Greater Sydney Roads Renewals – Cordeaux Dam

Statement of Heritage Impact

Report to Abergeldie Complex Infrastructure

April 2025

artefact

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EXECUTIVE SUMMARY

Artefact have been engaged to prepare this Statement of Heritage Impact that has been written to satisfy the requirements of a Section 60 Works Application for the proposed road remediation works within the heritage curtilage of Cordeaux Dam. The Statement of Heritage Impact identifies the potential heritage impacts of the proposed works within the listed curtilage of Cordeaux Dam, which includes the roads leading to the dam wall. The report also provides detailed advice on appropriate heritage approval pathways and provides management recommendations for the proposal.

Overview of findings

The proposed works on Trail B6 and the valve access roads involve original structures built between 1919 and 1927. Physical impacts caused by construction activities will occur, but the original road alignment will remain unchanged, and existing drainage systems will be cleaned without alteration. Safety upgrades are essential for preserving the access roads which are identified as significant elements of the Cordeaux site. The proposed works will have minimal impact on the heritage significance of Cordeaux Dam by utilising an existing road alignment and current road infrastructure. The core heritage values of Cordeaux Dam, including its historical, technological, and aesthetic significance, would be preserved despite the proposed works. Therefore, the proposed works would have **little to no** physical impact on the heritage significance of Cordeaux Dam.

While the works will slightly modify the roads' appearance, the new drainage infrastructure will be visible but will not obstruct views of the dam wall. These upgrades will enhance the appearance and functionality of the roads which are in poor condition. Therefore, the proposal would have **little to no** visual impact on the site.

The archaeological potential of the proposed study area is assessed as being **nil to low**, due to the limited historical land use patterns and previous ground disturbances. Due to the nil to low archaeological potential, it is expected that the proposed works would cause little to no impacts to significant archaeological remains.

In summary, this Statement of Heritage Impact has identified the following:

- Cordeaux Dam is listed on the following registers:
    - ‘Cordeaux dam’ - SHR Item 01360
    - Cordeaux Dam – Section 170 Listing No. 4580027
    - ‘Cordeaux dam’ - Wollondilly LEP 201, Item 56
- There would likely be **little to no** adverse physical heritage impacts as a result of the proposed works.
- There would likely be **little to no** adverse visual heritage impacts as a result of the proposed works.
- There would likely be **little to no** archaeological impacts as a result of the proposed works.

Approval pathway

As the proposed works are located within the curtilages of the Cordeaux Dam SHR listing an approval under Section 60 of the Heritage Act is required. The proposed works cannot be carried out under the Standard Exemptions and therefore obtaining an exemption for the works is not possible. The proposed works are eligible to be conducted under a S60 Works and a Section 60 approval must be obtained prior to the work commencing.

This report has been prepared to assess the potential heritage impacts of the proposed construction works at Cordeaux Dam.

Recommendations and mitigation measures

General

- An application for approval must be made to Heritage NSW under Section 60 of the Heritage Act
- A heritage induction should be provided to all contractors working on the site to ensure awareness of the site's heritage significance and the need to minimise impacts.

Built Environment

- The methods, tools and materials used should not cause inadvertent damage to original or early fabric within the study areas. Should unexpected damage to original or early fabric occur, the advice of a heritage specialist should be sought before repairs are made
- All works are to be undertaken in accordance with the principles and objectives of the *Australia ICOMOS Charter for the Conservation of Places of Cultural Significance* (the Burra Charter)
- Prior to the commencement of works, extant fabric of the Cordeaux Dam near the Dam wall and access gates should be flagged with non-intrusive markers for the purpose of visibility to ensure that no impacts from vehicular movements occur.

Archaeology

- An unexpected finds procedure (UFP) should be implemented during ground disturbance works in case of any archaeological discoveries. The contact details of a suitably qualified archaeologist should be included in the UFP to provide advice or attend site if needed.
- If found, the macadam road would be of particular interest and sample recording should be undertaken by a suitable qualified heritage consultant.
- As there would be little to no visual impacts to the overall heritage item, the preparation of a photographic archival recording of the study area to document the changes to the landscape is not recommended.

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1.0 INTRODUCTION

1.1 Project background

Artefact Heritage and Environment have been engaged by Abergeldie Complex Infrastructure to prepare a Statement of Heritage Impact (SoHI) for the proposed works at Cordeaux Dam. This report will assess the built heritage impact and historical archaeological assessment of the proposed works which will form part of a Section 60 works application to Heritage NSW.

The site is a state listed heritage item under the Heritage Act 1977 as 'Cordeaux dam' (SHR Item 01360). It is listed on the WaterNSW Section 170 Heritage and Conservation Register (S170) [Cordeaux Dam, (Listing No. 4580027)]. The northern section of the study area falls within the heritage item listed on the Wollondilly Local Environment Plan 2011 (LEP) as 'Cordeaux dam' (Item 56).

WaterNSW has an extensive number of assets throughout NSW that require access via safe and well-maintained access roads. During development of the Greater Sydney Independent Pricing and Regulatory Tribunal (IPART) FY21-24 Submission, several dam access roads at Cordeaux Dam were identified as candidates for renewal as part of the Greater Sydney Roads Renewal project (GSRR), due to their poor condition. A Condition Assessment was conducted by AssetReady and WaterNSW personnel in November 2021, and a remediation and renewal works have been proposed. Abergeldie Complex Infrastructure (Abergeldie) is the firm undertaking the remediation works.

Artefact have been engaged to prepare this Statement of Heritage Impact that has been written to satisfy the requirements of a Section 60 Works Application for the proposed road remediation works within the heritage curtilage of Cordeaux Dam. This report identifies the potential heritage impacts of the proposed works within the listed curtilage of Cordeaux Dam, which includes the roads leading to the dam wall. The report also provides detailed advice on appropriate heritage approval pathways and provides management recommendations for the proposal.

Project justification is outlined in a Condition Assessment of the site was undertaken as part of the GSRR Project. The assessment was completed by AssetReady and WaterNSW personnel in November 2021 (D2019/88317). The main observations relevant to Cordeaux Dam Road, which were included in the Scope of Works Report by WaterNSW are noted below:

- Trail B6 Office/Laydown Area: Major potholes and trip hazards.
- Trail B6 Laydown to Intersection: Erosion of the central carriage and a culvert needing clearing.
- Valve House Access Road: Sharp entrance/exit angle with a temporary causeway.
- Approach to Valve House: Potholes in the bitumen seal.[1]

1.2 Study area

The study area is in close proximity to the Cordeaux Dam wall site which is located on the northern most extent of Lake Cordeaux, one of four water reservoirs within the Upper Nepean water supply scheme. Lake Cordeaux is located to the south of Sydney on the Illawarra Plateau, approximately 13 kilometres to the northwest of Port Kembla and north of the Illawarra Escarpment with an elevation of 303 metres above sea level. The study area is located within the Wollongong Local Government Area (LGA) and is contained within Lot 14 DP1233164; it is under the ownership of WaterNSW.

[1] WaterNSW, GSSR Design and Construct Roads and Drainage – Scope of Works D2024/41172, 7 June 2024

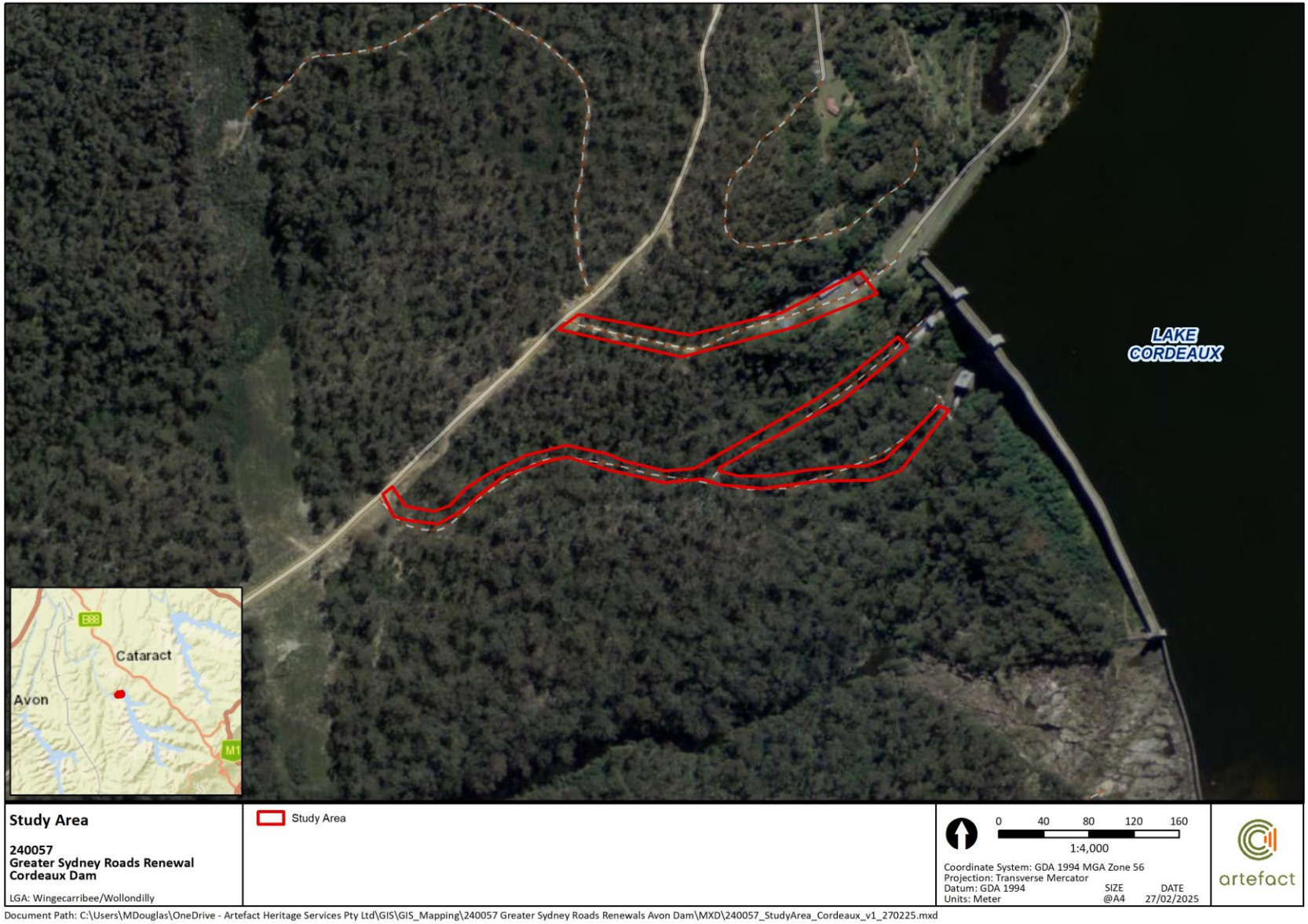

Figure 1: Map of study area near Cordeaux Dam

1.3 Authorship

This report has been prepared by [redacted]) all from Artefact Heritage.

1.4 Limitations

This report provides an assessment of built heritage and historical archaeology only. This report does not include an assessment of Aboriginal cultural heritage.

2.0 LEGISLATIVE CONTEXT

2.1 Overview

This section discusses the heritage management framework, notably legislative and policy context, applicable to the proposed development and study area.

2.2 Identification of heritage listed items

Heritage listed items were identified through a search of relevant state and federal statutory and non-statutory heritage registers:

- World Heritage List (WHL)
- Commonwealth Heritage List (CHL)
- National Heritage List (NHL)
- State Heritage Register (SHR)
- Section 170 Heritage and Conservation Registers
- NSW State Heritage Inventory database
- Wollongong Local Environmental Plan (LEP) 2009
- Register of the National Estate (RNE)
- National Trust of Australia (NSW) register.

Items listed on these registers have previously been assessed against the heritage assessment guidelines relevant to their peak governing body. Items that are of Commonwealth, National and World heritage significance have been assessed in accordance with the Environmental Protection and Biodiversity Conservation Act 1999 (the EPBC Act). Items of state or local significance have been assessed against the NSW Heritage Assessment guidelines. Assessments of heritage significance as they appear in relevant heritage inventory sheets and documents, are provided in this assessment.

There are several items of legislation that are relevant to the current study area. A summary of the relevant Acts and the potential legislative implications are provided below.

2.3 Heritage Act 1977

The NSW *Heritage Act 1977* (Heritage Act) provides protection for items of 'environmental heritage' in NSW. 'Environmental heritage' includes places, buildings, works, relics, movable objects or precincts considered significant based on historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values. Items considered to be significant to the State are listed on the SHR and cannot be demolished, altered, moved or damaged, or their significance altered without approval from the Heritage Council of NSW.

2.3.1 State Heritage Register

The SHR was established under Section 22 of the Heritage Act and is a list of places and objects of particular importance to the people of NSW, including archaeological sites. The SHR is administered by Heritage NSW, and includes a diverse range of over 1,500 items, in both private and public ownership. To be listed, an item must be deemed to be of heritage significance for the whole of NSW.

For works to an SHR item, a Section 60 application must be prepared for works that are not exempt under Section 57(2) of the Heritage Act.

Cordeaux Dam (SHR #01360) is listed on the State Heritage Register.

2.3.2 Archaeological relics and works

The Heritage Act also provides protection for 'relics', which includes archaeological material or deposits. Section 4 (1) of the Heritage Act (as amended in 2009) defines a relic as:

> *"...any deposit, artefact, object or material evidence that:*
>
> *relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and*
>
> *is of State or local heritage significance"*

Sections 139 to 145 of the Heritage Act prevent the excavation or disturbance of land known or likely to contain relics, unless under an excavation permit. Section 139 (1) states:

> *A person must not disturb or excavate any land knowingly or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, damaged or destroyed unless the disturbance is carried out in accordance with an excavation permit.*

Excavation permits are issued by the Heritage Council of NSW, or its Delegate, under Section 140 of the Heritage Act for relics not listed on the SHR, or under Section 60 for impacts within SHR curtilages. An application for an excavation permit must be supported by an Archaeological Research Design (ARD) and Archaeological Assessment prepared in accordance with the Heritage NSW archaeological guidelines. Minor works that would have a minimal impact on archaeological relics may be undertaken in accordance with the Section 139 (4) exceptions.

2.3.3 Conservation Management Plans

Under Section 38A of the Heritage Act, if a Conservation Management Plan (CMP) is prepared for an item listed on the SHR, the Heritage Council of NSW may endorse the plan, and use the CMP to make regulations or provisions in relation to the SHR item. A CMP is not required under the Heritage Act, however the Heritage Council of NSW continues to recommend the preparation of CMPs as best practice heritage management documents for places of State Heritage significance and to consider suitable site-specific exemptions.

The following CMP has been prepared for Cordeaux Dam:

- Extent Heritage, *Cordeaux Dam Site Conservation Management Plan Update*, June 2018

2.3.4 Section 170 registers

Under the Heritage Act all government agencies are required to identify, conserve and manage heritage items in their ownership or control. Section 170 (s170) requires all government agencies to maintain a Heritage and Conservation Register that lists all heritage assets and an assessment of the significance of each asset. They must also ensure that all items inscribed on its list are maintained

with due diligence in accordance with State Owned Heritage Management Principles approved by the Government on advice of the NSW Heritage Council. These principles serve to protect and conserve the heritage significance of items and are based on NSW heritage legislation and guidelines.

Cordeaux Dam is listed on the Water NSW s170 register under the following listing:

- Cordeaux Dam (#4580029)

2.4 Environmental Planning and Assessment Act 1979 (NSW)

The *Environmental Planning and Assessment Act 1979* (EP&A Act) establishes the framework for cultural heritage values to be formally assessed in the land use planning and development consent process. The EP&A Act requires that environmental impacts are considered prior to land development; this includes impacts on cultural heritage items and places as well as archaeological sites and deposits.

The EP&A Act also requires that local governments prepare planning instruments (such as Local Environmental Plans and Development Control Plans [DCPs]) in accordance with the EP&A Act to provide guidance on the level of environmental assessment required. The study area falls within the boundaries of the Wollongong and Wollondilly local government areas. Schedule 5 of each of the *Wollongong Local Environmental Plan* 2009 (LEP) and Wollondilly Local Environment Plan 2011 (LEP) includes a list of items/sites of heritage significance within this LGA.

2.4.1 Wollongong Local Environmental Plan 2009 and Wollondilly Local Environmental Plan 2011

Heritage items listed on the Wollongong LEP 2009 and Wollondilly LEP 2011 are managed in accordance with the provisions of Section 5.10 Heritage Conservation of this LEP. Under Clause 5 of this section of the Wollongong (2009) and Wollondilly (2011) LEP:

> *The consent authority may, before granting consent to any development:*
>
> *(a) on land on which a heritage item is located, or*
>
> *(b) on land that is within a heritage conservation area, or*
>
> *on land that is within the vicinity of land referred to in paragraph (a) or (b),*
>
> *require a heritage management document to be prepared that assesses the extent to which the carrying out of the proposed development would affect the heritage significance of the heritage item or heritage conservation area concerned.*

Part of the study area is included on Schedule 5 of the Wollondilly Local Environmental Plan [2011] as:

- ‘Cordeaux dam’ Item No. I56.

2.4.2 Development Control Plan

The Wollongong DCP 2009 and Wollondilly DCP 2011 are supporting documents that compliments the provisions contained within the respective LEPs and provides specific design detail in regard to

sympathetic development on, or in the vicinity of, items listed on Schedule 5 of the each of the Wollongong LEP and Wollondilly LEP.

Chapter E11 of the Wollongong DCP 2009 and Volume 1: Part 6 of the Wollondilly DCP 2011 provides sympathetic considerations for development that is in the vicinity of a heritage listed item. These considerations include ensuring that the character, bulk, scale and height of new development does not unreasonably overshadow a nearby heritage item, that colouring and texture of new materials of a new development is sympathetic to a heritage item, and that views of a heritage item should not be obscured from the point of view of areas of public domain.

2.5 Non-Statutory Considerations

2.5.1 Register of the National Estate

The RNE is no longer a statutory list; however, it remains available as an archive.

Cordeaux Dam is listed under a group listing for the 'Upper Nepean Water Catchment' (id # 14746).

2.5.2 National Trust of Australia (NSW)

Listing on the National Trust Heritage Register does not impose statutory obligations and is more an indication of the heritage significance held by the community.

Cordeaux Dam is listed on the National Trust Heritage Register as 'Cordeaux Dam' (id #1920).

2.6 Summary of heritage listings

2.6.1 Cordeaux Dam

The study area comprises the Cordeaux Dam, which is listed on multiple heritage registers as outlined in Table 1.

Table 1: Summary of heritage register search results

Register	Study area/item	Other items
State Heritage Register	Cordeaux Dam (SHR #01360)	
Section 170 Registers (Water NSW s170)	Cordeaux Dam (#4580029)	
Wollondilly LEP 2011	Cordeaux dam' Item No. I56.	
Register of the National Estate (RNE) (Non-Statutory)	Cordeaux Dam under group listing 'Upper Nepean Water Catchment' (id # 14746).	
National Trust of Australia (NT) NSW Register (Non-Statutory)	'Cordeaux Dam' (id #1920).	

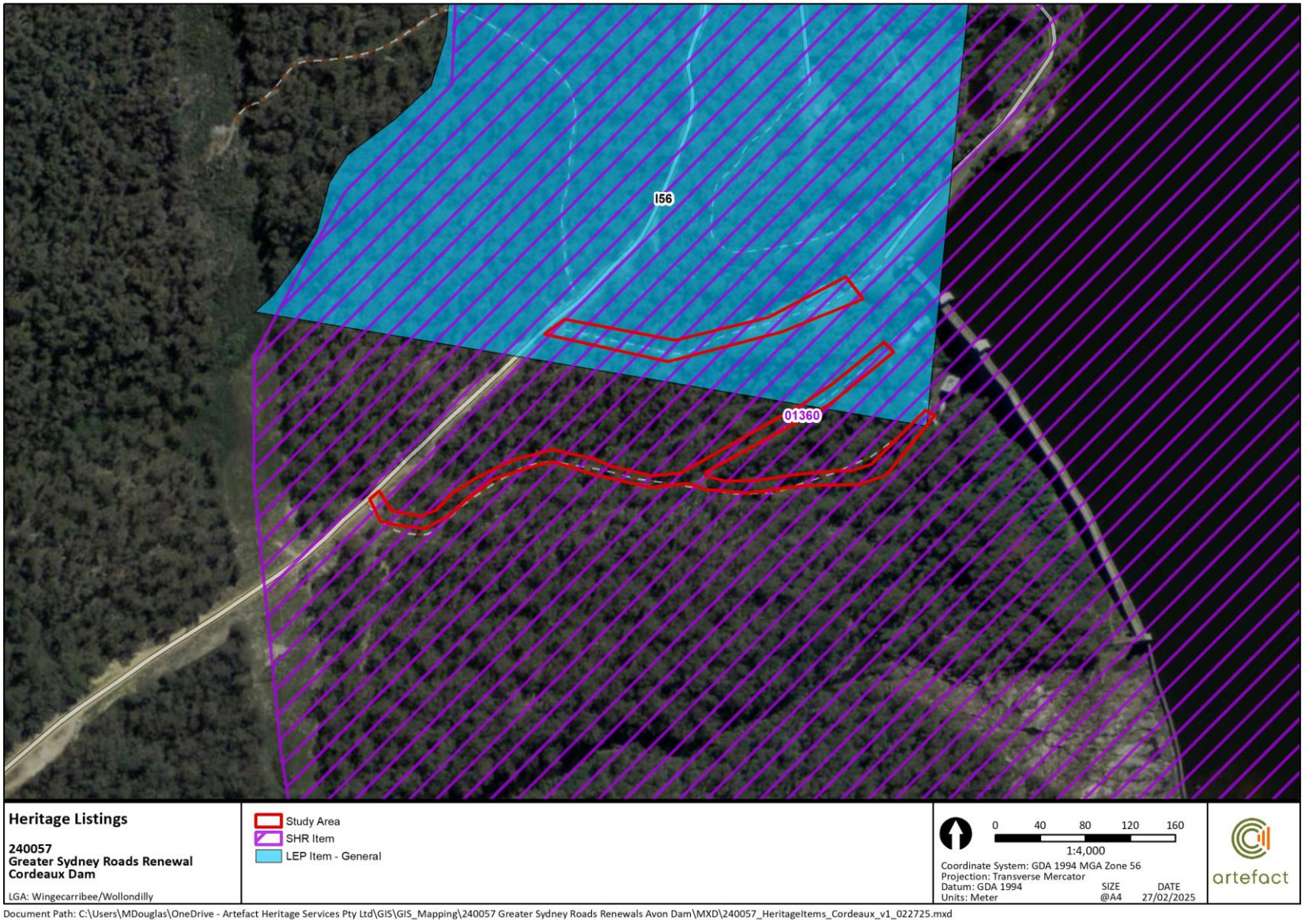

Figure 2: Heritage items in the vicinity of the study area

3.0 HISTORICAL BACKGROUND

3.1 Upper Nepean Scheme

The Cordeaux Dam was constructed in 1926 as part of the Upper Nepean Scheme, which comprises 924.6 square kilometres of natural river catchments and basins.[2] A severe drought between 1901 and 1902 caused the water levels in the Greater Sydney Basin to drop so low that the existing water storage provisions were found to be inadequate to supply the growing demand for water. As a result, four dams were constructed to supplement the Upper Nepean Scheme's capacity and provide a reliable water supply to Sydney.[3] The first stage of the Upper Nepean Scheme was commenced in 1880 after supply from the Botany Swamps proved to be inadequate to meet Sydney's water supply needs. By 1902, however, it became clear that the initial Upper Nepean scheme was inadequate after a severe drought had depleted the water supply. Construction of the Cataract Dam was completed in 1907. The site for a second storage dam, to be built on the Cordeaux River, was selected by the Water Board in the latter part of 1911 and a gauging weir was constructed. The dam was not begun until 1918 and was completed in 1926. In November of 1918 a Special Board of Experts recommended the construction of the Avon and Nepean Dams as well.[4]

3.2 Construction of the Cordeaux Dam

After the completion of the Cataract Dam in 1907, there was a necessity for more extra water storage in Sydney due to the increasing water demand and low rainfall on the catchment between 1907 and 1911.[5] A preliminary scheme and estimates were prepared for the dam and a gauging weir was built on the Cordeaux River in 1911 While preliminary site works occurred, the construction of the dam wall was delayed until 1918, due to World War I and satisfactory storage levels in Cataract Dam.[6]

Construction of the dam began in 1919 and was completed by 1926. It was constructed by the Department of Public Works and designed by Chief Engineer for Water Supply and Sewerage, E.M. de Burgh.[7] During the construction period, workers were housed near the dam in barracks or houses depending on their marital status[8] The dam was officially handed over to the Water Board on the 3rd of February 1927.[9] A 1927 article written after the completion of the dam describes it as follows.

> *'Cordeaux is the second reservoir of the Sydney water supply. As it has the same storage capacity as Cataract, the storage of water use by the citizens of the metropolis has thus been doubled.*[10]

[2] Graham Brooks and Associates, *Metropolitan Dams Conservation Management Plan Vol. 4,* April 2003
[3] Biosis Research, 2012. Camden Gas Project Amended Northern Expansion: Historic Cultural Heritage Assessment, p 54-55.
[4] Artefact, *Avon Dam HV Upgrade Statement of Non-Indigenous (historic) Heritage Impact*, September 2015
[5] WaterNSW, *Cordeaux Dam*, S170 Listing report (SHI 4580029), pp.3.
[6] Graham Brooks and Associates, *Metropolitan Dams Conservation Management Plan Vol. 3,* April 2003, pp.10.
[7] WaterNSW, *Cordeaux Dam*, pp.3
[8] 1923, 'Cordeaux Dam', *The Picton Post (NSW:1907-1954),* 31 October, pp.2.
[9] Graham Brooks, *Metropolitan Dams Vol. 3,* pp.10.
[10] 1927, 'CORDEAUX DAM', *The Sydney Morning Herald (NSW: 1842-1954),* 2 March, pp.8

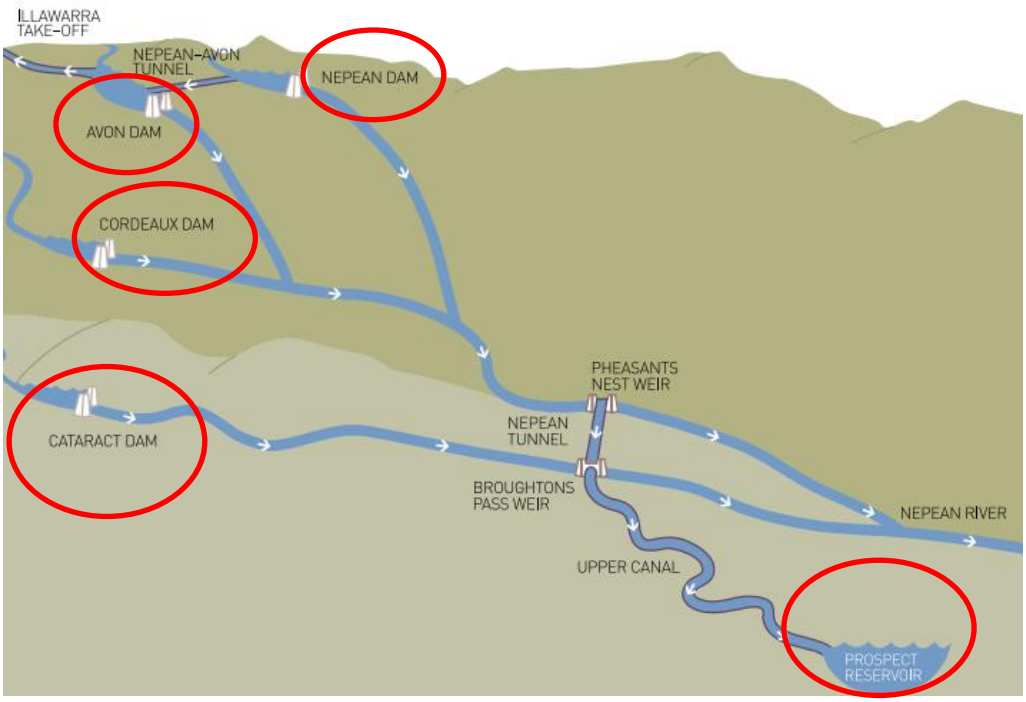

Figure 3. Diagram of Upper Nepean Scheme. (Water NSW: Dams of Greater Sydney and Surrounds, Upper Nepean Brochure.)

Figure 4. 1918 image of the Cordeaux dam wall during construction (State Library of New South Wales, Cordeaux dam, Record Identifier 9NaDQkWY)

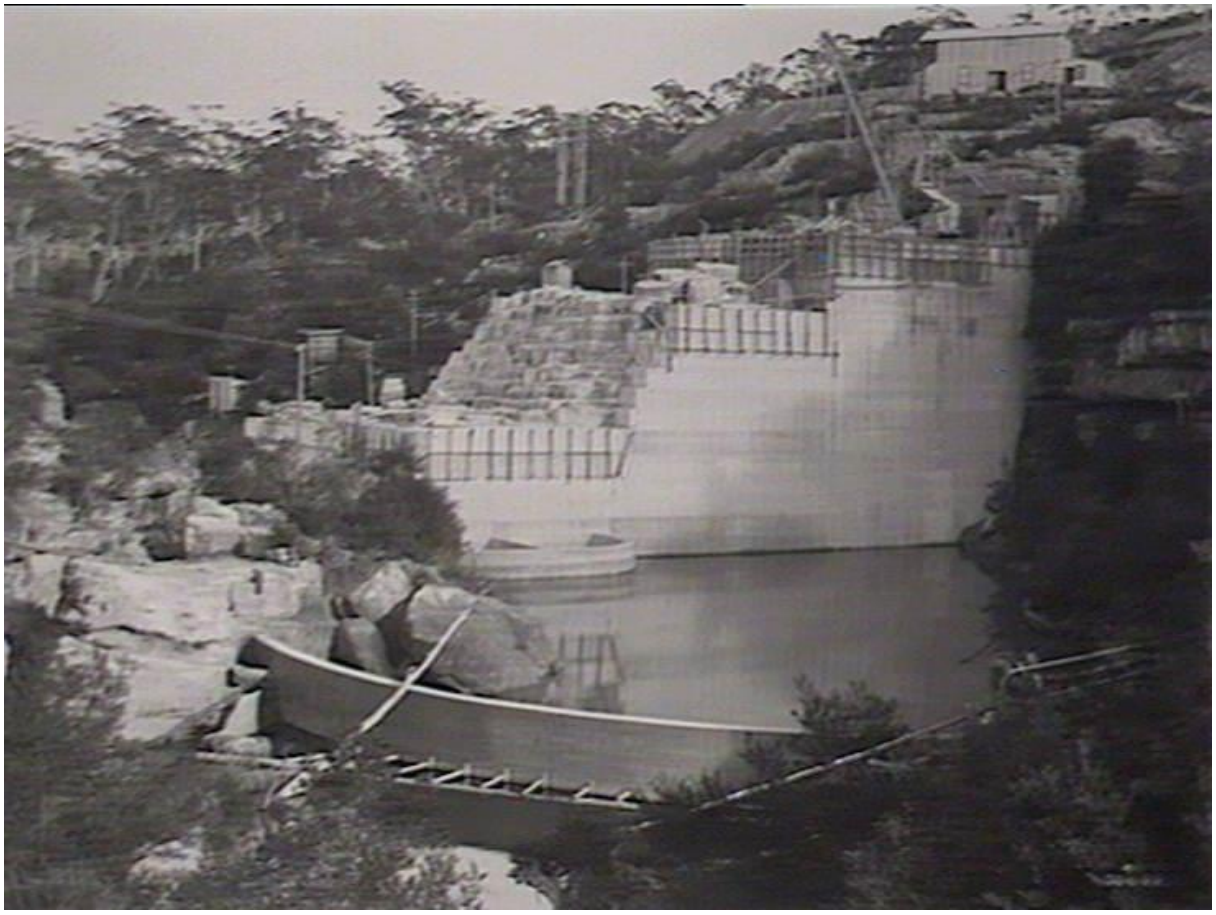

Figure 5. 1922 image of the wall during construction (State Library of New South Wales, Cordeaux dam, Record Identifier 92ezwm0Y)

Local Hawkesbury sandstone was quarried and used as blocks for the construction of the dam wall. Cordeaux is an arched dam, constructed using cyclopean masonry with sandstone blocks, quarried from the site. These blocks were fitted into an irregular pattern and packed with a sandstone concrete mix.[11] The upstream face is made of hard basaltic stone, which was preferred over the softer sandstone. It is 0.6 meters thick and transitions into sandstone concrete that is 1.8 meters wide at the lower levels and 1.2 meters wide at the higher levels. The downstream face consists of sandstone concrete that is 1.2 meters thick. The design of the dam improved from the earlier completed dams with the incorporation of contraction joints placed at regular intervals of 30m in the wall, inspection galleries at upper and lower levels of the wall and piping to monitor ground water pressure.[12]

In 1928 several works occurred on the site, including the establishment of a picnic area (for tourist attraction), sealing the access road to the dam wall and the construction of square timber post and rail fencing. New septic system lavatory blocks, landscaping elements and brick shelter sheds were established in the 1960s. Remedial work was carried out at Cordeaux Dam from 1985 to 1988 to enhance the structural integrity of the dam wall. This included the construction of a tailwater protection wall for the lower inspection gallery. The northern embankment was rebuilt using rockfill facing and stabilized, with a guardrail parapet added for safety. In the 1990s, all valves and associated operational equipment were upgraded. [13]

[11]WaterNSW, *Cordeaux Dam*, pp.3
[12]AMBS, *Statement of Heritage Impact: Cordeaux and Nepean Dams*, 2008, pp.9
[13] Graham Brooks, *Metropolitan Dams Vol. 3,* pp.21-22

Dendrobium Parish maps from 1903-1938 show the development of the Avon Dam over time (Figure 6). These maps, although capturing the progression of the Upper Nepean Scheme and construction of the dam, do not provide evidence of structures or infrastructure associated with the dam.

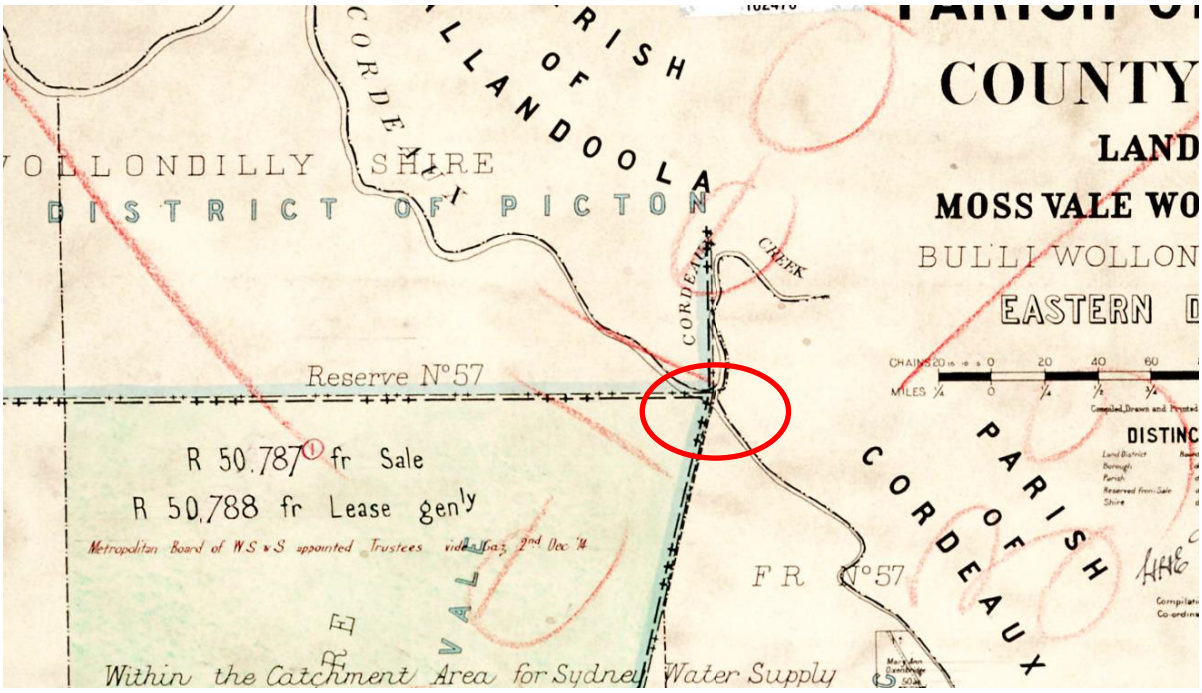

Figure 6. 1908 Dendrobium Parish Map showing approximate location of future Cordeaux Dam wall (indicated in red). (Source: NSW Historical Land Records Viewer, Parish of Dendrobium, Edition 3, 1908)

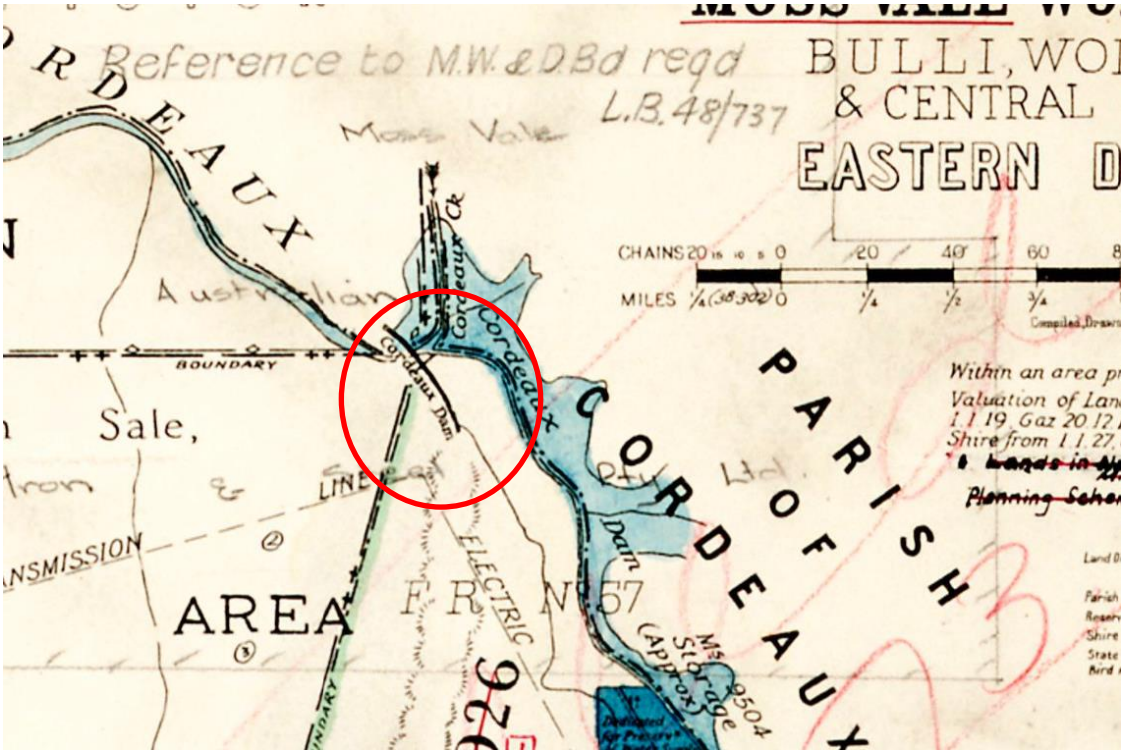

Figure 7. 1938 Dendrobium Parish Map showing approximate location of Cordeaux Dam (indicated in red). (Source: NSW Historical Land Records Viewer, Parish of Dendrobium, Edition 4, 1978)

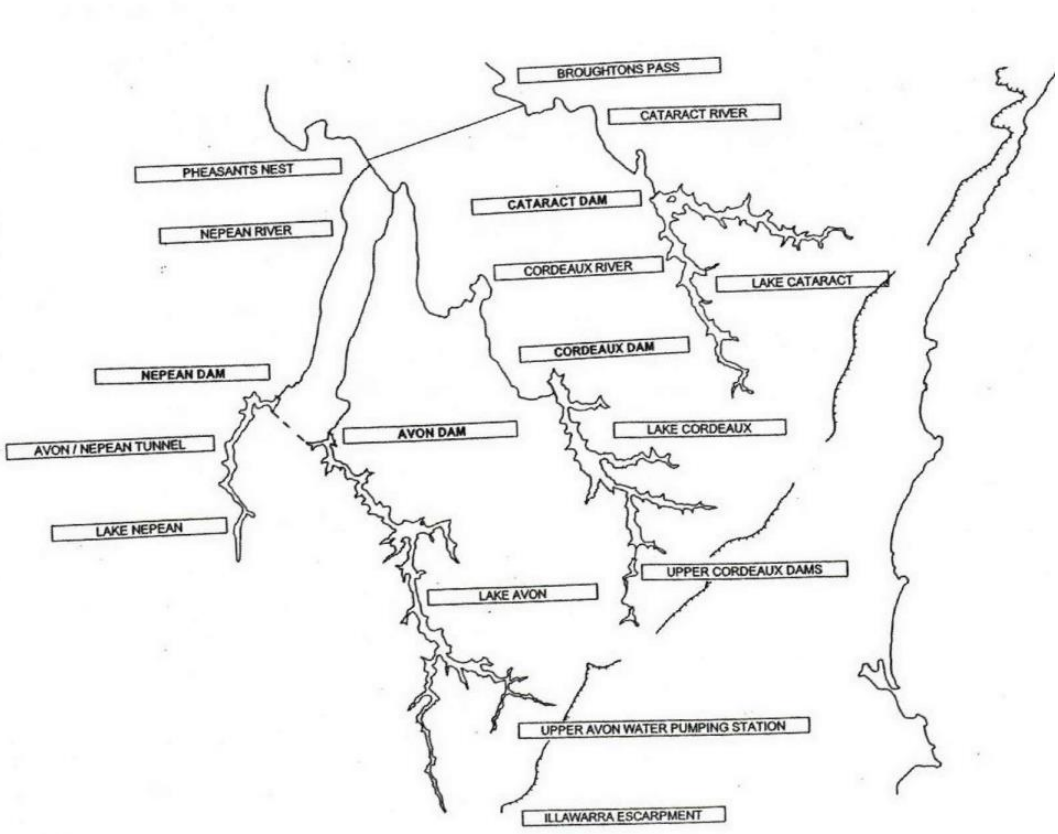

Figure 8: The Sydney Catchment Authority's Metropolitan Dams (Source: Sydney Catchment Authority Metropolitan Conservation Management Plan - Volume 1)

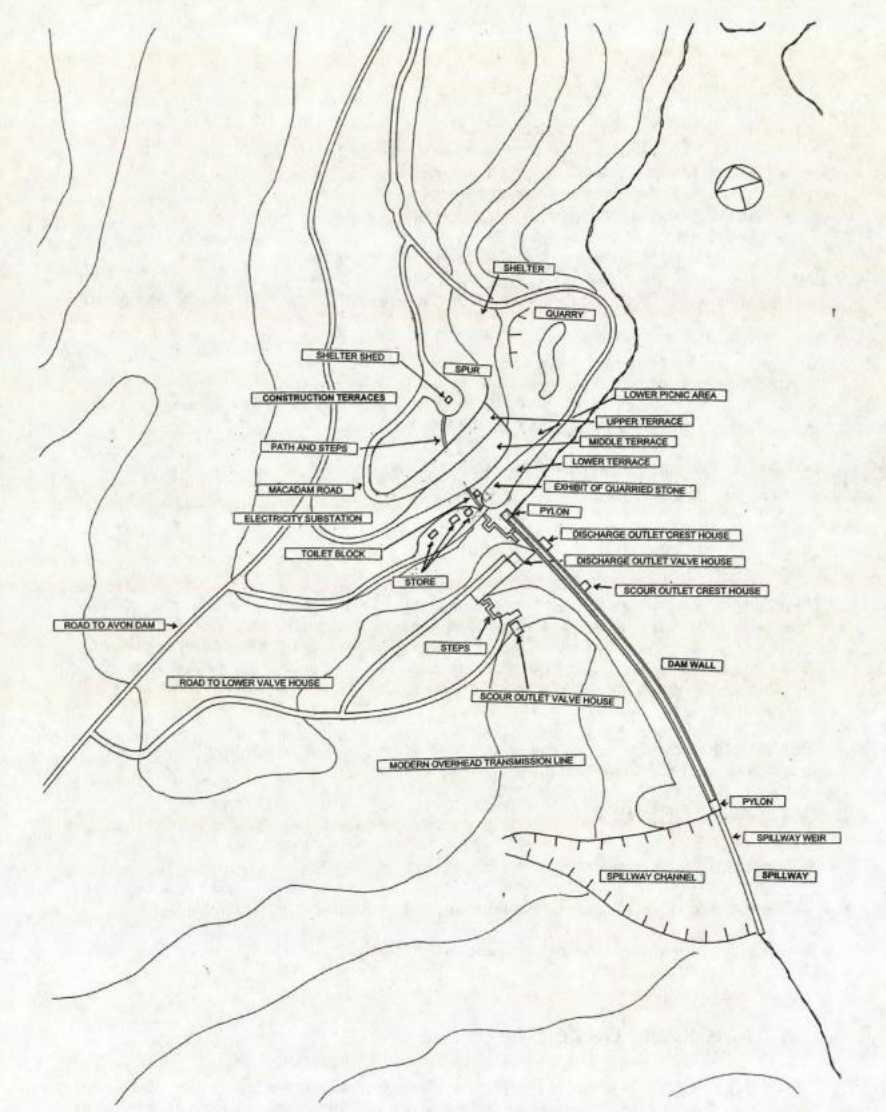

Figure 9: Cordeaux Dam site plan (Source: Sydney Catchment Authority Metropolitan Dams Conservation Management Plan 2003)

3.3 The Terraces

The study area forms part of the three terraces and access roads constructed to facilitate access to the western side of the dam throughout construction. The upper terrace housed maintenance sheds and workshops, including a filling shop, stop board store, and blacksmiths.[14] These facilities were serviced by a light tramway that connected the upper and middle terraces, transporting quarried stone, machinery, and personnel to and from the workers' township (Figure 10-Figure 13).

At Cordeaux Dam, the original tramway and road followed a shared path for much of the journey from Douglas Park to the dam. This alignment remains in use today, providing vehicular access to the dam. Some sections of the modern sealed road still have an underlying macadam surface, while a

[14] Graham Brooks and Assoc. Ltd. (2003) Sydney Catchment Authority, Metropolitan Dams N.S.W. : Conservation Management Plan. Available from: https://heritagensw.intersearch.com.au/heritagenswjspui/simple-search?query=cordeaux

disused, unsealed section of the road preserves this historic macadam layer.[15] It is uncertain which areas were laid with the macadam construction within the study area, if any.

During the dam's construction, all terraces were extensively used. The lower two terraces, which provided access to the valve houses, are smaller than the upper terrace. It seems that the roads leading to the valve houses were constructed towards the end of the dam's construction phase, specifically to facilitate access to the infrastructure, which the upper terrace continued to be utilised as a maintenance area post-construction.

Once the dam was completed, several buildings on the upper terrace were demolished as they were no longer needed for maintenance. Buildings from other parts of the site, such as the blacksmith's workshop, were relocated to the upper terrace. The railway, constructed on sleepers laid directly on levelled ground, was removed after it was no longer needed.

Historical images from the time show that the roads to the terraces were unsealed, single-lane access routes leading to the construction hubs between the two valve houses and up to the broader, flattened area of the upper terrace (Figure 14). Post completion of the dam, the area underwent targeted beautification works to stabilise the landscape using tree and shrub stock supplied by the Royal Botanic Gardens. Remnant infrastructure, equipment and parts can be seen strategically left in particular areas across the site.

The roads and accessways have been maintained over time with regrading performed as necessary to create firebreaks, ensure clear access, and maintain drainage. The lower two roads have been sealed with bitumen, and evidence of water damage management is evident in the forms of temporary culverts and drainage channels on the upper-slope of the roads.

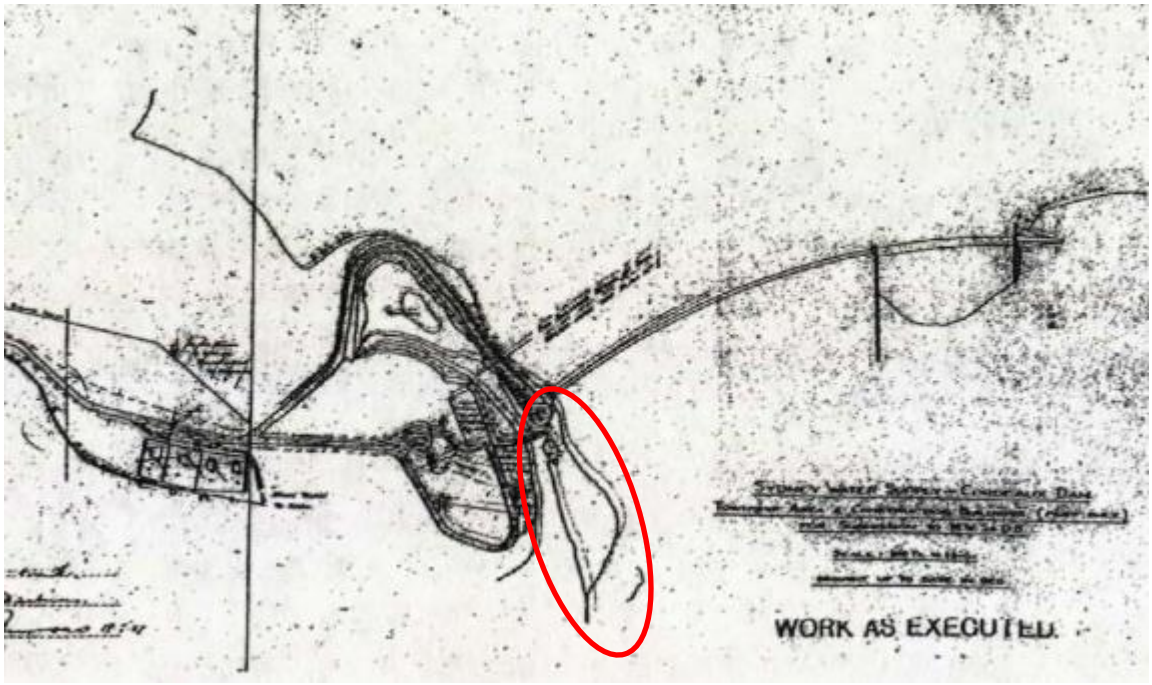

Figure 10: Detailed plan showing the roads and tramways from the workers' township around the various work zones, quarry and between terraces. Study area circled in red.[16]

[15] Graham Brooks and Assoc. Ltd. (2003) Sydney Catchment Authority, Metropolitan Dams N.S.W. : Conservation Management Plan. Available from: https://heritagensw.intersearch.com.au/heritagenswjspui/simple-search?query=cordeaux
[16] Ibid.

Figure 11: Northern view of Cordeaux Dam under construction. The upper terrace is visible to the left, whilst the valve houses and roads have not been constructed yet.[17]

Figure 12: Detail of Area 1 within the study area showing types of buildings and tramway that were once extant in the area.[18]

[17] Cordeaux Dam, 94RzOjy1. https://collection.sl.nsw.gov.au/record/94RzOjy1/mbGbANQGGe4Wx#viewer
[18] Cordeaux Dam, Government Printing Office. https://collection.sl.nsw.gov.au/record/Yj7LXG49/aG3OqQL7XygvZ

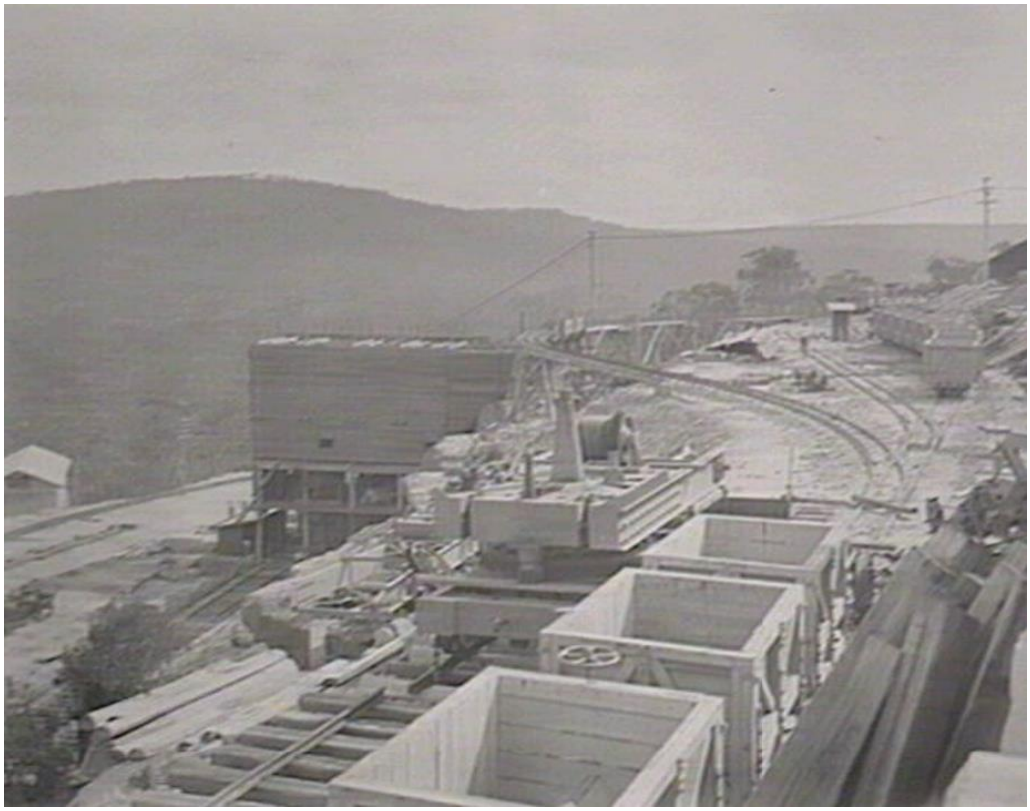

Figure 13: Detail showing the extensive rail around the upper terrace facilitating construction of the dam and movement of materials across the site.[19]

Figure 14: Detail of escarpment around Cordeaux Dam that gives an indication of the road construction and types of archaeological footprint within the surrounds of the study area.[20]

[19] Cordeaux Dam (16AD) [Preprint]. https://collection.sl.nsw.gov.au/record/YEGElLqn
[20] Cordeaux Dam, 9PQ5AbNn. https://collection.sl.nsw.gov.au/record/9PQ5AbNn/5ejxwlG3M744L#viewer

4.0 PHYSICAL CONTEXT

4.1 Site Inspection

A site inspection was conducted on 05 February 2025 by Emily Bennett (Heritage Consultant) of Artefact Heritage. The aim of the site inspection was to inspect the area of proposed impacts, inform a preliminary assessment of archaeological potential, and identify heritage items and heritage significant fabric of the item and in the vicinity that may be affected by the project. The inspection was undertaken on foot and a photographic record was made.

4.1.1 Study area

The study area consists of the lower picnic area and the dam wall located at the northern end of the Cordeaux River. The study area includes two main access roads (Trail B6 and the valve access road) extending east towards the Dam wall. The description of the study area is divided according to the proposed construction work areas identified in Figure 34 in Section 7.0.

4.1.2 Cordeaux Dam

The dam wall is a cyclopean masonry structure with an arched form. The wall is built from sandstone blocks that blocks were quarried on-site and are set in a cement mortar. The roughly rectangular blocks are placed on and surrounded by sandstone concrete, with cement mortar used only where deemed necessary. The concrete is made from crushed Hawkesbury sandstone. The dam wall is curved in shape and features a bywash spillway at its southern end.

Each end of the dam wall features substantial entry pylons located to the north and south ends of the wall. These are designed in the Interwar Neo Egyptian style, with decorative fluted lotus columns supporting a flat arched entry. The pylons have original timber framed doors, window vent openings and memorial plaques to their elevations. The interior walls have been painted.

There are two upper valve houses located on the upstream side at the northern end of the dam wall. These are square, flat-roofed (clad in lead sheeting) reinforced concrete buildings that exhibit Egyptian design elements, including tapered wall profiles, circular beading at the corners, and overhanging eaves. The valve houses contain discharge outlets, with the Upper Outlet featuring two 48-inch (1.2 m) pipes equipped with FCD valves and Ring Faulkner gate valves.

Figure 15: Entry pylons

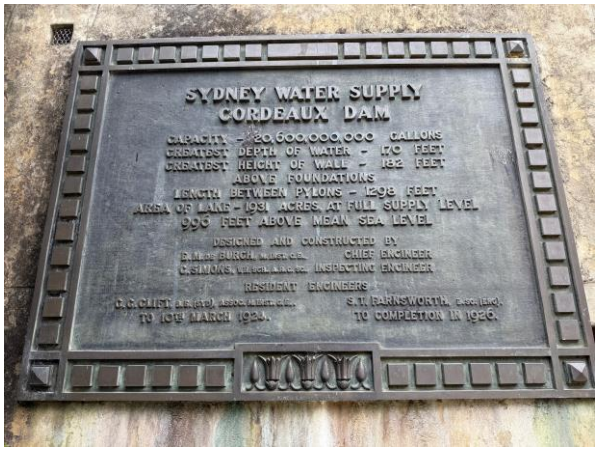

Figure 16: Memorial plaques on pylons

Figure 17: Interior of the dam pylons

Figure 18: Timber framed opening looking south towards the dam wall and upper valve houses

4.1.3 Area 1 and Area 2

Area 1 and 2 consist of an unsealed section of Trail B6, which extends from the west to the northern end of the dam wall and the lower picnic area. The road leads to a car park and public landscaped area which is directly in front of the northern most pylon entry.

The following buildings are located in Area 1:

- 1950s brick gable roofed toilet block located at the western side of the public area.
- 1928 timber framed garage/store (Building 1) with weatherboard cladding and a gable roof located to the west of the toilet block
- c. 1930s timber framed shed (Building 2) with corrugated iron cladding and timber openings, located to the west of the garage/store
- 1928 small, corrugated iron office with a gable roof (Building 3), located to the western end of Area 1.

Figure 19: Toilet Block

Figure 20: Building 1 – garage/store

Figure 21: Building 2- shed

Figure 22: Building 3- office

Figure 23: Unsealed access road (Trail B6) in Area 1

Figure 24: Unsealed access road (Trail B6) in Area 2 looking west

Figure 25: Northern view of unsealed access road (unnamed) to west of Area 2 and Area 3.

4.1.4 Area 3, 4 and 5

These areas consist of two former asphalt access roads leading to each lower outlet terrace on the western side of the dam. These contain original sections of roadway constructed between 1919 to1927.

The two access roads lead to upper and lower valve houses at the downstream foot of the dam wall are very similar in appearance and which contain 36 inch (0.9m) discharge pipes with Ring Faulkner gate valves and scour valves as outlets. The two lower valve houses (outlet and scour) are located on terraces on the northern end of the wall and at the base of the dam wall. They consist of similar reinforced concrete construction and detailing as the upper valve houses. The windows are openings with metal grilles on the east and west facades.

Figure 26: Lower valve outlet at the eastern end of Area 5

Figure 27: Upper valve outlet at the base of the dam wall in the eastern end of Area 5

Figure 28: Asphalt road in Area 3

Figure 29: Asphalt road in Area 5 looking west from the upper valve outlet

Figure 30: Bridge to the eastern end of Area 4, looking east

Figure 31: Culvert along Area 4

Figure 32: Access road along Area 5, looking west from the upper valve

5.0 SIGNIFICANCE ASSESSMENT

5.1 Methodology

Determining the significance of heritage items or a potential archaeological resource is undertaken by utilising a system of assessment centred on the *Burra Charter* (Australia ICOMOS 2013). The principles of the charter are relevant to the assessment, conservation and management of sites and relics. The assessment of heritage significance is outlined through legislation in the *Heritage Act* and implemented through the *NSW Heritage Manual*, the *Archaeological Assessment Guidelines*[21] and the document *Assessing Significance for Historical Archaeological Sites and 'Relics'*.[22]

If an item meets one of the seven heritage criteria and retains the integrity of its key attributes, it can be considered to have heritage significance (see Table 2). The significance of an item or potential archaeological site can then be assessed as being of local or State significance. If a potential archaeological resource does not reach the local or state significance threshold, then it is not classified as a relic under the *Heritage Act*.

'State heritage significance', in relation to a place, building, work, relic, moveable object or precinct, means significance to the State in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.

'Local heritage significance', in relation to a place, building, work, relic, moveable object or precinct, means significance to an area in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.[23]

Table 2. NSW heritage assessment criteria

Criteria	Description
A – Historical Significance	An item is important in the course or pattern of the local area's cultural or natural history.
B – Associative Significance	An item has strong or special associations with the life or works of a person, or group of persons, of importance in the local area's cultural or natural history.
C – Aesthetic or Technical Significance	An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in the local area.
D – Social Significance	An item has strong or special association with a particular community or cultural group in the local area for social, cultural or spiritual reasons.
E – Research Potential	An item has potential to yield information that will contribute to an understanding of the local area's cultural or natural history.
F – Rarity	An item possesses uncommon, rare or endangered aspects of the local area's cultural or natural history.
G - Representativeness	An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places of cultural or natural environments (or the cultural or natural history of the local area).

[21] NSW Heritage Office 1996, 25-27.
[22] NSW Heritage Branch 2009.
[23] This section is an extract based on the Heritage Office Assessing Significance for Historical Archaeological Sites and Relics 2009:6.

Integrity

Integrity relates to whether all the attributes that convey heritage significance are extant within the subject site and not eroded or under threat[24]. Integrity is a measure of the wholeness and intactness of the place and its attributes. Examining the conditions of integrity, therefore requires assessing the extent to which the subject site or element:

a) includes all elements necessary to express its heritage significance;

b) is of adequate size to ensure the complete representation of the features and processes which convey the property's heritage significance;

c) suffers from adverse effects of development and/or neglect.

Table 3: Levels of Integrity

Level	Definition
High	The physical fabric of the property and/or its significant features is in good condition, and the impact of deterioration processes controlled. A significant proportion of the elements necessary to convey the totality of the heritage significance conveyed by the property is included[25].
Moderate	The physical fabric of the property and/or its significant features have undergone some modifications. The changes may be reversible.
Low	The physical fabric of the property and/or its significant features have undergone substantial modifications and the original is irretrievable
N/A	Modern and / or intrusive fabric
Unknown	Elements that cannot be evaluated (i.e.. natural ventilation systems where their continued operation cannot be determined, fabric that cannot be inspected)

5.2 Existing heritage assessments

5.2.1 Statement of Significance

5.2.1.1 SHR Statement of Significance

The following Statement of Significance has been extracted from the SHR listing for the heritage item:

> *Cordeaux Dam was the second of the four water supply dams built as part of the development of the Upper Nepean Water Supply Scheme, one of the most important engineering works and items of public infrastructure in Australia, and still has the longest wall of all the NSW water supply dams. It was designed by the NSW Public Works Department under the direction of one of Australia's leading water supply engineers, E.M. De Burgh. The completion of the Cordeaux Dam was a significant step in the continuing process of providing a reliable water supply for Sydney and surrounding areas as part of the Upper Nepean Scheme. Even by the international standards of the time, Cordeaux was a large dam and was a*

[24] Guidance on Heritage Impact Assessments for Cultural World Heritage Properties, ICOMOS 2011, p10.
[25].Sheridan Burke, The long and winding road: a challenge to ICOMOS members, in *Changing World, Changing Views of Heritage: heritage and social change* ICOMOS, 2010

significant work of engineering in its day. It continues to play an important role as a major source of supply for the Sydney region.

Cordeaux Dam is a handsome, well proportioned structure with strong Egyptian style architectural character which complements the monumental nature of the structure and its attractive natural surroundings. Cordeaux Dam includes a range of ancillary structures which form components of the overall site, including residential cottages of various ages for operational staff, one of which appears to date from the construction of the dam. This latter is associated with the Residential Engineer for construction and operation of the dam and is a fine example of a late Federation Bungalow style building. The other residences are representative of their age and type.

The public picnic grounds and gardens attached to the Cordeaux Dam contain a cultural landscape resource - including remnants of its interwar period plantings, layout and detailing, and extensive areas of bushland. There is evidence in the landscape design, particularly in the use of palms and tree ferns and battered stonework retaining walls, of an intention to continue the Egyptian Revival references apparent in the design of the main dam structures.[26]

Summary for significant criteria

Cordeaux Dam has heritage significance at the State level for its historic, associative, aesthetic, social, rarity and representative values.

5.2.1.2 Cordeaux Dam CMP 2018 Statement of Significance

The following Statement of Significance has been extracted from the *Cordeaux Dam Conservation Management Plan*, 2018 prepared by Extent Heritage. This Statement of Significance has been replicated in the WaterNSW s170 listing for the heritage item:

Cordeaux Dam has STATE heritage significance. This State significance is largely embodied in: the dam wall, inlet and outlet system, spillway and water body; the site layout; the construction terraces, tramway cutting and associated archaeological evidence; evidence of the construction camp and remaining buildings from the construction period; and the mid-twentieth century landscaping.

Cordeaux Dam is part of the Upper Nepean Scheme and derives some of its significance from its association with the Scheme, which is itself of State heritage significance. Completed in 1926, Cordeaux Dam was the second of the major dams to be built as part of the Scheme. In conjunction with the completion of Avon Dam in 1927, the impounded water of the Cordeaux Catchment Area provided one of the major sources of water for domestic and industrial consumption in metropolitan Sydney, the largest city in New South Wales. In providing water for metropolitan Sydney during this era the dam, in ensuring security of supply, contributed to the extensive residential, commercial and industrial development of Sydney during the 1920s and 1930s. The scale and monumental design of the dam is a lasting reminder of the power and status of the Water Board at the time.

The wall of Cordeaux Dam is an engineering work imbued with a sense of high aesthetic values expressed through the long-curved wall set within the valley of the

[26] Cordeaux Dam, https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=5051470

Cordeaux River. The design and finishes of the crest house, entry pylons and lower valve house in the Inter War Egyptian style continue to demonstrate design philosophies of the day.

The design and technologies used in the construction of the dam are representative of methods developed at the time, for construction of cyclopean masonry gravity dams by the Public Works Department of New South Wales. The successful completion of the dam and its continuation of use as a water supply dam are a lasting testament to the professional capabilities of the Federation/Inter War era generation of engineers of the Public Works Department and its Chief Engineer De Burgh.

The metropolitan dams collectively demonstrate developments in dam design and construction as a specialist branch of civil engineering. Cordeaux Dam in particular is able to demonstrate the original form of the dam wall and the outlet system as both the dam wall and lower valve house remain largely unchanged without being obscured by the addition of considerable amounts of strengthening rockfill. The dam incorporates the first instances in NSW and Australia of: internal inspection galleries; pressure grouted foundations to prevent seepage in natural fault lines; foundation test bores; contraction joints; emergency roller gates; and upper and lower outlets to reduce vibration. The site also contains rare surviving evidence of WWII anti-torpedo nets installed immediately behind the dam wall.

Collectively, the Metropolitan Dams helped support the development of car-based tourism in NSW and Cordeaux Dam was the destination for the first motorised outing of the NRMA in 1930. The landscaping of the former construction terraces for recreational facilities continues to demonstrate the beautification of dam sites in NSW in the early to mid-twentieth century and the emphasis on visitor access to and appreciation of major government engineering works.

The remnants of the former construction camp continue to demonstrate the lives of construction workers on major public infrastructure projects and a practice of on-site accommodation for construction workers and their families that is now rare, although the remains of the camp at Cordeaux appear to be less intact than those at Avon and Nepean dams.[27]

[27] Extent Heritage, *Cordeaux Dam Site Conservation Management Plan Update,* 2018, pp. 17-18

5.2.2 Assessment of Significance

5.2.2.1 SHR Assessment of Significance

The following assessment of significance has been extracted from the SHR listing for the heritage item[28], all text extracted is in italics, any additional text by Artefact is in plain font.

Table 4. Heritage significance assessment for Cordeaux Dam

Criteria	Discussion
A) Historical Significance	*Cordeaux Dam is constructed within the Upper Nepean catchment area which was developed with the completion of the Cataract and Nepean tunnels in 1888, as the fourth source of water supply for Sydney. The potential of the Upper Nepean Catchment Area to supply water was fully developed through the construction of four major dams between 1903 and 1936. Cordeaux Dam is the second of these dams to have been completed. The Upper Nepean Catchment Area continues to supply the regions of Sydney and Illawarra.* *Cordeaux Dam was the fourth of the major water supply dams constructed in NSW during the first half of the twentieth century. The design and technologies used in the construction of the dam are representative the methods developed by the Public Works Department of NSW at the time.* *In conjunction with the completion of Avon Dam in 1927, the impounded water of the Cordeaux catchment area provided one of the major sources of water for domestic and industrial consumption in metropolitan Sydney, the largest city in New South Wales. In providing water for metropolitan Sydney during this era the dam, in ensuring security of supply, contributed to the extensive residential, commercial and industrial development of Sydney during the 1920s and 1930s.* Cordeaux Dam meets the threshold for this criterion at the State level.
B) Associative Significance	*The design and construction of Cordeaux Dam was undertaken by the Water Supply and Sewerage Branch of the NSW Public Works Department. The construction of the dam drew upon the knowledge and experience of a number of engineers employed in the Branch at the time, including Ernest M. de Burgh (Chief Engineer). The successful completion of the dam and its continuation of use as a water supply dam are a lasting testament to the professional capabilities of the Federation/Inner War era generation of engineers of the Public Works Department.* *The tract of Eucalyptus bordering the encircling road of the upper picnic area was planted out by Board members of the former Water Board in 1928. The trees have particular memorial associations with past identities of the Board.* Cordeaux Dam meets the threshold for this criterion at the State level.
C) Aesthetic Significance	*The wall of Cordeaux Dam is an engineering work imbued with a sense of aesthetic values expressed through the long curved wall set within the valley of the Cordeaux River.* *The design and finishes of the crest houses, entry pylons and lower valve houses in the Inter Egyptian style were undertaken by the Government Architect's branch of the Public Works Department at the time headed by George McCrae. The architectural detailing evokes a romanticised version of the Ancient Near East at a time when many Australians had first hand experience of the area through military service, and through knowledge of archaeological finds reported in the popular press.* *The dam is set within the valley of the Cordeaux River. Upstream of the dam wall this setting is characterised by the broad expanse of the pool of water bordered by the crests of the valley sides. Downstream of the dam wall the*

[28] Cordeaux Dam, https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=5051470

Criteria	Discussion
	setting is characterised by the steeper inclines that graduate into the gorge created by the river's flow over time. Collectively this topography at times of high water imparts a picturesque scene when viewed from selective vantage points above and on the dam wall. *The former resident officer's cottage erected at the time of the dam's construction to house the resident engineer, is an excellent and intact example of the high standard of accommodation provided for Public Works Department senior staff.* Cordeaux Dam meets the threshold for this criterion at the State level.
D) Social Significance	*The dam and grounds are recognised by the National Trust of Australia (NSW) as being a place which is part of the cultural environment of Australia, which has aesthetic, historical, architectural, archaeological, scientific and social significance for future generations, as well as for the present community of NSW.* *The dam and grounds are recognised by the Heritage Council of NSW as a place which is of significance to NSW in relation to its historical, scientific, cultural, social, archaeological, natural and aesthetic values.* Cordeaux Dam meets the threshold for this criterion at the State level.
E) Research Potential	*The cyclopean masonry of the dam is an excellent early example of gravity dam construction in the Inter War era. It incorporates inspection galleries, contraction joints, and foundation drainage systems which collectively demonstrate the advanced state of this technology at the time.* *Terraces and platforms adjoining the dam abutments demarcate the location of plant and equipment used in in the construction of the dam, in particular the location of the cableway head towers, and concrete batching plant. The plateau of the upper picnic area was the site of the original construction township and retains a road formation, culverts and drainage lines and tennis court from that era.* *The grounds of the dam retain numerous tree plantings undertaken for the opening of the dam in 1927. Collectively the diversity of these trees present a good record of past horticultural practices.* Cordeaux Dam meets the threshold for this criterion at the State level.
F) Rarity	*The wall of the Cordeaux Dam is the longest of all the dams constructed in the Upper Nepean Catchment Area. Cordeaux Dam is one of three dams in NSW which incorporate extensive inter War Egyptian architectural detailing. Cordeaux Dam is one of two extant dams in NSW which incorporate pedestrian and vehicular entry pavilions to the crest wall.* *The crest and valve houses and inlet works retain original ironwork and machinery such as roller gates, penstocks and penstock opening system which represent a substantial repository of water supply delivery technology for the era in NSW.* *The dam incorporates the first instance of multiple level water discharges and valve houses, and emergency roller gates in NSW. The ensemble of plant buildings either associated with the construction or completion of the dam, such as weatherboard machine shed (adapted to double garage) and the corrugated iron blacksmiths, are unique in situ examples within the broader context of the four Metropolitan Dams.* *The dam incorporates cyclopean masonry which is a construction technique unique to the Metropolitan Dams in Australia. The dam incorporates the first instance of internal inspection galleries and connecting pipework and V notch weirs in a dam in NSW.*

Criteria	Discussion
	Cordeaux Dam meets the threshold for this criterion at the State level.
G) Representativeness	*Cordeaux Dam is representative of a type of dam (cyclopean masonry gravity dam) constructed in NSW by the Department of Public Works during the first half of the twentieth century. Key representative attributes of the dam design and construction include the use of cyclopean masonry bedded in sandstone concrete, use of blue metal concrete in facing the upstream face, the use of sandstone concrete in facing the downstream wall, use of a spillway that is an extension of the gravity wall, upper and lower valve/crest houses attractively designed and finished to a high standard, the use of an array of upstream intakes to regulate the quality of water supply, the internal inspection galleries, the foundation grouting system, the contraction joints, and the internal drainage system.* *The upgrading of the valves within the dam wall and ancillary monitoring and operating equipment is representative of modern day safe operating practice.* *The construction technologies used at Cordeaux Dam are representative of dams constructed in NSW through the first half of the twentieth century. Key representative attributes include the use of cableways, the building of temporary townships to house labourers and tradesman, building of semi-permanent cottages to house salaried staff, the construction of terrace platforms for plant and machinery, mechanisation of concrete production, the construction of a purpose built road of access and tramway to transport men, supplies and materials from the nearest railhead to the construction site, the building of permanent infrastructure such as water supply for plant, men and horses and the use of electricity to power plant and equipment.* *The rehabilitation of tracts of land scarred in the construction processes employed at Cordeaux Dam through beautification works is representative of practices undertaken at other dams throughout NSW. Key representative attributes of this practice include utilising the former township as a picnic area, utilising the former terraced construction areas as picnic areas and lookouts, and utilising the former construction roads and tramway for vehicular access to the dam wall.* *The practice of ongoing maintenance of the wall after completion through surveillance provided by resident staff and workshop facilities is representative of procedures undertaken at other dams in NSW.* *The provision of public amenity at the dam site is representative of the use of large water supply and irrigation dams in NSW as places for recreation by the greater community.* Cordeaux Dam meets the threshold for this criterion at the State level.

5.2.2.2 Cordeaux Dam CMP 2018 Assessment of Significance

The following assessment of significance has been extracted from the *Cordeaux Dam Conservation Management Plan*, 2018 prepared by Extent Heritage.[29] This Assessment of Significance has been replicated in the WaterNSW s170 listing for the heritage item. All text extracted is in italics, any additional text by Artefact is in plain font.

[29] Extent Heritage, *Cordeaux Dam Site Conservation Management Plan Update,* 2018, pp. 11-16

Table 5. Heritage significance assessment for Cordeaux Dam

Criteria	Discussion
A) Historical Significance	*Cordeaux Dam is part of the Upper Nepean Scheme and derives some of its significance from its association with the Scheme, which is itself of State heritage significance. Completed in 1926, Cordeaux Dam was the second of the major dams to be built as part of the Scheme and as such has been a major part of Sydney's water supply for over 90 years. Cordeaux Dam was one of the major water supply/irrigation dams constructed in New South Wales during the first half of the twentieth century.* *In conjunction with the completion of Avon Dam in 1927, the impounded water of the Cordeaux Catchment Area provided on of the major sources of water for domestic and industrial consumption in metropolitan Sydney, the largest city in New South Wales. In providing water for metropolitan Sydney during this era, the dam, in ensuring security of supply, contributed to the extensive residential, commercial and industrial development of Sydney during the 1920s and 1930s. The scale and monumental design of the dam is a lasting reminder of the power and status of the Water Board at the time.* *Collectively, the Metropolitan Dams helped support the development of car-based tourism in NSW and Cordeaux Dam was the destination for the first motorised outing of the NRMA in 1930. The landscaping of the former construction terraces for recreational facilities continues to demonstrate the beautification of dam sites in NSW in the early to mid-twentieth century and the emphasis on visitor access to and appreciation of major government engineering works. The remnants of the former construction camp continue to demonstrate the lives of construction workers on major public infrastructure projects and a practice of on-site accommodation for construction workers and their families that is now rare, although the remains of the camp at Cordeaux appear to be less intact than those at Avon and Nepean Dam.* *Cordeaux Dam is one of five dams representing a major theme in the historical development of the area. The Clift Memorial Plaque is associated with the murder of the first Department of Public Works resident engineer employed at Cordeaux, an event which is notable in the course of history in the local area.* *Cordeaux Dam has STATE heritage significance under this criterion. This significance is largely embodied in: the dam wall, water body and inlet and outlet system; the remains of the WWII torpedo nets within the waterbody and remnant components stored on the dam foreshore the construction terraces and associated archaeological evidence; and the layout and terracing of the former construction camp.*
B) Associative Significance	*The design and construction of Cordeaux Dam was undertaken by the Water Supply and Sewerage Branch of the New South Wales Public Works Department. The construction of the Dam drew upon the knowledge and experience of a number of the engineers employed in the Branch at the time, including Ernest M. de Burgh (Chief Engineer). The successful completion of the dam and its continuation of use as a water supply dam are a lasting testament to the professional capabilities of the Federation/Inter War era generation of engineers of the Public Works Department. The tract of Eucalypts bordering the encircling road of the upper picnic area was plated by board members of the former Water Board in 1928. The trees have particular memorial associations with past identities of the Board.* *Cordeaux Dam has LOCAL heritage significance under this criterion. This significance is largely embodied in the evidence of the dam wall and inlet/outlet system; and the commemorative landscaping and plaques.*
C) Aesthetic Significance	*The wall of Cordeaux Dam is an engineering work imbued with a sense of high aesthetic values expressed through the long curved wall set within the valley of the Cordeaux River. The design and finishes of the crest house, entry pylons and lower valve houses in the Inter War Egyptian style continue*

Criteria	Discussion
	to demonstrate design philosophies of the day and the desire to evoke a romanticised vision of the 'Ancient Near East' at a time when many Australians had first hand experience of the area through military service and through knowledge of archaeological finds reported in the popular press. The care in designing the outward appearance of the Dam also demonstrates a sense of corporate pride and pride in the engineering achievement of the project. This site in particular is able to demonstrate the original form of the dam wall and the outlet system as both the dam wall and lower valve house remain largely unchanged without being obscured by the addition of considerable amounts of strengthening rockfill. *The dam in its setting within the valley of the Cordeaux River has scenic qualities. The contrast of the dam with its rugged natural setting heightens appreciation of the skill of the dam engineers.* *The design and technologies used in the construction of the dam are representative of methods developed at the time, for the construction of cyclopean masonry gravity dams by the Public Works Department of New South Wales. As the only four cyclopean masonry dams in NSW, the metropolitan dams collectively demonstrate developments in dam design and construction as a specialist branch of civil engineering. Cordeaux Dam incorporates innovations such as pressure grouted footings, inspection galleries, contraction joints, hydraulic pressure measurement systems and upper and lower outlets to reduce problems with intake vibration. The size of the masonry blocks in the dam wall continue to demonstrate the capacity of the construction cableways.* *The former resident officer's cottage erected at the time of the dam's construction to house the resident engineer is an excellent and intact example of the high standard of accommodation provided for resident Public Works Department senior staff.* *The grounds of the dam retain a major repository of planting and design which is evocative of post 1960s urban landscape practice in the local area and are a reflection of the requirements of evolving recreation patterns undertaken in a manner which respects former construction era landscaping patterns. The plants selected for the dam recreation and residential areas reflect the horticultural expression and aspirations of the time they were installed.* *Cordeaux Dam has STATE heritage significance under this criterion. This significance is largely embodied in: the dam wall; inlet and outlet systems; the water body in its natural setting; evidence of the construction methods; mid-twentieth century recreational landscaping and the former Resident Engineer's Cottage.*
D) Social Significance	*The social significance of Cordeaux Dam has not been formally assessed through community consultation. It is likely, however, that the Dam has Local and possibly State heritage significance under this criterion.* *The construction of Cordeaux Dam between the years 1918 and 1926 necessitated the employment of a large body of labourers and tradesmen who lived at the construction sites with their families. The number of residents at Cordeaux was in the hundreds, a number which represents a major influx to the local, predominantly rural, population of the local area. The ongoing maintenance and supervision of Cordeaux Dam has been undertaken by generations of resident maintenance men. It is a pattern of working life that is of considerable interest in regard to the history of the local area. The grounds of the Cordeaux Dam have also provided a centre of recreational amenity for the region for a considerable period of time (since c.1927). The picnic and lookout areas of the dam represent one of the major tourist destinations in the local area.* *The dam and grounds are recognised and listed by the National Trust of Australia, the NSW Heritage Council and Wollondilly Shire Council.*

Criteria	Discussion
	Cordeaux Dam meets the threshold for this criterion at the Local level.
E) Research Potential	*Terraces and platforms adjoining the dam abutments demarcate the location of plant and equipment used in the construction of the dam, in particular the location of the cableway head towers, and concrete batching plant.* *The plateau of the upper picnic area was the site of the original construction township and retains a road formation, culverts and drainage lines from that era.* *The grounds of the dam retain numerous tree plantings undertaken from the time of the opening of the dam in 1927. Collectively, the diversity of these trees presents a good record of past horticultural practices.* *The catchment area, which is relatively untouched bushland in close proximity to a major urban area, has a high potential for further research into natural ecosystems.* *Cordeaux Dam has LOCAL heritage significance under this criterion. This significance is largely embodied in: the natural setting of the dam; evidence of the construction methods in the terraces; the mid-twentieth century recreational landscaping and archaeological remains of the former construction camp.*
F) Rarity	*The wall of the Cordeaux Dam is the longest of all the dams constructed in the Upper Nepean Catchment Area.* *Cordeaux Dam is one of three dams in New South Wales which incorporate extensive Inter War Egyptian architectural detailing.* *Cordeaux Dam is one of two extant dams in New South Wales which incorporate pedestrian and vehicular entry pavilions to the crest wall.* *The crest and valve houses and inlet works retain original ironwork and machinery such as roller gates, penstocks and penstock opening system which represents a substantial repository of water supply delivery technology for the era in New South Wales.* *The dam incorporates the first instances in NSW and Australia of:* • *internal inspection galleries;* • *pressure grouted foundations to prevent seepage in natural fault lines;* • *foundation test bores;* • *contraction joints;* • *emergency roller gates;* • *and upper and lower outlets to reduce vibration.* *The site also contains rare surviving evidence of WWII anti-torpedo nets installed immediately behind the dam wall.* *Cordeaux Dam has STATE heritage significance under this criterion. This significance is largely embodied in: the dam wall; inlet and outlet systems; and the remnants of the anti-torpedo nets.*
G) Representativeness	*Cordeaux Dam is representative of a type of dam (cyclopean masonry gravity dam) constructed in New South Wales by the Water Supply and Sewerage Branch of the Department of Public Works during the first half of the twentieth century. Some of its features were used for the first time in this dam and as such it also represents a point in time in the technical development of cyclopean masonry dams in Australia. Key representative attributes of the dam's design and construction include:* • *the use of cyclopean masonry bedded in sandstone concrete*

Criteria	Discussion
	• *use of blue metal concrete in the upstream face;* • *the use of sandstone concrete in facing the downstream wall;* • *use of a spillway that is an extension of the gravity wall, upper and lower valve/crest houses attractively designed and finished to a high standard;* • *the use of an array of upstream intakes to regulate the quality of water supply;* • *the internal inspection galleries;* • *the foundation grouting system, the contraction joints, and the internal drainage system* *The upgrading of the valves within the dam wall and the ancillary monitoring and operating equipment is representative of modern day safe operating practice.* *The construction technologies used at Cordeaux Dam are representative of dams constructed in New South Wales through the first half of the twentieth century. Key representative attributes include:* • *the use of cableways;* • *the building of temporary townships to house labourers and tradesmen;* • *building of semi-permanent cottages to house salaried staff;* • *the construction of terrace platforms for plant and machinery;* • *mechanisation of concrete production;* • *the construction of a purpose-built road of access and tramway to transport men;* • *supplies and materials from the nearest railhead to the construction site;* • *the building of permanent infrastructure such as water supply for plant and men and horses and;* • *the use of electricity to power plant and equipment* *The rehabilitation of tracts of land scarred in the construction processes employed at Cordeaux Dam through beautification works is representative of practices undertaken at other dams throughout New South Wales. Key representative attributes of this practice include:* • *utilising the former township as a picnic area;* • *utilising the former terraced construction platforms as picnic areas and lookouts; and* • *utilising the former construction roads and tramway for vehicular access to the dam site and dam wall* *The practice of ongoing maintenance of the wall after completion through surveillance provided by resident staff and workshop facilities is representative of procedures undertaken at other dams and weirs constructed in New South Wales.* *The provision of ongoing public amenity at the dam site is representative of the use of large water supply and irrigation dams in New South Wales as places for recreation by the greater community.*

5.2.3 Grading of Significant Elements

Individual areas and elements of the Cordeaux Dam have been assessed and a level of significance has been applied. This detailed assessment is provided to enable decisions on the future conservation and development of the place.

Five levels of cultural significance have been used in the assessment of the Cordeaux Dam. These categories have been developed based on *Assessing Heritage Significance*,[30] prepared by the NSW Heritage Office, and the categories provide a framework for conservation policies, interpretation and recommended treatment of the fabric (

Table 6).

Table 6: Standard grades of cultural significance

Id.	Level	Justification	Status
E	**Exceptional**	Where an individual space, element, tree or shrub is assessed as making a rare or outstanding contribution to the overall significance of the place. Spaces, elements or fabric exhibit a high degree of intactness and quality. Minor alterations or degradation may be evident, but does not detract from the overall significance of the place. Demolition/removal of the element would diminish the heritage significance of the place.	Fulfils criteria for local or state listings.
H	**High**	Where an individual space, element, tree or shrub is assessed as making considerable contribution to the overall significance of the place. Spaces, elements or fabric exhibit a considerable degree of intactness and were originally of substantial quality. Considerable alteration may have been undertaken, which may alter the presentation and completeness, but does not detract substantially from the overall significance of the place. Demolition/removal of the element would diminish the heritage significance of the place.	Fulfils criteria for local or state listings.

[30] NSW Heritage Office, *Assessing Heritage Significance*, 2001

Id.	Level	Justification	Status
M	**Moderate**	Where an individual space, element, tree or shrub is assessed as making a moderate contribution to the overall significance of the place. Original spaces, elements or fabric may exhibit considerable alteration and/or degradation which detracts from the overall significance of the place. Original space, elements or fabric which were of some intrinsic quality, but are relatively intact may be included. Elements with little heritage value but contribute to the overall cumulative significance of the place may also be included. New elements of high-quality design and aesthetic value may be considered to contribute to the significance of the place. Demolition/removal of the element may diminish the heritage significance of the place. Elements or spaces can be altered or adaptively reused.	Fulfils criteria for local or state listings.
L	**Little**	Where an individual space, element, tree or shrub is assessed as making a minor contribution to the overall significance of the place, particularly compared with other elements. Original elements may exhibit extensive alterations or degradations which impact their significance and ability to interpret. New elements of little intrinsic quality or aesthetic value may be considered in this category. Demolition/removal of the element would not diminish the heritage significance of the place. Elements or spaces can be altered or adaptively reused.	Does not fulfil criteria for local or state listings.
I	**Intrusive**	Where an individual space, element, tree or shrub is assessed as detracting from the appreciation and overall significance of a place. The element may be adversely affecting or obscuring other significant areas, elements or items. Demolition/removal of the element is recommended.	Does not fulfil criteria for local or state listings.

Table 7 below lists the different elements of the Cordeaux Dam and provides a significance grading for each, as well as detailed gradings of the fabric of each structure. The heritage assessments for the elements have been guided by the Cordeaux Dam CMP, prepared by Extent Heritage in 2018[31].

[31] *Cordeaux Dam Site Conservation Management Plan Update,* 2018, pp. 47-72

Where no existing grading exists for a component, or where the existing grading is inaccurate or insufficient for the purposes of this SoHI, Artefact Heritage has prepared a brief assessment. Only relevant elements which are in the vicinity of the proposed works will be reproduced in the table below.

Table 7: Grading of Significance for Cordeaux Dam

Component	Assessment	Grading
Dam Wall Precinct		
Quarry	Integral and original component of the dam including: • massive scale of quarry openings • evidence in rock faces for the extractive process	**Exceptional**
Dam Wall & Crest Pylons	Integral and original component representative of 'state of the art' dam design and construction including: Dam Wall: • sandstone cyclopean masonry wall • blue metal and sandstone facings • drainage system and inspection galleries • contraction system of keyed radical joints • discharge outlet pipes • wide crest road • profile and relative dimensions of the dam • davits Entry Pylons • Inter War Neo Egyptian style • profile and relative dimensions of superstructure • window, door and vent openings • memorial plaques	**Exceptional**
Upper Valve (outlet)	A well designed and characteristic element of the pre-second World War dam in NSW including: • reinforced concrete wall and roof structure • profile and relative dimensions of the superstructure • Inter-war Neo Egyptian style • window , door and vent openings • large steel roller doors • Clift memorial plaque • water intake openings • penstock and roller gate wells • penstock, emergency roller gate and penstock operating system	**Exceptional** Fabric associated with later upgrades is **Little**

Component	Assessment	Grading
Lower Valve (outlet)	A well designed and characteristic element of the pre-second World War dam in NSW including: • reinforced concrete wall and roof structure • profile and relative dimensions of the superstructure • Inter-war Neo Egyptian style • window, door and vent openings • 5 ton overhead crane • Boving-Johnson valve	**Exceptional** Fabric associated with later upgrades is **Little**
Upper Valve (scour)	A well designed and characteristic element of the pre-second World War dam in NSW including: • reinforced concrete wall and roof structure • reinforced concrete bridge • profile and relative dimensions of the super structure • Inter-war Neo Egyptian style • window, door and vent openings • water intake openings • penstock and roller gate wells • penstock, emergency roller gate and penstock operating system	**Exceptional** Fabric associated with later upgrades is **Little**
Lower Valve (scour)	A well designed and characteristic element of the pre-second World War dam in NSW including: • reinforced concrete wall and roof structure • profile and relative dimensions of the superstructure • Inter-war Neo Egyptian style • window, door and vent openings • large steel roller doors • penstock operating system with 2 capstans • pair of emergency roller gate and emergency screen guides and guides	**Exceptional** Fabric associated with later upgrades is **Little**
Discharge and Stilling Pool	An integral and original component of the dam.	**Exceptional**
Spillway	An integral and original component of the dam including un-gated weir, cyclopean masonry construction and natural rock spillway channel.	**Exceptional**
South Embankment	An integral and original component of the dam. The electricity substation concrete platform evidences the works undertaken after the completion of the dam.	**Exceptional** **High**

Component	Assessment	Grading
Terrace of Former Electricity Substation	An integral and original component of the dam including: • levelled platform • dry pack stone revetments • rock cut retaining wall • interconnecting pathways and steps	**Exceptional**
Lower Terrace		
Former Access Roads	Original sections of the roadway were principal means of transport during the construction of the dam including: • well graded formation and alignment • road surface • drains and culverts	**Exceptional** Later road alignment is of **Little** significance as evidence of the continuing mean of access around the dam site.
Grotto	Evidence of the continuing beautification works at the dam site	**High**
Carpark/ Landscaping/ Gardens	Representative and characteristic landscape element which evokes the early beautification works at the site	**High**
Stone Core	Evidence of the construction technology and material used at the dam.	**High**
Toilet Block	Evidence of the continued use and upgrading of recreational facilities at the site.	**Little**
Office/Bldg 03	Representative and characteristic element that continues to evoke the means by which the dam was maintained.	**High**
Garage/Former Fitters Shop & Compressor Shed (Bldg 01)	Representative and characteristic element that continues to evoke the means by which the dam was maintained.	**High**
Shed (Bldg 02)	Representative and characteristic element that continues to evoke the means by which the dam was maintained.	**High**
Construction Terrace Slope	An integral and original component of the dam, that demonstrates that early means of access through the site.	**Exceptional**
Terrace and Rock Cut	An integral and original component of the dam including: • levelled platform • dry pack stone revetments • rock cut retaining wall • interconnecting pathways and steps	**Exceptional**
Needle Valves	An integral and original component of the dam.	**Exceptional**
Iron Shed	Minor component of later maintenance services.	**Little**

5.2.4 Significant views and vistas

The 2018 CMP identifies important sightlines to the dam wall and water body from the Lower Picnic Area and surrounding construction terraces. The dam wall can be seen from the western end of Trail B6, near the proposed works at Area 1. Additionally, the wall is visible from the western ends of both the lower and upper valve access roads.

6.0 ARCHAEOLOGICAL ASSESSMENT

6.1 Introduction

This section discusses the study area's potential to contain historical archaeological resources. The potential for the survival of archaeological remains is significantly affected by activities which may have caused ground disturbance. This assessment is therefore based on consideration of current ground conditions, and analysis of the historical development of the study area.

'Archaeological potential' refers to the likelihood that an area contains physical remains associated with an earlier phase of occupation, activity or development of that area. This is distinct from 'archaeological significance' and 'archaeological research potential'. These designations refer to the cultural value of potential archaeological remains and are the primary basis of the recommended management actions included in this document.

6.2 Archaeological potential

The archaeological potential of each site is presented in terms of the likelihood of the presence of archaeological remains, considering the land use history and previous impacts at the site. This evaluation is presented using the following grades of archaeological potential:

Table 8: Grading of archaeological potential

Grading	Rationale
Nil	No evidence of historical development or use, or where previous impacts would have removed all archaeological potential
Low	Research indicates little historical development, or where there have been substantial previous impacts, disturbance and truncation in locations where some archaeological remains such as deep subsurface features may survive
Moderate	Analysis demonstrates known historical development and some previous impacts, but it is likely that archaeological remains survive with some localised truncation and disturbance
High	Evidence of multiple phases of historical development and structures with minimal or localised twentieth century development impacts, and it is likely the archaeological resource would be largely intact

6.2.1 Land use summary

The European occupation of the study area has been divided into five general phases of historical activity, which are outlined in Table 9 below.

Table 9: Land us summary

Phase	Discussion
Phase 1: Early European Settlement (Pre-1917)	– Prior to the dam's construction, the Cordeaux River valley saw limited settlement due to poor forest cover and shallow soils. Some pockets of

Phase	Discussion
	agricultural activity existed in areas with volcanic intrusion and basalt soils, particularly along the upper reaches of the Cordeaux and Cataract Rivers, and Cataract Creek. The gazettal of the Upper Nepean water catchment in 1880 recognised the area's importance as a water reserve for Sydney. Primarily, farmers and their families lived here in small, scattered settlements, engaged in small-scale agriculture, exploiting pockets of fertile soil. They built modest farmhouses, outbuildings (barns, sheds), and fences, resulting in limited clearing of land for agriculture and grazing, construction of fences, and minor alterations to watercourses for irrigation. This phase represents the initial interaction between European settlers and the landscape, reflecting early stages of adaptation and resource utilisation. Any surviving physical evidence (e.g., building footings, modified landscapes from agricultural use) would hold historical value.
Phase 2: Construction (1917-1927)	– This phase marks a period of intensive industrial activity, where land use was dominated by the dam's construction, including quarrying of sandstone, the establishment of a construction township, the building of access roads and tramways (including an aerial ropeway), and terracing of hillsides for construction plant and equipment. Significant vegetation clearing occurred. Predominantly construction workers, engineers, supervisors, and their families lived here, residing in the purpose-built construction township. They worked in the construction of the dam, including quarrying, transportation of materials, operation of machinery, and supervision of the project. They built the Cordeaux Dam itself, a construction township comprising barracks for single men, cottages for married men, a school, a post office, access roads, tramways, an aerial ropeway, a power substation, concrete batching plant, machine shop and a quarry. This resulted in extensive quarrying of sandstone, terracing of hillsides for construction plant and equipment, clearing of vegetation, construction of access roads and tramways, and diversion of the river flow during construction. Terraces were constructed to house plant and equipment. Cableways were built to transport materials across the site. A gauging weir was constructed to measure the flow of the river. This phase is highly significant due to its association with a major public works project and the development of water supply infrastructure for metropolitan Sydney. Surviving elements from the construction phase (e.g., quarry faces, road alignments, building footings, modified topography, remnants of the aerial ropeway) provide insight into the engineering practices, labour conditions, and social environment of the time. The design of the dam used innovative techniques like grouting the foundations and contraction joints which were firsts for NSW. Development or modification of the landscape may impact archaeological remains of the construction phase, or impact any remaining original construction methods.
Phase 3: Operation and Early Recreation (1927-1941)	– Following completion, land use shifted to the dam's operation and maintenance, water supply, and limited recreational use. The construction township was dismantled, and the area was converted into a "picnicking reserve." Beautification works, including tree planting and fencing, were undertaken. Resident dam operators and maintenance staff, along with their families and occasional visitors and tourists, lived here. They operated and maintained the dam, monitored water levels and discharge, and managed the surrounding recreational areas. They built upper and lower level picnic areas inclusive of shelters, lavatory blocks, barbeques and benches and tables and garden features. Squared timber post and rail fencing was constructed. This resulted in beautification works including planting trees, creating paths, and establishing gardens. The old construction township was slowly dismantled. A "picnicking reserve" was established in the area of the "old township site." This phase reflects the transition from construction to ongoing management and the beginnings of public engagement with the dam as a recreational resource. Surviving features from this phase (e.g., early landscaping, fencing, and built structures like the picnic areas inclusive of shelters, lavatory blocks, barbeques and benches and tables and garden features) contribute to the site's aesthetic and social heritage values. Changes to the landscape or built environment may affect the legibility of this phase.

Phase	Discussion
Phase 4: Wartime and Post-War Development (1941-1980s)	– During World War II, an anti-aerial torpedo net was installed. Post-war, the site saw continued development as a tourist destination, with upgrades to recreational facilities (lavatory blocks, shelter sheds) and landscaped elements. Two c.1960s brick cottages and one c.1920s weatherboard cottage remain from this time. Resident dam operators and maintenance staff, along with increased numbers of tourists and recreational visitors, lived here. They maintained the dam and managed recreational facilities. The installation of anti-aerial torpedo net was undertaken. Upgrades to recreational facilities (lavatory blocks, shelter sheds) and landscaped elements, including two c.1960s brick cottages and one c.1920s weatherboard cottage were built. This resulted in installation of anti-aerial torpedo net across the upstream face of the dam wall. Additional landscaped elements to further develop the tourist destination. The wartime measures reflect the site's strategic importance during a period of national crisis. The post-war development reflects changing social values and increased demand for recreational amenities. Removal or alteration of structures or landscape features from this era may diminish the site's historical significance.
Phase 5: Remediation and Upgrading (1980s-Present)	– This phase focused on upgrading the dam's structural integrity to meet modern standards, including tailwater protection, embankment rebuilding, and valve replacement. An auxiliary spillway was created, and valves and operational equipment were upgraded in the 1990s. Primarily, maintenance and operational staff lived here, upgrading the structural integrity of the dam and associated infrastructure. A tailwater protection wall, reconstructed embankment, auxiliary spillway, and upgraded valves and operational equipment were built. This resulted in rebuilding the northern embankment in rockfill facing and stabilising. Creation of an auxiliary spillway by clearing vegetation. This phase reflects contemporary engineering practices and risk management strategies. While primarily functional, these interventions may also have heritage impacts, both positive (e.g., ensuring the dam's long-term preservation) and negative (e.g., alteration of original fabric). Interventions must be carefully managed to minimise impacts on significant fabric and maintain the site's overall heritage values.

6.2.2 Relevant archaeological investigations

Previous archaeological assessments are limited for Cordeaux Dam. A brief summary of three are presented below for comparative analysis.

Reference	Summary
Graham Brooks and Associates (2003): Conservation Management Plan - Volume 3 (Cordeaux Dam)	• This Conservation Management Plan assesses Cordeaux Dam as possessing high cultural heritage significance due to its association with Sydney's water supply, historical construction and infrastructure, and recreational activities. Key elements contributing to this significance include the dam wall (technical and historical significance), water inlets (technical significance), means of construction (historical significance), places of residence (social significance), support buildings and facilities (historical significance), and means of communication and transport (social significance). The report concludes that Cordeaux Dam is an important historical landmark with high technical, social, and cultural values related to its innovative engineering, role in Sydney's water supply, and historical context. The CMP provides detailed information on the elements that contribute to the overall significance.

Reference	Summary
NSW Government Architect's Office (2005): Heritage Impact Assessment	• The Heritage Impact Assessment (October 2005) evaluates the potential heritage effects of proposed reticulation upgrades and the installation of new chlorination plants at Avon, Cataract, Cordeaux, and Woronora Dams. Commissioned by the Sydney Catchment Authority, the assessment aimed to determine if the proposed works required approvals or exemptions under the NSW Heritage Act, 1977. For Cordeaux Dam, the report concluded that reticulation upgrades, a new 100mm pipeline, 1100m of new 150mm reticulation main, new hydrants, and a chlorination plant adjacent to the heliport and reservoir could proceed under existing exemptions, provided work remained within existing roadways and/or service trenches, and care was taken near picnic areas due to potential artefact deposits. The chlorination plant construction was deemed very unlikely to have any heritage impact due to its location in a bushland area with no archaeological potential. The overall conclusion was that the proposed works at Cordeaux Dam were not likely to adversely affect the site's heritage values and could be undertaken as planned, contingent on following mitigation measures and informing the NSW Heritage Office of the intention to apply Standard Exemption 7.
Australian Museum Business Services (AMBS) (2003): Statement of Heritage Impact: Cataract, Cordeaux and Nepean Dams Environmental Flow Releases for the Upper Hawkesbury-Nepean River	• This Statement of Heritage Impact addresses the effects of proposed works associated with environmental flow releases on the Cataract, Cordeaux, and Nepean Dams, significant elements of the Upper Nepean Scheme (1888). The proposed works at Cordeaux Dam include upgrades to the lower and upper outlet valve houses, such as replacing flanges and valves, installing ultrasonic flow meters, extending steel platforms, replacing hydraulic systems, converting position indicators, installing a control cabinet, and erecting an overhead power line. The report concluded that the proposal would have a minor impact on the original fabric of Cordeaux Dam, with short-term adverse impacts on aesthetic values during construction, but no adverse effects on the historic and technical heritage values. The report recommends photographic recording, environmental rehabilitation, minimising intervention into original fabric, making new additions readily identifiable, using minimally invasive installation methods, and providing the report to the NSW Heritage Council for an Exemption application.

6.2.3 Summary of historical archaeological potential

Based on the review of the information obtained from historical sources, previous archaeological works in the surrounding area and the current condition of the site, it can be concluded that the study area has nil-low potential to contain historical archaeological remains. For ease the archaeological potential is discussed below in project areas:

Area 1

During the dam's construction phase, this area was terraced and functioned as an intensive work zone and access road to the lower terraces. It featured several tram tracks that transported materials from the quarry across the site which were laid on sleepers directly on levelled ground, as evident from historical images. Following the dam's completion, the tram tracks were removed from Area 1, and many buildings were either relocated or demolished. The area then transitioned into a maintenance zone, equipped with sheds and ancillary workplace facilities, while continuing to provide access to the lower terraces. Notably, the blacksmith's shed, and possibly other structures, were relocated to this area after the dam's construction.

Given that the proposed works are confined within the existing road embankment, the archaeological potential of Area 1 is likely limited to remnants of earlier road surfaces or infrastructure such as kerbs

or culverts. However, since the roads have been continuously used and actively maintained for fire safety and graded for water damage, it is possible that earlier surfaces may have been removed over time. However, if present, the macadam road would be of particular archaeological interest.

As such, there is **low archaeological potential** associated with this area.

Area 2 and Area 3

Areas 2 and 3 were primarily developed to facilitate access between the terraces created during the dam's construction and may have only been formalised as roads post dam construction. Historical images reveal that the landscape was extensively cleared of vegetation and reshaped to accommodate the construction process. Despite this significant works surrounding the roads, the archaeological potential in these areas is likely minimal due to the limited archaeological footprint from previous use. However, if present, the macadam road would be of particular archaeological interest.

As such, there is **nil to low archaeological potential** associated with this area.

Area 4

Area 4 is a small, contained zone within Area 5, designated for the reconstruction of a culvert. As it appears the access roads to the valve houses were fortified post the dam construction to specifically facilitate access to the valve houses, it is unlikely to contain an archaeological footprint. Area 4 is in a slight depression of the road and may have been altered substantially over time to manage drainage or water damage. If present, remnant archaeological features could include the macadam road surface, earlier culvert or evidence of drainage systems. It is important to note that subsequent road works and management may have significantly impacted the preservation of these sub-surface features.

As such, there is **nil to low archaeological potential** associated with this area.

Area 5

Area 5 consists of a bitumen sealed road leading to both valve houses. As the other areas, the sections of road were likely formalised post the construction of the dam and are unlikely to have a significant archaeological footprint associated with them. If present, the macadam road surface would be of interest. As the proposed works are contained within the existing road infrastructure, it is unlikely that archaeological deposits from the surrounding area would be located by the proposed works.

As such, there is **nil to low archaeological potential** associated with this area.

The graphic representation of the site’s archaeological potential is presented in Figure 33 [Add figure below].

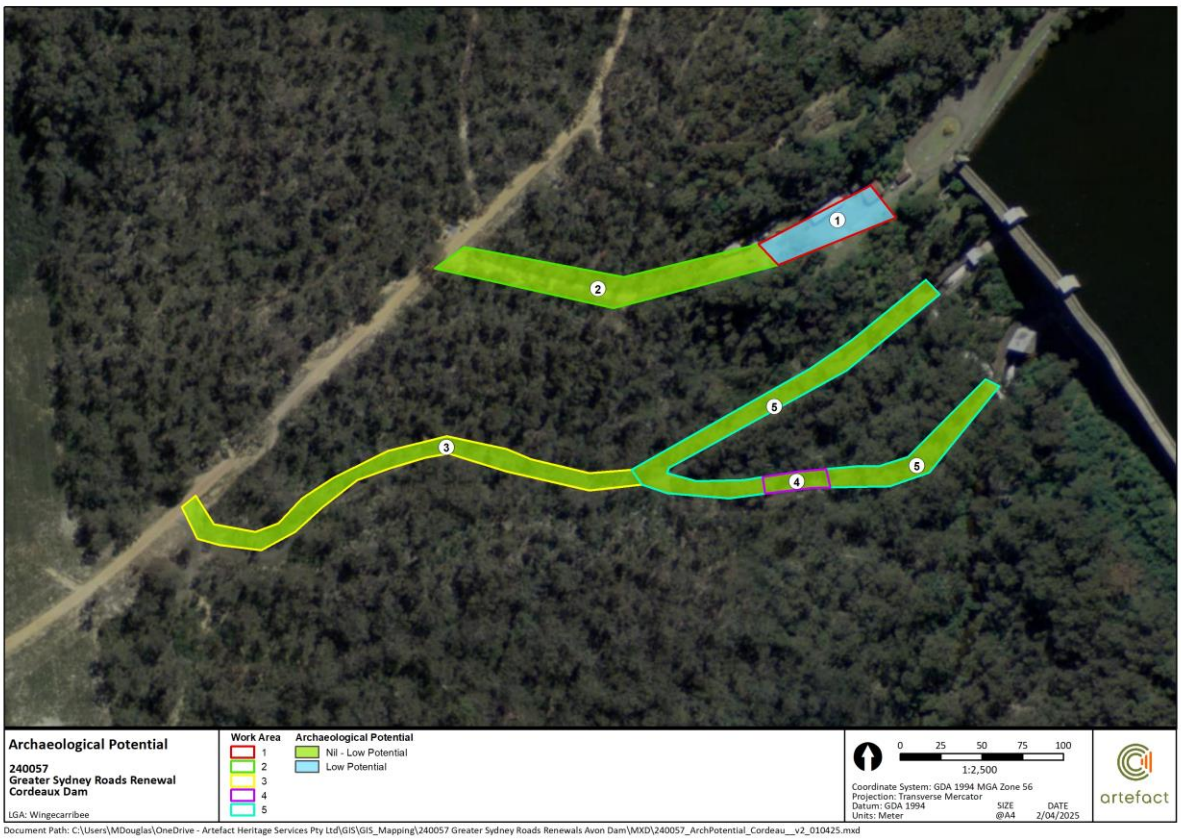

Figure 33: Archaeological potential map of the study area.

6.3 Archaeological significance

The significance assessment of historical archaeological sites and items requires a specialised framework in order to consider the range of values associated with each site/item. This because of the challenges associated with the often unknown nature and extent of buried archaeological remains and judgment is usually based on anticipated attributes. To facilitate assessment of archaeological significance, the NSW Heritage Branch (now Heritage NSW) arranged the seven heritage criteria into four groups (see below). The value of archaeological sources primarily lies in their research potential or the ability to provide additional information about site/item that is not contained in historical records. The following significance assessment of the study area's potential archaeological remains has been carried out by using these criteria as outlined in the *Assessing Significance for Historical Archaeological Sites and 'Relics'*.

6.3.1 NSW Heritage criteria for assessing significance related to archaeological sites and relics

6.3.1.1 Archaeological research potential (NSW Criterion E)

The construction and operation of the Metropolitan Dams system, particularly Cordeaux Dam, as a key water infrastructure project for Sydney, provides the primary context. The wider area has the potential to yield information related to several broad research themes. These include early 20th-century dam construction practices, allowing investigation into the technologies, labour practices, and logistical challenges involved in constructing large-scale dams in NSW. Furthermore, the potential to uncover information on working life and community at dam construction sites, could show details about the working conditions, social structures, and daily lives of the people who built the dams. Finally, evidence of past management practices (e.g., infrastructure, modifications to the landscape, and tools used) has the potential to allow the investigation of the management of Water Supply and

Catchment Areas shedding light on the process of how the dam and its surrounding catchment were managed to ensure a reliable water supply.

Area 1 (terraced area near workshops/sheds) has low archaeological research potential due to its association as an active work zone throughout construction and continued use as a maintenance workshop. The impacts of the proposed works are contained to the existing road surface, so are therefore unlikely to uncover substantial areas of archaeological potential. If present, the macadam surface would be of interest. As such if discovered, these remains would **likely meet the threshold for local significance** under this criterion.

The remaining areas, Area 2,3, 4 and 5 are considered to have nil-low research potential, with historic research indicating a low archaeological footprint in these areas. Additionally, it is considered that if present, the archaeological resource is unlikely to provide information that was not available in the historic resource already. Therefore, it is considered that these remains are **unlikely to meet the threshold for significance** under this criterion.

6.3.1.2 Association with individuals, events or groups of historical importance (Criteria A, B & D)

The Metropolitan Dams system, including Cordeaux Dam, holds State heritage significance owing to its strong links with the individuals, events, and groups that shaped Sydney's water supply infrastructure in the early 20th century. This significance goes beyond just the engineering accomplishment and includes the human aspect – the planners, engineers, workers, and their families – who all contributed to the project's completion. Key associations encompass the government and planning officials at the highest levels who recognised the need for a reliable water supply, including Governors and Public Works Ministers. Talented engineers and designers, like William Clark, E.M. de Burgh, and T.W. Keele, who conceptualised and designed the dams, tunnels, and related infrastructure, often pushing the limits of contemporary engineering practice. The construction workforce of labourers, quarrymen, tradesmen, and other workers physically built the dams, often in challenging conditions and remote locations, and their wages contributed to the local and state economy. As the workforce expanded to different dams, so too did the local businesses who sustained their commercial activities throughout the constructions. Finally, there were the resident staff and families, who managed and maintained the dams after construction, forming communities around these isolated sites, as well as the Water Board, responsible for ensuring public health, including waste management and medical care.

The scale and location of the proposed works are unlikely to uncover any archaeological resources that could shed further information on individuals, events or groups of historical importance, beyond their physical association with Cordeaux Dam itself. Therefore, it is **unlikely to reach the threshold for significance** under this criterion.

6.3.1.3 Aesthetic or technical significance (Criterion C)

The Metropolitan Dams, with Cordeaux Dam among them, are of considerable aesthetic and technical significance. Their construction represented a major feat of early 20th-century engineering, requiring solutions to challenges, and used local resources to deliver water to a main city. The designers also often prioritised aesthetic integration, balancing utility with visual impact on the natural surrounds, which needs to be maintained. However, the scale and location of the proposed works are **unlikely to reach the threshold for significance** under this criterion. If present, the macadam road would **likely meet the threshold for local significance**.

6.3.1.4 Ability to demonstrate the past through archaeological remains (Criteria A, C, F & G)

The Conservation Management Plan (CMP) highlights key themes for demonstrating the past, including construction practices, community life, and the management of water resources, which are closely linked to the engineering achievements embodied in the dams' construction. However, the study area is considered to have low potential for archaeological remains. The most likely archaeological elements present within the study area are remnants of earlier road infrastructure,

such as macadam road surfaces, culverts, and kerbs. If these elements are found, they would likely meet the threshold for local significance under this criterion.

6.3.2 Summary statement of archaeological significance

The proposed work areas at the Cordeaux Dam site, part of the Metropolitan Dams system, offers limited archaeological research potential due to its historical use as an active work zone and ongoing maintenance activities. The primary archaeological elements likely to be present are remnants of early road infrastructure, such as macadam road surfaces, culverts, and kerbs. These elements, if discovered, would likely meet the threshold for local significance under the NSW Heritage Criteria, particularly in demonstrating past construction practices and community life.

Key archaeological themes at the site include insights into early 20th-century dam construction techniques and technologies, as well as the working conditions and daily lives of workers during construction. Additionally, evidence of past infrastructure and modifications to the landscape could inform the management of water supply and catchment areas.

Area 1 has low archaeological research potential but may contain remnants of macadam surfaces, which would be of interest if discovered. In contrast, Areas 2-5 are considered to have nil-low archaeological research potential, with a limited likelihood of uncovering significant new information. Overall, while the archaeological potential is low, any discovered remains could contribute to understanding the site's history and significance.

6.4 Summary of historical archaeological potential and significance

This archaeological assessment has identified nil to low potential for historical archaeological remains of local significance. These remains are summarised in Table 10.

Table 10: Historical archaeological potential ad significance

Area	Anticipated remains	Potential for survival	Significance
Area 1	Macadam road, kerbs, culverts, drainage	Low	Local
Area 2	Macadam road, kerbs, culverts, drainage	Nil-Low	Local
Area 3	Macadam road, kerbs, culverts, drainage	Nil-Low	Local
Area 4	Macadam road, kerbs, culverts, drainage	Nil-Low	Local
Area 5	Macadam road, kerbs, culverts, drainage	Nil-Low	Local

7.0 THE PROPOSED WORKS

7.1 The proposed works

7.1.1 The proposal

The proposed works for Cordeaux Dam which are assessed in this report include remediation works to Trail B6 and the Valve house access roads. The study area is divided into five smaller sections in relation to the construction works along these roads. These areas include the office, laydown area, intersection with the mine managed road, causeway and the valve house approach. The following table and map provided by WaterNSW illustrates the proposed construction locations.

Figure 34: Section ID Map Markup -Cordeaux Dam (Greater Sydney Road Renewals Scope of Works Design and Construct, D2024/41172). Refer to Figure 35 for accurate location of area 4 culvert.

Table 11: Cordeaux Dam Construction Locations

Site	Location	Map ID (Refer Figure X)
Cordeaux Dam	Trail B6 – Office/Laydown Area	1
	Trail B6 – Laydown Area to Intersection with Mine Managed Road	2
	Causeway	3 & 4
	Valve House Approach	5

The proposed works include:

- Pavement remediation and construction at all locations in Table 11: Cordeaux Dam Construction Locations
- All existing drainage infrastructure to be jetted and cleaned of debris
- Construction of spoon drain and drainage infrastructure at the intersection of Trail B6 in Area 2
- Excavate and remediate damaged pavement near dam wall (sink holes)
- Repair all potholes

- Install new culvert(s) and headwalls at the causeway
- Road safety signage and other relevant signage along Trail B6
- A construction laydown/site shed area (location to TBC)
- All construction works associated with Drawings and required as per Detailed Design

All works shall be completed in accordance with the following documents:

- SMEC Concept Design Drawings (Cordeaux, Medlow Bath and Upper Cascade)
- AssetReady Geotechnical Interpretive Reports (Cordeaux, Medlow Bath and Upper Cascade)
- Environmental Impact Assessment (EIA) and Heritage Due Diligence Assessment Greater Sydney Road Renewals Cordeaux Dam Road Repair Scope Page 3
- Sydney Catchment Authority Road Management Manual
- WaterNSW Roads Asset Class Strategy
- WaterNSW signage manual

The proposal is documented in drawings prepared by Harryan Engineering Consulting and WaterNSW, issued on 19 March 2025, that are extracted here and included at full size in Appendix A.

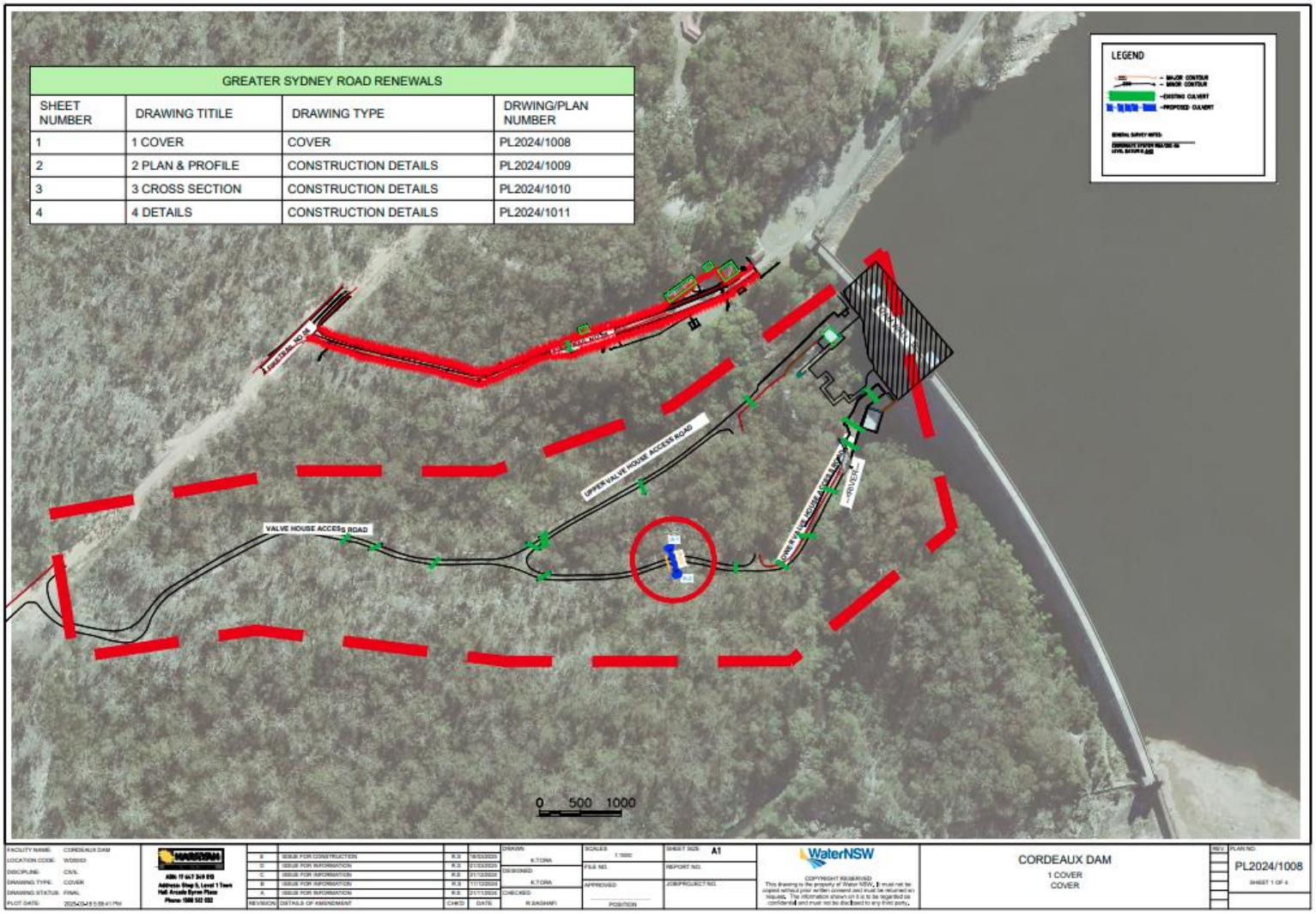

Figure 35: Location of existing (green) and proposed (blue) culverts (Source: Cordeaux Dam Construction Drawings, Water NSW)

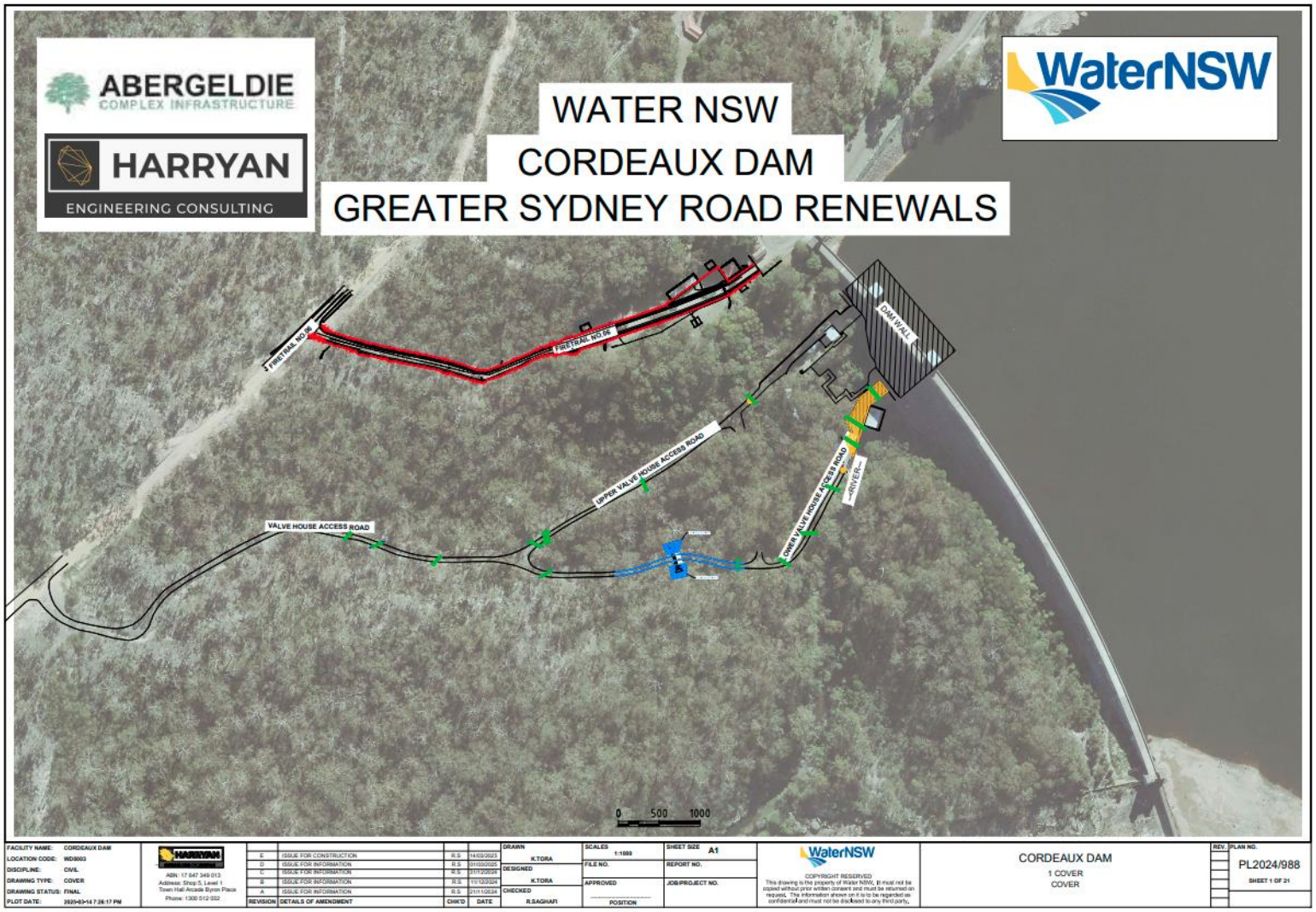

Figure 36: Construction areas (Source: Cordeaux Dam Construction Drawings, Water NSW)

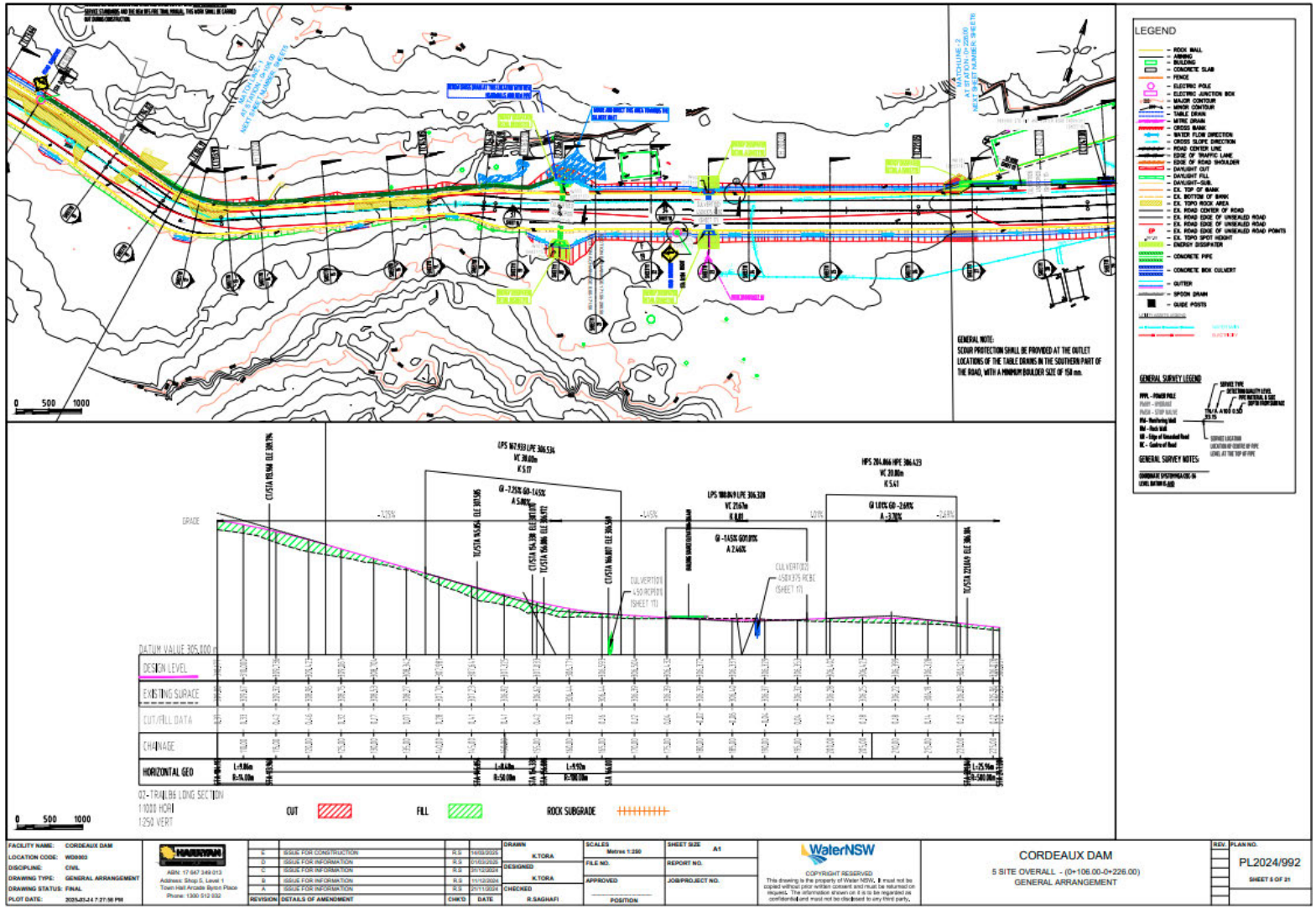

Figure 37: Cross Drain renewal and road signage in Area 2 (Source: Cordeaux Dam Construction Drawings, Water NSW)

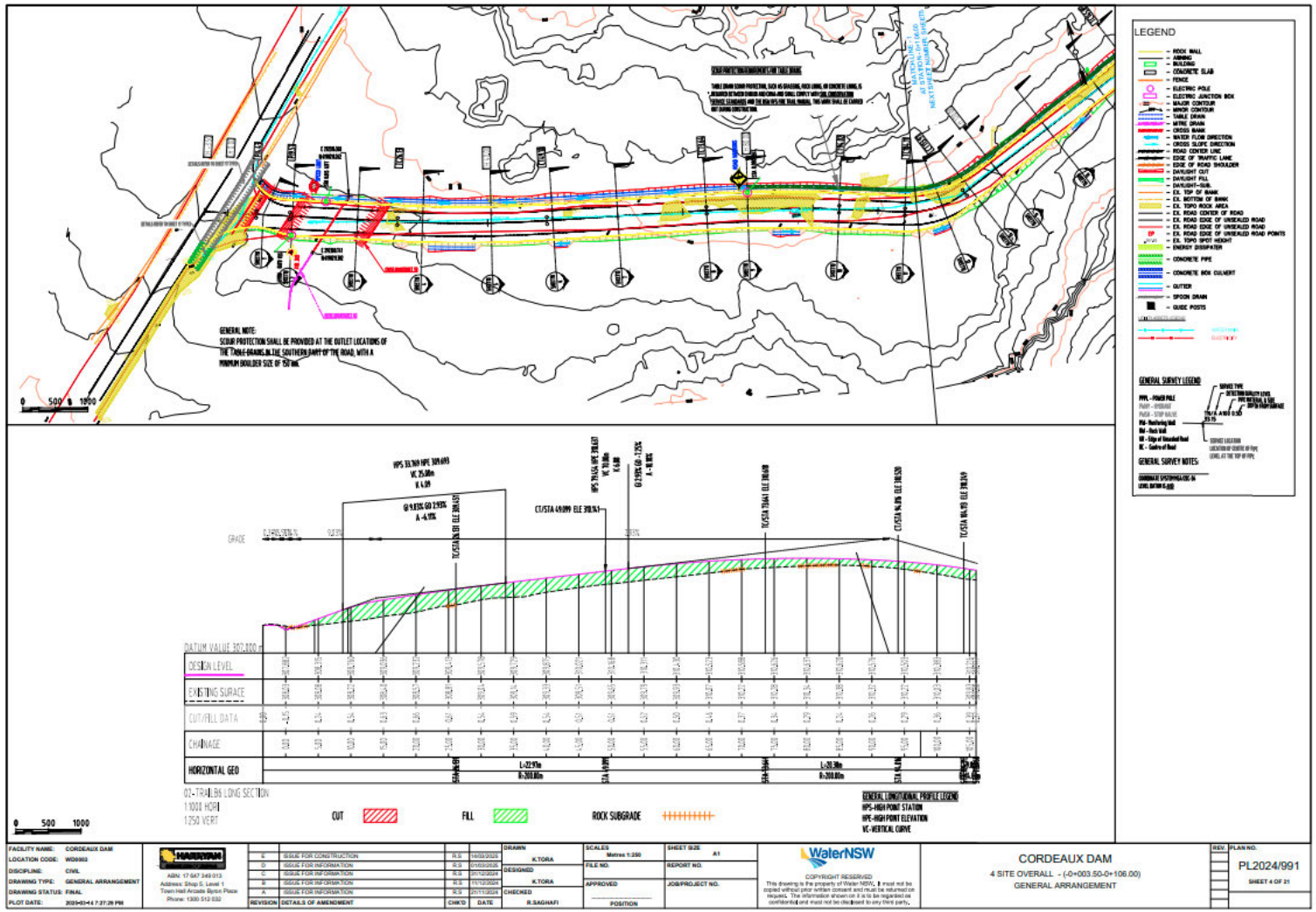

Figure 38: Scour protection details and road signage for Area 2, southern part of Trail B6 (Source: Cordeaux Dam Construction Drawings, Water NSW)

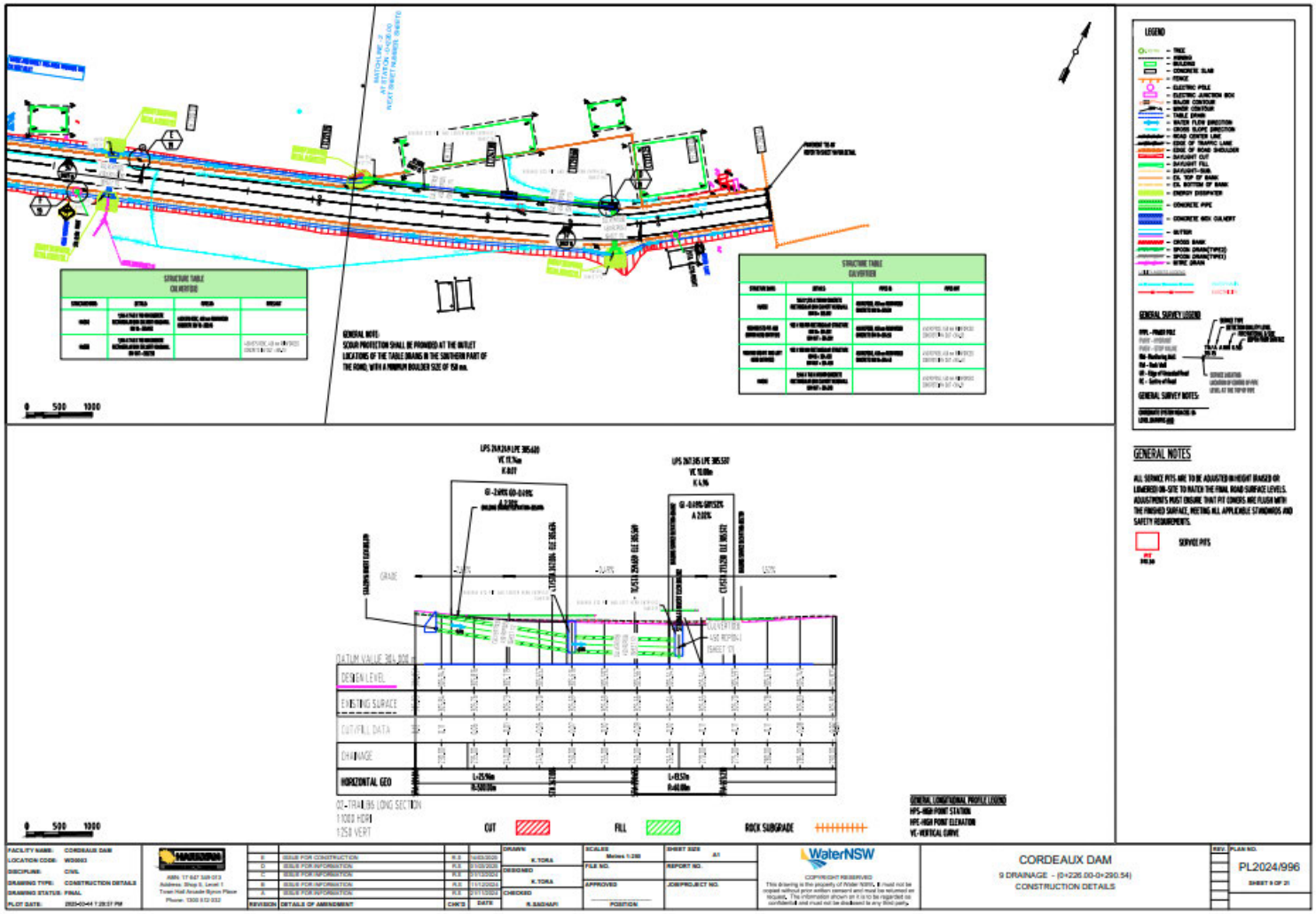

Figure 39: Scour protection details and road signage for Area 1, northern part of Trail B6 (Source: Cordeaux Dam Construction Drawings, Water NSW)

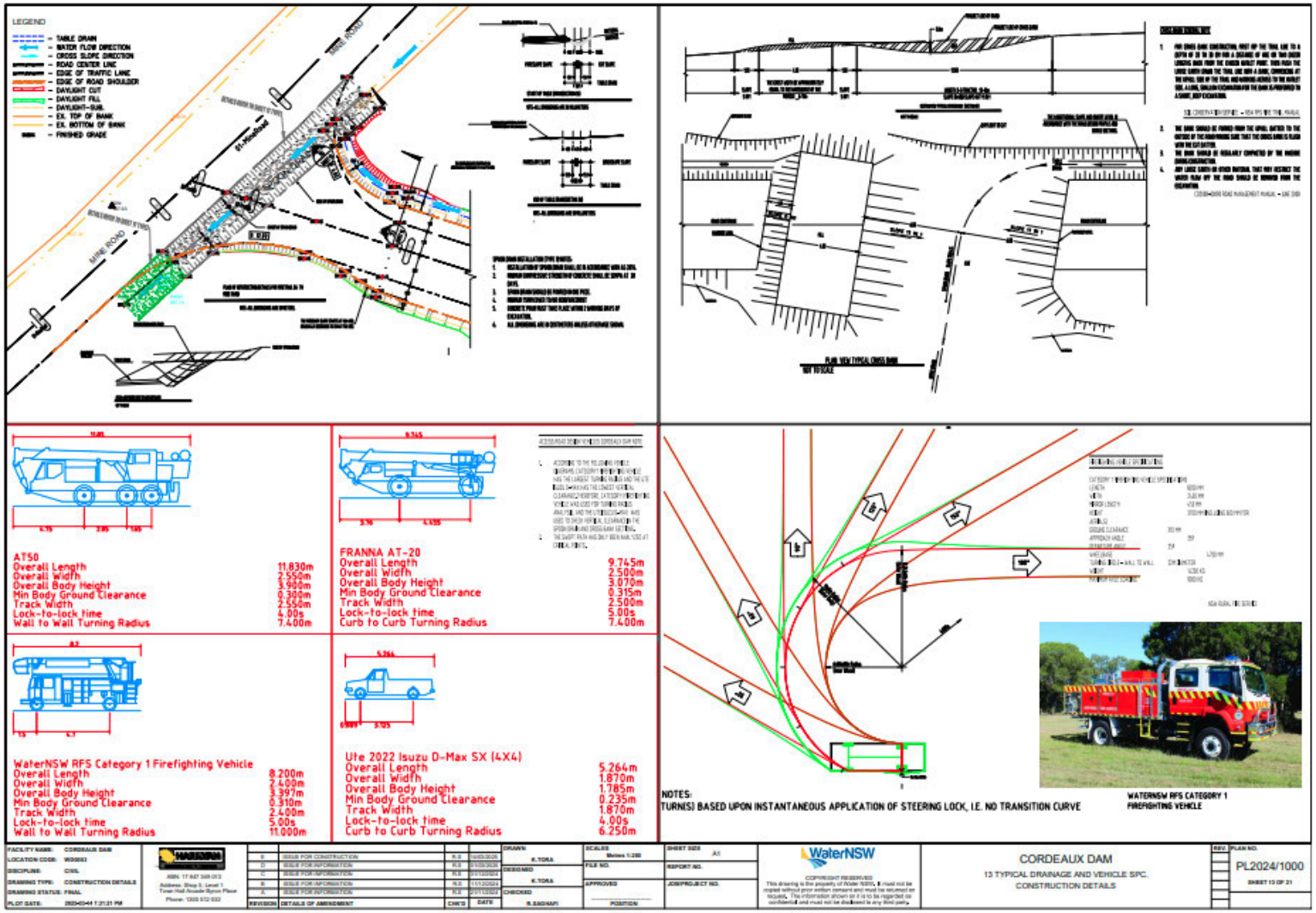

Figure 40: Installation of spoon drain and construction vehicle details (Source: Cordeaux Dam Construction Drawings, Water NSW)

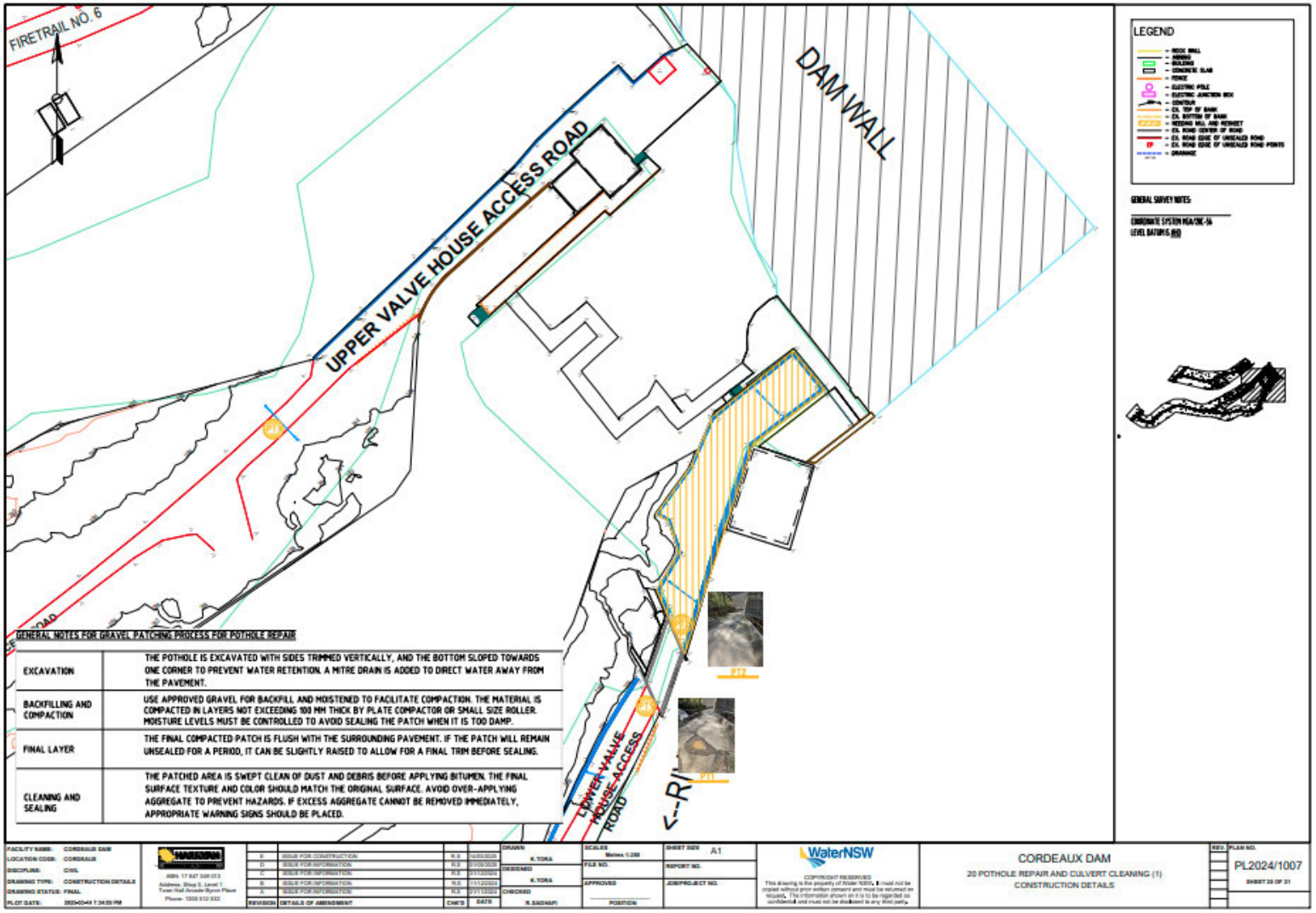

Figure 41: Pothole repair and culvert cleaning in Area 5 (Source: Cordeaux Dam Construction Drawings, Water NSW)

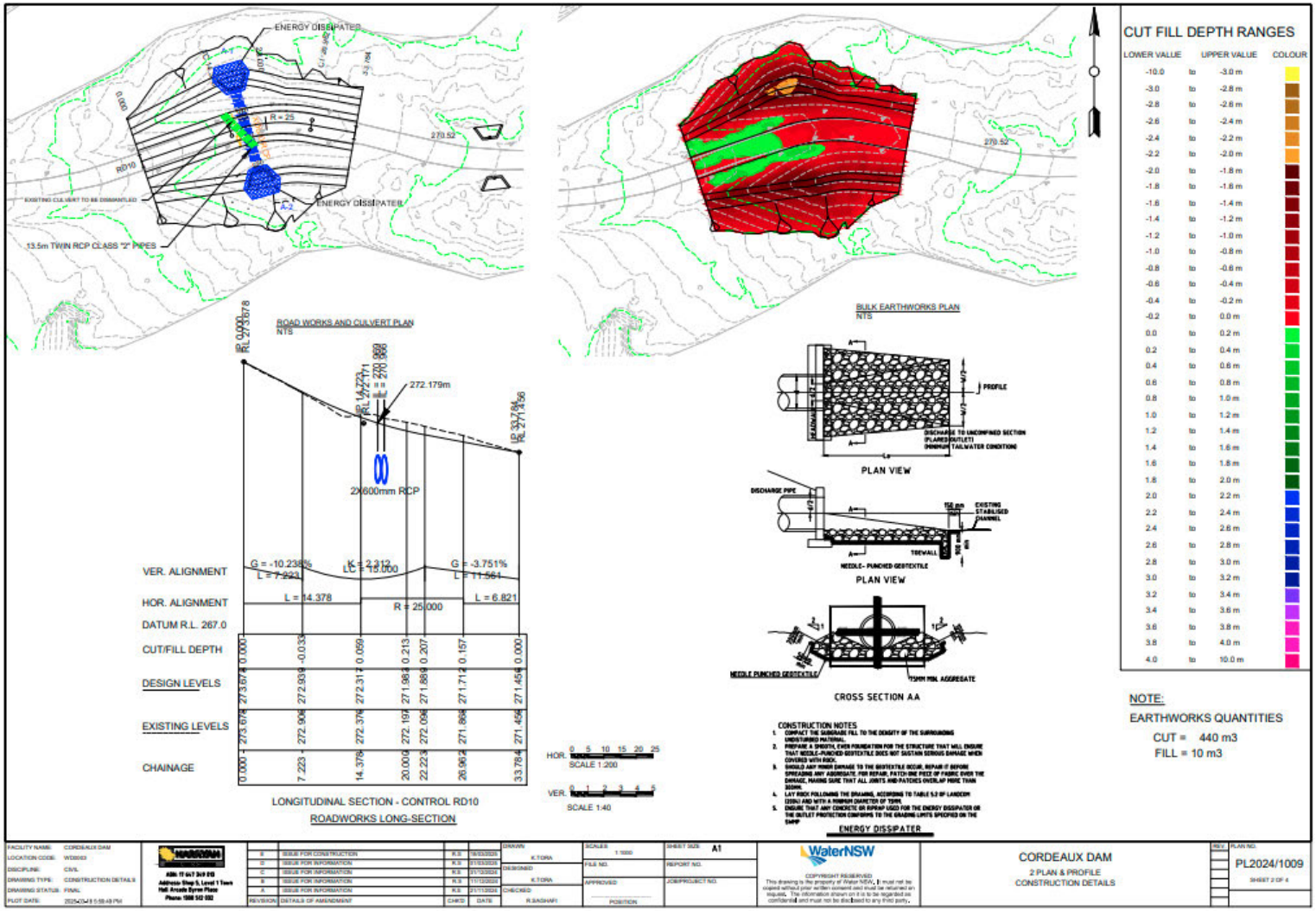

Figure 42: Culvert details in Area 4 (Source: Cordeaux Dam Construction Drawings, Water NSW)

8.0 HERITAGE IMPACT ASSESSMENT

8.1 Overview

This section assesses the heritage impact of the proposed works at the study area on heritage values within the study area. Justifications are also provided for the proposed works.

Within this approach, the objective of a heritage impact assessment is to evaluate and explain how the proposed works will affect the heritage value of the study area and/or place. A heritage impact assessment should also address how the heritage value of the site/place can be conserved or maintained, or preferably enhanced by the proposed works.

In order to consistently identify the impact of the proposed works, the terminology contained in the following table has been references throughout this document. The terminology and definitions are based on those contained in guidelines produced by Heritage NSW[32] and are shown in Table 12.

Table 12: Terminology for assessing the magnitude of heritage impact.

Grading	Definition
Total loss of significance	Major adverse impacts to the extent where the place would no longer meet the criteria for listing on the SHR.
Adverse impact	Major (that is, more than minor or moderate) adverse impacts to State heritage significance, defined as removing significant features, obscuring key views, or removing evidence of significant historical associations, which require substantial changes to the scope of works or design to sufficiently reduce those impacts. The material threshold applies when substantial changes to the application are required to reduce the adverse impacts to a moderate or minor level.
	Moderate adverse impacts to State heritage significance. Actions in this category would include removal of an important part of a heritage item's setting or temporary removal of significant elements or fabric. The impact of these actions could be reduced through appropriate mitigation measures.
	Minor adverse impacts to State heritage significance, defined as impacts to State heritage significance that are minor enough that they are outweighed by other benefits of the application, for example sympathetic alterations to an original non-compliant balustrade to enable continued public use.
Little to no impact*	An alteration to State heritage significance that is so minor that it is considered negligible. * Little to no impact (as opposed to no impact) acknowledges that any change will result in some level of impact/alteration to State heritage significance.
Positive impact	Alterations that enhance the ability to demonstrate the State heritage significance of an SHR listed place.

[32] Heritage NSW, *Material Threshold Policy*, 2020

Table 13: Terminology for heritage impact types

Impact	Definition
Physical	Impacts resulting from works located within or outside the curtilage boundaries of the heritage item, caused by removing or altering the item or fabric of heritage significance
Visual	Impact to views, vistas and setting of the heritage item resulting from proposed works within or outside the curtilage boundaries of the heritage item.
Potential	Impacts resulting from increased noise, vibrations and construction works located within or outside the curtilage boundaries of the heritage item.
Archaeological	Impacts to potential archaeological remains located within the curtilage boundaries of the heritage item.

8.1.1 Physical heritage impacts

The proposed works focus on Trail B6 and the valve house access roads, which contain original sections of roadways, drains and culverts constructed between 1919 and 1927. These roads are historically significant as they provided essential access during the construction of the Cordeaux Dam. The proposed work on these roads includes the installation of a spoon drains in the intersection on Trail B6 (Area 2), renewing cross drain in Area 2, and installing a new culvert at the causeway in Area 4. All existing culverts would be cleaned, and any damaged road surfaces and potholes will be repaired.

Trail B6 is an unsealed vehicle track, while the access roads to the valve house are paved with asphalt. Some sections of the asphalt roads may still contain original road surfaces. The road alignments have mostly remained unchanged since their inception. Although the proposed work will involve physical excavation, penetration and construction works, the road alignment will not be altered. The existing drainage systems and culverts are historically significant elements associated with the original access roads and will not undergo any physical changes; they will simply be cleaned of debris. The existing cross drain in Area 2 will be renewed with new headwalls and pipe, however this would be an essential safety procedure and would not greatly alter its visual appearance.

While there will be some physical impact on the road surfaces, the proposed upgrades are necessary for safety and are crucial for the long-term preservation and functionality of the original access roads. Therefore, the proposed works would likely constitute **little to no** adverse physical impact to the heritage significance of Cordeaux Dam.

There will be construction works to repair two sink holes in Area 5, on an original road surface leading to the lower valve outlet near the dam wall. These works would take place away from the dam wall and would have negligible adverse effect on Cordeaux Dam.

A new laydown area is proposed along the northern end of Trail B6 (location TBC). The laydown area will consist of site parking areas, dust control areas and small site containers. These elements would be distanced away from the dam wall and would not impact any significant built fabric along the road. Therefore, the proposed works would likely constitute **little to no** adverse physical impact to the heritage significance of Cordeaux Dam.

Five road safety signs (road narrows, speed and give way signage) are proposed along Trail B6. This would involve penetrating the wearing surface of the road which is a contributory item to the significance of Cordeaux Dam. The proposed safety signage posts would not extensively penetrate the wearing surface and would not cause an alteration to the road alignment. The proposed penetration works for the signage would be very minor and only affecting small sections along the

road. They would likely constitute **little to no** adverse physical impact to the heritage significance of the Cordeaux Dam.

Physical impact: little to none.

8.1.2 Visual heritage impacts

The proposed new culvert and spoon drain will affect the appearance of the causeway and Trail B6, both of which are significant features at the Cordeaux Dam site. These modifications will only be partially visible to the public when viewed from the start of the fire road. The scale of the works are minor and will not alter the original road alignment.

Although Area 1, 4, and 5 offer significant views of the Cordeaux Dam wall, the new culvert and spoon drain will be positioned away from the dam wall. Their scale is small enough that they will not visually impact the aesthetics of the dam. The remediation works to the road surfaces including the repair works to the potholes in Area 5 are imperative safety procedures to the and will ultimately improve the appearance of the access roads.

The asphalt access roads contain sections of original road surfaces that hold heritage significance. The proposed works will involve penetration, excavation, and remediation of these original asphalt surfaces. However, these procedures are essential for enhancing both the appearance and functionality of the access roads. Given that road surfaces typically undergo numerous modifications, the proposed changes will not have a significant impact on the heritage value of the Cordeaux Dam.

A new laydown area along Trail B6 including the site parking areas, dust control areas and small site containers would likely be visible to the public from the lower picnic ground area. The site containers and equipment would stand in contrast to the natural setting of the dam road and would constitute a temporary minor adverse visual impact. However, as the area would be present only over the course of the proposed works and it would not obscure any views to and from the dam wall, there would overall be little to no visual impact on the visual setting of Cordeaux Dam.

The road safety signs proposed along Trail B6 would be between 1.5-2 metres in height and would not obscure any views to the dam wall or significant built fabric at the northern end of Trail B6. The signage would not be visible to the public realm. There would overall be little to no visual impact as a result of the proposed works.

Visual impact: little to none

8.1.3 Potential heritage impacts

Potential indirect heritage impacts during construction works could occur due to vibrations. Appropriate mitigation measures will be recommended to minimise any potential indirect heritage impacts. Therefore, the proposal will have negligible potential indirect heritage impact.

Potential impact to the archaeological resource is considered nil to low. However, if encountered mitigation measures include appropriate archaeological recording and management by a suitably qualified heritage consultant.

8.1.4 Cumulative impacts

Cumulative impacts refer to the combined or overlaid or added actions and interactions within a particular place associated with the past, present and the reasonably foreseeable future.

This report has assessed that the proposed works would likely have little to no adverse physical and visual impacts on the heritage significance of Avon Dam, and little to no adverse impacts on the archaeological resource.

The 2018 Conservation Management Plan (CMP) for Cordeaux Dam identifies the significance of the access roads as being closely related to their role as the primary means of transport during the dam's construction. Specific policies in the CMP aim to maintain these roads as the main vehicle and pedestrian access to the dam. This includes sympathetic upgrades, necessary reconstruction of drainage infrastructure, and preservation of the road alignment for historical interpretation. The proposed works at Cordeaux Dam include remediation and renewal efforts that align with the conservation policies outlined in the CMP and are considerate of the heritage significance. Since these works are essential for the functionality of the original roads, the current proposal is expected to positively impact the heritage item.

8.2 Heritage considerations for the proposal

8.2.1 Matters for consideration

Heritage guidelines[33] prepared by the NSW Heritage Office (Heritage NSW) outline design considerations for projects involving heritage items. Design considerations are discussed in Table 14.

Table 14: Heritage considerations for Cordeaux Dam (Source: NSW DPE, 2023).

Heritage Consideration	Discussion
General Considerations	
Do the proposed works affect the setting of the heritage item, including views and vistas to and from the heritage item and/or a cultural landscape in which it is sited? Can the impacts be avoided and/or mitigated?	The proposed works would have little to no adverse impacts on the visual setting of the access roads and views to the dam wall. Since the work is focused on the road areas and involves infrastructure improvements, it will not visually affect the dam wall itself.
Are the proposed works part of a broader scope of works?	The proposed works are part of a broader program by for Water NSW assets that involve remediation measures and construction works to several dam access roads.
Does this proposal relate to any previous or future works? If so, what cumulative impact (positive and/or adverse) will these works have on the heritage significance of the item?	The proposed works involves ongoing remediation of the access roads to Cordeaux Dam by WaterNSW. These works are essential for preserving the original access roads and will have a positive impact on the heritage site.
Will the proposed works result in adverse heritage impact? If so, how will this be avoided, minimised or mitigated?	The proposed works will result in little to no adverse physical and visual impacts on the heritage item. These sympathetic safety upgrades will not affect the views of the dam wall and water body. Additionally, the overall character and alignment of the original access roads will be preserved. Appropriate mitigation measures will be implemented to minimize any potential heritage impacts on the heritage item.

[33] 'Guidelines for preparing a statement of heritage impact', Department of Planning and Environment, 2023

Heritage Consideration	Discussion
Alterations and Additions	
Do the proposed works comply with Article 22 of The Burra Charter, specifically Practice note article 22 — new work (Australia ICOMOS 2013b)?	The proposed works comply with Article 22 of The Burra Charter. An assessment against the relevant conservation articles is provided below.
Will the proposed works impact on the significant fabric, design or layout, significant garden setting, landscape and trees or on the heritage item's setting or any significant views?	The proposed works are sympathetic upgrades to the heritage item. They are situated away from the dam wall and will aim to retain significant elements and layouts.
How have the impact of the alterations/additions on the heritage item been minimised?	The proposed location and scale of the new infrastructure elements have been carefully considered to reduce any potential visual and physical impacts.
New Services and service upgrades	
Are any of the existing services of significance? In what way are they affected by the proposed works?	The original access roads and existing drains and culverts (constructed between 1919-1927) are significant elements within the Cordeaux Dam site. The proposed works seek to upgrade the existing roads and drainage infrastructure while installing new services as necessary.
How have the impacts of the installation of new services on heritage significance been minimised?	The proposed new services and upgrade works would be in areas away from the dam wall and are minor in scale to minimise any visual or physical impacts. As per the CMP, the original road alignment is maintained, and existing drains and culverts are retained and upgraded.

8.2.2 Statement of Heritage Impact

A statement of heritage impact has been prepared according to NSW Heritage Office guidelines in Table 15 below.

Table 15. Preliminary Statement of Heritage Impact for the proposed works at Cordeaux Dam

Development	Discussion
What aspects of the Proposal respect or enhance the heritage significance of the study area?	The proposed work will preserve the original road alignments along with the existing drains and culverts. The planned remediation efforts, which include upgrading the road surfaces and updating/cleaning drainage infrastructure, aim to improve both the visual appeal and functionality of the roads. The works will be conducted away from the dam wall, ensuring that there will be no physical or visual impact on the main heritage item.
What aspects of the Proposal could have a detrimental impact on the heritage significance of the study area?	The construction of drainage infrastructure and pavement remediation would involve construction works on some original road sections. Although this impacts original fabric, these are necessary upgrade works which ensures the long-term function of the access roads. Given that the proposed works involve the roads of access, there will be no construction works and impacts to the dam wall.
Have more sympathetic options been considered and discounted?	The proposed works are the most sympathetic and least impactful means of performing the necessary safety and drainage upgrades to the Cordeaux Dam access roads to allow it to continue its operation.

Development	Discussion
	In doing so, the significance of the heritage items in question will be retained, as they will continue to serve as the principal means of access to the Cordeaux Dam.

8.3 Assessment against relevant policies

8.3.1 Conservation Management Plan policies

The following table records the policies that are assessed as being directly relevant to the proposed works. A full list of policies can be seen in the 2018 Conservation Management Plan.[34]

Table 16: Assessment of proposal against 2018 CMP policies

Policy	Policy detail	Are works consistent with CMP policy? (Yes/No?)	Comments
Conservation of Significant Values	Conservation of the identified heritage values and characteristics of Cordeaux Dam and its components is to inform future management decisions about the place	Yes	The proposed works will not affect the dam wall or the waterbody, both of which are significant original fabric. The proposal seeks to upgrade the access roads while preserving the interpretation of the original features and road alignment. Original elements, such as existing drains and culverts, will be maintained. Areas of pavement and drainage infrastructure that are in poor condition will be upgraded sensitively.
Maintenance	Develop and implement a maintenance program for the Cordeaux Dam site, particularly for those items that are of a high level of heritage significance, but not subject to regular operational related maintenance.	Yes	A remediation works program would be implemented by WaterNSW to upgrade the access roads to the dam wall and drainage infrastructure which are listed as significant elements in the CMP.
Landscape and setting	Manage and maintain the cultural landscape areas of the Cordeaux Dam site, in particular the plantings immediately adjacent to the dam wall, in the Lower Picnic Area and on the former construction terraces.	Yes	The proposal seeks to upgrade and continue the use of the existing original access roads.

[34] Extent, Cordeaux Dam Conservation Management Plan, 2018

Policy	Policy detail	Are works consistent with CMP policy? (Yes/No?)	Comments
Views.	Maintain key significant views to and from the dam wall and waterbody	Yes	The proposed work will be confined to areas along the access roads, ensuring there is no visual impact or obstruction of views to the dam wall and waterbody.
Managing Change	Make decisions requiring change to the Cordeaux Dam site with a clear understanding of the potential impacts on the identified heritage values of the place and seek to minimise negative heritage impacts.	Yes	The proposed works are necessary to maintain the heritage item and its means of access. They are required to maintain the safety standards and functionality of the access roads.
Safety and Security Upgrades	Consider both visual and physical impacts associated with planned safety and security upgrades and aim to minimise negative heritage impacts. Seek heritage advice where the proposed work will impact an item of Exceptional or High heritage significance	Yes	The proposed work will not affect the structure of the dam wall. However, it will have physical and visual impacts on the access roads, which are classified as items of exceptional significance within the Conservation Management Plan (CMP). The proposed works are in line with the conservation policies for the access roads outlined in the CMP. These improvements will ensure the continued use of the roads while preserving the original layout and sympathetically upgrading the existing drainage systems.
Archaeological Resources	The CMP does not outline any specific policies relating to the archaeological resource.		The CMP notes that the ensemble of plant buildings either associated with the construction or completion of the dam, such as weatherboard machine shed (adapted to a double garage) and the corrugated iron blacksmiths, are unique in situ examples within the broader context of the four Metropolitan Dams.

8.3.2 Burra Charter

The conservation articles provided in Table 17 below from the Burra Charter, which are of particular relevance to the proposal, should be followed.

Table 17: Relevant articles from the *Burra Charter*[36]

[36] Australia ICOMOS 2013. *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance.*

Article No.	Article	Proposal
3.1	*Conservation is based on a respect for the existing fabric, use, associations and meanings. It requires a cautious approach of changing as much as necessary but as little as possible.*	The proposed works will retain the original access road layouts, existing drainage works and will not impact the dam wall and waterbody. The Works will be visible to the public along the access roads, but they are located sympathetically located to have the least visual and physical impact on the dam wall.
14	*Conservation may, according to circumstance, include the processes of: retention or reintroduction of a use; retention of associations and meanings; maintenance, preservation, restoration, reconstruction, adaptation and interpretation; and will commonly include a combination of more than one of these. Conservation may also include retention of the contribution that related spaces and related objects make to the cultural significance of a place.*	The proposed works will not adversely impact original significant fabric, such as the dam wall, outlet valve houses and the water body. While there will be general excavation, and upgrade works to the roads and the drainage, the existing layout of the road and its infrastructure will be retained.
17	*Preservation is appropriate where the existing fabric or its condition constitutes evidence of cultural significance, or where insufficient evidence is available to allow other conservation processes to be carried out.*	The original road alignments and existing drainage infrastructure is maintained.
22.1	*New work such as additions or other changes to the place may be acceptable where it respects and does not distort or obscure the cultural significance of the place, or detract from its interpretation and appreciation.*	The dam access roads are in poor condition and require necessary upgrades to ensure its continued use. The proposed remediation works seek to enhance the appearance and safety of the roads and sympathetically upgrade the drainage systems.
22.2	*New work should be readily identifiable as such, but must respect and have minimal impact on the cultural significance of the place.*	The new culverts and spoon drains do not alter the layout of the access roads and are sympathetically located away from the dam wall.
27.1	*The impact of proposed changes, including incremental changes, on the* cultural significance *of a* place *should be assessed with reference to the statement of significance and the policy for managing the* place. *It may be necessary to modify proposed changes to better retain cultural significance.*	This report provides an assessment of potential impacts of the proposal and includes reference to the statement of significance of Cordeaux Dam and the relevant CMP. The proposed construction works has been thoughtfully considered to ensure minimal impacts on the heritage significance of the heritage item.

9.0 CONCLUSION

9.1 Summary of findings

This report has found that the proposed works are taking place within the curtilage of three listed:

- 'Cordeaux Dam, SHR #01360
- Cordeaux Dam, S170 #4580029
- Cordeaux dam', Wollondilly LEP #I56.

Based on the civil drawings for Cordeaux Dam Road renewal works which were issued on 19 March 2025, the proposed works on Trail B6 and the valve access roads involve original structures built between 1919 and 1927. Physical impacts caused by construction activities will occur, but the original road alignment will remain unchanged, and existing drainage systems will be cleaned without alteration. Safety upgrades are essential for preserving the access roads which are identified as significant elements of the Cordeaux site. The proposed works will have minimal impact on the heritage significance of Cordeaux Dam by utilising an existing road alignment and current road infrastructure. The core heritage values of Cordeaux Dam, including its historical, technological, and aesthetic significance, would be preserved despite the proposed works.

In summary, based on the civil drawings for Cordeaux Dam Road renewal works (issued 19 March 2025) the proposed works would result in the following heritage impacts:

- **Little to no** physical and visual impacts
- **Negligible** potential heritage impacts
- **Little to no** archaeological impacts.

9.2 Approval pathway

As the proposed works are located within the curtilages of the Cordeaux Dam SHR listing an approval under Section 60 of the Heritage Act is required. The proposed works cannot be carried out under the Standard Exemptions and WaterNSW Exemptions and therefore obtaining an exemption for the works is not possible. The proposed works are eligible to be conducted under a S60 Works and a Section 60 approval must be obtained prior to the work commencing.

9.3 Recommendations and mitigation measures

The following recommendations should be adhered to when implementing the proposed works in order to mitigate potential heritage and archaeological impacts:

General

- An application for approval must be made to Heritage NSW under Section 60 of the Heritage Act
- A heritage induction should be provided to all contractors working on the site to ensure awareness of the site's heritage significance and the need to minimise impacts.

Built Environment

- The methods, tools and materials used should not cause inadvertent damage to original or early fabric within the study areas. Should unexpected damage to original or early fabric occur, the advice of a heritage specialist should be sought before repairs are made
- All works are to be undertaken in accordance with the principles and objectives of the *Australia ICOMOS Charter for the Conservation of Places of Cultural Significance* (the Burra Charter)
- Prior to the commencement of works, extant fabric of the Cordeaux Dam near the Dam wall and access gates should be flagged with non-intrusive markers for the purpose of visibility to ensure that no impacts from vehicular movements occur.

Archaeology

- An unexpected finds procedure (UFP) should be implemented during ground disturbance works in case of any archaeological discoveries. The contact details of a suitably qualified archaeologist should be included in the UFP to provide advice or attend site if needed.
- If found, the macadam road would be of particular interest and sample recording should be undertaken by a suitable qualified heritage consultant.
- As there would be little to no visual impacts to the overall heritage item, the preparation of a photographic archival recording of the study area to document the changes to the landscape is not recommended.

10.0 REFERENCES

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