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Clare O'Brien
Senior Project Officer
Heritage Conservation,
Sydney Water Corporation,
PO Box A53
SYDNEY SOUTH NSW 1232

Dear Ms O'Brien

Re: Ashfield Reservoir, Pipehead Site and SP0038 Conservation Management Plans

The Director of the Heritage office under delegation from the Heritage Council considered the above conservation management plans prepared by Sydney on 16th June 2005, and resolved as follows:

1. **endorses the conservation management plans titled *Pipehead Site Conservation Management Plan*, dated May 2005*; Ashfield Reservoir WS0003 Conservation Management Plan,* dated June 2005*; and Sewage Pumping Station SP0038 [Mascot],* dated May 2005, all prepared by Sydney Water for Sydney Water, for a period of five years; and**
2. **agrees that these conservation management plans will provide guiding documents for the Heritage Council in its consideration of any proposals for change to or involving the items subject to the conservation management plans for the period of the endorsement.**

Thank you for submitting the plan for consideration for endorsement. If you have any queries please contact Bruce Baskerville on the above number.

Yours sincerely

Cameron White
Principal Heritage Officer
for 29/6/05

ENDORSED
CONSERVATION MANAGEMENT PLAN
Heritage Council

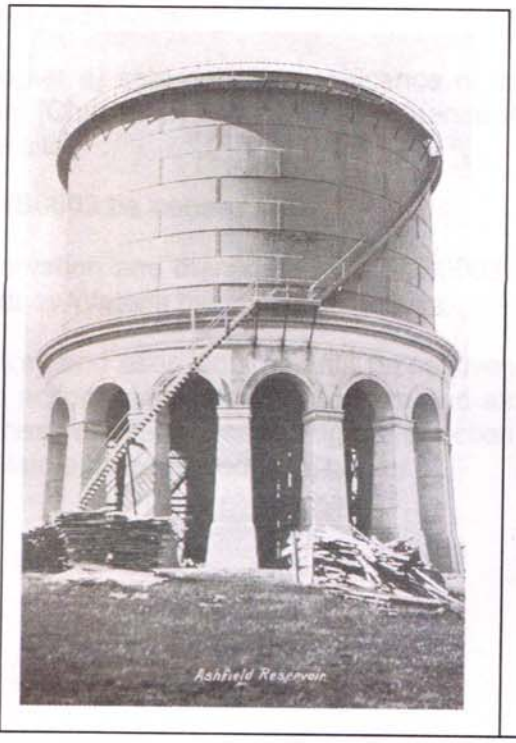
Date endorsed
16/6/2005
Date expires
16/6/2010
Copy no. 1 of 2 stamped copies
H04/00253
NSWHO File

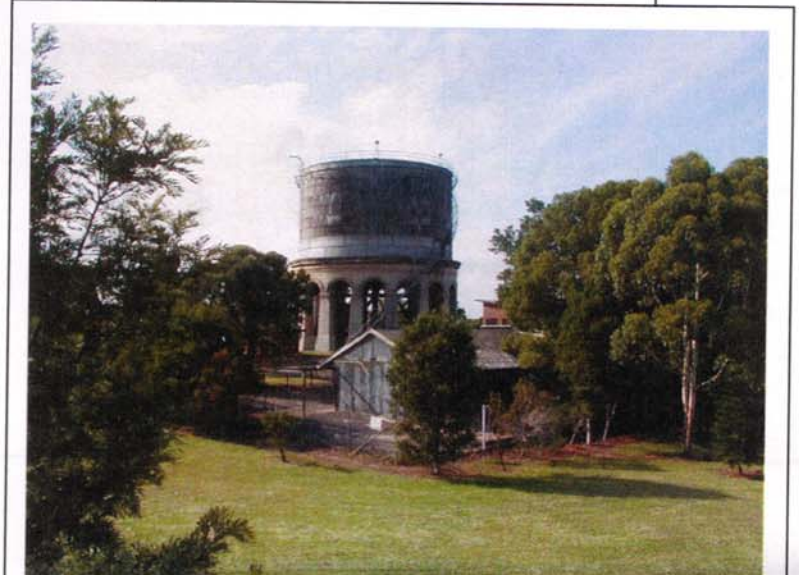
Sydney WATER

Ashfield Reservoir WS0003

Conservation Management Plan

Sydney Water Corporation





June 2005

EXECUTIVE SUMMARY

Conservation Management Plans (CMPs) determine the significance of a heritage item and recommend appropriate conservation and management policies. They are prepared to set guidelines and standards, and establish significance through investigation of the historical development of an item, using documentary, pictorial, oral and physical evidence. In NSW CMPs for places of state heritage significance have a legal status that is binding upon the owner of the heritage item.

This CMP has been prepared in conformity with best practice guidelines. The first section is descriptive and culminates in the statement of significance. This is followed by the development of recommended policies and actions to direct future conservation and management.

What is Ashfield Reservoir WS0003 and why is it significant?

Ashfield Reservoir is an elevated water reservoir built by the Metropolitan Board of Water Supply and Sewerage, Sydney between 1910 and 1914. One of a group of four elevated reservoirs constructed during this period using the innovative combination of steel and concrete, Ashfield Reservoir continues to perform an essential function by supplying the growing local community with water.

The statement of significance [Chapter 4] sets out the significance of the place in detail. The description of the history [Chapter 2] and physical evidence [Chapter 3] provides the detailed analysis of the site.

How should Ashfield Reservoir WS0003 be conserved?

The framework for the future conservation and management of WS0003 is directed by legislative obligations and by Sydney Water's own policy directives.

Chapters 5 and 6 look at the statutory and user requirements respectively. Sydney Water needs to undertake specific actions and establish policies and strategies to comply with these requirements. These are set out as a program of action within the policy chapter [Chapter 7] and the Maintenance Schedule [Chapter 8].

The future of this Conservation Management Plan

The final version of this CMP will be endorsed by Sydney Water and the Heritage Council of NSW. Upon endorsement, this CMP will form the basis for statutory exemptions under the *Heritage Act 1977* (NSW). All work undertaken in accordance with the endorsed CMP will be exempt from approval.

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Table of Figures

1. INTRODUCTION

Section 1 of the Ashfield Reservoir CMP introduces the specific Item CMP brief and objectives, defines the methodology and limitations of the report, and identifies the project team and authors.

The Introduction of the Ashfield Elevated Steel Reservoir CMP should be read in conjunction with Chapter 1 of the CMP Manual.

1.1 Background

Ashfield Elevated Steel Reservoir (hereafter Ashfield Reservoir) is one of the 59 assets owned by Sydney Water Corporation and listed on the State Heritage Register.

Sydney Water has determined that Conservation Management Plans (CMPs) should be prepared for its State significant heritage items, in order to achieve Sydney Water's heritage objectives and obligations, including legislative compliance and stakeholder expectations.

As outlined in the CMP Manual, the preparation of CMP documents for Sydney Water comprise of three levels of documents. The full range of analysis and documents is undertaken, but is broken down into sections that are more easily manageable and accessible.

The *CMP Manual*, A Tier 1 document, provides the policy level advice with respect to Sydney Water's heritage obligations and heritage practice and principle. The *System CMPs*, Tier 2 documents, provide generic conservation analysis of a system and the *Item CMPs*, Tier 3 documents, provide specific detailed conservation advice for the State Heritage listed elements of the system. This Item CMP addresses the conservation and management of Ashfield Reservoir and site. This CMP should be read in conjunction with the CMP Manual.

The endorsement of this CMP by the Heritage Council of NSW means that the CMP is recognised as endorsed for the purposes of the Heritage Act 1977 (NSW). Works in accordance with an endorsed CMP do not require further Heritage Council approval for the period of endorsement, which is generally 10 years.

1.2 Site Identification

Ashfield Reservoir, built in 1914, is one of a group of four elevated steel reservoirs, which also included Drummoyne, Penshurst and Bellevue Hill Reservoirs. These reservoirs are not only significant in regards to the part they played in the historic development of Sydney, but also the technological advancements of the time that they utilised.

Ashfield Reservoir, a landmark in the suburb of Ashbury, was constructed when the existing reservoir on the site no longer had the capacity to meet the demand of the growing western Sydney suburbs. The reservoir continues to operate today and is considered to be of historical, aesthetic, technological and cultural significance. Table 1-1 provides basic site information regarding Ashfield Reservoir and Figure 1-1 shows the location of the Reservoir.

Table 1.1 Site details for Ashfield Reservoir

SITE IDENTIFICATION	
Identification	Description
Address	Holden Street, Ashbury
LGA	Canterbury
Other Name(s)	WS003
Access	Holden Street, Ashbury
Zoning	Special Uses 5(a) – Canterbury LEP
Boundary	Peace Park, Holden St and Fifth St, Ashfield
Owner	Sydney Water Corporation

Figure 1-1 Location of Ashfield Reservoir

Source: http://www.street-directory.com.au/aus_new/index.cgi

1.3 Heritage Listing Status

Ashfield Reservoir is listed on the following Heritage Registers:

Table 1-2 Heritage Listing

Heritage Listings	
Heritage Register	Listing
NSW State Heritage Register http://www.heritage.nsw.gov.au	Ashfield Reservoir (Elevated) 01622
Sydney Water s.170 register http://inetdev.sw.com.au/heritage/search.cfm	Ashfield Reservoir (Elevated) 4575750

The reservoir is not listed on the Canterbury Local Environmental Plan (LEP) or the Register of the National Estate nor the non-legislative heritage registers of the National Trust, Engineers Institute of Australia and the Professional Historians Society.

1.4 Authorship

The Ashfield Reservoir Site CMP is the result of the collaborative effort of the CMP team members. Team members contributed to the assembly of information, analysis and discussion of drafts. Team members have agreed to be identified as joint authors of the entire CMP for purposes of intellectual copyright:

- Clare O'Brien, Senior Project Officer, completed chapters 3 and 6

Clare holds a Bachelor of Science (Environmental Studies) from Griffith University and a Masters of Environmental Studies from Macquarie University. The course components included cultural heritage and planning. Clare has worked with SWC organisation for the past 7 years.

- Lisa Rogers, Project Officer, completed chapters 2 and 4

Lisa has a Bachelor of Arts (Town Planning), a Graduate Certificate in Heritage Conservation from the Victorian University of Technology, Melbourne and has recently completed a Masters of Environmental Law at the University of Sydney.

- Zoran Popovic, Project Officer, completed chapters 7 and 8

Zoran has a Bachelor of Architecture from Belgrade University (Serbia). The qualifications achieved were verified prior to his migration to Australia by the Architects Accreditation Council of Australia (AACA) and the National Office of Overseas Skills Recognition (NOOSR).

- Heidi Gleeson, Research Assistant, completed chapters 1 and 5 and parts of Chapter 3.

Heidi holds a Bachelor of Environmental Science, majoring in Environmental Management, and is in her third year of Sydney Water's Graduate Program.

The CMP was quality reviewed by MacLaren North, Sydney Water's Heritage Manager and Phil Bennett, Heritage Adviser. The document was also reviewed by the CMP Steering Committee, comprising of senior operational managers from various SWC divisions.

1.5 Documentary Sources

This CMP has been prepared using primary and secondary documentary material and physical evidence. Principal documentary resources used in the preparation of this report were plans, maps, sketches, photographs, annual reports, previous studies, oral histories and other published information.

The site was inspected by various members of the team to assist in interpretation of the site's significance.

Unless otherwise noted, all contemporary photographic evidence was taken by the CMP team.

1.6 Acknowledgements

The CMP team would like to acknowledge the assistance of the following people: Tony Sillavan and Alana Choice, SWC Archives, Colin Kay, SWC Planning Room, Lindsay Mullard, SWC Water Operations, Annette Hura, SWC Group Property

2. HISTORICAL OUTLINE

The Historical Outline of Ashfield Reservoir (WS 0003) CMP should be read in conjunction with the Organisational History in the CMP Manual.

This chapter outlines the construction and modification history of the item and identifies the ability of this item to demonstrate Sydney Water's historic themes.

2.1 Aboriginal Land Use

Due to the impact of the arrival of European colonists from 1788 and the almost immediate impact that this had upon established patterns of subsistence our knowledge of the Aboriginal people of the Sydney district is limited.

Some eight individual groups or clans within the vicinity of the Parramatta area have been identified and two, the Cadigal and Wangal most likely lived in the area that now makes up the Ashfield municipality (Ashfield Council SOE, 2003).

The Wangal group of the geographical area of Wann, which extended from the south side of the harbour from Sydney Cove to Rose Hill (Attenbrow, 2002:26) are likely to have found Ashfield an attractive locality, the mangrove estuaries of the Long Cove and Iron Cove Creeks a good source of fish and molluscs (Pratten, 1998:1).

Post-contact, the stretch of land between Iron Cove and the Cook's River was known as Kangaroo Ground, the natural woodland would have provided a suitable habitat for possums, fern rhizomes and tubers, all of which would have been identified as valuable food sources for the Wangal (Pratten, 1998:1). The use and development of the land is described in the Marrickville Council's http://www.cadigalwangal.com.au/river/index.php website:

> Aboriginal people lived along the Cooks River for thousands of years prior to European arrival. They had developed an enormous body of knowledge and skills to harness the resources provided by the river and surrounding lands. This included trapping birds and animals, exploiting fish and shellfish, gathering plants, removing bark from trees to create carrying dishes and canoes, making use of sandstone shelters for occupation and the creation of art.
>
> The Cadigal and Wangal peoples made use of the land and seasons to hunt, trap, fish and forage for fruit and plants. As firestick farmers, they burned off scrub near rivers leaving only large trees spaced several metres apart, creating a open, park like appearance. In the absence of competition, the large trees became broader and taller, attracting possums and other small animals which could be trapped. Working in small groups, they harvested the natural products of the forests within the boundaries of their own and neighbouring associated clan lands. Bennelong, for example, who was a Wangal, was seen gathering fruit in Cammeraigal territory.

There is no evidence to suggest any particulars of the pre-historic Aboriginal use of the site subject of this report or its immediate vicinity other than in the broadest terms.

2.2 Establishing the Immediate Historical Context of the Development

2.2.1 Early Post Settlement Local Area History

Prior to European settlement Ashfield was a heavily timbered district of Turpentine – Ironbark open eucalypt forest growing on the clay soils developed from the Wianmatta Shale geology (Benson, 1995:46). On the swampy land at the head of Iron Cove and along Long Cove Creek (now the Hawthorne Canal) grew mangroves and Swamp Oak of *Casuarina glauca* forest. These were filled and made into parks and much of the eucalypt forest was cleared in the late nineteenth century, during major suburban expansion.

The construction of two of the oldest roads in Australia, Parramatta Road and the Great South Road to Liverpool shaped the future suburb of Ashfield.

The earliest known grant in the area was made in 1793 to Rev. Richard Johnson, other grants soon followed and sections of the area used for farming (Stephany, 1996:4).

By 1810 most of the land in the Ashfield municipality had been granted to Europeans and the name 'Ashfield' first recorded in a newspaper in 1816 (Pratten, 1998, 1).

The highest point in the district, the general area now contained by the Ashfield Reservoir site and by Peace Park, situated on corners of three properties, was originally granted in the 1790s. In 1803 Robert Campbell purchased the area from William Cox who had bought a number of properties in the area. The present day municipality of Ashfield was, by 1820, in the hands of four people, Campbell with the largest holding (Godden Mackay, 1993:35-36).

From the 1840s Ashfield was transformed from large rural estates to small urban allotments. In 1855 Ashfield became one of the few intermediate stations on the Sydney-Parramatta railway and by 1880s the suburbs population was booming (Stephany, 1996:4). The earliest social institution apart from churches was the Infants Home and the first open space, Ashfield Park, established in 1879 (Pratten, 1998:2).

A boost to settlement came in 1838 when the owner of Ashfield Park, Elizabeth Underwood, subdivided lots north of Liverpool Road, establishing the Village of Ashfield. The subdivision created from the Canterbury Estate south of Liverpool Road by Robert Campbell in 1841, to hold the Government cattle rejects he had shipped from Bengal (Ruhen, 1972:14). The opening of the railway line in 1855 gave real impetuous to the development of Ashfield and housing boomed from the 1880s (Bensen, 1995:46).

The large precinct immediately adjacent to the subject site was a brick pit for a number of years. The Ashfield Brick and Tile Company, incorporated in 1910, tapped the local Wianamatta Series shales to manufacture brick tiles, drain pipes and other pottery wares. The brick production eventually ceased and the disused brick pit covered by fill and purchased by the Government for open space in 1978, named Peace Park in 1993 (http://www.canterbury.nsw.gov.au/history/parks/peace.htm). The Ironbark gum trees growing at Peace Park are a remnant of the original bush that grew in the area before settlement, however there are no remants of these on the Ashfield Reservoir site.

2.2.2 Post Contact Aboriginal History

Post- contact, the Cadigal and Wangal nations were dispersed, dispossessed and alienated from their traditional lands, see (Cadigal Wadigal website http://www.cadigalwangal.com.au/main.php).

Little written records are known to exist relating to the demise of the aboriginal population from this district, however it is likely that the well documented outbreak of smallpox in 1789 had a devastating impact (Pratten, 1998:1).

Conflict between the settlers and the Wangal is recorded with the recorded burning down of Hermitage Farm, in 1798, Ashfield's earliest recorded building. A land grant had been made to Baron Alt, first Surveyor-General and Justice of the Peace of the colony in 1794.

The impact of development, particularly the brick making industries of early Ashfield, has most likely resulted in the loss of many Aboriginal heritage sites or objects of significance and there are no current formally recorded Aboriginal sites in the municipality.

2.2.3 Early Sydney Water Organisational History Context

It is widely known that the availability of fresh water was the reason to choose the location of the city of Sydney. Of course prior to settlement water storage tanks had been used the Aborigines. The first source of water, a tiny course enriched with tanks cut in sandstone, was known as the Tank Stream.

In supplement, and, at a later stage, in substitute to the Tank Stream, the water was provided from several smaller springs and numerous public and private owned or tenanted wells. Among the most important running watercourses were those at Ultimo and in Rushcutters Bay.

The major public wells were equipped with pumps providing the flow. One of the most important of these public wells was located relatively close to the site subject to this report, near the entrance to Victoria Barracks, "just outside the Barrack Wall" (Roseby, p. 21).

As the population of Sydney grew over 10,000 in the early 1820s, and to about 20,000 in the late 1830s, the available water sources were becoming insufficient. An additional problem emerged in the early 1800s as the Tank Stream was used in a manner typical for a local creek in an industrial age agglomeration, i.e. both as a source of water and as a sewer. As a result of this, its water was officially declared too polluted for human use as of 1826.[1]

The solution was found in carrying water from the Lachlan Swamps, in today's Centennial Park. It was accomplished through creation of an underground tunnel with gravitational feed. The project, created by the Mineral Surveyor and Civil Engineer of the Colony John Busby, is known as Busby's Bore.

The system was developed from 1827, and effective water supply started from 1830. The original idea envisaged creation of a reservoir in Hyde Park, with capacity of about 60 million litres, or at least a month's supply for the city of about 20,000 inhabitants. However, the reservoir was never built, and to great public discontent,

1 On history of the Tank Stream, see also Tank Stream CMP, prepared by the Sydney Water Conservation Management Plan Team in 2003.

the tunnel was not finished until ten years after the beginning of works, possibly due to underground watercourses.

The Busby's Bore tunnel was largely cut in sandstone bedrock, and ran across the area below today's Moore Park and Victoria Barracks to the point below today's corner of Dowling and Oxford Streets. It then continued below Oxford Street to the outlet in Hyde Park, where water carts could be filled, with a total length of the system of about 2 miles (3.6km). Maximum supply capacity of the tunnel was about 1.2-1.5 Megalitres a day.

In 1839, a new scheme was envisaged, based on provision of water from the Tempe Dam. Unfortunately, the collected water was not usable due to high concentration of salt, and the scheme was abandoned. The Dam structure was gradually removed over time, but stone abutments still survive in vicinity of the today's Tempe Bridge, which operates as part of the Princess Highway.

This did not have a major impact on the water supply in the early 1840s, as due to plenty of rain in those years Busby's Bore had proved sufficient for the city's needs. However, the situation changed with the droughts of 1847.

In the meantime, the population of Sydney rose to about 40,000, and was set to increase above 50,000 in the early 1850s, rendering Busby's Bore insufficient in capacity. The issue was addressed through a proposal to create an additional supply system.

The system, known as the Botany Water Supply, was developed by City Engineer W. B. Rider and, in its modified form, by his successor Edward Bell. The strategic concept of this scheme was to divide Sydney in the upper and lower area, supplied from two different reservoirs. The reservoirs were fed via a 30inch (about 750mm) cast iron rising main supplied from the Botany Swamps, with a total length of over 7km.

The Pumping Engines of the Botany Swamps water supply scheme were complete in 1858 however were unused until the reservoirs were completed.[2]

2.2.4 Development of the Botany Water Supply System

The Botany Water Supply System drew water from the swamps located on the southeast edge of the city in an area now partly occupied by Kingsford-Smith Airport. The swamps, which naturally drained into Botany Bay, had been noted as having significant quantities of water, with some potential for industrial use, from the early days of the nineteenth century, and several entrepreneurs utilised this potential.

A prominent figure among these was Simeon Lord, who owned and operated a dam, and water powered flour and woollen mills there from around 1815. Lord's land was eventually resumed by the Council for the water supply, the first land in Australia to be resumed for such purposes (Aird, p. 10).

Around 1850, Sydney had more than 40,000 inhabitants, living in about 8,000 residences. Of this number, about 2,000 homes, almost exclusively concentrated in the area between The Rocks, Macquarie Street, Hyde Park, and Kent Street, were connected to mains supply from Lachlan Swamps Scheme (Busby's Bore).

2 It is possible that the pumps were used to pump the water directly into the mains, as assumed by some researchers. However, this assumption could not be confirmed in the available documents. On history of the Botany Swamps Scheme, see also Botany Wetlands CMP, prepared for Sydney Water in 2003.

The system's average daily use of water at the time was below one Megalitre, understandably low per capita consumption taking into account that about three quarters of the population had to carry water home prior to utilisation. During the following decades, the delivery of water to homes strongly affected the average daily per capita consumption of water.

The Botany Swamps Scheme was designed by the City Engineer William Rider, and rationalised by his successor Edward Bell of the Sydney Corporation. When the Scheme was proposed, with capacity about nine times greater than the actual consumption, it seemed like a long-term solution with almost limitless potential. This allowed for introduction of numerous additional users and, sometimes, entire new suburbs to the network of mains.

The introduction of the Botany Scheme allowed the water supplied by the Lachlan Swamps Scheme to be diverted to Woolloomooloo, at the time a low priority outer suburb populated by working class. The number of homes connected also rose sharply, and by the time Upper Nepean Scheme was commenced in 1879, about 26,000 homes were already connected to mains. This soon resulted in expansion of the Botany system by additional dams, but each attempt was soon rendered insufficient. As early as 1867, the Botany Swamps supply scheme was overtaxed enough to cause the appointment by the Governor of a special commission to investigate future water supply. The answer was found in the described Upper Nepean Scheme, which forms the basis of the water supply until the present day.

2.2.5 Development of the Upper Nepean Water Supply Scheme

In spite of the seemingly huge quantity of water provided, by 1867 it was envisaged that a new water supply scheme was required, and the first plans were developed. The implementation of the new *Upper Nepean* Scheme did not start until 1879 due to the lack of funds. The scheme became partly effective in 1886, and was commisionally approved in 1888.

In 1884 and 1885 severe drought reduced Botany's water reserves to a level sufficient for only ten days of average consumption. This initiated building of an emergency scheme supplementing the Botany Swamps lakes from the partly finished Upper Nepean system.

The 1885/1886 emergency system, known as *Hudson Brothers' Temporary Scheme* after the engineering company that built it, was created within six months and provided 13,000 Megalitres a day. It was in use between 1886 and 1888, and was abandoned and dismantled after the completion of the Upper Nepean Scheme in that year.

The Upper Nepean Scheme was based on the provision of water from Nepean River and its tributaries Avon, Cataract, and Cordeaux. A system of tunnels, canals and aqueducts, known as the Upper Canal, directed the water towards Prospect Reservoir, from where it was taken via the *Lower Canal* to *Pipe Head*, the basin located in Guildford. At the Pipe Head, water was piped and distributed via the Potts Hill Reservoir to other reservoirs.

The Upper Nepean Scheme was expanded through creation of the supplementary dams, including the Upper Nepean Dams between 1907 and 1935, Warragamba Dam in 1960, and Tallowa Dam in 1977.

The Woronora Dam, built in 1941, is an element separate to this scheme, providing water supply to the area to the south of Sydney.

In total, the Upper Nepean Scheme includes 16km of tunnel, 66km of open channel, and 8km of wrought iron pipeline to the service reservoir at Potts Hill. Numerous elements of the Scheme, including Prospect Reservoir, major parts of the Upper Canal and some of the mains laid in the 1880s, are still in use today. The Lower Canal has been decommissioned and is now used as a cycleway. Prospect Reservoir is used as a back-up supply only.

2.2.6 Southern Water Distribution System

In spite of the construction of the storage dams of the Upper Nepean Scheme, described above, drought, urban expansion, water restrictions and failure of supply caused much criticism. Between the period 1904 and 1910 was the worst drought period in the Sydney region's water supply history. The media and public largely blamed the Board's management practices for shortages in supply. Cartoons lampooning the Board and the lack of water supply were common (Beasley, 1998). By the time the group of four steel and concrete reservoirs were being designed and constructed, the Board was under significant pressure to deliver.

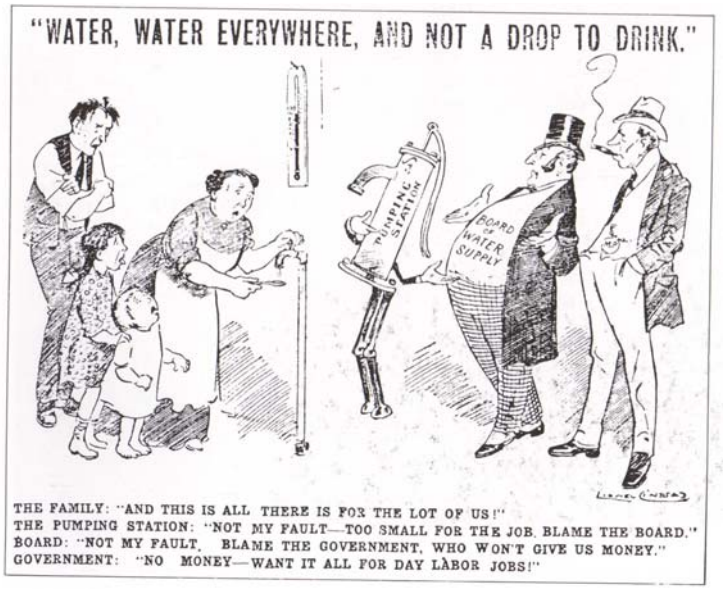


Figure 2-1 Lionel Lindsay Cartoon from News March 11 1915

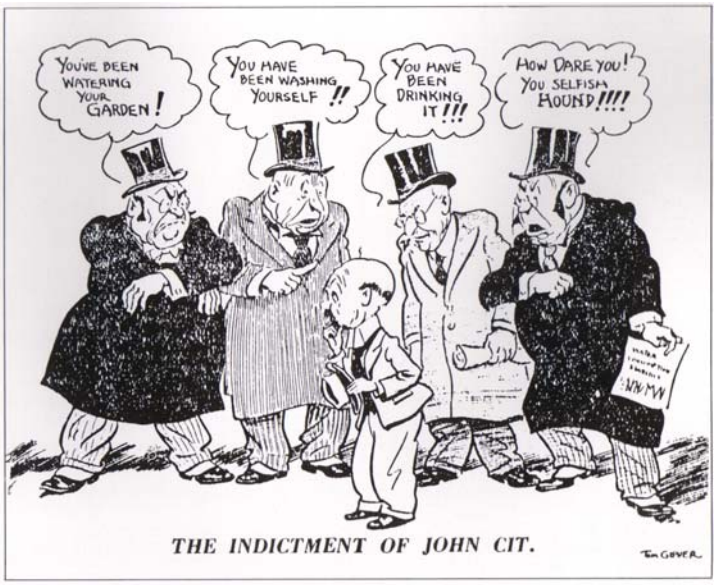


Figure 2-2 Cartoon published in the Sun, 15 November 1928,

Cartoon expressing popular view that the government blamed customers for water shortages. (Beasley, 1996)

Distribution to Sydney and suburbs south of Parramatta and Sydney Harbour was centred on Potts Hill. Initial supply from 1888 was carried by a single pipe connecting to reservoirs at Petersham and Crown Street. Water was pumped to Paddington and Woollahra, then to Waverley Reservoir. A second main was laid in 1893 followed by a succession of feeders and the construction of a pressure tunnel (1935) from Potts Hill to Waterloo (Stephany, 1993:10). The three principal pumping stations, other than Potts Hill, providing the southern system are Crown Street, Waterloo and Lakemba. Owing to the topographical nature of Sydney, the water supply and distribution system requires a large number of service tanks and reservoirs.

2.2.7 Service Reservoirs

Reservoirs, as water storage tanks, are designed to enable the water supply system to cope with variations in flow, ensuring continuous supply. Situated at high points to command the widest territory, reservoirs were elevated or built at ground level. Sufficient storage was required to meet maximum demand over a 24-hour period.

Service reservoirs are of two broad types – elevated or ground/subsurface reservoirs. Elevated steel tanks have an advantage over buried concrete tanks due to the gravity possessed, avoiding additional distribution pumping. Elevated reservoirs were used where the terrain required a reservoir high above the ground, in order to meet the pressure requirements for the area to be served.

The first service reservoirs, built between 1859 and 1899 were brick walled with brick or concrete walls supported by brick or timber piers and built into the ground (Godden Mackay, 1996:9). Such reservoirs in the southern water distribution system include Crown Street, in 1859 and Waverley No. 1 in 1887. These graduated to above ground tanks of riveted iron and later, steel. Between 1888 and 1910 twelve circular reservoirs were constructed in wrought iron, cast iron and mild steel. Two of these were elevated on brick substructures, the rest built at ground level. Materials and construction methods have varied with the progress of technological advancement, so that a variety of types and shapes are represented – brick, concrete, cast iron, wrought iron and mild steel (Aird, 1960:64).

2.2.8 Steel Reservoirs and Use of Reinforced Concrete

Most reservoirs constructed are circular, an economical design with uniform pressure transmitted around the circumference. The majority of circular reservoirs built by the board were steel and concrete, with a small number of large rectangular concrete and earth/rockfill reservoirs, with concrete lined floors and occasionally walls (SWBJ, 1982:29).

Reinforced concrete construction was introduced into Australia in the early 19th century and by 1909 there were about six companies using patented systems. Australia was quick to take up the use of reinforced concrete, a number of different systems for floors and roofs were used, including straps and external forms, however by 1915 the use of reinforced concrete was regulated. It was not until the 1950s that pre-stressed concrete, using tensioned steel to increase strength, was used in Australia. When structural steel was in short supply after WWII, prestressed concrete was used as a substitute. The ice tower at Warragamba Dam is one such early example. (NSW Heritage Office, 2003:4).

From 1892 mass concrete began to be used in reservoir and dam construction. Sydney Water historic assets Whites Creek and Johnstons Creek sewer channels were considered Australia's first major reinforced concrete structures, built by Carter Cummow & Co, using Joseph Monier's reinforced concrete technique, under licence from the French company (Heritage Office, 2003:4). The first reinforced concrete water tank using the Monier system was a reservoir built in 1899 at Kiama. This was followed by two wholly reinforced concrete reservoirs at Liverpool (1901) and Randwick (1910). The subsequent construction of Drummoyne, Penshurst No. 2, Bellevue Hill and Ashfield No. 2 between 1910 and 1914 marked a new phase in the Board's reservoir development through the composite use of concrete and steel (Godden Mackay 1996:9). The group represent an important technological development being the first elevated service reservoirs of over 0.5Ml capacity built, the first reservoirs to combine steel tank walls with reinforced concrete floors and the first reservoirs to be built using the Monier concrete reinforcement system. Concrete was used for the floor, outer columns and arches of the elevated reservoirs. Mild steel was used for the walls and extra support columns (Godden Mackay, 1996:9). In 1982 the Sydney Water Board Journal discussed the use of steel and concrete in construction of reservoirs. The Journal noted that circular steel reservoirs were the most frequently constructed, providing an economical and uniform solution. The floors were constructed of steel or concrete, lined internally with bitumen and externally with red lead paint, followed by 'reservoir green' (SWBJ, 1982:29).

2.3 Initial Development of the Site

2.3.1 Ashfield Reservoir and the Elevated Reservoirs Group

Ashfield Reservoir was one of a group of four reservoirs of the same design constructed between 1910 and 1914. These were Drummoyne, Ashfield, Penshurst and Bellevue Hill. These four reservoirs were built at the instigation of the Board, to enable supply to the elevated areas of Sydney. Of similar design, style and capacity, these reservoirs form a comparative group and as such have been the subject of previous studies (Stephany, 1993 and Godden Mackay Logan, 1996). Ashfield, Drummoyne and Penshurst Elevated Steel Reservoirs are listed on the State Heritage Register and are considered, collectively, to be of State significance, and of individual State significance.

All of the reservoirs demonstrate common construction techniques and the intention of the designers to create aesthetically pleasing landmark structures. (GML, 1996:81) Physical differences in the reservoirs are not important, Penshurst No. 2 is the

largest, Bellevue Hill is the smallest and both Drummoyne and Ashfield have equal capacity, this is not significant. Similarly there is little functional difference between them, although Drummoyne is now surplus to requirements. The point of difference between them is architectural and flowing from this, certain historical associations which contribute to the significance of individual reservoirs (GML, 1996:81). All four reservoirs have value in terms of their form, function, mode of operation and construction technology, Drummoyne is the most significant demonstrating a range of social and historic associations in its form and fabric (GML, 1996:82).

The specifications of the four reservoirs were summarised as follows in the 1913 Official Handbook of the Metropolitan Board of Water Supply and Sewerage:

Figure 2-3 Ashfield Reservoir, as published in MBWSS Annual Report 1915

Ashfield – T.W.L., 223,000; capacity, 1,000,000 gallons; depth of water, 16 ft. This is an open elevated steel tank 35 ft diameter, erected on brick piers in Holden Street, in the highest part of Ashfield; it is filled from Centennial Park Reservoir at night-time, and supplies the surrounding heights during the day. The area served by this tank is now generally supplied from the Hermitage Reservoir.

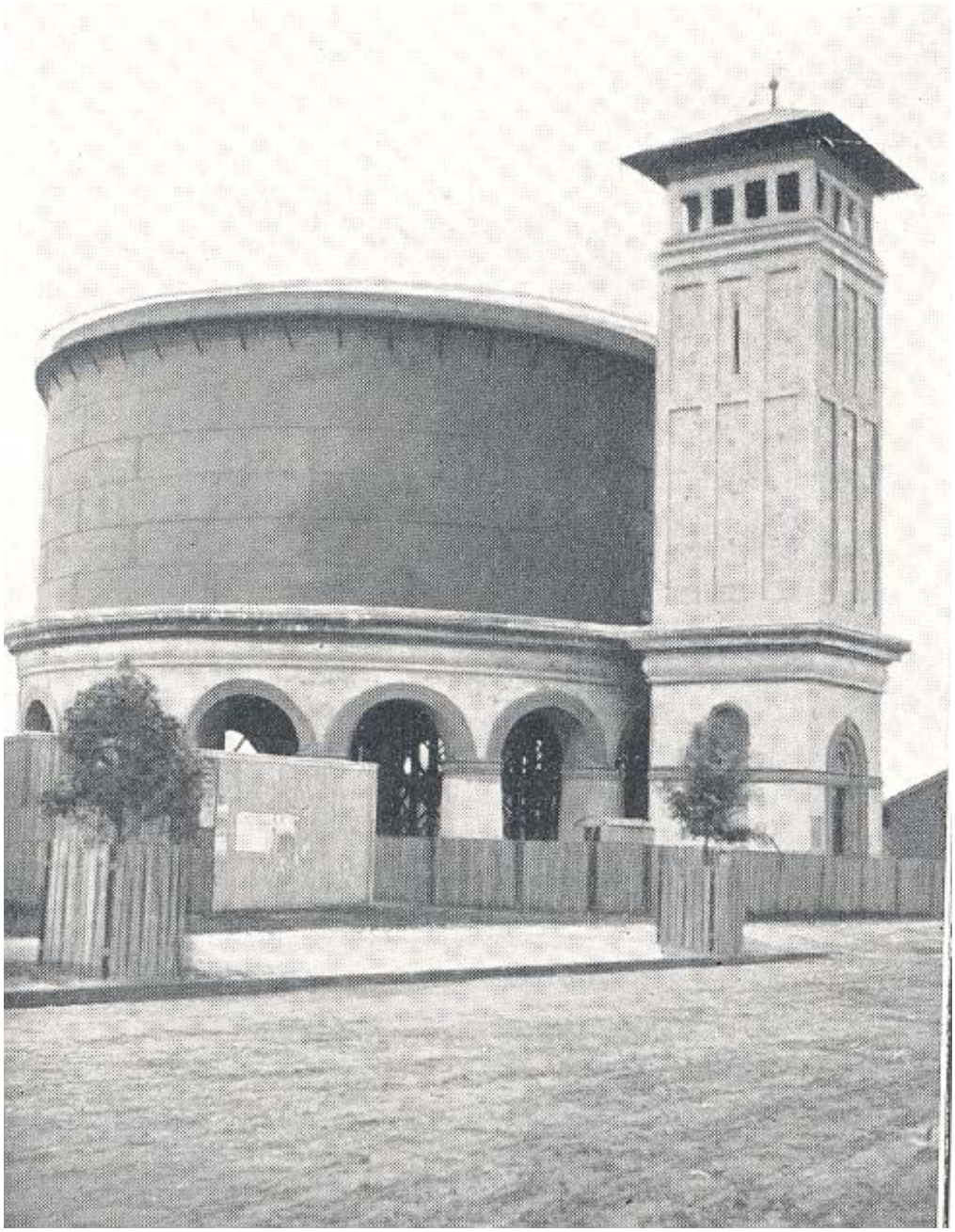
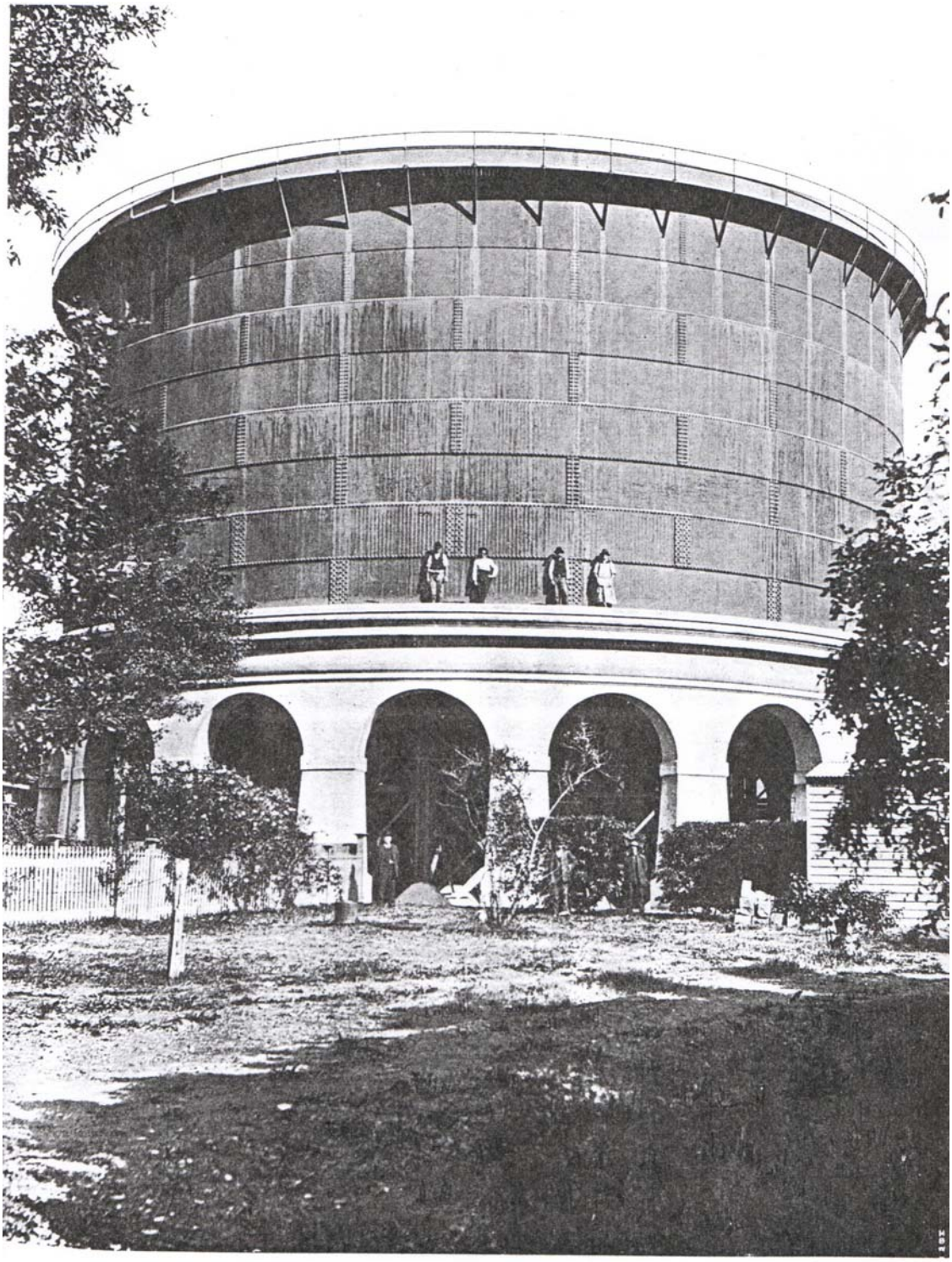


Figure 2-4 Drummoyne Reservoir, as published in 1913 Official Handbook

(MBWSS, 1913)

Drummoyne Elevated Tank – T.W.L., 168.00; capacity, 1,000,000 gallons; depth of water 32 ft. This is an open elevated steel tank, 8oft diameter, erected on concrete arches and steel stanchions and girders with a reinforced concrete floor, situated in Rawson Avenue, Drummoyne. It is filled with gravitation water from Potts Hill, and acts as a storage and balance reservoir for Drummoyne. A square tower or campanile has been attached to the front of this tank for ornamental purposes, and is utilised as a stairway to top of the tank.



Penshurst Reservoir.

Figure 2-5 Penshurst Reservoir, as published in MBWSS Annual Report 1915

Penshurst Elevated Tank No. 2 – T.W.L., 300.00; capacity, 1, 500,000; depth of water, 40ft. This is an open elevated steel tank, 88ft diameter, erected on concrete arches and steel staunchions and girders, with a reinforced concrete floor, situated in the same grounds as the No. 1 Tank. It is filled by pumped water from Carlton, and is intended for extra storage, and will either supply through No. 1 Tank or direct as required.

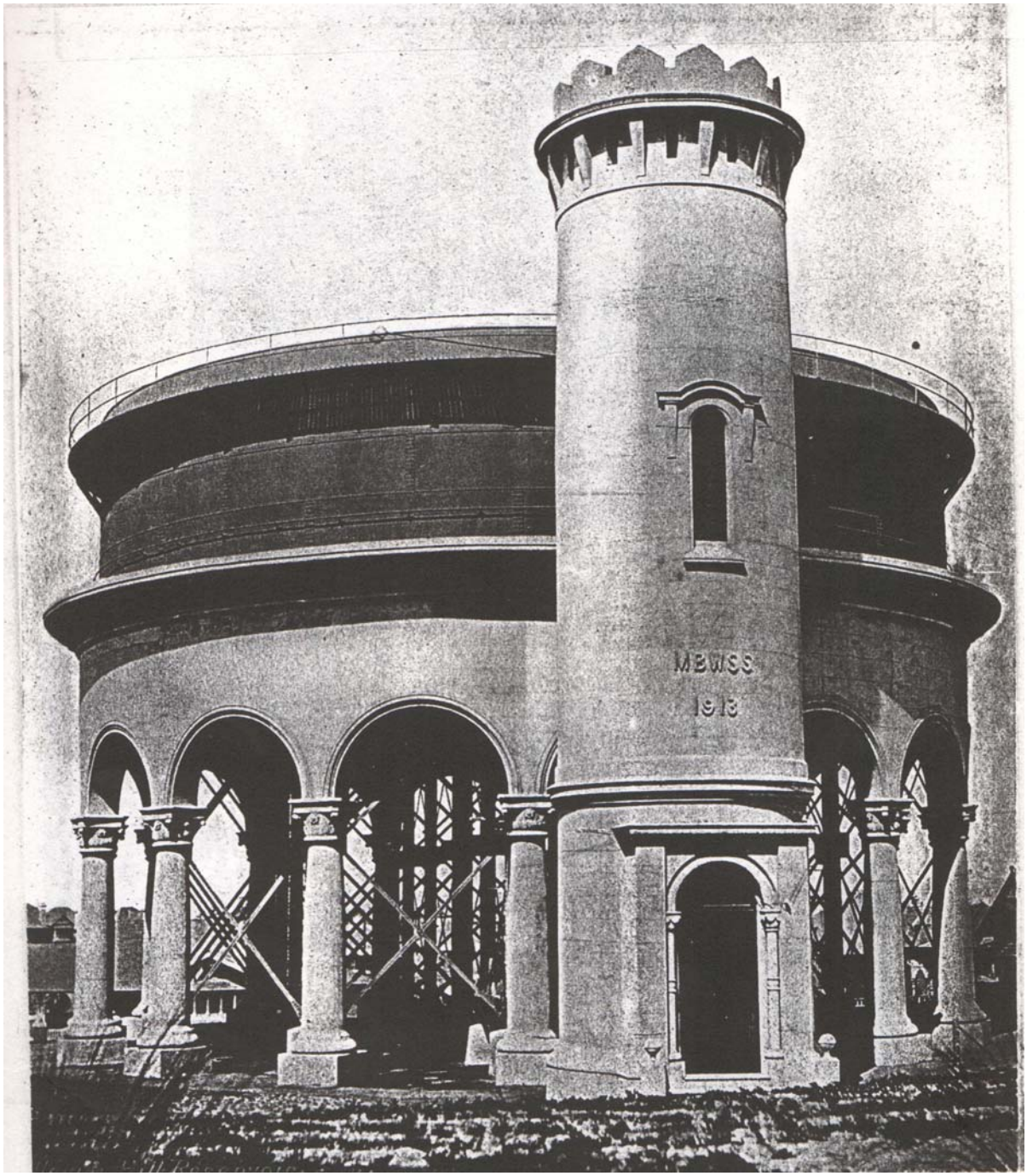


Figure 2-6 Bellevue Hill Reservoir as published in MBWSS Annual Report, 1914

Bellevue Hill – T.W.L., 380.00; capacity, 400,000 gallons; depth of water, 15 ft. This is an open elevated steel tank 74 ft. diameter; erected on steel sub-structure with a reinforced concrete floor on the highest part of Bellevue Hill; it is filled with pumped water from Waverley Park Pumping Station, and supplies the surrounding heights. A concrete tower erected for the Military Authorities for signalling purposes, has been made a feature of, in connection with this tank.

2.3.2 Development of the Site and Creation of Ashfield Reservoir

Early Water Supply in Ashfield and Resumption of Land

As noted in the earlier summary history of the post-settlement history of Ashfield, by the 1880s Ashfield was a well-populated suburb. The Upper Nepean Scheme, as described above, enabled supply to be extended to then 'fringe' suburbs, the Botany Water supply having served the inner city.

Ashfield lay directly on the path of a 1200 mm diameter cast iron main running from Potts Hill to the Crown Street Reservoir. When this main was completed in 1888 and the scheme fully operational, the lower areas of Ashfield no longer had to rely upon wells and tanks for its domestic water. Thus, the 'town water' provided a major stimulus to the growth of the suburb.

In anticipation of the completion of the Upper Nepean Scheme, Ashfield Council (as responsible authority for the provision of reticulated water supply both within and outside its own boundaries) began laying watermains in Ashfield in 1887. Ashfield was able in 1888 to hand this network over to the MBWSS, founded in that year.

From 1888 therefore, the low level areas of Ashfield were supplied with water by off takes from the 1200 mm diameter Potts Hill – Crown Street Main.

Original water supply to the high level areas of Ashfield was supplied by a small, elevated wrought iron tank on the hill at Holden Street (within the existing reservoir site) to which water from the Upper Nepean was fed back from the Woollahra Reservoir and later from Centennial Park Reservoir.

The site as configured today consists of three lots, Lot 1, DP 911478, Lot 1, DP 115504 and Lot 1 DP 711077, Holden Street, Ashfield. The first lot, fronting Holden Street, was purchased by the Minister for Public Works on 15 November 1889, from D. Robertson, to construct the first elevated wrought iron tank on the hill. Within this same lot the second and current Ashfield Reservoir was built in 1914 the property having been transferred to the M.B.W.S.&S. Five years earlier, in 1909, the purchased the second lot from the AMP Society, adjacent to the Brickworks site. The third and final lot, on Holden Street, the site of the water pumping station, was purchased from the Brickworks in c1947 for construction of a water pumping station which occurred after the 1957 completion of the City Tunnel. The second lot was primarily purchased for possible expansion of the site which has not yet eventuated (Sydney Water Real Estate History Case File No. 518, Group Property, Sydney Water Head Office).

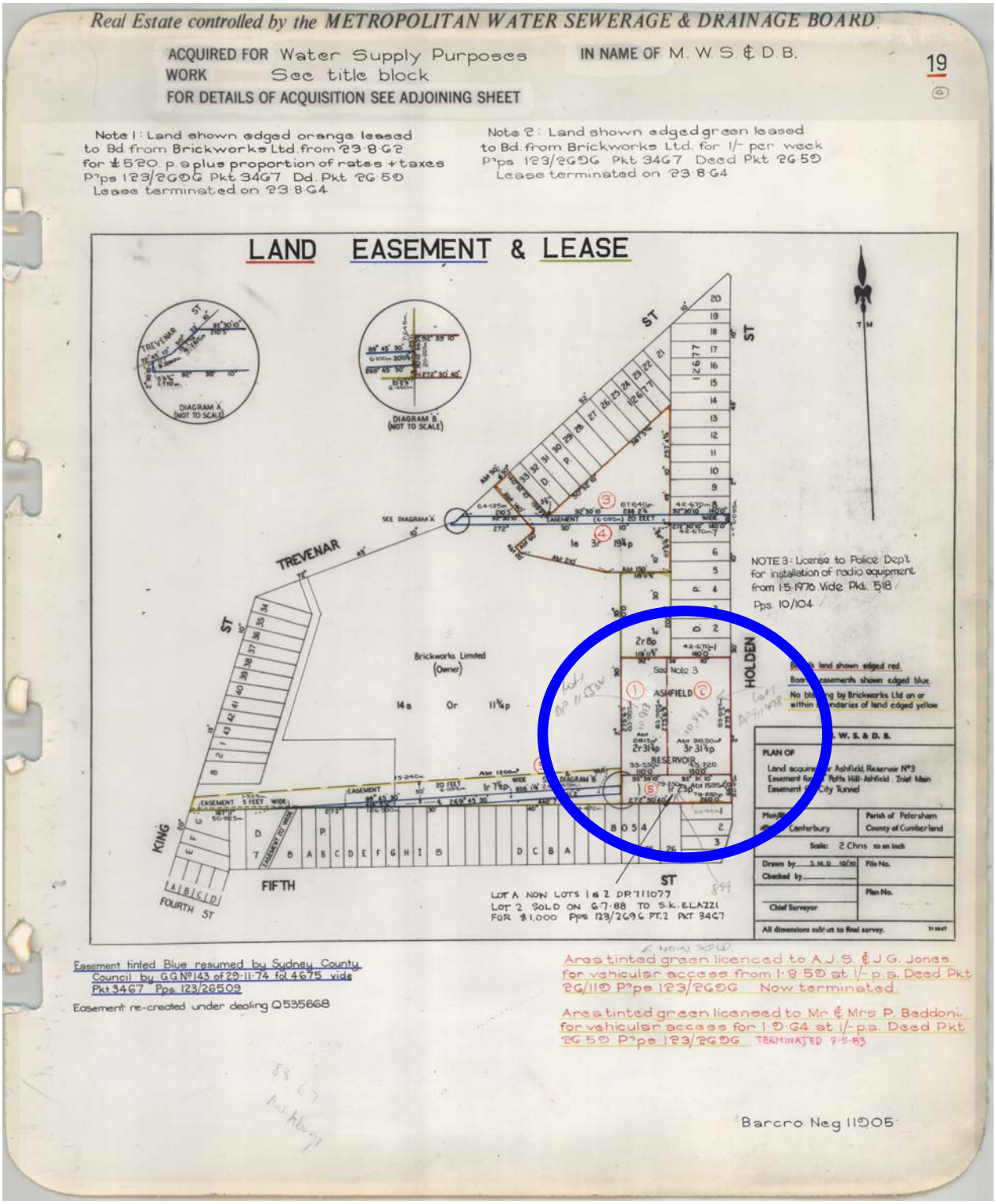


Figure 2-7 Property resumed for Ashfield Reservoir

Ashfield Reservoir site comprises three lots on this map. Lot marked # 2 was purchased in 1889 and it was on this site that the two reservoirs were built, Lot marked # 1 was purchased in 1909 and Lot 5 purchased in 1947.

First Elevated Water Tank

The first elevated water tank, built in 1888, had a 100,000 gallon capacity (MBWSS, 1913:75). As the tank became inadequate to supply the high level areas, a new elevated reservoir was required. The first tank was described in the 1913 Handbook:

> Ashfield Tank, capacity 100,000 gallons, depth of water 16ft. This is an open elevated steel tank 35ft diameter, erected on brick piers in Holden Street, in the highest part of Ashfield, it is filled from Centennial Park Reservoir at night-time, and supplies the surrounding heights during the day. The area served by this tank is now generally supplied from the Hermitage Reservoir (MBWSS, 1913:76).

This tank was still being maintained in 1909, when the Board's Annual Report recorded that the steel tank required repainting (MBWSS, 1909:84). Evidently in situ but obsolete by 1913, this tank was removed to Holroyd after the present Ashfield Reservoir was completed.

As outlined in the history of Drummoyne Reservoir, a Board Member and local prominent citizen, Mr Thomas Henley was instrumental in the Board's provision of a group of elevated water reservoirs in the suburbs of Sydney. Henley's influence in achieving elevated reservoirs may not have been restricted to the construction of Drummoyne Reservoir, however, the minutes of the Board meeting held on 6 January 1909 record that Henley led a motion to encourage the MBWSS to construct elevated reservoirs in Sydney generally:

> (Item) 69. – On the motion of Alderman Henley, the following resolution was carried:
>
> a.- "That the Engineer-in-Chief report on providing suitable Balance Reservoirs in each Suburb.
>
> b. – " That steps be taken to acquire the necessary sites."

Whilst the Ashfield reservoir is recorded as being commissioned in 1912, plans for the construction of the reservoir were being made some years earlier and in the case of Ashfield, the MBWSS already owned the property. In 1908 the MBWSS Annual Report noted:

> Plans are well advanced for a large service reservoir at Holden-street, Ashfield for supply to the high-level zones of the Western Suburbs. This reservoir will be fed from the Hermitage system (MBWSS, Annual Report, 1912).

Funds were not immediately available to carry out the plans however, as noted in the 1909 MBWSS Annual Report, 'The scheme of proposed reservoirs at Crows Nest, Bellevue Hill, Ashfield and Wahroonga has made no advance since last report owing to funds not been available.'

Ashfield Reservoir

As noted above, Ashfield Reservoir was built on MBWSS Board property next to the original elevated water tank, on the one lot. An archival plan of the Public Works Department Survey (PWD 984) shows the original large water tank on circular masonry, later revised in 1912 to show the position of the new Ashfield Reservoir 'new water tank in course of erection concrete pillars' (Refer Figure 2-8).

Figure 2-8 Excerpt from Archival Plan PWD Survey 1890

PWD Survey, Syvr J.Duncan A. Riddle 17 Nov 1890, then a large Iron water tank on circular masonry. Revised by Svyr T. Fender 24 Jul 1912 with notation, 'New Water Tank in course of erection concrete pillars'. (Sydney Water Plan Room)

Early plans demonstrate that the replacement originally proposed for the 100,000 gallon tank was far more ambitious than the single tanks constructed at Drummoyne, Bellevue Hill and Penshurst and that actually constructed at Ashfield. A 1908 plan shows a proposed layout (Figure 2-9) of four reservoir tanks, each of 1,000,000, in the apparent same location as the in Holden Street, Ashfield (MBWSS, 1908). In addition, the design is recorded in several different manifestations in 1912 (Refer Figures 2-9 and 2-10) originally a ground level reservoir in January 1912 (Figure 2-10) to an elevated steel tank and concrete substructure (Figure 2-11). Whilst the materials at this stage are the same as that constructed, the December 1912 design includes an elegant and detailed substructure with spiral staircase. An additional plan records a variation on this design, which appears to propose a brick superstructure (Figure 2-12).

The construction of the valve house is not documented in detail; an early plan (Figure 2-14) is dated 1914.

An early plan has been sighted detailing a steam water pumping plan, including boiler house (with three boilers) and engine house, dated 1902, prepared by A Cutler for 'Ashfield', although it is not known whether this was proposed for the Holden Street site. The water pumping station (WS0085) was eventually added in the 1960s after completion of the City Tunnel.

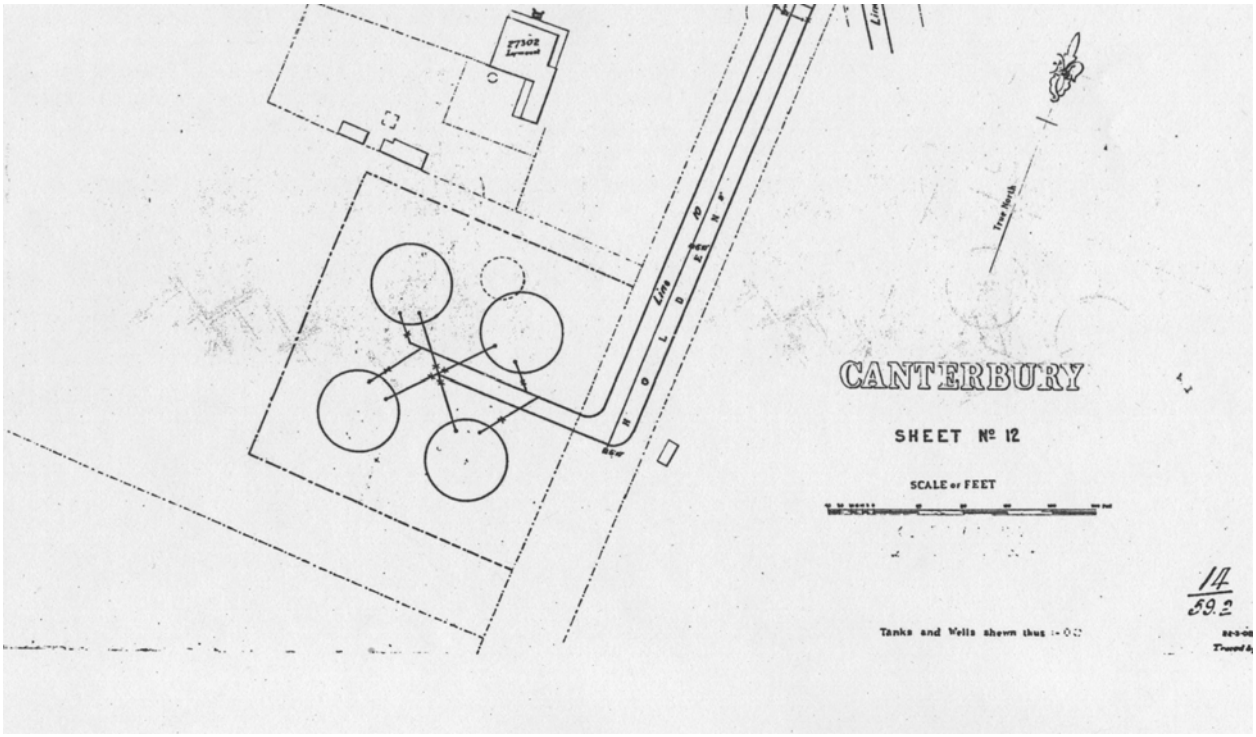


Figure 2-9 Archival Plan PWD Survey 1908.

(Excerpt from Archival Plan, Metropolitan Board of Water Supply Sewerage and Stormwater, Proposed Installation of four 1,000,000 gallon tanks, Ashfield, Sydney Water Plan Room.)

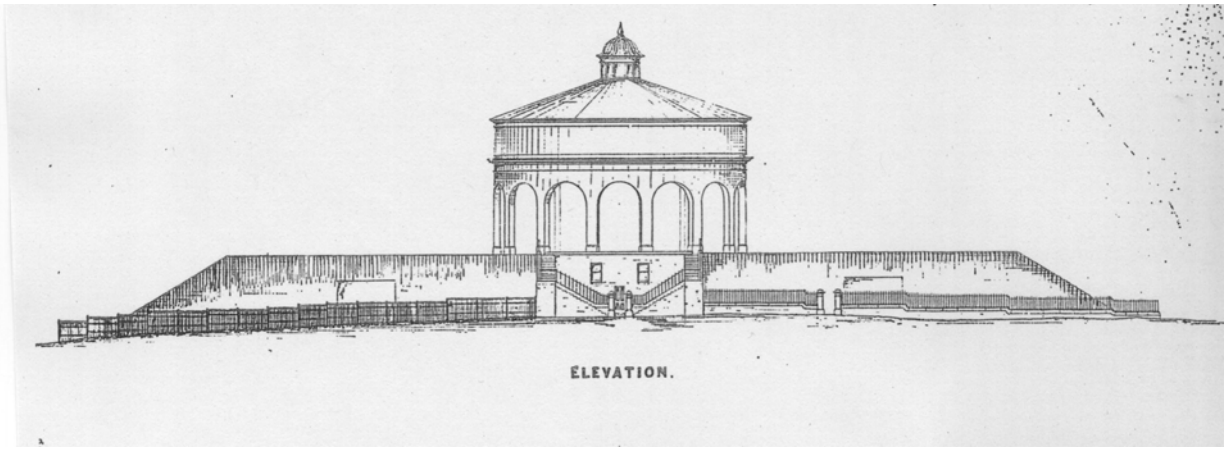


Figure 2-10 Early design for Ashfield 'Concrete Tank', January 1908

(Excerpt from Archival Plan, Metropolitan Board of Water Supply and Sewerage, 'Proposed Concrete Tanks, Ashfield', 1908, Sydney Water Plan Room.)

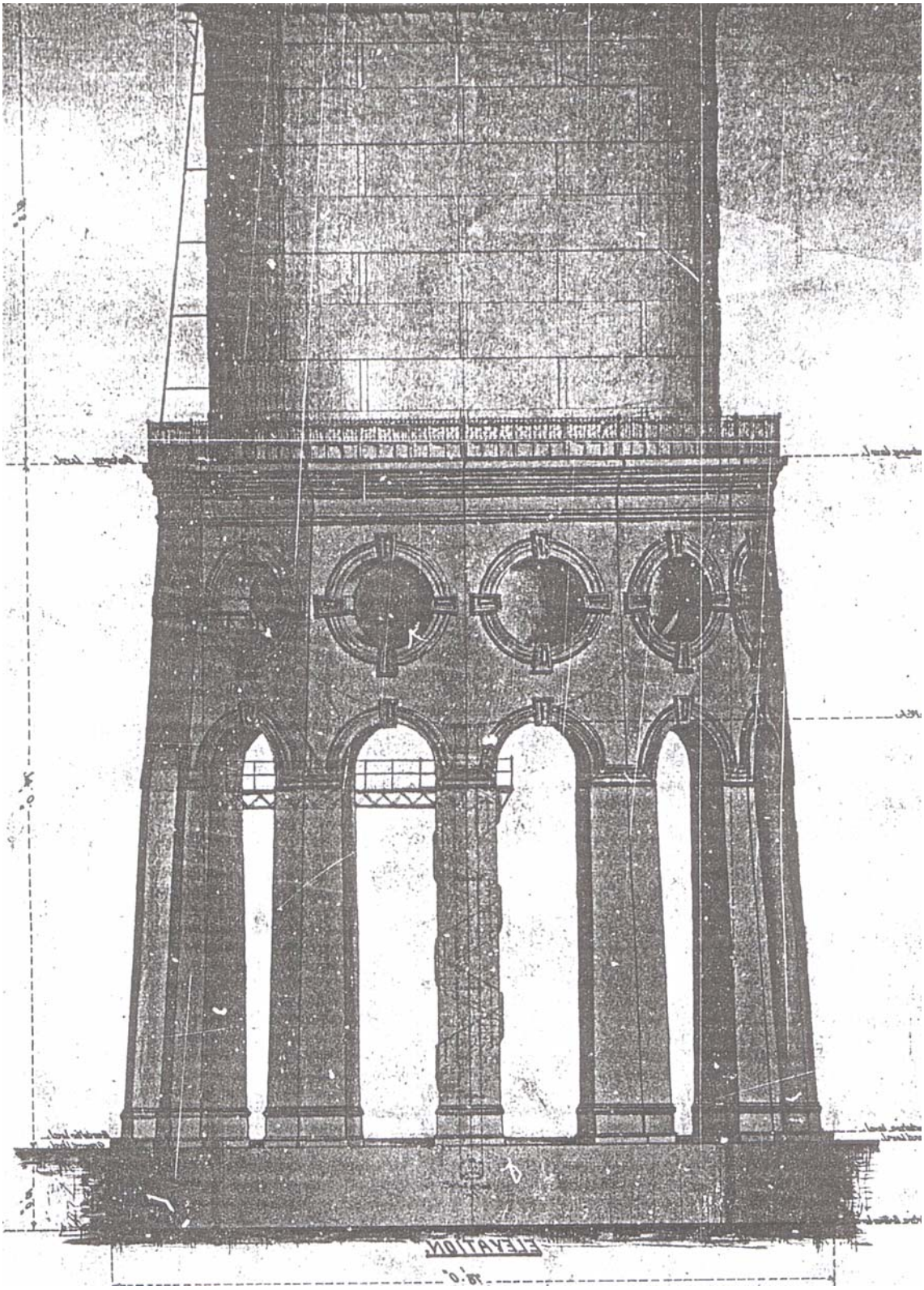


Figure 2-11 Early design for Ashfield 'Proposed 1,000,000 gallon steel tank on brick in cement & concrete tower for Ashfield, 1908.

(Archival Plan, Metropolitan Board of Water Supply and Sewerage, Proposed 1,000,000 gallon steel tank on brick in cement & concrete tower for Ashfield, 19081909, Sydney Water Plan Room)

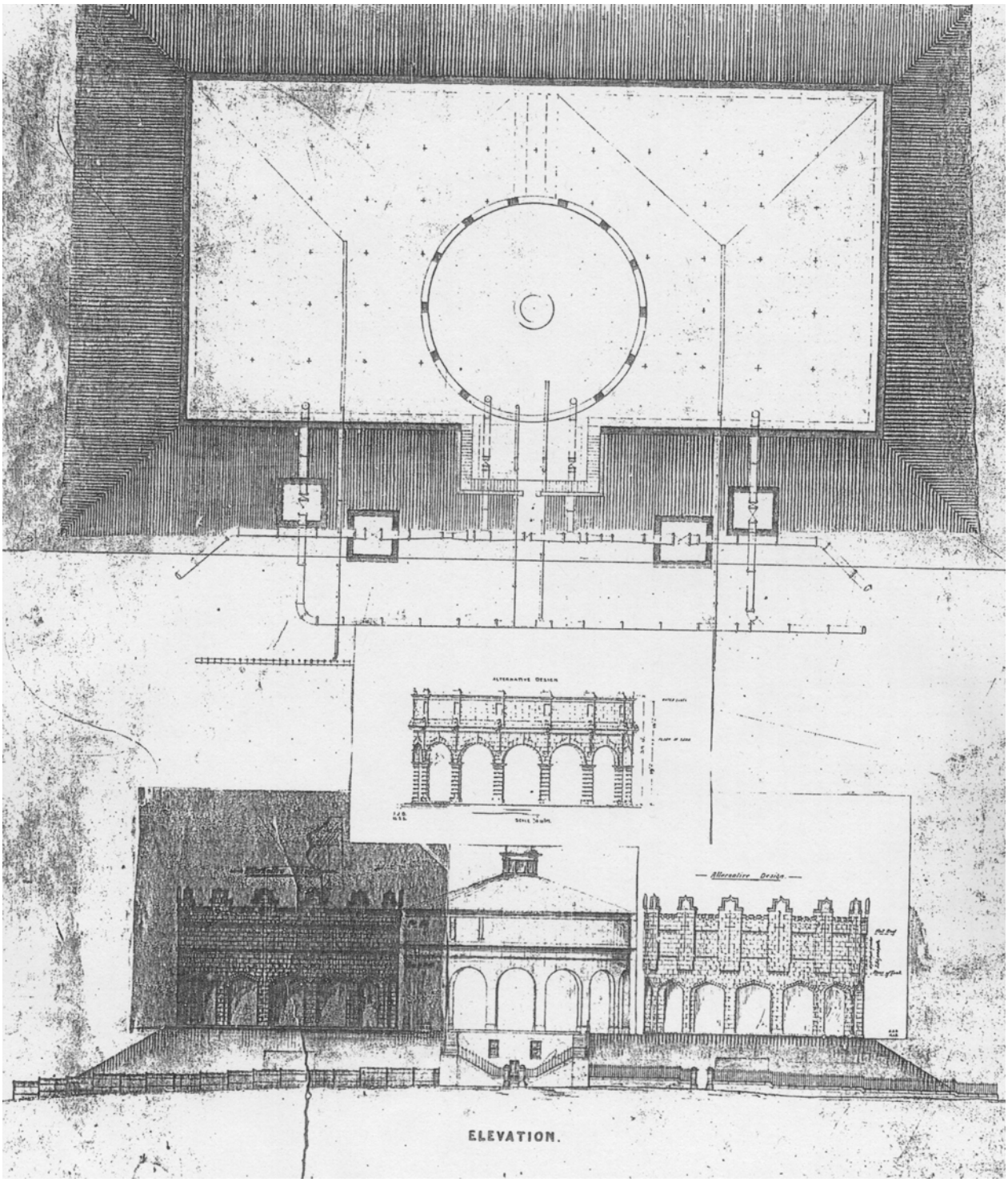


Figure 2-12 Early design for Ashfield, Variation on 'Proposed Concrete Tanks', 1908

(Archival Plan, Metropolitan Board of Water Supply and Sewerage, Proposed Concrete Tanks, 1908 Ashfield, Sydney Water Plan Room.)

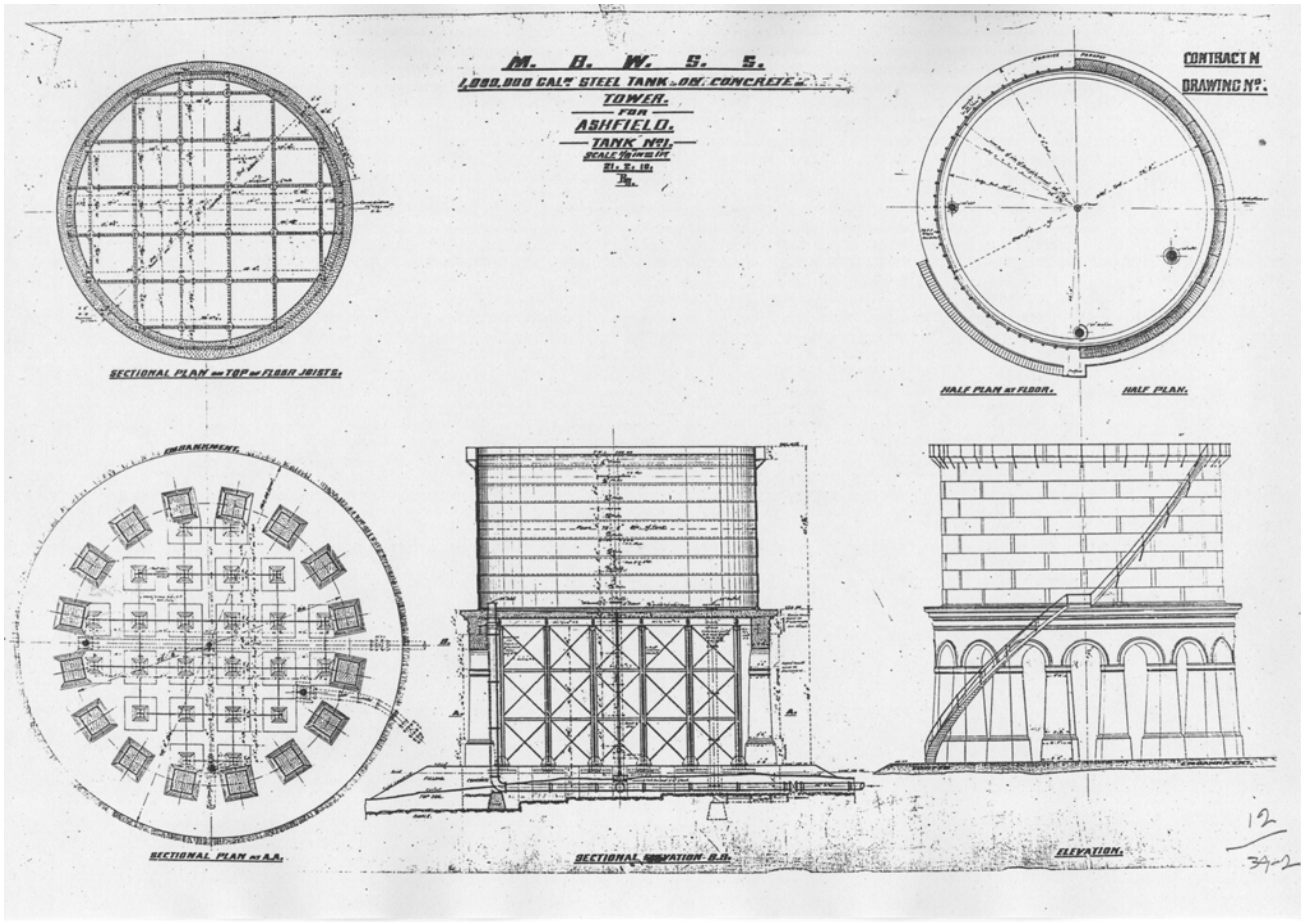


Figure 2-13 Archival Plan, Steel Tank on Concrete Tower for Ashfield, 1910

(Archival Plan, Metropolitan Board of Water Supply and Sewerage, 1,000,000 Gallon Steel Tank on Concrete Tower for Ashfield, 1910, Sydney Water Plan Room. archival Plan, February 1910, Sydney Water Plan Room)

It is not known from currently available evidence, whether similarly ambitious plans were made for Penshurst, Drummoyne or the Bellevue Hill Reservoir sites. This is unlikely at Drummoyne at least, confined to a small site and no other plans have been sighted for other sites, which detail alternate designs.

The eventual design of Ashfield is shown in Figure 2-13, as finalised in 1910. It is not known whether Poole & Steele supplied the steel tank, suppliers for Drummoyne Reservoir, however once again the Board constructed the substructure‘ (MBWSS, Annual Report, 1910).

Construction commenced during the 1911 financial year, the 1910 MBWSS Annual Report notes that ‘Reservoirs at Penshurst and Ashfield will be put into hand during the coming year’.

In the 1911 MBWSS Annual Report, the four reservoirs, at Ashfield, Penshurst, Bellevue Hill and Drummoyne were ‘under construction’ (MBWSS, Annual Report, 1911:73).

The Board’s Annual Report noted the slow progress in completing construction of Drummoyne, Penshurst, Ashfield and Bellevue Hill, citing difficulties in obtaining material (Annual Report, 1912:70). During the financial year 1912 – 1913 the concrete and steel substructure was finished and the ‘steel shell’ in progress of erection (MBWSS, 1913:72). It was noted that in the financial year of 1913-1914 the Ashfield Reservoir was ‘practically finished and will be available for the coming summer’ (MBWSS, 1914:75). Ashfield Reservoir was observed to be of similar construction to Penshurst No. 2.

Ashfield Reservoir was declared completed 26 September 1914. Penshurst and Bellevue Hill Reservoirs were completed in December 1914 and February 1915 respectively (MBWSS, 1915:85). There is no indication from early plans that Ashfield was to have a tower, as at Drummoyne and Bellevue Hill.

The Hermitage, Bellevue Hill and Drummoyne Reservoirs, preceded the Reservoirs at Penshurst and Ashfield which seem to have been largely built simultaneously.

Ashfield was constructed as an open elevated circular steel tank with a capacity of 1,000,000 gallons, erected on concrete arches and steel stanchions and girders with a reinforced concrete floor. It was completed by 1913 or 1914. There is little mention of Ashfield Reservoir after the initial construction phase in MBWSS Annual Reports.

The completion of the existing Reservoir thus continued the reticulation of water first supplied to the local community in 1888.

The Reservoir’s valve house, a modest structure with little architectural detailing was built in 1914 (Figure 2-14). Early photographs record a site with little vegetation or plantings within the site bounded by a paling fence.

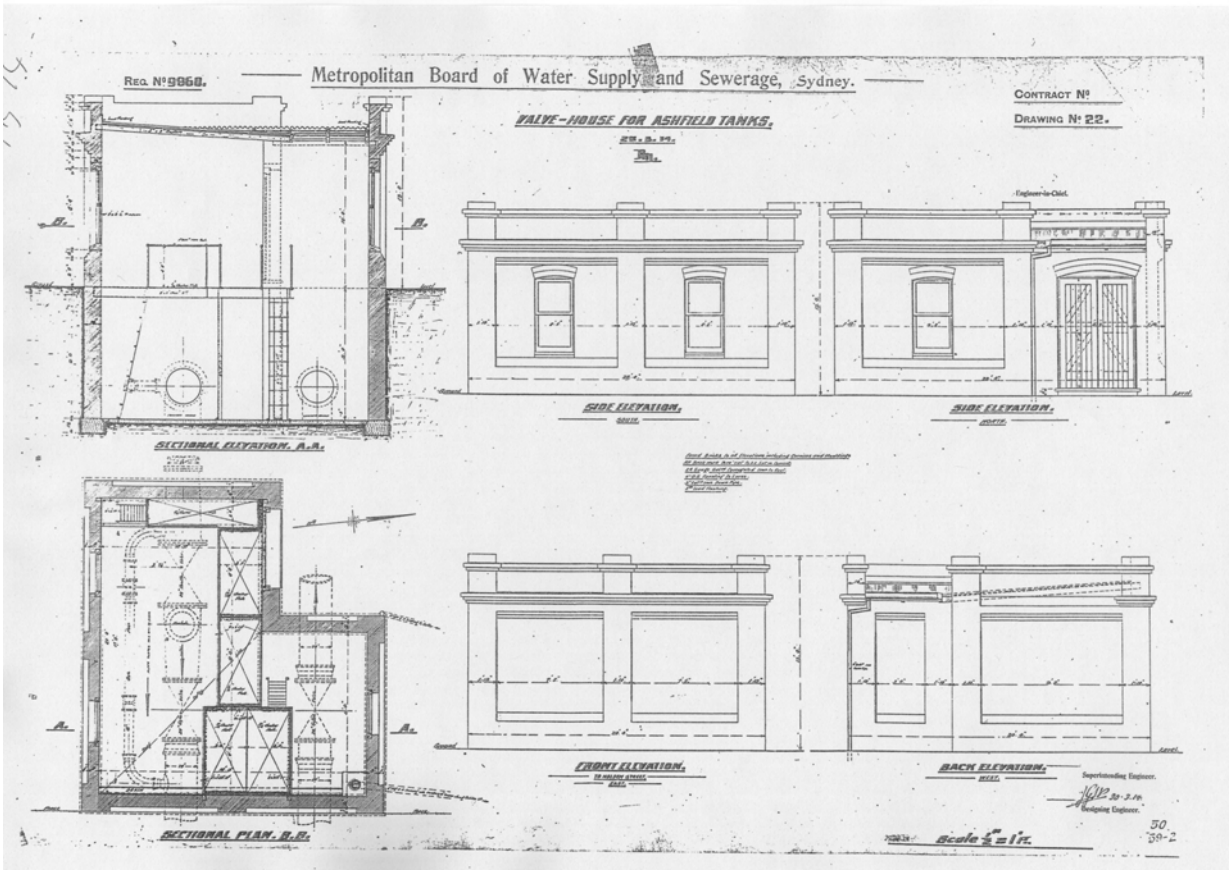


Figure 2-14 Ashfield Valve House 1914

Metropolitan Board of Water Supply and Sewerage, Sydney, Archival Plan of Valve House for Ashfield Tanks, 1914.

2.4 Subsequent History of the Item

2.4.1 Item History within the Sydney Water System

With the construction of the Ashfield Reservoir, the higher areas of Ashfield gained a reticulated water supply. Ashfield's lower areas were supplied from the two pressure tunnels from Potts Hill Reservoirs – the Pressure Tunnel and the City Tunnel, which were completed in 1935 and 1957 respectively.

These tunnels run through the centre of Ashfield along with two shallow depth mains, laid in 1888 and 1893. Water is pumped from the City Tunnel to the Ashfield reservoir for supply to high level areas of Ashfield, low level areas supplied by gravity from the Pressure Tunnel and the two shallow mains described above.

By the 1940s, the Ashfield Reservoir was not meeting demand, and additional reservoirs were proposed, to be supplied by the City Tunnel. These included an additional elevated reservoir of 2 mg capacity and a low level reservoir of 2 mg capacity. This scheme was not implemented.

The underground water pumping station (WP085), built in the 1960s, enabled the direct supply of water from the City Tunnel.

Ashfield Reservoir has served as a storage and balance reservoir from c.1914 (one year after Drummoyne) and is still in operational use in that capacity.

2.4.2 Other developments on the Site

The site was also used as a works depot. The 1951 aerial photograph (refer to Figure 2-15) of the site shows that there were numerous buildings and it is likely that these may be associated with the construction of the City Tunnel. With the completion of the project most of the buildings have been removed. The only building that has survived from this time is the galvanised metal shed in the south – east corner of the site.

The Water Services Depot building was constructed in 1967. The utilitarian structure consisting of a flat roofed brick building (refer to Chapter 3 for a full description) was used as the depot office and still stands, now disused, on the site. The plans for the building are shown below (Refer to Figure 2-16). Very similar structures were constructed about the same time at Penshurst and Wahroonga Reservoirs.

Associated with the use of the site as a works depot was the construction of the sheet metal store. This was constructed in the mid 1970s (pers. comm. L Mullard, May 2005).

The use of the site as a works depot was abandoned following a decision by Sydney Water to centralise depots. Numerous Sydney Water sites across Sydney were used as depots.

With such intensive use of the site there are no landscaping features that are considered to be historic and associated with the original construction of the reservoir.

Figure 2-15 !951 Aerial Photgraph of the site

Source: Land Photo Sydney (Cumberland) Run 14 May 1951 12" 12200

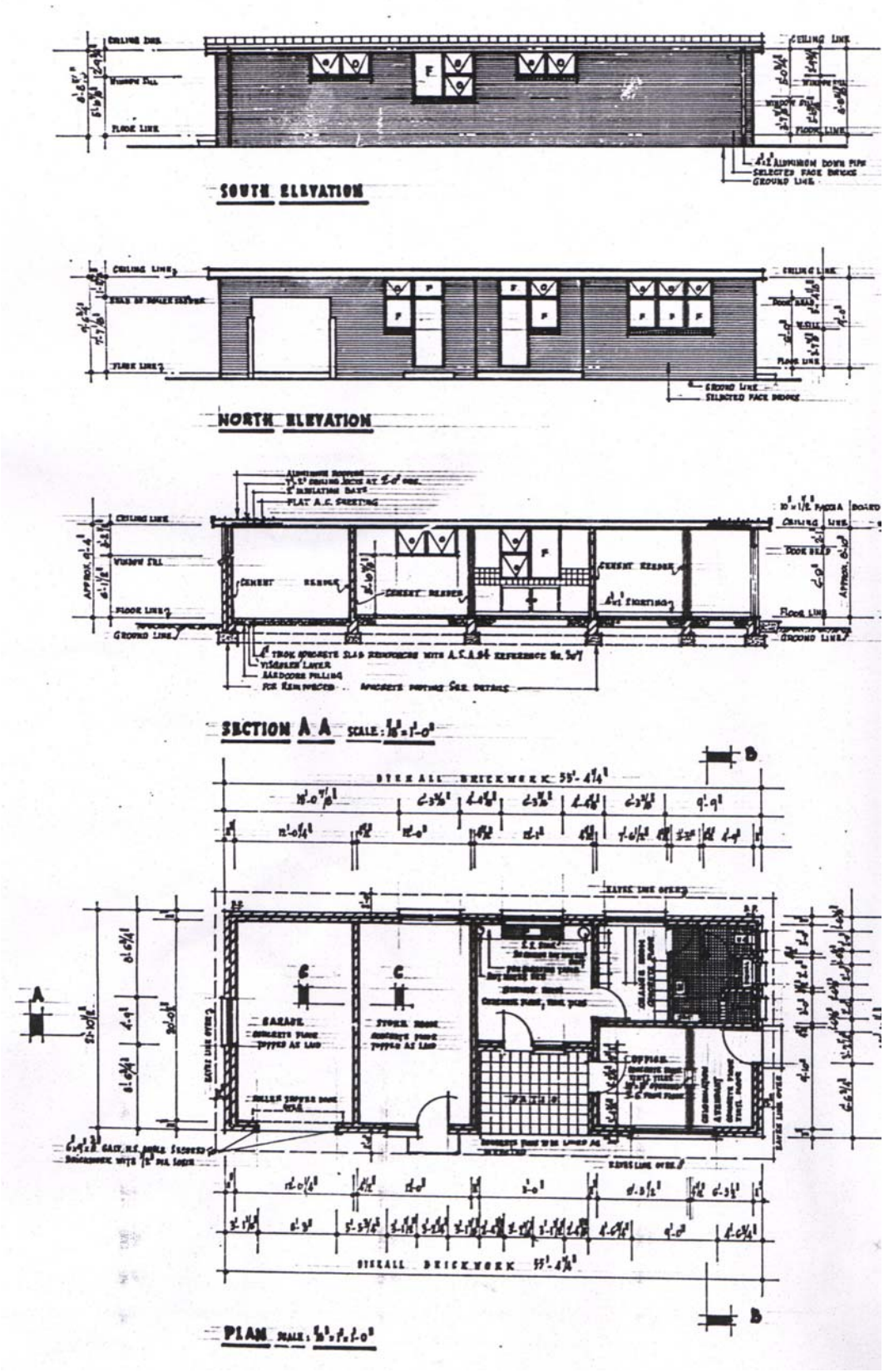


Figure 2-16 Proposed W.S.O. Depot at Holden Street, Ashfield. Plans, Elevations, Sections and Details. Dated as Recommended 22.5.67. Plan No 37-39-2 Sydney Water Plan Room

2.5 Changes to the Fabric

2.5.1 History of Use and Changes to the Fabric

There are no remains of the first 1888 elevated reservoir on site, subsequently removed to Holroyd.

Ashfield Reservoir is largely intact, modifications include removal of the timber from the upper walkway and mid to late period additions including a steel davit (c. 1970s), guttering and a security gate on the stair. These elements are specified in Chapter 4, Schedule of Significant Elements.

As noted in the historical background, the original intention was for several large reservoirs to be built, supplied by a water pumping station.

Later, the whole site was retained for the possibility of the construction of an additional reservoir and the site was subsequently used as a depot. Several subordinate mid/late period buildings and structures associated with the depot were constructed, as described in Chapter 3.

The Ashfield Water Pumping Station (WP0085) was built in the 1960s on the site supplying the reservoir with water from the City Tunnel.

2.6 Historical Evidence and Themes

The chart below sets out the relevant national and state themes that apply to Ashfield Reservoir. Themes can trace connections that are not immediately apparent. The thematic analysis also provides a basis for evaluating historical significance, which forms Criterion A under the NSW State heritage assessment system. This is further explored in Chapter 4.

Ashfield Reservoir obviously expresses the Sydney Water theme of water, but its fabric and associations also demonstrate other historical themes.

Historical Themes		
National Theme / Sub-Theme	State Theme / Local Theme	Major Theme
Governing Building Settlements, Towns and Cities	Government and Administration Utilities	Water Supply Fittings
Developing Local, Regional and National Economies	Health	Water Supply
Developing Local, Regional and National Economies	Technology Events	Water Supply Fittings
Building Settlements, Towns and Cities Developing Local, Regional and National Economies	Townships Housing Technology	Social History

Historical Themes		
National Theme / Sub-Theme	State Theme / Local Theme	Major Theme
Governing Marking the Phases of Life	Government and Administration Persons	Administration
Working Building Settlements, Towns and Cities	Labour Townships	Social History

3. PHYSICAL DESCRIPTION

Section 3 of the Ashfield Reservoir CMP describes the physical and functional nature of Ashfield Reservoir.

This section should be read in conjunction with Chapter 3 of the CMP Manual.

3.1 Physical curtilage

3.1.1 Position within the Water Supply System

Ashfield Reservoir is an operational component of Sydney's water supply network. Water is supplied from a gravitational pressure tunnel, known as the City Tunnel, which originates at Potts Hill and culminates at the Dowling Street Pumping Station along with the parallel Pressure Tunnel.

The water is pumped from the City Tunnel to the Ashfield Reservoir. This pumping station is located below the surface although the pumping station access building is located adjacent to the reservoir. Ashfield Reservoir supplies water to Ashfield, Abbotsford, Chiswick, Drummoyne, Haberfield, Ashfield, Summer Hill, Hurlstone Park, Dulwich Hill. The supply arrangement in shown in the figure below.

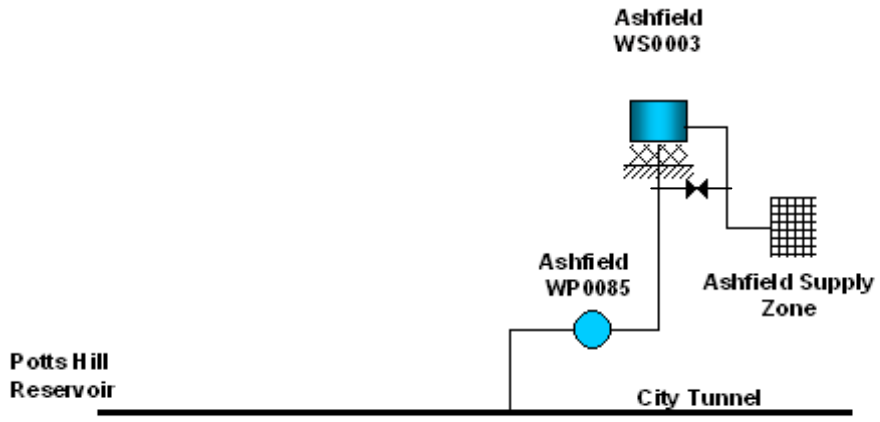


Figure 3-1 Diagram of the arrangement of the Ashfield Reservoir within the water supply system

3.1.2 Location and Landscape Description

Geology and Topography

The Ashfield Reservoir site is elevated and located on a crest in the landscape. The site itself has a gentle incline from south to northeast. Much of the surrounding area has gently declined slopes. However, Peace Park, to the west of the site, has a much sleeper decline.

The site is situated on the extensive Wianamatta Group Shales, comprising of Ashfield Shale and Bringelly Shale. These shales consist of a mixture of laminate, siltstone, claystone, shale and coal. These soils can generally be characterised as having low fertility and moderate erodibility (Chapman et al.1989).

Vegetation

The site is highly modified and it appears that there is no remnant vegetation. The vegetation on site is a mixture of native and exotic species. Much of the vegetation on site has been planted to improve the aesthetics of the site. The site comprises predominantly of grassed areas and mature plantings.

Native species found on the Ashfield Reservoir site include;

- Eucalyptus spp. (Including Eucalyptus nicholii – Peppermint Gum)
- Leptospernum sp. (Tea Tree)
- *Callistemon sp*. (Bottlebrush)
- *Sterncarpus sinuatus* (Wheel of Fire Tree)
- *Acacia sp*.(Wattle)
- Pittosporum sp.

Exotic species on site include:

- Cinnamon camphora (Camphor Laurel)
- Nerium Oleander (Oleander)
- Pinus sp.
- Japonica sp.
- *Metrosideros excelsus* (New Zealand Christmas Bush)
- Catoneasta sp.
- *Plumeria sp.* (Frangipani)
- *Ficus sp.* (Columbian Fig)

The site is well maintained and there are few weed species.

Waterways

There are no significant waterways in the immediate vicinity of the Ashfield Reservoir site. The Cooks River is located approximately 1.5km south of the site.

3.1.3 Ownership and Tenure of Land

Ashfield Reservoir and site is owned and operated by Sydney Water Corporation. The sites comprise of 3 separate lots:

Table 3-1 Land Parcel Summary for Ashfield Reservoir site

Land Parcel Summary			
Parcel Code	Lot Number	Plan Code	Plan Number
LOT	1	DP	911478
LOT	1	DP	115504
LOT	1	DP	711077

With the exception of Lot 1/ DP 115504, the Ashfield Reservoir site is defined for Sydney Water purposes as “System Land”. The Lots defined as “System Land” are the minimum land required for current operational purposes. The remaining Lot, Lot 1/DP 115504, is defined as “Marketable Land”. This land is considered surplus to Sydney Water’s current operational requirements.

All of the Lots are considered as being within the heritage curtilage, by both the S.170 register and State Heritage Register.

3.1.4 Urban Context, Streetscape and Architectural Layout of Built Components

Ashfield Reservoir is located in the suburb of Ashbury. The reservoir is surrounded by residential development to the north, east and south. Peace Park, modified parkland, is located adjacent to the western boundary of the site.

The eastern boundary of the site fronts Holden St, which receives relatively low volumes to traffic. Most south bound traffic is directed to Armstrong St and joins with the busy Canterbury Rd. The intersection of Holden and Armstrong St for south bound traffic occurs before the Ashfield Reservoir site.

The layout of the built items within the site is shown in Figure 3-2. The north side of the block includes several brick, skillion- roofed office, amenity, workshop and garage buildings. These buildings were used as a works depot site. A large asphalt paved car park is sited to the west of the Reservoir. The south side of the block features a fenced electrical substation. A small brick valve house is located on the boundary of Holden Street, an adjacent to the Reservoir.

Figure 3-2 **Aerial Photo showing the land use surrounding Ashfield Reservoir and the layout of the built items within the site.**

3.1.5 Visual Curtilage – Views and Vistas

The elevation of Ashfield Reservoir affords it expansive, panoramic views. The top of the reservoir offers views to a substantial proportion of Sydney including the Pacific Ocean to the east, beyond Chatswood to the North, Bankstown to the West and beyond Miranda to the south. A typical view from the Reservoir is shown in Figure 3-3.

The Reservoir, itself, is a dominant element in the landscape and a landmark in the suburb of Ashbury. The reservoir is highly visible to the surrounding residential areas and adjacent recreational Peace Park. The elevation of the site means that the site is visible from suburbs away, particularly from elevated vantage points such as multi-storey residential and commercial complexes.

Figure 3-3 Photo from Ashfield Reservoir looking North-west

Figure 3-4 View of the Ashfield Reservoir from the adjacent Peace Park.

Figure 3-5 View of the reservoir from the viewing platform in Peace Park.

3.2 Item Description

3.2.1 Basic Description of Item

The general layout of the built components of the site is shown in Figure 3-2. The site includes a valve house, workshops and offices (described in Table 3-2), as well as access to the City Tunnel and pumping station.

Ashfield Reservoir (Elevated) (WS 0003) is an elevated cylindrical riveted steel tank, resting on a concrete apron and supported on a steel girder frame. The perimeter is a ring of mass concrete columns linked by semicircular arches.

The steel tank has nine rows of steel plates welded and riveted, the horizontal seams are lap jointed with a single row of rivets. The vertical seam use fishplates and four rows of rivets, the space between each rivet widening from top to bottom. The expansion joint is likely to be a bituminous coated lead ring gasket in a cast-iron seating.

Figure 3-6 **Western view of Ashfield Reservoir showing the lower stairs and landing.**

Note the absence of planks from the walkway below the top of the tank.

The reservoir has stairs to the roof. These consist of a flight from the ground to the cornice around the base of the tank and another rising to the upper walkway frame, attached to the outside of the top row of steel plates. The two flights of stairs are separated by a steel landing at the cornice at the base of the tank. The landing is supported by three diagonal braces. A ladder leads to the roof of the tank.

The timber decking has been removed from the walkway and not replaced. The walkway frame is attached to the outside of the top row of the steel plates, approximately 1m below the top. This walkway is attached to the tank wall and by short steel braces. The light metal handrail of the walkway remains in place.

The substructure consists of steel posts of riveted composite sections, braced vertically in two dimensions by diagonal angle sections and horizontally by light RSJ (rolled steel joists) beams. These support steel floor joists riveted in a square grid and connected at their extremities to an encircling crown girder that is embedded in the surrounding concrete wall below the slab. The perimeter consists of a series of masonry arches. These are rendered and capped by a corbelled masonry cornice.

The tank has been covered with aluminium roofing and a light two-rail handrail has been attached around the outer rim at the top.

The reservoir has a diameter of 22.2m and a depth of 11.9m. It has a capacity of 4.6 ML and the height of the full service level is 80m.

Table 3-2 Description of other site elements

	Super structure for access to the City Tunnel and access to the pumping station. A redbrick skillion roofed building with mesh covered ventilation. High roller door on the eastern elevation. Eastern elevation approximately 3 storeys high.
	**Modern ventilation and secondary access** associated with the water pumping station

	**Sheet metal shed** associated with the use of the site as a maintenance depot- now disused. Three roller doors on the southern end of the building indicate that it was used as garage. Embankment on the southern side of the building likely to have been used as materials store area.
	**Corrugated iron shed** workshop on the western side of the site. Simple construction of corrugated iron on a timber frame, gabled roof.
	Large area of asphalt to the west of the site

	Office Building Small modern office and amenities building- red brick, skillion roof. Situated on the site to the north of the reservoir.
	**Store** Small brick building with roller door – likely to have used as a store close to the northern boundary of the site
	**Valve house**- Masonry brick building, skillion roof that is hidden by parapet. The parapet has a decorative course of cantilevered bricks at the top and an under cornice consisting of 3 courses of cantilievered profiled bricks. Eastern and western elevations of the building have blind recesses with cement rendered sills. Northern elevation has roller door that replaces the original double hung wooden doors Windows on the southern and

	northern sides have metal grills and have been boarded up. Originally these windows were double hung with arched lintels. Now houses Police communication control equipment – cabling and antennae evident. Pipework and valves are in the lower level of the structure
	Entrance and garden beds Northern entrance showing garden beds and conifers

3.2.2 Condition and Integrity

Ashfield Reservoir has not undergone significant alteration since it was built. The most noticeable change is the removal of the timbers of the circumferential walkway close to the top of the reservoir. Condition of the Reservoir is described below in Table 3-3 and some aspects are shown in Figure 3-6.

Table 3-3 Condition Assessment for Ashfield Reservoir WS0003

Item	Element	Condition
Reservoir roof and support structure		Appears to be in good condition –some internal corrosion on non-key supports
Reservoir Interior	Internal walls	Corrosion obvious through coating –more obvious adjacent to brass outlet screen Bitumen coating in fair condition
	Internal floor	Render coating is failing and flaking off
	Inlet pipe	Appears to be in good order
Reservoir Exterior		External surfaces area exhibiting corrosion particularly around the mounting areas of the stairway and handrails
Reservoir Walkways	Circumferential Walkway	Mounting of the stairs and walkways showing signs of corrosion especially at the mounting areas. Timber planks missing Some corrosion of the handrails
	Roof walkway	Appears in good order
Stairway		In fair order – signs of corrosion on the treads and where bracing is attached to the steel tank. Handrail height not compliant with current BCA requirements
Reservoir Substructure-Render/Concrete		Mouldings have broken away in some areas-worst on the northern side
Reservoir Substructure – Concrete Columns /Arches		Single radial direction cracks found through the soffit of some arches Generally in good condition Render patched in places
Reservoir Substructure – Steel Framework		Steel framework generally in good condition
Other		There is no bird netting to the substructure and pigeons are using the area for roosting Down pipes –paint flaking and corrosion Graffiti has been a problem in the past and cleaned areas are obvious

	A) Reservoir substructure- Mouldings have broken away
	B) Stair bracing – signs of corrosion and concrete spalling at attachments
	C) Stair - Signs of corrosion on the treads

Figure 3-7 Some aspects of the Condition of the Reservoir

Alterations to the Valve House include the replacement of wooden double hung doors with a roller doors, the installation of metal grills on the windows, the installation of cabling, antennae etc for the additional use of the building for police communication.

3.3 Item Specific Issues

3.3.1 Moveable Heritage Elements and Machinery Components

The closure of the site as a work depot has resulted in the skid (moveable site) sheds, identified in the original listing of the site, being removed from the site.

No other elements on the site are moveable heritage items.

3.3.2 Surviving Aboriginal and Historical Archaeological Evidence

The Ashfield Reservoir site has limited archaeological potential, which is restricted to discrete areas of the site. The site is not associated with any known Aboriginal archaeological findings, and does not feature any prehistoric archaeological potential or associations other than those that apply to the area of Ashfield in general. In addition to this, it is unlikely that any evidence of the pre-historic period exists before the 1888 construction of the first elevated wrought iron tank on the hill.

The property may contain some archaeological evidence of the historic period, particularly associated with the ongoing water storage and pumping use during the past 100 years. The original reservoir was sited on an area of site not significantly subsequently disturbed. This material, however, is not likely to yield significant information or information not obtainable elsewhere or through records and plans held by Sydney Water. The significant historic process of the site continues and represented by the current elevated reservoir and valve house. Any other historical archaeological remains in these areas are of little archaeological significance, as they relate to historical activities well known and well documented on this site, and are likely to be fragmentary in nature, at best. The subsequent construction of the water pumping station and several additional buildings on site is also likely to have significantly disturbed the site.

3.3.3 Notable Geological and Natural Heritage Features and Issues

There is no notable geological or natural heritage features on this site.

3.3.4 Evidence of Environmental Issues (Contamination, Threatened Species, Aboriginal Environment)

Contamination

Due to the telecommunication facilities on site there is a potential risk of exposure to non-ionising radiation.

Elevated steel reservoirs have a history of use of lead paint. It is expected that there would be some soil contamination within a few meters of the tanks. This would be consistent with other reservoir site investigations (Pers. Comm. Brian Burns, 2004). A detailed site investigation would be required to determine the exact extent of contamination.

Threatened Species

A search of the NPWS Wildlife database indicates that there are no endangered or vulnerable species in the immediate vicinity of the Ashfield Reservoir site. The closest sighting of an endangered species is more than 1km away. The site is highly

modified and as such would be unlikely to provide suitable habitat for threatened flora and/or fauna species.

Aboriginal Environment

A search of the NPWS Aboriginal Sites database indicates that there are no known Aboriginal sites or objects on or in the immediate vicinity of the Ashfield Reservoir site.

3.4 Heritage Items in the Vicinity

3.4.1 Heritage Items with Associations to the Water Industry

Table 3-4 Heritage Items with Associations to the Water Industry

Heritage Items with Associations to the Water Industry		
Item Name	Address	Significance
Southern and Western Ocean Outfall Sewer	Rockdale to Homebush (sub-surface)	State (Western Main Carrier)

3.4.2 Heritage Items without Associations to the Water Industry

Table 3-5 Heritage Items without Associations to the Water Industry

Heritage Items without Associations to the Water Industry		
Item Name	Address	Significance
Palm Trees	Fifth Avenue	Local
Portuguese Seventh Day Adventist Church	126 Holden St	Local
Andrews Avenue Urban Conservation Area	Andrews Ave, Ashbury	National

4. ASSESSMENT OF SIGNIFICANCE

This Chapter explains the heritage significance of Ashfield Reservoir (in accordance with the process outlined in the Tier 1 document – CMP Manual, an analysis of the significance of the item is made by addressing the NSW Heritage Assessment Criteria and a Statement of Significance is presented summarising the value of Ashfield Reservoir for current and future generations.

The information presented in this Chapter was largely derived from the Sydney Water Section 170 Heritage Register and the 1996 Comparative Study of Ashfield, Penshurst, Drummoyne and Bellevue Hill Reservoirs.

4.1 Examination of NSW Heritage Office Criteria

The assessment of Ashfield Reservoir by the NSW Heritage Office criteria reads as follows:

CRITERION A –

An item is important in the course, or pattern, of NSW's cultural or natural history or the cultural or natural history of the local area

Ashfield Reservoir (Elevated) (WS 0003) is one of a small group of four similar elevated reservoirs, the others being Bellevue Hill Reservoir (WS 10, built in 1910), Drummoyne Reservoir (Elevated) (WS 38, built in 1910), and Penshurst Reservoir (Elevated) (WS 87, built in 1910), which, together, represent an important technological development in the use of reinforced concrete for reservoirs in NSW.

The group of four elevated steel and reinforced concrete reservoirs is the first group of large (over 0.5Ml) water storage reservoirs built above ground level as part of the metropolitan water supply system, allowing gravity reticulation to the highest land areas. This was a major improvement in supply and an important developmental stage in the provision of water supply in Sydney.

Ashfield Reservoir provides evidence of the extent of urban development in its service area at the time of its construction, both by its selected locality and size.

Ashfield Reservoir's history of usage and current role within the Water Supply system is illustrative of the growth of Sydney and the corresponding development of the water supply network over this period.

Ashfield Reservoir provides evidence of the cultural philosophy prevalent at the time of its construction, whereby there was a conscious effort by public authorities to integrate the appearance of mundane, functional structures into the aesthetic context of the community. This is in contrast to the late twentieth century trend towards cost-based functionalist design for such structures.

The design of Ashfield Reservoir illustrates the Victorian and early twentieth century attitude that the provision of public infrastructure was evidence of a cultural and material progress and that the arrival of such structures within a community was a matter of achievement. The boldness of its landmark design qualities and the aesthetic details of its fabric show the pride and confidence of the designers and their supervisors.

Ashfield Reservoir (WS0003) is the second reservoir to be located at this site; the first having been transferred elsewhere after the present reservoir was completed. This latter tank continues the reticulation of water that had commenced in 1888.

Ashfield Reservoir meets the State level of significance for this criterion.

CRITERION B –

An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history, or the cultural or natural history of the local area

The design of the historic structures of Ashfield Reservoir is important in demonstrating the late nineteenth and early twentieth century attitude that the provision of public infrastructure was evidence of cultural and material progress and that the arrival of such structures within a community was a matter of achievement. This is in contrast to the late twentieth century trend towards cost-based 'functionalist' design for such structures.

The design of Ashfield Reservoir is not associated with any particular persons in NSW history.

Ashfield Reservoir does not meet the State level of significance for this criterion.

CRITERION C –

An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW, or the local area

The Ashfield Reservoir is a prominent skyline feature and landmark in its area. It is visible in all directions for a considerable distance.

The Ashfield Reservoir is a simple, functional structure, which has been designed with deliberate architectural stylisation. A strikingly elongated structure, it is relatively narrow in relation to its height, with its classical arches set on tall rectangular columns. The Reservoir's arched substructure is a fine example of Federation Free Classical architecture, one of the styles in vogue at the time of its construction.

Ashfield Reservoir does not meet the State level of significance for this criterion.

CRITERION D –

An item has strong or special association with a particular community or cultural group in NSW, or the local area, for social, cultural or spiritual reasons

The Ashfield Reservoir site has performed an essential community function for over 100 years. The level of understanding of the operation and value of this item to the wider community has not been investigated for the purposes of this CMP, however the site has significant local landmark value and is also highly visible in its location to a public park.

Special interest groups such as the Institution of Engineers and the National Trust of Australia especially esteem sites such as Ashfield Reservoir and its comparative group.

Ashfield Reservoir does not meet the State level of significance for this criterion.

CRITERION E –

An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history, or the cultural or natural history of the local area

The Ashfield Reservoir, with the other three Reservoirs with which it forms a group, has potential scientific value in the analysis of the long-term performance of its construction method.

CRITERION F –

An item possesses uncommon, rare or endangered aspects of cultural or natural history of NSW, or cultural or natural history of the local area.

The Ashfield Reservoir is one of only four large water supply reservoirs in the metropolitan system, which are elevated and combine steel tank walls with a reinforced concrete floor.

The group is the first elevated water service reservoirs built in house by the Metropolitan Water Sewerage and Drainage Board to utilise the Monier concrete reinforcement system.

The rarity of Ashfield Reservoir is further discussed in Section 4.2.

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 (or cultural or natural places; or cultural or natural environments of the local area)

The Ashfield Reservoir is a representative example of the four elevated service reservoirs built between 1910 and 1914 which utilised a reinforced concrete floor and riveted steel walls. The role that Ashfield Reservoir played in the water supply of its vicinity is representative of the function of all service reservoirs throughout the Sydney metropolitan water supply system.

Ashfield Reservoir, in its appearance and detailing, is representative of a class of historic buildings and structures demonstrating the care and consideration with which these elements were placed in existing environments.

This criterion for comparative significance is further discussed in Section 4.2.

4.2 Comparative Analysis, Rarity and Representativeness

Position of Ashfield Reservoir within Development of Sydney Water

Within Sydney's Metropolitan Water Supply System, Ashfield Reservoir is an element of the Southern Water Distribution System established with the completion of the Upper Nepean Scheme.

The Upper Nepean Scheme was based upon the provision of water from the Nepean River and its tributaries Avon, Cataract and Cordeaux. A system of tunnels, canals and aqueducts, known as the Upper Canal directed water towards Prospect Reservoir, from where it was taken via the Lower Canal to Pipe Head filtering basin at Guildford, finally distributed to several major pumping stations, including Crown Street, Waterloo and Lakemba, supplying the Southern Water Distribution System.

Reservoirs

Reservoirs, as water storage tanks, are designed to enable the water supply system to cope with variations in flow, ensuring continuous supply. Situated at high points to command the widest territory, reservoirs were elevated or built at ground level. Elevated steel tanks have an advantage over buried concrete tanks due to the gravity possessed, avoiding additional distribution pumping.

The first service reservoirs, built between 1859 and 1899 were brick walled with brick or concrete walls supported by brick or timber piers and built into the ground (Godden Mackay, 1996:9). These graduated to above ground tanks of riveted iron and later, steel. Between 1888 and 1910 twelve circular reservoirs were constructed in wrought iron, cast iron and mild steel. Two of these were elevated on brick substructures, the rest built at ground level.

From 1892 mass concrete began to be used in reservoir and dam construction. Sydney Water's historic assets, Whites Creek and Johnstons Creek sewer channels were considered Australia's first major reinforced concrete structures, built by Carter Cummow & Co, using Joseph Monier's reinforced concrete technique, under licence from the French company (Heritage Office, 2003:4).

The first reinforced concrete water tank using the Monier system was a reservoir built in 1899 at Kiama. This was followed by two wholly reinforced concrete reservoirs at Liverpool (1901) and Randwick (1910).

The subsequent construction of Drummoyne, Penshurst No. 2, Bellevue Hill and Ashfield between 1910 and 1914 marked a new phase in the Board's reservoir development through the composite use of concrete and steel (Godden Mackay 1996:9). These were the Board's first use to combine the use of steel and concrete. Concrete was used for the floor, outer columns and arches of the elevated reservoirs. Mild steel was used for the walls and extra support columns (Godden Mackay, 1996:9).

It was 1917 before this combination was attempted at Waverley, with a 500,000 gallon reservoir. Bankstown Reservoir, completed in 1920, was built with a similar capacity to that of Drummoyne. After these constructions, fully reinforced concrete elevated reservoirs became standard to the 1950s (Godden Mackay, 1996:53)

Bellevue Hill, Ashfield, Drummoyne and Penshurst No. 2 Reservoirs

This section is summarised from Godden Mackay Logan's comparative study of these four reservoirs, Conservation Analysis of Drummoyne Reservoir, in relation to Bellevue Hill, Penshurst No. 2 and Ashfield Reservoirs (1996). The study also preceded the current heritage assessment system, by relying on rankings of 'regional significance'. Bellevue Hill Reservoir is included in this discussion in so far as it is a relevant comparative item, but its level of significance has not been reassessed, having been previously assessed during the S.170 Sydney Water Heritage Register Review.

Built between 1910 and 1914, these four reservoirs were designed and built by the staff of the Metropolitan Board of Water Supply and Sewerage.

The reservoirs were the only reservoirs built to combine steel tank walls with a reinforced concrete floor, elevated upon a reinforced concrete support. The reinforced concrete tank floors, supported on steel and concrete columns, provided the strength for the water load with the walls of the tank fabricated from steel which was an already proven material and lighter than concrete. It was 1917 before a

concrete support and walls was used, at Waverley reservoir and a more ambitious sized reservoir at Bankstown in 1920.

Only two reservoirs were ever built with a tower, Bellevue Hill and Drummoyne Reservoirs. The tower at Bellevue Hill was erected for the 'Military Authorities' for signalling purposes and the tower at Drummoyne erected for 'ornamental purposes' also functioning as a stairway to the top of the tank (MBWSS, Official Handbook, 1913). The four reservoirs are the first series of large elevated reservoirs, which were built into skyline positions within established urban areas.

All four reservoirs are significant with respect to their form, function, mode of operation and construction technology. Drummoyne Reservoir is the most significant and intact and demonstrates a range of social & historic associations. Bellevue Hill reservoir, formerly similar to Drummoyne has lost significance due to the removal of the tower. Penshurst No. 2, as an element within a larger site, has the ability to relay information about the developmental history of water supply reservoirs. Ashfield, is of a similar level of significance to Penshurst.

The difference between the four reservoirs, therefore, is largely architectural.

The most obvious attribute of Drummoyne is the addition of the tower, (the Bellevue Hill tower having been demolished in 1972) and the only example of such a structure in the water supply system. The tower at Bellevue Hill however, was less associated with the water supply than a convenient site for a signalling tower and the tower at Drummoyne less to do with the function of the site than the desire of Sir Thomas Henley, local politician, landowner and Board member, to have a tower erected to mitigate the impact of the reservoir on the local built environment.

The Drummoyne Reservoir, built in Federation Free Classical style and Italianate tower, also has a strong Classical or Romanesque nature. The Bellevue Reservoir follows a more strict Classical design, utilising Corinthian columns to the arches of the reservoir. The rendered concrete was ashlar lined to simulate stone construction.

Both Ashfield and Penshurst reservoirs are similar to Drummoyne Reservoir except in size and proportion. Ashfield Reservoir, although it has the same capacity as Drummoyne, uses a taller substructure and taller columns and features an external access stair. Ashfield and Drummoyne are the most intact and original. Whilst Ashfield is more monumental in scale, Drummoyne retains its tower. Penshurst is the largest and most simply detailed, but the upper walkway has been removed, altering its architectural balance.

The group of reservoirs have historic and scientific values at a State level. Drummoyne has additional historic, aesthetic and rarity values of State significance and Bellevue Hill has additional historic and rarity values of significance, however these have no associated on site evidence. Penshurst No. 2 has additional historic and rarity values of significance.

The comparative study concluded that Drummoyne was the most significant of the four reservoirs, despite being the only site which has ceased to serve as a water reservoir.

Drummoyne, Ashfield and Penshurst No. 2 Reservoirs are currently listed on the State Heritage Register, recognised for their State significant values. Bellevue Hill, having lost its significant values, is not listed on the State Heritage Register or S.170 Register.

4.3 Statement of Heritage Significance

Ashfield Reservoir is of State significance for its historic, aesthetic and technical/research values.

Ashfield Reservoir site is important for its role in the history of Sydney's water supply, continually operating in this function since 1888.

The current Ashfield Reservoir, completed in 1914, has a historic and technical association with a class of reservoirs that utilised elevated riveted steel walls and reinforced concrete floor and posts, featured a capacity of over 0.5 Megalitre, and were built between 1910 and 1914.

Ashfield Reservoir is representative of this class of reservoirs. It is rare, being one of only four reservoirs of this class ever constructed, each built to a unique design. The class/group as a whole is also important as the first major instance of elevated water service reservoirs built by the Metropolitan Water Sewerage and Drainage Board to utilise *Monier* concrete reinforcement system. Ashfield Reservoir structure has a certain potential research value in the analysis of the long-term performance of this construction method.

Design of Ashfield Reservoir, including Federation Free Classical architectural style, provides evidence of the cultural philosophy prevalent at the time of its construction, whereby public authorities exercised a conscious effort to integrate the appearance of public utility structures into the aesthetic context of the community. The boldness of Ashfield Reservoir prominent skyline and detailing features landmark qualities, shows pride of its designers and demonstrates that the arrival of such structures within a community was regarded as a matter of achievement and material progress.

In local terms, Ashfield Reservoir is demonstrative of the extent of urban development in its service area and Sydney at the time of its construction, as evidenced by the selection of its locality and its size.

4.4 Thematic Associations

The historical context of the development of Ashfield Reservoir is outlined in Chapter 2. Ashfield Reservoir illustrates a number of historical themes, as identified by the State and Commonwealth heritage agencies. These themes are expressed both in the fabric and in the function of the place.

4.5 Schedule of Significant Elements

This section of the report has been prepared in accordance with the *Grading of Significance* process outlined in the CMP Manual. The grade of significance endorsed for a particular element reflects its importance of the Ashfield Reservoir site as a whole. Considered as a whole, 'Ashfield Reservoir' is of exceptional significance, justifying listing on the State Heritage Register.

The attributes outlined in the significance assessment above are manifested in the built elements on site. The exceptional significance of the site is primarily manifested in the reservoir structure itself which dominates the site.

The general site and various ancillary and other elements make a contribution to the water pumping and storage function of the Ashfield Reservoir site and therefore contribute to the significance of the place. Apart from the reservoir structure itself none of the other elements on site are considered to be of exceptional significance.

The schedule of significant elements identifies how the site's elements and the specific components of those elements variously embody the historic, social, technical or aesthetic attributes of the place.

The elements of *Exceptional Significance* are those that make a VITAL contribution to the overall significance of the item. These elements are essential for the recognition of the State level of significance of the item as a whole.

The elements of *High Significance* are making a CONSIDERABLE contribution to the overall significance of the item, and are identified as contributing to the recognition of the State level of significance for the whole site.

The elements of *Medium Significance* are those elements which make SOME contribution and contribute to a recognition of a significance status at the Local level.

Elements of *Low Significance* are those that are considered to have a neutral impact on the overall significance of the site.

No elements have been identified as particularly *Intrusive* to this significance, as additions and modifications to the complex are considered to be part of the item's functional operation and at some level, contributing to significance.

The level of significance of elements also determines the appropriate conservation treatment of its surviving fabric. This is detailed further in the CMP Manual, in the Policy 7.6 –*Treatment of Fabric of Different Grades of Significance*.

This grading was undertaken in two stages, assessing:

- The complex/site components, structures and natural elements, and
- The relevant elements of important individual buildings. The buildings analysed are those assessed as components of Exceptional or High significance in the first stage of the grading process.

The Level of Significance of elements within the Ashfield Reservoir site has been identified as follows:

Schedule of Significant Elements ASHFIELD RESERVOIR			
Element	Condition*	Significance Level	Notes
Site and General Features			
Site use generally	N/A	Exceptional	
Existing architectural layout	N/A	Low	
Existing site boundaries	N/A	Low	
Property boundary mesh fence	Good	Low	
Ashfield Reservoir (WS0003)	Good	Exceptional	

Schedule of Significant Elements ASHFIELD RESERVOIR			
Element	Condition*	Significance Level	Notes
Valve House	Good/Fair	High	Internal condition unknown
Water Pumping Station (WP0085)	Good	Medium	Some associated contributory value to interpretation of reservoir as a minor water pumping station supplying Ashfield reservoir, water is pumped from the City Tunnel.
Corrugated Iron Shed	Fair	Low	Contains timber benches demonstrating past use of place as a depot.
Office Building	Poor	Low	Substantial damage from vandalism.
Brick Store Building	Good	Low	
Corrugated Sheet Metal Store Building	Fair/Poor	Low	
Grassed landscaping immediately around reservoir and support wall marking boundary of reservoir structure proper	Good	Medium	
Other site features generally, including concrete slabs, brick storage bins, bitumen driveway, modern ground level valve chambers, vegetation.	Fair to Good	Low	

Schedule of Significant Elements ASHFIELD RESERVOIR			
Element	Condition	Significance Level	Notes
Buildings and Structures			
ASHFIELD RESERVOIR			
Structure generally	Good	Exceptional	
Original concrete substructure including mass concrete columns and arches	Fair	Exceptional	

Schedule of Significant Elements ASHFIELD RESERVOIR			
Element	Condition	Significance Level	Notes
Original tank walls and external finishes	Good	Exceptional	
Original tank walls – internal finishes	Unknown	High	
Reinforced concrete slab Reservoir floor	Unknown	High	
Reservoir roof with corrugated metal roofing	Good	Low	Roofing of all reservoirs conducted in 1970s.
Original supportive steel structure	Good	Exceptional	
Remaining elements of original circumferential walkway structure, stair and steel pipe handrail	Fair/Good	Exceptional	Timber walkway previously removed on upper walkway Corrosion of brackets
Other replaced or added components generally	Good	Low	Including features like davit, guttering, security gate on stair, guttering with square downpipes.
VALVE HOUSE			
Structure generally	Good	High	High degree of original fabric, modified, key element in significance of Ashfield Reservoir. Not inspected internally.
Original brickwork and detailing	Good/Fair	High	
Timber joinery	Poor	High	
Corrugated iron roof	Good	Medium	Current is replacement of earlier corrugated iron roof.
Corrugated iron roller door	Good	Low	Replaced original timber doors.
Guttering and square downpipe and cement sills	Good	Low	
Telecommunications/Police installations including cabling from Valve House to Reservoir	N/A	Low	
Other features, installations and services in general	Good	Low	

*Condition based upon external visual inspection only, refer Chapter 3.

5. HERITAGE MANAGEMENT FRAMEWORK

Section 5 of the Ashfield Reservoir CMP outlines the relevant heritage listings applicable to the reservoir. It also outlines the statutory approvals which may be required if works are undertaken on site.

This section should be read in conjunction with Chapter 5 of the CMP Manual.

5.1 Schedule of Heritage Listings

Title Text	
Heritage Register	Listing
NSW State Heritage Register http://www.heritage.nsw.gov.au	Ashfield Reservoir (Elevated) 01622
Sydney Water s.170 register http://inetdev.sw.com.au/heritage/search.cfm	Ashfield 4575750
Canterbury Council http://www.canterbury.nsw.gov.au	Not listed
Register of the National Estate http://www.ahc.gov.au/register/index.html	Not listed
National Trust (No online database)	Not listed
Engineers Australia http://www.ieaust.org.au/about_us/sig/eha/	Not listed
Professional Historian's Society (PHA) http://www.phansw.org.au/Publications/rohpo.html	Not listed

5.2 Schedule of Statutory Approvals

Works conducted on the Ashfield Reservoir may require particular approvals depending on the nature of the works. These may involve development approvals, heritage approvals, licences from the NPWS and other forms of approvals. Table 5-2 demonstrates the approvals that may be needed. This table is intended to act as a guide only.

Works proposed by this endorsed CMP and NSW Heritage Act Exemptions relating to maintenance and repair prevent the need to obtain a S.60 permit for those activities.

Figure 5-1 Potential Statutory Approvals

APPROVAL / LICENCE	ADMINISTERING AUTHORITY	CONTROLLING ACT	TIMING	COMMENT
HERITAGE CONTROLS				
Section 60 permit**	Heritage Council of NSW	Heritage Act, 1977	If heritage items are affected	Check exemptions and CMP
Amendment to s170 register- demolishing, transferring ownership, cease to occupy	Heritage Council of NSW	Heritage Act, 1977	14 days notice	SWC Heritage Manager must be notified.
PLANNING CONTROLS				
Local Council Development Application	Local Government	Environmental Planning & Assessment Act, 1979	Prior to construction commencing	Depends on the work – check LEP zoning requirements
OTHER ENVIRONMENTAL APPROVALS				
Native Vegetation Removal	Local Government – Council	Tree Preservation	Prior to removal of trees	Consult with Council to see if TPO's are in place.
Licence/permit under NPWS Act -damage or destroy threatened species	NSW National Parks & Wildlife Service	National Parks & Wildlife Act, 1974	As soon as aware of threatened species	May be required if threatened species are found prior/during construction
Licence/permit under NPWS Act -damage or destroy relic	NSW National Parks & Wildlife Service	National Parks & Wildlife Act, 1974	As soon as aware of relic	May be required if relics are discovered prior/ during construction

APPROVAL / LICENCE	ADMINISTERING AUTHORITY	CONTROLLING ACT	TIMING	COMMENT
PUBLIC HEALTH AND SAFETY				
Occupational Health and Safety (including chemical storage and transport)	*Work Cover Authority (NSW)*	Occupational Health & Safety Act, 1983 Dangerous Goods Act, 1975 Construction Safety Act, 1912 (amended)	Pre-construction and Construction	
Land Contamination	*Environmental Protection Authority*	Contaminated Lands Management Act 1997	Pre-construction	

**Section 60 permits are not required if the activity is exempt by Heritage Act Exemptions for works relating to maintenance and repair or are works proposed by an endorsed CMP

6. HERITAGE MANAGEMENT ISSUES

Section 6 of the Ashfield Reservoir CMP identifies the key heritage issues, both constraints and opportunities, arising from the statement of significance. It also sets out the context for developing appropriate conservation strategies and policies to address the issues.

This section should be read in conjunction with Chapter 6 of the CMP Manual.

6.1 Ownership and Control of Land

All three lots associated with the Ashfield Reservoir have been included in the Heritage listing (see Section 3.1.3 of this CMP). It is considered that a reduced curtilage would be adequate to protect the heritage values of the site. The proposed new curtilage is shown in Figure 6-1.

The site is owned by SWC and has until recently been used as a works depot. The site as a depot is now surplus to need and SWC is investigating the sale of part of the site. Consideration of the future needs for an additional reservoir at the site is being undertaken prior to a firm decision being made about property disposal. The location of the any future reservoir is likely to be the southwest corner of the site. Also prior to the land disposal an investigation of the levels of soil contamination would need to be undertaken.

Sydney Water intends to undertake s detailed survey and proposed changes to the curtilage will be undertaken in accordance with the requirements of the legislation and the Heritage Office.

Figure 6-1 Proposed boundary for heritage curtilage

6.2 Built Heritage Conservation

The past maintenance of the reservoir has concentrated on the ensuring the operation of the item for water supply. The main issues have been to maintain internal coating of the tank and the operation of the valves.

Operationally, deterioration of the fabric which does not result in structural unsoundness is of little concern. Consequently, deterioration of the external substructure that affects the appearance only has not been remedied eg. deterioration of the render.

6.2.1 Structural Issues

Generally, the reservoir and the valve house appear to be in good structural condition.

6.2.2 General Deterioration of Fabric Issues

There is evidence of some deterioration of the fabric such as, render loss of the concrete sub structure, and corrosion and staining of the steel elements. This has been described in section 3 of this report.

6.2.3 General Repair and Rebuilding

Minimal intervention is considered the optimal method of retaining the surviving fabric. Consequently, only the fabric that is dysfunctional should be repaired and only fabric beyond repair should be removed and replaced. Where intervention is necessary the new work will be identifiable from the original on close inspection, in accordance with the Burra Charter.

6.2.4 Health and Safety Concerns

The existing stairway does not meet current Australian Standards with regard to safe access (refer to section 3 for additional details). However, the risks have been rated as low as it is functional and meets the needs of infrequent roof access requirements.

Deterioration of the render is also identified as a safety concern, as falling render constitutes a risk to those on the site.

SWC undertakes site risk assessments for all works being undertaken. Safe Work Plans are developed with an understanding of these risks. Risks at this site would include those in association with:

- Contaminated soils for excavation close to the tanks;
- Confined spaces for work inside the tanks;
- Working at heights for exterior work on the reservoir and gaining access to interior.

As the extent of soil contamination on the site is unknown before any extensive excavation is undertaken a full site assessment should be made.

6.3 Engineering and Technical Significance Issues

The engineering and technical significance of the reservoir and the valve house is based on the design and can be preserved through information of this design, largely contained in the technical plans and drawings. The information vital to the technical significance of the item can also be preserved through archival recording of the fabric prior to major works.

6.4 Machinery and Moveable Heritage Conservation

No moveable heritage items have been identified. Should any items require replacement or be found they will be assessed in accordance with the Sydney Water Moveable Heritage Policy.

6.5 Archaeological Issues

Aboriginal Archaeology

No definitive Aboriginal association has been determined for this site, as the highest point in the immediate landscape the site may have had potential as a viewpoint by the Cadigal and Wangal groups in area now known as the Ashfield municipality (Ashfield Council SOE, 2003).

There is no evidence to suggest the presence of any particular natural resources which may have been of interest to the Aboriginal community. The site is not identified as an 'Aboriginal place' under the *National Parks and Wildlife Act* 1974.

Given the intense nature of disturbance to this site, including excavation to bedrock in certain areas, and moderate disturbance elsewhere, this site is assessed as having very little potential for the presence of Aboriginal archaeological remains ('Aboriginal objects' under the *National Parks and Wildlife Act* 1974).

Two of the three parcels of land (Lot 1, DP 115504 and Lot 1 of DP711077) which make up the Ashfield Reservoir site were lots originally part of the Brickworks, the site later filled in to become Peace Park. In relation to the third lot, which fronts Holden Street (DP 911478), was not purchased from the brickworks and contains the significant built elements of reservoirs and valve house. In relation to this area, should this parcel be deeply disturbed by any future works and any potential Aboriginal objects be discovered, work should cease in the affected area until the Aboriginal objects can be assessed for significance. In the instance of such a discovery, a heritage impact permit under S.90 (formerly consent to destroy) of the *National Parks and Wildlife Act* 1974 may be required before works can proceed.

European Archaeology

Historical evidence suggests that this area of land was not developed prior to the purchase for water storage purposes. It is likely to have exploited for timber or grazing purposes, characteristic of the local area. At the time of purchase the immediate area was largely owned by the company operating the brick pit, which was incorporated in 1910.

The only use since the late 1880s has been the provision of potable water and support services for Sydney Water and its predecessors. There is no evidence to suggest the likelihood of any physical remains of pre-reservoir uses of this site. Service mains and ancillary services have disturbed other areas of the site to a moderate level. There is a limited potential for historical archaeological remains ('relics', under the NSW *Heritage Act* 1977) to be present in the area of the original reservoir however any such remains are likely to be fragemented, disturbed by later uses and services. Their potential to provide additional information regarding the history of the site is likely to be limited.

6.6 Natural Heritage Management Issues

6.6.1 Vegetation Management

The vegetation on the site consists of a mixture of native and exotic plantings. No vegetation on the site has been identified as being of conservation significance. Older exotic species, such as the conifers at the entrance, are typical plantings at Sydney Water sites. There are some minor areas of weed on the site.

6.6.2 Threatened Species and Endangered Ecological Communities

No threatened species or endangered ecological communities have been identified on the site or in the near vicinity.

6.6.3 Views and Vistas

The view of the reservoir from the adjacent Peace Park is considered to be a significant link with the general public and important for the interpretation of this item.

Future development of land in the immediate vicinity of the reservoir, if land is sold, could have an impact on the views to and from the item. The impact of any proposed development on views will need to be considered by the approving authorities at the time.

6.7 Community Associations and Social Environment

The Ashfield Reservoir is a dominant feature in the local landscape and as such there is likely to be strong community association. This association will continue if the views to the reservoir are maintained. Interpretation of the site would increase the social value of the item.

7. CONSERVATION POLICIES

The Conservation Policies of this Chapter append to the Chapter 7 –Conservation Policies of the CMP Manual, and should be read in conjunction with the above document. The Policy Statements offered here address site-specific and issues related to particular elements of the subject item.

7.1 Retention of Significance

Background

The key element of the Ashfield Reservoir Site is the Reservoir itself, as the only element of Exceptional significance. The Ashfield Reservoir is significant for its importance and association with the development of the Metropolitan water supply system in Sydney, particularly in the early decades of the Upper Nepean Scheme.

The Ashfield Reservoir is one of the four reservoirs representative of the phase in the Water Board's reservoir development that took place c.1910-1914. This phase is characterised by the composite use of reinforced concrete and mild steel in construction of elevated reservoir structures, differing from the previous phase that was characterised by underground structures built in brick. The Ashfield Reservoir is also representative of a number of technical innovations introduced to water reservoirs during this phase.

The Reservoir site has significance for its association with the development of the Ashfield local area. The site also comprises the associated Valve House and several other structures of lesser significance.

The significance of the item comprises historical, scientific and, to a degree, social aspects, and is therefore not limited to the surviving elements of fabric of the Reservoir. However, the fabric and the information about fabric remains the primary bearer and demonstrator of this significance.

It is estimated that an important part of the significance of the item will be preserved in historic documents and literature, which can contribute to its better presentation to the wider public. However, conservation of the surviving historic fabric remains important, due to its ability to interpret the established significance.

Policy Statement

The surviving historic fabric of Exceptional and High significance should be retained and conserved in ways that protect and enhance the features and characteristics that define its cultural significance. Conservation should be undertaken in the context where the original primary function of the item is retained, and the water reservoir remains fully operational.

Interpretation Guidelines

- The surviving historic fabric of exceptional and high significance should be retained and conserved. This includes the surviving original elements of the Ashfield Reservoir and the associated Valve House.
- Much of the surviving historical fabric is still in operation, and this operational use should be maintained.
- Explore ways to present significance of Ashfield Reservoir Site to general public, without compromising security and public safety.

7.2 Built Environment

7.2.1 Conservation of Significant Built Fabric

Background

The operational requirements have an ongoing effect on the retention of the item's significant fabric. While majority of the requirements have a strong positive effect through ongoing maintenance programs, there are occasions when some historic elements may need to be replaced or removed. This particularly applies to some relatively small elements, like the valves and associated pipes and fittings. This also includes occasional alterations to parts of the larger elements, like new openings in the historic fabric and similar modifications.

Much of the surviving original and early fabric of exceptional and high significance is generally in fair to good condition, although some elements need care and maintenance. Similar to the other water reservoirs of this group, Ashfield Reservoir has some damaged render on the concrete structure of the Reservoir, and visible corrosion spalling on the Reservoir structure and tank.

Policy Statement

All surviving elements of the historic built fabric shall generally be retained and conserved in accordance with the levels of significance identified in Section 4.5 – *Schedule of Conservation Works* of this Conservation Plan. The priority of works is to be allocated in accordance with the condition of the elements affected.

Interpretation Guidelines

- Retention and conservation of the fabric identified as being of Exceptional or High significance should be given a priority in future conservation and repair works.
- Conservation of elements of Exceptional and High significance should not have an adverse impact on the ongoing functional use of the item.
- Conservation works to elements of High and Exceptional significance should include remedial works to the exterior of the elements, allowing their better presentation to the wider public and retention of the popular landmark qualities.
- In conservation and repair works to elements of High and Exceptional significance, the priority should be determined by the condition assessment. The elements in Poor condition should be given a greatest degree of priority, followed by the elements in Fair, and then the elements in Good and Very Good condition.
- Where elements of High and Exceptional significance need to be removed, they should be catalogued and stored under supervision of Sydney Water's Heritage Adviser.

7.2.2 New Services and Upgrading to Suit Contemporary Use

Background

The Ashfield Reservoir Site existing components have no particular need for installation of new services or upgrade identified in the foreseeable future, however, it is appreciated that these issues often emerge suddenly on similar water storage facilities.

There are also elements that need to be examined for safety and that may need to be made compliant with the Building Code of Australia. This particularly applies to the circumferential walkway and the associated stairs and railings.

Policy Statement

Any eventual repairs or upgrading of the site elements of High and Exceptional level of significance should be based on respect for the historic fabric. Any upgrading of the water storage facilities or other site elements and any installation of new services must respect the item's significance and the general integrity of the item's significant historic fabric.

The removal of elements deteriorated beyond repair and their replacement with modern elements is generally considered acceptable, provided that the original elements are assessed for suitability to be included in the moveable heritage collection of the site.

Investigation of safety upgrade measures required on walkways and stairs of the Reservoir should be undertaken, and the adequate measures applied to ensure safety of the employees and compliance with the relevant legislative requirements.

Interpretation Guidelines

- Identify required safety upgrade measures to be applied. Before installation of any new services, request an assessment of impact of the works proposed to the surviving significant fabric from the Sydney Water's Heritage Adviser.
- Any new safety features installed, including railing to walkways, are to be compliant with the Building Code of Australia and their design verified by Sydney Water's Heritage Adviser.
- Any work in the areas of potential structural sensitivity, including the circumferential walkway and the stairs to the walkway, is to be approved by a suitably qualified structural engineer.

7.3 Curtilage and Subdivision

Background

The minimum curtilage lot of Ashfield Reservoir Site is outlined in Section 6.1 of this CMP. The current lot boundaries are encompassing the boundaries as consolidated after the purchase of Lot 1, DP 711077 c.1947. The minimum lot required for heritage curtilage includes the Reservoir and its minimum operational grounds and installations.

Policy

Development of the site, including further subdivision and land/asset disposals may be considered within the curtilage of the site, but outside of the minimum lot curtilage required to conserve the significance of the place, and where there has been no significant historic development or use and/or where early sites have been destroyed (as supported by evidence).

Guidelines

- The curtilage shown in Figure 6-1 of this CMP – *Proposed boundary for heritage* curtilage, is adopted for the protection of the State significant elements of the site.

- Any eventual new development within the minimum lot curtilage should only be considered if required for the essential water pumping operation of the site. Any such development should be sympathetic and comply with archaeological and natural heritage recommendations.

- Any eventual land/asset disposal proposals require notification to the Heritage Council under Section 170(A) of the Heritage Act 1977.

7.4 On-going Maintenance

Background

The historic fabric deteriorates due to the effects of time and use. To ensure the on-going conservation of significant fabric, a regular maintenance schedule should be implemented, providing for regular inspection and remedial action where necessary.

Policy Statement

The original fabric of the components of Ashfield Reservoir and the Valve House, assessed as being of Exceptional and High significance should be conserved through the implementation of an on-going cyclical maintenance programme. Prevention of continuing deterioration should take priority over widespread repair or reconstruction.

Interpretation Guidelines

All heritage assets will comply with the Minimum Standards of Maintenance and Repair under the *Heritage Regulations 1999*.

The services and built fabric of the reservoir and site features are to be subject to continuing care and maintenance as set out in the On-going Maintenance Schedule.

In addition to regular maintenance activities, prompt preventative action and repair should be undertaken as necessary, and executed with the greatest care towards protecting the original significant fabric. No maintenance work or repairs should negatively impact significant fabric.

Inspection and maintenance works should be conducted by external contractors and Sydney Water project managers and trades personnel experienced in work on historic buildings and with experience in work with particular materials applied.

The On-Going Maintenance Schedule should be reviewed and updated every five years to coincide with a review of the Conservation Plan, or subsequent to major programs of upgrading and re-use.

7.5 Engineering Heritage and Technical Significance

7.5.1 Engineering and Technical Significance Protection

Background

The Ashfield Reservoir is significant in terms of engineering heritage, being one of the four early water reservoirs in Sydney featuring an elevated structure, created in combined steel tank walls with reinforced concrete floors and columns, and with a capacity of over 0.5Ml. At the time of construction these features presented a significant innovation.

Some elements of the original or early fabric, originally utilised in operation of the Reservoir, can have some technical significance on their own merit, even if removed from their original operational and physical context. As with other historic water reservoirs, this typically includes valves and associated structures –valve chambers and valve houses.

An important part of this aspect of significance is embossed in the historic plans and drawings, currently stored in the SWC Archives, Sydney Water Plan Room and several other institutions, including the Mitchell Library, the City of Sydney Archives and the State Archives of NSW.

Policy Statement

Engineering significance of the Ashfield Reservoir is largely encapsulated in its original structure and the technical information about its creation. The preservation of this aspect of significance can be ensured through ongoing retention of the historic fabric of the Reservoir and through interpretation of the technical information of the four early elevated reservoirs.

The surviving historic plans and drawings of Ashfield Reservoir currently stored in Sydney Water Archives and other collections need to be preserved.

Elements of the Ashfield Reservoir assessed as being of Exceptional or High significance should be preserved. Should any elements of Exceptional or High significance have to be removed due to deterioration beyond repair or a health and safety issue, the removed element should be assessed for suitability to be included in Sydney Water's Moveable Heritage collection. The elements assessed as unsuitable should be recorded for archival purposes prior to their disposal.

Interpretation Guidelines

The surviving historic valves and other fittings shall be preserved *in situ*.

Should further retention of an element identified as being of Exceptional or High significance become technologically unfeasible, the element should be assessed for suitability for inclusion in an on-site or off-site public display prior to its removal.

The removed historic elements should be stored at an allocated location, preferably on the site, in accordance with instructions of the Sydney Water Heritage Adviser and in accordance with the SWC Moveable Heritage Policy and Guidelines.

Elements scheduled for removal should be recorded in situ for archival purposes and the record deposited with the SWC Archives.

Further investigation should be undertaken to clarify location of documents held by other archives and libraries in Sydney. The plans retrieved should be reviewed, copied, and the copies should be collected and stored with SWC Archives.

7.6 Archaeological Resources

7.6.1 Aboriginal Archaeological Resources

Background

Sites of pre-historic archaeological potential are protected under clauses of the *NSW National Parks and Wildlife Act 1974*. Given the high level of disturbance to the site, the survival of Aboriginal archaeological material is considered unlikely.

Policy Statement

Any potential Aboriginal archaeological resources within Ashfield Reservoir should be conserved in accordance with the requirements of the *NSW National Parks and Wildlife Act 1974*. In the event Aboriginal archaeological material is unexpectedly discovered during any works to this site, work shall immediately cease in the affected area and the National Parks and Wildlife Service will be contacted for advice.

Interpretation Guidelines

Should disturbance be required where Aboriginal archaeological material has been identified, a Heritage Impact Permit under section 90 of the *National Parks and Wildlife Act* will be required for this disturbance.

7.6.2 European Archaeological Resources

Background

Sites of Historic archaeological potential are protected under clauses of the *NSW Heritage Act 1977*. Given the level of disturbance to the site, archaeological remains associated with the water use are only likely to be found.

Policy Statement

Any potential archaeological resources on the property should be conserved in accordance with the requirements of the *NSW Heritage Act* 1977.

Interpretation Guidelines

Wherever technically feasible, works to this site should avoid areas of archaeological potential or significance.

Should disturbance be required to areas of archaeological potential or significance, an application under section 60 of the *Heritage Act* will be required for this disturbance. Any archaeological resources must be managed in accordance with the recommendations arising from the Archaeological Assessment and any approval issued by the NSW Heritage Council.

In the event archaeological material is unexpectedly discovered during any works to this site, work shall immediately cease in the affected area and the Heritage Office will be contacted for advice.

7.7 Social Environment

7.7.1 Management of Social Values

Background

It is considered that the preferred way to manage the social significance of the item is through its interpretation, as means of communication with the wider public. It is also considered that the interpretation should be associated with the idea rather than the fabric.

The interpretation of social values of the Ashfield Reservoir Site should address all the relevant site elements and historic themes.

Policy Statement

The interpretation of the Ashfield Reservoir Site should seek to establish and convey the item's significance. This will require both interpretation of the place as an element of Sydney's historical landscape and as a landmark site in its own right.

Interpretation Guidelines

Develop an Interpretation Plan for the Ashfield Reservoir Site defining strategic and tactical ways to present the historic item and its significance to the wider public.

During the process, particular consideration should be given to the social aspect of its significance and its position within history of Sydney Water and the local area.

The Interpretation Plan should address all the relevant historic links and thematic associations, as identified in this CMP.

8. IMPLEMENTATION

This Chapter presents the policies for the implementation of the Ashfield Reservoir Conservation Management Plan, within the Sydney Water Environmental Management System. This chapter outlines conservation works and maintenance schedules and policies for the interpretation of the Ryde Pumping Station Site.

8.1 Item Management Processes

This section establishes general guidelines for on-going maintenance and minor works. Any future proposals for major works should be accompanied by the preparation of a Heritage Impact Statement or a new Conservation Plan, as appropriate. There are a number of general issues that should be addressed in the establishment of the implementation of the overall conservation strategies.

1. A copy of this Conservation Management Plan should be submitted to the Heritage Council of NSW for review and endorsement and deposit into the library of the NSW Heritage Office.

2. A copy of this Conservation Management Plan should be lodged in the Local Studies Section, Canterbury Council Library.

3. Whenever there is a development proposal affecting surviving historic fabric of the pumping station, the reservoir and other structures on the site, copies of this report should be included in the information material provided to the Canterbury Council or made available to managers, tenants or future owners with the clear advice that it represents a guide as to acceptable future directions for the property.

4. The elements of exceptional and high significance should be recorded photographically prior to any major works. A copy of the recording should be lodged with NSW Heritage Council, and a copy should remain with the Sydney Water Corporation.

5. All necessary work to stabilise deterioration should be carried out in accordance with the Schedule of Conservation Works, Section 8.2.

6. Ongoing maintenance works and inspections shall be performed at regular intervals as set out on the On-Going Maintenance Schedule in Section 8.3.

7. Specialist consultants in the relevant fields with experience in dealing with heritage material should be commissioned as necessary to report on specific problems such as stone deterioration or hazardous materials. All necessary work recommended by consultants should be performed and shall be so done having regard to significant fabric.

8. The schedule of maintenance works should be regularly monitored by the manager responsible for operating the water system.

9. All external contractors/consultants are to be made aware of this document.

10. This CMP will be reviewed in 5 years.

8.2 Schedule of Conservation Works

The following *Schedule of Conservation Works* describes work that should be implemented to preserve the significant fabric. Where the damage is yet to be confirmed, further investigation on site will be required prior to the finalisation of specific repair techniques.

Schedule of Conservation Works ASHFIELD RESERVOIR		
Element	Significance Level	Notes
Site and General Features		
Site generally	Exceptional	Retain in use as a water storage facility. No immediate action required. New elements can be added to the site, and elements of Low significance can be removed as required. No changes to site boundaries are envisaged in the foreseeable future.
Existing architectural layout	Low	
Existing site boundaries	Low	
Property boundary mesh fence	Low	No immediate action required. Retain, repair or replace as required.
Ashfield Reservoir (WS0003)	Exceptional	See detailed Schedule below.
Valve House	High	See detailed Schedule below.
City Tunnel Shaft and Pumping station access building	Medium	No immediate action required. General exterior appearance of the building, as defined by face brick elevations and low sloping roof, should be retained. Other elements, fittings, doors and windows may be retained, repaired or replaced as required.
Corrugated Iron Shed	Low	From the heritage aspect, these elements are unimportant and can be retained, repaired, or removed as required. It is estimated however that each of these structures has another 5 to 10 years of use before decommissioning.
Office Building	Low	
Brick Store Building	Low	
Corrugated Sheet Metal Store Building	Low	
Grassed landscaping immediately around reservoir and support wall marking boundary of reservoir structure proper	Medium	No immediate action required.

Schedule of Conservation Works ASHFIELD RESERVOIR		
Element	Significance Level	Notes
Other site features generally, including concrete slabs, brick storage bins, bitumen driveway, modern ground level valve chambers, vegetation.	Low	No immediate action required.

Schedule of Conservation Works ASHFIELD RESERVOIR		
Element	Significance Level	Notes
Buildings and Structures		
ASHFIELD RESERVOIR		
Structure generally	Exceptional	No immediate action required.
Original concrete substructure including mass concrete columns and arches	Exceptional	Clean structure exterior utilising non-abrasive techniques (light hand washing, low pressure water). Repair damaged render to match the original condition.
Original tank walls and external finishes	Exceptional	Remove corrosion on external surfaces, repaint affected areas to match the existing as required.
Original tank walls – internal finishes	High	No immediate action required. On dewatering, inspect, assess condition, and repair to match the existing form and finish as required.
Reinforced concrete slab Reservoir floor	High	
Reservoir roof with corrugated metal roofing	Low	No immediate action required.
Original supportive steel structure	High	Inspect, assess condition. If corrosion is detected on external surfaces, remove it and repaint affected areas to match the existing as required.
Original circumferential walkway structure, stair and steel pipe handrail	High	
Other replaced or added components generally	Low	No immediate action required.
VALVE HOUSE		

Schedule of Conservation Works ASHFIELD RESERVOIR		
Element	Significance Level	Notes
Structure generally	High	Retain in use. Preserve historic fabric, including valves *in situ* as long as technologically feasible. Historic fabric beyond repair is to be replaced to maintain the operational requirements.
Original brickwork and detailing	High	No immediate action required.
Timber joinery	High	Retain *in situ*, sand back, repair and repaint as required.
Corrugated iron roof	Medium	Inspect, repair to match the existing as required.
Corrugated iron roller door	Low	Repair damaged or corroded elements to match the existing and maintain function as required.
Guttering and square downpipe and cement sills	Low	
Telecommunications/Police installations including cabling from Valve House to Reservoir	Low	No immediate action required.
Other features, installations and services in general	Low	

8.3 Schedule of On-going Maintenance

The On-going Maintenance Schedule refers to the cyclical maintenance works to the fabric that should be implemented as part of the process of on-going management of the Ashfield Reservoir and Site components. These works should be initiated following the completion of the Conservation Works. A record of when this work is performed, any faults discovered, or repairs made should be maintained and kept alongside this maintenance schedule.

The maintenance works set out in this document will ensure the conservation of the existing significant fabric. Maintenance works have been identified by *The Burra Charter* as conservation works.

Frequency of some maintenance tasks is defined out of the typical 1, 2 or 5 year pattern, as it depends on the specific fabric issues.

Specific Repair and Inspection Techniques

Since the Reservoir is in operational use, the access to its interior is limited. However, divers' inspections with CCTV recordings and dewatering of the tank is possible.

The SWC Managing Maintenance Group's policy is to dewater reservoirs only when there is a need for major inspections or carry out some repairs. The divers'

inspections take place every five years, and dewatering is undertaken when a need for urgent intervention is identified. However, the SWC Water Operations Group may also need to conduct an inspection or a dewatering to ensure ongoing water supply, in which case the next regular inspection is re-scheduled to 5 years from the date of the previous inspection. The exact schedule of inspections is thus adjusted with the operational needs.

While divers can perform cleaning, inspection and other works, however tank repairs generally require dewatering. The dewatering process typically takes place when it does not cause major disturbances in the water supply system of the local area. For example, only five reservoirs were dewatered in 2003, and in 2004, due to drought strategy, there is no dewatering planned.

Recently, new products also became available, which will cure tank underwater and are safe in drinking water. Hence some minor repairs were lately undertaken with some success. This however is still in experimental stages.

Reservoir cleaning is no longer undertaken by SWC on regular intervals as the quality of reticulated water available today makes the silt level practically non-existent. The cleaning is thus undertaken on a needs basis, and initiated by:

- Reservoir medicals (water quality),
- Visual inspection of depth of silt by diver, or
- The need to some major refurbishment i.e. reline the reservoir.

For smaller tank repairs and minor leakage, Epoxy UHB (ultra-high build epoxy) is used. It is also suitable for repairs to reservoir damage due to the amount of pitting on the steel walls. The UHB epoxy creates a layer of 2 to 3mm in thickness, rather than the 500mm minimum for traditional repair methods.

Table 8-1 Schedule of Ongoing Maintenance

Schedule of On-going Maintenance ASHFIELD RESERVOIR			
Element	Every Year	Every Two Years	Every Five Years
Site and General Features			
Site use generally	Retain in use as a water storage facility. New elements can be added to the site, and elements of Low significance can be removed as required. No changes to site boundaries are envisaged in the foreseeable future, however, the integrity of the current site boundaries is not considered to be of importance.		
Existing architectural layout			
Existing site boundaries			
Property boundary mesh fence	Retain, repair or replace as required.		
Ashfield Reservoir (WS0003)	See detailed Schedule below.		
Valve House	See detailed Schedule below.		

Schedule of On-going Maintenance ASHFIELD RESERVOIR			
Element	Every Year	Every Two Years	Every Five Years
City Tunnel shaft and Pumping station access building	Inspect structure and interior, maintain in operational condition. Pumps, valves, installations, fittings and joinery may be retained, repaired or replaced as required.	Inspect exterior, monitor condition. In case of graffiti occurrence, remove graffiti and apply protective coating as required.	Repaint the entrance door. Inspect joinery, repair as required. The existing architectural imagery should be retained in general terms.
Corrugated Iron Shed	No specific action is required at annual intervals.	No specific action is required at bi-annual intervals.	Inspect, monitor condition, repair to match the original condition. Elements or portions of elements decayed beyond repair can be replaced as required.
Office Building			
Brick Store Building			
Corrugated Sheet Metal Store Building			
Grassed landscaping immediately around reservoir and support wall marking boundary of reservoir structure proper	Inspect above-ground and under-ground elements, assess condition and repair as required. Retain elements *in situ*. When deteriorated beyond repair, elements can be assessed further, for possible removal. Maintain trees and other vegetation as required.	No specific action is required at bi-annual intervals.	No specific action is required at five year intervals.
Other site features generally, including concrete slabs, brick storage bins, bitumen driveway, modern ground level valve chambers, vegetation.			

For particular elements of the most important buildings on the site, the following Schedule of On-going Maintenance Works applies:

Schedule of On-going Maintenance ASHFIELD RESERVOIR			
Element	Every Year	Every Two Years	Every Five Years
Buildings and Structures			
ASHFIELD RESERVOIR			
Structure generally Original concrete substructure including mass concrete columns and arches	No specific action is required at annual intervals.	Inspect and assess condition. Any concrete cracking or other potential structural issues are to be assessed by a suitably qualified structural engineer.	No specific action is required at five-year intervals.
Original tank walls and external finishes	No specific action is required at annual intervals.	Remove corrosion on external surfaces, repaint affected areas to match the existing as required.	No specific action is required at five-year intervals.
Original tank walls – internal finishes Reinforced concrete slab Reservoir floor	No action required at regular intervals, due to the physical nature of the item. On dewatering, inspect, assess condition, and repair to match the existing form and finish as required.		
Reservoir roof with corrugated metal roofing	Inspect condition, repair missing or damaged elements to match the existing as required.	No specific action is required at bi-annual intervals.	No specific action is required at five-year intervals.
Original supportive steel structure Original circumferential walkway structure, stair and steel pipe handrail	Inspect, monitor condition. If corrosion appears on external surfaces, remove it and repaint affected areas to match the existing as required.	No specific action is required at bi-annual intervals.	No specific action is required at five-year intervals.
Other replaced or added components generally	Inspect, monitor condition as required or once every five years. Decayed portions or elements can be repaired as required.		
VALVE HOUSE			
Structure generally	Inspect condition of elements, including historic valves and fittings, as required or once a year. Retain historic elements *in situ* as long as technologically feasible. Historic fabric beyond repair is to be replaced to maintain the operational requirements.		

Schedule of On-going Maintenance ASHFIELD RESERVOIR			
Element	Every Year	Every Two Years	Every Five Years
Original brickwork and detailing	No specific action is required at annual intervals.	Inspect condition, repair decayed bricks as required. Deteriorated brickwork that is not likely to cause ongoing deterioration should not be replaced solely for aesthetic reasons.	No specific action is required at five-year intervals.
Timber joinery	No specific action is required at annual intervals.	No specific action is required at bi-annual intervals.	Sand back, repair and repaint as required.
Corrugated iron roof	No specific action is required at annual intervals.	No specific action is required at bi-annual intervals.	Inspect, monitor condition. Repair deteriorated elements to match the original as required.
Corrugated iron roller door	No specific action is required at annual intervals.	Inspect, monitor condition. Decayed original fabric can be replaced with modern elements.	No specific action is required at five-year intervals.
Guttering and square downpipe and cement sills	Inspect guttering, repair damaged or missing gutters and downpipes to match the existing as required.	No specific action is required at bi-annual intervals.	No specific action is required at five-year intervals.
Telecommunications/Police installations including cabling from Valve House to Reservoir	Inspect, monitor condition as required or once every five years. Decayed portions or elements can be repaired as required.		
Other features, installations and services in general			

9. HERITAGE IMPACT ASSESSMENT OF PROPOSED WORK

9.1 Proposed Works

The Ashfield Reservoir is a critical asset for the delivery of water to the Ashfield area.

It is proposed that the outer buildings that are no longer in use be demolished.

The disused buildings on the site have been subject to vandalism. The brick building and tin sheds are being damaged on a regular basis. These building can harbor trespassers, which pose a safety risk as they capable of damaging facilities and workers.

9.2 Assessment of Heritage Impact

It was considered necessary to assess the proposed works against the relevant NSW Heritage Office questions for preparation of Statement of Heritage Impact. The applicable NSW HO questions, for *Minor partial demolition* and *Minor Additions to Heritage Item*, read as follows:

–How is the impact of the addition on the heritage significance of the item to be minimised?

–Can the additional area be located within an existing structure? If no, why not?

–Will the additions visually dominate the heritage item?

–Is the addition sited on any known, or potentially significant archaeological deposits? If so, have alternative positions for the additions been considered?

–Are the additions sympathetic to the heritage item? In what way (e.g. form, proportions, design)?

–Is the demolition essential for the heritage item to function?

–Are important features of the item affected by the demolition (e.g. fireplaces in buildings)?

–Is the resolution to partially demolish sympathetic to the heritage significance of the item?

–If the partial demolition is a result of the condition of the fabric, is it certain that the fabric cannot be repaired?

9.3 Scope of Work

9.3.1 Demolition of Unused Sheds

There are four buildings on the site that are proposed for demolition. These are referred to as the

- Corrugated Iron Shed;
- Office Building
- Brick Store Building; and

the Sheet Metal Store Building (refer to table 3-2 for photographs and description).

Vandals have seriously damaged the derelict buildings on the site and they now require substantial restoration work. These buildings are being damaged on a regular basis. They are considered to pose a safety risk to workers as they can harbor trespassers.

All these buildings are currently disused and have been assessed as being of Low Significance. The history of use of these buildings is associated with the use of the site as a maintenance depot and materials store. This was a common practice on Sydney Water sites and had no particular association with the use of the site for water storage and distribution purposes. They therefore had no special function associated with the item and the demolition will not adversely affect the heritage significance of the site.

Reference list

The following list of references are those sources specific to Ashfield Reservoir Site. It should be read in conjunction with the comprehensive reference list in the CMP Manual. The publications, unless noted are held by the Sydney Water Library, Head Office, Sydney.

Publications

Benson, D & Howell, J (1990) Taken for Granted: The Bushland of Sydney and its Suburbs, Royal Botanic Gardens Sydney.

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Sydney Water Archival Files/Other

Ashfield Reservoir Real Estate History Case No. 518 'Land Acquired for Ashfield Reservoir' and Case No. 3467 Easement for City Tunnel', c/- Group Property, Sydney Water Head Office, Level 5 (old building), Sydney Water Head Office.

Canterbury City Council online history resources at http://www.canterbury.nsw.gov.au and Cadigal Wangal information website at http://www.cadigalwangal.com.au.

Metropolitan Board of Water Supply & Sewerage, Minutes of Board Meeting Held 6 January 1909, Item Number 69, Historical Research & Archives Facility.

Sydney Water Records File, File Number 115705F1, Ashfield Reservoir No. 2 Investigation File (Government Records Repository).

Archival Plans/Drawings

Metropolitan Board of Water Supply Sewerage and Stormwater, Proposed Installation of four 1,000,000 gallon tanks, Ashfield, Sydney Water Plan Room.

Metropolitan Board of Water Supply and Sewerage, 'Proposed Concrete Tanks, Ashfield', 1908, Sydney Water Plan Room.

Metropolitan Board of Water Supply and Sewerage, Proposed 1,000,000 gallon steel tank on brick in cement & concrete tower for Ashfield, 1909, Sydney Water Plan Room.

Metropolitan Board of Water Supply and Sewerage, Proposed Concrete Tanks, Ashfield, Sydney Water Plan Room.

Metropolitan Board of Water Supply and Sewerage, 1,000,000 Gallon Steel Tank on Concrete Tower for Ashfield, 1910, Sydney Water Plan Room.

Metropolitan Board of Water Supply and Sewerage, Valve-House for Ashfield Tanks, 1914, Sydney Water Plan Room.

Public Works Department Survey, Syvr J. Duncan A. Riddle, November 1890, Sydney Water Plan Room.

Public Works Department Survey, 1908, Sydney Water Plan Room.

Archives and Repository

Documentary evidence relating to Ashfield Reservoir is held at the following repositories:

Sydney Water Archive Facility, PO Box A53, Sydney South, NSW 1232,

Sydney Water Library, Level 2, Head Office, 115-123 Bathurst Street, Sydney

Sydney Water Plan Room, Level 6, Head Office, (Old Building), 115-123 Bathurst Street, Sydney.