail heritage, which is managed by the State Rail Heritage Supervisor. This includes rolling stock, furniture, signage, small objects, paintings, books and some documents from all over the State. An internal wall, along the centreline of road 2, separates the Paint Shop. Roads 0 and 1 provide a workshop area where restoration work to historic electric trains is carried out by Historic Electric Traction on a voluntary basis.
- Suburban Car Workshop – part used also for storage of moveable rail heritage, the building also houses a tunnel “mock-up” used by State Rail Fire Service for training purposes. The fan of tracks, head shunts and points are all owned and operated by State rail for the purpose of moving heritage rolling stock into the Paint Shop and Suburban Car Workshop.

In addition, there are a number of temporary current uses and leases on parts of the site, as follows:

FIRE PROTECTION AND DRUG EVALUATION BUILDING

- ground floor occupied by the Drug Evaluation Unit of State Rail.
- first floor occupied by Fire Protection Services, a unit of State Rail.

FIRE BRIGADE SHED

- occupied by Fire Protection Services.
- Fire Brigade and Drug Evaluation Unit will be relocated in accordance with the development timeframe.

CLOTHING STORE

- Still used by the State Rail for storage and issue of rail uniforms. The State Rail clothing store functions will be relocated in accordance with the development timeframe.

CARRIAGE WORKSHOPS

- Belvoir Street Theatre has a lease over Bays 21 – 25 of the workshop building to 24 March 2005.
- SOCOG leased the eastern end of the Carriage Workshops building for a period prior to the Sydney Olympics from State Rail and concreted over some of the internal rails.
- Ristwood Pty Ltd has leased the Bays 16 – 20 for film set construction and storage to 11 April 2003.

BULK STORE

- Leased to Hallabar Pty Ltd until 25 February 2003 for storage, workshop and truck parking.

CABLE STORE

- Currently vacant. Available for short term lease to appropriate users.

FAN OF TRACKS

- Roads 9, 0, and 3 or 4 were upgraded for the Matrix.
- The rest of the rails in the Fan of Tracks require maintenance also. The sleepers need to be replaced. The drains are blocked so the tracks get flooded.

CME's BUILDING

- Currently partly occupied by State Rail for record storage.
- Available for short term lease until such time as State Rail has funds to restore adaptive reuse as potential offices or other appropriate use/s.

The terms of the leases vary. Generally, there is a requirement to obtain consent for any work or change to the building. The lessee also has responsibility for maintenance and repair, cannot sublet any space without the written permission of the lessor, must comply with current and future legislation applying to the building and is required not to interfere with and to maintain existing drainage and water supply. The 1996 lease to the Belvoir Street Theatre however, does not appear to contain any of these clauses for the safeguarding of the building.

6.5 FUTURE USES OF THE PRECINCT

6.5.1 COMPATIBLE USES

INTRODUCTION

Compatible uses are those that have minimal affects on the cultural significance of the place. Uses should be selected to suit the space rather than the space being modified to suit the use.

There are many different types of buildings and elements on the Carriageworks and compatible uses will differ with each building, element, space or typology.

The International significance of the Eveleigh Carriage Workshops relies on its physical and visual associations with the former Locomotive Workshops, now the Australian Technology Park and is set out in *Section 5 Analysis and Statement of Significance*. In order to maintain the association between the two sides of the Eveleigh Railway Workshops complex, new uses for the site should not only be compatible with the history of the workshops but also between the two former workshops. This association can be maintained in the presentation of the public spaces and in the fitouts of the retained structures.



SCHLUMBERGER FACTORY, MONTROUGE FRANCE, FORMER ELECTROMAGNETICS FACTORY

The former electromagnetics factory at Montrouge was transformed into a housing and retail complex. The single storey building in the centre of the former factory complex has been removed and replaced with a large park that hides parking for 1000 cars beneath it. In addition, the park covers a restaurant, bar, bank, travel agency, sports facility, auditorium, projects room, conference room and administration headquarters, all accessed via the tent structure in the centre. Source: Richter Greer 1998, pp 126, 127.

APPLICATION AT EVELEIGH

This example is used to illustrate how the entire Eveleigh Carriage Workshop precinct can be designed to retain its industrial aesthetic, while providing housing and green space within a circumscribed area.

The technological innovations in the design and construction of the workshops on both sides of the main rail line are what remain of the physical evidence of the importance of the government venture in rail transport. The sophisticated lines of the facade and the even spacing of the pediments, columns and panelling are repeated along the length of the buildings on both sides of the main line, which are deliberately placed in order to be a visual signal, or 'gateway' into the city. Today, the former Carriage and Locomotive Workshops are still part of a visual pair heralding the southern entrance into the Sydney CBD.

It is imperative then, that the exterior treatment of the buildings on both sides of the rail line are consistent. Note that this does not mean exactly the same, but that the aesthetic of both sides are sympathetic with each other. Therefore, the landscaping and signage of the former workshops should not deviate significantly from each other. The public domain treatment and interpretation of the Carriage Workshops should be related to that of the entire former Eveleigh Workshops site in order for the sites to retain their original associations.

Active rail use should be encouraged and other new uses should not have needs which limit the ability to have active rail use. New uses that are intolerant of the noise and dirt of rail movements and activity are not compatible.

Where facilities, ancillary services etc. are needed to support new uses they should not infill significant open spaces or require demolition of significant elements of the site. There are opportunities for the accommodation of such functions in modern structures in open spaces adjoining buildings or where buildings have already been removed. Such additions provide opportunities for architecturally stating the identity of new functions rather than by altering heritage buildings.

Historically, rail vehicles predominated on the site with few road vehicles. Ideally uses should not generate large numbers of road vehicles that will dominate the site with road and parking requirements. If necessary, underground parking that avoids subsurface features can accommodate cars without dominating the site.

CRITERIA FOR THE ASSESSMENT OF COMPATIBLE USES

The following criteria could be used to evaluate a compatible use.

- The cultural significance of the site is not compromised
- The new use is sympathetic to the significance of the site
- The relationship between the industrial settings and individual spaces and buildings is retained and these elements are conserved and enhanced
- Significant fabric is retained
- The proposed use does not result in unacceptable levels of wear and tear
- The proposed use does not result in major traffic generation and complies with traffic management and parking requirements
- The proposed use incorporates modern services that do not damage or compromise significant fabric or spaces
- The proposed use does not result in a fair degree of change and intrusion
- The proposed work is reversible
- The open characteristics of large spaces is maintained

In addition the proposed uses should allow for:

- Interpretation
- Site visitation
- Traditional site circulation
- Retention of machinery and moveable heritage
- Retention of services
- Retention of spaces between buildings

(See design examples overleaf)



TINDECO WHARF, BALTIMORE, MARYLAND USA

Now known as “Harbor [sic] Place” this former industrial complex that housed the Tin Decorating Company and built in 1914, has been turned into a combined residential and retail complex. The original powerhouse of the factory has been turned into a restaurant and the spaces on either side have been transformed into greenspace and a pool. The complex was developed successfully after being abandoned for almost 25 years.

APPLICATION AT EVELEIGH

Once again, this example illustrates the potential for high quality housing and retail on former industrial sites while retaining the industrial railway aesthetic that defines the Eveleigh Precinct. Note the minimal landscaping in the top left photo that is the preferable option for greenspace on the site. Source: Richter Greer, 1998: 136-138.





NAVY PIER, CHICAGO, ILLINOIS

This pier, built to extend over Lake Michigan in 1916, catered for social events as well as the usual freight and passenger boats. New buildings have been designed to recall the architectural forms of the former freight sheds with one noticable feature - glass walls to allow views across the site and into shops and restaurants. Source: Richter Greer 1998, pp. 184, 186 & 189.

APPLICATION AT EVELEIGH

The large-scale use of glass to maximise views across the site or within the buildings themselves. The use of modern tension structures to house new functions clearly distinguishes them from the historic. Although the nautical landscaping at Navy Pier is inappropriate for Eveleigh, the many uses such as entertainment, retail, restaurants and housing is a combination that could be easily supported on the site.



CARRIAGE WORKSHOP & PAINT SHOP

The Carriage Workshops and the Paint Shop are Victorian era industrial buildings. Their character, significance and fabric are described in previous sections of the CMP and the Inventory. Preferred and compatible uses will maintain the open nature of the spaces and the views and vistas through bays as well as the significant items such as the existing rail lines, machinery, cranes, interior and exterior fabric and services.

A survey of the reuse of railway and former industrial buildings of this type and configuration show a wide range of possible compatible uses. These include railway museums, art museums, performance spaces, film and TV workshops, exhibition spaces, theatres and cinemas. Further examples are gymnasiums and sports facilities such as basketball and tennis courts. In addition, light industry, warehousing, and storage are also acceptable and can either be permanent or temporary.

An industrial use (similar to the type and intensity of former railway uses) is most in keeping with the character and the significance of these buildings and the workshop precinct. Uses that subdivide the spaces and require a greater degree of intervention in the fabric are not compatible with the significance of the place. Incompatible uses include residential and corporate facilities, both of which require many small rooms.

Preferred Uses

Industrial - Industrial uses, similar in scale to the former uses would enhance the significance of the place. These uses should allow site visitation.

Railway Museum - A railway museum that pertains to Eveleigh and is linked to the Powerhouse and other regional museums would be a preferable and compatible use for the Carriage Workshops and the Paint Shop.

Performance Spaces, Theatre & Film Facility - These uses are compatible, if they require spaces of the size available within the buildings, particularly if they are at the lower end of the production process. Providing that these uses do not require a high degree of environmental control that would result in a high degree of intervention in the fabric, facilities that are lightweight and reversible could be provided.

Sports Facilities - This use could be short term or long term and would require little intervention. The fitout should be reversible.

Storage - Warehousing is not the “highest and best use” and does not allow public appreciation and visitation. In the short term however, and/or between uses, storage could be appropriate especially as little intervention would be required.

Art/Studios - These uses are compatible. Facilities that are light weight and reversible could be provided. Although revenue may not be high, conservation and restoration costs can be minimum.

Art Museum & Museum Uses - Examples of museums that have been successfully established in former railway buildings and industrial buildings are the Musée d'Orsay in Paris, the Tate Modern at Bankside in London and the Launceston Railway Museum, which is part of the Queen Victoria Museum and Art Gallery in Tasmania. The success of these projects is the quality of the contemporary design by leading architects such as Gae Aulenti, Herzog and de Meuron, the retention of the spatial quality and the innovative use of materials. These are shown as examples in this section, demonstrating general principles for adaptation. The success will depend on the type of material displayed. Environmental control needs vary and devices such as glass envelopes may have to be employed as part of the design. However, in order to realise projects such as these a considerable budget is required.

Mix Of Uses - Mixed uses of these buildings, and the workshop precinct may be satisfactory as a short or long term option. Ideally they should be interrelated and allow interpretation and visitation of the site.



FORMER POCKLINGTON STATION, HUMBERSIDE UK

The former Pocklington Station is shown (above) after it ceased operating for the railways. On the right is a photo showing the station after it had been transformed into a sports hall for use by the local school. Source: Binney & Pearce 1979: 220, 221

APPLICATION AT EVELEIGH

The bays in the Carriage Workshop and the Paint Shop are of similar proportions to the former station. The photograph shows the potential the buildings have for any type of use that requires large spaces with minimum intervention to the fabric.

CME's BUILDING

The CME's Building is a late Victorian office building. The building is prestigious, decorative and detailed in contrast to the industrial character of the rest of the site. Its character, significance and fabric are described in previous sections of the CMP and the Inventory.

Preferred and compatible uses will maintain the nature of the internal layout, decorative detail, finishes and fitouts and should only remove fabric that is identified as intrusive. Similarly this principal applies to the exterior. Views and vistas from Wilson Street and the railway precinct should be considered when carrying out works to and around this building.

Preferred and compatible uses will retain fabric that shows the different construction phases. New uses will allow the reconstruction of the garden in its planned form and retain the curtilage with appropriate boundary fencing. New uses should maintain the site entry adjacent to the building which is the traditional entry and allows the enjoyment of the garden.

The building should retain its traditional name for any new use and the CME's precinct should be under one control.

Preferred Uses

Continued office use by the railways - This is preferred because the building has a long association with the railways and was the centre of its high level administration.

Commercial offices - The building is suitable for commercial office space if the structure or arrangement of the office accommodation fits with the traditional use of the building, and involves little or no change to the place. Commercial uses could include a small government department; university related office space, legal offices etc.

Institutional use - An institutional use of the building would be acceptable if it involved little or no change to the place.

Incompatible uses - Uses that require larger spaces and intervention in the fabric for adaptation are not preferred uses.

Residential use is an example that is not compatible.

THE BLACKSMITHS' SHOP

The building is significant as a late 19th century, early 20th century factory building for its construction techniques, in particular, the riveted trussed roof of the building, the counter trusses which reduce the need for extra columns, the brick wall and returns. Additionally, evidence of the former wall sashes and winding system, the former line shafts and former blacksmiths' equipment, all contribute to the significance of the Blacksmiths' shop. The retaining wall to Wilson Street predates the building and extends past it.

The blacksmiths' building is a very important element in the workshop precinct. The building's fabric demonstrates most of the themes of the place and spatially it defines the street. The opportunity exists for adaptive reuse providing the significant fabric is retained.

Preferred Uses

See also *Preferred Uses for the Carriage Workshops and Paint shop*.

Commercial (partial of whole) - The building is suitable for an adaptatng it to commercial use particularly on the Wilson Street level. The rail level could also be commercial, or used as office space for the administration or relevant function associated with the Carriage Workshops use.



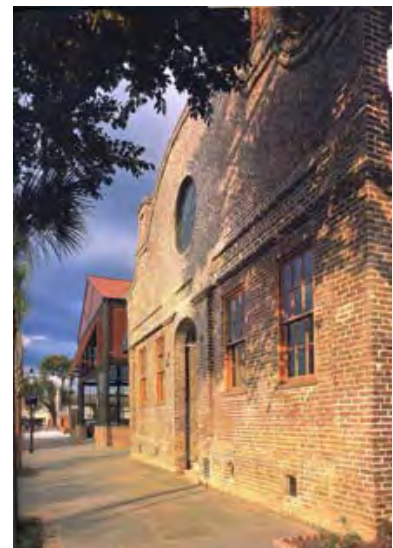
VISITOR CENTRE, CHARLESTOWN, SOUTH CAROLINA, USA

ADAPTIVE RE-USE

The photograph shows the adaptive re-use of former railroad buildings. The timber structure has a modern facade treatment which is sympathetic to the character of the building. It functions as an open bus shed. Source: Richter Greer 1998: 152, 155.

APPLICATION AT EVELEIGH

At Eveleigh this treatment is suitable for parts of the Blacksmiths' Workshop and the Timber Shed Extension.



GENERAL STORE BUILDING

The building is a robust structure and capable of adaptation. The external envelope is capable of interpretation as part of the Carriageworks. Much of its significance is likely to be in its history of use as a hostel rather than in the fabric itself.

Preferred Uses

The building is suitable for commercial use with open plan spaces.

The building is also suitable for residential use, and conversion is acceptable if significant fabric is retained. This may be the preferred option as the building is on the western end of the site adjacent to the proposed residential development zone.

TRAVERSER – NO 1

The traverser is integral to understanding of the workings of the site. It is to be retained as an operational piece of machinery. When not in operation the space may be used.

Preferred Uses

To be retained as open space as is with machinery in operation and tracks preserved and retained *in situ*. Landscaping should not be introduced. Conceptually the traverser space can be considered as a European piazza space.

TRAVERSER – NO 2

The traverser has considerable significance for the understanding of the workings of the site.

Preferred Uses

To be retained as open space as is with the static machinery and tracks preserved and retained *in situ*. Soft landscaping should not be introduced. Conceptually the traverser space can be considered as a European piazza space or can be used for vehicular traffic.

THE ELECTRICAL WORKSHOP - TELECOMMUNICATIONS EQUIPMENT

The building has a historic and continuous use for telecommunications. The building has the potential for the interpretation of other uses on the site apart from the carriage construction. It is noted that the interior has original moveable fitout and fixtures which have considerable significance.

There should be no subdivision of the spaces. However intrusive fabric nominated in the Inventory can be removed.

Preferred Uses

These are set out in order of preference:

- a railways telecommunications use
- continuation of a telecommunications use or a use that is closely related even if it is not by the railways
- commercial uses or possibly some retail uses providing the industrial interior is maintained.

SCIENTIFIC SERVICES BUILDING - MATERIALS TESTING LABORATORY BUILDING

The adaptive reuse of this building is constrained by the significant interior fitout and fixtures. The key areas of fitouts should remain intact. At present it is functioning in its original capacity as a lab and this is proposed to continue.

Preferred Uses

The preferred use is the ongoing use of the building by the railways. Other possible uses are commercial, scientific uses which could utilise at least some of the fitout. Should this not be possible, the building could be a museum or interpretation centre, with partial office use as an adjunct to a site interpretative facility.

6.5.2 DESIGN PRINCIPLES FOR NEW WORK

EVELEIGH CARRIAGE WORKSHOP PRECINCT

The site is a very large flat area at rail level formed by a cutting along most of Wilson Street. Only the CME's and Scientific Services buildings are at the higher level, addressing Wilson Street. The Trimming Shop that was also on the higher level. The remainder of the site presents a fence or brick wall (the back of the Blacksmiths' Shop) to the street. Design of development should aim to treat the site as a whole so that the original extent of the site remains obvious. This requires consistent design themes and details over various developments and may need overall design control via a DCP, covenant or lease conditions. Throughout the lower part of the site, rail level was the generator of the original design and should also inform new design. The repetitive, rhythmic facades of the Carriage Workshop and Paint Shop are a significant design feature, which should be referred to in new work, although not copied. Similarly the sweep of the rail lines, by and through the site, can be picked up in large new buildings.

DESIGN PRINCIPLES FOR THE NINETEENTH CENTURY BRICK INDUSTRIAL BUILDING – THE CARRIAGE WORKSHOP, THE PAINT SHOP & THE BLACKSMITHS' WORKSHOP

The Carriage Workshop, the Paint Shop and the Blacksmiths' Workshop are nineteenth century industrial buildings with large open bays. Conservation management principles for these buildings include policies for the retention of these open spaces and for the retention of views and vistas within these spaces.

The following section illustrates how design of adaptive reuse works in the interiors of the Carriage Workshop, and Paint Shop can be implemented according to the conservation management principals. These principles also apply to the Suburban Car Workshop.

The current proposed use for the Carriage Workshops and the Blacksmiths' Workshop is for a performing arts complex including, rehearsal spaces (open spaces), rehearsal studios, offices and a contemporary performance space.

The current proposal for the Paint Shop and Suburban Car Workshop is to house key heritage railway rolling stock with display in an 'open day arrangement' which will be available to the public and to railway enthusiasts in a limited way.

The design of infrastructure for such offices, barriers and interpretation centres should be sympathetic to the character of the place. They should be a contemporary interpretation of the industrial / engineering aspects of the building without being an overtly fashionable architectural design statement (which dates quickly).

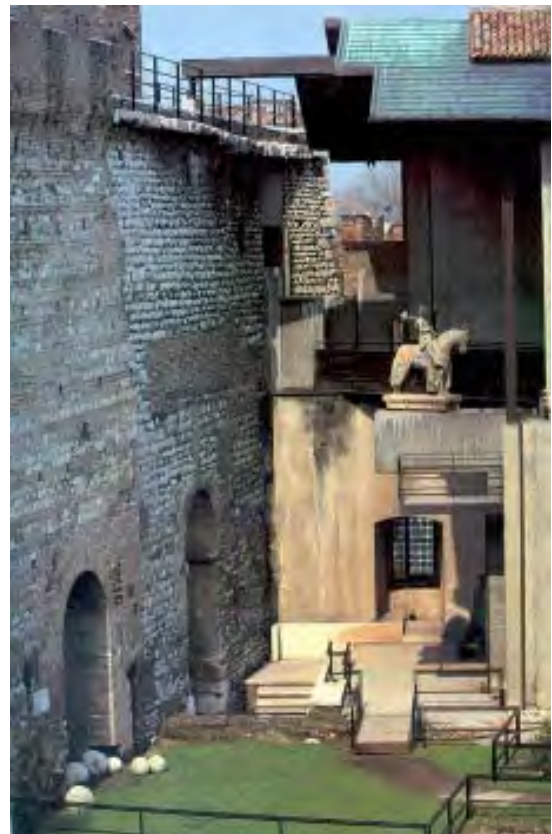
Designs should consider using steel with thin sections, transparent elements, details sympathetic to the industrial/ engineering character and which may reinterpret machinery relevant to railway technology. The location and fixing of new elements should be with regard to historic precedents in the place.

CASTLEVECHIO MUSEUM, VERONA, ITALY - ELEVATED WALKWAYS

The photograph shows elevated walkways constructed of fine steel sections and detailed in a contemporary manner. A closed balustrade treatment or semi-transparent metal mesh is shown on the upper walkway and an open balustrade treatment is shown on the lower walkway. Dark neutral colours have been used to make the additions recessive. Source: Scarpa 1985: 60, 62.

APPLICATION AT EVELEIGH

At Eveleigh this treatment is suitable for elevated walkways, balustrades in tenancy fitouts and safety fences.



Various functions will require small spaces within the large bays. Such spaces should have a lightweight and portable appearance with a design derived from the historic portables used at Eveleigh, and elsewhere in the railways, for offices. The design could be a contemporary interpretation of a lightweight railway portable and could incorporate transparent elements.

The site offers opportunities to interpret its history both in conserving fabric or in an interpretation centre. Such a centre could be incorporated into the Carriage Workshops building, or the Paint Shop and Suburban Car Workshop, or in a freestanding building such as the Compressor House. An interpretation centre could have relational information, incorporating graphic and written and interpretative material, about the workshop building/s, the whole of the Carriageworks, with the possibility for a whole of site interpretation.



FORMER SEWAGE WORKS, BOSTON
MASSACHUSETTS

The photograph shows a free standing office inserted within the volume of the historic building. The fitout has retained the sense of openness while providing offices and conference rooms. The old pump in the foreground is a focal point in the space. Source: Richter Greer, 1998: 134, 135,

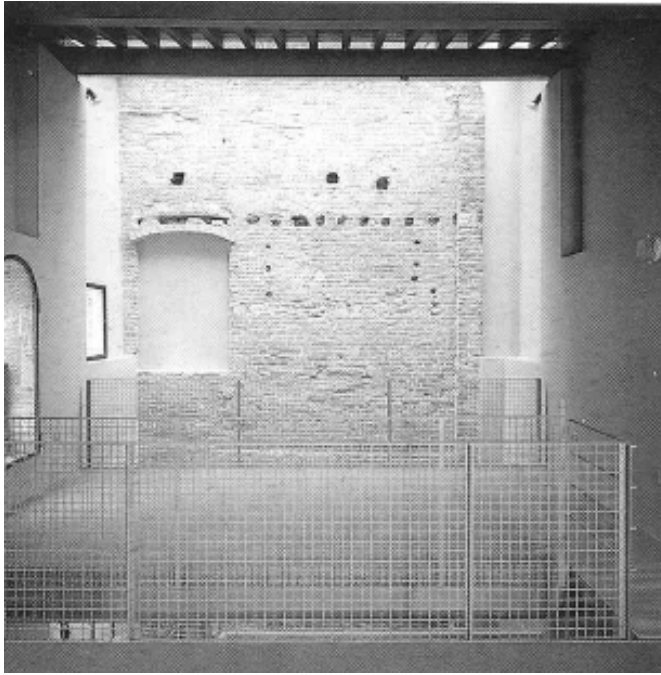
APPLICATION AT EVELEIGH

The use of single storey 'boxes' for display rooms or offices has many applications at Eveleigh. A contemporary interpretation of the rail portable could be used and be designed as a self-contained unit.

This principle could be used for a box-office, administration offices or dressing rooms etc., in the Carriage Workshops or the Paint Shop.

See also Design Example: Musee d'Orsay.

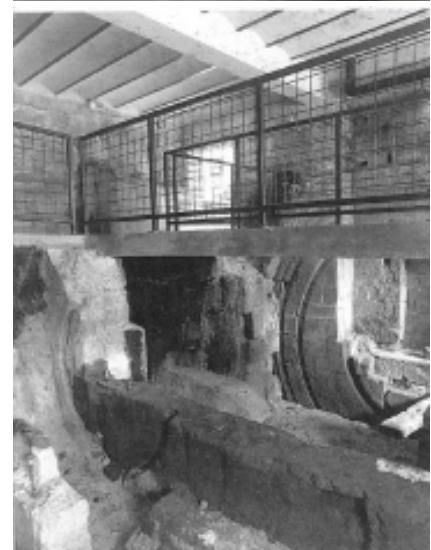




EXHIBITION ROOMS, PISA, ITALY, ELEVATED WALKWAYS, OLD & NEW
This former mediaeval palace was converted by architect, Massimo Carmassi into exhibition rooms and an audio visual centre. His work aims to expose traces of work carried out throughout history without undue preference for any period. Traces of alterations over time have been deliberately displayed and new circulation bridges provided, running clear of the old walls. The balustrades are detailed as modern metal installations of unobtrusive elegance. Source: Robert: 15-17.

APPLICATION AT EVELEIGH

At Eveleigh this treatment is suitable for elevated walkways or around archaeological displays within a space.



CASTLEVICHIO MUSEUM, VERONA, ITALY, ENTRANCE DETAILING

This photograph shows the use of steel and glass with contemporary detailing. It also shows the hierarchy of solid materials at ground floor with glass above suggested for Eveleigh tenancies.



ARTS CENTRE, NANTES, FRANCE, MINIMUM INTERVENTION

The former chocolate factory in the Loire Valley was converted into an arts centre. The philosophy was of transformation with minimal intervention and a deliberately crude conversion. The main new addition is a theatre which is likewise 'unfinished'. Source: World Architecture, Issue 95, April 2001, Tower Publishing.

APPLICATION AT EVELEIGH

At Eveleigh this treatment provides a model for minimising impact and for not cleaning the place up too much



DESIGN PRINCIPLES FOR OFFICES AND ENCLOSED SPACES

Rather than the usual conventional and ubiquitous office fitouts, bays in the Carriage Workshop that require some small rooms should be fitted out using design themes that reflect the previous layout of the workshops. They should not fill the spaces, by means of number, density, heights and solid materials, or affect views and vistas of the interior spaces. Detailing of the fitouts, stairs, handrails and elevated walkways should respond to the industrial character of the building and the following principles:

- Minimise height solid partitioning and enclosure
- Use transparent materials such as glass, where possible with expressed steel frames instead of solid walls
- Introduce a hierarchy of materials which are solid on the ground floor level and transparent at higher levels
- Configure fitouts to retain open spaces and have regard for views and vistas of the interior space
- Use colour complementary to the character of the building.

Any covering of floors should be reversible and use material that reflects the industrial nature of the building. Rather than covering floors a 'walkway' over the floor surface should be considered. Where this is not feasible, a polished concrete screen (laid on a membrane so it is reversible) or new sheet floor coverings could be laid. Suitable materials are rubber sheet or tile, or sheet material in linoleum or vinyl.

Interpretation of the building can be achieved in the physical fabric of the place. For example, pits or rails, which have to be covered could be interpreted by metal strips in flooring and written material as part of the floor surface. Transparent sections of floor could reveal rails, pits or archaeology. Machinery such as line-shafts can be retained and interpreted in adjoining new walkways etc.



See also Design Example: Former Sewage Works, Boston Mass.

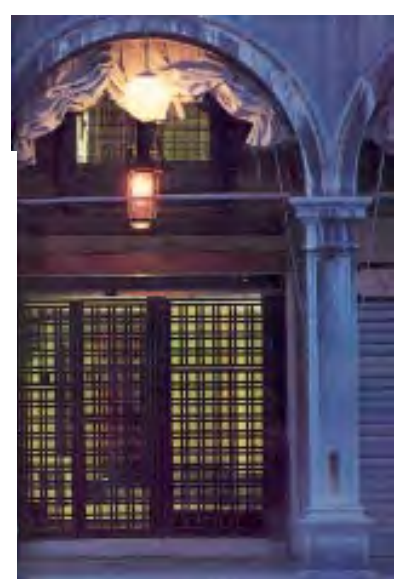
MUSEE D'ORSAY, INSERTION OF NEW ELEMENTS IN THE INTERIOR SPACE

In Paris a former railway station has been converted to a Fine Arts museum. In the Musée d'Orsay exhibition rooms have been built within the space for the display of art works and the 'terraces' over them are used for the display of sculpture. These are linked with other rooms on the same level. The use of single storey 'boxes' allows the viewing of the building itself and maintains views and vistas throughout the building.

APPLICATION AT EVELEIGH

The use of single storey 'boxes' for display rooms or offices with a terrace space over the top has many applications at Eveleigh. They can be designed in the same way as the traditional railway 'portable' that was used by the railways for offices. The design principles for these structures are that they can be relocated. A contemporary interpretation of the rail portable could be used rather than a literal version and be designed as a self-contained unit without fixings to the floor. They could be designed to be relocatable with cranes or have wheels on a trolley base. This principle could be used by the Ministry for the Arts as office/administrative space or dressing rooms for the performers.







7.0 CONSERVATION POLICIES

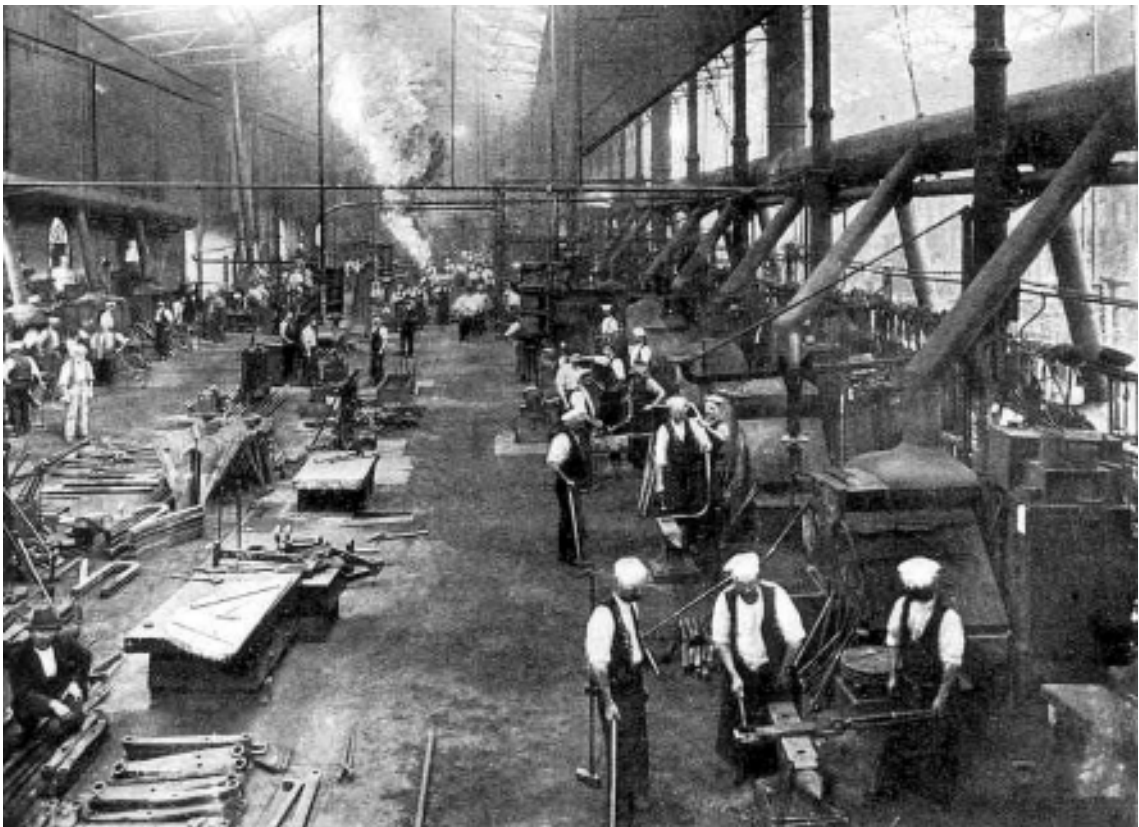


Figure 7.0 : View of the interior of the Blacksmiths' Workshop in about 1900. The view is taken from the west looking east with the retaining wall to Wilson Street on the left and the open side facing the main carriage Workshops building on the right. In the right foreground blacksmiths are working at an anvil and are in front of a row of forges. Source: SHFA

7.0 CONSERVATION POLICIES

7.1 INTRODUCTION

These policies arise out of the Statement of Significance (Chapter 5) for the Carriageworks and acknowledge the site as part of the overall Eveleigh Railway Workshops complex. The policies provide practical information to guide planning and works and are based on the principles of the Burra Charter (1999) of ICOMOS Australia.

These policies are based on those in the document *Eveleigh Carriage Workshops, Conservation Policies* by Otto Cserhalmi + Partners, November 2000 and the *Statement of Heritage Impact - Development Control Plan North Eveleigh Railway Yard* prepared by Otto Cserhalmi + Partners December 2000. Additional policies augment the original policies and reflect the revised Statement of Significance.

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POLICIES SUMMARY

1. IMPLEMENTATION & MANAGEMENT

1.1 USE OF THE CONSERVATION MANAGEMENT PLAN

Use and update this Conservation Management Plan and prepare and use ancillary documents including the inventory, historic documentary material and briefing notes for users.

1.2 THE APPROACH TO CONSERVATION

Conserve and develop the Eveleigh Carriage works in accordance with the Conservation Management Plan and the Burra Charter of ICOMOS Australia.

1.3 SITE MANAGEMENT

Set up management structures to undertake and coordinate the staged conservation and development of the place.

2. CONSERVING THE FABRIC

2.1 EVELEIGH RAILWAY WORKSHOPS COMPLEX

Enhance the significance of the Eveleigh Carriageworks by relating it to the whole of the Eveleigh Railway Workshops complex, including the former Locomotive Workshops (ATP) and the rail network.

2.2 CONSERVATION

Conserve the place, as a whole and significant fabric.

2.3 MAINTENANCE

Undertake maintenance as a key process of conservation.

2.4 BUILDINGS, MACHINERY & RAILS

Conserve the authentic fabric of the buildings, associated machinery and rail lines in situ.

2.5 ARCHAEOLOGY

Leave archaeological remains in situ and avoid disturbing them.

3. CULTURAL IDENTITY

3.1 CULTURAL LANDSCAPE

Retain the railway industrial cultural landscape.

3.2 SOCIAL

Involve the local community and those that have association with the place.

3.3 ACCESS AND INTERPRETATION

Allow access and interpret the place to the public as a railway workshop.

4.0 NEW WORKS

4.1 COMPATIBLE FUTURE USES

Ensure conservation by adapting the place to compatible new uses.

4.2 PRINCIPLES OF ADAPTIVE REUSE

Adaptation should enhance the significance of the place and conserve the fabric.

4.3 NEW WORKS

Design new works so that the heritage significance of the place is retained.

7.2 POLICIES

I IMPLEMENTATION & MANAGEMENT

I.1 USE OF THE CONSERVATION MANAGEMENT PLAN

Use and update this Conservation Management Plan (CMP) and prepare and use ancillary documents including the inventory, historic documentary material and briefing notes for users.

The conservation plan provides policies to guide decision-making and development. It also provides practical information to guide documentation of works, in particular the building fabric inventory. The inventory should be completed to guide future work. The conservation plan meets the requirements of the REP for submission with development applications. It also serves as a reference document for historical and physical information about the building.

The Conservation Management Plan needs to be reviewed regularly, both over time and to include new information, in order to remain relevant. New information may include further historical research, social history research, information from former machine operators, and archaeological findings.

Of necessity the document uses jargon and is too bulky for on site use. A short manual or pamphlet ('Carers' Guide') should be prepared summarising key points in lay terms and which is suitable for issue to site workers or users. It should provide contact information for approvals or advice.

Policy I.1.1

Apply this Conservation Plan during development and conservation works.

Policy I.1.2

Lodge copies of the completed Conservation Management Plan with a public library and with the stakeholders, including South Sydney Council, the Ministry for the Arts, the State Library of New South Wales and other relevant libraries. Make it readily accessible to the public.

Policy I.1.3

Seek approvals as required by legislation and address the Conservation Management Plan in planning and development applications, applications under the NSW Heritage Act and in statements of impact.

Policy I.1.4

Review the Conservation Management Plan every five years and when otherwise required, to take into consideration any new information.

Policy I.I.5

Prepare individual Conservation Management Plans for each significant item in the Eveleigh Carriageworks, as listed below, and prior to lodging individual developments applications. The owner or the developer may do this. Other detailed reports may be required for development applications, such as Statements of Heritage Impact.

- Carriage Workshops
- Paint Shop, Carriage Lifting Area and Suburban Car Workshop
- Chief Mechanical Engineer's Building (CMP by Paul Rappoport Architect 1997, exists but requires updating) and the garden
- Timber Shed Extension
- Blacksmiths' Workshop
- Cable Store
- Telecommunications Equipment Centre
- Clothing Store
- Compressor House
- Scientific Services Building
- Traversers & Significant Rails

Policy I.I.6

If the No 1 & 2 Stores are retained as a result of conservation incentives prepare a CMP. Otherwise analyse the history and fabric of these and of any significant items to be demolished and record them according to the NSW Heritage Office Guidelines.

Policy I.I.7

Development Applications should address the CMP.

Policy I.I.8

Brief all those working at the site on the conservation of the place and the need for care. This may be in a one page briefing note, and/or sign, video, model, etc.

Policy I.I.9

Provide relevant specific detailed information, to all levels of owners and users, extracted from conservation documents including the CMP, and any future Maintenance Plan, Interpretation Plan or other similar document.

Policy I.I.10

Prepare a 'Carers' Guide', in lay terms, and make it readily available to inform all those involved in working on the place.

Policy I.I.11

Continue to use and update the site inventory, which addresses the significance, condition and recommended policies for each element.

Policy I.I.12

Carry out in the medium to long term, the further research identified in this plan and including social and oral history.

Policy I.I.13

Compile and maintain, on site, current and historical documentary material such as photographs, maps, plans, drawings and reports relating to the construction and conservation of the Eveleigh Carriageworks.

I.2 APPROACH TO CONSERVATION

Conserve and develop the Eveleigh Carriageworks in accordance with the Conservation Management Plan and the Burra Charter of ICOMOS Australia.

Policy I.2.1

This CMP and the principles of the ICOMOS Burra Charter Australia should guide the approach to the conservation of the Eveleigh Carriageworks (Revised 1999).

Policy I.2.2

Retain the cultural significance of the place, including the aesthetic, historic, scientific, social or spiritual value for past, present or future generations as set out in the statement of significance in the CMP.

Policy I.2.3

Ensure the conservation of the place, using all the processes for care of the place including maintenance, preservation, restoration, adaptation and interpretation to retain the cultural significance embodied in its fabric, setting, use, associations, meanings records, related places and related objects.

Policy I.2.4

Consider the place as a whole, that is, the site, area, land, landscape, building or other works, and including components, contents, spaces and the machinery and its setting.

Policy I.2.5

The contributions of all aspects of a place should be respected (Burra Charter: Article 15.4).

Policy I.2.6

The approach to the building fabric and contents is to be one of minimal intervention consistent with the place's conservation.

Policy I.2.7

Change may be necessary to retain cultural significance, but it is undesirable where it reduces cultural significance (Burra Charter: Article 15.1).

Policy I.2.8

Use the cultural significance of the place and its appropriate interpretation to guide the changes made to the place (Burra Charter: Article 15.1).

Policy I.2.9

The impact of proposed changes on the cultural significance of the place should be analysed with reference to the Statement of Significance and the policy for managing the place.

Policy I.2.10

Ensure that changes, which reduce cultural significance, are reversible and are reversed when circumstances permit (Burra Charter: Article 15.2).

Policy I.2.11

Carry out urgent works whenever they are identified if the conservation of the place is threatened.

1.3 SITE MANAGEMENT

Set up management structures to undertake and coordinate the staged conservation and development of the place.

The effectiveness of the Conservation Management Plan depends on how it is implemented. The existence of a management structure and an understanding of who is responsible for the implementation of the Conservation Management Plan are essential for the site. These policies cover management structures and mechanisms. A steering committee (similar to the role previously performed by the Eveleigh Locomotive Workshops Steering Committee) or an overseeing body needs to be established to perform in an overseeing role. However, conservation management should be pursued as an active day-to-day responsibility. It is not adequate to have a committee in a conservation management role and it should be the active responsibility of an appropriately skilled person.

The exceptional heritage significance of the whole of the Eveleigh Railway Workshops complex lies in the relative intactness of the buildings, their settings and the machinery and associated railway lines which enables an understanding of the workings on the site – its scientific/educational significance.

The retention of this aspect of significance of the site depends on the site being managed with an understanding of this physical evidence and the processes that were undertaken over the whole site.

Thus, prior to or in conjunction with the resolution of the adaptive re-use of the Carriageworks and any sale or lease of parts of this site, a management structure should be developed and formalised. This structure should also provide liaison and links to the ATP Locomotive Workshops site.

Include professional heritage representation in the management body as well as representation relating to the active rail network when necessary. Ensure that operation is based on clear guidelines that include:

- consideration of the impact of any proposal on the identified heritage significance of the site
- effective and consistent conservation of buildings and their settings across the site
- control of vehicular access and car parking
- selection of appropriate tenants/occupants without adverse impact on the fabric, the spaces and the setting
- balancing the individual needs of tenants and occupants of the site and the desire for public access to the site
- encouraging cooperation between the managers of all components of the site to ensure overall management and objectives are consistent between managing agencies
- areas and precincts to be managed are created on the basis of logical spatial units, maintaining the integrity of the industrial setting of the site.

Policy 1.3.1

Obtain endorsement of the revised CMP from the NSW Heritage Office and the Heritage Council prior to any works being carried out.

Policy 1.3.2

Ensure the endorsed CMP is adopted by the site owner and current and future lessees and occupiers as a basis for the future management of the site.

Policy I.3.3

Refer to the CMP in any lease, sale or other ownership or control agreement affecting the site.

Policy I.3.4

Integrate development and conservation work and care and management for the site, and the Eveleigh Railway Workshops complex as a whole, particularly between future owners of the site, the SRA, PlanningNSW and South Sydney Council (approval authorities), and SHFA (owner of the former Locomotive Workshops, now the ATP).

Policy I.3.5

Manage the site to ensure that conservation aims and responsibilities are understood and complied with by all parties involved with the place including government, developers, temporary and end users.

Policy I.3.6

Integrate conservation and development planning, design and construction for all stages and precincts including ensuring continuity of approach and management of incremental change.

Policy I.3.7

Set up management structures and identify individuals to manage and execute the conservation of the Eveleigh Carriageworks. A management body should be responsible overall for adopting the CMP & policies, seeking approvals, etc.

Policy I.3.8

Establish clear responsibility for the management and care of the Eveleigh Carriageworks, set out the management structure and make it available to all persons involved. The Walsh Bay redevelopment provides a model for a management structure based on site precincts and it incorporates lease and sale areas.

Policy I.3.9

Institute an overseeing role by a steering committee or other group with an on-going role. Ensure that membership includes appropriate expertise as required, such as a conservation architect, industrial archaeologist and a State Rail Authority representative. Bodies such as the National Trust could be on the committee or kept informed as appropriate. The major tenants or property owners should request meetings of the steering committee or overseeing group when required.

Policy I.3.10

Appoint a “project coordinator” integrated into the site management structure, to implement the conservation policies contained in the CMP, including mechanisms for the stabilisation, short and long term conservation of the place including buildings, machinery and open space. Ensure that an appropriately skilled individual is responsible for care and management, giving practical advice and that this individual makes decisions and reports to the steering committee or other overseeing group.

Policy I.3.11

Establish a conservation and design review committee whose purpose is to inform owners, managers and tenants of the cultural significance and provide guidance for design approaches. This may be related to the ‘steering committee’ or be separate.

Policy 1.3.12

Provide temporary users with the “Carers’ Guide” so they understand the significance of the site and act responsibly, minimising intervention of the fabric.

Policy 1.3.13

Secure the site during all phases of planning and site development and ensure there is a mechanism and funds to carry out any urgent works identified during the project.

2 CONSERVING THE FABRIC

2.1 EVELEIGH RAILWAY WORKSHOPS COMPLEX

Enhance the significance of the Eveleigh Carriageworks by relating it to the whole of the Eveleigh Railway Workshops, including the former Locomotive Workshops (ATP) and the rail network.

One of the major themes determined in the Statement of Significance is that the total site of the Eveleigh Railway Workshops complex is of exceptional national and international heritage significance. This significance therefore, relies on its physical and historical relationship to the Locomotive Workshops and the open spaces, circulation, rails, machinery, moveable items and services that form part of the total infrastructure.

The Eveleigh Carriageworks have not undergone any restoration or addition since they have become surplus to State Rail requirement. Their conservation, restoration and adaptation provide an opportunity for an outstanding adaptive reuse and interpretation project. The Locomotive Workshops building has undergone conservation, restoration and adaptation in the last five years. The work that has occurred at the Locomotive Workshops and the interrelationship of the two sites, as part of the whole workshop complex, should be considered in the approach to the conservation and management of the Eveleigh Carriageworks.

Policy 2.1.1

Retain and enhance the heritage significance of the Eveleigh Carriageworks as part of the overall Eveleigh Railway Workshops complex. That is, retain the historical relationship between the Carriageworks and Locomotive Workshops sites.

Policy 2.1.2

Retain, develop and interpret the physical and social relationships between the Eveleigh Carriageworks and the Locomotive Workshops as part of the overall Eveleigh Railway Workshops.

Policy 2.1.3

Retain the industrial cultural landscape of the Eveleigh Carriageworks site as part of the overall industrial landscape of the Eveleigh Railway Workshops complex.

Policy 2.1.4

Promote the idea that the Eveleigh Carriageworks site is part of the Eveleigh Railway Workshops complex in the conservation, adaptation, management structure, signage, interpretation, urban design elements, views and vistas and site links. Cooperate with the Australian Technology Park Management and SHFA.

Policy 2.1.5

Maintain and develop visual and pedestrian connections between the Carriageworks and Locomotive Workshops based on the major historical vistas, access points and cultural significance of the place.

Policy 2.1.6

Identify and retain significant views into and out of the site where possible, including views:

- to and from the main rail lines
- to the Locomotive Workshops
- from rear of the Chief Mechanical Engineer's Office, to the Innovation Plaza area of the Locomotive Workshops
- from Codrington Street to the Carriage Workshops facade
- along the brick facade of the Blacksmiths' Workshop on Wilson Street
- of the Chief Mechanical Engineer's Building from Wilson Street
- and glimpses from Wilson Street (near the CME's building, near the Fire Brigade shed, at Codrington Street and from the west end of the Blacksmiths' Workshop), through the site to the main rail line and the Locomotive Workshops.

Policy 2.1.7

Maintain railway access to the Eveleigh Carriageworks as part of the site strategy.

Policy 2.1.8

Liaise with relevant parties to restore pedestrian access along the north of the site to an overbridge to the south of Redfern Station with connections to the Locomotive Workshops. Maintain access to Redfern Station. Keep the design of connecting structures in line with the character of the site and where practical, utilise historical access points and routes.

Policy 2.1.9

Limit visual separation between the precinct and the railway line, defining the edge of the site while maintaining the industrial character.

Policy 2.1.10

All aspects of the site are significant, including buildings, extant sites, spaces between buildings, former circulation patterns for rail and pedestrians, moveable heritage, fixtures and fittings, services identified in the site inventory of the CMP, and the relationship of the two sites. Do not put unwarranted emphasis on any one aspect such as architectural features or on any stage of the initial development phase.

2.2 CONSERVATION

Conserve the place, as a whole and significant fabric.

Maximising the amount of original fabric retained is important if the Eveleigh Carriageworks are to maintain their authenticity and significance. If there is a choice available, retain existing fabric, e.g. in general paint over old paint rather than strip it back; when repairing embedded downpipes do not unnecessarily disturb the brickwork. If original material has to be removed, ensure it is recorded. Records made before intervention are intended to add to the documentary evidence of the place and should include photographs and plans locating all items involved.

Policy 2.2.1

Use only appropriately skilled tradespeople or professionals with demonstrated experience to carry out and supervise any work, for example, a conservation architect for project control, skilled bricklayers for brickwork, specialised machine fitters for machinery. Seek proof of their skill level. Encourage the training of apprentices and tradespeople in higher skills where appropriate during the works.

Policy 2.2.2

Conserve significant fabric by repair, maintenance, restoration and preservation. Conserve individual elements according to their significance and as recommended in the Site Inventory. A table shows the recommended approach for fabric of each level of significance.

Policy 2.2.3

Remove intrusive elements identified in the Site Inventory as they detract from the heritage significance of the place, e.g. the plane trees immediately north of the CME's building.

Policy 2.2.4

Prioritise conservation work according to conservation needs. Address unstable fabric or deterioration that endangers significant fabric first.

Policy 2.2.5

During documentation and work, retain the maximum amount of significant fabric and patina consistent with the preservation of the element and in relation to the relative significance of the element. Replacements are of less heritage value than the original fabric and any intervention required should be in areas of new fabric to avoid original fabric.

Policy 2.2.6

Reconstructing elements to a known earlier state is acceptable if it is required for conservation, if it enhances the significance, does not distort existing evidence and allows interpretation of the change. Reconstruction is not generally necessary for conservation and repair. Preservation is to have priority.

Policy 2.2.7

Before any intervention, record existing fabric that has to be altered or removed, for example in order to repair the structure, or to reveal aspects of the building's significance. Retain the record, and if applicable, retain a sample on site.

Policy 2.2.8

If fabric must be removed from buildings and is appropriate for reuse in future works, carefully stockpile and tag. Protect from deterioration and theft and keep a list of the items.

Policy 2.2.9

Employ traditional techniques in conservation work. Only use modern techniques where there is a firm scientific basis supported by evidence of the performance of the technique in use.

Policy 2.2.10

Maintain both traversers, one operational, and do not build on the open space in which they operated.

2.3 MAINTENANCE

Undertake maintenance as a key process of conservation.

These policies recognise that maintenance is an important conservation process. Develop a long-term Maintenance Plan and coordinate it with the management and use of the place. For example, general clearing of the drains can be integrated with regular cleaning of the place. The Maintenance Plan should be subject to regular review.

Policy 2.3.1

Prepare Maintenance Plans for the Eveleigh Carriageworks. Include regular inspections, outline who is responsible for various aspects of it and allow for prompt follow-up maintenance and repair if required.

Policy 2.3.2

Preserve the fabric (in the short term) by stabilising deterioration - including making watertight, structurally stable and adequately disposing of stormwater.

Policy 2.3.3

Conserve the fabric (in the longer term) by continuing maintenance, the singlemost important process of conservation.

Policy 2.3.4

Undertake regular inspections and maintenance by persons skilled in the conservation of buildings and machinery of this nature and with an understanding of the heritage value of the Carriageworks (Burra Charter: Article 30). For instance, Rail Infrastructure Corporation to carry out scheduled track inspections to keep the tracks in the fan and sidings in operational use.

Policy 2.3.5

Conserve the fabric of the place by preservation, stabilisation and continuing maintenance.

Policy 2.3.6

Commit ongoing and adequate financial resources to the development and implementation of Maintenance Plans.

Policy 2.3.7

Commit ongoing and adequate financial resources to restoration and maintenance.

Policy 2.3.8

Repair rather than replace significant fabric.

Policy 2.3.9

Ensure that surviving historic services and fittings are retained during conservation and maintenance. Where new services are required to significant areas, add by further layering and distinguishing old from new.

Policy 2.3.10

Retain and do not obscure evidence of railway work practices, by conservation and maintenance.

2.4 BUILDINGS, MACHINERY & RAILS

Conserve the authentic fabric of the buildings, associated machinery and rail lines in situ.

As long as health and safety regulations are observed and the integrity of the building is not compromised, the current approach to building maintenance is minimal intervention. Retain fixtures *in situ* and where possible, leave contents and objects that contribute to cultural significance *in situ* as well.

Policy 2.4.1

The approach to the building fabric and contents is to be one of minimal intervention consistent with the place's conservation (Burra Charter: Article 3 & 21).

Policy 2.4.2

The contents, especially the significant machinery, should remain *in situ* and be conserved (Burra Charter: Article 10).

Policy 2.4.3

Only undertake intrusive, physical investigation of the building fabric or machines if necessary and unavoidable, e.g. inspection of footings or downpipes or the inspection of cylinders or gear boxes. Keep interventions to a minimum (Burra Charter: Article: 28.1).

Policy 2.4.4

Undertake physical inspections of building fabric every two years or when extreme climatic conditions dictate (e.g. major hailstorms).

Policy 2.4.5

Maintain the existing and operational rail link from the main line

- to the head shunt near Redfern Station
- the Fan of Tracks
- the Carriage Lifting area
- to and around the Paint Shop buildings
- through the Paint Shop doorways to the traverser on the western side
- to No. 1 Traverser
- to the southernmost line in the Carriage Workshops building, through it to the No. 2 Traverser on the west side and to the east facade of the Cable Store (this item not necessarily operational)
- to and including the run-around on the north of the Suburban Car Workshops
- the rail line along the north side of the Carriage Workshops (this item not necessarily operational).

Policy 2.4.6

Retain samples of each type of rail/track arrangements including elevated rails, rails with pits, jacking rails etc. to contribute to the interpretation of the site.

Policy 2.4.7

As far as possible retain existing rail lines and pits *in-situ* and with a degree of visibility (including within buildings). Relocation of items, especially out of context, is not recommended (Burra Charter: Article 9.1).

Policy 2.4.8

Retain significant machinery and associated services *in situ*. The removal of any machinery significant to the Eveleigh Carriageworks, including associated services, is unacceptable unless it is the only means of ensuring its survival.

Policy 2.4.9

Where a choice exists, retain significant items, buildings and contents, especially machinery and cranes *in situ* and conserve.

Policy 2.4.10

Repair masonry with lime mortar, not cement, and do not unnecessarily clean or apply anti-graffiti or water-repellent coatings unless researched and recommended by a conservation architect in each case for this site.

2.5 ARCHAEOLOGY

Leave archaeological remains in situ and avoid disturbing them.

The current philosophy regarding the conservation of archaeological relics is that they are best conserved by remaining undisturbed. Locate new works, such as service trenches, to avoid known remains such as significant pits for working under carriages, pits at sets of points and turntables. Stormwater drains and other underground services may be located throughout the site. If major works are being undertaken, it is advisable to obtain an archaeological excavation or monitoring permit prior to commencement as permits may take some weeks to be processed.

Policy 2.5.1

Before undertaking any form of excavation, investigate the archaeological zones of the site. Refer to the *Archaeological Assessment of the Eveleigh Carriage Workshops Site*, Austral Archaeology, November 2000, in particular section 3.8 "Table of Demolished Buildings", which breaks the site down into buildings and suggests the archaeological potential for each (Appendix B).

Policy 2.5.2

Leave archaeological relics *in situ* and adopt strategies for development that avoid archaeological remains or interpret archaeological remains in new fabric or fitouts.

Policy 2.5.3

Do not undertake archaeological investigation unless relics will be disturbed by other work or if required for interpretation.

Policy 2.5.4

Intervention for archaeological investigation, other than associated with conservation and re-use, must only proceed on the basis of an explicit proposal from a skilled professional and an excavation permit under the Heritage Act, 1977 Amended 2001, must be obtained (Section 139).

Policy 2.5.5

During construction works, avoid disturbing known archaeological remains. Where it is known from an archaeological survey that remains are in the vicinity of excavation for new building works, an archaeologist must maintain a watching brief (permit required Section 139 Heritage Act 1977 Amended 2001).

Policy 2.5.6

If archaeological remains are unexpectedly disturbed, cease work and engage an archaeologist who will apply for an archaeological excavation permit (Heritage Act, 1977 Amended 2001) before any further work is undertaken.

Policy 2.5.7

Where underground services are discovered, assessment shall be made of their significance and whether they are active before disturbance or removal.

3.0 CULTURAL IDENTITY

3.1 CULTURAL LANDSCAPE

Retain the railway industrial cultural landscape.

The association of the Eveleigh Carriageworks with the railway system is fundamental to the significance, understanding and interpretation of the place. The Eveleigh Carriageworks are part of an industrial cultural landscape that should not be obscured by an attempt to give the site a sense of 'heritage' it never had or to 'clean' it up. The survival of the industrial character and the railway features give the place its cultural identity.

Policy 3.1.1

Retain the large-scale industrial character of the Eveleigh Carriageworks.

Policy 3.1.2

Consider the place as a whole, that is, the railway tracks, the traversers, the buildings, the machinery and their setting. Design boundary fencing or buildings and spaces on the site boundary to reflect the historical extent and character of the site.

Policy 3.1.3

Treatment of circulation areas, areas occupied by extant structures and machinery, and open spaces should use materials and detail to retain the railway character of the place.

Policy 3.1.4

Limit parking at grade and keep the majority of parking underground or within new structures. Consider the use of alternative car parking areas, for example at the Australian Technology Park. Encourage the use of public transport, including through Redfern and Macdonaldtown Stations.

Policy 3.1.5

Develop a detailed strategy to determine the extent and type of landscaping that is most appropriate for the site. Consider the CME's garden according to its heritage significance and as a discreet area that is also connected to the rest of the site.

Policy 3.1.6

Keep new fencing and street furniture such as seating, bollards and light fittings in character with the large-scale railway industry or a simple modern design. A historicist "heritage" look is inappropriate.

Policy 3.1.7

Limit planting on site and design it so that the character is retained: suburban green parks are unsuitable. Maintain significant open spaces, including the CME's garden, the fan of rails and both traversers, and utilise to meet open space requirements of site development.

Policy 3.1.8

Introduce soft landscaping only where earlier landscape existed or in designated areas of new development where it is interpreted in a manner sympathetic to the character of the site.

Policy 3.1.9

The design of signage should not detract from the visual character of the place.

3.2 SOCIAL

Involve the local community and those that have association with the place.

The statement of significance identifies the cultural and social associations with former workers and the community as significant themes. The place was an integral part and catalyst for the historical development of the surrounding area.

Policy 3.2.1

Implement a program to encourage community involvement in all phases of the project including allowing inspection of the Eveleigh Carriageworks prior to and during works. Hold open days prior to starting works. Consider establishing a 'Friends of Eveleigh' to be involved in tours, historical and oral history, etc.

Policy 3.2.2

Ensure that adaptive reuse, interpretation and new development on the site is undertaken with community consultation in the local area and involve the Australian Railway Heritage Society and other similar community groups in site research and development.

3.3 ACCESS AND INTERPRETATION

Allow access and interpret the place to the public as a railway workshop.

The place should continue to be available for public inspection and for related community functions. A guidebook to the place would enhance the significance to the public and could be based on information in this and associated documents.

Policy 3.3.1

Interpret the use of the place as railway workshops on the site and allow public access to within the limits of security required for commercial operations and physical security.

Policy 3.3.2

Use traditional access points and routes to establish access links and networks within the site for the purposes of interpretation (see later plan).

Policy 3.3.3

Allow the public access to the following locations:

- the full length/width/volume of at least a bay of the Carriage Workshops and the Paint Shop
- the Traversers
- part of the Blacksmiths' Shop that shows the whole cross-section
- the space between the Carriage Workshops and the Blacksmiths' Shop
- corridors and major spaces in the Chief Mechanical Engineer's Office.

Policy 3.3.4

Tell the story of the place, its processes, its products and people to visitors to the site through the fabric of the place and by interpretation.

Policy 3.3.5

Interpret on site the significant historical themes identified in the Interpretation Plan.

Policy 3.3.6

Interpret the Eveleigh Carriageworks as part of the overall Eveleigh Railway Workshops complex. Keep interpretive signage and content consistent across the Eveleigh Carriageworks and the Locomotive Workshops.

Policy 3.3.7

Interpret the place as a railway carriage workshop by a combination of:

- interpretive devices (pamphlets, displays, signs, tours/open days)
- displaying railways carriages
- restoration and, where appropriate, reconstruction of fabric and allowing access to the public and specialists.

Policy 3.3.8

Include information contained in the Conservation Analysis and Statement of Significance in interpretation of the place and provide relational material as well as item and/or building specific information (see later examples and plans of placement and locations).

Policy 3.3.9

Interpret contents and fitout and recover and conserve moveable heritage to assist interpretation.

Policy 3.3.10

Use further research e.g. on social history, to interpret the site and develop oral history projects and on-site events and activities accessible to the community.

Policy 3.3.11

Establish a facility on site to enable the recording of and access to social history information, e.g. as part of an interpretive facility.

Policy 3.3.12

Signage should be contemporary not historicist, be of a high design quality, be fixed, reflecting traditional patterns and placement of sign and should be succinct and clear and consistent across the site.

Policy 3.3.13

Produce a guidebook to the place in the long term (possibly in conjunction with the SHFA for the entire Eveleigh Railway Workshops complex).

4.0 NEW WORKS

4.1 COMPATIBLE FUTURE USES

Ensure conservation by adapting the place to compatible new uses.

The place is no longer a railway workshop and is surplus to railway needs. Temporary users are currently occupying some of the spaces. Finding new uses for the place is vital to its conservation as an empty building is subject to vandalism and neglect. Uses should be compatible and some uses enhance significance. Compatible uses are those that are suited to existing buildings and allow for an adaptive “loose fit” involving minimal intervention in the existing fabric. For instance, the Carriage Workshops and the Paint Shop uses that retain the large open spaces, or in the Chief Mechanical Engineer’s building uses that require the smaller spaces found in the existing room layout.

Policy 4.1.1

Keep the future use of the place compatible with its cultural significance. Compatible uses enhance, retain or regain significance, require minimum intervention in the fabric, enhance the industrial character of the place and include uses relating to railway workshops.

Policy 4.1.2

Consider future uses for the site/parts of the site in the light of the following criteria:

- sympathetic to the significance of the site
- sympathetic to the configuration of existing buildings
- utilisation of traditional entry points and site circulation
- retention of significant fabric
- do not result in unacceptable levels of wear and tear
- do not result in major traffic generation
- retention and enhancement of the industrial character of the place, including the present level of finishes and do not “clean up” the place.

Policy 4.1.3

Discourage uses that:

- lessen, obscure or confuse the many historical associations of the place
- do not take advantage of the interpretation potential of the place.

Policy 4.1.4

Encourage uses that:

- reflect the historic processes and manufacture
- facilitate visitation and interpretation of the overall site.

Policy 4.1.5

Make the minimum changes necessary to accommodate new uses, while taking into account the Cultural Significance (Burra Charter: Article 21.1 & 21.2).

Policy 4.1.6

Within the existing buildings future uses which are most compatible will be those that do not change the division of internal spaces, retain the original spatial qualities and utilise existing features to enhance existing spatial qualities.

Policy 4.1.7

It is preferable to select the tenant/user/use whose requirements are suitable for the space, rather than modifying the space to suit the tenant.

Policy 4.1.8

Locate commercial and residential uses requiring small spaces and heavy servicing in new buildings on the site.

Policy 4.1.9

Possible future uses compatible within the main workshop buildings are active railway uses, railway museum, industrial uses and commercial or other activities that:

- require large open spaces
- minimise the subdivision of spaces
- use no less than one bay in the Carriage Workshops
- maintain the cross-sectional volume of buildings
- use the doorways, creating a sense of activity
- retain interior views and axial and diagonal vistas of the volume of spaces and the structure of buildings.

4.2 PRINCIPLES OF ADAPTIVE REUSE

Adaptation should enhance the significance of the place and conserve the fabric.

To allow new uses, and continue existing uses, adaptation of the existing buildings will be necessary. This will involve change to the physical fabric of the place. Changes should be designed to minimise removal of significant fabric and to retain significant spaces.

Policy 4.2.1

Adaptive reuse of the site/parts of the site should be considered in the light of the following criteria:

- cultural significance should not be compromised
- the integral relationship between the industrial settings and individual spaces and buildings should be conserved and enhanced
- parking and vehicular access should be managed discreetly
- modern services should not damage or compromise significant fabric or spaces
- fixtures and fittings should not damage or compromise significant fabric or spaces
- adaptation involving minimal change is preferable
- choose occupants who fill existing spaces rather than require extensive modifications
- adaptation, including fitout, should suit the character of the place.

Policy 4.2.2

Ensure that the adaptive reuse of the place retains all aspects of the significance as well as evidence of the former processes of the Eveleigh Carriageworks.

Policy 4.2.3

The level of adaptation to existing buildings must be derived from an understanding of the context and structure of the site, the industrial themes of the site and with regard to significant views and vistas.

Policy 4.2.4

Consider the recovery of significance through varied aspects of interpretation using adaptive work or new work.

Policy 4.2.5

Continue the overall interpretation of the precinct with adaptive reuse.

Policy 4.2.6

The adaptive reuse of the industrial buildings must reflect their significance and be undertaken in ways that allow their former functioning to be seen and understood.

Policy 4.2.7

Retain the original numbering system of the bays and lines in the Carriage Workshops and the Paint Workshops (i.e. Bays 16-25).

Policy 4.2.8

In future works aim to retain the openness and industrial character of the interiors and interpret and reveal structures that show evidence of the workshops (e.g. pits and line shafts).

Policy 4.2.9

Ensure that new fitouts are innovative and of high design excellence. Retain significant views and vistas within and through interior spaces either by transparency or limiting bulk and scale of new work.

Policy 4.2.10

Appropriately reference railway technology and building in new fitouts for adaptive reuse of spaces in the Carriage Workshops and Paint Shop. In particular the traditional practice of accommodating offices etc. in lightweight and portable (adaptable) structures placed in the large spaces (see examples in Bays 1 & 2 ATP).

Policy 4.2.11

Preferably keep new fitouts in the Carriage Workshops and Paint Shop single storey to allow the appreciation of the workshop spaces. Limited upper levels can be inserted using traditional precedents such as mezzanines, walkways, balconies overlooking spaces and towers to accommodate tall machinery (see examples).

Policy 4.2.12

Mezzanines introduced into the Carriage Workshops, the Blacksmiths' Workshop or the Paint Shop should:

- be designed to allow the spaces to be appreciated
- not overwhelm the interior of the buildings
- cover no more than $\frac{1}{3}$ of the floor area
- not require removal of significant fabric such as crane girders
- relate to the existing subdivision of the spaces into bays
- preferably be open with handrails and without roof or walls
- allow the existing structure to be visible
- run along bays or be at the end of bays rather than across multiple bays
- minimise interference with the existing cranes.

4.3 NEW WORKS

Design new works so that the heritage significance of the place is retained.

New work will be required to adapt the Eveleigh Carriage Workshops to new uses. This will include new structures on the site and the works for the adaptation of existing buildings. Ensure that new structures on the site are comparable with the old in quality, do not dominate the existing buildings in terms of location and in bulk and scale. Their placement should not affect the important spatial arrangements, site links, open spaces and views and vistas. In general, keep new work in existing buildings contained within the envelope. Appropriate contemporary design using modern materials and techniques can be an effective way of distinguishing new work from original, so long as it is used with care and design excellence.

Policy 4.3.1

The siting of new buildings and their bulk and scale should retain significant views and vistas within the precinct and within the site as a whole.

Policy 4.3.2

Ensure that new work or changes are compatible with the heritage significance of the place, that is, minimise impact, be distinguishable from the original, and be reversible.

Policy 4.3.3

Reflect new work in the original design concept for the buildings and site expressed in the Statement of Significance. Use the existing buildings as a starting point for the design of new work.

Policy 4.3.4

Reflect spatial arrangements in new development, the relationships and connections of buildings and their materials and scale.

Policy 4.3.5

Base the scale of new buildings on the existing site pattern using the consistent facades and mixed scale that reflects the layers of site development. Appropriately interpret in relation to context and using appropriate cues.

Policy 4.3.6

Retain significant spaces, materials and details, scale, colour, texture and quality in any new development.

Policy 4.3.7

Do not obscure or overwhelm significant fabric with new development.

Policy 4.3.8

The design of new structures should contribute to a quality urban environment.

Policy 4.3.9

New design and conservation teams are to work together from initial stages through design concepts, design development and construction.

Policy 4.3.10

Match the excellence of the original in the quality of design and construction of the new.

Policy 4.3.11

The design of new development should reflect the quality of the historic buildings, which were exemplary and fine examples of late Victorian industrial buildings with innovative use of materials and structure. This may be expressed in a contemporary idiom and interpret scale, rhythm, proportions and facade modulation.

Policy 4.3.12

Utilise new work as an opportunity to enhance or recover significance.

Policy 4.3.13

Aim for a design approach for new development that favours: a contemporary idiom and not an historicist reproduction; is of high design quality and takes appropriate references from the industrial character of the site; and the historical use of innovative materials and structure.

Policy 4.3.14

Aim for new designs within and adjacent to significant items, to have a modern and 'industrial' aesthetic, i.e. clean, robust and uncomplicated (buildings and cultural landscapes). The use of design competitions can ensure higher quality design.

8.0 STRATEGY



Figure 8.0 : Chief Mechanical Engineer's Office, Wilson Street. Undated (post 1900) view from north east. This photograph shows the garden to the east of the building. The garden is grass with flower beds and hedge planting with a flagpole in the centre. The area to the left of the access road has been treated similarly including the side of the path leading to the pedestrian overbridge. Source: SRAO

8.0 STRATEGY

Generally detailed implementation recommendations are included with the policies. Aspects are summarised in the plans in this section. An implementation matrix has also been prepared for the policies.

8.1 DEVELOPMENT GUIDELINE PLANS

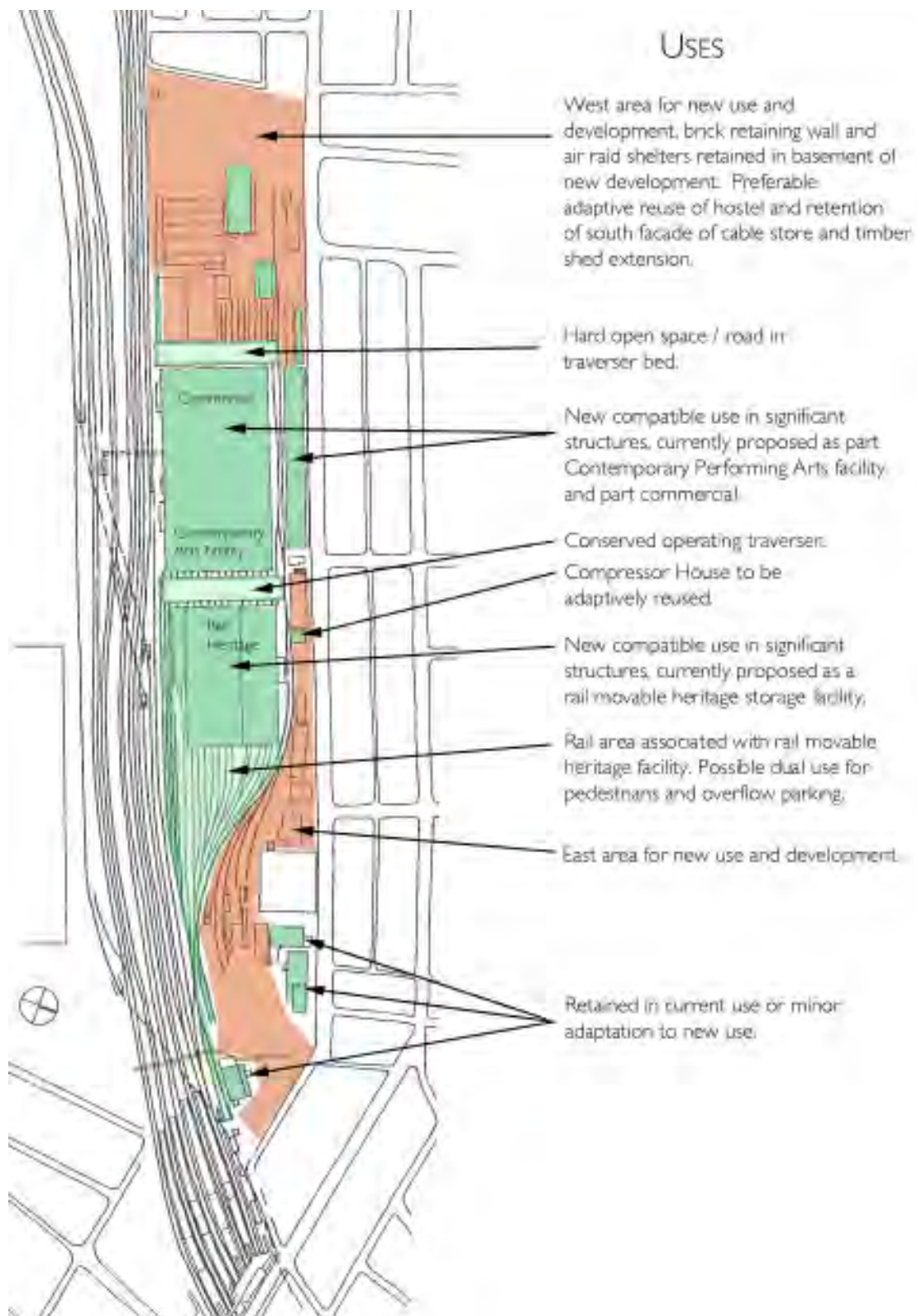
Plans have been prepared indicating development limitations, circulation in the building and for interpretation. These are included at the end of this section.

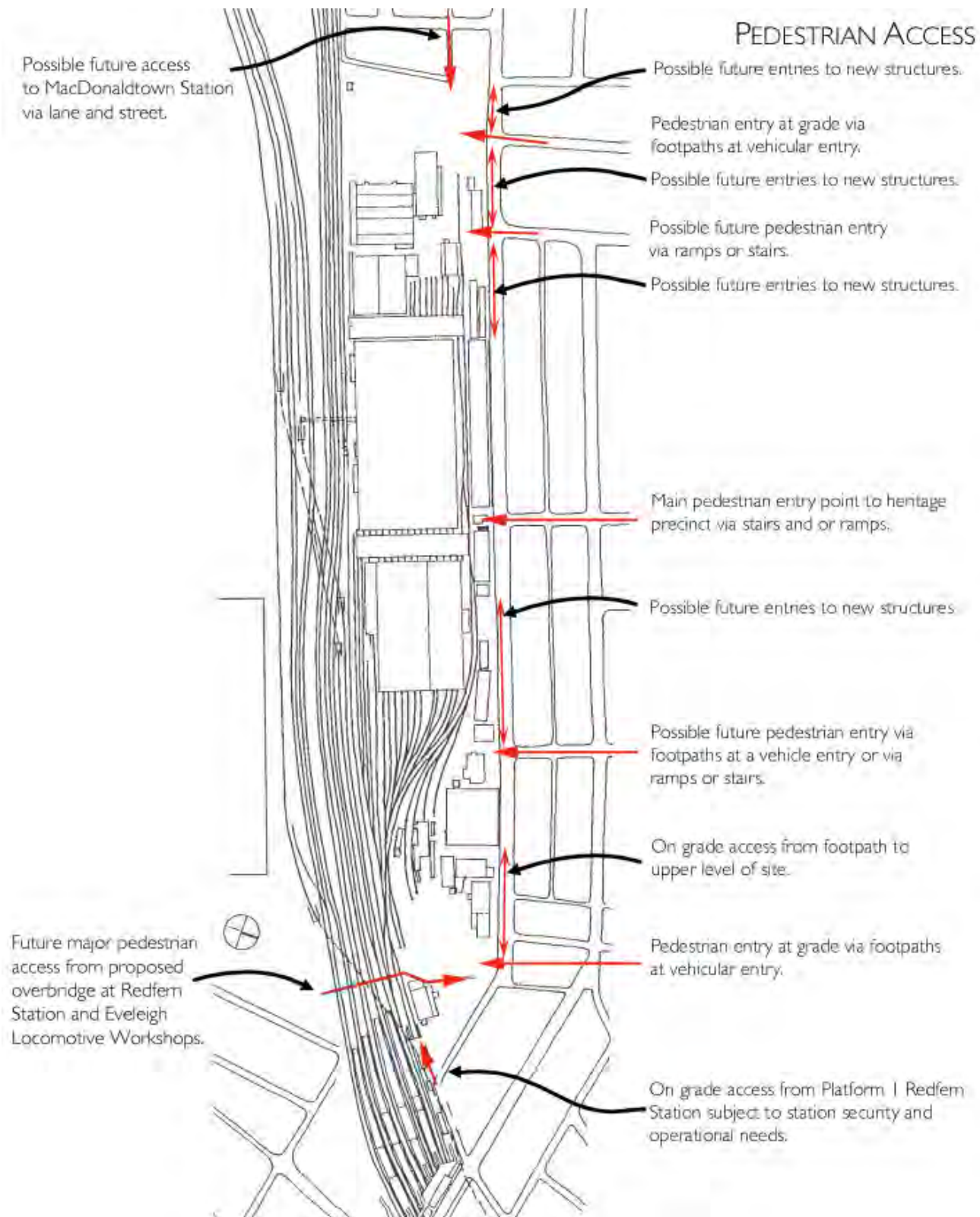
8.2 IMPLEMENTATION STRATEGY

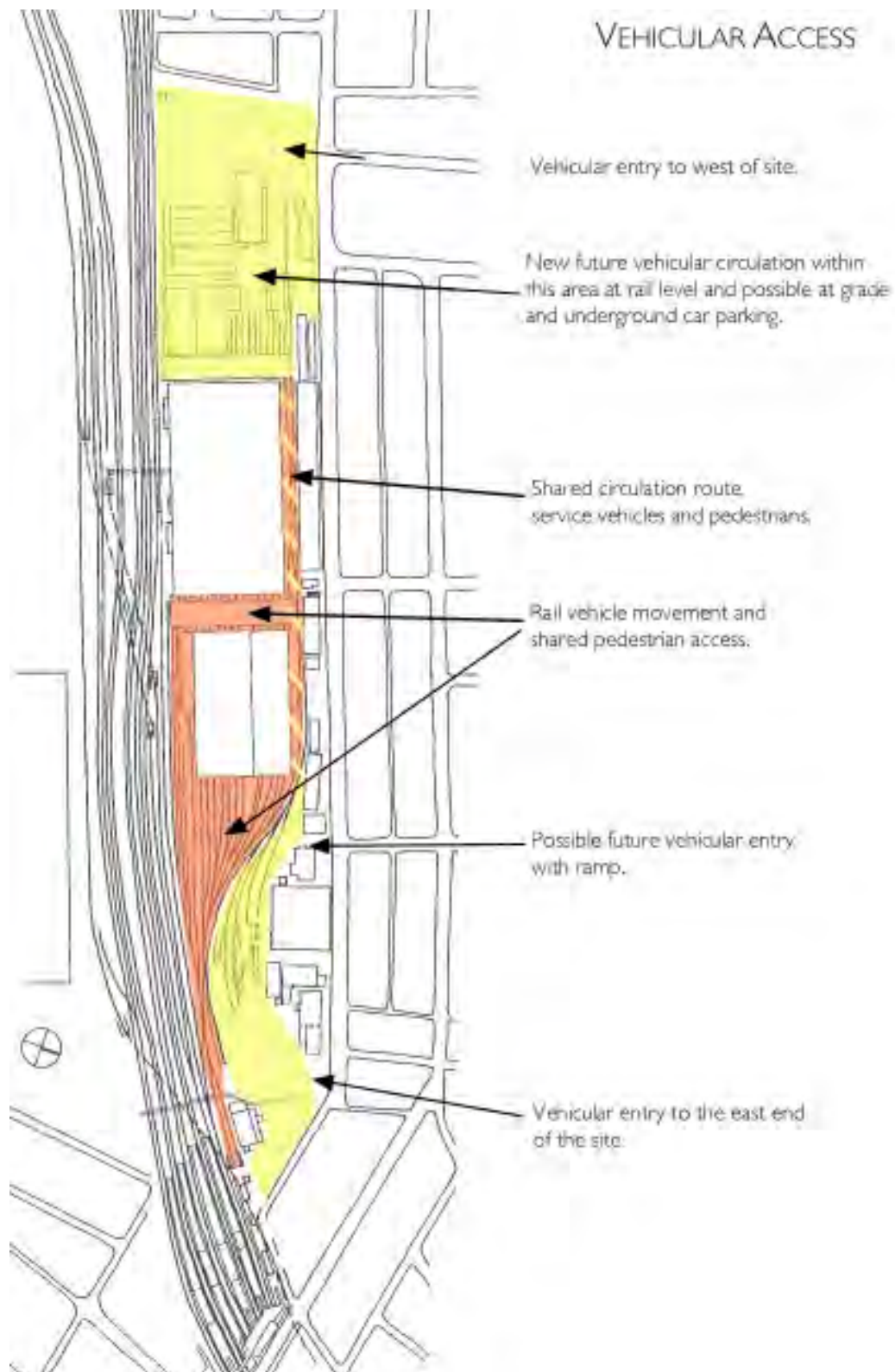
The matrix is indicative and is not fully developed. SRA should further develop this in the future and include other responsible parties when they establish an interest in the site. The matrix indicates when policies should be carried out, either short term, medium term or long term. Many items are ongoing and are to guide all parties on a continuing basis. the grey boxes indicate the main period when a group of policies applies. Responsibility for implementation is also indicated using abbreviations as follows:

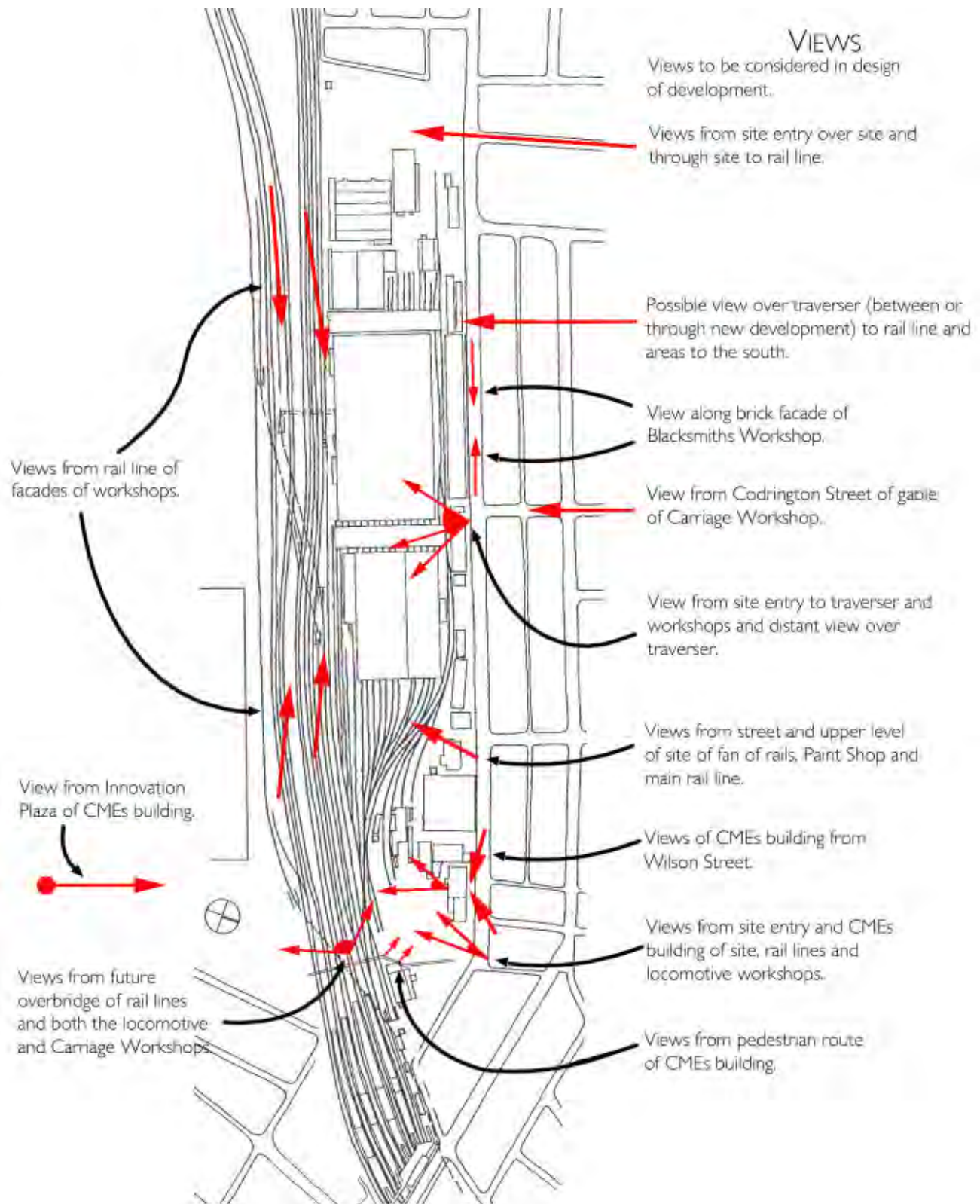
SRA	The State Rail Authority owns the site at present and will retain ownership of some parts of it. It also controls the rail network to which the site is connected and the machinery in Bays 16 & 17.
Arts	The Ministry for the Arts will own the Carriage Workshops building and the blacksmiths' Shop and open space between them.
Proponents	Those undertaking works and construction projects on the site and in the buildings.
Designers	Architects, building designers, interior designers, exhibition and graphics designers, etc. responsible for design of projects.
Conservator	Machinery conservation experts required for work on heritage machinery.
Users	Tenants, lessees etc. of spaces in the buildings.
SHFA	The Sydney Harbour Foreshore Authority is the custodian of adjoining the Eveleigh Locomotive Workshops. The CMP calls for links between the management of the whole of the Eveleigh Railway Workshops complex.

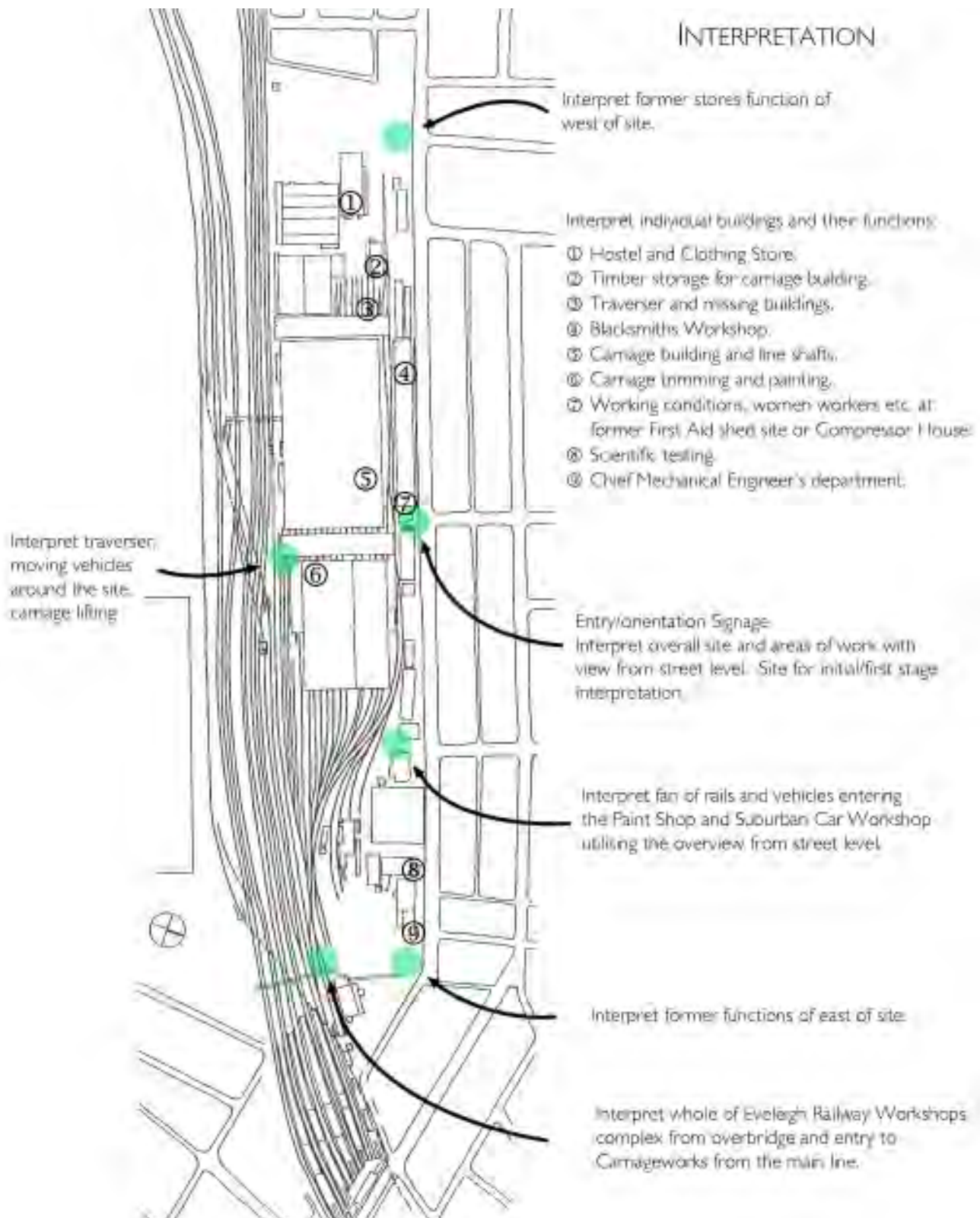
*Eveleigh Carriageworks
Conservation Management Plan*











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SECTION 3.5.3 CARRIAGE CONVERSIONS

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SECTION 3.6.1 WORKING CONDITIONS AND STANDARDS

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- 42 SRA Plan Room Drawing 1010-37,198.
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- 48 ibid.
- 49 Hearn M 1990, op. cit., p 150 (observation by Louie Cavaliere, former employee on the Locomotive Works side of the site).

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APPENDIX A

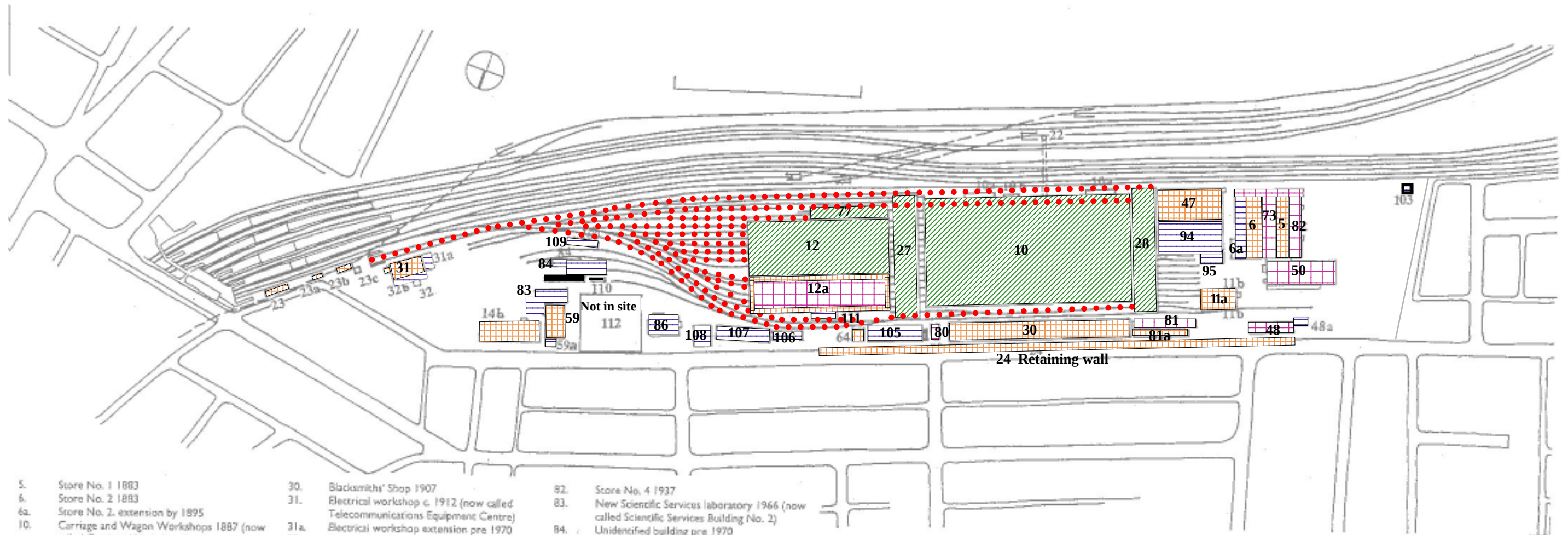
HERITAGE LISTINGS

NOTE: NOT INCLUDED IN ELECTRONIC VERSION.
SEE PAPER COPY

APPENDIX B

TABLE OF DEMOLISHED BUILDINGS EVELEIGH CARRIAGE WORKSHOPS ARCHAEOLOGICAL ASSESSMENT

NOTE: NOT INCLUDED IN ELECTRONIC VERSION.
SEE PAPER COPY



- | | | |
|---|--|---|
| 5. Store No. 1 1883 | 30. Blacksmiths' Shop 1907 | 82. Store No. 4 1937 |
| 6. Store No. 2 1883 | 31. Electrical workshop c. 1912 (now called Telecommunications Equipment Centre) | 83. New Scientific Services laboratory 1966 (now called Scientific Services Building No. 2) |
| 6a. Store No. 2. extension by 1895 | 31a. Electrical workshop extension pre 1970 | 84. Unidentified building pre 1970 |
| 10. Carriage and Wagon Workshops 1887 (now called Carriage Workshops) | 32. Electrical workshop outbuildings (altered) c. 1912 | 86. Outward Parcel Depot 1956 (now called Trackfast Depot) |
| 10a. Carriage and Wagon Washing Facilities c. 1952 | 32b. Electrical workshop outbuildings addition pre 1991 | 94. Boilermakers' Shop 1964 |
| 10b. Unidentified addition pre 1970. | 47. Carriage Shop extension c. 1912 including additional bay c. 1916. Partially demolished to make way for No. 94 below. | 95. Toilets 1964 |
| 11a. Timber shed extension pre 1911 | 48. Spring Store (now called Bulk Store) pre 1916 | 103. Unidentified Shed pre 1991. |
| 11b. Timber shed extension pre 1967 | 48a. Store extension pre 1967 | 105. Carpenters, Plumbers and Food Distribution building 1981 |
| 12. Paint Shop 1887 | 50. General Store 1913 (now called Clothing Store) | 106. Unidentified post 1970 pre 1991. |
| 12a. Paint Shop addition c. 1912 (now called Cable Store) | 59. Materials Testing Laboratory and outhouse 1921, including earlier building c. 1916 (now called Scientific Services Building No. 1) | 107. Fire Protection and Drug Analysis building 1981 |
| 14. Chief Mechanical Engineer's Office 1887 | 59a. Materials Testing Laboratory addition pre 1970 | 108. Fire Protection Brigade Shed post 1970 pre 1991 |
| 14a. Extension to Chief Mechanical Engineer's offices by 1917 | 64. Compressor House pre 1913 | 109. Unidentified building post 1970 pre 1991 |
| 14b. Extension to CME's office c. 1926 | 73. Store No. 3 c. 1926 | 110. Asbestos Shed c. 1986 |
| 22. Subway by 1887, lengthened by 1926 | 77. Carriage lifting shop pre 1926 (possibly altered) | 111. Private development post 1995 |
| 23. Redfern Station Platform 1 c. 1891 | 80. First Aid Station 1937 | |
| 23a. Ticket Office and Workshop | 81. Reclamation Shed c. 1937 | |
| 23b. Amenities Building | 81a. Air Raid Shelters WWII | |
| 23c. Station Building | | |
| 24. Brick retaining wall pre 1887 | | |
| 27. New Traverser No. 1, 1969 | | |
| 28. New Traverser No. 2 1969 | | |

- INTERNATIONAL / NATIONAL - RAIL LINES
- INTERNATIONAL / NATIONAL - OTHER
- STATE
- LOCAL
- NEUTRAL
- INTRUSIVE

LEVELS OF SIGNIFICANCE PLAN

<i>Policy</i>	<i>Short term</i>	<i>Mid term</i>	<i>Long term</i>	<i>Responsibility, comments</i>
1 Implementation, Management				
Apply CMP	Lodge	Apply	Update	SRA then also Arts, p, d, esp. when doing building work
Adopt Burra Charter approach	Ongoing	Ongoing	Ongoing	To guide all parties & all use & works
Site management	Establish	Ongoing	Ongoing	SRA initially then also Arts, users
2 Conserving the Fabric				
Relate ECW to ELW	Planning	Liaise	Liaise	SRA & SHFA
Conserve place & authentic fabric	Urgent, stabilisation	Major works	Ongoing	SRA, Arts, proponents, designers
Maintain ECW	Catchup	Ongoing	Ongoing	SRA initially then also Arts, users
Conserve machinery & rails in situ	Planning	Integrate in use/ works		SRA, Arts, conservator, designers
Manage archaeology, don't disturb	Research, planning	During all excavation		SRA, Arts, proponents, users
3 Cultural Identity				
Retain railway industrial landscape	Control / implement	Detailed design	Manage changes	SRA, Arts, Designers
Allow public access, involve community	Planning	Information	Use, visit, oral history	SRA, Arts, Users
Interpret ECW as a railway workshop	Fabric	Devices	Book	SRA
4 New Works				
Find compatible new uses	Find temp uses	New long term uses	Change of use	SRA, Arts, Proponents, Designers
Adapt for reuse but minimise change	No change temp users	Guide & control	Manage incremental	SRA, Arts, Proponents, Designers
Design new works to retain significance	Scale, siting	Design	Any later new works	SRA, Arts, Proponents, Designers