

Appendix B Heritage Impact Assessment

STATEMENT OF HERITAGE IMPACT

Proposed Development at Prospect Reservoir Prospect



Job No. 9659
January 2023

Heritage 21
CULTURAL BUILT HERITAGE IN THE 21ST CENTURY

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Acknowledgement of Country

Heritage 21 wishes to acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and community. We pay our respects to them and their cultures; and to elders both past and present.

Cover page: Location of proposed new structure within the subject site within Prospect Reservoir, Prospect (Source: Heritage 21, 05.09.2022).

The following Table forms part of the quality management control undertaken by Heritage 21 regarding the monitoring of its intellectual property as issued.

Issue	Description	Date	Written by	Reviewed by	Issued by
1	Draft report (D1) issued for comment.	14.09.2022	TG	EM	EM
2	Draft report (D1) issued for comment.	10.10.2022	TG	EM	TG
3	Draft report (D2) issued for comment.	12.10.2022	TG	-	TG
4	Final report issued to Client (RI).	13.10.2022	TG	-	TG
5	Amended report (RI).	13.10.2022	TG	-	EM
6	Report update – following comments from Heritage NSW (RI2)	16.11.202	TG / Revised by EM	-	EM
7	Report update – following comments from Heritage NSW (RI3)	30.01.2023	TG / Revised by EM	-	EM

1.0 INTRODUCTION

1.1 Background

This Statement of Heritage Impact ('SOHI' or 'report') has been prepared on behalf of EMM Consulting who have been engaged by Endeavour Energy to accompany an application made under Section 60 of the *Heritage Act 1977*, submitted to the Heritage Council of NSW for the relocation of Endeavour Energy's Huntingwood communication tower and associated equipment.

The communications tower is a critical component of Endeavour Energy's wide area network (WAN), which provides connectivity and redundancy for several depot sites which are vital to keep their power grid active and managed. Endeavour Energy's Huntingwood tower is being decommissioned and requires relocation and replacement. As such, the proposed relocation of this communications tower within the north-eastern part of Prospect Reservoir site is essential to provide connectivity to Endeavour Energy's field assets and substation which is directly connected to Endeavour Energy's Huntingwood site.

1.2 Site Identification

The subject site is located at William Lawson Drive, Prospect, which falls within the boundaries of the Blacktown Local Government Area (LGA), and it comprises Lot 304 Deposit Plan (DP) 1122291. As depicted in Figure 1 below, the site is located on the southern side of Reservoir Road and is part of the larger Prospect Reservoir site. The larger Prospect Reservoir site also encompasses the state listed Veteran Hall and Prospect Reservoir sites. This Statement of Heritage Impact report only pertains to the portion of land at the north-eastern part of the Prospect Reservoir site, along its eastern boundary. The setting and topography of the site will be more fully described in Section 3.0 below.



Figure 1. Aerial view of the larger Prospect Reservoir site, which is highlighted in yellow. The location of the proposed works has been indicated with the arrow (Source: NSW Land and Property Information, 'SIX Maps', accessed 7 September 2022 <http://maps.six.nsw.gov.au/>, annotated by Heritage 21).



Figure 2. Aerial view of the subject site, indicating the approximate locations of the proposed works, the Veteran Hall - House Remains site and the Prospect Reservoir Valve House (Source: NSW Land and Property Information, 'SIX Maps', accessed 7 September 2022, <http://maps.six.nsw.gov.au/>).

1.3 Heritage Context

1.3.1 Heritage Listings

The subject site is located on land which forms part of two items as items of environmental heritage on the NSW State Heritage Register. It is also listed in the Sydney Water s.170 Register, under Schedule 5 of the Holroyd Local Environmental Plan 2013 ('HLEP'), and in the National Trust Register (NSW). The site is also listed on the Former Register of the National Estate as an indicative place. It is **not**, however, listed on the National Heritage List or the Commonwealth Heritage List.

The details of the listings follow:

Statutory List – Legislative Requirements			
State Heritage Register			
Item Name	Address	Significance	SHR No.
Prospect reservoir and surrounding area	Reservoir Road, Prospect, NSW	State	01370
Prospect Reservoir Valve House	East of Reservoir, Prospect	State	01371

Sydney Water S.170 Register			
Item Name	Address	Item No.	
Prospect Hill Reservoir (Elevated)	Number 49, Prospect Reservoir, off Reservoir Road, Prospect	4575776	
Holroyd Local Environmental Plan 2013			
Item Name	Address	Significance	Item No.
Prospect Reservoir and surrounding area	1 Picrite Close	State	I01370
Non-Statutory List – Information Only			
National Trust Register - National Trust NSW			
Item Name/ Description			
Sydney water supply prospect reservoir			



Figure 3. State Heritage Register Map of Prospect Reservoir and surrounding area showing the boundary of the SHR listing (Source: Heritage NSW, accessed 7 September 2022)



Figure 4. State Heritage Register Map of Prospect Reservoir Value House, and surrounding area showing the boundary of the SHR listing (Source: Heritage NSW, accessed 9 September 2022)



Figure 5. Detail from Heritage map HER_002. The location of the works is indicated with the red arrow, and heritage items are shaded brown (Source: NSW Legislation Online, <https://www.legislation.nsw.gov.au/maps>, annotated by Heritage 21, accessed 7 September 2022)

The subject site **is not** located within the boundaries of a Heritage Conservation Area under the HLEP 2013.

1.3.2 Heritage Items in the Vicinity

The subject site is situated within the general vicinity of a heritage item listed in the NSW State Heritage Registry under the *NSW Heritage Act 1977*. In addition, as shown in Figure 5 above, the site is not located in the vicinity of any heritage items listed under Schedule 5 of the HLEP 2013.

The details of the listings follow:

Item/HCA Name	Address	SHR Number
Veteran Hall – House Remains	Great Western Highway, Prospect	01351

The proposed works would be within the visual catchment of Veteran Hall – House Remains (Item 01351). However, we note that the site **is not** within the curtilage of the Veteran Hall – House Remains site (refer to Figure 6 and Figure 7 below). Accordingly, the discussion in Section 6.0 of this SOHI of the potential heritage impact of the proposal on heritage items in the vicinity includes Veteran Hall – House Remains (Item 01351).

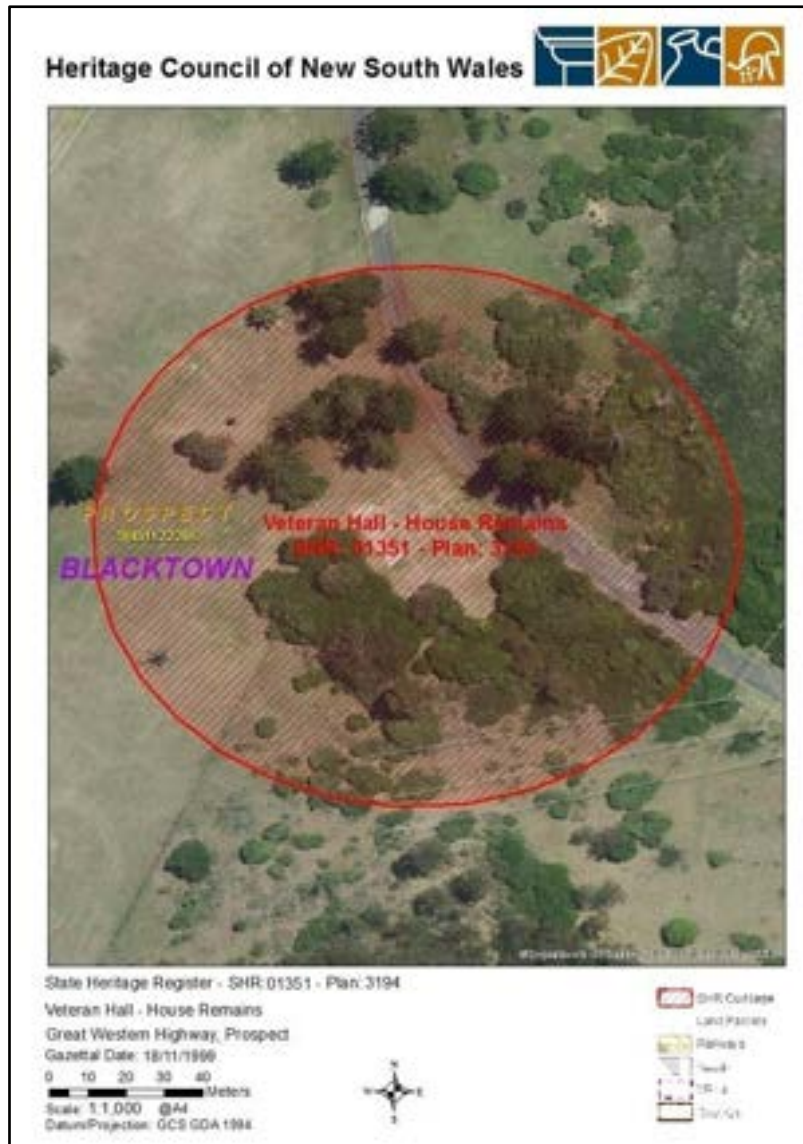


Figure 6. State Heritage Register Map of Veteran Hall – House Remains, and surrounding area showing the boundary of the SHR listing (Source: Heritage NSW, accessed 9 September 2022)



Figure 7. Veteran Hall Site curtilage established by the Prospect Reservoir CMP is indicated in blue. Veteran Hall Site curtilage as defined by the National Trust listing is indicated in red. (Source: Sydney Water Corporation, CMP, 2005, annotated by Heritage 21)

1.4 Purpose

The subject site is a heritage item listed on the NSW State Heritage Register. Section 60 of the *Heritage Act 1977* (NSW) requires the NSW Heritage Council, as the approval body, to assess the potential impact of non-exempt works (such as those described in Section 5.0 of this report) on the heritage significance of the item. Heritage 21 has carried out an independent assessment of the proposed works, which is presented in Section 6.0 of this report. Accordingly, this report provides the Heritage Council, as the approval body, the information necessary to make an assessment of the proposal on heritage grounds.

1.5 Methodology

The methodology used in this SOHI is consistent with *Statements of Heritage Impact* (1996) and *Assessing Heritage Significance* (2001) and *Standard Exemptions from Works Requiring Heritage Council Approval* (2009), published by the Heritage Division of the NSW Office of Environment and Heritage and has been prepared in accordance with the principles contained in the most recent edition of *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance 2013* ('Burra Charter').

1.6 Authors

This Statement of Heritage Impact ('SOHI' or 'report') has been prepared by Tanith-Louise Granger, reviewed by Emily McSkimming, and overseen by Paul Rappoport, of Heritage 21, Heritage Consultants.

1.7 Limitations

- This SOHI is based upon an assessment of the heritage issues only and does not purport to have reviewed or in any way endorsed decisions or proposals of a planning or compliance nature. It is assumed that compliance with non-heritage aspects of Council's planning instruments, the BCA and any issues related to services, contamination, structural integrity, legal matters or any other non-heritage matter is assessed by others.
- This SOHI essentially relies on secondary sources. Primary research has not necessarily been included in this report, other than the general assessment of the physical evidence on site.
- It is beyond the scope of this report to address Indigenous associations with the subject site.
- It is beyond the scope of this report to locate or assess potential or known archaeological sub-surface deposits on the subject site or elsewhere.
- It is beyond the scope of this report to assess items of movable heritage.
- Any specifics regarding views should be assessed by a view expert. Heritage 21 does not consider itself to be a view expert and any comments in this report are opinion based.
- Heritage 21 has only assessed aspects of the subject site that were visually apparent and not blocked or closed or to which access was not given or was barred, obstructed or unsafe on the day of the arranged inspection.

1.8 Copyright

Heritage 21 holds copyright for this report. Any reference to or copying of the report or information contained in it must be referenced and acknowledged, stating the full name and date of the report as well as Heritage 21's authorship.

2.0 HISTORICAL CONTEXT

2.1 Local History

The following historical development of Prospect has been sourced from the site's listing on the NSW State Heritage Register:¹

Aboriginal & European settler history: The area of Prospect Reservoir is an area of known Aboriginal occupation, with favourable camping locations along the Eastern Creek and Prospect Creek catchments, and in elevated landscapes to the south. There is also evidence to suggest that the occupation of these lands continued after European contact, through discovery of intermingled glass and stone flakes in archaeological surveys of the place. The area was settled by Europeans by 1789.

Prospect Hill, Sydney's largest body of igneous rock, lies centrally in the Cumberland Plain and dominates the landscape of the area (Ashton, 2000). Very early after first settlement, on 26 April 1788, an exploration party heading west led by Governor Phillip, climbed Prospect Hill. An account by Phillip states that the exploration party saw from Prospect Hill, 'for the first time since we landed Carmathen Hills (Blue Mountains) as likewise the hills to the southward'. Phillip's 'Bellevue' (Prospect Hill) acquired considerable significance for the new settlers. Prospect Hill provided a point from which distances could be meaningfully calculated and became a major reference point for other early explorers (Karskens 1991). When Watkin Tench made another official journey to the west in 1789, he began his journey with reference to Prospect Hill, which commanded a view of the great chain of mountains to the west. A runaway convict, George Bruce, used Prospect Hill as a hideaway from soldiers in the mid-1790's.

During the initial struggling years of European settlement in NSW, Governor Phillip began to settle time-expired convicts on the land as farmers, after the success of James Ruse at Rose Hill (Higginbotham 2000). On 18 July 1791 Phillip placed a number of men on the eastern and southern slopes of Prospect Hill, as the soils weathered from the basalt cap were richer than the sandstone derived soils of the Cumberland Plain. The grants, mostly 30 acres, encircled Prospect Hill (Ashton 2000). The settlers included William Butler, James Castle, Samuel Griffiths, John Herbert, George Lisk, Joseph Morley, John Nichols, William Parish and Edward Pugh (Higginbotham 2000).

The arrival of the first settlers prompted the first organised Aboriginal resistance to the spread of settlement, with the commencement of a violent frontier conflict in which Pemulwuy and his Bidjigal clan played a central role (Flynn 1997). On 1 May 1801 Governor King took drastic action, issuing a public order requiring that Aboriginal people around Parramatta, Prospect Hill and Georges River should be 'driven back from the settlers' habitations by firing at them'. Kings edicts appear to have encouraged a shoot-on-sight attitude whenever any Aboriginal men, women or children appeared (Flynn 1997).

With the death of Pemulwuy, the main resistance leader, in 1802, Aboriginal resistance gradually

¹ Heritage NSW, "Prospect Reservoir and Surrounding Area," State Heritage Inventory, Heritage Item ID 5045336, accessed 12 September 2022, <https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=5045336>.

diminished near Parramatta, although outer areas were still subject to armed hostilities. Prompted by suggestions to the Reverend Marsden by local Prospect Aboriginal groups that a conference should take place 'with a view of opening the way to reconciliation', Marsden promptly organised a meeting near Prospect Hill. (ibid 1997). At the meeting, held on 3 May 1805, local Aboriginal representatives discussed with Marsden ways of ending the restrictions and indiscriminate reprisals inflicted on them by soldiers and settlers in response to atrocities committed by other Aboriginal clans (ibid 1997). The meeting was significant because a group of Aboriginal women and a young free settler at Prospect named John Kennedy acted as intermediaries. The conference led to the end of the conflict for the Aboriginal clans around Parramatta and Prospect (Karskens 1991). This conference at Prospect on Friday 3 May 1805 is a landmark in Aboriginal/European relations. Macquarie's 'Native Feasts' held at Parramatta from 1814 followed the precedent set in 1805. The Sydney Gazette report of the meeting is notable for the absence of the sneering tone that characterised its earlier coverage of Aboriginal matters (ibid 1997).

From its commencement in 1791 with the early settlement of the area, agricultural use of the land continued at Prospect Hill. Much of the land appears to have been cleared by the 1820s and pastoral use of the land was well established by then.

When Governor Macquarie paid a visit to the area in 1810, he was favourably impressed by the comfortable conditions that had been created (Pollon & Healy, 1988, 210).

Nelson Lawson, third son of explorer William Lawson (1774-1850), married Honoria Mary Dickinson and before 1837 built "Greystanes House" as their future family home on the western side of Prospect Hill. Lawson had received the land from his father, who had been granted 500 acres here by the illegal government that followed the overthrow of Governor Bligh in 1808.

Governor Macquarie confirmed the grant, where William Lawson had built a house, which he called "Veteran Hall", because he had a commission in the NSW Veterans Company. Lawson lived in the area for 40 years until his death at the age of 76 in 1850. The exact date of completion of the house is uncertain. A date prior to Lawson crossing the Blue Mountains in May 1813, and a date c.1821 have been variously proposed. Regardless, Veteran Hall underwent continuous restructuring over its century-long existence (SWC, 2005, 15) It was a substantial building by 1825. Its estimated size at this time was 65 sq.m., including around 8sq.m. of verandah. During the 50 years pre-1880s it was extended to around 110 sq.m., with more than 20 rooms and approximately 30 sq.m. of verandah. Structural modifications appear to have been made in 1895 to accommodate a residence/office. It was occupied by the Water Board's Engineer-in-Charge of Headworks, who was overseeing construction of the Prospect Reservoir until 1912. It is claimed that the house was then leased to the Commonwealth military authority until it abandoned the area. Veteran Hall became empty and fell into disrepair. It was judged uneconomical to restore and plans were made to demolish it. Despite citizen protests the building was demolished in 1929 and remnant contents such as fittings and stone quoins were handed over the Vaucluse House Trust, Lawson's descendants and/or historically minded supplicants. A memorial cairn was erected in the early 1970s and now marks the site of the homestead (SCW, 2005, 16-18). The site is now partly covered by the waters of Prospect Reservoir.

*Greystanes was approached by a long drive lined with an avenue of English trees - elms (*Ulmus procera*), hawthorns (*Crataegus sp.*), holly (*Ilex aquifolium*), and woodbine (*Clematis sp.*) mingling with jacarandas (*J. mimosifolia*). It had a wide, semi-circular front verandah supported by 4 pillars. The foundations were of stone, the roof of slate, and the doors and architraves of heavy red cedar. It was richly furnished with articles of the best quality available and was the scene of many glittering soirees attended by the elite of the colony. Honoria Lawson died in 1845, Nelson remarried a year later, but died in 1849, and the property reverted to his father. Greystanes house was demolished in the 1940s (Pollon, 1988, 116, amended Read, S., 2006 - the house can't have been 'on the crest' of Prospect Hill as Pollon states, if its site was covered by the Reservoir).*

By the 1870s, with the collapse of the production of cereal grains across the Cumberland Plain, the Prospect Hill area appears to have largely been devoted to livestock. The dwellings of the earliest settlers largely appear to have been removed by this stage. By the time that any mapping was undertaken in this vicinity, most of these structures had disappeared, making their locations difficult to pinpoint (Higginbotham 2000).

The land was farmed from 1806-1888 when the Prospect Reservoir was built. (Prospect).



Figure 8. 'Prospect 1839-1845' (Source: Drawing by Henry Curzon Allport from the collections of the State Library of NSW [PXD86/33], Dictionary of Sydney, <https://dictionaryofsydney.org/media/4047>)

2.2 Site Specific History

The following historical development of Prospect Reservoir has been sourced from the site's listing on the NSW State Heritage Register:

In 1867, the Governor of NSW appointed a Commission to recommend a scheme for Sydney's water supply, and by 1869 it was recommended that construction commence on the Upper Nepean Scheme. This consisted of two diversion weirs, located at Pheasant's Nest and Broughton's Pass, in the Upper Nepean River catchment, with water feeding into a series of tunnels, canals and aqueducts known as the Upper Canal. It was intended that water be fed by gravity from the catchment into a reservoir at Prospect. This scheme was to be Sydney's fourth water supply system, following the Tank Stream, Busby's Bore and the Botany (Lachlan) Swamps.

Designed and constructed by the Public Works Department of NSW, Prospect Reservoir was built during the 1880s and completed in 1888. Credit for the Upper Nepean Scheme is largely given to Edward Orpen Moriarty, the Engineer in Chief of the Harbours and Rivers Branch of the Public Works Department from 1858-88 (B Cubed Sustainability, 2005, 7).

The quintessential feature of the scheme was the diversion of the Nepean River below its junction with the Avon and Cordeaux Rivers. The Peasant's Nest weir, near the township of Wilton, diverts the water through a 7km long tunnel to the Cataract River at Broughton's Pass, near the township of Appin, where a similar weir diverts the flow of the four rivers through a 58km system of tunnels, aqueducts and open channels to Prospect Creek upon which the earthen dam wall is located. When it was completed in 1888, Prospect reservoir provided the storage component of the scheme, as the weirs did not have the capacity to store water.

Between 1893 and 1916, extensive remedial works were carried out in order to correct slumps in the upstream face.

With completion of Warragamba Dam in 1960, Prospect Reservoir continued to play an important role in storing Sydney's water. A second pipeline linking Warragamba and Prospect was completed in 1966, significantly increasing the volume of water that could be transferred during peak demand periods. In 1979-80, a major strengthening programme on the reservoir wall was completed by increasing the volume of its downstream side. The upstream face was strengthened in 1997 (Sydney Water Corporation) (Caitlin Allen, Dept. of Commerce/Heritage Group, 2006).

With the commissioning of the Prospect Water Filtration Plant in 1996, raw water transferred from Warragamba and the Upper Nepean Dams was sent directly to the treatment facility, bypassing the Reservoir. However, the filtration plant can draw water directly from the Reservoir if needed. This is one of the largest such facilities in the world and it has changed the role of the Reservoir to that of a service reservoir and large off-line settling basin for the Warragamba & Upper Canal systems in the event of a water quality problem, covering daily fluctuations of demand in the distribution system. Since its construction, parts of the area surrounding the reservoir have formerly been used for passive community recreation, and consequently the Water Board provided numerous parks and picnic facilities, primarily on its eastern side (B Cubed Sustainability, 2007,3).

From 2006 a new raw water pumping station and associated infrastructure were built on the reservoir's south-eastern side, including pipeline, power supply and access road.

It was formerly the major distribution reservoir for Sydney's main water supply system until the commissioning of the Prospect Water Filtration Plant in 1996. The reservoir's role has since been changed to that of an off-line storage service reservoir, which covers daily fluctuations of demand in the distribution system. The reservoir can now be drawn on when needed to supplement the Warragamba Pipeline and Upper Canal inflows into the Filtration Plant. It remains an essential component of Sydney's water supply system and therefore is critical Government infrastructure.

Scour/Outlet System:

Prior to construction of the Prospect Water Filtration Plant, the water supply was delivered to the Lower Canal via the scour/outlet system, which consists of a number of components (including submerged inlet pipelines, outlet tower with access walkway, lower valve house with outlet to the Lower Canal, scour pipelines, various control and guard valves, brick-lined interconnecting tunnel between outlet valve and lower valve house, with ventilation shaft and access shaft/manhole, discharge pipelines under the Sydney Water Corporation-owned picnic area and an outlet structure.

The Outlet Tower is a small octagonal brick structure standing in the Reservoir waters with access by a small, riveted iron footbridge. The tower extends below water with three main platforms accessed by ladders. The interconnecting tunnel is routed in a large U running from the Outlet Tower, into the hillside, then curving back to skirt the end of the Reservoir wall.

The Lower Valve House is similar in style to the Outlet Tower and originally controlled water entering the Lower Canal. The Lower Canal was decommissioned in the 1980s, but the original equipment in the Lower Valve House remains largely intact. The tunnel extends a short distance beyond the Lower Valve House.

The Scour/Outlet system originally terminated at the end of the tunnel, with a simple brick headwall with wing-walls and iron grill gate. In the late 1970s the scour system was extended with twin concrete pipes and a new outlet structure constructed closer to Prospect Creek. At that time the area downstream and east of the Reservoir wall was re-shaped to form a public picnic area, burying the end of the tunnel and new concrete pipes.

Since decommissioning the Lower Canal, the sole purpose of the Scour/Outlet system is to allow scouring or draining of the Reservoir. This is critical to ensure dam safety and consequently the system must be adequately maintained. The primary control valves were imported from England in 1887 and are believed to be the last remaining examples of their type in the world. They are in poor condition and at high risk of failure if operated to drain the Reservoir. They are beyond their operational life and cannot be refurbished. Consequently, SCA can no longer test the system as required or safely dewater the Reservoir under emergency conditions (SCA, 2009, 1).²

² Ibid.

Note – For additional information regarding the historical development of Prospect Reservoir, refer to the Conservation Management Plan prepared by Sydney Water Corporation in December 2005.



National Library of Australia

nla.pic-an2820617-v

Figure 9. 'The farmhouse of W Lawson Esqre, N S Wales c1826' (Source: Image by Augustus Earle, contributed by the National Library of Australia [nla.pic-an2820617], Dictionary of Sydney, <https://dictionaryofsydney.org/media/3948>)



Figure 10. 'Atlas of the Suburbs of Sydney – Prospect & Sherwood 1889-1894', showing Prospect & St John Parishes by Higinbotham & Robinson, 1889-1894 (Source: Contributed by City of Sydney Archives, Dictionary of Sydney, <https://dictionaryofsydney.org/media/3925>)



Figure 11. 'Sydney Water Supply Prospect Hill c1890' (Source: Photograph by Harold Arthur Blomfield, courtesy of Charles Blomfield, Wagga Wagga, Dictionary of Sydney, <https://dictionaryofsydney.org/media/2612>)



Figure 12. "Prospect Reservoir, Prospect, NSW," c.1900-1920 (Source: Photographed by William Henry Weston, part of the Weston Family Collection, Flickr, <https://www.flickr.com/photos/98887654@N05/21892929272/>)

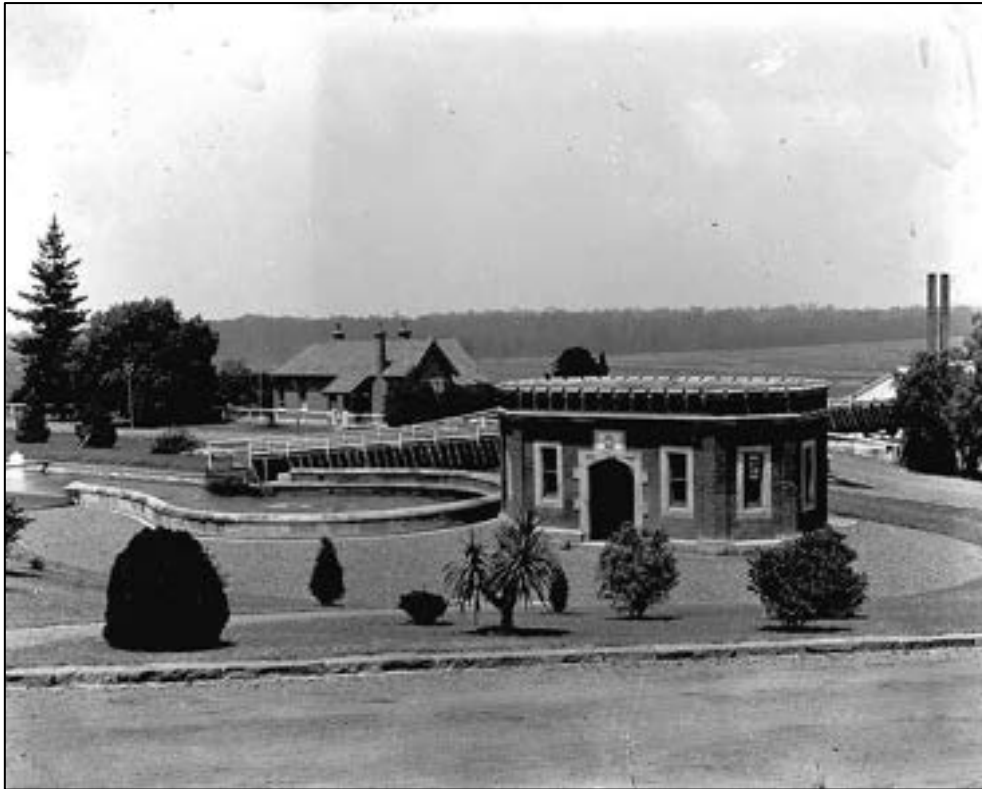


Figure 13. 'Prospect Reservoir, Prospect, NSW', c.1900-1920 (Source: Photographed by William Henry Weston, part of the Weston Family Collection, Flickr, <https://www.flickr.com/photos/98887654@N05/21716844870/>)



Figure 14. The Lower Valve House and Lower Canal Inlet (Source: Sydney Water Corporation, CMP, 2005)

3.0 PHYSICAL EVIDENCE

3.1 The Setting

The site is located at William Lawson Drive, Prospect, on the southern side of Reservoir Road and is part of the larger Prospect Reservoir site. The suburb of Prospect is located 32 kilometres west of the Sydney Central Business District (CBD), and approximately 13 kilometres north-west of the Bankstown Airport. Reservoir Prospect itself is located within the Blacktown, Fairfield and Cumberland Council LGAs. The section of the site pertaining to this proposal is located to the eastern part of the larger Prospect Reservoir site and is mostly a vegetated area, consisting of a grassed area surrounded by mature trees, and with some structures visible in the distance. It has an undulating topography, sloping down towards the reservoir, to the west. This section of the site relevant to this report is part of the Cumberland Local Government Area.

3.2 Physical Description

The following physical description of the larger Prospect Reservoir Site has been sourced from the site's listing on the NSW State Heritage Register:³

Prospect Reservoir is Sydney's largest reservoir and stores water conveyed from Warragamba Dam, the Upper Nepean Dams (Cataract, Cordeaux, Avon and Nepean) and if necessary, from the Shoalhaven Scheme, for supplying the larger component of the water distribution system of the Sydney metropolis.

Located approximately 34kms west of Sydney, the reservoir is a zoned earth embankment dam, 26m high and approximately 2.2km long, with a storage capacity of 50,200 megalitres (SCA, 2009, 1) and an open capacity of 8,870 megalitres. With the completion of the main storage dams, the reservoir's function has changed from largely being a storage apparatus to the main service reservoir and sedimentation basin for the metropolitan system. Prospect is an earth dam 2210 metres long and consists essentially of a puddle clay core with shoulders of selected earth placed in layers 300mm thick. During construction these were compacted by rolling. It was completed in 1888, and in 1898 the crest level was raised by 0.5 meters.

The upstream slope of the wall is pitched with locally quarried diorite blocks 450 mm thick.

The curtilage includes the boundary of the grounds owned by Sydney Water Corporation and the components within it, namely:

- *The reservoir itself.*
- *Side spillway and channel at the southern end of the wall.*
- *Drainage and monitoring installations at the toe on the downstream face of the wall.*
- *The access road along the toe of the downstream face of the wall.*

³ Ibid.

- *The outlet works which connect the stored water to the Lower Canal - consisting of outlet tower, pipelines, valve house and valve, scour lines and valves, and the other metering, screening and control installations. (Sydney Water Corporation)*

The listing includes Prospect Reservoir, landscape elements and all associated structures, including pumping stations, to the property boundary. The environs of the reservoir and hence this listing also include a wide range of items, which relate to later amplification of water supply. These include examples of 1920s and 30s pumping stations, a residence, and the 72" (1,800 mm) main, constructed between the Upper Canal and Pipe Head in 1937. Later items associated with the Warragamba Supply Scheme and more modern developments include several more recent pumping stations, screening and boosting plants on the eastern and southern sides of the Reservoir, and the 84 inch (2,100 mm) water main from Prospect, to Pipe Head, completed in 1958.

Natural Heritage Values

The immediate catchment area of the reservoir is almost entirely vegetated. This vegetation, cleared during settlement, has recovered to be one of the finest examples of the native bushland left in the western suburbs of Sydney.

The bushland surrounding Prospect Reservoir is classified as Cumberland Plain Woodland (CPW). Less than 13% of CPW remains and a high proportion of this figure is heavily degraded through weed invasion, rubbish dumping, illegal vehicle use and overgrazing. In the protected catchment these degrading influences are largely absent and this is reflected in the excellent bushland condition.

Cumberland Plain Woodland is listed at state and federal levels as an endangered ecological community. Legislation at both levels provides a framework for the protection of ecological communities under threat.

Bushland condition is best in the northern section and decreases in the southern areas. A rapid flora survey of Prospect Reservoir (approximately 1km North from spoil site) revealed over fifty native species.

Prospect Reservoir is an important refuge for many fauna species in Western Sydney. Mammals such as wombats, echidnas and eastern grey kangaroos are listed as recent sightings in the National Park species atlas. Importantly, over 12 species of bats (including threatened species) have been recorded within the vicinity of the reservoir.

*The bushland near the filtration plant is less diverse and more degraded than in the immediately adjacent Sydney Catchment Authority land. A similar but much more restricted suite of native species can be found there. Exotic species including *Chloris gayana* (Rhodes grass), *Setaria gracilis* (pigeon grass) and *Eragrostis curvula* (African love grass) dominate. These species are indicators of significant soil disturbance. The vegetation condition varies from a young eucalypt canopy with a low diversity understorey to eucalypt regrowth in a largely exotic pasture. Other areas are exotic pastures with no native element present.*

Despite the lower quality of bushland this site still has significant ecological importance. If rehabilitated, it would significantly improve ecological connectivity, especially between Prospect Reservoir and the riparian vegetation along Eastern Creek. (Greening Australia, 2006)

See listing for Veteran Hall for significance as part of the William Lawson Estate.

Modifications and dates:

Extensive modifications occurred during the period 1898-1916. It is substantially intact and is constantly maintained and monitored for indications of subsidence or other which could affect the longevity of the structure. Altered again in 1934.

Late 1950's and early 1960's - excavation along the southern shore to construct the Warragamba to Prospect Pipeline during the - a second pipeline linking Warragamba and Prospect was completed in 1966, significantly increasing the volume of water that could be transferred during peak demand periods.

1979-80, a major strengthening programme on the reservoir wall was completed by increasing the volume of its downstream side. The upstream face was strengthened in 1997.

1996 With the commissioning of the Prospect Water Filtration Plant in 1996, raw water transferred from Warragamba and the Upper Nepean Dams was sent directly to the treatment facility, by-passing Prospect Reservoir. However, the filtration plant at Prospect can draw water directly from the Reservoir if needed. The role of the reservoir has since changed to that of a service reservoir, which covers daily fluctuations of demand in the distribution system.

The following physical description of the Prospect Reservoir Valve House has been sourced from the site's listing on the NSW State Heritage Register:⁴

The Prospect Reservoir Valve House was a key element in the Upper Nepean Water Supply Scheme. The valve house has a high level of historic significance, as it has had a direct role in the supply and regulation of water to Sydney after the Scheme's inception in 1888. The building is representative of Board owned buildings designed in Free Classical style and is executed in such a way that allows aesthetic appreciation whilst being free of adornment or fussy decoration. The architectural expressions which imbue the building with significance at the local level include the classical parapet and lintel detail, symmetrical facade and unadorned wall surfaces. The valve house continues to be a central element of the Sydney water supply system.

Following the physical description of the larger Prospect Reservoir site and the Prospect Reservoir Valve House above, the section of the site pertaining to this proposal consists of a vegetated area, consisting of a grassed area, surrounded by mature trees, and with two elevated reservoirs visible to the north. There is a service, gravel road adjacent to the portion of land pertaining to the works. There are no existing built structures in this area, with the exception of an existing electricity pole and overhead electricity mains.

⁴ Ibid.

3.3 Views

The Prospect Reservoir site is a readily visible item within Prospect and the locality. The primary view lines to the site are made from Reservoir Road. However, the section of the site pertaining to this proposal would not be visible from this view line.

The proposed works would be in a relatively obscure location in the context of the Prospect Reservoir and Valve House. However, the proposed works would be visible from William Lawson Drive, an internal road in the subject site which is part of the Prospect Valve House curtilage and greater Prospect Reservoir curtilage.

3.4 Images

The following photographs have been taken by Heritage 21 at the site inspection undertaken on 5 September 2022, unless stated otherwise.



Figure 15. View to the proposed location of the relocation of the Huntingwood communications tower within the subject site (indicated with blue arrow), facing north-east



Figure 16. View from the proposed location of the new works, facing north-east towards two elevated reservoirs



Figure 17. View to the proposed location of the new works, facing north-west



Figure 18. View to the proposed location of the new works, facing south-west



Figure 19. View to the proposed location of the new works, facing west



Figure 20. View to the proposed location of the new works, facing north-west



Figure 21. View from the proposed location of the new works, facing south-east



Figure 22. View from the proposed location of the new works, facing south-west



Figure 23. View from William Lawson Drive, facing east towards the location of the proposed works, indicated in blue. The tower would be visible from this location (Source: Heritage 21, 2 June 2022)



Figure 24. View from the southern lookout, facing north towards the location of the proposed works, indicated in blue (Source: Heritage 21, 2 June 2022)

4.0 HERITAGE SIGNIFICANCE

In order to assess the impact of the proposed works on the heritage significance of the subject site and heritage items in the vicinity of the site, it is necessary to first ascertain the heritage significance of these places. Accordingly, Statements of Significance for the subject site (refer to Section 4.1.1), and items 01371 and 01351 in the vicinity are provided below. The significance of these places will form part of our considerations in the assessment of heritage impact, undertaken in Section 6.0 below.

4.1 Established Significance

4.1.1 Prospect Reservoir and Surrounding Area (SHR 01370)

The following Statement of Significance is available for the Prospect Reservoir and Surrounding Area on the State Heritage Inventory:⁵

Prospect Reservoir is historically significant at the state level as it is a central element of the Sydney water supply system. As a part of the Upper Nepean Scheme, the Reservoir has continued to supply water to Sydney for over 120 years, and generally still operates in the same way as it was originally constructed. That it has continued to be used since its construction reflects the inventive and progressive way in which the reservoir was designed and built, and this contributes to its significance greatly.

The Reservoir reflects three significant changes in municipal life during the late 19th century; the development of water and general public utility services; the importance of ensuring an adequate and dependable centralised water supply; and the collective bureaucratic response to the delivery of capital works of this nature.

Built between 1882 and 1888, it was an outstanding achievement in civil engineering technology at the time, using innovative design and construction methods. It has a high level of historical engineering significance.

Prospect Reservoir is strongly associated with the Harbours and Rivers Branch of the NSW Public Works Department, particularly Edward Orpen Moriarty, Head of the branch at the time of the Reservoir's construction, and later with the Board of Water Supply and Sewerage (later the Metropolitan Water and Sewerage Board) and most recently, with the Sydney Catchment Authority.

The Reservoir area is aesthetically significant, as a picturesque site with a large expanse of water, parklands, landscaping and bush. The place is valuable for its recreational amenity for passive recreation, punctuating the monotony of the surrounding urban landscape. It has been used for recreation by the community for generations.

It continues to regulate the release of water from Prospect Reservoir to the Lower Canal and the Sydney Distribution system.

*The place also contains examples of functional colonial architecture.
(Sydney Water Corporation)(amended by BCubed Sustainability, 2006)*

⁵ Heritage NSW, "Prospect Reservoir and Surrounding Area."

The listing includes Prospect Reservoir, landscape elements and all associated structures, including pumping stations, to the property boundary. The environs of the reservoir and hence this listing also include a wide range of items, which relate to later amplification of water supply. These include examples of 1920s and 30s pumping stations, a residence, and the 72" (1,800 mm) main, constructed between the Upper Canal and Pipe Head in 1937. Later items associated with the Warragamba Supply Scheme and more modern developments include several more recent pumping stations, screening and boosting plants on the eastern and southern sides of the Reservoir, and the 84-inch (2,100 mm) water main from Prospect, to Pipe Head, completed in 1958.

See listing for Veteran Hall for significance as part of the William Lawson Estate.

4.1.2 Prospect Reservoir Valve House (SHR 01371)

The following Statement of Significance for Prospect Reservoir Valve House is on the State Heritage Inventory:⁶

The Prospect Reservoir Valve House was a key element in the Upper Nepean Water Supply Scheme. The valve house has a high level of historic significance, as it has had a direct role in the supply and regulation of water to Sydney after the Scheme's inception in 1888. The building is representative of Board owned buildings designed in Free Classical style and is executed in such a way that allows aesthetic appreciation whilst being free of adornment or fussy decoration. The architectural expressions which imbue the building with significance at the local level include the classical parapet and lintel detail, symmetrical facade and unadorned wall surfaces. The valve house continues to be a central element of the Sydney water supply system.

4.2 Heritage items in the Vicinity

4.2.1 Veteran Hall – House Remains (SHR 01351)

The following Statement of Significance for Veteran Hall – House Remains – located in the vicinity of the subject site – is on the State Heritage Inventory:⁷

The Veteran Hall archaeological remains are associated with the explorer and statesman, William Lawson, who built the first substantial house on the site. The remains can potentially provide insights into settlement in the area and 19th century pastoralism, due to their intactness. The site has the potential to yield information about the second occupants of the site, the Metropolitan Water Supply Board, who occupied the site during the early phases of the Upper Nepean Scheme until the early years of the 20th century, when the Military took it over. The remains make a positive contribution to the landscape and relate harmoniously to the visual catchment of the Prospect Reservoir curtilage.

⁶ Heritage NSW, "Prospect Reservoir Valve House," State Heritage Inventory, accessed 10 September 2022, Heritage ID 5051479, <https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=5051479>.

⁷ Heritage NSW, "Veteran Hall – House Remains," State Heritage Inventory, accessed 10 September 2022, Heritage ID 5051453, <https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=5051453>.

5.0 WORKS PROPOSED

5.1 Proposal Description

The Endeavour Energy proposal includes the relocation and installation of a communications facility comprising:

- A 60m freestanding heavy duty lattice tower made from galvanised steel with matte finish including, self-supporting concrete footings.
- Medium intensity red obstacle light at the top of the tower.
- An equipment building (7.0 x 4.0m) on concrete footing foundations.
- An External ladder approximately 57.0m in height.
- A compound area 15.0m x 15.0m around the infrastructure, including a 2.8m high security fence with double access gates.
- A New pole with substation and overhead lines.
- Power supply works including underground cabling.

The following images are Waterboard Tower at Horsley Park (Figure 25 and Figure 26). This structure is of a similar design to the proposal and provides a visual representation. However, this tower is of a significantly greater height than the proposed tower. The other image below is of the existing Huntingwood Tower (Figure 27). The proposed design would be slenderer than this tower.



Figure 25. Aerial imagery of an existing tower (Waterboard Tower at Horsley Park) which is similar in design to the proposal. (Source: Image provided by Endeavour Energy, 9 November 2022)



Figure 26. Aerial imagery of an existing tower (Waterboard Tower at Horsley Park) which is similar in design to the proposal. (Source: Image provided by Endeavour Energy, 9 November 2022)



Figure 27. Aerial imagery of an existing tower (Huntingwood tower). (Source: Image provided by Endeavour Energy, 9 November 2022)

5.2 Drawings

Our assessment of the proposal is based on the following concept drawings by Endeavour Energy dated 6 July 2022 and received by Heritage 21 on 9 January 2023. The drawings are reproduced below for reference only.



Figure 28. Cover Sheet.



Figure 29. Overall Site Plan



Figure 30. Overall Sectional View

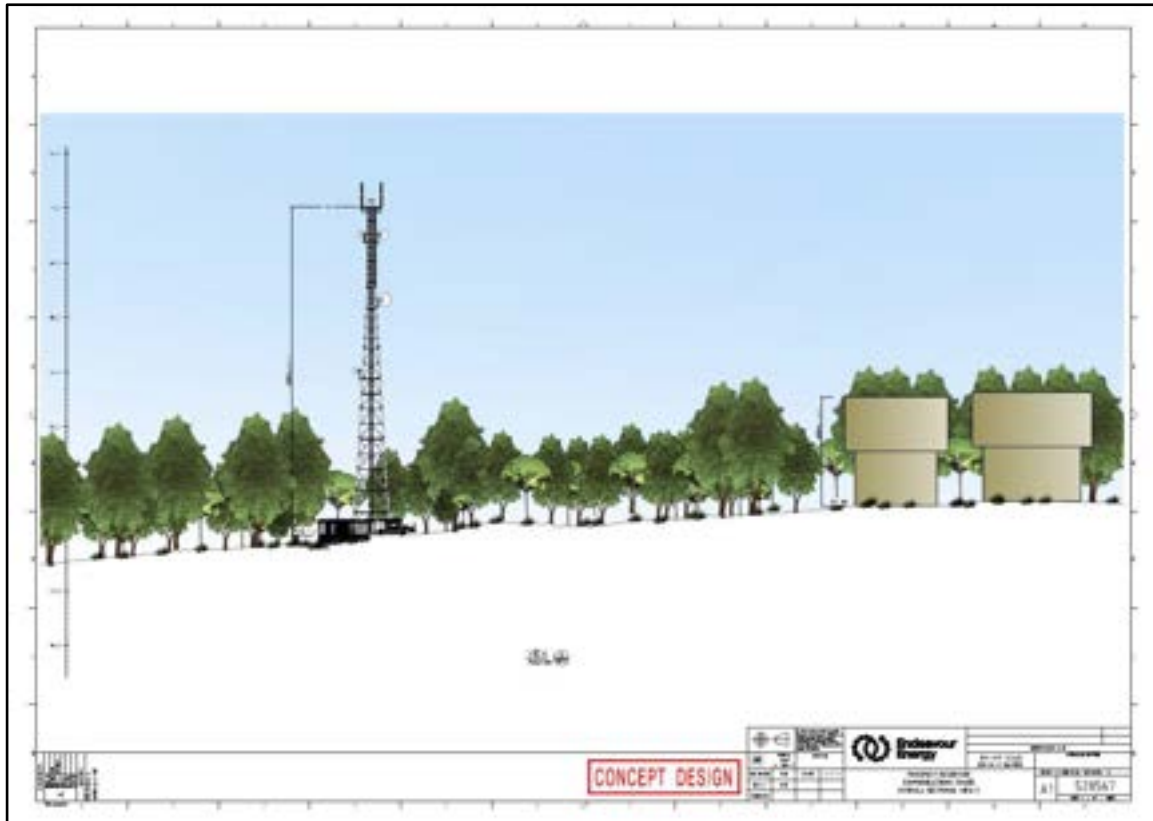


Figure 31. Overall Sectional View 2

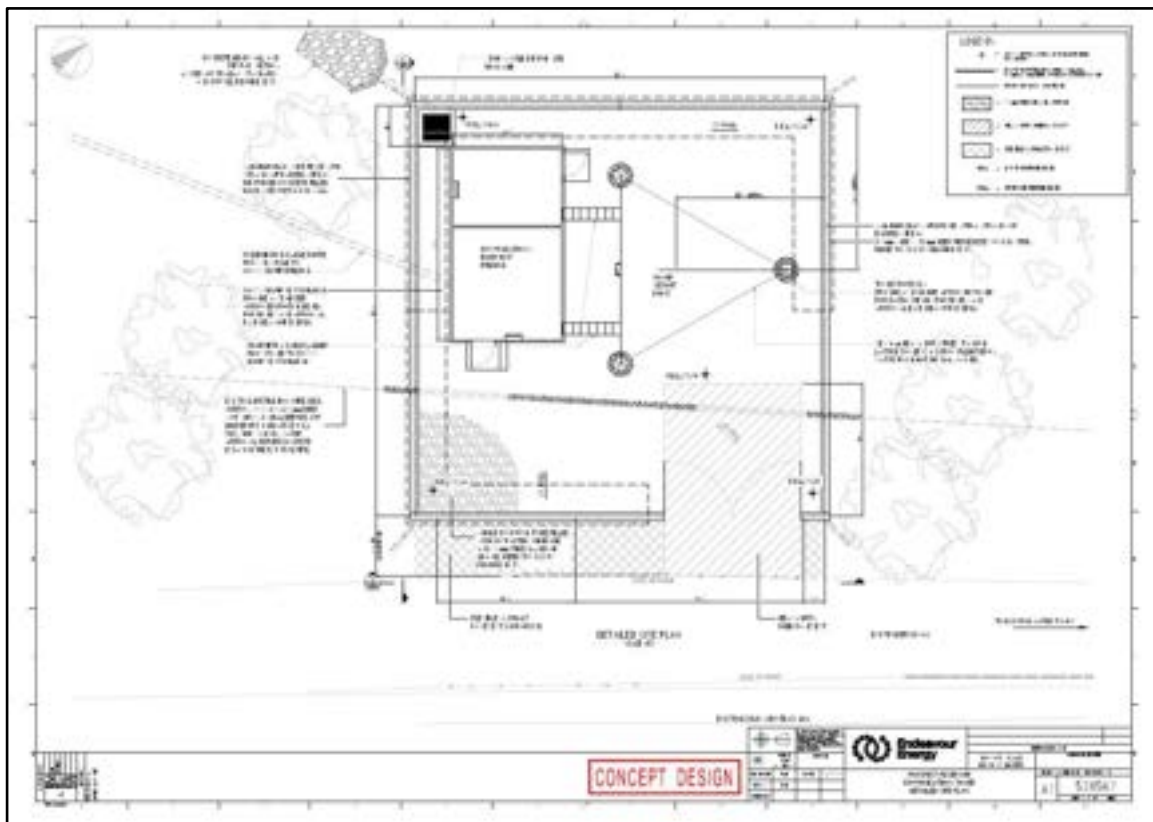


Figure 32. Detailed Site Plan

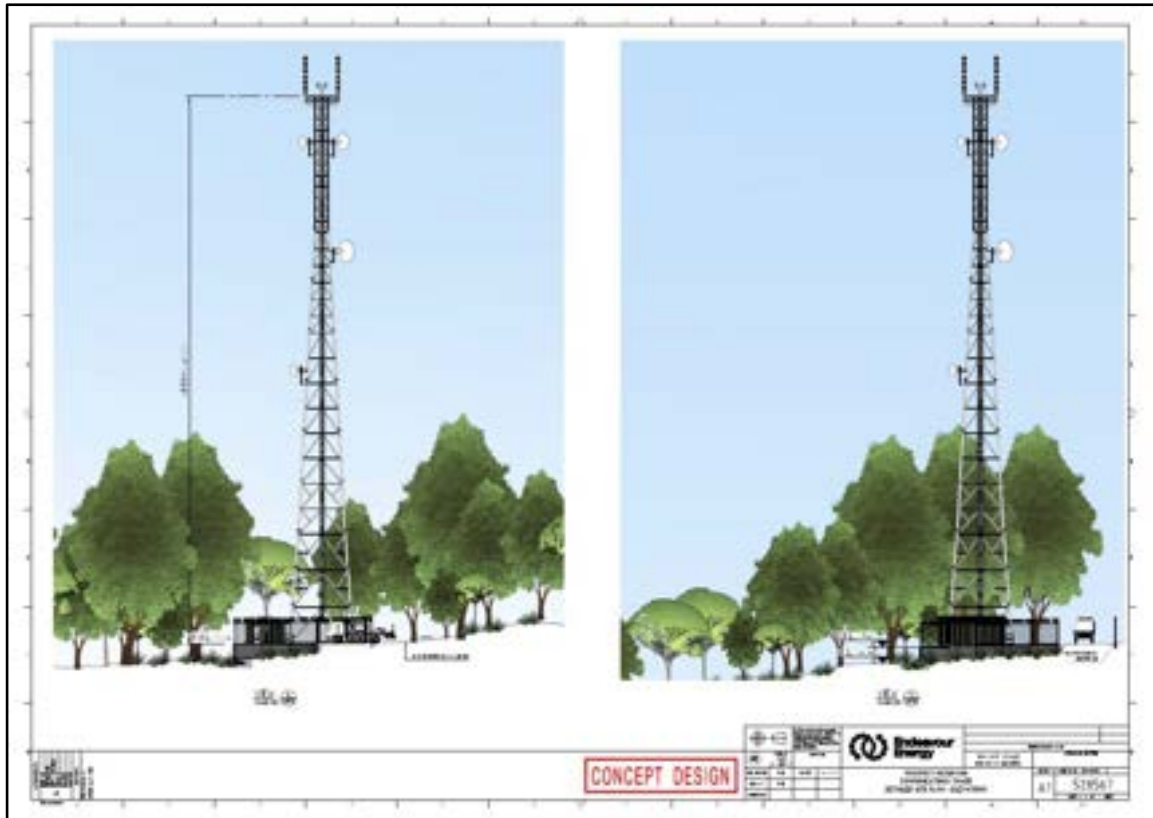


Figure 33. Detailed Site Plan - Elevations

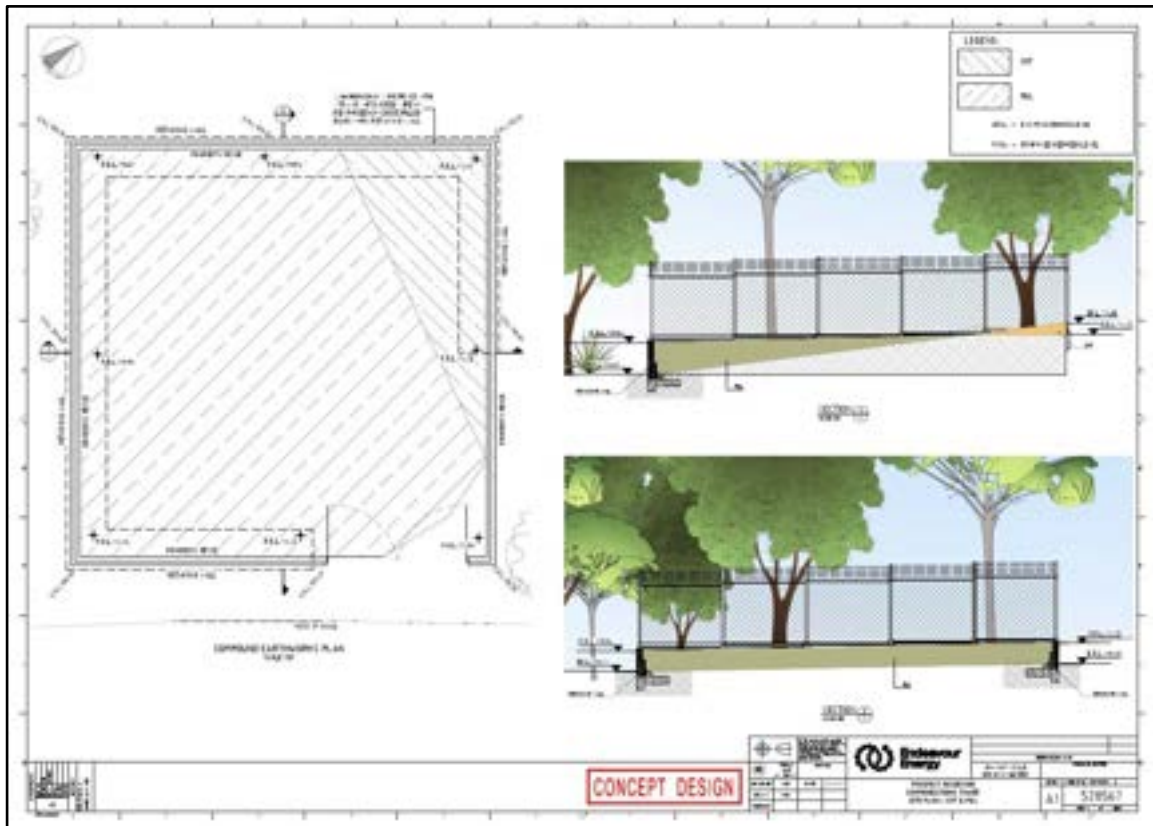


Figure 34. Site Plan – Cut & Fill

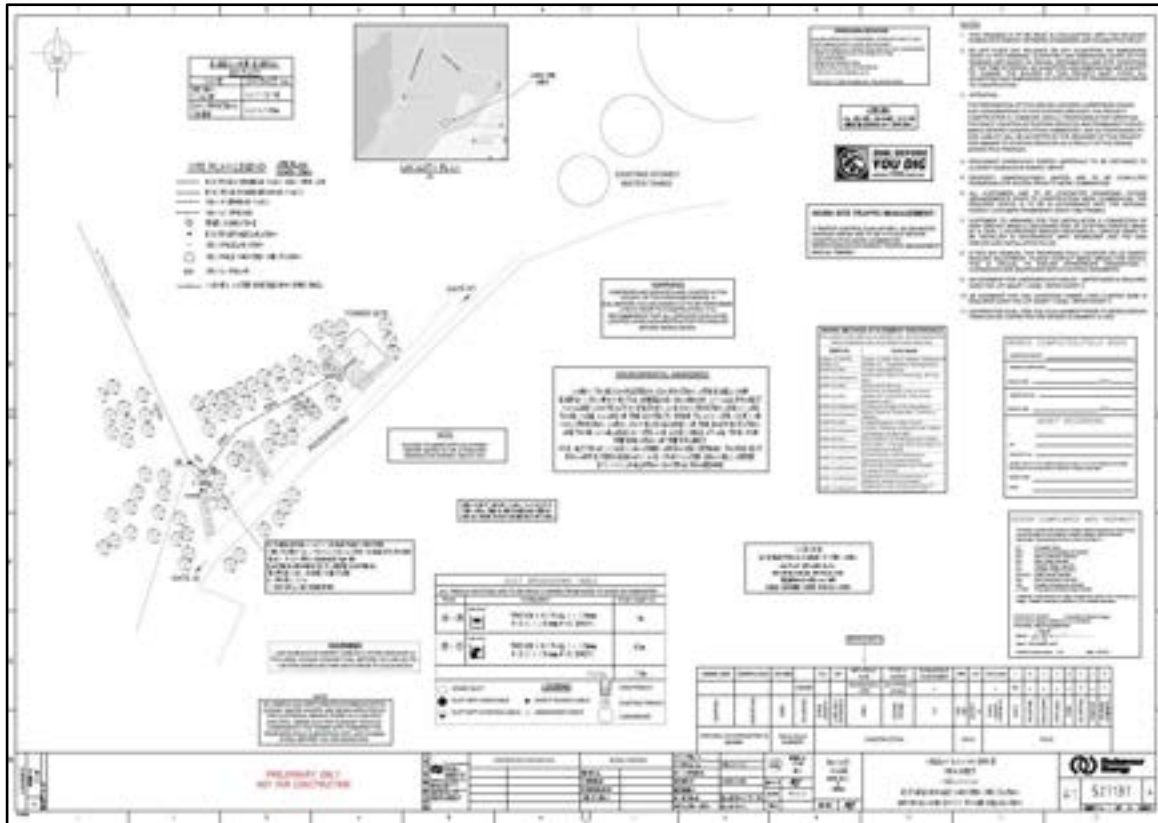


Figure 35. Established Pole Mounted Substation

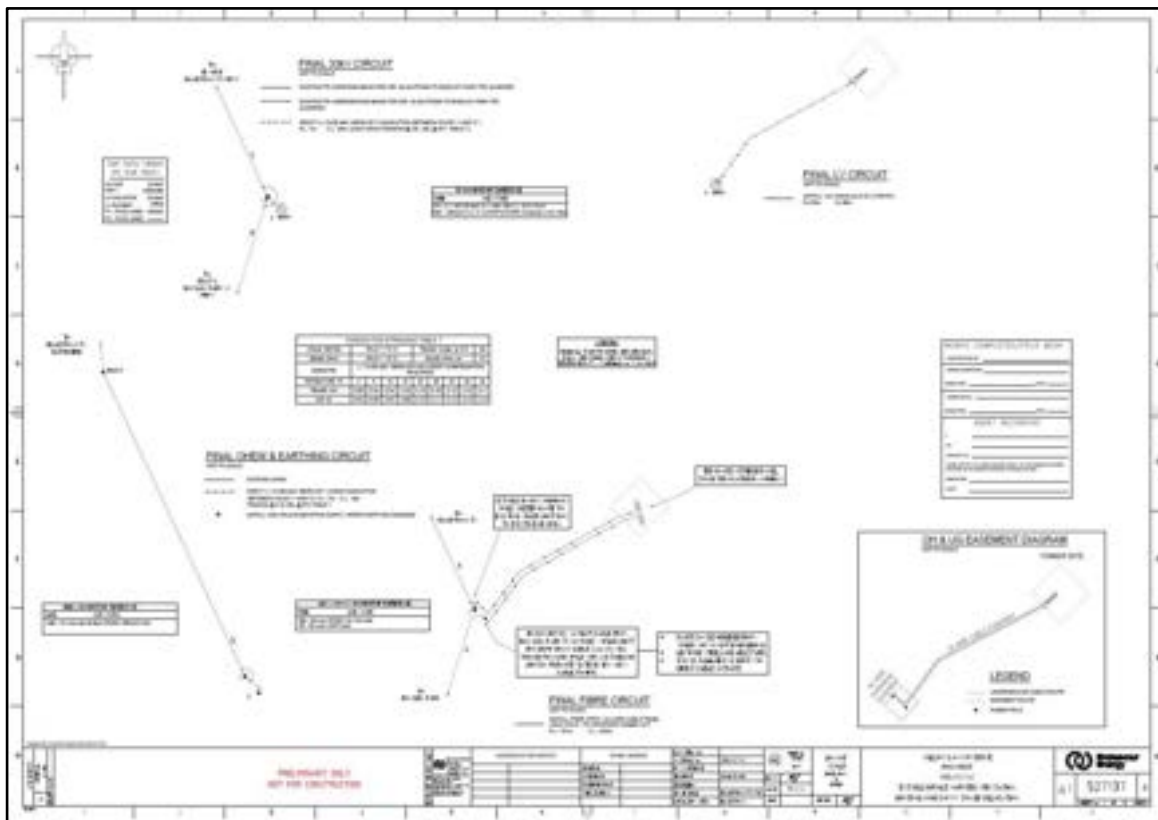


Figure 36. Established Pole Mounted Substation

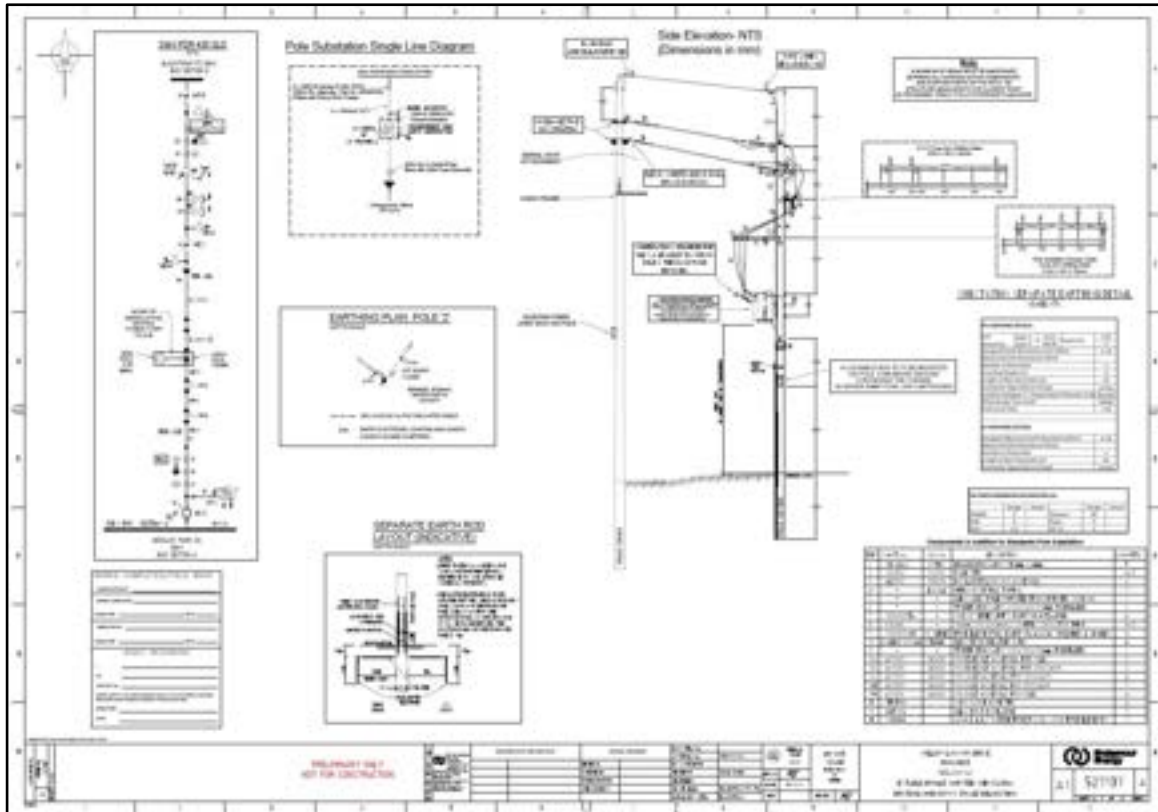


Figure 37. Established Pole Mounted Substation

6.0 ASSESSMENT OF HERITAGE IMPACT

6.1 Heritage Management Framework

Below we outline the heritage-related statutory and non-statutory constraints applicable to the subject site including the objectives, controls and considerations which are relevant to the proposed development as described in Section 5.0 above. These constraints and requirements form the basis of this Heritage Impact Assessment.

6.1.1 Heritage Act 1977 (NSW)

The subject site is listed on the NSW State Heritage Register. Listing on the state heritage register provides statutory heritage protection to the site under the *Heritage Act 1977 (NSW)* (“the Act”).

Listing on the State Heritage Register signifies that the site:

- Is of particular importance to the people of NSW and enriches the understanding of our history and identity.
- Is legally protected as a heritage item under the NSW Heritage Act; and
- Requires approval from the Heritage Council of NSW for major changes.

The proposed works are to be assessed under the provisions of Section 57(1) and Section 60 of the Act, which apply to non-exempt works at places listed on the NSW State Heritage Register. This Statement of Heritage Impact has been prepared by Heritage 21 in order to allow the Heritage Council of NSW to assess the potential heritage impact of the proposed works.

6.1.2 Prospect Reservoir Site Conservation Management Plan 2005

Our assessment of heritage impact also considers the relevant section of the Prospect Reservoir Conservation Management Plan (CMP), prepared by Sydney Water Corporation in December 2005, namely Section 7, “Conservation Policies.”

6.1.3 NSW Office of Environment & Heritage guidelines

In its guidelines for the preparation of Statements of Heritage Impact, the NSW Office of Environment & Heritage provides a list of considerations in the form of questions aiming at directing and triggering heritage impact assessments. These are divided in sections to match the different types of proposals that may occur on a heritage item, item in a heritage conservation area or in the vicinity of heritage. Below are listed the considerations which are most relevant to the proposed development as outlined in Section 5.0 of this report.

Major additions (see also major partial demolition)

- *How is the impact of the addition on the heritage significance of the item to be minimised?*
- *Can the additional area be located within an existing structure? If not, why not?*
- *Will the additions tend to visually dominate the heritage item?*
- *Are the additions sited on any known, or potentially significant archaeological deposits? If so, have alternative positions for the additions been considered?*
- *Are the additions sympathetic to the heritage item? In what way (e.g. form, proportions, design)?*

New services (e.g. air conditioning, plumbing)

- *How has the impact of the new services on the heritage significance of the item been minimised?*
- *Are any of the existing services of heritage significance? In what way? Are they affected by the new work?*
- *Has the advice of a conservation consultant (e.g. architect) been sought? Has the consultant's advice been implemented?*
- *Are any known or potential archaeological deposits (underground and under floor) affected by the proposed new services?*

6.1.4 State Environmental Planning Policy (Transport and Infrastructure) 2021

Our assessment of heritage impact also considers the heritage-related sections of the State Environmental Planning Policy (Transport and Infrastructure), 2021 ('TISEPP') that are pertinent to the subject site and proposed development. These include:

Part 2 General

Division 1 Consultation

2.11 Consultation with councils—development with impacts on local heritage.

6.1.5 Other Heritage Considerations

Other general heritage matters which may not have been addressed in heritage controls or requirements by the local Council or the NSW Office of Environment & Heritage are likely to include considerations as to whether:

- The historical use of the site would be maintained and if not if the proposed new use would be suitable to the heritage significance.
- The historical setbacks and boundaries of the site would be retained as existing.
- Any significant views to and from significant buildings or elements, or across significant areas would be impacted.

6.2 Heritage Impact Assessment

Below we assess the impact that the proposed development would have upon the subject site, and the heritage items in the vicinity. This assessment is based upon the Historical Context (refer to Section 2.0), the Physical Evidence (refer to Section 3.0), Heritage Significance (refer to Section 4.0) the Proposal (refer to Section 5.0), a review of the Heritage Management Framework (refer to Section 6.1) and the impact of the proposal on the relevant heritage item in the vicinity of the site (refer to Sections 1.3 and 1.3.2).

6.2.1 Summary

The proposal involves the installation of a 60m freestanding heavy duty lattice tower which would serve as a communication facility. As discussed in Sections 1.3 and 3.3 above, the proposed tower has been sited within the Prospect Reservoir and surrounding area (SHR 01370) and the Prospect Reservoir Valve House (SHR 01371), both items are of heritage significance listed under the NSW State *Heritage Act 1977*. The proposed location for the tower is also within the vicinity of Veteran Hall – House Remains (SHR 01351), although not within the curtilage of the item.

The proposal includes the relocation of communication services from Huntingwood and the construction of a tower with an adjacent equipment hut and a fence surrounding the new structure. We note that the new communications equipment would be considered an essential service to provide connectivity to Endeavour Energy’s wide area network along with associated sites and vital to keep the power grid active and managed. Endeavour Energy have provided further context regarding the requirements for the tower, and why it is deemed to be essential, in their response to Heritage NSW, dated 14 November 2022.

As discussed in Section 3.0 above, the section of the site pertaining to this proposal does not contain any built fabric of significance but is predominately vegetated, consisting of a grassed area and surrounded by mature trees. As a result, the proposal to introduce a new communications structure within the site would not include the removal of any built fabric of significance and mature trees within the subject site. However, it is recognised that the significance of the Prospect Reservoir site is tied to its aesthetic qualities as a picturesque, landscaped area and to its natural heritage values considering the reservoir is one of the “finest examples of the native bushland left in the western suburbs of Sydney.”⁸ As such, the impact of the proposed tower should also consider the visual impact to the area, and whether there is an impact to the natural heritage values of the place.

Heritage 21 acknowledges there would inevitably be some visual impact as a result of the proposed tower installation. The tower would be of a significant scale and height which, unfortunately, cannot be reduced without compromising operational requirements and regulations of the communications service. In order to mitigate this visual impact, the design of the tower would employ a range of measures including a slender design, lattice configuration to provide relief in the solid massing and a matte finish. A similar tower to the proposed design, located within a bushland setting, is presented at Figure 25 and 26. Communication infrastructure is commonly seen in the context of Greater Sydney,

⁸ Heritage NSW, “Prospect Reservoir and Surrounding Area,” State Heritage Inventory, Heritage Item ID 5045336, accessed 12 September 2022, <https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=5045336>.

and it is Heritage 21's opinion that the proposal at the subject site follows an established precedent in this regard. Whilst that hardly justifies ad hoc placement, the proposal has involved a considered siting process, involving stakeholder consultation with Sydney Water, to ensure the proposed tower has minimal impact to the Prospect Reservoir site, including its aesthetic and natural heritage values.

The Visual Impact Assessment, prepared by Endeavour, dated 24 January 2023, has aimed to capture a number of vantage points within the Prospect Reservoir site, including in the near vicinity and the wider curtilage. It was desirable to include a vantage point to the east of the Prospect Reservoir site, however this area was not publicly accessible. Due to the strategic siting of the tower along the eastern boundary of the site, it is obscured from many of these view lines. However, the Visual Impact Assessment does indicate that the tower would be visible from several locations, notably the industrial area to the east and the internal road, William Lawson Drive, within the reservoir site. In our opinion, the view lines to the Reservoir from the adjacent industrial area are not of high significance; however, the view lines from within the reservoir site should remain unaltered, where possible.

As identified in the Visual Impact Assessment, Viewpoint 1, the tower would be visible from William Lawson Drive. Heritage 21 notes that generally, it appears that views to the tower would be obscured and balanced by the existing vegetation in the foreground (including the mature Eucalyptus and Araucarias). From this viewpoint, we are of the opinion that the tower would remain in the background and would not directly obstruct any key view lines. It is also noted that telecommunications towers and service poles are not uncommon to the east of William Lawson Drive. To that end, the views of the surrounding area are already altered by existing services infrastructure, and the proposed tower would not impact a pristine landscape. As such, Heritage 21 is of the opinion that this visual impact acceptable despite a minor visual impact.

The impact to Viewpoint 2, 3, 4 and 6 has been assessed as having a negligible impact, as the tower would generally be obscured because of the topography and existing vegetation. These view lines have all been selected due to their significance and/or their public accessibility. Heritage 21 is of the opinion that the tower would have a neutral impact to these view lines. However, we do note that the tower would be visible from Viewpoint 5 which is a public picnic area. This public picnic area has key views over the reservoir, facing west. These would not be impacted by the proposed tower which would only be visible when facing north. The other views from this location, including to the industrial area to the east, are not considered to be significant. As such, Heritage 21 is of the opinion that this visual impact would be acceptable.

Viewpoint 7 has been selected due to its associations with indigenous significance and its visual relationship with the Prospect Reservoir Site. The key view line from this location is facing east towards Paramatta and Sydney – which would remain uninterrupted. The tower, however, would be partially visible when facing west towards the industrial zone. This is presently an altered view line, which contains a high quantity of infrastructure. As such, the tower would not detract from this view line and in our opinion, this visual impact would be acceptable.

The impact to the natural heritage values has also been addressed in the response made by Endeavour to Heritage NSW, dated 14 November 2022. It is noted that tower would not be sited within the Prospect Nature Reserve, which is located at the northern part of the site and would not include the

removal of any significant species or mature trees. The proposal would involve clearing of juvenile grass/weeds. This assessment provided by Endeavour does not indicate that there would be any impact to the natural heritage values of the place. Considering that no significant vegetation would be removed as part of this proposal, Heritage 21 is of the opinion that the proposed removal of juvenile grass/weeds is acceptable. Heritage 21 notes that there is potential to improve the immediate site of the tower through the implementation of a replantation strategy, including weed removal and replanting with endemic species.

The location of the proposed tower is critical to ensure that the operational and regulatory requirements continue to be met by Endeavour Energy. Whilst the siting of this tower within a state listed asset is not ideal, the location at the eastern boundary has been selected whilst also considering a reduced visual impact and preventing any impact to natural heritage. Ultimately, the proposed tower, due to its height and scale, would have a visual impact on the Prospect Reservoir site. However, this visual impact has been minimised through the design of the tower and also the proposed siting, which was chosen in collaboration with Sydney Water as the most appropriate location following an options analysis. In the opinion of Heritage 21, this visual impact would not significantly detract from the aesthetic qualities of the site it would be widely obscured from within the wider Prospect Reservoir site. We also note that where the tower would be visible, it would not be unique to the surrounding landscape, which contains numerous telecommunications system towers. As such, we are of the opinion that the tower would have a minimal albeit acceptable impact to the heritage significance of the Prospect Reservoir site.

6.2.2 Impact Assessment Against the Prospect Reservoir Site Conservation Management Plan, 2005

<p>7. Conservation Policies</p> <p>7.2 Procedural Recommendations</p> <p>7.2.1 Treatment of Fabric of Different Grades of Significance</p> <p>Guidelines</p>
<p><i>7. Proposed changes to suit new use requirements should ideally be focused on areas or components with low significance. Where changes to more significant elements are unavoidable, they should be carefully designed to respect and retain the architectural and spatial features that contribute to the overall significance.</i></p>
<p>The proposed new communications tower and equipment which would allow Endeavour Energy to provide an essential service. The new tower and equipment would be introduced within a grassed area of the site which does not contain any built fabric. The proposed electrical conduits and cables would utilise existing overhead lines where possible with the new services to be introduced underground. As a result, the works would not include the removal of any built fabric of significance. This would ensure that the proposal would retain the architectural and spatial features that contribute to the overall significance of the site.</p>
<p>7.5 Built Environment</p> <p>7.5.2 Conservation of Significant Built Fabric and Other Site Elements</p> <p>Guidelines</p>
<p><i>All Areas Generally</i></p> <p><i>2. All future work undertaken should be based on a respect for the original fabric, where it survives and should involve the least possible physical intervention.</i></p> <p><i>3. No future work to the item should negatively impact the significant fabric elements, allowing exceptions in cases where technically feasible alternative do not exist.</i></p>
<p>The proposed works would not include the removal of any original built fabric. They would be concentrated to a small portion of the site consisting of a grassed area, ensuring the least possible physical intervention. The siting of the tower has been carefully considered to ensure that it is placed at a location which has a similar elevation to the existing Huntingwood tower (which is 86m AHD) to ensure regulatory requirements continue to be met. While the proposed new tower would be 60m high, it would be considered a necessary and essential service. In addition, it would be located in a vegetated area, be surrounded by mature trees, and would employ design features to minimise the visual impact. In order to mitigate its visual impact, the design of the tower would employ a range of measures including a slender design, a steel lattice configuration to provide relief in the solid massing, and a matte finish.</p>
<p>7.5.4 Installation of New Services and Upgrading to Suit Contemporary Use</p> <p>Guidelines</p>
<p><i>2. Before installation of any new services, an assessment of potential impact of the proposed works to the surviving significant fabric should be sought from the Sydney Water's Heritage Manager and Heritage Adviser.</i></p>
<p>This Statement of Heritage Impact report has been prepared to assess the impact of the proposed works on the surviving significant fabric of the site.</p>

7.10 Landscape, Cultural Plantings & Natural Heritage Guidelines
<p>1. Maintain plantings to ensure they remain healthy. Contact a specialist if tree looks to be in decline.</p> <p>3. Significant trees should only be removed if they pose a safety hazard or if all other options have been exhausted.</p>
<p>It is our understanding that the works would not include the removal of any mature trees. The impact to the natural environment has also been addressed in the response made by Endeavour to Heritage NSW, dated 14 November 2022.</p>
7.14 Curtilage Guidelines
<p>2. New development within the minimum curtilage should only be considered if required for the essential operation of the site. Any such development should be sympathetic and comply with archaeological and natural heritage recommendations</p>
<p>The proposed location of the new tower would be outside the curtilage of the Veteran Hall – House Remains (SHR 01351). However, it would fall within the far eastern boundary of the Prospect Reservoir Valve House (SHR 01371) curtilage and also within the curtilage of the Prospect reservoir and surrounding area (SHR 01370). The proposed tower, due to its height and scale, would have a visual impact on the Prospect Reservoir site. However, this visual impact has been minimised through the design of the tower and also the proposed siting, which was chosen in collaboration with Sydney Water as the most appropriate location. The location of the proposed tower is critical to ensure that the operational and regulatory requirements continue to be met by Endeavour Energy.</p>

6.2.3 Impact Assessment Against the NSW Office of Environment and Heritage Guidelines

Question	Assessment
Major additions (see also major partial demolition)	
<i>How is the impact of the addition on the heritage significance of the item to be minimised?</i>	The proposal includes the relocation of communication services and the construction of a tower and equipment hut with a fence surrounding it. The proposed new tower would be appropriately sited in a grassed area of the site, surrounded by mature trees and, away from fabric of significance. Further, the works would not include the removal of any built fabric of significance, would retain mature trees within the site, with the recommended galvanised steel with matte finish for the tower. Such measures would ensure that the impact of the works on the heritage significance of the item would be minimised.
<i>Can the additional area be located within an existing structure? If not, why not?</i>	No, the new communications tower cannot be located within an existing structure due to its nature and height.
<i>Will the additions tend to visually dominate the heritage item?</i>	The proposed structure would likely be visually dominant to the heritage items and item in the vicinity due to its height and nature. The proposed works would not be considered subservient within the context of the surrounding natural context.

Question	Assessment
	However, considerations have been made within the proposal to mitigate this visual impact. This includes the existing topography, the nature of the site, the distance from the items, as well as through the incorporation of design features, the appropriate siting of the site in a landscaped area, and the distance of the new works from fabric of significance would ensure the impact of the works would be minimised. Due to the nature of the proposed communication tower, it would be considered an essential service for Endeavour Energy, their associated sites within the wide area network and maintaining an active power grid.
<i>Are the additions sited on any known, or potentially significant archaeological deposits? If so, have alternative positions for the additions been considered?</i>	It is beyond the scope of this report to assess subsurface deposits.
<i>Are the additions sympathetic to the heritage item? In what way (e.g. form, proportions, design)?</i>	These works present an opportunity for Endeavour Energy to provide an essential service to the general public. These towers, which are a relatively common feature within the architectural landscape, have been designed to minimise their visual impact. The design of the tower would employ a range of measures including a slender design, lattice configuration to provide relief in the solid massing, and a matte finish.
New services (e.g. air condition, plumbing)	
<i>How has the impact of the new services on the heritage significance of the item been minimised?</i>	The proposed services have been placed to the eastern side of the reservoir's surrounding landscape. No significant fabric would be modified to accommodate the new services. The new services would utilise existing cabling where possible to minimise the impact.
<i>Are any of the existing services of heritage significance? In what way? Are they affected by the new work?</i>	No, to our knowledge, the existing services are the electrical services of the Sydney Water main switchboard. As a result, they are not of heritage significance.
<i>Has the advice of a conservation consultant (e.g. architect) been sought? Has the consultant's advice been implemented?</i>	Heritage 21 has been involved with the project to provide advice and prepare this Statement of Heritage Impact.
<i>Are any known or potential archaeological deposits (underground and under floor) affected by the proposed new services?</i>	Archaeological subsurface deposits are not in the scope of this report.

6.2.4 Impact Assessment Against the TISEPP

Part 2 General**Division 1 Consultation****2.11 Consultation with councils—development with impacts on local heritage.**

- (1) *This section applies to development carried out by or on behalf of a public authority if the development—*
- (a) *is likely to affect the heritage significance of a local heritage item, or of a heritage conservation area, that is not also a State heritage item, in a way that is more than minor or inconsequential, and*
 - (b) *is development that this Chapter provides may be carried out without consent.*
- (2) *A public authority, or a person acting on behalf of a public authority, must not carry out development to which this section applies unless the authority, or the person has—*
- (a) *had an assessment of the impact prepared, and*
 - (b) *given written notice of the intention to carry out the development, with a copy of the assessment and a scope of works, to the council for the area in which the heritage item or heritage conservation area (or the relevant part of such an area) is located, and*
 - (c) *taken into consideration any response to the notice that is received from the council within 21 days after the notice is given.*

Response: This Statement of Heritage Impact has been prepared to assess the impact of the proposed works to the heritage item and items located in the vicinity. As discussed above in Section 6.2.1, the proposal would not include the removal of any significant or original built fabric of the Prospect Reservoir site. The proposed communications tower would provide an essential service for Endeavour Energy, and it would be sited on a grassed area, away from significant heritage fabric. The tower would be of a significant scale and height which, unfortunately, cannot be reduced without compromising operational requirements and regulations of the communications service. In order to mitigate this visual impact, the design of the tower would employ a range of measures including a slender design, lattice configuration to provide relief in the solid massing, and a matte finish. A similar tower to the proposed design, located within a bushland setting, is presented at Figure 25 and 26. In the opinion of Heritage 21, these towers have become an acceptable and common feature in the natural landscape. Whilst that hardly justifies ad hoc placement, the proposal has involved a lengthy siting process, involving stakeholder consultation with Sydney Water to ensure the tower has minimal impact to the Prospect Reservoir site, including its aesthetic and natural heritage values.

It is our assessment that the proposed works are not likely to affect the heritage significance of the heritage-listed site in a way that would be more than minor. Consequently, Clause 11 of the TISEPP would not be triggered.

7.0 CONCLUSION & RECOMMENDATIONS

7.1 Impact Summary

The NSW Office of Environment & Heritage's guidelines require the following aspects of the proposal to be summarised.⁹

7.1.1 Aspects of the proposal which respect or enhance heritage significance

In our view, the following aspects of the proposal would respect the heritage significance of the subject site and heritage items in the vicinity:

- The proposal does not include the demolition of any heritage-listed item listed in the State Heritage Register under the *NSW Heritage Act 1977*, or the HLEP 2013.
- The proposal does not include the removal of any built fabric of significance or elements of landscape value.
- The proposed communications tower would be critical in providing connectivity to the wide area network, including Endeavour Energy's associated sites, and would be vital to keep the power grid active and managed.
- The proposed tower, through a considered siting process, would be located to the eastern boundary of the site where it would be largely obscured from within the wider Prospect Reservoir site.
- The proposed design of the tower would employ a range of measures to minimise the visual impact including a slender design, lattice configuration to provide relief in the solid massing, and a matte finish.
- The proposal has been sited in an area dominated by grass and juvenile plantings to prevent any impact to the natural heritage values of the site.

7.1.2 Aspects of the proposal which could have detrimental impact on heritage significance

In our view, there are no aspects of the proposal which could be detrimental to the significance of the subject site and heritage items in the vicinity. The neutral impacts of the proposal have been addressed above in Section 7.1.1.

7.1.3 Sympathetic alternative solutions which have been considered

Heritage 21 provided heritage advice to the applicant which has been incorporated in the final proposal as described in Section 5.0. This advice included the following consideration:

- The proposal should incorporate a muted colour scheme, material or finish if permissible, to minimise the visual impact of the communications tower and have a neutral impact on the

⁹ NSW Office of Environment and Heritage, 'Statements of Heritage Impact' (Heritage Office and Department of Urban Affairs & Planning, 1996), <http://www.environment.nsw.gov.au/resources/heritagebranch/heritage/hmstatementsofhi.pdf>.

heritage items in the vicinity. This was considered and the visual assessment recommends the use of galvanised steel with a matte finish for the proposed tower.

No solutions of greater sympathy with the significance of the subject site or heritage items in the vicinity have been discounted to our knowledge.

7.2 Recommendations

In order to improve the immediate site and surroundings of the proposed tower, Heritage 21 recommends a replantation strategy which would involve the removal of weeds and involve replanting additional plants with locally endemic species.

7.3 General Conclusion

Heritage 21 is therefore confident that the proposed development complies with pertinent heritage controls and would engender a minimal impact on the heritage significance of the subject site, and heritage items in the vicinity. We therefore recommend that Heritage NSW view the application favourably on heritage grounds.

8.0 SOURCES

Australia ICOMOS. 'The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance'. Australia ICOMOS, 2013. <http://australia.icomos.org/publications/charters/>.

Dictionary of Sydney. <https://home.dictionaryofsydney.org/>.

Flickr. "Weston Family Collection." Picture Maitland.
<https://www.flickr.com/photos/98887654@N05/albums/72157659127938432>.

Heritage NSW, "Prospect Reservoir and Surrounding Area," State Heritage Inventory. Heritage Item ID 5045336. Accessed 12 September 2022,
<https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=5045336>.

———. "Prospect Reservoir Valve House." State Heritage Inventory. Accessed 10 September 2022. Heritage ID 5051479.
<https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=5051479>.

———. "Veteran Hall – House Remains." State Heritage Inventory. Accessed 10 September 2022. Heritage ID 5051453,
<https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=5051453>.

NSW Government. *Heritage Act 1977*. <https://www.legislation.nsw.gov.au/#/view/act/1977/136>.

———. *Holroyd Local Environmental Plan 2013*
<https://www.legislation.nsw.gov.au/#/view/EPI/2013/139/full>.

———. *State Environmental Planning Policy (Transport and Infrastructure) 2021*.
<https://legislation.nsw.gov.au/view/html/inforce/current/epi-2021-0732>.

NSW Land and Property Information. 'SIX Maps', n.d. <http://maps.six.nsw.gov.au/>.

NSW Office of Environment and Heritage. 'Assessing Heritage Significance'. NSW Heritage Office. 2001. NSW Heritage Manual.
<http://www.environment.nsw.gov.au/resources/heritagebranch/heritage/listings/assessingheritagesignificance.pdf>.

———. "Statements of Heritage Impact." Heritage Office and Department of Urban Affairs & Planning, 1996. NSW Heritage Manual.
<http://www.environment.nsw.gov.au/resources/heritagebranch/heritage/hmstatementsofhi.pdf>.

Sydney Water Corporation. "Prospect Reservoir Site Conservation Management Plan." 2005.

Ms Emily McSkimming
Heritage 21
20-28 MADDUX ST
ALEXANDRIA NSW 2015

By email: emily@heritage21.com.au

Dear Ms McSkimming

APPLICATION UNDER SECTION 60 OF THE HERITAGE ACT 1977
Prospect Reservoir and surrounding area
STATE HERITAGE REGISTER Nº 01370

Address: Reservoir Road, PROSPECT NSW 2148
Proposal: The Endeavour Energy proposal includes the relocation and installation of a communications facility comprising:
A 60m free-standing heavy duty lattice tower made from galvanised steel with matte finish including, self-supporting concrete footings.

Section 60 application no: HMS ID 1632, received 25/10/2022

As delegate of the Heritage Council of NSW (the Heritage Council), I have considered the above Section 60 application. Pursuant to section 63 of the *Heritage Act 1977*, approval is granted subject to the following conditions:

APPROVED DEVELOPMENT

1. All work shall comply with the information contained within:
 - a) Architectural drawings, prepared by Endeavour Energy as listed below:

Dwg No	Dwg Title	Date	Rev
Project Name: Prospect Reservoir Communications Tower - 52856			
Sheet 1 of 7	Drawing Title and Location Plan	14/12/2022	A
Sheet 2 of 7	Overall Site Plan	14/12/2022	A
Sheet 3 of 7	Overall Sectional View 1	14/12/2022	A
Sheet 4 of 7	Overall Sectional View 2	14/12/2022	A
Sheet 5 of 7	Detailed Site Plan	14/12/2022	A
Sheet 6 of 7	Detailed Site Plan - Elevations	14/12/2022	A
Sheet 7 of 7	Site Plan – Cut and fill	14/12/2022	A

Project Name: Pole Mounted Substation Site Plan – Cut and fill Huntington Comms Tower Relocation - 527137			
Sheet 1 of 3	Pole - Site Plan	19/10/2022	A
Sheet 2 of 3	Pole - Cabling diagrams	19/10/2022	A
Sheet 3 of 3	Pole - Plan and Elevation fill	19/10/2022	A

- b) Report: *Statement of Heritage Impact*, prepared by Heritage 21, dated 1 January 2023
- c) Report: *Visual Impact Assessment*, prepared by EMM Consulting, dated 31 January 2023
- d) Report: *Vegetation Management Plan*, prepared by Gingra Ecological Surveys, dated 1 January 2023

EXCEPT AS AMENDED by the conditions of this approval:

SITE PROTECTION

- 2. Significant built and landscape elements are to be protected from potential damage during site preparation and during construction. Protection systems must ensure significant fabric, including landscape elements, is not damaged or removed. Individual tree protection requirements shall be determined through consultation between the Project Manager and the Project Arborist prior to installation.

Reason: To ensure significant fabric including vegetation is protected during construction.

VEGETATION MANAGEMENT PLAN IMPLEMENTATION

- 3. The implementation of the recommendations at Section 5 of the Vegetation Management Plan listed in Schedule 1 are to be implemented to the satisfaction of the Lead Heritage Adviser at Sydney Water.

Reason: To mitigate the visual impact of the proposed tower on the cultural landscape.

PROJECT ARBORIST

- 4. A suitably qualified Project Arborist (AQF - Level 5) must be nominated for this project. The Project Arborist must provide input into tree protection measures, provide a detailed schedule of pruning, provide heritage information to be imparted to all arborists and tradespeople during site inductions, and oversee the works to minimise impacts to heritage values. During the site establishment stage the Project Arborist must provide a detailed assessment of the pruning requirements for work to significant trees.

Reason: So that appropriate advice is provided to support best practice conservation and ensure works are undertaken in accordance with this approval.

ARBORIST

- 5. All work to, or affecting, trees belonging to the significant Cumberland Woodland Community shall be carried out by suitably qualified tradespersons with practical experience in conservation and restoration of similar heritage structures, materials and construction methods.

Reason: So that the management of the significant landscape follows best heritage practice.

UNEXPECTED FINDS

- 6. The Applicant must ensure that if substantial intact archaeological deposits and/or State significant relics are discovered, work must cease in the affected area(s) and the Heritage Council of NSW must be notified. Additional assessment and approval may be required prior to works continuing in the affected area(s) based on the nature of the discovery.

Reason: All significant fabric within a State Heritage Register curtilage should be managed according to its significance. This is a standard condition to identify to the applicant how to

proceed if historical archaeological relics, or other unexpected buried discoveries such as works are identified during the approved project.

ABORIGINAL OBJECTS

7. Should any Aboriginal objects be uncovered by the work which is not covered by a valid Aboriginal Heritage Impact Permit, excavation or disturbance of the area is to stop immediately and Heritage NSW is to be informed in accordance with the *National Parks and Wildlife Act 1974*. Works affecting Aboriginal objects on the site must not continue until Heritage NSW has been informed and the appropriate approvals are in place. Aboriginal objects must be managed in accordance with the *National Parks and Wildlife Act 1974*.

Reason: This is a standard condition to identify to the applicant how to proceed if Aboriginal objects are unexpectedly identified during works.

COMPLIANCE

8. If requested, the applicant and any nominated heritage consultant may be required to participate in audits of Heritage Council of NSW approvals to confirm compliance with conditions of consent.

Reason: To ensure that the proposed works are completed as approved.

DURATION OF APPROVAL

9. This approval will lapse five years from the date of the consent unless the building works associated with the approval have physically commenced.

Reason: To ensure the timely completion of works

Advice

Section 148 of the *Heritage Act 1977* (the Act), allows people authorised by the Minister to enter and inspect, for the purposes of the Act, with respect to buildings, works, relics, moveable objects, places or items that is or contains an item of environmental heritage. Reasonable notice must be given for the inspection.

Right of Appeal

If you are dissatisfied with this determination appeal may be made to the Minister for Heritage under section 70 of the Act.

It should be noted that an approval under the Heritage Act is additional to that which may be required from other Local Government and State Government Authorities in order to undertake works.

Stamped documents

Any stamped documents (e.g. approved plans) for this application are available for the Applicant to download from the Heritage Management System at <https://hms.heritage.nsw.gov.au> under 'My Completed Applications.'

If you have any questions about this correspondence, please contact James Quoye, Senior Assessments Officer, at Heritage NSW on 9873 8612 or James.Quoye@environment.nsw.gov.au.

Yours sincerely

Michael Ellis
Manager Assessments
Heritage NSW
Department of Planning and Environment
As Delegate of the Heritage Council of NSW
21 February 2023

cc: Cumberland City Council: council@cumberland.nsw.gov.au

Sydney Water, Philip Bennett: philip.bennett@sydneywater.com.au

PROSPECT RESERVOIR - COMMUNICATIONS TOWER

DWG No.	DWG TITLE
SHEET 1	DRAWING TITLE AND LOCATION PLAN
SHEET 2	OVERALL SITE PLAN
SHEET 3	OVERALL SECTIONAL VIEW 1
SHEET 4	OVERALL SECTIONAL VIEW 2
SHEET 5	DETAILED SITE PLAN
SHEET 6	DETAILED SITE PLAN - ELEVATIONS
SHEET 7	SITE PLAN - CUT & FILL



PROSPECT RESERVOIR

LOCATION OF WORKS

LOCATION PLAN

HERITAGE ACT 1977
APPLICATION UNDER SECTION 60
 Application No: HMS 1632
 Approved by: the Heritage Council of NSW
 Delegated Authority
 On: 21/02/2023
 These plans should be read in conjunction with
 the decision notice

 (for) Delegate
 Heritage Council

AMENDMENTS	DESIGNER	CHECKED	DATE
1	PJB	PJB	14/12/22

CONCEPT DESIGN

DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			



PROSPECT RESERVOIR
 COMMUNICATIONS TOWER
 DRAWING TITLE AND LOCATION PLAN

DO NOT SCALE DIMENSIONS IN MILLIMETRES		REFERENCE DRAWINGS
A1	528567	DESIGN MANAGER CIVIL & SECONDARY
SHEET No 1 OF 7 SHEETS		



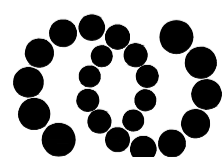
HERITAGE ACT 1977
APPLICATION UNDER SECTION 60
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 Heritage Council

OVERALL SITE PLAN
 SCALE 1:500

CONCEPT DESIGN

DESIGNED		PJB	DATE	14/12/22
DRAWN		PJB		
CHECKED				

 **Endeavour Energy**


PROSPECT RESERVOIR
 COMMUNICATIONS TOWER
 OVERALL SITE PLAN

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DESIGN MANAGER CIVIL & SECONDARY		AUTHORISED/CERTIFIED
A1	528567	
SHEET No 2 OF 7 SHEETS		

AMENDMENTS	DESIGN JOB	DESIGNER	DATE	REASON
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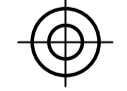


VIEW
SCALE 1:250

HERITAGE ACT 1977
APPLICATION UNDER SECTION 60
 Application No: HMS 1632
 Approved by: the Heritage Council of NSW
 Delegated Authority
 On: 21/02/2023
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 Heritage Council

AMENDMENTS	
DESIGN JOB	DESIGN JOB
DRN	DRN
CHKD	CHKD
APPD	APPD
HISTORY	
REVISION A	ORIGINAL ISSUE

CONCEPT DESIGN

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PROSPECT RESERVOIR COMMUNICATIONS TOWER OVERALL SECTIONAL VIEW 1		528567	
		SHEET No 3 OF 7 SHEETS	



VIEW X
SCALE 1:250

HERITAGE ACT 1977
APPLICATION UNDER SECTION 60
 Application No: HMS 1632
 Approved by: the Heritage Council of NSW
 Delegated Authority
 On: 21/02/2023
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 Heritage Council

AMENDMENTS	DESIGNER	CHECKED	DATE
1	DESIGNER	DESIGNER	14/12/22
2	DESIGNER	DESIGNER	14/12/22
3	DESIGNER	DESIGNER	14/12/22
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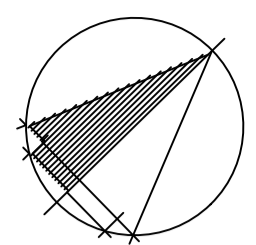
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DRAWN	PJB		
CHECKED			

Endeavour Energy

PROSPECT RESERVOIR
 COMMUNICATIONS TOWER
 OVERALL SECTIONAL VIEW 2

DO NOT SCALE DIMENSIONS IN MILLIMETRES	AUTHORISED/CERTIFIED
DESIGN MANAGER CIVIL & SECONDARY	
A1	528567
SHEET No 4 OF 7 SHEETS	



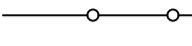

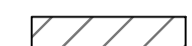

CONCEPT DESIGN



CONCRETE HEADWALL AND RIP RAP SECTION AS PER AUSTRALIAN STANDARDS AND COUNCIL REQUIREMENTS

STORMWATER PIT FOR SITE DRAINAGE

LEGEND:

-  - COMMS HUT BASE FRAME TO EARTH GRID CONNECTION
-  - EXISTING DUCTILE IRON PIPE 100mm DIA. 600mm-800mm DEEP. TO BE CONCRETE ENCASED
-  - PROPOSED CHAIN WIRE FENCE
-  - 100mm THICK GRAVEL SURFACE,
-  - HEAVY DUTY RIGID PAVEMENT
-  - FLEXIBLE/ASPHALT PAVEMENT
- E.R.L. - EXISTING REDUCE LEVEL
- P.R.L. - PROPOSED REDUCED LEVEL

2.8m HIGH CHAIN WIRE FENCE WITH STRANDS OF BARBED WIRE ON REINFORCED CONCRETE FILLED BLOCKWORK RETAINING WALL

UNDERGROUND CABLE ROUTE FROM NEW POLE TO COMMS/EQUIP BUILDING

COMMS/EQUIPMENT BUILDING PROVIDE AN ENGINEER APPROVED FOOTING DESIGN FOR REVIEW AND APPROVAL BY ENDEAVOUR ENERGY

PROPRIETRY CABLE LADDER FROM TOWER TO COMMS/EQUIPMENT BUILDING

EXISTING DUCTILE IRON PIPE (DICI) APPROX. Ø100, 600-800mm DEEP (NOT SHOWN IN DIAL BEFORE YOU DIG REPORT) INDICATIVE ONLY TBC. SEEK SYDNEY WATER APPROVAL BEFORE CONCRETE ENCASING THE EXISTING PIPE.

TOWER SETOUT POINT

2.8m HIGH CHAIN WIRE FENCE WITH 4 STRANDS OF BARBED WIRE ON 300mm WIDE x 250mm DEEP FIBRECRETE MOWING STRIP. REFER TO MINIMUM REQUIREMENTS.

TOWER FOOTINGS: PROVIDE AN ENGINEER APPROVED TOWER FOUNDATION DESIGN FOR REVIEW AND APPROVAL BY ENDEAVOUR ENERGY

NEW 60m HEAVY DUTY FREE STANDING LATTICE TOWER C1403 FROM FLIGHT BROS. MATTE FINISH HOT DIP GALVANISED.


WHOLE COMPOUND TO BE FILLED WITH COMPACTED SUBGRADE AND 100mm THICK LAYER OF GRAVEL REFER TO MINIMUM REQUIREMENTS

FLEXIBLE/ASPHALT PAVEMENT CARPARKING

HEAVY DUTY RIGID PAVEMENT

TO EXISTING WATER TANKS



DETAILED SITE PLAN
SCALE 1:50

HERITAGE ACT 1977
APPLICATION UNDER SECTION 60
Application No: HMS 1632
Approved by: the Heritage Council of NSW
Delegated Authority
On: 21/02/2023
These plans should be read in conjunction with the decision notice

(for) Delegate
Heritage Council

AMENDMENTS	DESIGNER	DATE

REVISION A	DATE

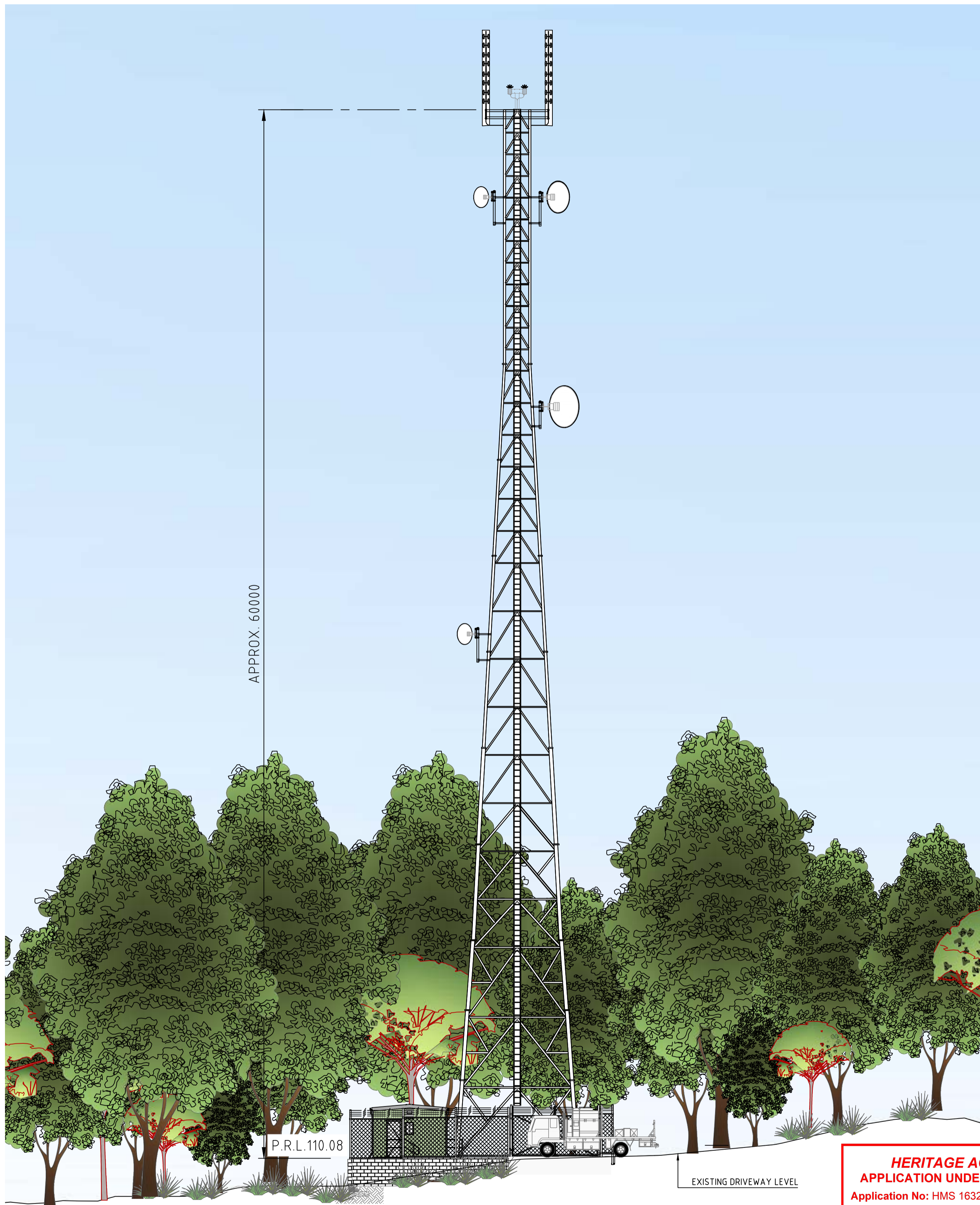
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DESIGNED	PJB	DATE	14/12/22
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DESIGN MANAGER CIVIL & SECONDARY			
A1	528567	SHEET No 5 OF 7 SHEETS	

PROSPECT RESERVOIR
COMMUNICATIONS TOWER
DETAILED SITE PLAN



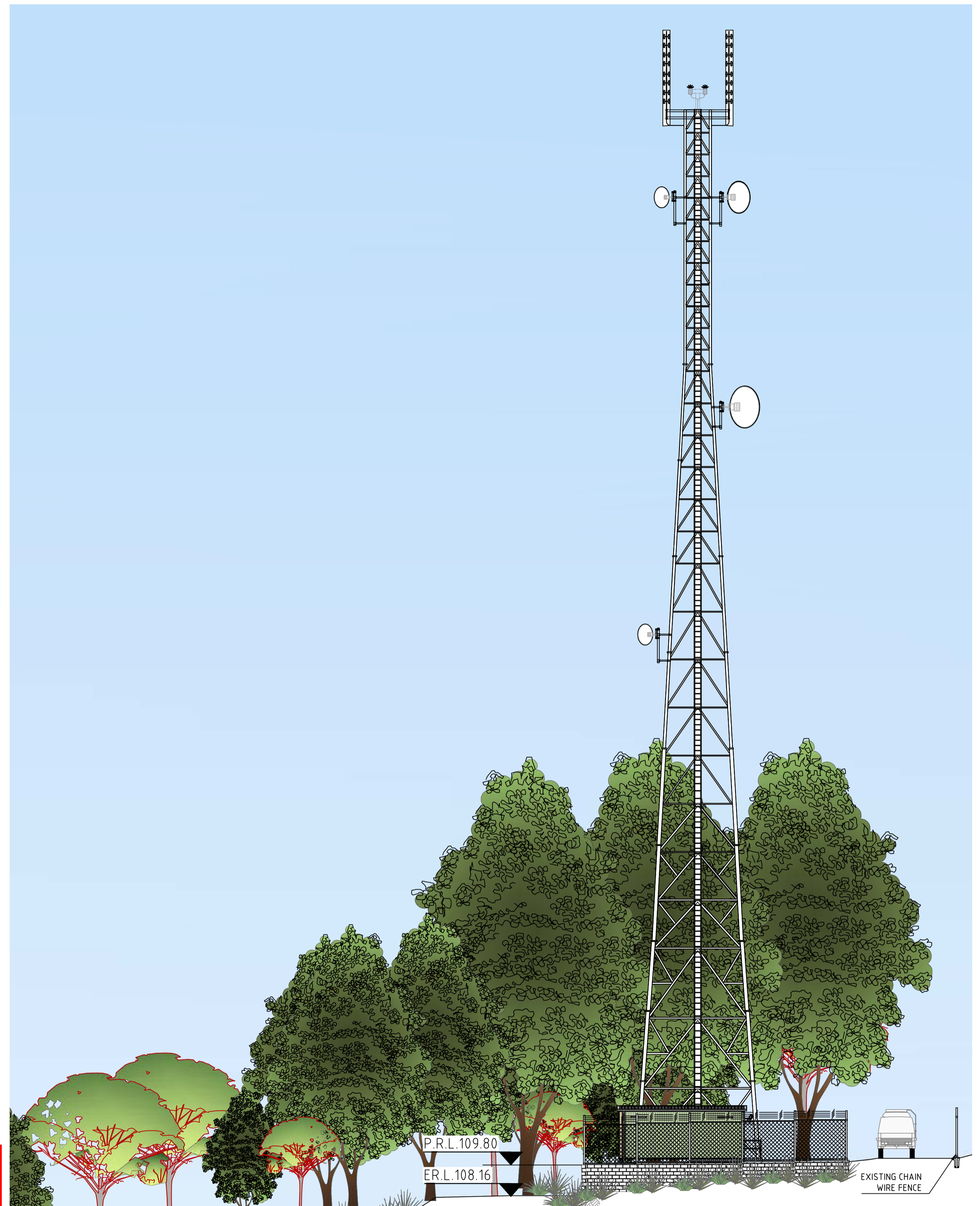
APPROX. 60000

P.R.L. 110.08

EXISTING DRIVEWAY LEVEL

VIEW X
SCALE 1:150

**HERITAGE ACT 1977
APPLICATION UNDER SECTION 60**
Application No: HMS 1632
Approved by: the Heritage Council of NSW
Delegated Authority
On: 21/02/2023
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the decision notice
[Signature]
(for) Delegate
Heritage Council



P.R.L. 109.80

E.R.L. 108.16

EXISTING CHAIN WIRE FENCE

VIEW Y
SCALE 1:150

CONCEPT DESIGN

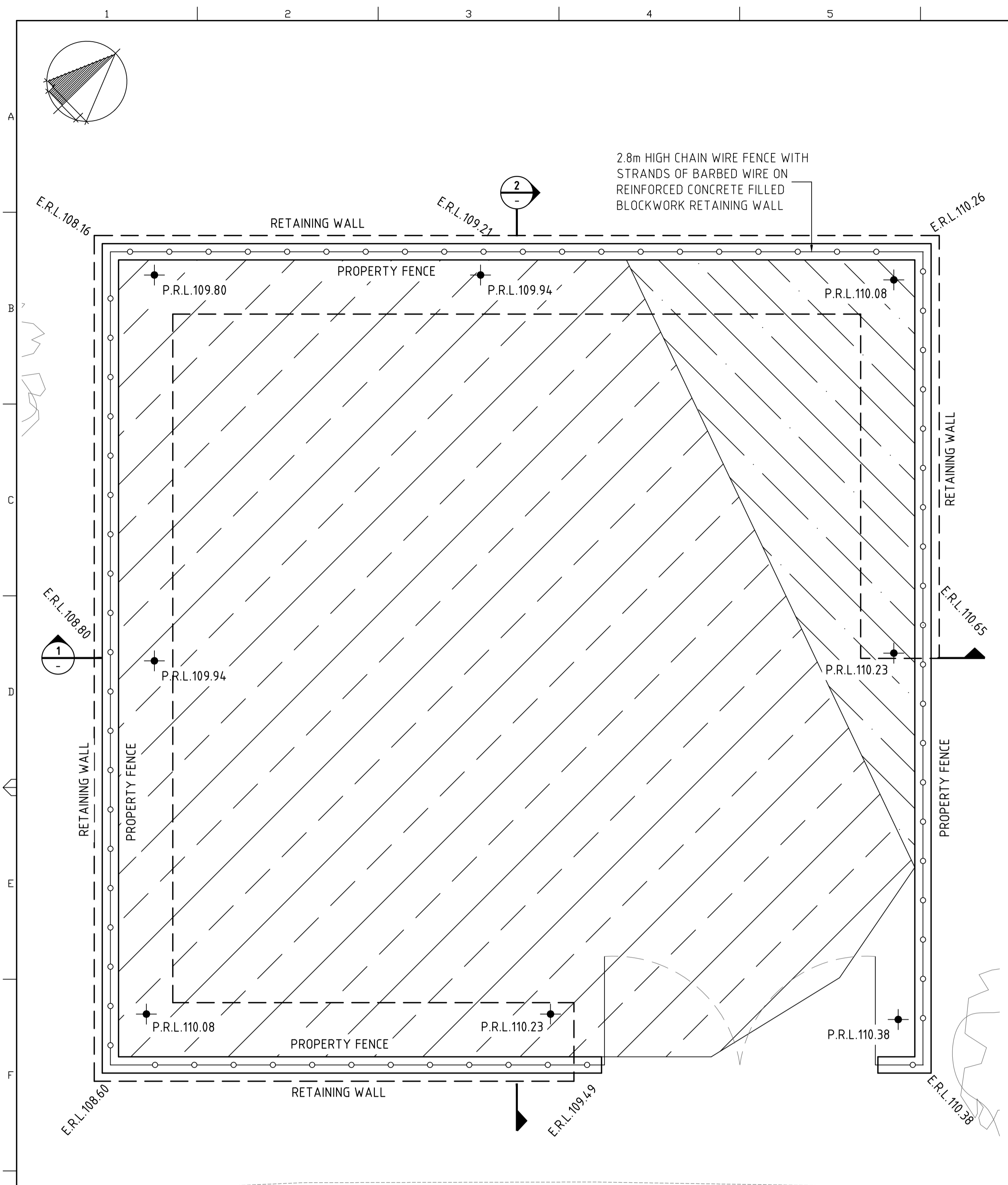
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1	DESIGN	14/12/22
2	DRAWN	
3	CHECKED	
4	APPROVED	

DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			


Endeavour Energy

PROSPECT RESERVOIR
COMMUNICATIONS TOWER
DETAILED SITE PLAN - ELEVATIONS

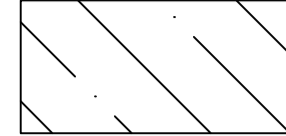
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SHEET No 6 OF 7 SHEETS	

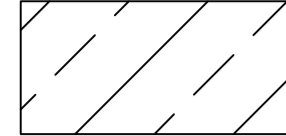


COMPOUND EARTHWORKS PLAN
SCALE 1:50

HERITAGE ACT 1977
APPLICATION UNDER SECTION 60
 Application No: HMS 1632
 Approved by: the Heritage Council of NSW
 Delegated Authority
 On: 21/02/2023
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 Heritage Council

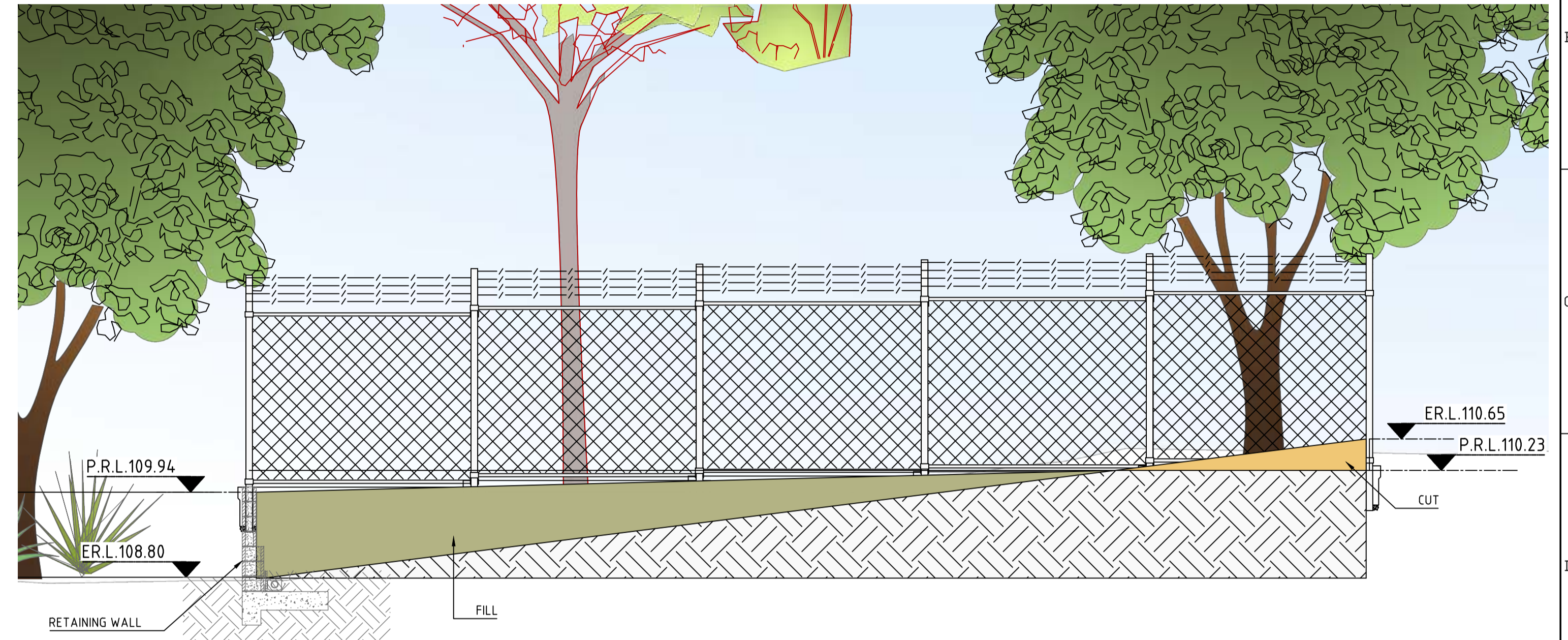
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 CUT

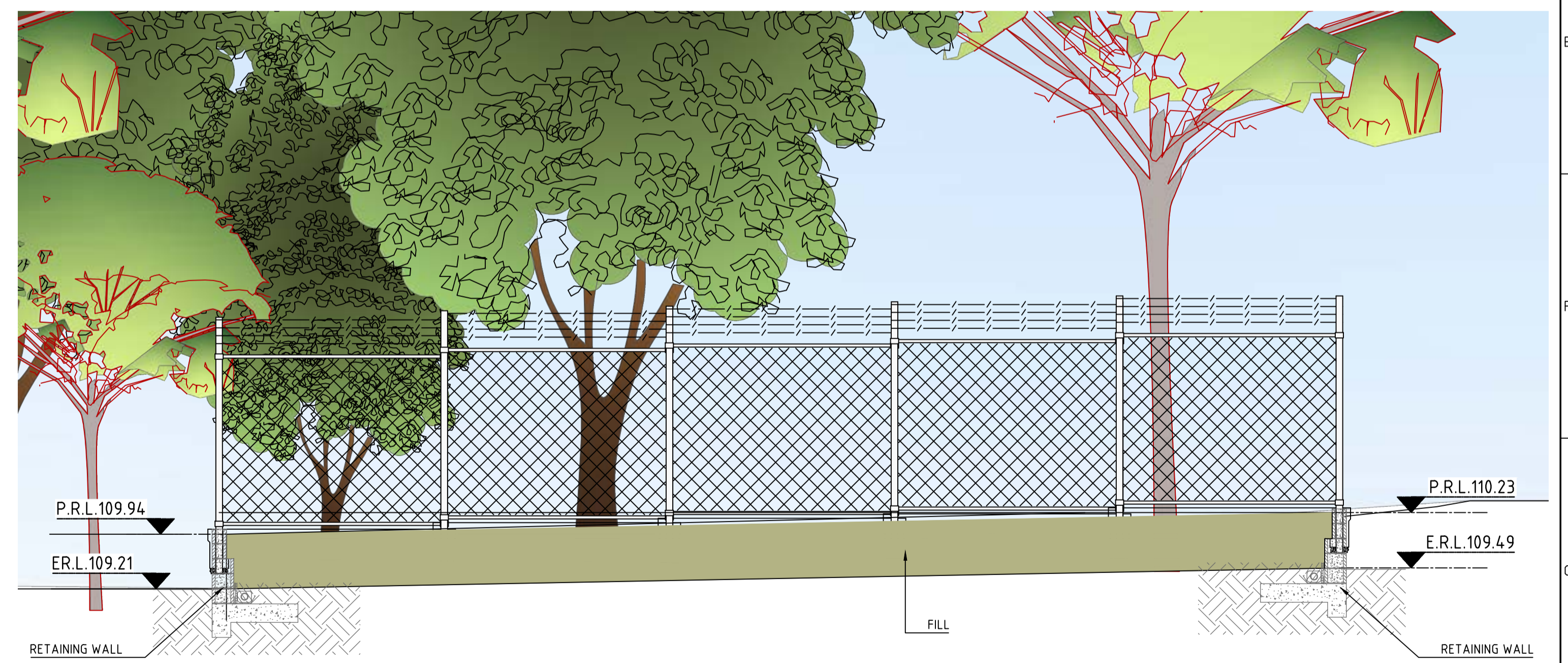
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E.R.L. - EXISTING REDUCE LEVEL

P.R.L. - PROPOSED REDUCE LEVEL



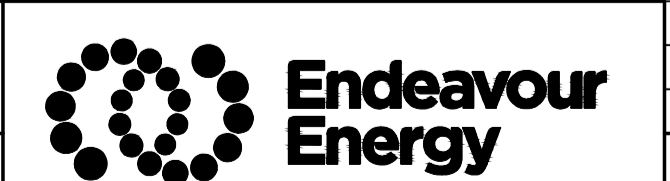
SECTION 1
SCALE 1:50



SECTION 2
SCALE 1:50

AMENDMENTS	DESIGN	DATE
1	DESIGN	14/12/22
2	REVISED	
3	REVISED	

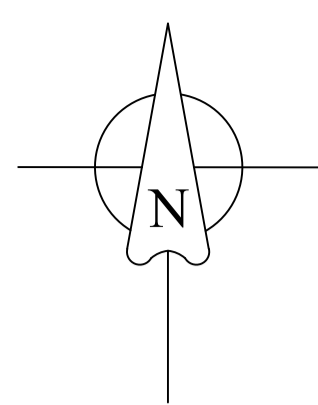
DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
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PROSPECT RESERVOIR
 COMMUNICATIONS TOWER
 SITE PLAN - CUT & FILL

DO NOT SCALE DIMENSIONS IN MILLIMETRES		AUTHORISED/CERTIFIED	
A1		528567	
		SHEET No 7 OF 7 SHEETS	

CONCEPT DESIGN



ENDEAVOUR ENERGY CONTACT	
NAME	CONTACT No.
DESIGN: M JANIF	0472723705
CONSTRUCTION: T.KIDD	0401470936



LOCALITY PLAN
NTS

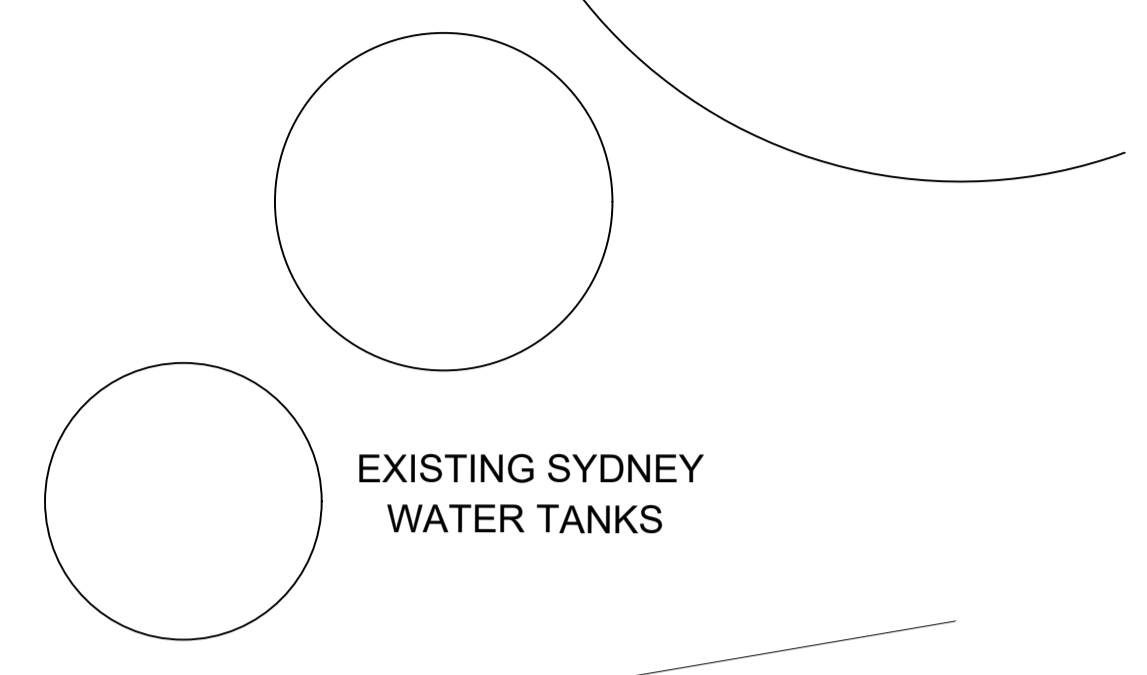
OPERATIONAL LIMITATIONS
UNLESS APPROVED OTHERWISE, INTERRUPTIONS TO ANY CUSTOMERS SUPPLY MUST BE AVOIDED. THE FOLLOWING ALTERNATIVES SHOULD BE CONSIDERED:
- LIVE LINE WORK;
- DESIGN ALTERNATIVES;
- WORK PRACTICES / STANDARDS;
- LOW VOLTAGE PARRALLELS
THIS COST TO BE FUNDED BY THE DEVELOPER.

ATTENTION
ALL SERVICES SEARCHES MUST BE CHECKED BEFORE CONSTRUCTION.

- NOTES**
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT ENDEAVOUR ENERGY NETWORK STANDARDS AND CONNECTION POLICY.
 - DO NOT PLACE ANY RELIANCE ON ANY QUANTITIES OR DIMENSIONS GIVEN IN THIS DRAWING. QUANTITIES AND DIMENSIONS ON THIS DRAWING ARE BASED ON DESIGN INFORMATION AND SITE CONDITIONS AT THE TIME OF DESIGN. AS QUANTITIES AND DIMENSIONS ARE SUBJECT TO CHANGE, THE BUILDER OF THIS PROJECT MUST CHECK ALL QUANTITIES AND DIMENSIONS ON SITE PRIOR TO TENDERING AND PRIOR TO CONSTRUCTION.
 - ATTENTION:
THE PREPARATION OF THIS DESIGN HAS BEEN UNDERTAKEN GIVING DUE CONSIDERATION TO THE EXISTING SERVICES. THE PROJECT CONSTRUCTOR IS, HOWEVER, WHOLLY RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF EXISTING SERVICES AND PERMANENT SURVEY MARKS BEFORE CONSTRUCTION COMMENCES, AND NO RESPONSIBILITY NOR LIABILITY WILL BE ACCEPTED BY THE DESIGNER OF THIS PROJECT FOR DAMAGE TO EXISTING SERVICES AS A RESULT OF THIS DESIGN AND/OR POLE PEGGING.
 - REDUNDANT ENDEAVOUR ENERGY MATERIALS TO BE RETURNED TO CLOSEST ENDEAVOUR ENERGY DEPOT.
 - PROPERTY OWNERS(SYDNEY WATER) ARE TO BE CONSULTED REGARDING SITE ACCESS PRIOR TO WORK COMMENCING.
 - ALL CUSTOMERS ARE TO BE CONTACTED REGARDING OUTAGE ARRANGEMENTS PRIOR TO CONSTRUCTION WORK COMMENCING. THE REQUIRED NOTICE IS TO BE IN ACCORDANCE WITH THE NATIONAL ENERGY CUSTOMER FRAMEWORK (NECF) TIME FRAMES
 - CUSTOMER TO ARRANGE FOR THE INSTALLATION & CONNECTION OF NEW SERVICE MAINS & DISCONNECTION OF EXISTING SERVICE MAINS BY A LEVEL 2 ACCREDITED SERVICE PROVIDER. ALL SERVICE WORK TO BE INSTALLED IN ACCORDANCE WITH AS3000:2007 AND THE NSW SERVICE AND INSTALLATION RULES.
 - IF FOR ANY REASON, THE PROPOSED POLE LOCATION OR UG ASSETS REQUIRE ADJUSTMENT, PLEASE CONTACT MAINS DESIGN FOR ADVICE. THIS IS CRUCIAL TO ENSURE APPROPRIATE SEPARATIONS / CLEARANCES ARE MAINTAINED WITHIN EXISTING EASEMENTS.
 - AN EASEMENT FOR UNDERGROUND CABLES 1 METER WIDE IS REQUIRED OVER THE LOT 304/DP 1122291. REFER SHEET 2
 - AN EASEMENT FOR 33KV OVERHEAD POWER LINES 9 METER WIDE IS REQUIRED OVER THE LOT 304/DP 1122291. REFER SHEET 2.
 - CONTRACTOR SHALL PEG THE UG ALIGNMENT PRIOR TO WORKS. DESIGN TEAM CAN BE CONTACTED FOR DESIGN ALIGNMENT IN CAD.

SITE PLAN LEGEND **SITE PLAN:**
(SCALE - 1:500)

- EXISTING OVERHEAD MAINS 33kV FDR 4/35
- EXISTING UNDERGROUND MAINS
- - - NEW OVERHEAD MAINS
- - - NEW LV TRENCH
- ⊗ TREES INDICATIVE
- EXISTING POLE LOCATION
- NEW POLE LOCATION
- ⊕ NEW POLE MOUNTED SUBSTATION
- NEW LV PILLAR
- w- SYDNEY WATER DUCTILE IRON PIPE (DICI)



WORK SITE TRAFFIC MANAGEMENT:
A TRAFFIC CONTROL PLAN AS WELL AS ADVANCED WARNING AREAS ARE TO BE IN PLACE BEFORE CONSTRUCTION WORK COMMENCES. REFER ENDEAVOUR ENERGY TRAFFIC MANAGEMENT MANUAL TMM0001

WARNING
UNDERGROUND SERVICES ARE LOCATED IN THE VICINITY OF THE PROPOSED WORKS. A DIAL-BEFORE-YOU-DIG SEARCH IS TO BE PERFORMED 2 DAYS PRIOR TO CONSTRUCTION. IT IS RECOMMENDED THAT ALL SERVICES SHOULD BE LOCATED USING NON-DESTRUCTIVE TECHNIQUES BEFORE WORKS BEGIN.

ENVIRONMENTAL AWARENESS
WORKS TO BE COMPLETED IN CONJUNCTION WITH ENDEAVOUR ENERGY'S ENVIRONMENTAL GUIDELINES HANDBOOK 2017. ALL PROJECT MANAGERS, CONTRACT INSPECTORS AND CONSTRUCTION CREWS ARE TO BE MADE AWARE OF THE CONTENTS PRIOR TO ANY SITE VISITS OR CONSTRUCTION WORKS COMMENCING. COPIES OF THE DOCUMENTATION ARE TO BE AVAILABLE ON SITE AND ACCESSIBLE AT ALL TIMES FOR THE DURATION OF THE PROJECT. USE SILT TRAPS/SOCKS OR OTHER APPROVED METHODS TO PREVENT RUN-OFF ENTERING DRAINS AND STORMWATER CHANNELS. REFER EMS 0002-POLLUTION CONTROL PROCEDURE

NOTE
ACCESS TO WORKSITE VIA SYDNEY WATER GATES G1 OR J2 REQUIRE ENDEAVOUR ENERGY ABLOY KEY

WORK METHOD STATEMENT REFERENCE
The contents of this table are an indication only, and the required Work Method Statements may not be limited to those listed here.

WMS No.	TASK NAME
Index of SWMS	Index of Safe Work Method Statements
SRMH 12	SRMH 15 - Vegetation Management
SWM 01.001	Traffic Management
SWM 01.004am01	Excavation Work (Trenching, Boring, etc)
SWM 01.008	Deep Earth Boring
SWM 01.015	Working at Heights (use of work platforms, Guardrails, Fall Arrest Systems, etc.)
SWM 03.008am01	Construct Single Pole Substation
SWM 03.011am01	Earth Testing (Separate, Common, SWER)
SWM 05.008	Install/Replace Cable Guard
SWM 05.010am02	Install / Replace Underground Cables (including cut and cap)
SWM 05.011	Termination of Underground Cables
SWM 06.005am03	Erect New / Change Pole (Includes all Comdemned Poles)
SWM 07.001am01	Transmission and Distribution Switching (Overhead Mains)
SWM 13.001am01	Recording of Underground Assets (Cables & Ducts)
SWM 13.002am01	Inspection & Commissioning of Network Assets (Overhead)
SWM 13.003am01	Inspection and Commissioning of Network Assets (Underground)

WORKS COMPLETED/FIELD BOOK

CONSTRUCTED BY: _____

WORKS COMPLETED: _____

SIGNATURE: _____ DATE: _____

INSPECTED BY: _____

SIGNATURE: _____ DATE: _____

ASSET RECORDING

I: _____

OF: _____

CONTACT No.: _____

HEREBY CERTIFY THAT ASSETS MARKED AS BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOUR ENERGY STANDARD S4D 0004

SIGNATURE: _____

DATE: _____

DESIGN COMPLIANCE AND INDEMNITY

This design complies with Endeavour Energy's relevant standards as current at this time and as listed on the Endeavour Energy Accredited Service Provider's Internet site. These standards include, but are not limited to:

- CP: Connection Policy
- EMS: Environmental Management Standard
- MCI: Mains Construction Instruction
- MDI: Mains Design Instruction
- PDI: Protection Design Instruction
- SDI: Substation Design Instruction
- S4D 0001: Design Drawing Standard
- MMI: Mains Maintenance Instruction
- SMI: Substation Maintenance Instruction
- LDI 0001: Public Lighting Electrical Design Element

Additionally, where relevant, the design complies with AS/NZS 7000 "Overhead Line Design - Detailed Procedures" published by The Australian Standards.

ENDEAVOUR ENERGY indemnifies Endeavour Energy for any loss or damage resulting from non-compliance of the design with the above standards.

Signed: _____
Name: MOHAMMED JANIF
Service Provider Number: 1149 Date: 19/10/22

WARNING
LIVE ELECTRICAL CABLES IN THIS AREA
CONTACT NETWORK DATA,
HUNTINGWOOD DR, HUNTINGWOOD
TELEPHONE 9853-4161 FOR
CABLE SEARCHES PRIOR TO EXCAVATION

WARNING
LIVE ENDEAVOUR ENERGY CABLES & OTHER SERVICES IN THIS AREA. PLEASE CONTACT DIAL BEFORE YOU DIG ON TEL: 1100 FOR SEARCHES TWO DAYS PRIOR TO EXCAVATION.

WARNING
LIVE ENDEAVOUR ENERGY CABLES & OTHER SERVICES IN THIS AREA. PLEASE CONTACT DIAL BEFORE YOU DIG ON TEL: 1100 FOR SEARCHES TWO DAYS PRIOR TO EXCAVATION.

NOTE:
NO JEMENA GAS WEST/NBN/TELECOMMUNICATION /SYDNEY WATER ASSETS ARE BEING AFFECTED BY THE ELECTRICAL WORKS. THERE IS A CONCRETE AND STEEL 100MM DCLP PIPE RUNNING THROUGH UNDERNEATH THE TOWER SITE TOWARDS THE PROPOSED POLE SUBSTATION SITE. NOT SHOWN IN DIAL BEFORE YOU DIG SEARCHES.

DUCT BREAKDOWN TABLE
ALL TRENCH SECTIONS ARE TO BE READ & VIEWED FROM NODE TO NODE AS NOMINATED

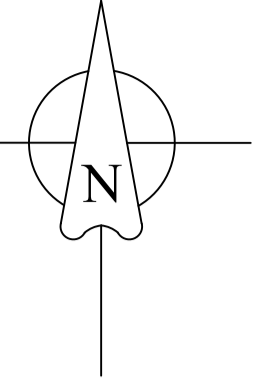
Route	Configuration	Route Length (m)
A - B	(New Duct) TRENCH & INSTALL 2 x 125mm PVC & 2 x 50mm PVC DUCTS	7m
B - C	(New Duct) TRENCH & INSTALL 2 x 125mm PVC & 2 x 50mm PVC DUCTS	63m
TOTAL		70m

LEGEND

- SPARE DUCT
- DUCT WITH NEW CABLE
- ⊙ DUCT WITH EXISTING CABLE
- DIRECT BURIED CABLE
- ABANDONED CABLE
- ⊕ NEW TRENCH
- ⊕ EXISTING TRENCH
- UNDERBORE

306909.2660	6255578.2840	1001686	7m	20°	66T+POLE SUB	TYPE 4 OHEW	SUB-SINGLE CUSTOMER	750	2.5	17m/12kN (TIMBER)	-	C	-	-	X	-	-	2			
			728305		33UGOH(EX)+TEE	EX+TYPE 4 OHEW	-				EX	-	-	-	X	-	-	1			
EASTING		NORTHING		NEW	EXISTING	SPAN LENGTH	LINE DEV DEGREES	33kV	OHEW/OPGW	LV	DIA mm	DEPTH m	TYPE (LENGTH /STRENGTH)	STAY	FOOTING	RELOCATE	REPLACE	NEW	EXISTING	REMOVE	DESIGN NUMBER
STAKING (CO-ORDINATES IN MGA56)				FIELD POLE NUMBER	CONSTRUCTION				HOLE		POLE										

HERITAGE ACT 1977 APPLICATION UNDER SECTION 60
Application No: HMS 1632
Approved by: the Heritage Council of NSW Delegated Authority
On: 21/02/2023
These plans should be read in conjunction with the decision notice
(for) Delegate Heritage Council



FINAL 33kV CIRCUIT

NOT TO SCALE

- EXISTING TR OVERHEAD MAINS FDR 435 - BLACKTOWN TO BOSSLEY PARK TEE QUARRIES
- - - EXISTING TR UNDERGROUND MAINS FDR 435 - BLACKTOWN TO BOSSLEY PARK TEE QUARRIES
- - - ERECT 3 x 7/4.50 AAC 'MERCURY' CONDUCTOR (BETWEEN POLES '1' AND '2')
R.L. 7m C.L. 30m. SLACK SPAN (TENSION @ 2% CBL @ 5°C TABLE 1)

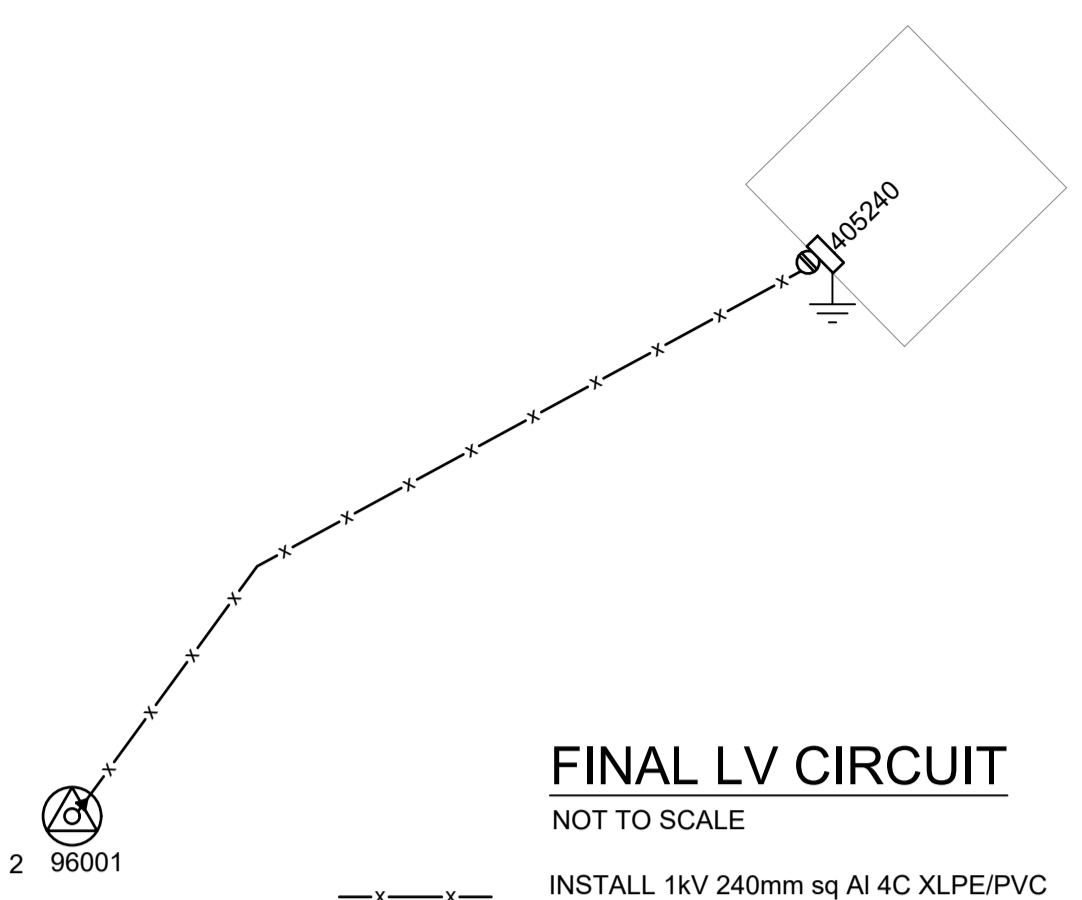
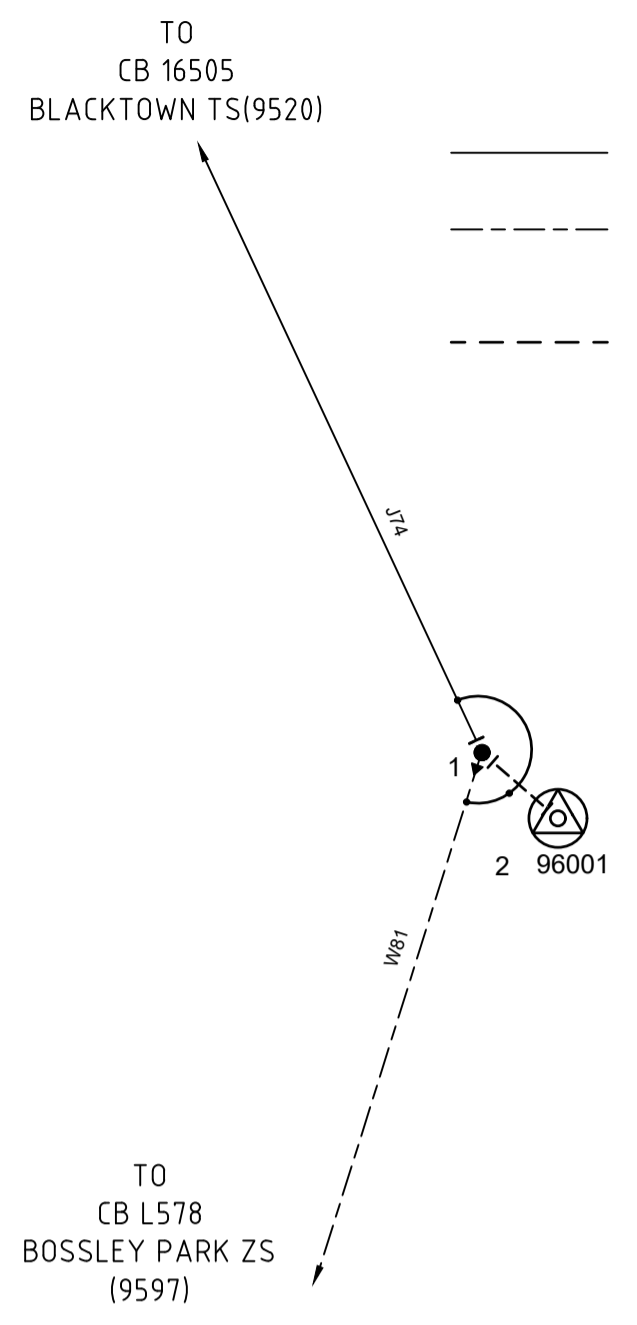
SAP DATA URBAN OH SUB 96001	
HV DOF	231947
TRF 1	10004450
LV ISOLATOR	231948
LV BUSBAR	37528
F1 - FUSE LABEL	403332
F2 - FUSE LABEL	

TR CONDUCTOR REFERENCE	
CODE	SIZE & TYPE
J74	2 x 19/3.25 AAC (2 x 19/0.128) 2 x (OH) 33 kV
W81	630mm2 Cu 1C XLPE/PVC/HDPE Screened (UG) 33kV

FINAL LV CIRCUIT

NOT TO SCALE

- - - INSTALL 1kV 240mm sq Al 4C XLPE/PVC
R.L.63m CL:80m



CONDUCTOR STRINGING TABLE 1										
STRAIN SECTION	POLE '1' TO '2'		TENSION (%CBL) @ 5°C							2%
DESIGN SPAN	POLE '1' TO '2'		RULING SPAN (m)							7.0
CONDUCTOR	1 x 7/4.50 AAC 'MERCURY' (NO CREEP COMPENSATION REQUIRED)									
TEMPERATURE (°C)	0	5	10	15	20	25	30	35	40	
TENSION (kN)	0.65	0.34	0.24	0.19	0.16	0.15	0.13	0.12	0.11	
SAG (m)	0.03	0.05	0.07	0.08	0.10	0.11	0.12	0.13	0.14	

ATTENTION
REGIONAL STAFF TO NOTIFY NETWORK DATA DAILY WHEN CABLE WORK IS IN PROGRESS.
TELEPHONE: EXT. - 0298536664 or 0478403699

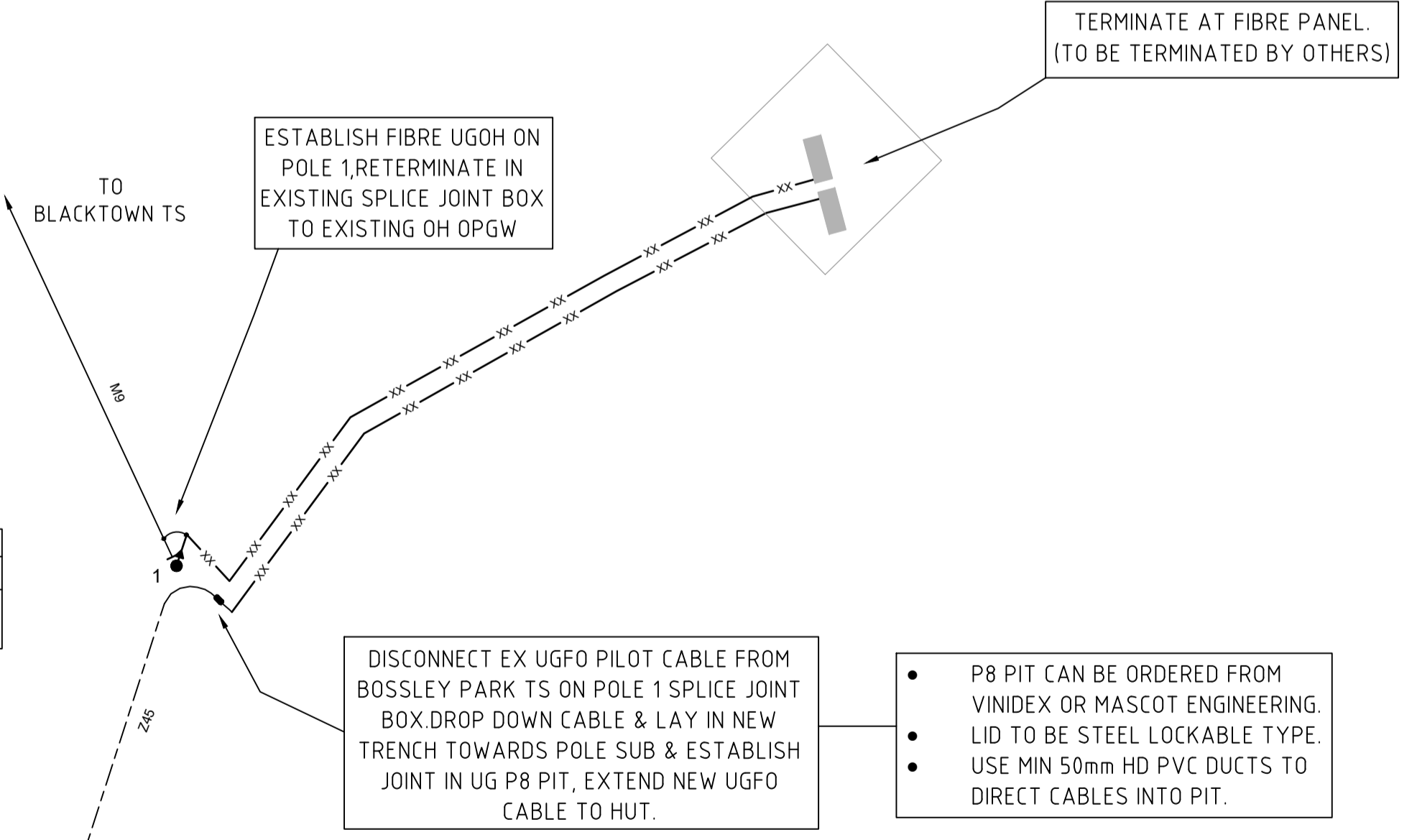
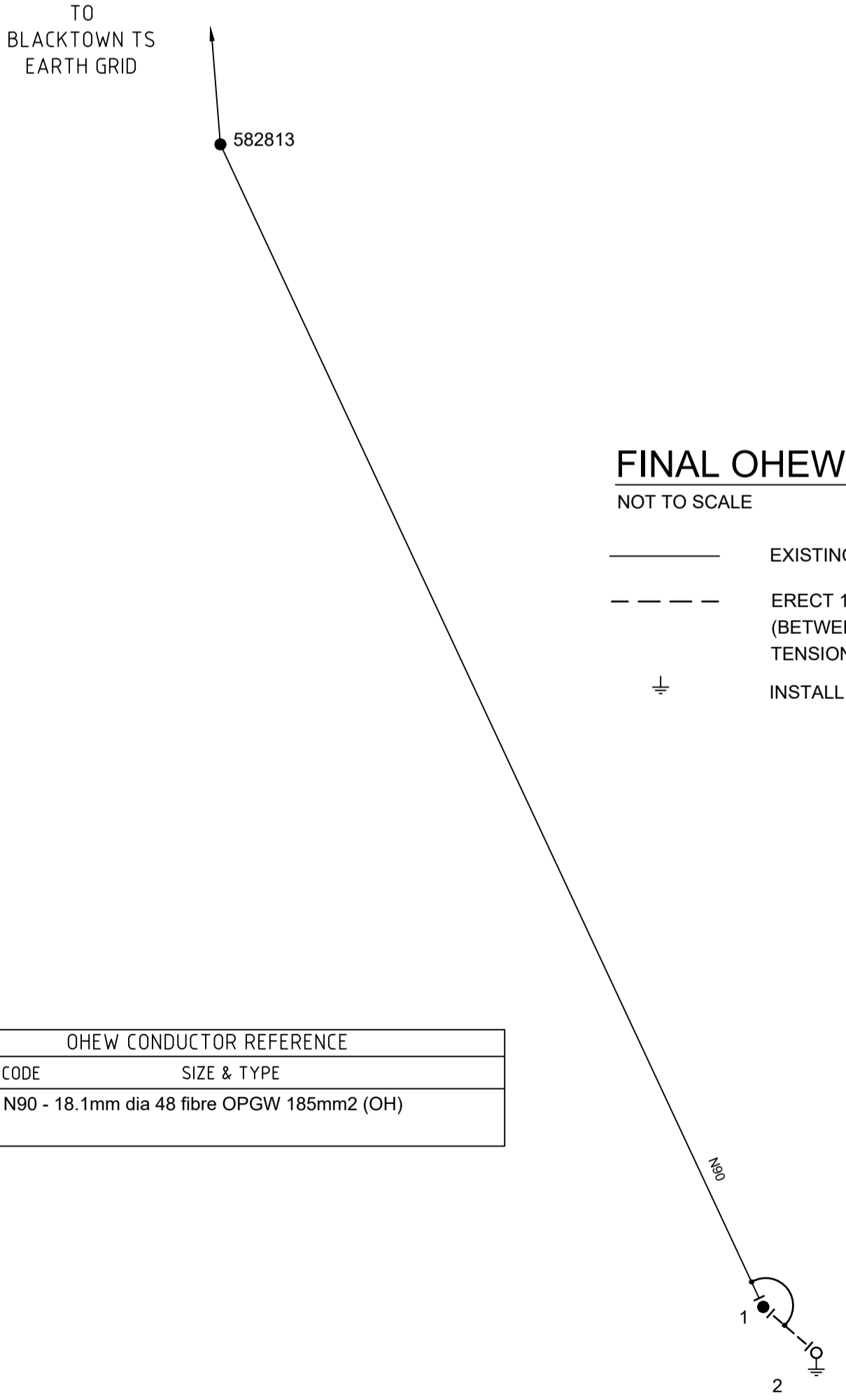
FINAL OHEW & EARTHING CIRCUIT

NOT TO SCALE

- EXISTING OHEW
- - - ERECT 1 x 7/4.50 AAC 'MERCURY' OHEW CONDUCTOR (BETWEEN POLES '1' AND '2') R.L. 7m C.L. 10m TENSION @ 2% CBL @ 5°C TABLE 1
- + INSTALL 33kV POLE/SUBSTATION EARTH (REFER EARTHING DIAGRAM)

OHEW CONDUCTOR REFERENCE	
CODE	SIZE & TYPE
N90	18.1mm dia 48 fibre OPGW 185mm2 (OH)

ADSS/COMMS CONDUCTOR REFERENCE	
CODE	SIZE & TYPE
M9	48 core OPGW (18.1mm dia)
Z45	60 core UGFO pilot



FINAL FIBRE CIRCUIT

NOT TO SCALE

- - - INSTALL FIBRE OPTIC 144 CORE CABLE FROM: UG/OH POLE 1 TO PROPOSED COMMS HUT
R.L - 70 m C.L - 220m
- JOINT/SPLICE

HERITAGE ACT 1977
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(for) Delegate
Heritage Council

WORKS COMPLETED/FIELD BOOK

CONSTRUCTED BY: _____

WORKS COMPLETED: _____

SIGNATURE: _____ DATE: _____

INSPECTED BY: _____

SIGNATURE: _____ DATE: _____

ASSET RECORDING

I: _____

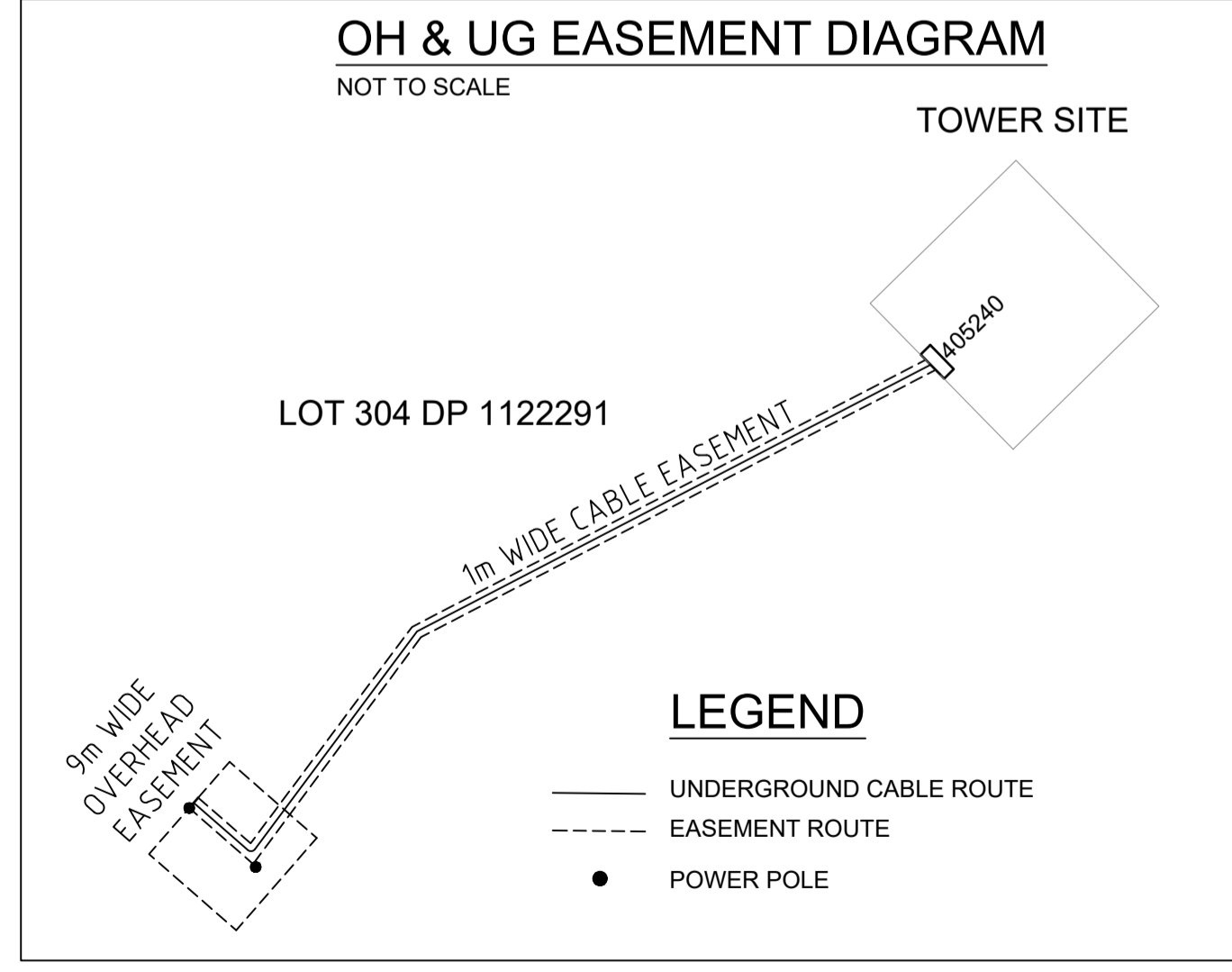
OF: _____

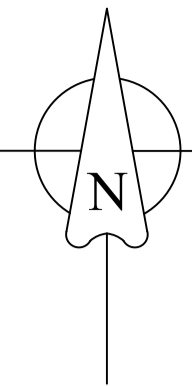
CONTACT No.: _____

HEREBY CERTIFY THAT ASSETS MARKED AS-BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOUR ENERGY STANDARD SAD 0004.

SIGNATURE: _____

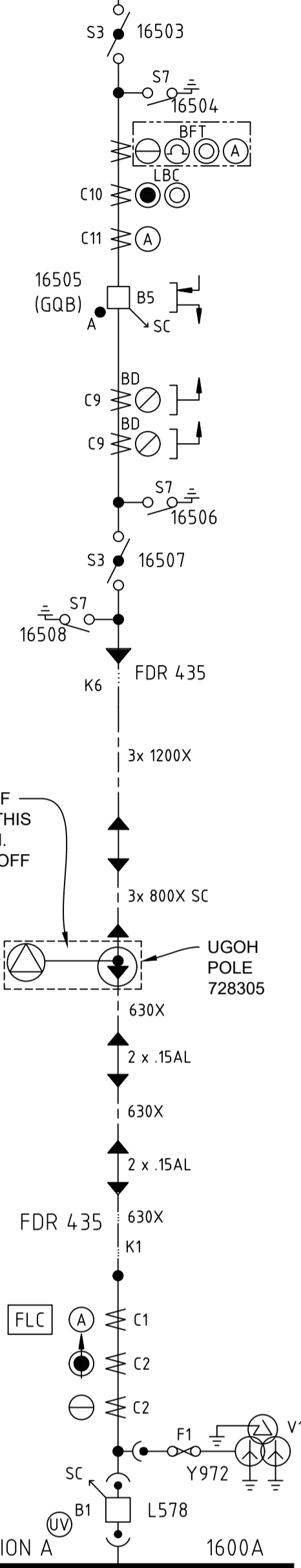
DATE: _____





33kV FDR 435 LLD
NTS

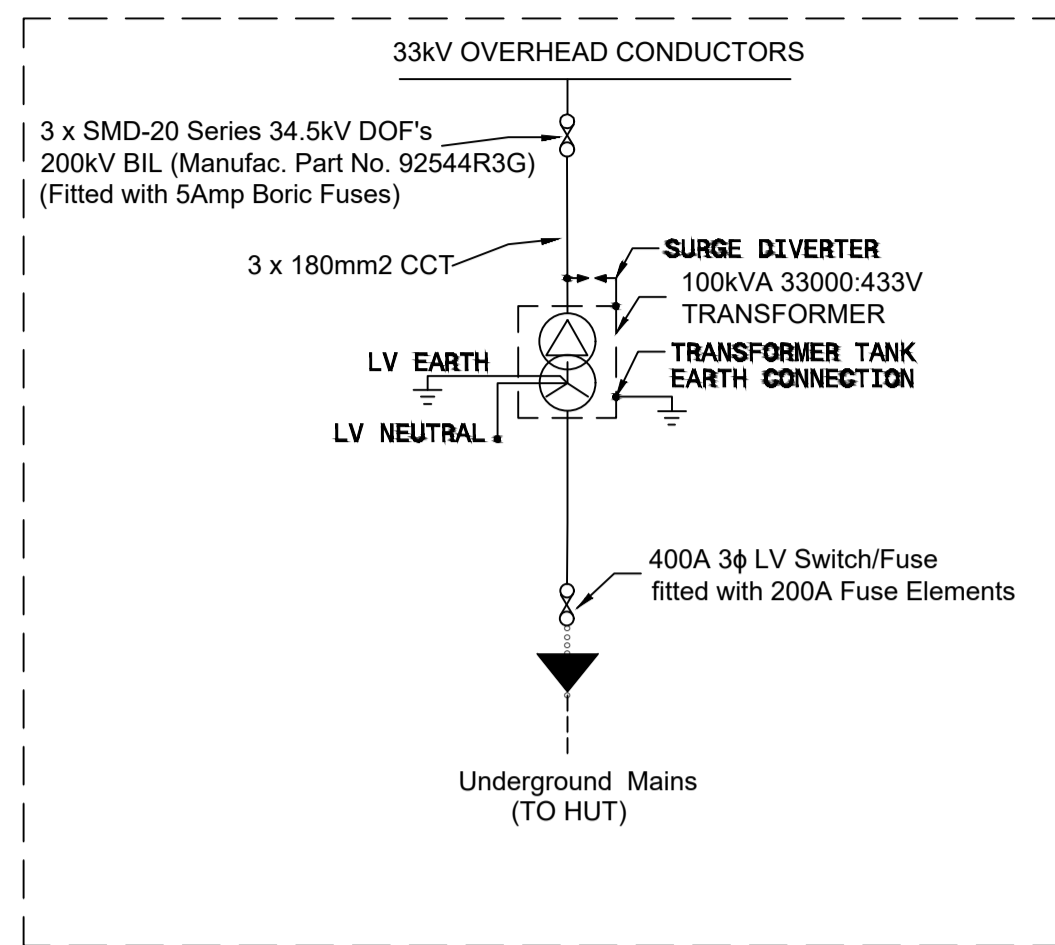
BLACKTOWN TS 33kV
BUS SECTION 3



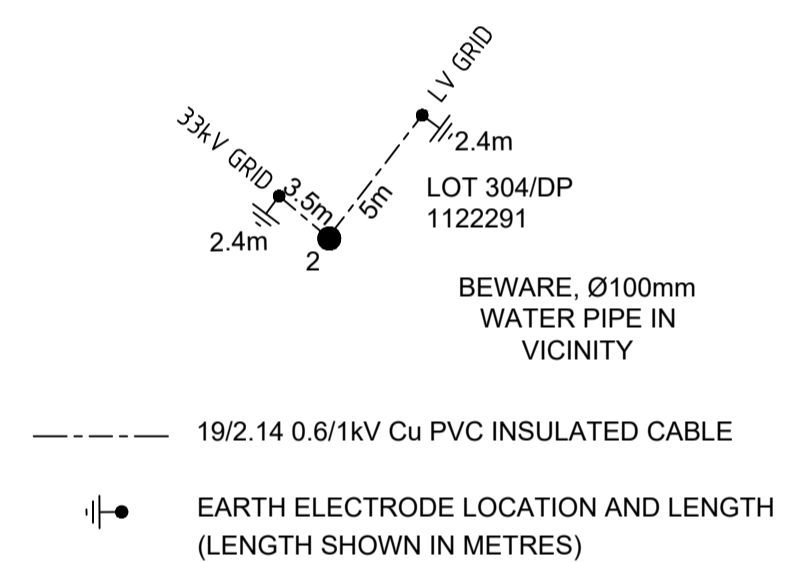
SCOPE OF WORKS IN THIS SECTION
7/4.5AAC T-OFF TO SUB
NEW POLE SUB 96001

BOSSLEY PARK ZS
33kV
BUS SECTION A

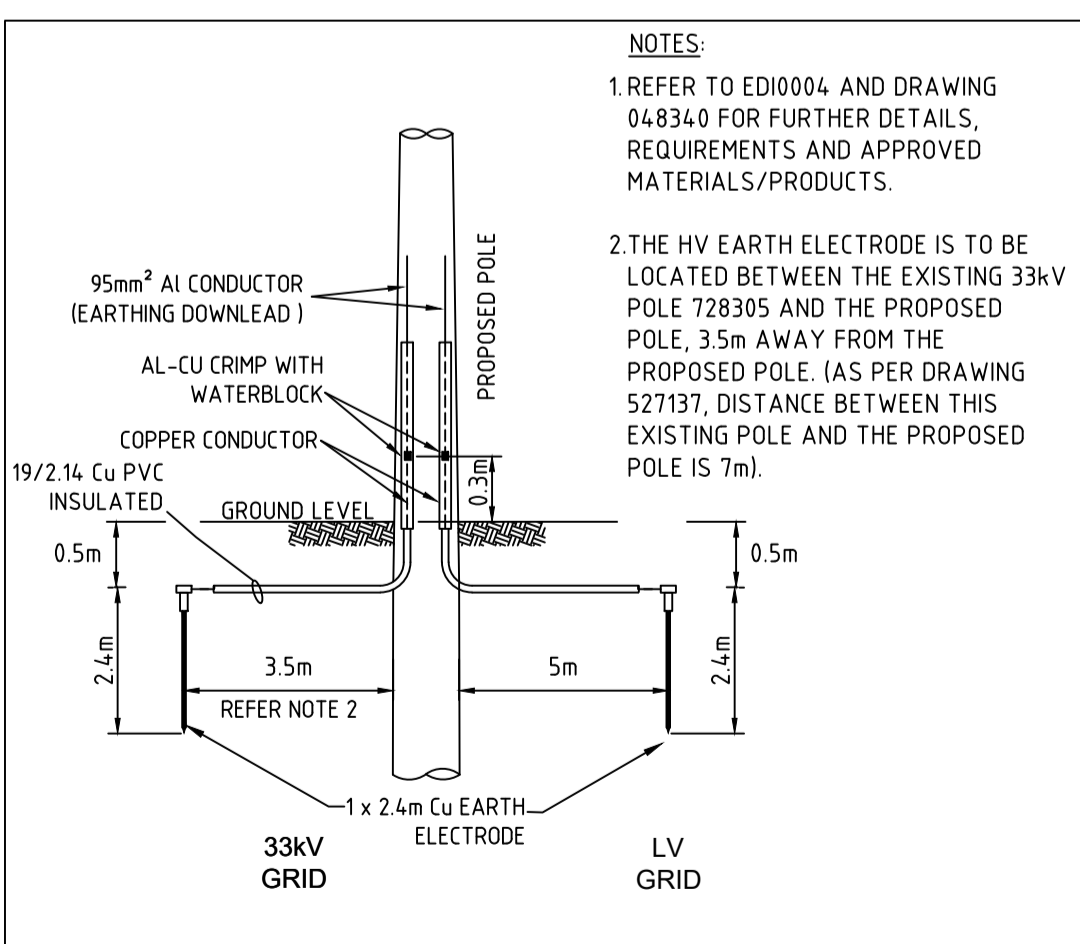
Pole Substation Single Line Diagram



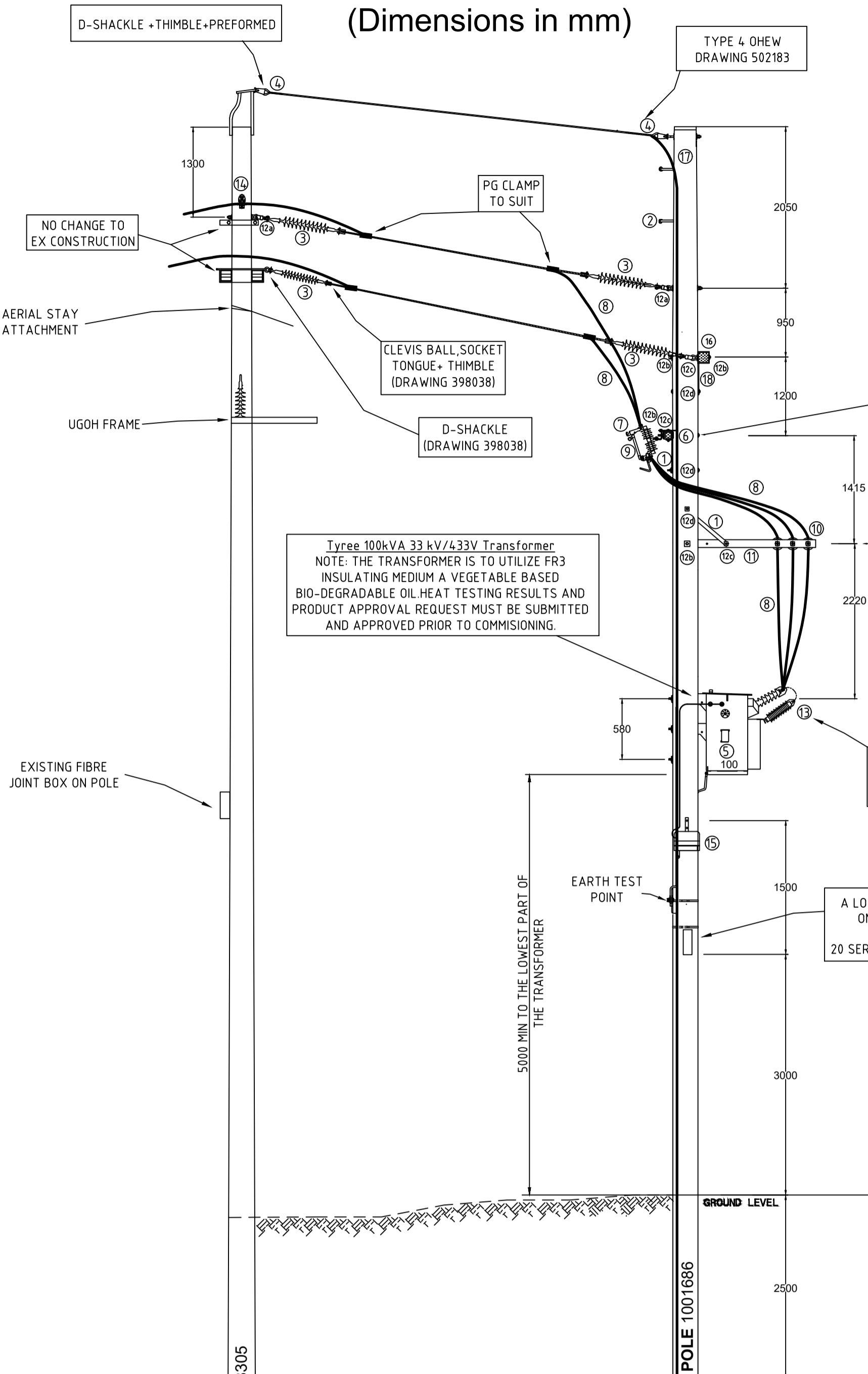
EARTHING PLAN POLE '2'
NOT TO SCALE



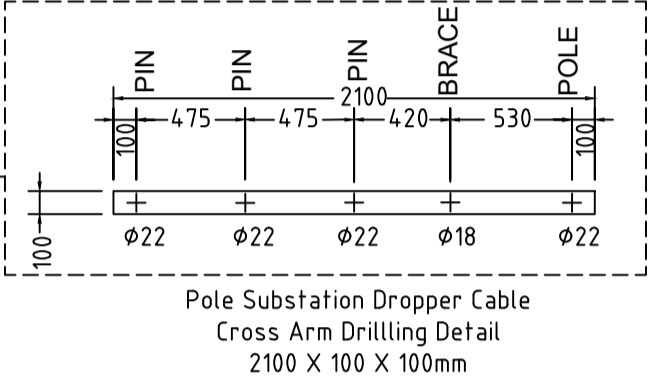
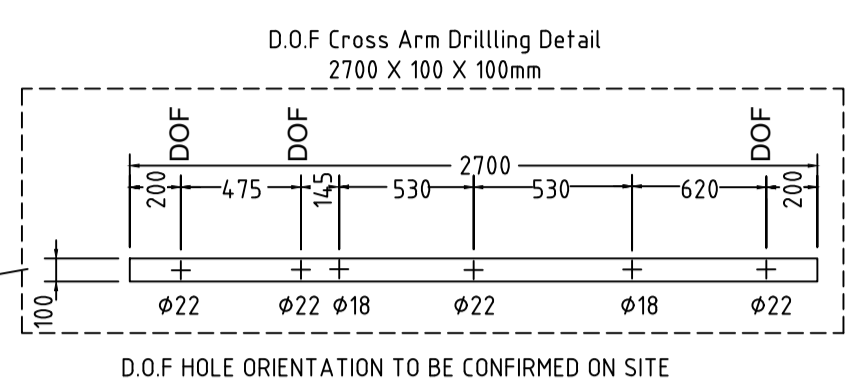
SEPARATE EARTH ROD LAYOUT (INDICATIVE)
NOT TO SCALE



Side Elevation- NTS
(Dimensions in mm)



Note
A MINIMUM OF 380mm MUST BE MAINTAINED BETWEEN ALL EXPOSED ACTIVE COMPONENTS AND EARTHED PARTS OF THE POLE OR STRUCTURE MEASURED TO THE CLOSEST POINT AS PER MDI0031 TABLE 17.5.4.2 TO PREVENT FLASHOVER



Tyree 100kVA 33 kV/433V Transformer
NOTE: THE TRANSFORMER IS TO UTILIZE FR3 INSULATING MEDIUM A VEGETABLE BASED BIO-DEGRADABLE OIL HEAT TESTING RESULTS AND PRODUCT APPROVAL REQUEST MUST BE SUBMITTED AND APPROVED PRIOR TO COMMISSIONING.

MODIFICATIONS REQUIRED FOR THE S.A BRACKET TO SUIT ON POLE & THE BASE TO BE REMOVED.

A LOCKABLE BOX IS TO BE MOUNTED ON POLE 3.0m ABOVE GROUND CONTAINING THE 3 SPARE 20 SERIES 5AMP FUSE LINK CARTRIDGES

SUBSTATION SEPARATE EARTHING DETAIL
SCALE: NTS

HV EARTHING DETAILS			
Soil Resistivity	Layer 1	11.52	Depth (m)
	Layer 2	144.95	∞
Designed Earth Resistance Limit (Ohm)	4-10		
Measured Earth Resistance (Ohm)	1		
Number of Electrodes	1		
Insulated Depth (m)	0.5		
Length of Bare Electrode (m)	2.4		
Connector Type (CAD or Crimp)	Crimp		
Location Category: F- Frequented, R-Remote, S-Sp	Re mote		
What Design Tool Used?	CDEGS		
Fault Level (kA)	7.33		
LV EARTHING DETAILS			
Designed Maximum Earth Resistance (Ohm)	4-10		
Measured Earth Resistance (Ohm)	1		
Number of Electrodes	1		
Length of Bare Electrode (m)	2.4		
Connector Type (CAD or Crimp)	Crimp		

HV EARTH MINIMUM SEPARATION (m)				
	Design	Actual	Design	Actual
TD/MEN	5		Telecom	90
TDB	4		Pipes	5
TDU	3.5		HV-LV	5

WORKS COMPLETED/FIELD BOOK

CONSTRUCTED BY: _____
 WORKS COMPLETED: _____
 SIGNATURE: _____ DATE: _____
 INSPECTED BY: _____
 SIGNATURE: _____ DATE: _____
ASSET RECORDING
 I: _____
 OF: _____
 CONTACT No.: _____
 HEREBY CERTIFY THAT ASSETS MARKED AS-BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOUR ENERGY STANDARD SAD 0004.
 SIGNATURE: _____
 DATE: _____

HERITAGE ACT 1977
APPLICATION UNDER SECTION 60
Application No: HMS 1632
Approved by: the Heritage Council of NSW
Delegated Authority
On: 21/02/2023
These plans should be read in conjunction with the decision notice
[Signature]
(for Delegate Heritage Council)

Components in Addition to Standards Pole Substation

ITEM	PART No.	DWG No	DESCRIPTION	QUANTITY
1	SB14.34.2	011962	BRACE CROSSARM (750mm x 6mm)	3
2	1561802	370399	POLE STEP	A/R
3	ALR002	398038	INSULATOR LONG ROD ASSEMBLY	6
4	-	502183	OHEW ASSEMBLY TYPE 4	2
5	-	-	33kV/433V POLE MOUNTED TRANSFORMER (100kVA)	1
6	-	-	TIMBER CROSSARM 2700X100X100mm (UNDRILLED)	1
7	1000002154	-	S&C 20 SERIES DOF'S PART NO. 92544R3G	3
8	11000001028	-	WIRE, 7/4.75 CCT, 120MM2, GREY, 6.35/11KV	A/R
9	1000002265	20 SERIES	FUSE ELEMENT 5A (PART NO. 614.006) "INCLUDES 3 SPARES"	6
10	1014559/1017639	015366C	33kV PIN INSULATOR & PIN	3/3
11	-	-	TIMBER CROSSARM 2100X100X100mm (UNDRILLED)	1
12a	ATP007	054798	M20 EYEBOLT ASSEMBLY FOR POLE	2
12b	ATP009	054798	M20 EYEBOLT ASSEMBLY FOR CROSSARM	3
12c	ATP010	054798	M16 BOLT ASSEMBLY FOR CROSSARM BRACE	5
12d	ATP011	054798	M16 COACH SCREW ASSEMBLY FOR CROSSARM BRACE	3
13	1550516		33KV SURGE ARRESTER	3
14	ALP004	398035	66kV POST INSULATOR	1
15	1548841/1143866	332001	400A 3 φ LV SWITCH FUSE F/W 3 x 200A FUSE ELEMENTS	1/3
16	SC14.819	052796	CROSSARM TYPE C3 STEEL RHS 152x 152 x 3000 LG	1
17	6000000197		POLE - WOOD IMPREGNATED 17m/12kN	1
18	1018620	054790	BRACE CROSSARM 915 LG	2

Visual Impact Assessment for Heritage Council of NSW

60 m Communications Tower, Prospect Reservoir

31/01/23






Contents

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2	Methodology	6
3	Project Description	8
4	Existing Visual Landscape	12
5	Visual impact assessment	14
6	Conclusion	32
	Attachment A – Design Drawings	33
	Attachment B – Photos of existing landscape	34
	Attachment C – Consultation with Heritage NSW	45

Document Approval

To the best of the knowledge of the below signatories, this REF has been prepared to be neither false nor misleading and is in accordance with The Code of practice for Authorised Network Operators approved under section 171 of the Environmental Planning and Assessment Regulation 2021.

Prepared by	Verity Blair and Tadd Andersen, EMM Consulting
Signed	
Date	21/12/ 2022, 24/01/23
Title	Associate Director, EMM Consulting Pty Ltd
Reviewed by	Dave Kelly, EMM Consulting
Signed	
Date	24/1/2023
Title	Associate Director, EMM Consulting Pty Ltd
Approved By	Peter Oxnam
Signed	
Date	31/01/2023
Title	Environmental Services Manager, Endeavour Energy

Document Control

Revision	Prepared by and Company Name	Date	Reviewed by and Company Name	Comments
V1	Verity Blair, EMM Consulting Pty Ltd	16 December 2022	Roweena D Souza Endeavour Energy	Review comments to be addressed
V2	Verity Blair, EMM Consulting Pty Ltd	21 December 2022	Peter Oxnam Endeavour Energy	Approved
V3	Tadd Anderson	24 January 2023	Roweena D Souza Endeavour Energy	Final review
V4	Lia Zwolinski	31 January	Peter Oxnam Endeavor Energy	Final approval

1 Introduction

1.1 Background

Endeavour Energy (EE) is an electricity distribution system operator servicing over 2.5 million people living and working across Sydney's Greater West, the Blue Mountains, the Southern Highlands, Illawarra and the South Coast of New South Wales (NSW).

In March 2023 the main EE office in Sydney will move from its current location at Huntingwood to a new premises in Parramatta. EE have a communications tower within the Huntingwood site and it is a critical component of EE's wide area network (WAN). The tower provides connectivity and redundancy for several depots, including both EE's Information Technology and Operational Technology data centres as well as for Supervisory Control and Data Acquisition (SCADA) sites which are vital to keep EE's power grid active and managed. As a result of this move, the existing EE communications tower will no longer be accessible and there is a need for a new communications tower.

EE have considered various options for a practicable solution and the site adjacent to the Sydney Water tanks at Prospect Reservoir was deemed as a suitable location for this purpose in terms of microwave links, line of sight and coverage which can provide connectivity to 98 SCADA field assets and one substation that are currently directly connected to the Huntingwood site.

Key features of this proposal include installation of:

- a 60m free-standing heavy duty lattice tower with self-supporting concrete footings;
- an external ladder, approximately 57m in height;
- a new equipment shelter (6m by 3m) on concrete footing foundations;
- a new 600mm cable tray support system from the tower to the equipment hut and support posts;
- a compound area 15m by 15m around the tower and associated infrastructure, including a 2.8 m high security fence with 4.8m wide double access gate;
- a new 17m pole with substation and overhead lines; and
- power supply works and underground cabling.

No trees are required to be removed as part of this proposal.

The site is located on the southern side of Reservoir Road and is part of the larger Prospect Reservoir site. As the proposal is located on land that is within the curtilage of two items on the NSW State Heritage Register namely, Prospect reservoir and surrounding area and the Prospect Reservoir Valve House and in the general vicinity of the NSW State Heritage listed item namely Veteran Hall – House remains, section 60 of the NSW *Heritage Act 1977* is triggered and approval from Heritage Council of NSW (HNSW) is required. EE submitted a Statement of Heritage Impact (SOHI) to HNSW in October 2022 and an updated version in November 2022.

1.2 Purpose of this report

This Visual Impact Assessment (VIA) has been prepared by EMM on behalf of Endeavour Energy. The purpose of this report is to provide an assessment of the visual impact of the proposed tower on key heritage-listed items in response to the clarifications sought by HNSW:

The reservoir is identified as being of state significance as aesthetically significant as a picturesque site (SoS). The proposed erection of a 60m high electrical tower at a high point within the picturesque landscape will impact these values.

- *The impact on the picturesque landscape identified in the SoS is not adequately addressed and requires more consideration, details and with options explored.*
- *A Visual Impact Assessment (VIA) of the proposed development is required. The views are to be located on a plan to indicate the location from which they were taken and why that location is significant.*
- *Include a photomontage of the proposed development as seen from significant locations.*

1.3 Applicable environmental planning instruments and guidelines

The proposal requires assessment and approval under Division 5.1, section 5.5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

Clause 171(2) of the NSW Environmental Planning and Assessment Regulation 2021 requires consideration of environmental factors, including:

- d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality
- e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations

This report also considers the Guidelines for Division 5.1 assessments (DPE June 2022). These guidelines support the assessment of environmental effects noted in Clause 171(2) of the EP&A Regulation.

2 Methodology

The following is an overview of the methodology adopted for the visual assessment.

2.1 Existing visual environment

2.1.1 Desktop analysis

A review of key planning requirements, policies and guidance was undertaken in relation to the visual environment within the heritage curtilage. The review identified elements outlined in legislation, policy and planning documents relevant to the visual character of the area. Existing environment data and project information was gathered and reviewed, including:

- project design information and site photographs;
- topography, land use, and vegetation maps;
- Google Earth and Google Street View; and
- LiDAR (light detection and ranging) data.

Using this data, a preliminary assessment of the visual environment was undertaken to inform the site inspection.

2.1.2 Site Inspection

Site inspections were undertaken by an environmental specialist from EMM consulting on 12 August and 13 November 2022 and 23 January 2023. The purpose of the inspections was to:

- identify visual receiver locations;
- inspect the site and appreciate views to / from sensitive heritage items;
- inspect publicly accessible locations identified during the desktop analysis as likely to provide views of the proposal, including roads, footpaths, infrastructure, etc; and
- take photographs for preparation of photomontages.

2.1.3 Definition of existing visual environment

An assessment of existing visual conditions was undertaken to establish the key views, topography, vegetation and other visual features relevant to the proposal. Refer to Section 4 for an assessment of the existing visual environment.

2.1.4 Viewpoint selection

Visual receivers were considered in terms of the views they are likely to have of the proposal from within and outside the heritage curtilage including consideration of any key vantage points, such as picnic areas and lookouts.

Refer to Section 5 for viewpoint locations.

2.2 Impact assessment

2.2.1 Visual effects

The evaluation of potential impacts on the visual environment is based on the sensitivity of the viewpoint (and the visual receiver it represents) to change, and the magnitude of change that is likely to occur. The sensitivity of each viewpoint is considered to be dependent on:

- the importance of the view, its existing scenic qualities and the presence of other existing man-made elements in the view; and
- the type of visual receiver and their likely interest in the view.

The assessment considers the likely impacts of the project. To measure the visual sensitivity and the visual effect of the site, specific locations known as viewpoints are chosen as representative views. In this instance, the viewpoints have been chosen to demonstrate any visual impacts on the heritage. The effect on a view depends on factors such as the extent of visibility, degree of obstruction of existing features, degree of contrast with the existing view, angle of view, duration of view and distance from the project. The steps that were undertaken to assess the visual effects of the project included:

- identifying and mapping viewpoint locations close to key heritage items; and
- undertaking an assessment of visual effects, comprising:
 - sensitivity of visual receivers to proposed change and value attached to views; and
 - magnitude of visual effect, based on: size or scale of change; geographical extent of effects, and duration and reversibility of effects.

An assessment was undertaken of the overall level of significance of the visual effects from the project in relation to the existing view.

2.3 Assumptions

This VIA has been prepared in response to comments from Heritage NSW and therefore only assesses the visual effects the proposal will have on heritage listed items including Prospect Reservoir and curtilage, the Valve House and former Veterans Hall (refer Figure 8) as agreed with Heritage NSW.

It is assumed that the visual sensitivity is high within the heritage curtilage, given the proximity of heritage items to the proposed tower. This high visual sensitivity triggers the need for this VIA in order to determine the level of visual impact of the proposed tower.

Further, it is noted that impacts associated with the construction of the proposed tower and associated infrastructure have not been as assessed as they are considered temporary in nature.

2.3.1 Photography

Photographs were taken from the seven viewpoints shown in Figure 7. Photomontages were prepared using WindPro, a program designed to accurately generate photomontages using digital terrain data, 3D models of the proposed tower and site photographs. In order to validate the photomontages, a program called Neara was used to create a similar looking tower and assess the location of the tower from the three viewpoints using LIDAR data.

3 Project Description

3.1 Location of the study area

The proposal site is located off William Lawson Drive, Prospect on the southern side of Reservoir Road and is part of the larger Prospect Reservoir site (refer Figures 1 and 2). The site is located on part of Prospect Hill in the vicinity of existing water tanks to its northeast and within Lot 304 Deposited Plan (DP) 1122291. It is noted that the larger Prospect Hill site takes in a larger area, including the former quarry and second summit to the east. For the purposes of this report, the site location is referred to as Prospect Hill and is defined as the western summit of the wider Prospect Hill site. Prospect Reservoir and surrounds is located across Cumberland, Fairfield and Blacktown Local Government Areas (LGAs), while the proposal site is located solely within Blacktown LGA (refer Figure 3). The proposal site is located at the top of Prospect Hill, on the second highest summit known as Water Tower Hill, which is located within the curtilage of the Prospect Reservoir. The reservoir and its surrounds, along with the Prospect Reservoir Valve House, are listed on the State Heritage Register. Water Tower Hill is not accessible to the public and access to the tower would be via an existing gated access track.



Figure 1: Aerial view of the Prospect reservoir site highlighted in yellow (source: sixmaps).

Sensitive visual receivers in the area include recreational users accessing the picnic, open space and lookout areas and Sydney Water staff working in the Sydney Water offices. There is only a relatively small area of the reservoir and surrounds, in the south-east corner, that is accessible to the public, due to access restrictions for Prospect Nature Reserve and some Sydney Water land.

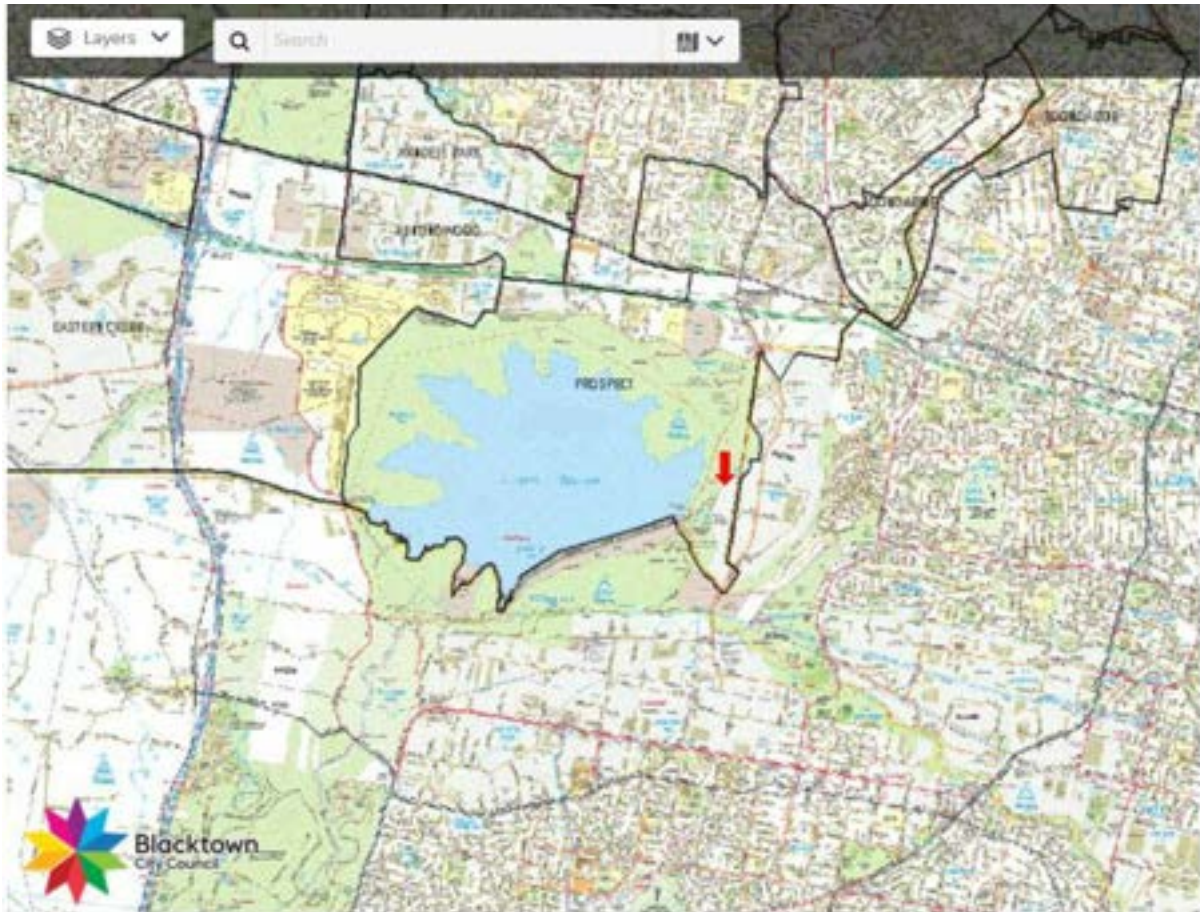


Figure 2: Location of proposal within Blacktown LGA wherein LGA extent is shown by a black border (source: Blacktown City Council)

3.2 Site layout components

Key components that will need to be constructed and installed are listed below:

- a 60m free-standing heavy duty lattice tower with self-supporting concrete footings (constructed in matt galvanised steel to reduce reflectivity);
- an external ladder, approximately 57m in height;
- a new equipment shelter (6m by 3m) on concrete footing foundations;
- a new 600mm cable tray support system from the tower to the equipment hut and support posts;
- a compound area 15m by 15m around the tower and associated infrastructure, including a 2.8m high security fence with 4.8m wide double access gate;
- a new pole with substation and overhead lines; and

- power supply works and underground cabling.

The overall site plan in Figure 3 shows the location of the tower in relation to the existing water towers and quarry edge, while Figures 6 and 7 show detailed elevations of the tower and associated infrastructure.



Figure 3 - Overall Site Plan

4 Existing Visual Landscape

The area surrounding Prospect Reservoir is characterised by a number of land uses including Eastern Creek Raceway and Western Sydney Dragway to the north and Raging Waters theme park to the west. A former quarry now developed as an industrial park adjoins the east while Austral bricks and other various industrial development is located to the south (refer Figure 4). In addition, there are a number of guyed masts, towers and electricity pylons in the surrounding area.

It is noted that there are no permanent residential dwellings in close proximity to the site for the proposed tower.



Figure 4 - Overview of the key land uses in the vicinity of the proposal

Prospect Nature Reserve occupies the northern and western area immediately surrounding Prospect Reservoir. It is noted that this nature reserve is not publicly accessible and views into the site from the local road network and adjoining land are very limited given Prospect Nature Reserve and other existing vegetation that surrounds the reservoir. There are no views to the proposed tower location from publicly accessible area on the northern, western and south western edges of Prospect Reservoir.

Land within the Prospect Reservoir heritage curtilage is characterised by open grassed areas, with scattered picnic spots, stands of mature vegetation (primarily Cumberland Plain Woodland) and a number of State heritage-listed buildings associated with the reservoir including the Prospect Reservoir Valve House. There are also a few single-storey modern buildings that house Sydney Water site offices. The visual catchment of Prospect Reservoir is limited primarily to views from publicly accessible areas, including William Lawson Drive, picnic areas in the south-east corner of the Reservoir and picnic areas/lookouts on Prospect Hill.

The site for the proposed tower is a gently sloping grassed area surrounded by mature vegetation, predominantly comprised of Eucalyptus species, which are between 15m and 25m in height. There are a number of picnic areas and car parks at various levels on Prospect Hill and around the edge of the reservoir. George Maunders lookout affords views over the reservoir itself. It is noted that there are two large water tanks/reservoirs at the top of Prospect Hill, which are around 20m in height. Views of these tanks from within

Prospect Reservoir curtilage are very limited given the topography of the site and the mature vegetation along the ridgeline and further down Prospect Hill.

Views to the western side of Prospect Hill comprise a vegetated slope, with power lines visible. Views to the south of Prospect Hill are steeper, with vegetation above the wall of a disused quarry.

While the reservoir and northern vegetated areas provide a naturalistic landscape with remnant bushland, it sits within an urban context and this is demonstrated by visual elements including the rides and infrastructure of Raging Waters theme park and other communications towers that make up part of the general urban landscape.

There is one public lookout (George Maunder Lookout) located within the curtilage of Prospect Reservoir. Views from this lookout are predominantly over the reservoir towards the west and south-west whereas the proposed tower is towards the northeast of this lookout. In addition, the undulating landform character and tree cover surrounding the proposed tower, effectively screen views of the proposed tower, thereby preserving the scenic quality of views from the lookout.

In order to identify the visual character of the area, a number of photos were taken from various viewpoints (refer Figure 7) within the State Heritage item curtilage and from a highpoint on Prospect Hill Lookout, adjacent to the industrial park, looking towards the proposed tower location. The photos demonstrate that this location is characterised by open, grassy fields that are lined with trees that obscure distant views. These photos are provided in Attachment B.

5 Visual impact assessment

The proposed tower is located towards the high point within the landscape to maximise line of site and coverage. Given that the tower is 60 m in height, there is a potential for a visual impact on the surrounding area, including key heritage items within the heritage curtilage.

In order to address the effect of the proposed tower on the relevant heritage-listed items, an assessment of the visual effects the proposed tower will have, particularly on heritage-listed items, has been undertaken.

The predominant views of the tower will be from the adjoining industrial site to the northeast, with limited vegetation between the tower and the cliff edge above the industrial estate. Notwithstanding, the character of the industrial area, with large scale warehouses, means that the visual impacts from this viewpoint will not be significant or out of character.

It is noted that the key heritage viewpoints are located near the edge of the reservoir, at the toe of Prospect Hill. The sections provided in Figures 5 and 6 below (also included in Attachment A) show how the topography of the land and existing mature vegetation screen views of the tower when viewed from William Lawson Drive and the edge of the reservoir.

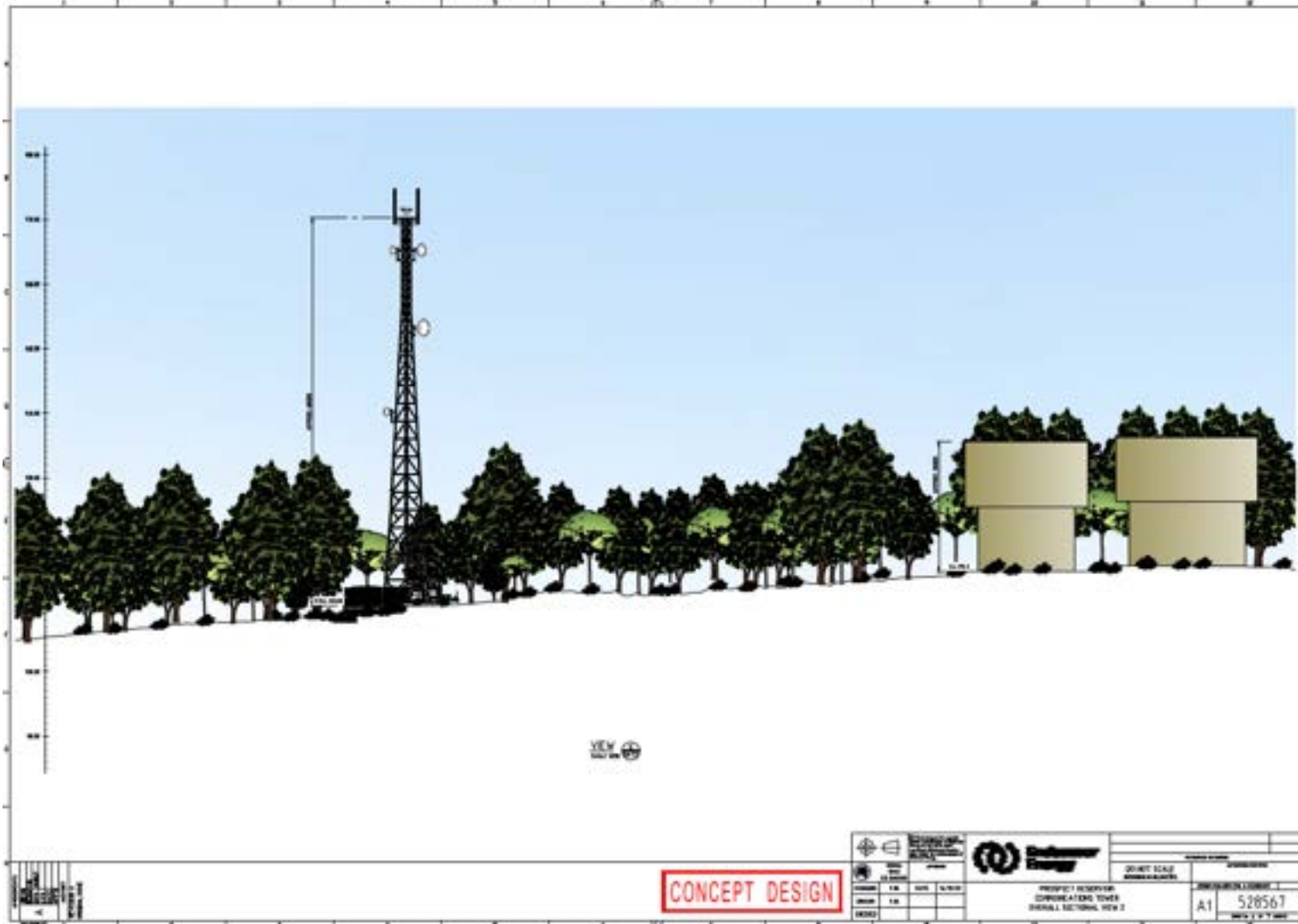


Figure 5 - Section showing proposed tower and existing water towers (refer Figure 3 for section location)

In order to assess the visual impact on key heritage items within the curtilage of Prospect Reservoir, Endeavour Energy met with Heritage NSW on 19th January 2023 (meeting notes in Attachment C) and presented the Neara model and key viewpoints. This VIA captures all the viewpoints discussed at the meeting with the following exception/deviations:

- 1) The areas west of the reservoir were heavily vegetated with limited access. Based on site inspections, there were no locations with views to Prospect Hill and the proposed tower along the western and northern sides of the reservoir. Therefore, there were no viewpoints chosen in these areas.
- 2) Prospect Lookout – during the meeting the viewpoint discussed was within the north western end towards Clunie Ross Street on land to which the Plan of Management, Cumberland Council March 2019 applies. During the site visit to capture photos for the photomontage at this point, it was noticed that the dense vegetation, industrial area and the steep slope on the western side of a pathway from Clunie Ross St to the high point screened most of the views past the ridgeline. It was only at a specific point on the hilltop that had some view towards the proposed tower and this point is captured as Viewpoint 7 in this report.

Seven photomontages were prepared to demonstrate the visibility of the tower. These were based on selected viewpoints in discussion with HNSW, which are locations chosen to represent the view of a development from that area.

Five viewpoints illustrate views from within the heritage curtilage. These are views from locations with public views or from heritage items. The remaining two viewpoints were from further afield in the surrounding community. These were chosen due to their significance as a lookout location and accessibility to people. Figure 7 indicates the locations of the viewpoints.

The photomontages were prepared using WindPro, a specific visual impact modelling program and a 3D model of the proposed tower. In order to validate the photomontages, a program called Neara was used to create a similar looking tower and assess the location of the tower from three viewpoints using LIDAR data. Both the original photomontages and Neara validations are shown as part of the analysis for viewpoints 1-3 below.

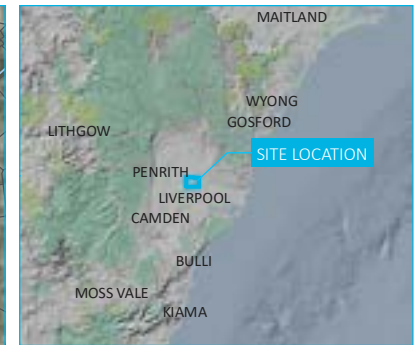
As a tower structure is not available in Neara, a pole that represents the tower, and with dimensions similar to that of the proposed tower was used:

- pole base: 650 cm
- pole top: 150
- pole height: 60 m
- pole material (the aesthetic look): steel

For the LiDAR accuracy specs below are the contract accuracy requirements for the full network scan.

	Vertical accuracy 95% confidence	Horizontal accuracy 95% confidence
LiDAR surveys	+/- 0.15 m	+/- 0.20 m

	Relative accuracy 95% confidence
LiDAR surveys	+/- 0.05 m



- KEY**
- Proposed Tower Location
 - ⊕ Viewpoint
 - ▭ Prospect Reservoir and surrounding area as listed on the SHR (no. 01370)
 - ▨ Prospect Reservoir Valve House as listed on the SHR (no. 01371)
 - ▨ Veteran Hall – House Remains as listed on the SHR (no. 01351)
 - Major road
 - Minor road
 - Named watercourse
 - ▭ Named waterbody
- INSET**
- ▭ NPWS Reserve

Viewpoint locations

Endeavor Energy
Prospect Tower
Figure 7



\\lemmsvr1\EMM\2022\E220571 - Endeavour Energy Environment Support\GIS\02 - Maps\G007 - Viewpoints\Locations_20230124_01.mxd 30/01/2023

Source: EMM (2023); ABS (2021); DFSI (2017, 2020); GA (2011); Metromap (2023)

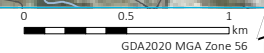




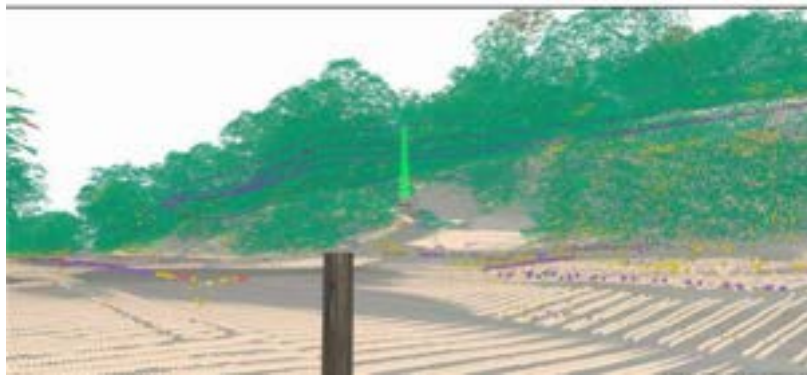
Table 1 – Viewpoint 1 Photomontage



Criteria	Comments
Location	Located just outside the heritage curtilage on William Lawson Drive. It is approximately 400 m from the proposed tower and located just outside the heritage curtilage. This view south-east towards the proposed tower is representative of views to site users driving to the reservoir edge and picnic areas along William Lawson Drive.
Description of existing view	The existing view is characterised by open grassed areas on either side of William Lawson Drive, with mature vegetation on the slopes of Prospect Hill enhancing the natural quality of the view. The view is important as it forms part of the main public access to Prospect Reservoir however the presence of power-lines, chain wire fencing and Sydney water offices and vehicles (parked on the road edge) diminish the natural quality of the view. Given this, it is considered that this view has a low to medium value.
Anticipated change to view	The upper portion of the tower is visible from viewpoint 1, with existing vegetation and the slope of the land screening views to the lower part of the tower and associated infrastructure. While the view is scenic in nature, the proposed tower will not significantly impact any specific heritage items. The anticipated change to viewpoint 1 would be negligible. While part of the proposed tower would be visible on the treed ridgeline, it does not impact any heritage items (the reservoir is not visible from this point, nor any of the other key heritage items), the proposed tower would be a distant feature and the natural quality of the landscape is already impacted by man-made infrastructure.
Validation of photomontage using Neara.	
Significance of impact	Given the location of viewpoint 1 outside the heritage curtilage and the interruption of the natural landscape by existing man-made infrastructure, it is not considered that this viewpoint is particularly sensitive to change.

Mitigation measures	<p>The landscape plan (Figure 9) proposes planting native, fast growing trees with potential to bear hollows in the future along the William Lawson Drive proposed planting area. This would assist with quicker screening and also in the long term contribute to wildlife corridors and provide habitat for native fauna.</p> <p>The plan also identifies a Bush Regeneration area in the vicinity of the proposed tower to remove exotic shrubs which are competing with the native tree species. This would assist in growth of the native trees improving overall vegetation quality and in further screening.</p>
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Table 2 - Viewpoint 2 Photomontage

	
Criteria	Comments
Location	This photomontage is taken from just outside the gate near the existing submerged tower within the reservoir, at the base of the road up Prospect Hill looking north-east towards the proposed tower. The red arrow indicates the location of the top of the tower.
Description of existing view	This viewpoint is publicly accessible and while there are elements of modern infrastructure, such as power lines and road signs, the view incorporates heritage elements such as the former residential dwelling, post-and-rail fencing and palm trees along the road edge. The mature vegetation on the slopes of Prospect Hill lends a natural quality to the view.
Anticipated change to view	The anticipated change to this view is negligible as the topography of the land and existing vegetation mean that any views of the tower from this viewpoint are obscured.
Validation of photomontage using Neara.	
Tower highlighted (for reference only) in green to indicate location	


Tower is obscured by the vegetation and topography	
Significance of impact	The significance of change in this location, resulting from the proposed tower, is considered to be negligible, as views of the tower are screened by the vegetation and topography.
Mitigation measures	None required.

Table 3 - Viewpoint 3 Photomontage



Criteria	Comments
Location	This photomontage is taken from William Lawson Drive in the vicinity of the Prospect Reservoir Valve House looking north-east towards the proposal. The red arrow indicates the location of the top of the tower.
Description of existing view	This view is important as receivers see the heritage-listed Valve House in the foreground, with the vegetated Prospect Hill in the background. Views to the opposite site of William Lawson Drive are quite natural in character, comprising the open grassed slope below the reservoir. It is considered that this view is of high value aesthetically given the unusual and detailed design of the Valve House with the vegetated backdrop of Prospect Hill.



Anticipated change to view	The anticipated change to this view is negligible as the topography of the land and existing vegetation mean that any views of the tower from this viewpoint are obscured.
Validation of photomontage using Neara.	
Tower highlighted in green (for readers reference only) to indicate location	
Tower is obscured by the vegetation and topography	
Significance of impacts	The significance of change in this location, resulting from the proposed tower, is considered to be negligible, as views of the tower are screened by the vegetation and topography.
Mitigation measures	None required.

Table 4 – Viewpoint 4 Photomontage



Criteria	Comments
Location	<p>This view is from the picnic area at Walder Park. It is a popular area for picnicking and recreation use with the public. Prospect Dam rises to the west of this view. Views to the tower location are to the northeast, up the existing hill and past the Valve House.</p> <p>The red arrow indicates the location of the top of the tower.</p>
Description of existing view	<p>This viewpoint is publicly accessible. The view incorporates heritage elements such as the Valve House, former residential dwelling, post-and-rail fencing and palm trees along the road edge. The mature vegetation on the slopes of Prospect Hill lends a natural quality to the view.</p>
Anticipated change to view	<p>The anticipated change to this view is negligible as the topography of the land and existing vegetation mean that any views of the tower from this viewpoint are obscured.</p>
Significance of impact	<p>The significance of change in this location, resulting from the proposed tower, is considered to be negligible, as views of the tower are screened by the vegetation and topography.</p>
Mitigation measures	<p>None required.</p>

Table 5 – Viewpoint 5 Photomontage



Criteria	Comments
Location	This view is from the George Maunder Lookout, which is located 350 m south of the tower location. There is significant, mature tree canopy within the picnic area and the parking lot.
Description of existing view	<p>This area is publicly accessible, and even though this viewpoint is relatively close to the tower, the view focus is towards the west and south (as demonstrated in the image below) whereas the proposed tower is towards the north.</p> <p>The mature vegetation on the slopes of Prospect Hill lends a natural quality to the view. These trees along with trees in the parking area screen much of the view toward the tower.</p>



Photograph from Viewpoint 6 showing the dominant views to west (Reservoir) from the picnic area.

Anticipated change to view	The anticipated change to this view is negligible as the topography of the land and existing vegetation mean that any views of the tower from this viewpoint are obscured.
Significance of impact	The significance of the change to views from this location is low due to the existing tree canopy, and the main direction of views is away from the tower.
Mitigation measures	Although the significance of impact is low, Endeavour Energy propose to carry out tree planting within the gated area to further reduce the visual impact.


Table 6 – Viewpoint 6 Photomontage



Criteria	Comments
Location	<p>This view is from Reservoir Road, approximately 1.4 km north of the tower location. Very few views of the tower are available near this location due to large expanses of bushland and roadside vegetation.</p> <p>The red arrow indicates the top of the tower.</p>
Description of existing view	<p>The tower is south of this viewing location. Bushland trees and roadside planting screen views of the tower site. Since this is a public road, viewing times would be short and fairly distant.</p>
Anticipated change to view	<p>The anticipated change to this view is negligible due to the trees that screen views toward the tower site, and the short time-frame any viewer would have to absorb the change.</p>
Significance of impact	<p>The significance of the change to views from this location is negligible due to the existing tree canopy and short duration of views.</p>
Mitigation measures	<p>None required.</p>

Table 7 – Viewpoint 7 Photomontage



Criteria	Comments
Location	<p>This view is from the highest point on Prospect Lookout, approximately 1.45 km northeast of the tower location. This site is known as an important Aboriginal site and is part of the Prospect Hill Plan of Management (Cumberland Council March 2019). It offers panoramic views across the landscape predominantly to the east and south (refer to image below).</p>  <p>Views from Viewpoint 7 looking toward Parramatta and Sydney</p> <p>Access to this summit is from the Clunies Ross Street, although the gates have been closed since 2017. This location is situated atop a ridge that runs north-south, screening views of the tower from further east. The vegetation is characterised by a row of planted trees adjacent to boundary lines, scattered shrubs, weeds obscuring the views to the west and south-west and</p>

	<p>makes the western slope inaccessible. There is extensive pasture grassland on the north-eastern slope which is accessible.</p>
<p>Description of existing view</p>	<p>The tower is southwest of this viewing location. The view towards the tower is across planted vegetation, an industrial development that sits in an old quarry site and electrical infrastructure.</p>
<p>Anticipated change to view</p>	<p>The tower is predicted to be visible from this specific location where the photograph was taken. Moving away from this immediate location, views to the tower location are obscured by trees, vegetation, electricity poles, overhead mains, industrial buildings between the viewpoint and the proposed tower that screen the view. As indicated in the photomontage, the water tower is visible over the trees as is the tower from this viewpoint, however, it is only the elevated nature of this viewpoint that allow views to the tower. The land drops away steeply from this point and views quickly become obscured in the immediate vicinity of this location.</p> <p>The Plan of Management also identifies that the views to the west is impacted by the industrial area and existing infrastructures and hence has measures to:</p> <p><i>retain and add to existing trees on Prospect Hill, consistent with the Prospect Hill Conservation Management Plan, thereby forming large stands of trees to provide a visual buffer to built form when viewed from the top of Prospect Hill.</i></p> <p>Construct unobtrusive viewing areas at Prospect Hill, and south of the hill looking south-east using low maintenance materials.</p> <p><i>Plant scattered trees and shrubs on the western boundary to screen industrial areas.</i></p> <p>These measures would further obscure the tower from potential visual impact.</p>
<p>Significance of impact</p>	<p>The significance of the change to views from this location is low due to the existing vegetation and industrial nature of the view towards the tower. This view is only available from the hilltop that is only accessible by foot. While the site is an important Aboriginal site, the key views are to the east and south, away from the tower location. Existing trees screen views to the tower location away from the location of this viewpoint.</p>
<p>Mitigation measures</p>	<p>None required.</p>

5.1 Mitigation measures

A range of visual impact mitigation methods are available to reduce the impact of a development. As a general rule, mitigation should aim first at reducing the visible changes to the landscape. Secondly, mitigation should screen new infrastructure introduced by the project to present a landscape that is as similar to the existing landscape as possible.

In order to reduce any visual impacts, it is proposed that the tower will be constructed using matt steel, to decrease reflectivity.

Endeavour Energy, in consultation with Sydney Water, will consider the option to undertake revegetation works to support the aesthetics of the visual landscape ensuring access and maintenance requirements met. Endeavour Energy have had a Vegetation Management Plan (VMP) prepared to assess and make recommendations for areas proposed as revegetation areas. Figure 8 (taken from the VMP) indicates locations proposed for infill planting and bush regeneration. This will extend the remnant bushland vegetation further around the reservoir and in doing so, create a visual screen that is consistent with the existing landscape character.

A second recommendation indicated on the landscape plan (refer Figure 8), is the continuation of the street tree planting along William Lawson Drive. This extends the roadside tree planting and will screen views of the tower as vehicles travel south on William Lawson Drive.



Figure 8: Vegetation Management Plan

6 Conclusion

This VIA has been undertaken to understand effect of the proposed tower on the visual amenity of the heritage listed items (Prospect Reservoir, including the Valve House and remains of the Veterans Hall) and respective curtilage, in addition to surrounding industrial and residential land uses, as shown in Figure 5. The proposal is located towards a high point on Prospect Hill, approximately 75 m southwest from the existing Sydney Water tanks. The site is surrounded by mature vegetation to its west, a picnic area to the south, an industrial area to the east and Sydney Water tanks to the north.

Five viewpoints (viewpoints 1 to 5) were chosen to assess the visual impact of the proposal on key heritage items and receivers within the heritage curtilage area. Visual receivers in the area include recreational users accessing the picnic areas, open space and lookout areas and Sydney Water staff working in the Sydney Water offices. Two viewpoints were chosen to assess the impacts onto road users and a recognised important Aboriginal site which may have a line of sight onto the heritage curtilage area, including viewpoints 6 and 7.

Based on the heritage viewpoints and surrounding visual receivers assessed the following outcomes were identified:

- Viewpoint 1 – Given the location of viewpoint 1 outside the heritage curtilage and the interruption of the natural landscape by existing man-made infrastructure, it is not considered that this viewpoint is particularly sensitive to change.
- Viewpoint 2 - The significance of change in this location, resulting from the proposed tower, is considered to be negligible, as views of the tower are screened by the vegetation and topography.
- Viewpoint 3 - The significance of change in this location, resulting from the proposed tower, is considered negligible, as views of the tower are screened by the vegetation and topography.
- Viewpoint 4 – The significance of change in this location, resulting from the proposed tower, is considered to be negligible, as views of the tower are screened by the vegetation and topography.
- Viewpoint 5 – The significance of the change to views from this location is low due to the existing tree canopy, and the main direction of views is away from the tower.
- Viewpoint 6 – The significance of the change to views from this location is negligible due to the existing tree canopy and short duration of views.
- Viewpoint 7 – the significance of the change to views from this location is low due to the existing trees screening views and the industrial nature of the view toward the tower.

Overall, it is considered that the visual impact on Prospect Reservoir and key heritage items will be low to negligible.

Attachment A – Design Drawings

PROSPECT RESERVOIR - COMMUNICATIONS TOWER

DWG No.	DWG TITLE
SHEET 1	DRAWING TITLE AND LOCATION PLAN
SHEET 2	OVERALL SITE PLAN
SHEET 3	OVERALL SECTIONAL VIEW 1
SHEET 4	OVERALL SECTIONAL VIEW 2
SHEET 5	DETAILED SITE PLAN
SHEET 6	DETAILED SITE PLAN - ELEVATIONS
SHEET 7	SITE PLAN - CUT & FILL



LOCATION PLAN

AMENDMENTS								
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NO.	DATE	BY	REASON					

REVISION A
ORIGINAL ISSUE

Civil version 3.0

CONCEPT DESIGN

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	APPROVED
ORIGINAL SCALE AS SHOWN	DATE 14/12/22
DESIGNED PJB	DRAWN PJB
CHECKED	DATE

Endeavour Energy

PROSPECT RESERVOIR
COMMUNICATIONS TOWER
DRAWING TITLE AND LOCATION PLAN

REFERENCE DRAWINGS	
DO NOT SCALE DIMENSIONS IN MILLIMETRES	AUTHORISED/CERTIFIED
DESIGN MANAGER CIVIL & SECONDARY	A1
528567	SHEET No 1 OF 7 SHEETS



OVERALL SITE PLAN
SCALE 1:500

CONCEPT DESIGN

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DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			

Endeavour Energy

PROSPECT RESERVOIR COMMUNICATIONS TOWER OVERALL SITE PLAN

REFERENCE DRAWINGS		AUTHORISED/CERTIFIED	
DO NOT SCALE DIMENSIONS IN MILLIMETRES			
DESIGN MANAGER CIVIL & SECONDARY		A1 528567	
		SHEET No 2 OF 7 SHEETS	

AMENDMENTS	DESIGN JOB	DESIGNER	DATE	REASON
A	528567	PJB	14/12/22	ORIGINAL ISSUE



VIEW
SCALE 1:250

AMENDMENTS	
DESIGN	DESIGN
CHKD	CHKD
APPD	APPD
HISTORY	
REVISION A	ORIGINAL ISSUE

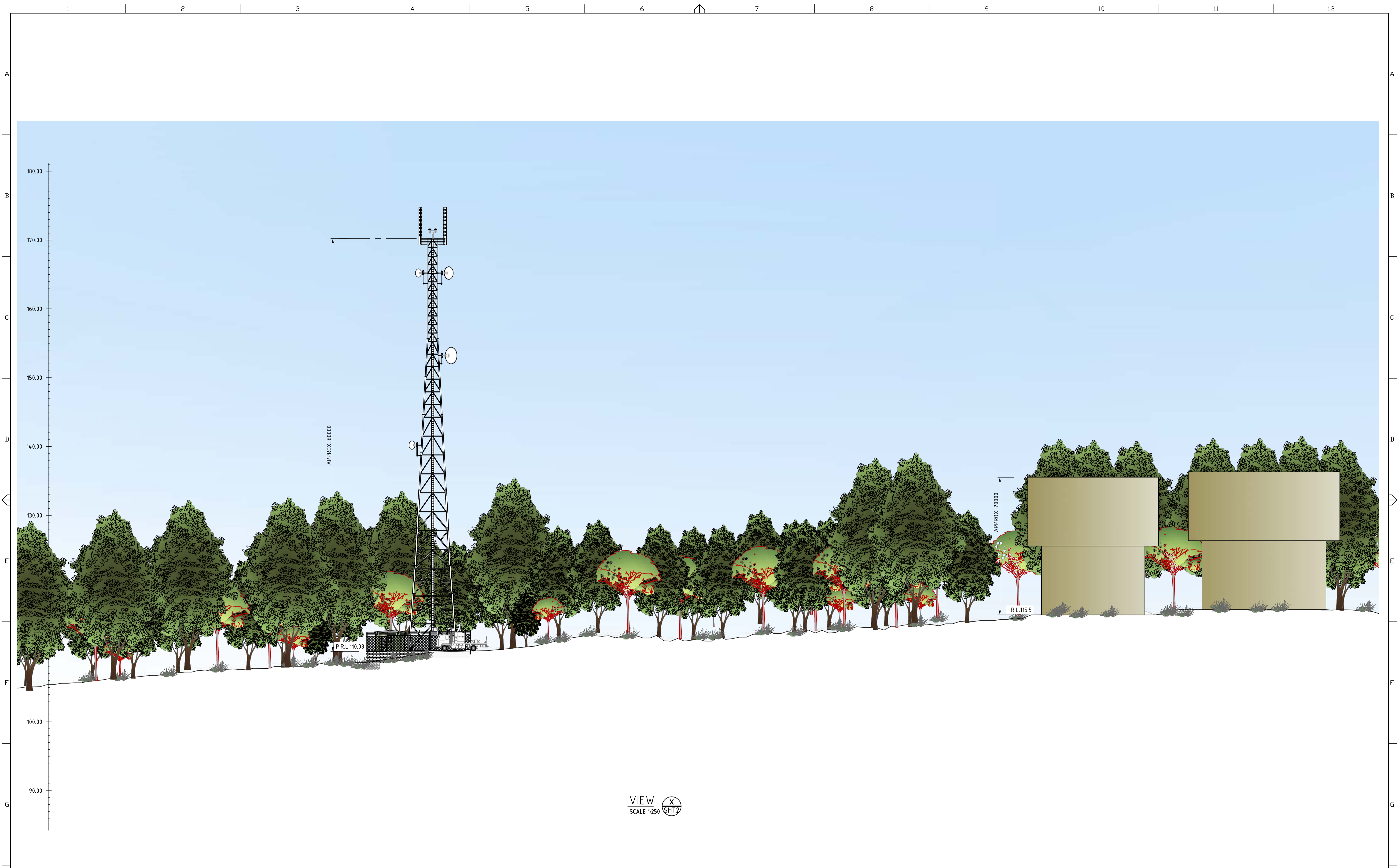
CONCEPT DESIGN

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DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			

Endeavour Energy

PROSPECT RESERVOIR
COMMUNICATIONS TOWER
OVERALL SECTIONAL VIEW 1

REFERENCE DRAWINGS		AUTHORISED/CERTIFIED	
DO NOT SCALE DIMENSIONS IN MILLIMETRES		DESIGN MANAGER CIVIL & SECONDARY	
A1	528567	SHEET No 3 OF 7 SHEETS	



VIEW X
SCALE 1:250

AMENDMENTS								
<table border="1"> <tr> <th>ISSUE NO.</th> <th>DESIGNER</th> <th>DATE</th> <th>REASON</th> </tr> <tr> <td>1</td> <td>PJB</td> <td>14/12/22</td> <td>ORIGINAL ISSUE</td> </tr> </table>	ISSUE NO.	DESIGNER	DATE	REASON	1	PJB	14/12/22	ORIGINAL ISSUE
ISSUE NO.	DESIGNER	DATE	REASON					
1	PJB	14/12/22	ORIGINAL ISSUE					

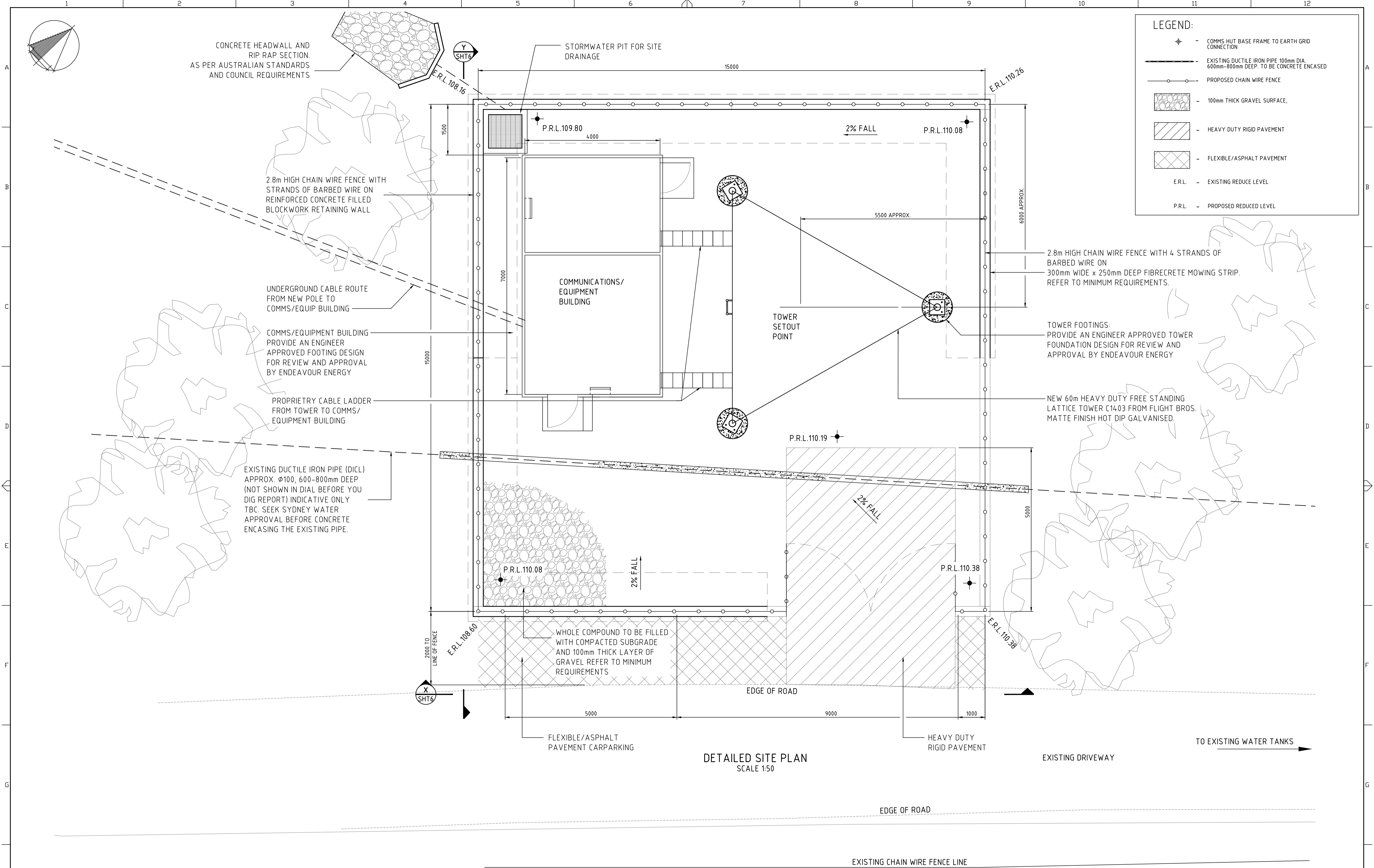
HISTORY				
<table border="1"> <tr> <th>REV</th> <th>DESCRIPTION</th> </tr> <tr> <td>1</td> <td>ORIGINAL ISSUE</td> </tr> </table>	REV	DESCRIPTION	1	ORIGINAL ISSUE
REV	DESCRIPTION			
1	ORIGINAL ISSUE			

CONCEPT DESIGN

		<small>This drawing and the copyright therein is the property of Endeavour Energy and may not be copied, reproduced, distributed, loaned or used without the written consent of Endeavour Energy.</small>	
DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			

PROSPECT RESERVOIR COMMUNICATIONS TOWER OVERALL SECTIONAL VIEW 2

REFERENCE DRAWINGS		AUTHORISED/CERTIFIED	
DO NOT SCALE DIMENSIONS IN MILLIMETRES		DESIGN MANAGER CIVIL & SECONDARY	
A1	528567	SHEET No 4 OF 7 SHEETS	



LEGEND:

- COMMS HUT BASE FRAME TO EARTH GRID CONNECTION
- EXISTING DUCTILE IRON PIPE 100mm DIA. 600mm-800mm DEEP. TO BE CONCRETE ENCASED
- PROPOSED CHAIN WIRE FENCE
- 100mm THICK GRAVEL SURFACE,
- HEAVY DUTY RIGID PAVEMENT
- FLEXIBLE/ASPHALT PAVEMENT
- E.R.L. - EXISTING REDUCE LEVEL
- P.R.L. - PROPOSED REDUCED LEVEL

DETAILED SITE PLAN
SCALE 1:50

CONCEPT DESIGN

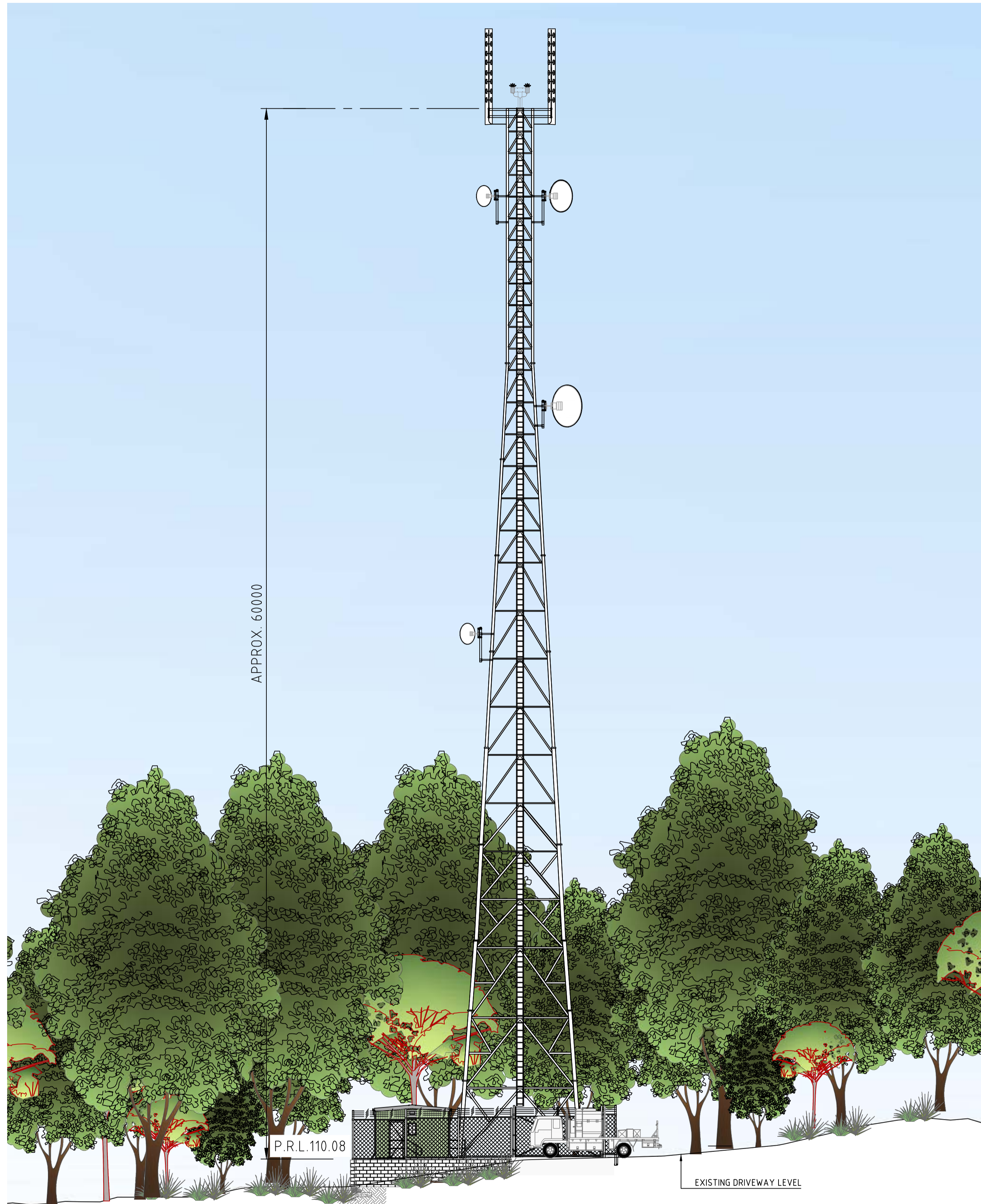
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DESIGN NO.	DESIGN JOB
DRN	BOUNCEP
CLD	
APPD	
HISTORY	
REVISION A	ORIGINAL ISSUE

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	DESIGNED	PJB	DATE 14/12/22
	DRAWN	PJB	
	CHECKED		

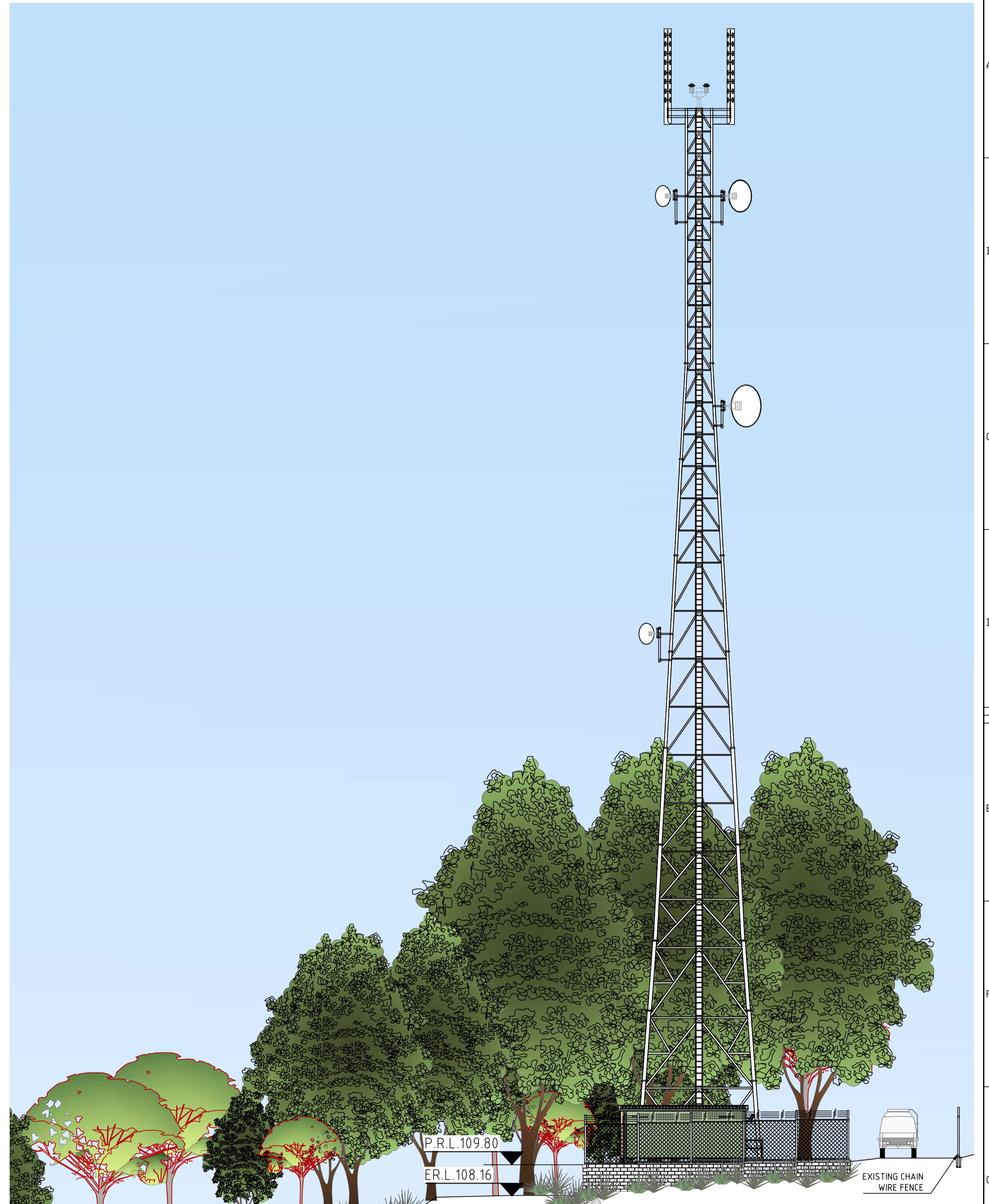
Endeavour Energy

PROSPECT RESERVOIR
COMMUNICATIONS TOWER
DETAILED SITE PLAN

DO NOT SCALE DIMENSIONS IN MILLIMETRES		AUTHORISED/CERTIFIED
DESIGN MANAGER CIVIL & SECONDARY	A1 528567	
SHEET No 5 OF 7 SHEETS		



VIEW X
SCALE 1:150



VIEW Y
SCALE 1:150

AMENDMENTS	DESIGNER	CHECKED	DATE
1	DRN	DRN	14/12/22
2	DRN	DRN	14/12/22
3	DRN	DRN	14/12/22
4	DRN	DRN	14/12/22
5	DRN	DRN	14/12/22
6	DRN	DRN	14/12/22
7	DRN	DRN	14/12/22
8	DRN	DRN	14/12/22
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12	DRN	DRN	14/12/22

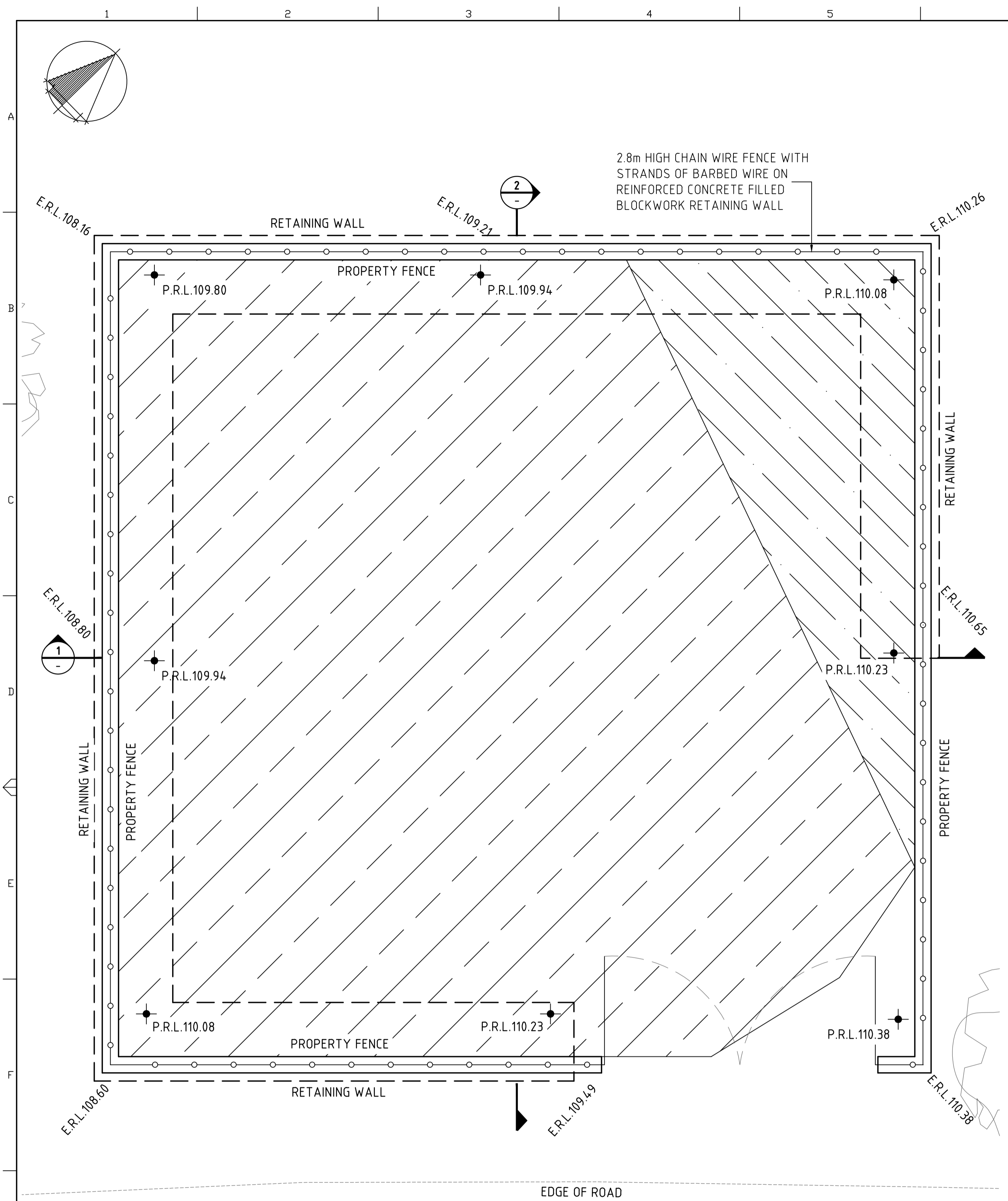
CONCEPT DESIGN

DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			

Endeavour Energy

PROSPECT RESERVOIR COMMUNICATIONS TOWER
DETAILED SITE PLAN - ELEVATIONS

DO NOT SCALE DIMENSIONS IN MILLIMETRES	REFERENCE DRAWINGS
A1	528567
SHEET No 6 OF 7 SHEETS	



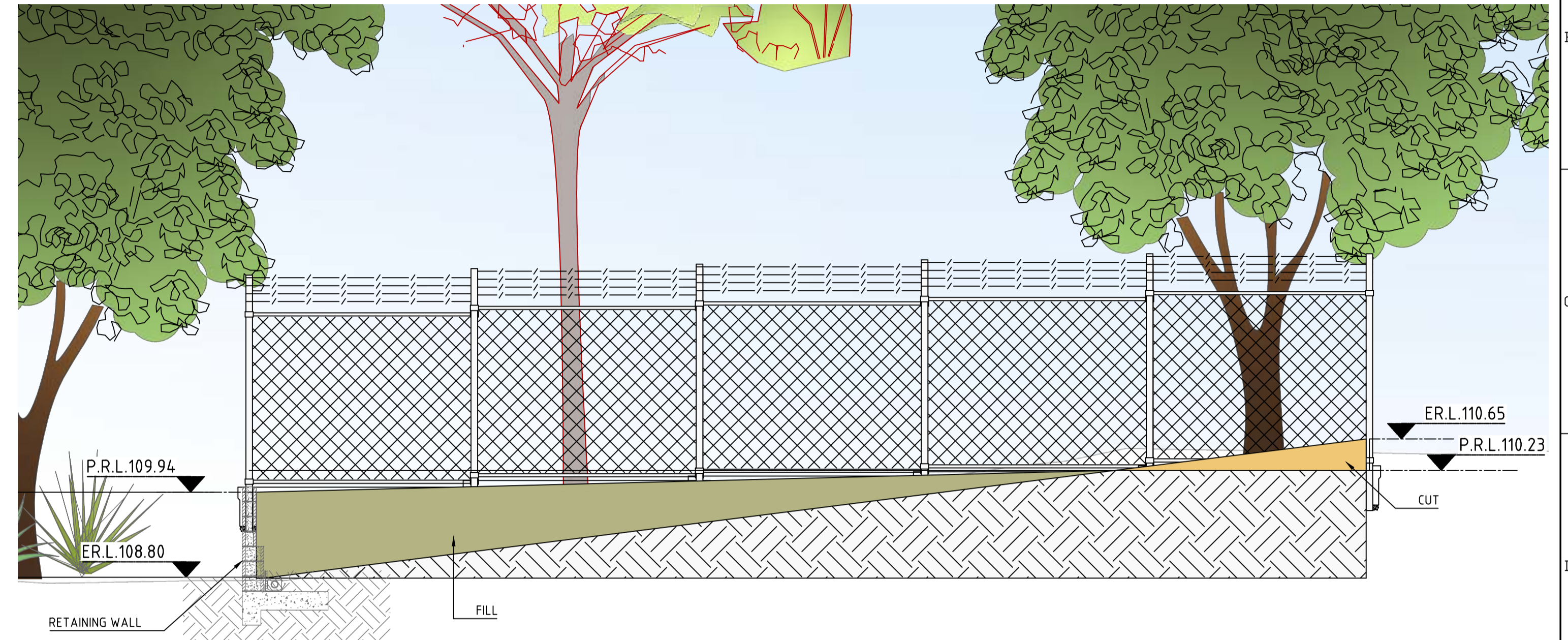
LEGEND:

CUT

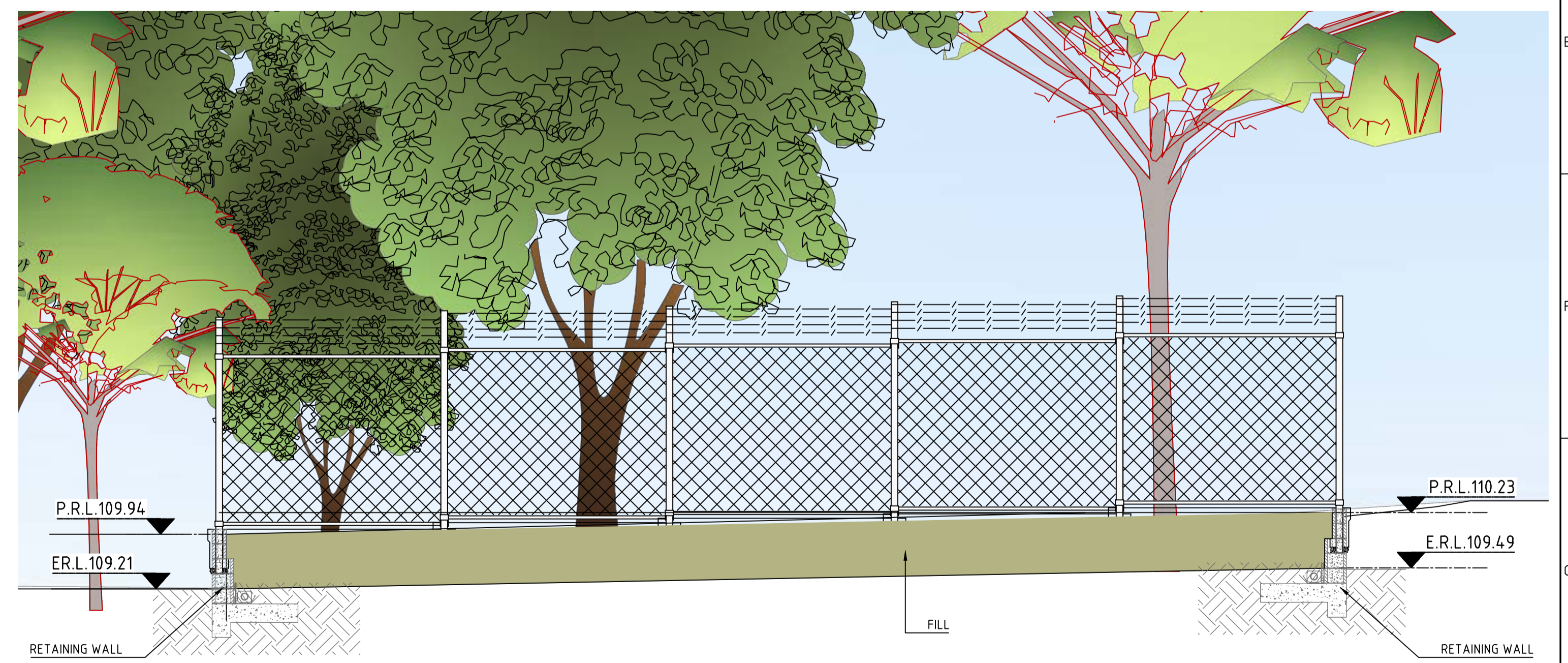
FILL

E.R.L. - EXISTING REDUCE LEVEL

P.R.L. - PROPOSED REDUCED LEVEL



SECTION 1
SCALE 1:50



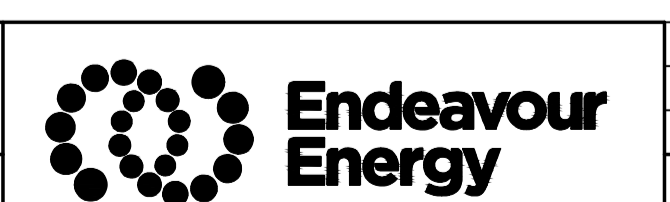
SECTION 2
SCALE 1:50

AMENDMENTS	DESIGNER	CHECKED	DATE
A	BOB BOWEN		

HISTORY	REVISION	DATE
1	ORIGINAL ISSUE	

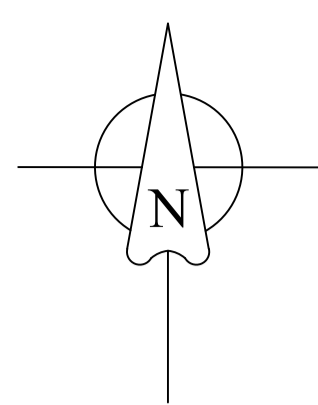
CONCEPT DESIGN

DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			



PROSPECT RESERVOIR COMMUNICATIONS TOWER
SITE PLAN - CUT & FILL

DO NOT SCALE DIMENSIONS IN MILLIMETRES		AUTHORISED/CERTIFIED	
DESIGN MANAGER CIVIL & SECONDARY		A1 528567	
		SHEET No 7 OF 7 SHEETS	



ENDEAVOUR ENERGY CONTACT	
NAME	CONTACT No.
DESIGN: M JANIF	0472723705
CONSTRUCTION: T.KIDD	0401470936



LOCALITY PLAN
NTS

OPERATIONAL LIMITATIONS
UNLESS APPROVED OTHERWISE, INTERRUPTIONS TO ANY CUSTOMERS SUPPLY MUST BE AVOIDED. THE FOLLOWING ALTERNATIVES SHOULD BE CONSIDERED:
- LIVE LINE WORK;
- DESIGN ALTERNATIVES;
- WORK PRACTICES / STANDARDS;
- LOW VOLTAGE PARALLELS
THIS COST TO BE FUNDED BY THE DEVELOPER.

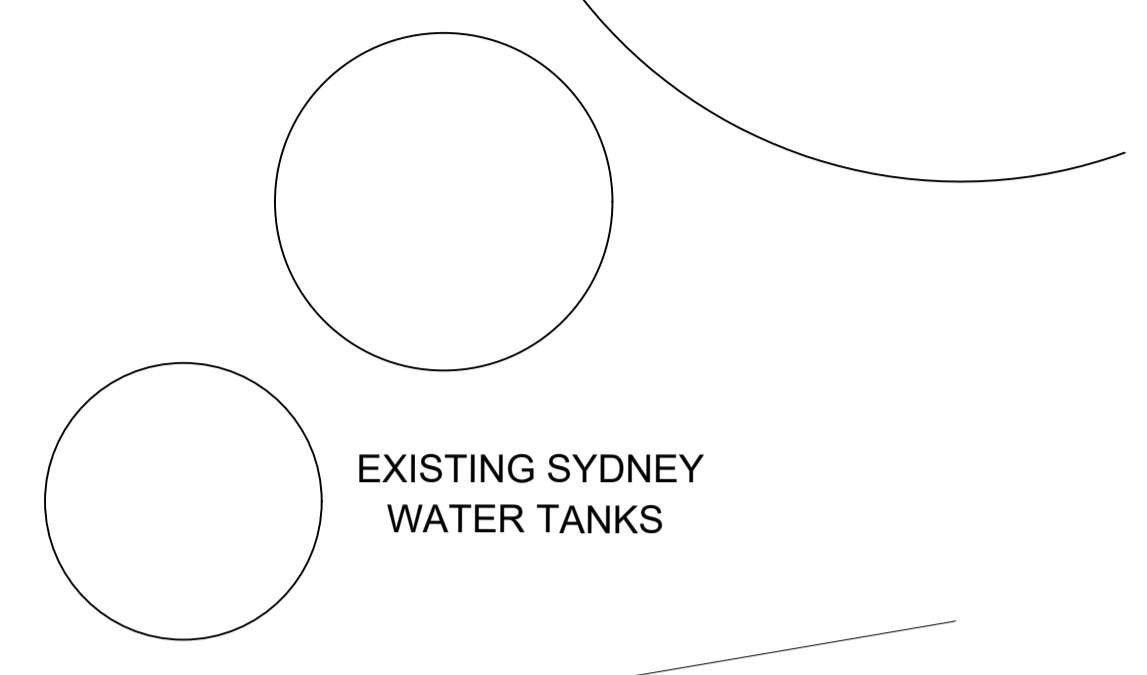
ATTENTION
ALL SERVICES SEARCHES MUST BE CHECKED BEFORE CONSTRUCTION.

NOTES

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT ENDEAVOUR ENERGY NETWORK STANDARDS AND CONNECTION POLICY.
- DO NOT PLACE ANY RELIANCE ON ANY QUANTITIES OR DIMENSIONS GIVEN IN THIS DRAWING. QUANTITIES AND DIMENSIONS GIVEN ON THIS DRAWING ARE BASED ON DESIGN INFORMATION AND SITE CONDITIONS AT THE TIME OF DESIGN. AS QUANTITIES AND DIMENSIONS ARE SUBJECT TO CHANGE, THE BUILDER OF THIS PROJECT MUST CHECK ALL QUANTITIES AND DIMENSIONS ON SITE PRIOR TO TENDERING AND PRIOR TO CONSTRUCTION.
- ATTENTION:
THE PREPARATION OF THIS DESIGN HAS BEEN UNDERTAKEN GIVING DUE CONSIDERATION TO THE EXISTING SERVICES. THE PROJECT CONSTRUCTOR IS, HOWEVER, WHOLLY RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF EXISTING SERVICES AND PERMANENT SURVEY MARKS BEFORE CONSTRUCTION COMMENCES, AND NO RESPONSIBILITY NOR LIABILITY WILL BE ACCEPTED BY THE DESIGNER OF THIS PROJECT FOR DAMAGE TO EXISTING SERVICES AS A RESULT OF THIS DESIGN AND/OR POLE PEGGING.
- REDUNDANT ENDEAVOUR ENERGY MATERIALS TO BE RETURNED TO CLOSEST ENDEAVOUR ENERGY DEPOT.
- PROPERTY OWNERS(SYDNEY WATER) ARE TO BE CONSULTED REGARDING SITE ACCESS PRIOR TO WORK COMMENCING.
- ALL CUSTOMERS ARE TO BE CONTACTED REGARDING OUTAGE ARRANGEMENTS PRIOR TO CONSTRUCTION WORK COMMENCING. THE REQUIRED NOTICE IS TO BE IN ACCORDANCE WITH THE NATIONAL ENERGY CUSTOMER FRAMEWORK (NECF) TIME FRAMES
- CUSTOMER TO ARRANGE FOR THE INSTALLATION & CONNECTION OF NEW SERVICE MAINS & DISCONNECTION OF EXISTING SERVICE MAINS BY A LEVEL 2 ACCREDITED SERVICE PROVIDER. ALL SERVICE WORK TO BE INSTALLED IN ACCORDANCE WITH AS3000:2007 AND THE NSW SERVICE AND INSTALLATION RULES.
- IF FOR ANY REASON, THE PROPOSED POLE LOCATION OR UG ASSETS REQUIRE ADJUSTMENT, PLEASE CONTACT MAINS DESIGN FOR ADVICE. THIS IS CRUCIAL TO ENSURE APPROPRIATE SEPARATIONS / CLEARANCES ARE MAINTAINED WITHIN EXISTING EASEMENTS.
- AN EASEMENT FOR UNDERGROUND CABLES 1 METER WIDE IS REQUIRED OVER THE LOT 304/DP 1122291. REFER SHEET 2
- AN EASEMENT FOR 33KV OVERHEAD POWER LINES 9 METER WIDE IS REQUIRED OVER THE LOT 304/DP 1122291. REFER SHEET 2.
- CONTRACTOR SHALL PEG THE UG ALIGNMENT PRIOR TO WORKS. DESIGN TEAM CAN BE CONTACTED FOR DESIGN ALIGNMENT IN CAD.

SITE PLAN LEGEND **SITE PLAN:**
(SCALE - 1:500)

- EXISTING OVERHEAD MAINS 33kV FDR 4/35
- EXISTING UNDERGROUND MAINS
- - - NEW OVERHEAD MAINS
- - - NEW LV TRENCH
- ⊗ TREES INDICATIVE
- EXISTING POLE LOCATION
- NEW POLE LOCATION
- ⊕ NEW POLE MOUNTED SUBSTATION
- NEW LV PILLAR
- w- SYDNEY WATER DUCTILE IRON PIPE (DICI)



WORK SITE TRAFFIC MANAGEMENT:

A TRAFFIC CONTROL PLAN AS WELL AS ADVANCED WARNING AREAS ARE TO BE IN PLACE BEFORE CONSTRUCTION WORK COMMENCES. REFER ENDEAVOUR ENERGY TRAFFIC MANAGEMENT MANUAL TMM0001

WARNING
UNDERGROUND SERVICES ARE LOCATED IN THE VICINITY OF THE PROPOSED WORKS. A DIAL-BEFORE-YOU-DIG SEARCH IS TO BE PERFORMED 2 DAYS PRIOR TO CONSTRUCTION. IT IS RECOMMENDED THAT ALL SERVICES SHOULD BE LOCATED USING NON-DESTRUCTIVE TECHNIQUES BEFORE WORKS BEGIN.

ENVIRONMENTAL AWARENESS
WORKS TO BE COMPLETED IN CONJUNCTION WITH ENDEAVOUR ENERGY'S ENVIRONMENTAL GUIDELINES HANDBOOK 2017. ALL PROJECT MANAGERS, CONTRACT INSPECTORS AND CONSTRUCTION CREWS ARE TO BE MADE AWARE OF THE CONTENTS PRIOR TO ANY SITE VISITS OR CONSTRUCTION WORKS COMMENCING. COPIES OF THE DOCUMENTATION ARE TO BE AVAILABLE ON SITE AND ACCESSIBLE AT ALL TIMES FOR THE DURATION OF THE PROJECT. USE SILT TRAPS/SOCKS OR OTHER APPROVED METHODS TO PREVENT RUN-OFF ENTERING DRAINS AND STORMWATER CHANNELS. REFER EMS 0002-POLLUTION CONTROL PROCEDURE

WORK METHOD STATEMENT REFERENCE

The contents of this table are an indication only, and the required Work Method Statements may not be limited to those listed here.

WMS No.	TASK NAME
Index of SWMS	Index of Safe Work Method Statements
SRM 12	SRM 15 - Vegetation Management
SWM 01.001	Traffic Management
SWM 01.004am01	Excavation Work (Trenching, Boring, etc)
SWM 01.008	Deep Earth Boring
SWM 01.015	Working at Heights (use of work platforms, Guardrails, Fall Arrest Systems, etc.)
SWM 03.008am01	Construct Single Pole Substation
SWM 03.011am01	Earth Testing (Separate, Common, SWER)
SWM 05.008	Install/Replace Cable Guard
SWM 05.010am02	Install / Replace Underground Cables (including cut and cap)
SWM 05.011	Termination of Underground Cables
SWM 06.005am03	Erect New / Change Pole (Includes all Comdemned Poles)
SWM 07.001am01	Transmission and Distribution Switching (Overhead Mains)
SWM 13.001am01	Recording of Underground Assets (Cables & Ducts)
SWM 13.002am01	Inspection & Commissioning of Network Assets (Overhead)
SWM 13.003am01	Inspection and Commissioning of Network Assets (Underground)

WORKS COMPLETED/FIELD BOOK

CONSTRUCTED BY: _____
 WORKS COMPLETED: _____
 SIGNATURE: _____ DATE: _____
 INSPECTED BY: _____
 SIGNATURE: _____ DATE: _____
ASSET RECORDING
 I: _____
 OF: _____
 CONTACT No.: _____
 HEREBY CERTIFY THAT ASSETS MARKED AS BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOUR ENERGY STANDARD S4D 0004.
 SIGNATURE: _____
 DATE: _____

NOTE
ACCESS TO WORKSITE VIA SYDNEY WATER GATES G1 OR J2 REQUIRE ENDEAVOUR ENERGY ABLOY KEY

PERMANENT SURVEY MARKS MAY EXIST IN THIS AREA. THESE ARE TO BE LOCATED BY SURVEY PRIOR TO COMMENCEMENT OF WORK.

ESTABLISH 33kV/400V SINGLE POLE MOUNTED SUBSTATION No - 96001: 100kVA 3 PH (SINGLE CUSTOMER) (Dyn11, KNAN FR3 Natural Ester Oil) EARTHING REQUIREMENT : REFER EARTHING . TR FUSES: 5A - BORIC ACID TYPE LV FUSES: 200A (1 SET OF LV DISTRIBUTOR)

WARNING
LIVE ENDEAVOUR ENERGY CABLES & OTHER SERVICES IN THIS AREA. PLEASE CONTACT DIAL BEFORE YOU DIG ON TEL: 1100 FOR SEARCHES TWO DAYS PRIOR TO EXCAVATION.

NOTE:
NO JEMENA GAS WEST/NBN/TELECOMMUNICATION /SYDNEY WATER ASSETS ARE BEING AFFECTED BY THE ELECTRICAL WORKS. THERE IS A CONCRETE AND STEEL 100MM DCLP PIPE RUNNING THROUGH UNDERNEATH THE TOWER SITE TOWARDS THE PROPOSED POLE SUBSTATION SITE. NOT SHOWN IN DIAL BEFORE YOU DIG SEARCHES.

DUCT BREAKDOWN TABLE		
ALL TRENCH SECTIONS ARE TO BE READ & VIEWED FROM NODE TO NODE AS NOMINATED		
Route	Configuration	Route Length (m)
A - B	(New Duct) TRENCH & INSTALL 2 x 125mm PVC & 2 x 50mm PVC DUCTS	7m
B - C	(New Duct) TRENCH & INSTALL 2 x 125mm PVC & 2 x 50mm PVC DUCTS	63m
TOTAL		70m

LEGEND

- SPARE DUCT
- DUCT WITH NEW CABLE
- ⊙ DUCT WITH EXISTING CABLE
- DIRECT BURIED CABLE
- ABANDONED CABLE
- ⊕ NEW TRENCH
- ⊕ EXISTING TRENCH
- UNDERBORE

WARNING
LIVE ELECTRICAL CABLES IN THIS AREA
CONTACT NETWORK DATA, HUNTINGWOOD DR, HUNTINGWOOD TELEPHONE 9853-4161 FOR CABLE SEARCHES PRIOR TO EXCAVATION

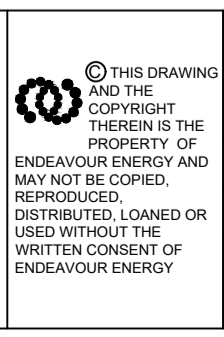
REFER SHEET 3

306909.2660	6255578.2840	1001686	7m	20°	66T+POLE SUB	TYPE 4 OHEW	SUB-SINGLE CUSTOMER	750	2.5	17m/12kN	-	C	-	-	X	-	-	2	
			728305		33UGOH(EX)+TEE	EX+TYPE 4 OHEW	-				EX	-	-	-	X	-	-	1	
EASTING	NORTHING	NEW	EXISTING	SPAN LENGTH	LINE DEV DEGREES	33kV	OHEW/OPGW	LV	DIA mm	DEPTH m	TYPE (LENGTH /STRENGTH)	STAY	FOOTING	RELOCATE	REPLACE	NEW	EXISTING	REMOVE	DESIGN NUMBER
STAKING (CO-ORDINATES IN MGA56)			FIELD POLE NUMBER		CONSTRUCTION				HOLE		POLE								

AMENDMENTS
ORIGINAL
ISSUE
DRAFT No. 01

PRELIMINARY ONLY
NOT FOR CONSTRUCTION

TEMPLATE VERSION No. 5.20



REFERENCE DRAWING'S	WORK ORDERS	CAMS File No.
GENERAL		AM PROJ. No. NCC-000742
OVERHEAD		HV SWITCHING
UNDERGROUND		EE DEPOT
SUBSTATIONS		KINGS PARK
		EE REGION
		HV OP DIAG
		BLACKTOWN TS/T8
		LOCAL GOV AREA
		BLACKTOWN

ORIGINAL SCALE 1:500
DRAWN MJ
DATE 19/10/22
CHD

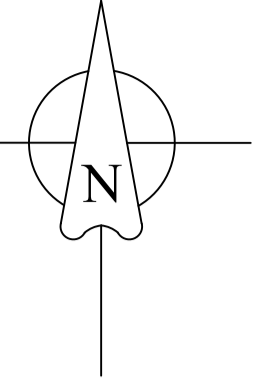
DO NOT SCALE DIMENSIONS IN METRES
DESIGN MJ

WILLIAM LAWSON DRIVE
PROSPECT
NCC-000742
ESTABLISH POLE MOUNTED SUBSTATION
HUNTINGWOOD COMMS TOWER RELOCATION

Endeavour Energy

A1 527137 A

SHEET No 1 OF 3 SHEETS



FINAL 33kV CIRCUIT

NOT TO SCALE

- EXISTING TR OVERHEAD MAINS FDR 435 - BLACKTOWN TO BOSSLEY PARK TEE QUARRIES
- - - EXISTING TR UNDERGROUND MAINS FDR 435 - BLACKTOWN TO BOSSLEY PARK TEE QUARRIES
- - - ERECT 3 x 7/4.50 AAC 'MERCURY' CONDUCTOR (BETWEEN POLES '1' AND '2')
R.L. 7m C.L. 30m. SLACK SPAN (TENSION @ 2% CBL @ 5°C TABLE 1)

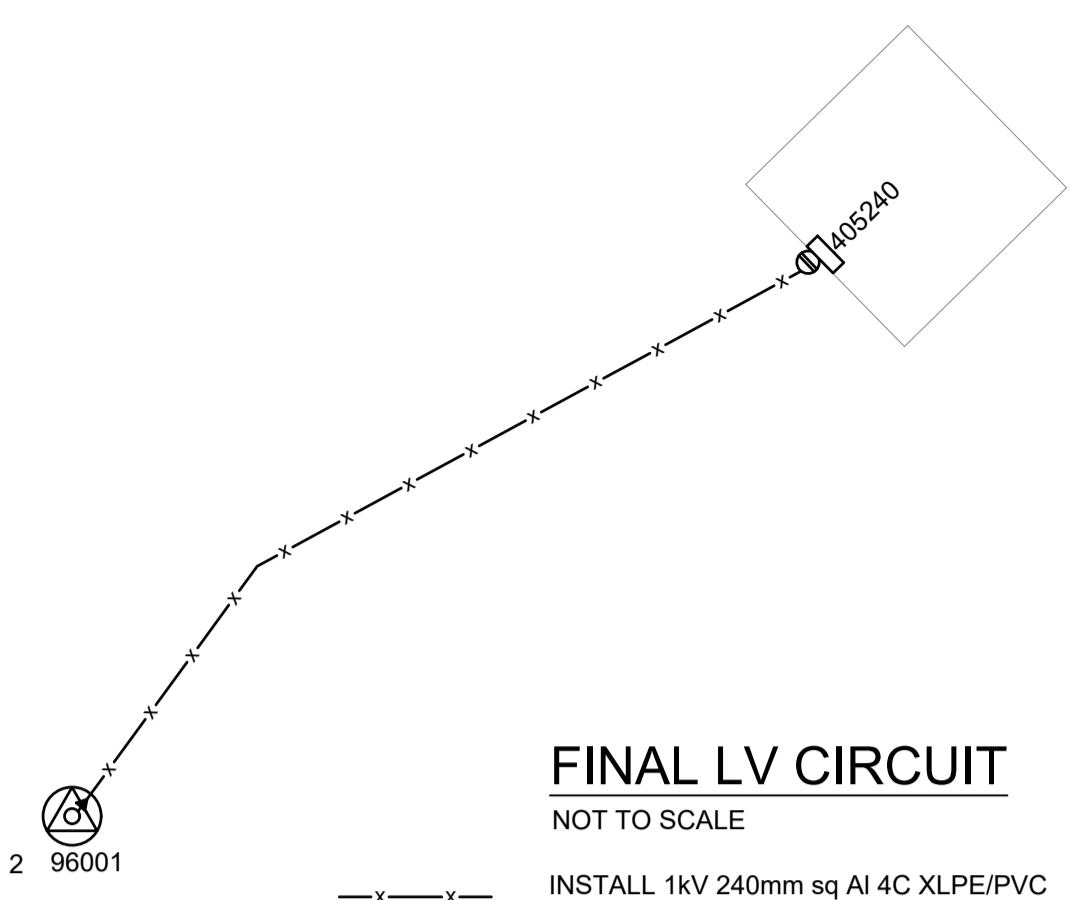
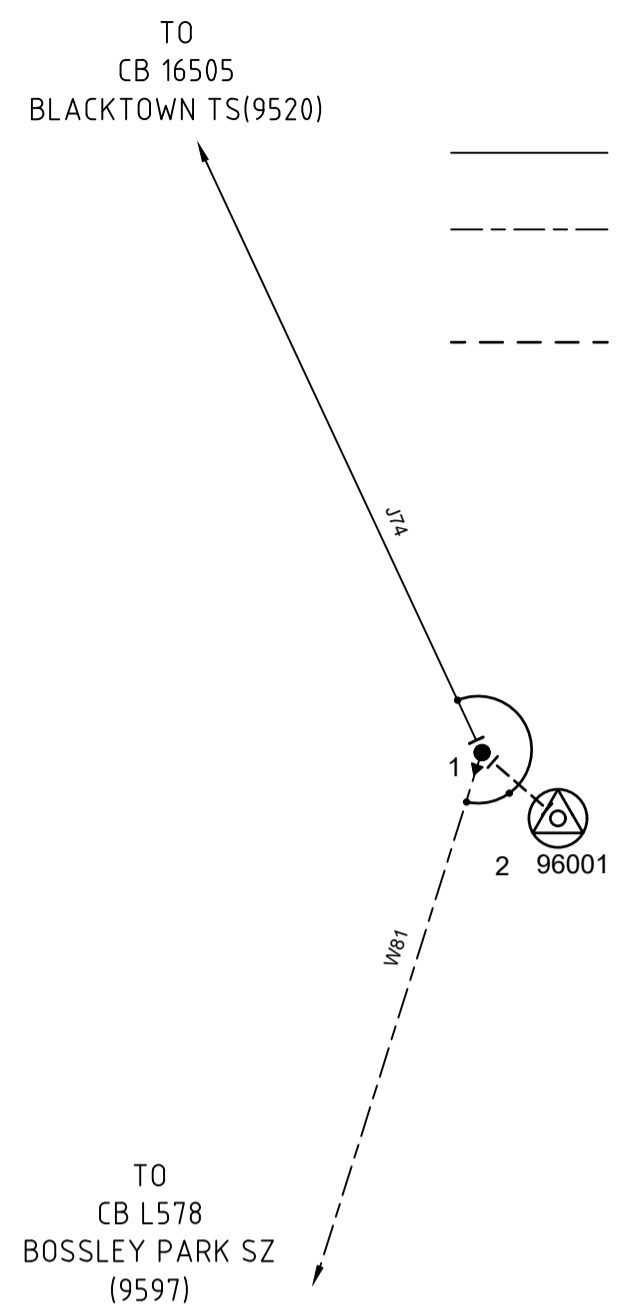
SAP DATA URBAN OH SUB 96001	
HV DOF	231947
TRF 1	10004450
LV ISOLATOR	231948
LV BUSBAR	37528
F1 - FUSE LABEL	403332
F2 - FUSE LABEL	

TR CONDUCTOR REFERENCE	
CODE	SIZE & TYPE
J74	2 x 19/3.25 AAC (2 x 19/0.128) 2 x (OH) 33 kV
W81	630mm ² Cu 1C XLPE/PVC/HDPE Screened (UG) 33kV

FINAL LV CIRCUIT

NOT TO SCALE

- x-x- INSTALL 1kV 240mm sq Al 4C XLPE/PVC
R.L.63m CL.80m



CONDUCTOR STRINGING TABLE 1										
STRAIN SECTION	POLE '1' TO '2'		TENSION (%CBL) @ 5°C							2%
DESIGN SPAN	POLE '1' TO '2'		RULING SPAN (m)							7.0
CONDUCTOR	1 x 7/4.50 AAC 'MERCURY'(NO CREEP COMPENSATION REQUIRED)									
TEMPERATURE (°C)	0	5	10	15	20	25	30	35	40	
TENSION (kN)	0.65	0.34	0.24	0.19	0.16	0.15	0.13	0.12	0.11	
SAG (m)	0.03	0.05	0.07	0.08	0.10	0.11	0.12	0.13	0.14	

ATTENTION
REGIONAL STAFF TO NOTIFY NETWORK DATA DAILY WHEN CABLE WORK IS IN PROGRESS.
TELEPHONE: EXT. - 0298536664 or 0478403699

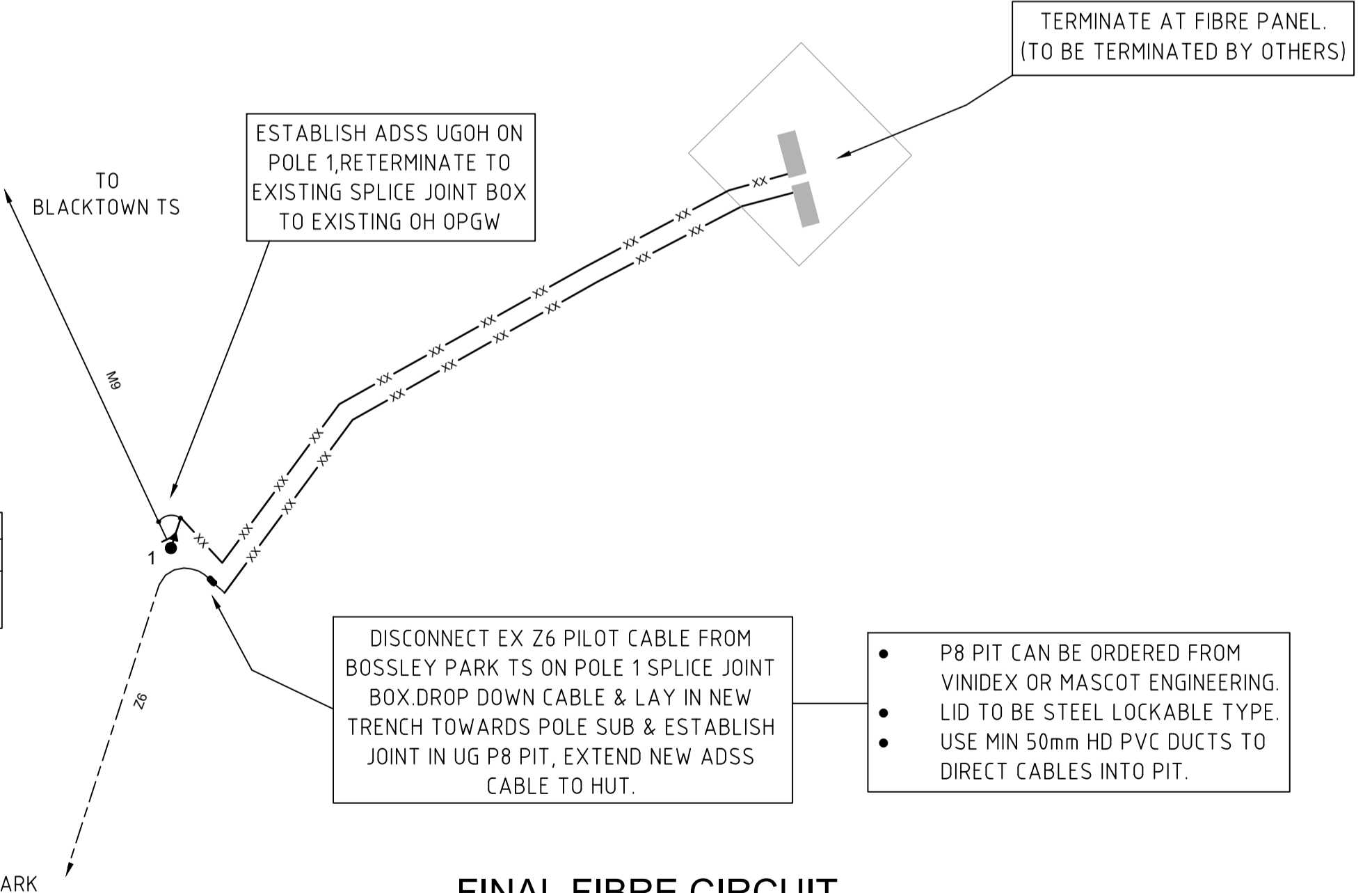
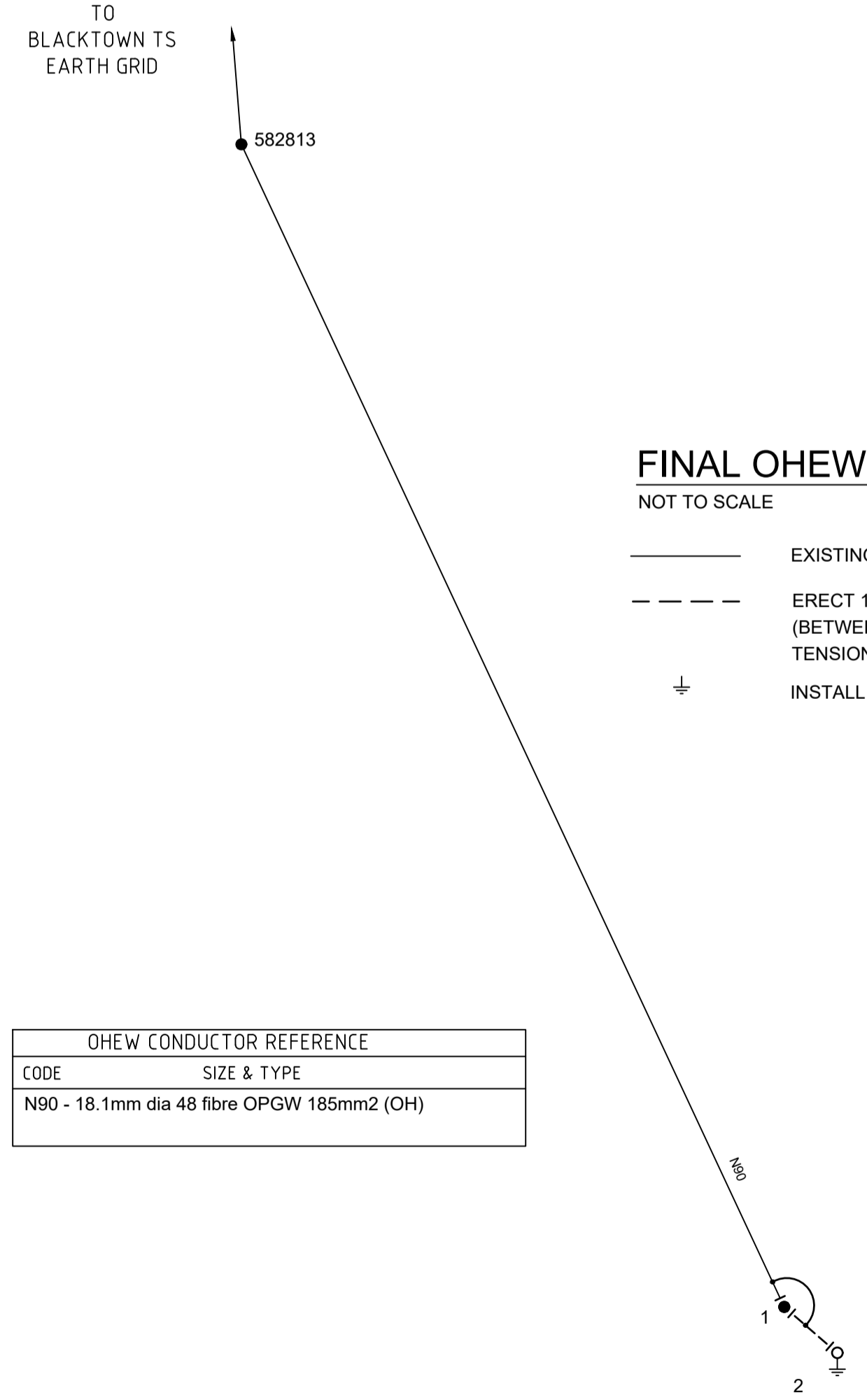
FINAL OHEW & EARTHING CIRCUIT

NOT TO SCALE

- EXISTING OHEW
- - - ERECT 1 x 7/4.50 AAC 'MERCURY' OHEW CONDUCTOR (BETWEEN POLES '1' AND '2') R.L. 7m C.L. 10m TENSION @ 2% CBL @ 5°C TABLE 1
- + INSTALL 33kV POLE/SUBSTATION EARTH (REFER EARTHING DIAGRAM)

OHEW CONDUCTOR REFERENCE	
CODE	SIZE & TYPE
N90	18.1mm dia 48 fibre OPGW 185mm ² (OH)

ADSS/COMMS CONDUCTOR REFERENCE	
CODE	SIZE & TYPE
M9	48 core OPGW (18.1mm dia)
Z6	60 core UGFO pilot

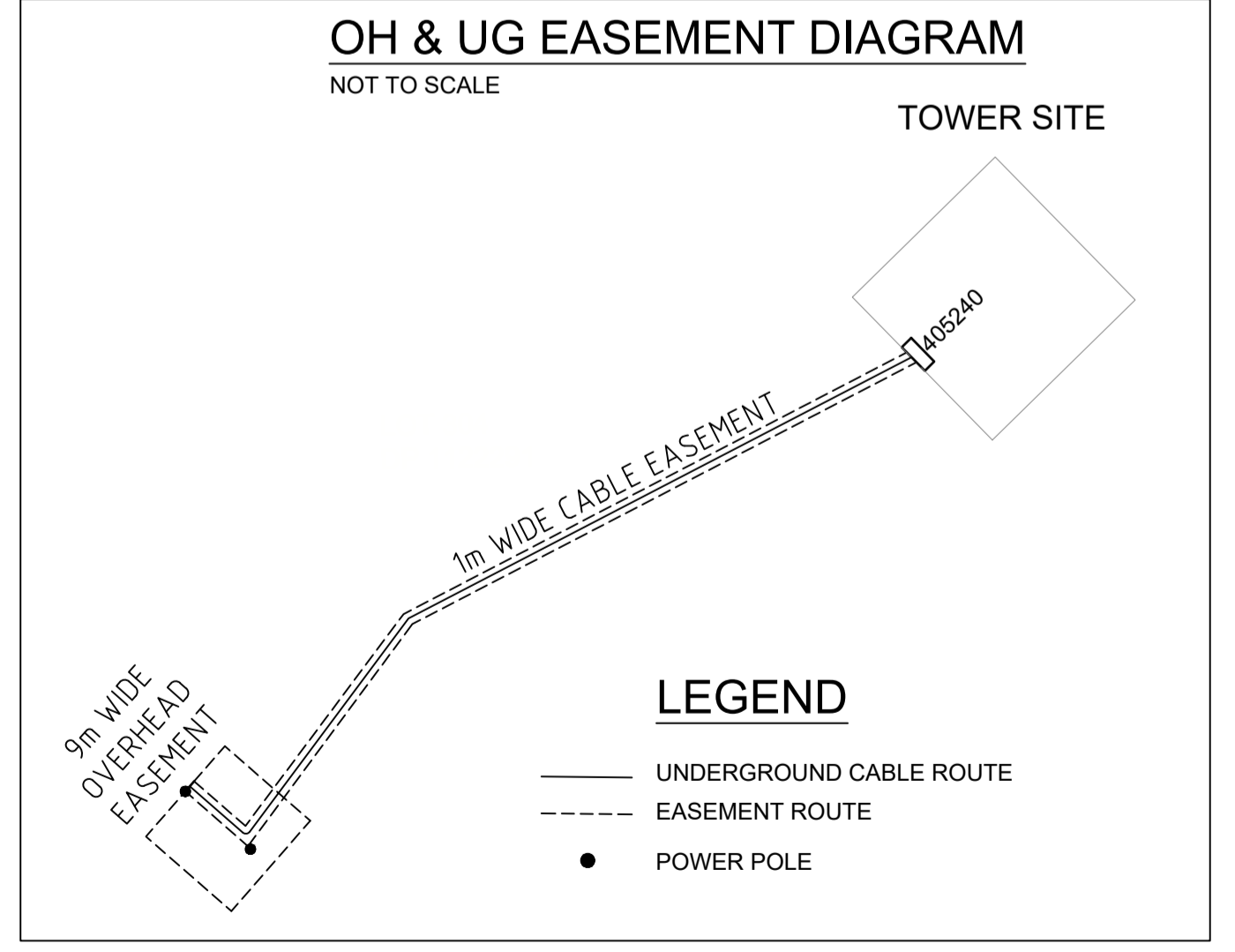


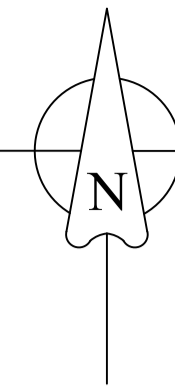
FINAL FIBRE CIRCUIT

NOT TO SCALE

- x-x- INSTALL FIBRE OPTIC 144 CORE CABLE FROM: UGOW POLE 1 TO PROPOSED COMMS HUT
R.L - 70 m C.L - 220m

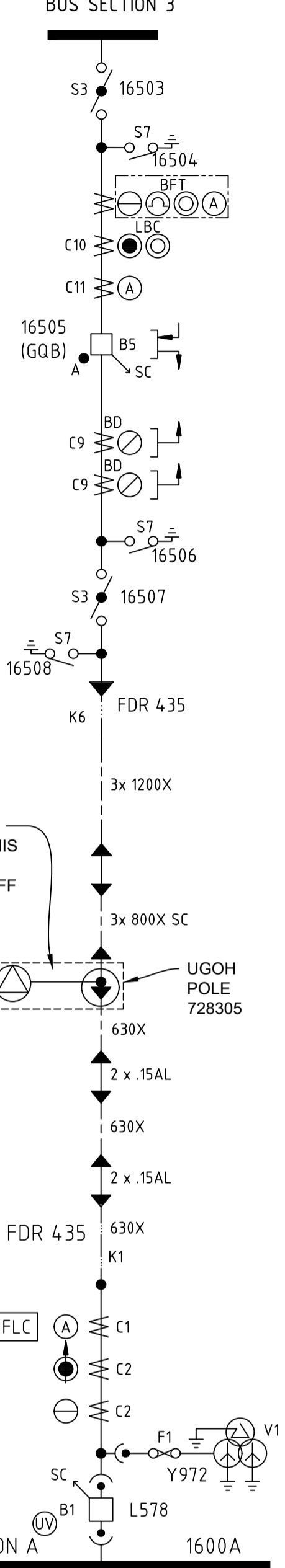
WORKS COMPLETED/FIELD BOOK	
CONSTRUCTED BY:	_____
WORKS COMPLETED:	_____
SIGNATURE:	_____ DATE: _____
INSPECTED BY:	_____
SIGNATURE:	_____ DATE: _____
ASSET RECORDING	
I:	_____
OF:	_____
CONTACT No.:	_____
HEREBY CERTIFY THAT ASSETS MARKED AS-BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOUR ENERGY STANDARD SAD 0004.	
SIGNATURE:	_____
DATE:	_____





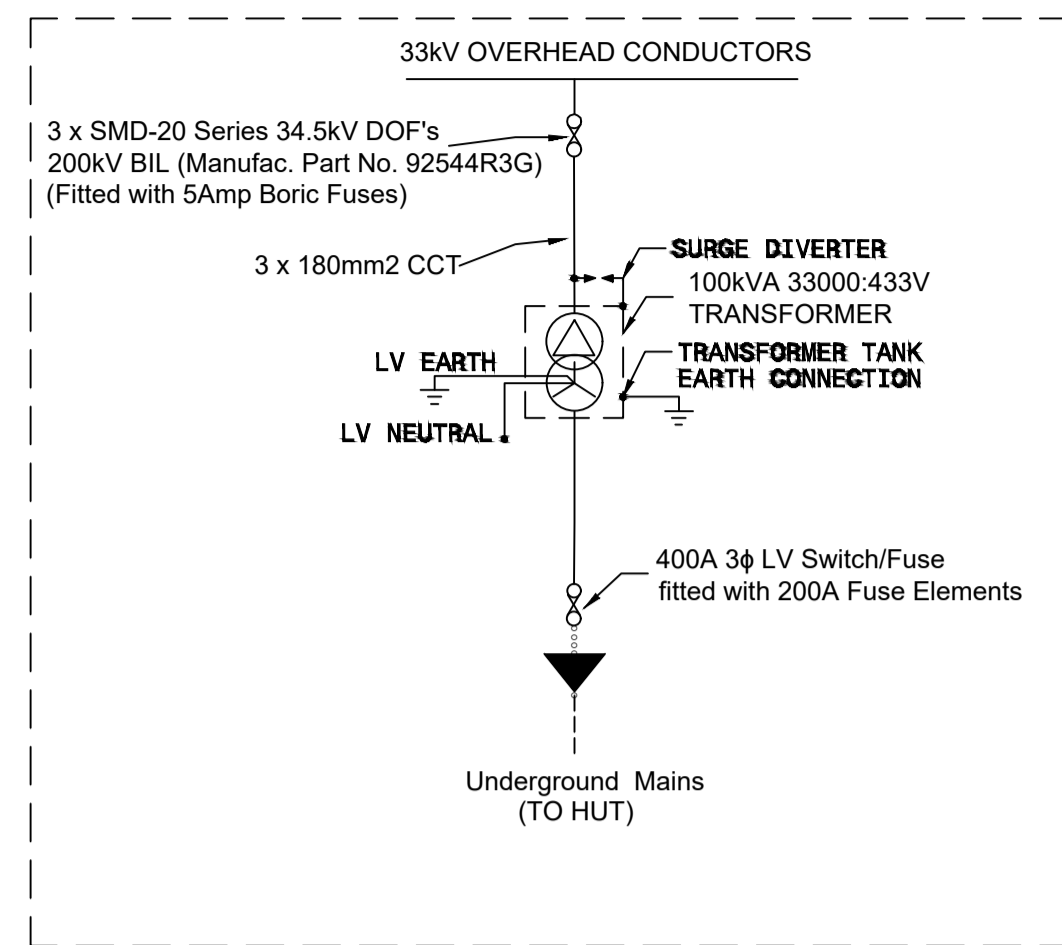
33kV FDR 435 SLD
NTS

BLACKTOWN TS 33kV
BUS SECTION 3

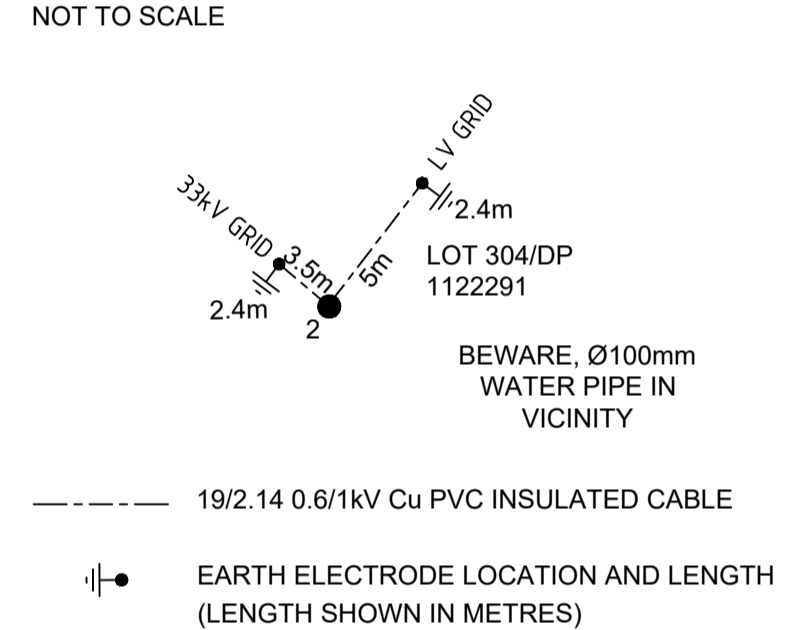


BOSSLEY PARK ZS
33kV
BUS SECTION A

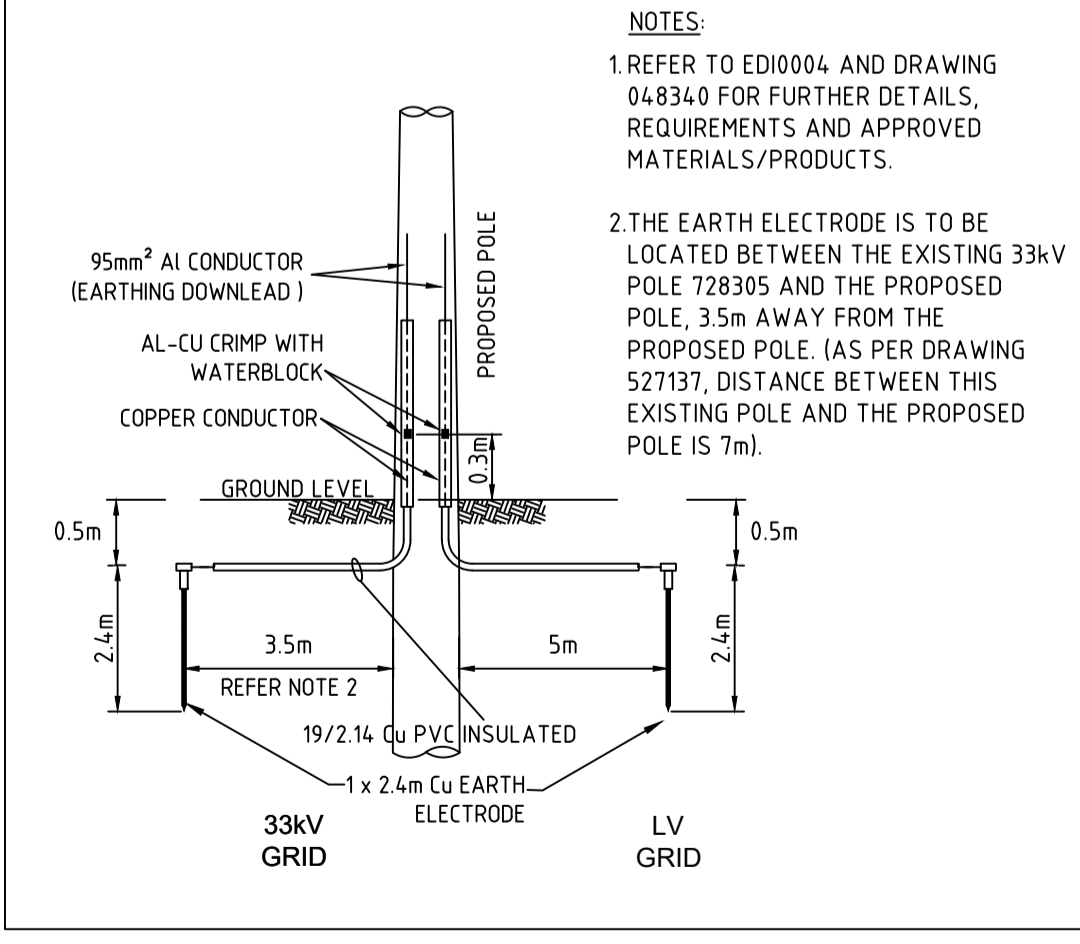
Pole Substation Single Line Diagram



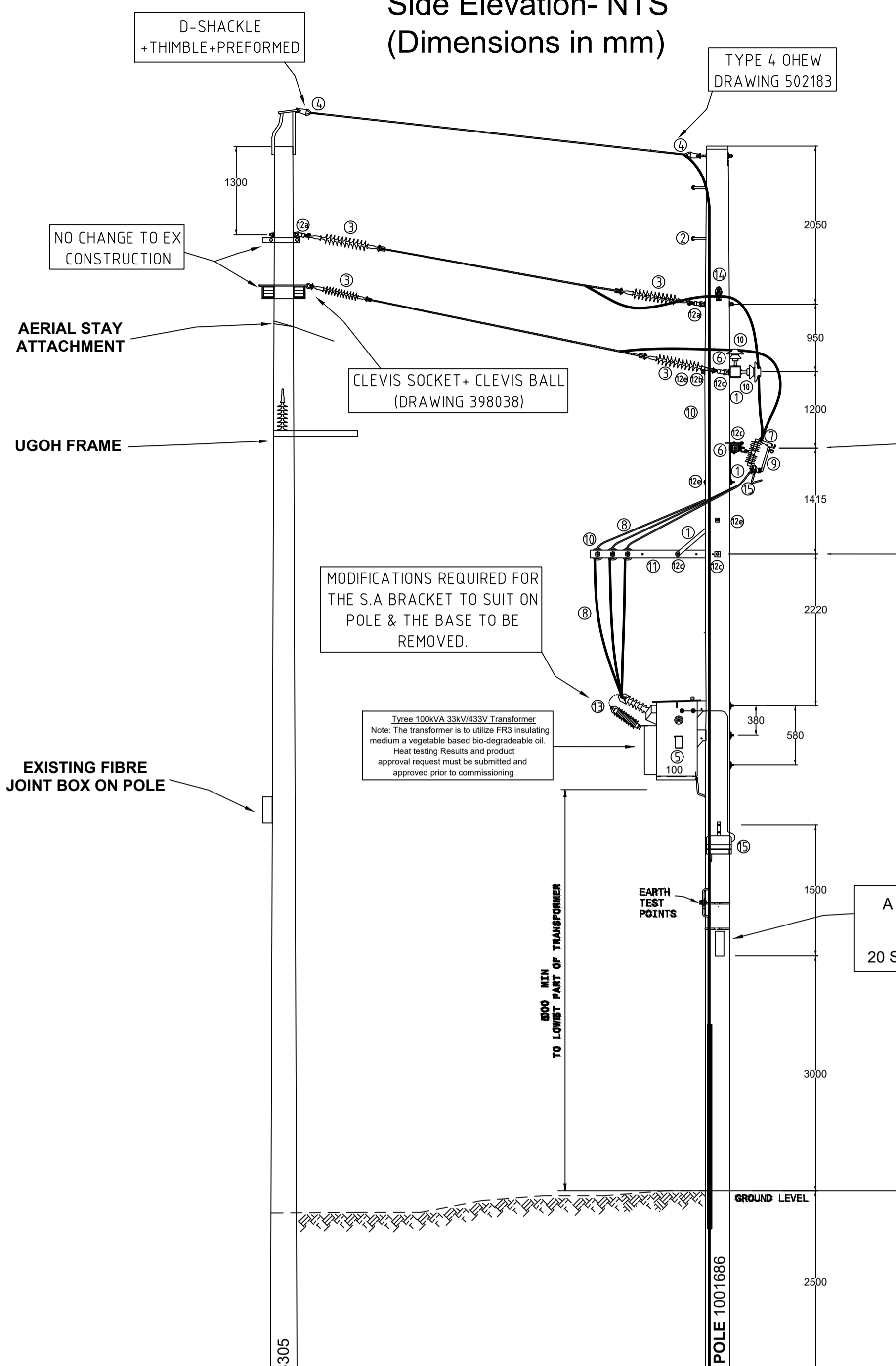
EARTHING PLAN POLE '2'
NOT TO SCALE



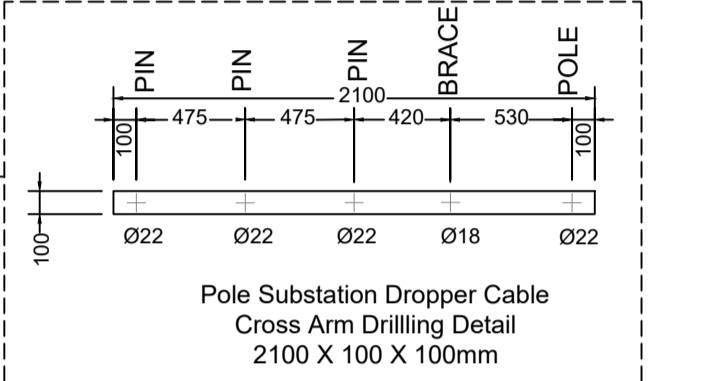
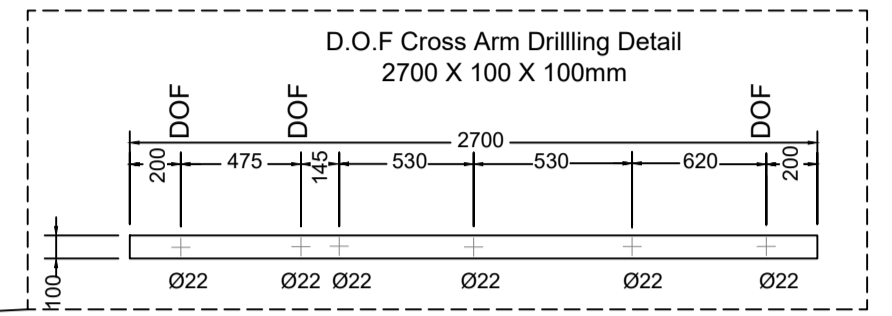
SEPARATE EARTH ROD LAYOUT (INDICATIVE)
NOT TO SCALE



Side Elevation- NTS
(Dimensions in mm)



Note
A MINIMUM OF 380mm MUST BE MAINTAINED BETWEEN ALL EXPOSED ACTIVE COMPONENTS AND EARTHED PARTS OF THE POLE OR STRUCTURE MEASURED TO THE CLOSEST POINT AS PER MDI0031 TABLE 17 5.4.2 TO PREVENT FLASHOVER



SUBSTATION SEPARATE EARTHING DETAIL
SCALE: NTS

HV EARTHING DETAILS				
Soil Resistivity	Layer 1	11.52	Depth (m)	2.24
	Layer 2	144.95		∞
Designed Earth Resistance Limit (Ohm)	4-10			
Measured Earth Resistance (Ohm)				
Number of Electrodes	1			
Insulated Depth (m)	0			
Length of Bare Electrode (m)	2.4			
Connector Type (CAD or Crimp)	Crimp			
Location Category: F- Frequented, R-Remote, S-Sp Remote	Remote			
What Design Tool Used?	CDEGS			
Fault level (kA)	7.33			
LV EARTHING DETAILS				
Designed Maximum Earth Resistance (Ohm)	4-10			
Measured Earth Resistance (Ohm)				
Number of Electrodes	1			
Length of Bare Electrode (m)	2.4			
Connector Type (CAD or Crimp)	Crimp			

HV EARTH MINIMUM SEPARATION (m)				
	Design	Actual	Design	Actual
TDMEN	5		Telecom	90
TDB	4		Pipes	5
TDU	3.5		HV-LV	5

Components in Addition to Standards Pole Substation

ITEM	PART No.	DWG No	DESCRIPTION	QUANTITY
1	SB14342	011962	BRACE CROSSARM (750mm x 6mm)	5
2	1561802	370399	POLE STEP	A/R
3	ALR002	398038	INSULATOR LONG ROD ASSEMBLY	6
4	-	502183	OHEW ASSEMBLY TYPE 4	2
5	-	-	33kV/433V POLE MOUNTED TRANSFORMER (100kVA)	1
6	-	-	TIMBER CROSSARM 2700X100X100mm (UNDRILLED)	2
7	100002154	-	S&C 20 SERIES DOF'S PART NO. 92544R3G	3
8	1116540	-	180mm2 (19/3.50AAAC) COVERED CONDUCTOR THICK	A/R
9	1000002265	20 SERIES	FUSE ELEMENT 5A (PART NO. 614.006) "INCLUDES 3 SPARES"	6
10	1014559/1017639	015366C	33kV PIN INSULATOR & PIN	6
11	-	-	TIMBER CROSSARM 2100X100X100mm (UNDRILLED)	1
12a	ACP005	240600	M20 EYEBOLT ASSEMBLY FOR POLE	2
12b	ACP006	240600	M20 EYEBOLT ASSEMBLY FOR CROSSARM	2
12c	ACP007	240600	M20 BOLT ASSEMBLY FOR CROSSARM	3
12d	ACP009	240600	M16 BOLT ASSEMBLY FOR CROSSARM	1
12e	ACP010	240600	M16 BOLT ASSEMBLY FOR POLE	4
13	1550516	-	33kV SURGE ARRESTER	3
14	ALP004	-	33kV POST INSULATOR	2
15	1143866	-	400A 3 φ LV SWITCH FUSE F/W 3 x 200A FUSE ELEMENTS	1

WORKS COMPLETED/FIELD BOOK

CONSTRUCTED BY: _____
 WORKS COMPLETED: _____
 SIGNATURE: _____ DATE: _____
 INSPECTED BY: _____
 SIGNATURE: _____ DATE: _____
ASSET RECORDING
 I: _____
 OF: _____
 CONTACT No.: _____
 HEREBY CERTIFY THAT ASSETS MARKED AS-BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOUR ENERGY STANDARD SAD 0004.
 SIGNATURE: _____
 DATE: _____

PRELIMINARY ONLY
NOT FOR CONSTRUCTION

Attachment B – Photos of existing landscape

Photos depicting visual character of proposal site

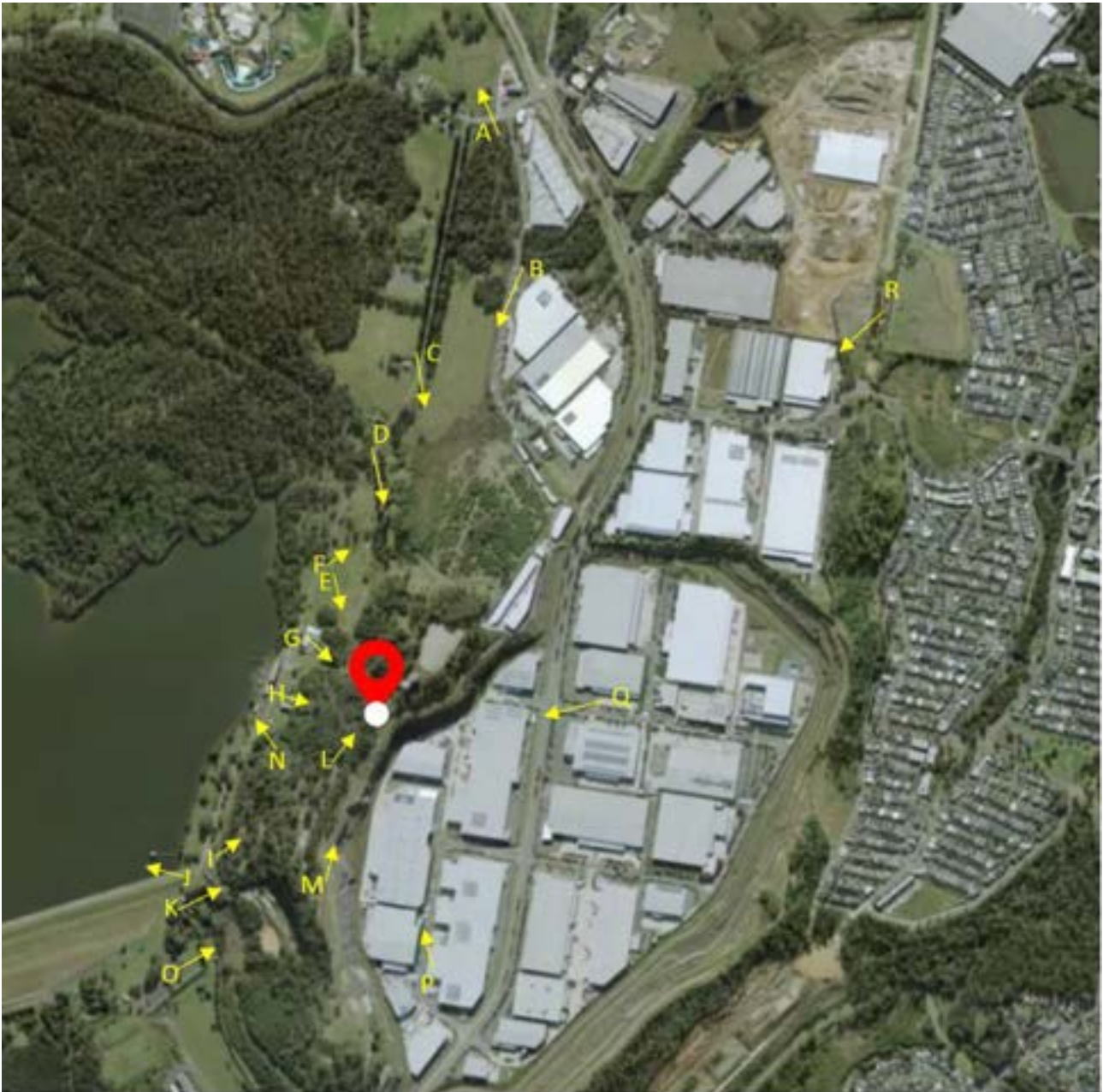


Photo A –
guyed masts
on corner
Prospect
Highway and
Reservoir
Road.



Photo B –
View towards
site from
industrial park
at Picrite
Close.



Photo C –
Towards the site from house on William Lawson Drive (tower will be predominantly obscured by vegetation).



Photo D –
View towards proposed tower from start of access track (not accessible by public). View of tower obscured by vegetation.



Photo E –
view to
proposed
tower from
William
Lawson Drive.
Tower will be
partially
obscured by
vegetation.



Photo F –
view towards
existing power
lines from
William
Lawson Drive.



Photo G – view to proposed tower from Water NSW offices.



Photo H – view to proposed tower from heritage information area on William Lawson Drive. View will be predominantly obscured by existing vegetation.



Photo I – View from gateway adjacent submerged tower and in close proximity to Prospect Reservoir Valve House, looking up road to picnic areas and George Maunder Lookout on Prospect Hill.



Photo J - View from Reservoir wall

to existing communications towers and electricity pylons in the surrounding area.



Photo K – view to proposed tower from heritage listed Prospect Reservoir Valve House. Tower will be obscured by former quarry wall and existing vegetation.



Photo L –
View to
proposed
tower from
Maunder
picnic area.
Tower will be
predominantly
obscured by
existing
vegetation.



Photo M –
view to
proposed
tower from top
of former
quarry wall
(not publicly
accessible).



Photo N – view to existing guyed towers next to Raging Waters theme park and existing electricity pylons.



Photo O – view to proposed tower from lower car park. Views to the tower will be partially obscured by vegetation and former quarry wall.



Photo P – view towards proposed tower from Dolerite Way in former quarry industrial park. Tower will be partially obscured by existing industrial buildings.



Photo Q – View to proposed tower from Belleview Circuit in former quarry industrial park.



Photo R –
View to the
proposed
tower from
Prospect
Lookout.



Attachment C – Consultation with Heritage NSW

Lia Zwolinski

From: James Quoyle <James.Quoyle@environment.nsw.gov.au>
Sent: Thursday, 19 January 2023 10:51 AM
To: Roweena Dsouza
Cc: Michael Ellis
Subject: RE: Comms Tower at Prospect (HMS1632)

Hi Roweena

Thank you for meeting with HNSW today.

The demonstration of the data and modelling to verify the accuracy of the visual impact from key significant areas across the site and from the top of Prospect Hill to the east provided a fuller understanding of the terrain and was effective.

Also, the proposed mitigation measure to reduce the visual impact by improving and rehabilitating the vegetation in this area of the site has benefit and this needs to be part of the application and in a form that may be included in Schedule 1 – APPROVED DOCUMENTS.

Based on your presentation, HNSW are of the opinion that the proposed tower in that location is not likely to materially affect the aesthetic values of the item. Therefore, the application will not be exhibited by HNSW and the approval will be completed under delegation.

What is required:

- Updated VIA
- Updated SoHI
- Updated architectural drawings (extracted from the REF)
- Details of the vegetation rehabilitation plan.

I will initiate a task request in HMS and this will stop the clock to enable you the time to consult with Sydney Water and prepare a vegetation rehabilitation plan. Could you provide an estimate of the time required to finalise this component?

Regards James

James Quoyle (he/him)
Senior Assessments Officer
Heritage NSW
Department of Planning and Environment

T 9873 8612 E james.quoyle@environment.nsw.gov.au

dpie.nsw.gov.au heritage.nsw.gov.au

4 Parramatta Square 12 Darcy Street Parramatta
Locked Bag 5020 Parramatta 2124

Working days Monday to Thursday



I acknowledge the traditional custodians of the land and pay respects to Elders past and present. I also acknowledge all the Aboriginal and Torres Strait Islander staff working with NSW Government at this time.

Please consider the environment before printing this email.

From: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>
Sent: Wednesday, 18 January 2023 4:14 PM
To: James Quoyle <James.Quoyle@environment.nsw.gov.au>
Subject: RE: Comms Tower at Prospect (HMS1632)

Hi James,

We are preparing a detailed response to answer your queries. In light of time, I would like to have a quick call with you today to explain what I'm proposing and schedule a meeting to demonstrate visibility of the tower from all the viewpoints that have been suggested. This would really help your understanding of our proposal.

Please call me or let me know your thoughts.

Thanks
Row

From: James Quoyle <James.Quoyle@environment.nsw.gov.au>
Sent: Monday, 16 January 2023 11:26 AM
To: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>
Subject: RE: Comms Tower at Prospect (HMS1632)

Hi Roweena
Would you have some time today to go through the submission and address any immediate queries?
Regards
James

From: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>
Sent: Wednesday, 11 January 2023 3:56 PM
To: James Quoyle <James.Quoyle@environment.nsw.gov.au>
Subject: RE: Comms Tower at Prospect (HMS1632)

Hi James,

Sorry about that. I have resent the submission and if you have any issue downloading it, let me know. The combined file size is huge, but if there are particular documents you require, I can extract them from the submission and send them separately which would be easier to review.

In addition, as this project is at a critical stage for Endeavour Energy, I would appreciate if you have 10-15 minutes tomorrow so I can go through the submission with you and address any immediate queries that you may have?

Look forward to hearing from you.

Regards

Roweena D'Souza | Environmental Specialist

M 0447 919 365
51 Huntingwood Drive, Huntingwood NSW 2148.

Dharug Country

endeavourenergy.com.au



Endeavour Energy respectfully acknowledges the Traditional Custodians on whose lands we live, work, and operate and their Elders past, present and emerging.

From: James Quoyle <James.Quoyle@environment.nsw.gov.au>
Sent: Wednesday, 11 January 2023 3:26 PM
To: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>
Subject: RE: Comms Tower at Prospect (HMS1632)

Hello Roweena

Could you resend this document – I thought I had downloaded it but cannot retrieve it - and I did not save my password because I didn't think I would need it.

Sorry for the inconvenience.

Regards

James

James Quoyle (he/him)

Senior Assessments Officer

Heritage NSW

Department of Planning and Environment

T 9873 8612 E james.quoyle@environment.nsw.gov.au

dpie.nsw.gov.au heritage.nsw.gov.au

4 Parramatta Square 12 Darcy Street Parramatta
Locked Bag 5020 Parramatta 2124

Working days Monday to Thursday



I acknowledge the traditional custodians of the land and pay respects to Elders past and present. I also acknowledge all the Aboriginal and Torres Strait Islander staff working with NSW Government at this time.

Please consider the environment before printing this email.

From: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>

Sent: Monday, 9 January 2023 10:38 AM

To: James Quoye <James.Quoye@environment.nsw.gov.au>

Subject: Comms Tower at Prospect (HMS1632)

Your files are ready for pickup

The following file(s) have been sent to you from
Roweena.Dsouza@endeavourenergy.com.au:

EE Letter to HNSW _22122022.pdf 62.75 MB

[Download Files](#)

The secure message expires on 23/1/23 10:38:09 AM

If the link above does not open, please copy and paste the following URL into your browser:
<https://mft.endeavourenergy.com.au/register?token=c386b9e2-68b7-4044-8a9d-b61b983c306a>

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authority states them to be the views of the NSW Office of Environment, Energy and Science.

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

Lia Zwolinski

From: Roweena Dsouza
Sent: Thursday, 19 January 2023 10:51 AM
To: Chris Maddocks; James Quoyle; Michael Ellis; Hooman Goodarznia; Tadd Andersen
Cc: Emily@Heritage21; philip.bennett@sydneywater.com.au
Subject: RE: Prospect Reservoir HMS 1632 Visualisation

Hi All,

Thank you for meeting this morning and running through the various viewpoints.

Key notes from today's meeting:

- Aim: To go through the various viewpoints in Neara to understand visual context of the proposed tower and validate the photomontages in the VIA submitted to HNSW on 23rd Dec 2022.
- Agenda:
 - Introductions – Row (5 minutes)
 - Neara Model – setup – Chris (10 Minutes)
 - Viewpoints – Chris and HNSW (20 minutes)
 - Questions, conclusion, way forward - ALL (10 minutes)
- Conclusion
 - HNSW are satisfied with the validity of the photomontages and do not require Endeavour Energy to further validate the photomontages i.e. no crane required onsite
 - HNSW acknowledge the effort put into careful site selection to minimise visual and heritage impact
 - HNSW acknowledge that Endeavour Energy in discussions with Sydney Water propose to have a veg management plan or strategy that would benefit the aesthetic value of the site
 - Endeavour Energy will provide an updated VIA to include additional photomontages as discussed in the meeting today by Monday 23rd Jan
 - Endeavour Energy will provide an updated SOHI that will capture the updated VIA and design by Monday 23rd Jan
 - Endeavour Energy are in the process of updating the REF and shall advertise it on their website when discussions with HNSW are satisfactorily completed
 - HNSW, in lieu of the above, will reconsider the potential impact of the proposal and will get back to Endeavour Energy if the proposal needs to go to advertisement

Please let me know if I have missed any item or if there are any corrections.

Else this can be considered as the Minutes of the Meeting.

Thanks
Roweena

-----Original Appointment-----

From: Roweena Dsouza
Sent: Wednesday, 18 January 2023 4:58 PM
To: Roweena Dsouza; Chris Maddocks; James Quoyle; Michael Ellis; Emily@Heritage21; Hooman Goodarznia; tandersen@emmconsulting.com.au; philip.bennett@sydneywater.com.au
Subject: Prospect Reservoir HMS 1632 Visualisation

When: Saturday, 21 January 2023 9:30 AM-10:15 AM (UTC+10:00) Canberra, Melbourne, Sydney.

Where: Microsoft Teams Meeting

Hi All,

Setting up a meeting to run through Near and go through the various viewpoints at Prospect reservoir looking towards the proposed tower.

Regards

Roweena D'Souza | Environmental Specialist

M 0447 919 365

51 Huntingwood Drive, Huntingwood NSW 2148.

Dharug Country

endeavourenergy.com.au



Endeavour Energy respectfully acknowledges the Traditional Custodians on whose lands we live, work, and operate and their Elders past, present and emerging.

Microsoft Teams meeting

Join on your computer, mobile app or room device

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POWER
together

PROSPECT RESERVOIR - COMMUNICATIONS TOWER

DWG No.	DWG TITLE
SHEET 1	DRAWING TITLE AND LOCATION PLAN
SHEET 2	OVERALL SITE PLAN
SHEET 3	OVERALL SECTIONAL VIEW 1
SHEET 4	OVERALL SECTIONAL VIEW 2
SHEET 5	DETAILED SITE PLAN
SHEET 6	DETAILED SITE PLAN - ELEVATIONS
SHEET 7	SITE PLAN - CUT & FILL



LOCATION PLAN

AMENDMENTS								
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NO.	DATE	BY	REASON					
1								

CONCEPT DESIGN

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DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			

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<small>DO NOT SCALE</small> <small>DIMENSIONS IN MILLIMETRES</small>	<small>AUTHORISED/CERTIFIED</small>
<small>DESIGN MANAGER CIVIL & SECONDARY</small>	<small>A1</small>
<small>528567</small>	<small>SHEET No 1 OF 7 SHEETS</small>



OVERALL SITE PLAN
SCALE 1:500

CONCEPT DESIGN

DESIGNED		DATE	
PJB		14/12/22	
DRAWN			
PJB			
CHECKED			

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PROSPECT RESERVOIR COMMUNICATIONS TOWER OVERALL SITE PLAN

REFERENCE DRAWINGS		AUTHORISED/CERTIFIED	
DO NOT SCALE DIMENSIONS IN MILLIMETRES			
DESIGN MANAGER CIVIL & SECONDARY		A1 528567	
		SHEET No 2 OF 7 SHEETS	

AMENDMENTS	DESIGN JOB	DATE
A	DESIGN	14/12/22
	CHKD.	
	APPD.	
HISTORY		
REVISION A		
ORIGINAL ISSUE		



VIEW Y
SCALE 1:250

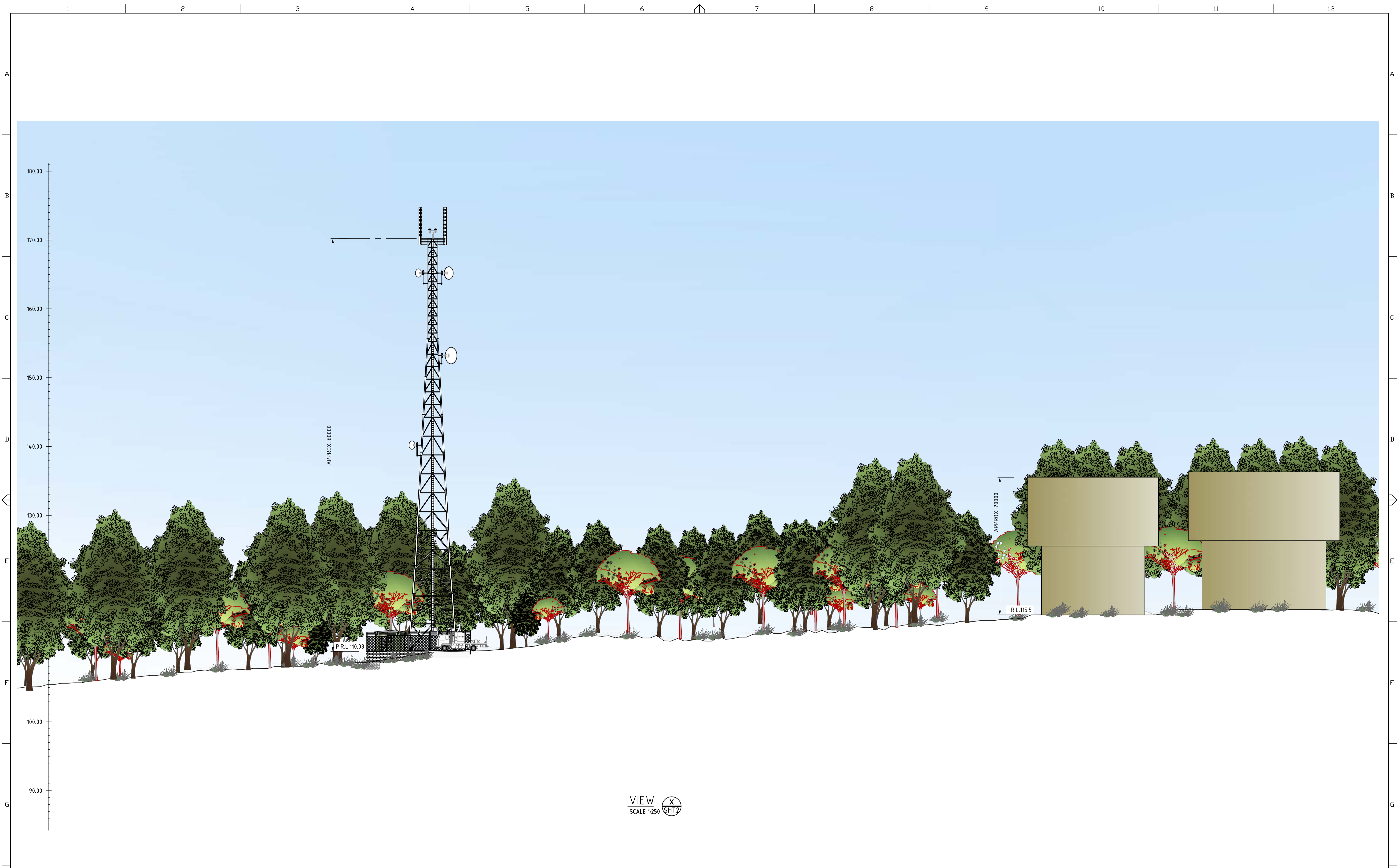
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DESIGN JOB	DESIGN JOB
DRN	BOONELP
CHKD	
APPD	
HISTORY	
REVISION A	ORIGINAL ISSUE

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DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
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DESIGN MANAGER CIVIL & SECONDARY		A1	
PROSPECT RESERVOIR COMMUNICATIONS TOWER OVERALL SECTIONAL VIEW 1		528567	
		SHEET No 3 OF 7 SHEETS	



VIEW X
SCALE 1:250

AMENDMENTS								
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ISSUE NO.	DESIGNER	DATE	REASON					
1	PJB	14/12/22	ORIGINAL ISSUE					

HISTORY				
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REV	DESCRIPTION			
1	ORIGINAL ISSUE			

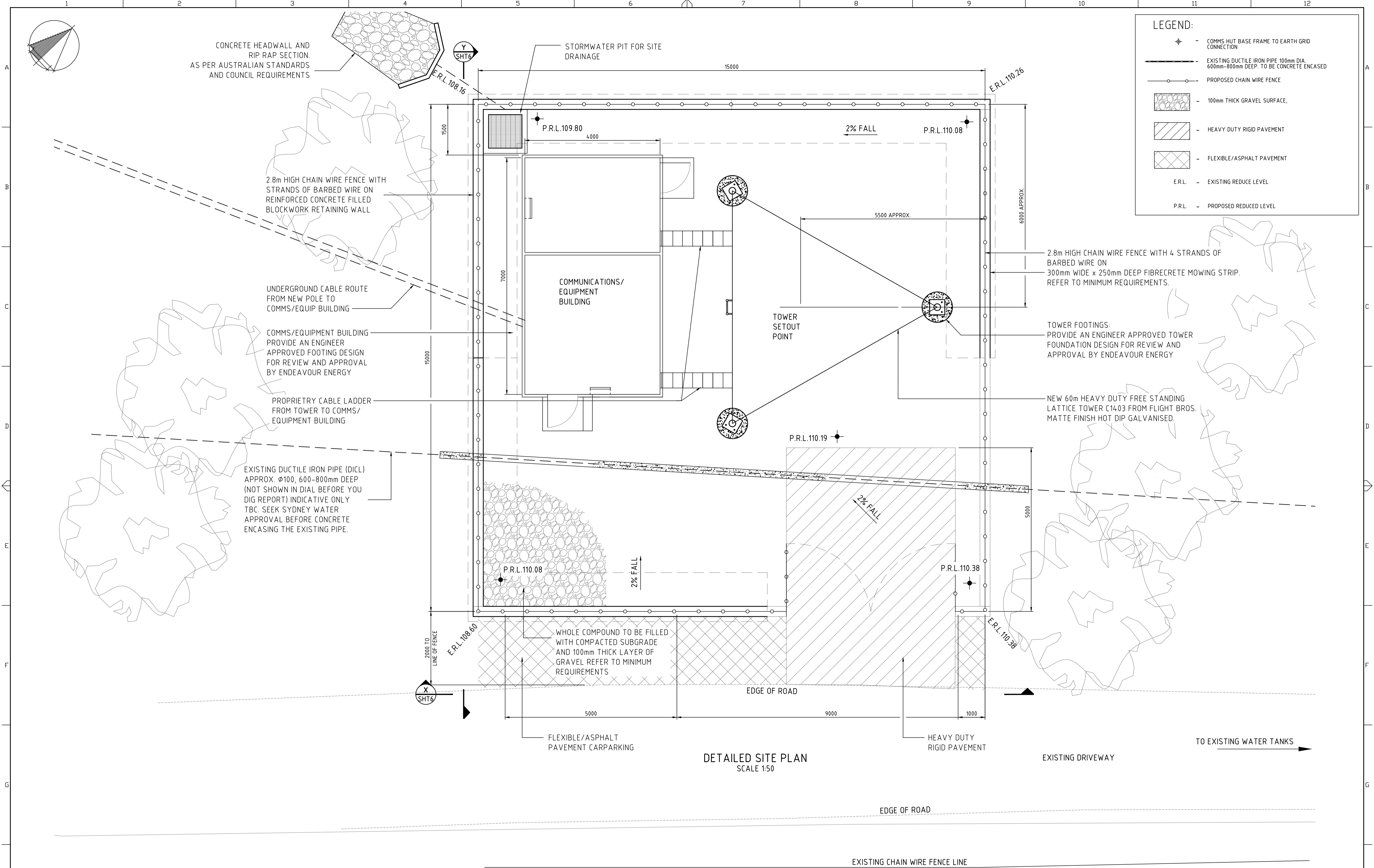
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DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			

Endeavour Energy

PROSPECT RESERVOIR COMMUNICATIONS TOWER OVERALL SECTIONAL VIEW 2

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A1	528567	SHEET No 4 OF 7 SHEETS	



LEGEND:

- COMMS HUT BASE FRAME TO EARTH GRID CONNECTION
- EXISTING DUCTILE IRON PIPE 100mm DIA. 600mm-800mm DEEP. TO BE CONCRETE ENCASED
- PROPOSED CHAIN WIRE FENCE
- 100mm THICK GRAVEL SURFACE,
- HEAVY DUTY RIGID PAVEMENT
- FLEXIBLE/ASPHALT PAVEMENT
- E.R.L. - EXISTING REDUCE LEVEL
- P.R.L. - PROPOSED REDUCED LEVEL

DETAILED SITE PLAN
SCALE 1:50

CONCEPT DESIGN

AMENDMENTS								
<table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>BY</th> <th>REASON</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	DATE	BY	REASON				
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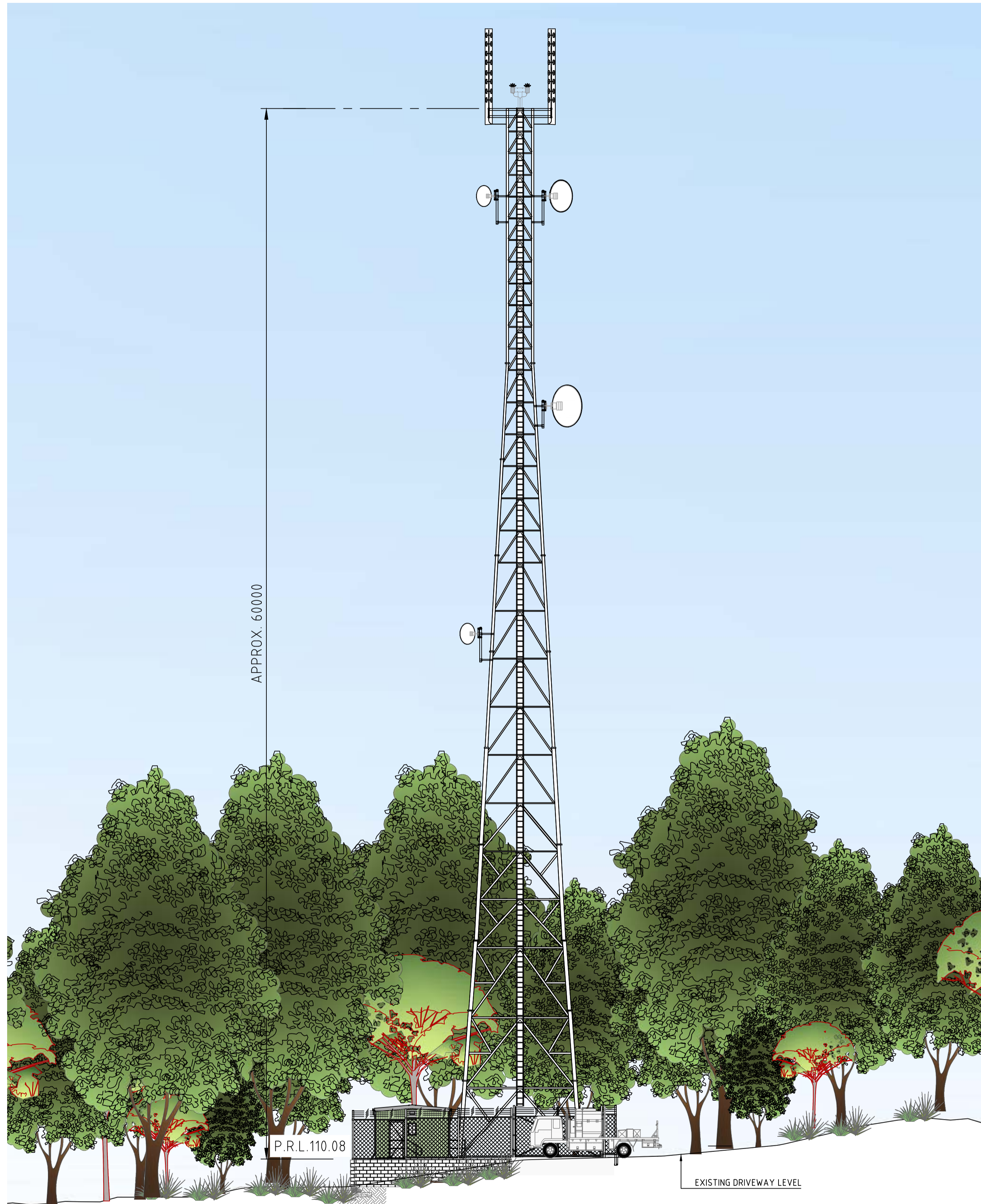
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NO.	DATE	BY	REASON					

REVISION A
ORIGINAL ISSUE

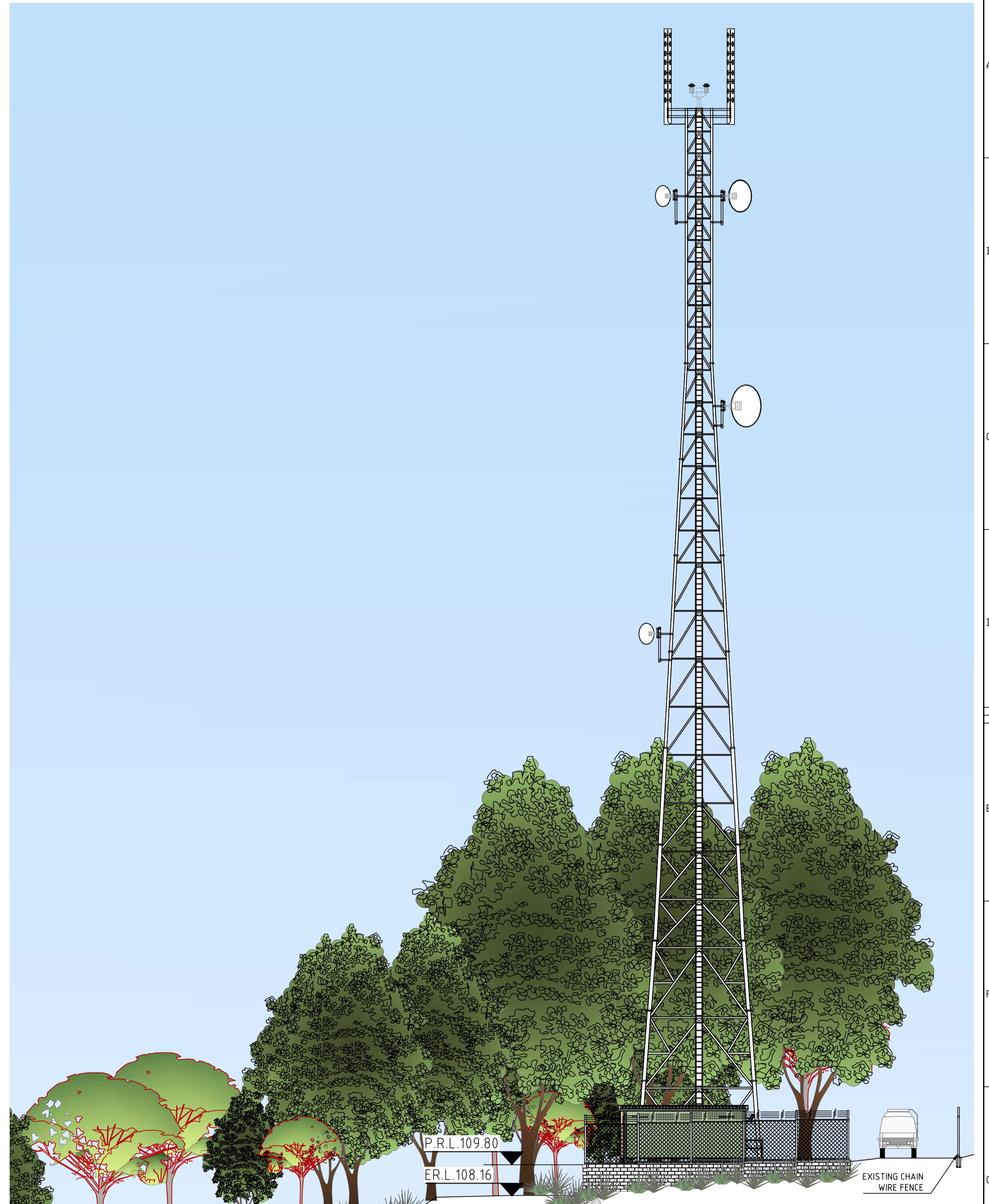
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DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			

PROSPECT RESERVOIR COMMUNICATIONS TOWER DETAILED SITE PLAN

REFERENCE DRAWINGS		AUTHORISED/CERTIFIED	
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A1		528567	
SHEET No 5 OF 7 SHEETS			



VIEW X
SCALE 1:150



VIEW Y
SCALE 1:150

AMENDMENTS	
NO.	DESCRIPTION
1	DESIGN
2	DRAWN
3	CHECKED
4	APPROVED

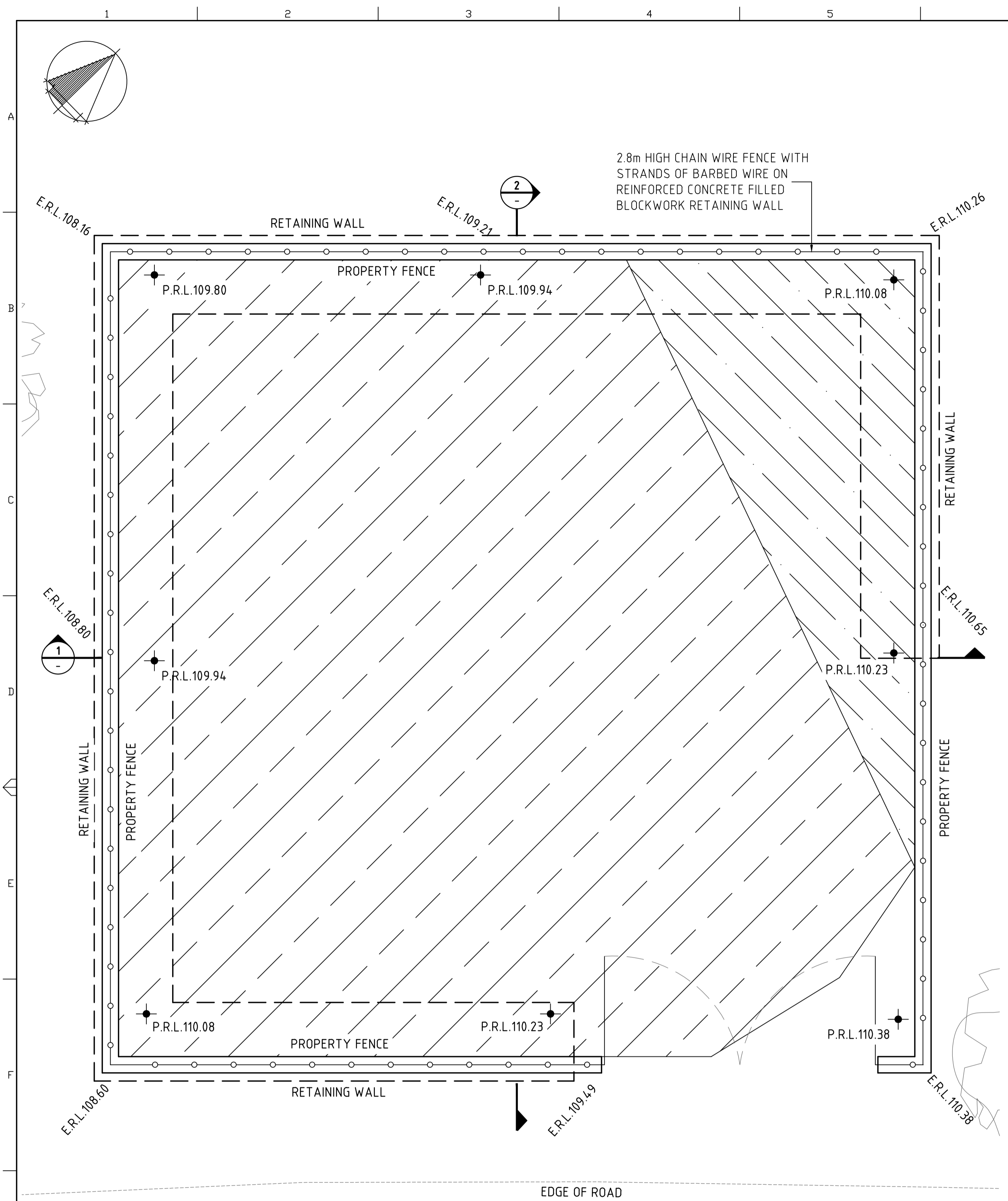
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NO.	DESCRIPTION
1	REVISION A
2	ORIGINAL ISSUE

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DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			

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DO NOT SCALE DIMENSIONS IN MILLIMETRES		DESIGN MANAGER CIVIL & SECONDARY	
A1	528567	SHEET No 6 OF 7 SHEETS	



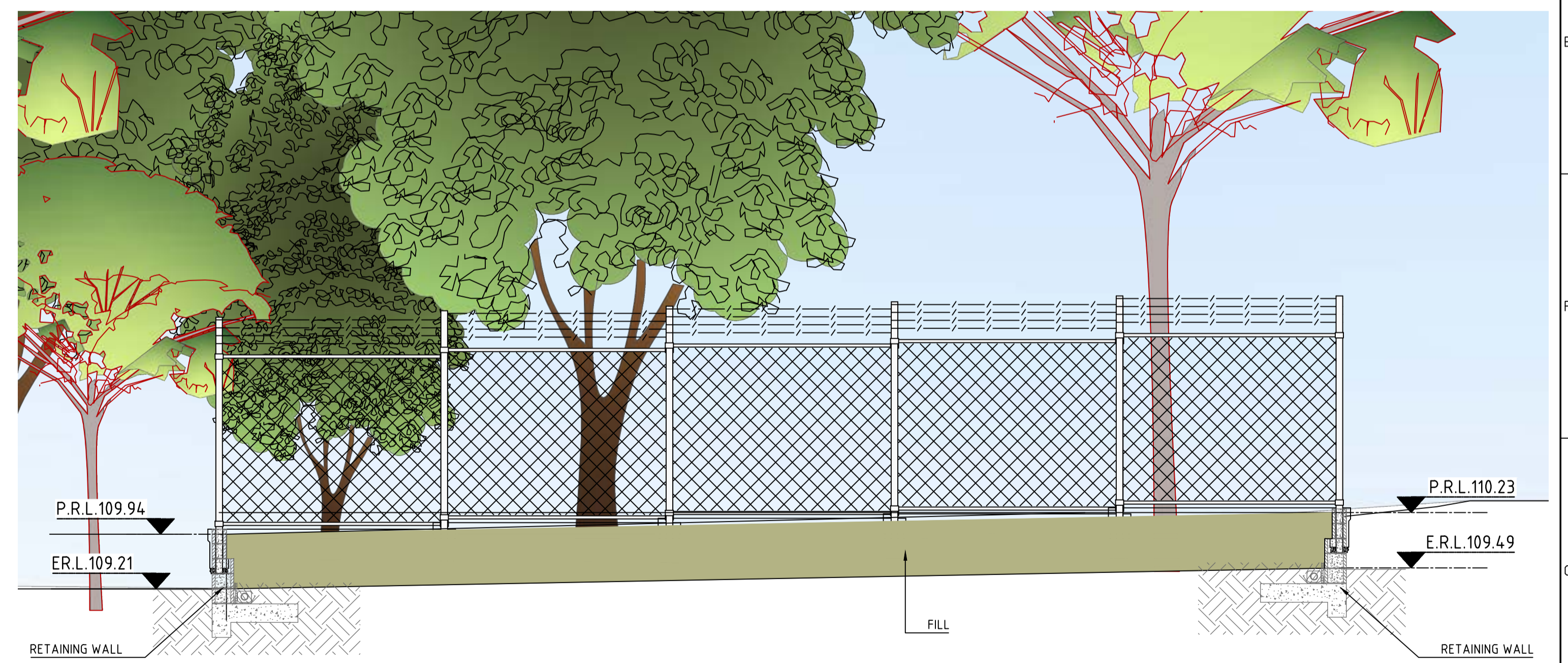
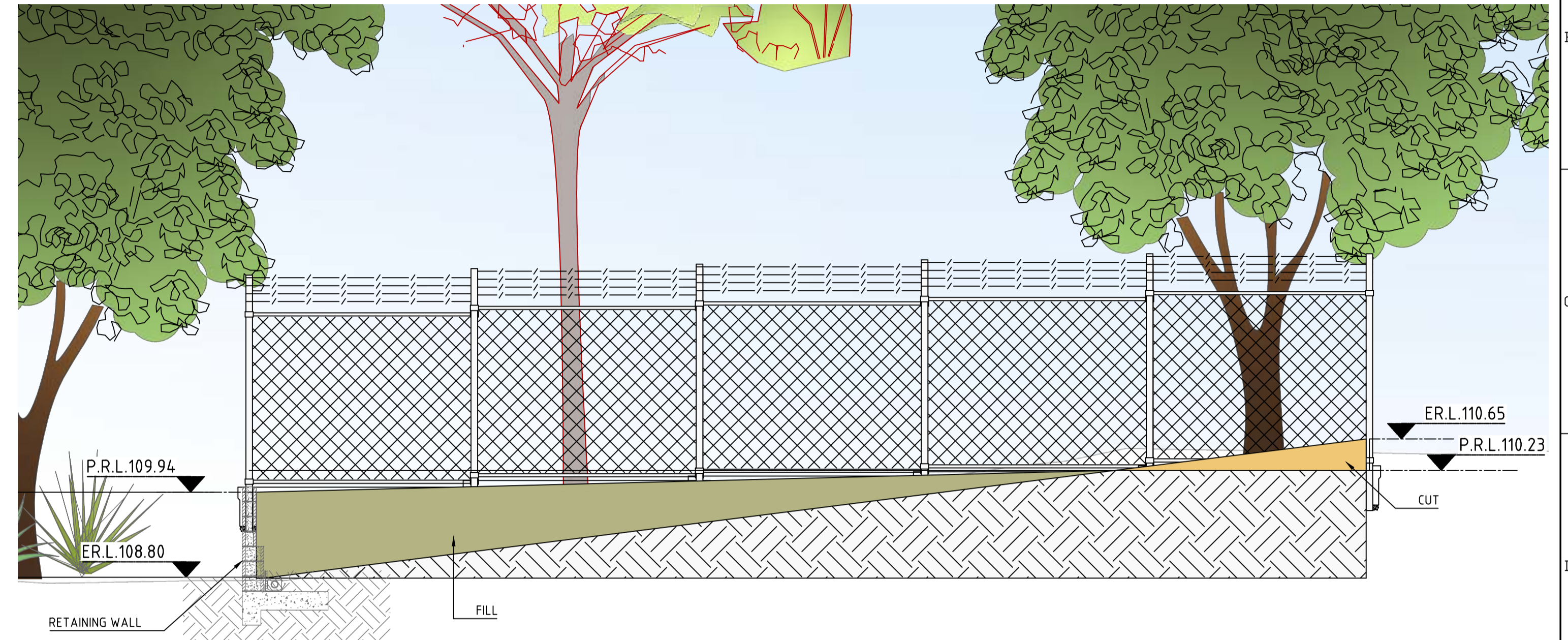
LEGEND:

CUT

FILL

E.R.L. - EXISTING REDUCE LEVEL

P.R.L. - PROPOSED REDUCED LEVEL



AMENDMENTS	
NO.	DESCRIPTION
1	DESIGN
2	CHKD.
3	APPD.
HISTORY	
REVISION A	ORIGINAL ISSUE

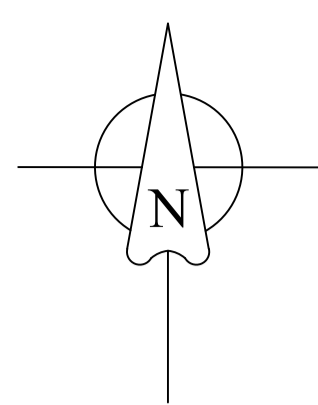
CONCEPT DESIGN

DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			

Endeavour Energy

PROSPECT RESERVOIR COMMUNICATIONS TOWER
SITE PLAN - CUT & FILL

REFERENCE DRAWINGS	
DO NOT SCALE DIMENSIONS IN MILLIMETRES	AUTHORISED/CERTIFIED
DESIGN MANAGER CIVIL & SECONDARY	
A1	528567
SHEET No 7 OF 7 SHEETS	



ENDEAVOUR ENERGY CONTACT	
NAME	CONTACT No.
DESIGN: M JANIF	0472723705
CONSTRUCTION: T.KIDD	0401470936



LOCALITY PLAN
NTS

OPERATIONAL LIMITATIONS
UNLESS APPROVED OTHERWISE, INTERRUPTIONS TO ANY CUSTOMERS SUPPLY MUST BE AVOIDED. THE FOLLOWING ALTERNATIVES SHOULD BE CONSIDERED:
- LIVE LINE WORK;
- DESIGN ALTERNATIVES;
- WORK PRACTICES / STANDARDS;
- LOW VOLTAGE PARRALLELS
THIS COST TO BE FUNDED BY THE DEVELOPER.

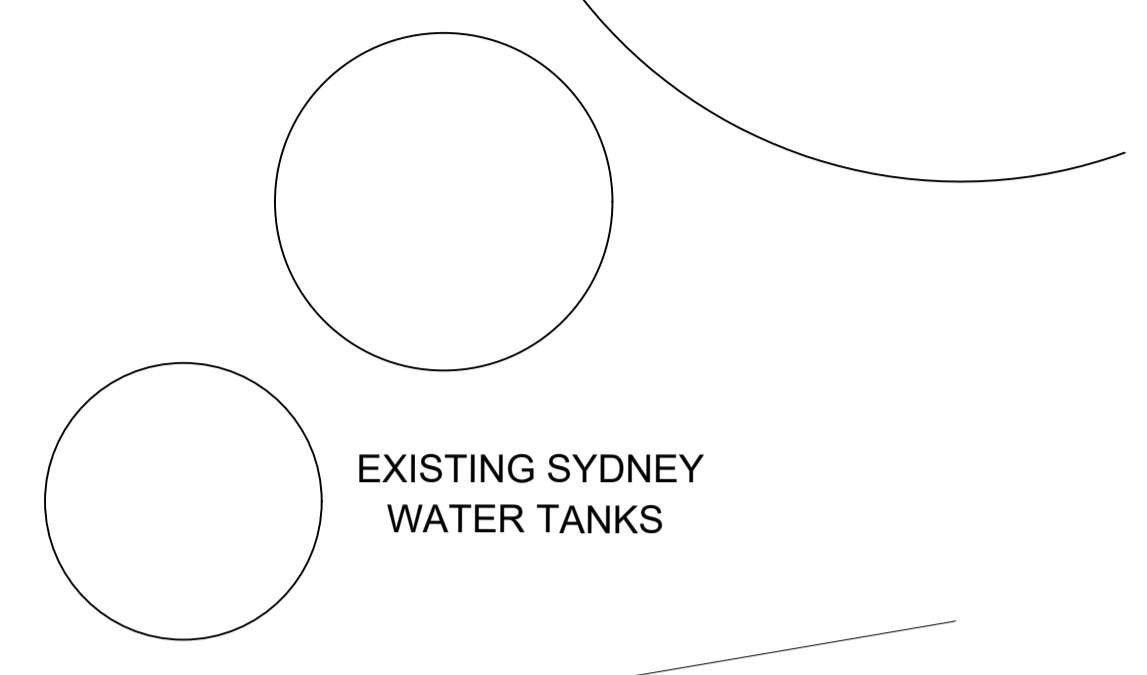
ATTENTION
ALL SERVICES SEARCHES MUST BE CHECKED BEFORE CONSTRUCTION.

NOTES

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT ENDEAVOUR ENERGY NETWORK STANDARDS AND CONNECTION POLICY.
- DO NOT PLACE ANY RELIANCE ON ANY QUANTITIES OR DIMENSIONS GIVEN IN THIS DRAWING. QUANTITIES AND DIMENSIONS ON THIS DRAWING ARE BASED ON DESIGN INFORMATION AND SITE CONDITIONS AT THE TIME OF DESIGN. AS QUANTITIES AND DIMENSIONS ARE SUBJECT TO CHANGE, THE BUILDER OF THIS PROJECT MUST CHECK ALL QUANTITIES AND DIMENSIONS ON SITE PRIOR TO TENDERING AND PRIOR TO CONSTRUCTION.
- ATTENTION:
THE PREPARATION OF THIS DESIGN HAS BEEN UNDERTAKEN GIVING DUE CONSIDERATION TO THE EXISTING SERVICES. THE PROJECT CONSTRUCTOR IS, HOWEVER, WHOLLY RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF EXISTING SERVICES AND PERMANENT SURVEY MARKS BEFORE CONSTRUCTION COMMENCES, AND NO RESPONSIBILITY NOR LIABILITY WILL BE ACCEPTED BY THE DESIGNER OF THIS PROJECT FOR DAMAGE TO EXISTING SERVICES AS A RESULT OF THIS DESIGN AND/OR POLE PEGGING.
- REDUNDANT ENDEAVOUR ENERGY MATERIALS TO BE RETURNED TO CLOSEST ENDEAVOUR ENERGY DEPOT.
- PROPERTY OWNERS(SYDNEY WATER) ARE TO BE CONSULTED REGARDING SITE ACCESS PRIOR TO WORK COMMENCING.
- ALL CUSTOMERS ARE TO BE CONTACTED REGARDING OUTAGE ARRANGEMENTS PRIOR TO CONSTRUCTION WORK COMMENCING. THE REQUIRED NOTICE IS TO BE IN ACCORDANCE WITH THE NATIONAL ENERGY CUSTOMER FRAMEWORK (NECF) TIME FRAMES
- CUSTOMER TO ARRANGE FOR THE INSTALLATION & CONNECTION OF NEW SERVICE MAINS & DISCONNECTION OF EXISTING SERVICE MAINS BY A LEVEL 2 ACCREDITED SERVICE PROVIDER. ALL SERVICE WORK TO BE INSTALLED IN ACCORDANCE WITH AS3000:2007 AND THE NSW SERVICE AND INSTALLATION RULES.
- IF FOR ANY REASON, THE PROPOSED POLE LOCATION OR UG ASSETS REQUIRE ADJUSTMENT, PLEASE CONTACT MAINS DESIGN FOR ADVICE. THIS IS CRUCIAL TO ENSURE APPROPRIATE SEPARATIONS / CLEARANCES ARE MAINTAINED WITHIN EXISTING EASEMENTS.
- AN EASEMENT FOR UNDERGROUND CABLES 1 METER WIDE IS REQUIRED OVER THE LOT 304/DP 1122291. REFER SHEET 2
- AN EASEMENT FOR 33KV OVERHEAD POWER LINES 9 METER WIDE IS REQUIRED OVER THE LOT 304/DP 1122291. REFER SHEET 2.
- CONTRACTOR SHALL PEG THE UG ALIGNMENT PRIOR TO WORKS. DESIGN TEAM CAN BE CONTACTED FOR DESIGN ALIGNMENT IN CAD.

SITE PLAN LEGEND **SITE PLAN:**
(SCALE - 1:500)

- EXISTING OVERHEAD MAINS 33kV FDR 4/35
- EXISTING UNDERGROUND MAINS
- - - NEW OVERHEAD MAINS
- - - NEW LV TRENCH
- ⊗ TREES INDICATIVE
- EXISTING POLE LOCATION
- NEW POLE LOCATION
- ⊕ NEW POLE MOUNTED SUBSTATION
- NEW LV PILLAR
- w— SYDNEY WATER DUCTILE IRON PIPE (DICI)



WORK SITE TRAFFIC MANAGEMENT:

A TRAFFIC CONTROL PLAN AS WELL AS ADVANCED WARNING AREAS ARE TO BE IN PLACE BEFORE CONSTRUCTION WORK COMMENCES. REFER ENDEAVOUR ENERGY TRAFFIC MANAGEMENT MANUAL TMM0001

WARNING
UNDERGROUND SERVICES ARE LOCATED IN THE VICINITY OF THE PROPOSED WORKS. A DIAL-BEFORE-YOU-DIG SEARCH IS TO BE PERFORMED 2 DAYS PRIOR TO CONSTRUCTION. IT IS RECOMMENDED THAT ALL SERVICES SHOULD BE LOCATED USING NON-DESTRUCTIVE TECHNIQUES BEFORE WORKS BEGIN.

ENVIRONMENTAL AWARENESS
WORKS TO BE COMPLETED IN CONJUNCTION WITH ENDEAVOUR ENERGY'S ENVIRONMENTAL GUIDELINES HANDBOOK 2017. ALL PROJECT MANAGERS, CONTRACT INSPECTORS AND CONSTRUCTION CREWS ARE TO BE MADE AWARE OF THE CONTENTS PRIOR TO ANY SITE VISITS OR CONSTRUCTION WORKS COMMENCING. COPIES OF THE DOCUMENTATION ARE TO BE AVAILABLE ON SITE AND ACCESSIBLE AT ALL TIMES FOR THE DURATION OF THE PROJECT. USE SILT TRAPS/SOCKS OR OTHER APPROVED METHODS TO PREVENT RUN-OFF ENTERING DRAINS AND STORMWATER CHANNELS. REFER EMS 0002-POLLUTION CONTROL PROCEDURE

WORK METHOD STATEMENT REFERENCE

The contents of this table are an indication only, and the required Work Method Statements may not be limited to those listed here.

WMS No.	TASK NAME
Index of SWMS	Index of Safe Work Method Statements
SRMH 12	Traffic Management
SWM 01.001	Excavation Work (Trenching, Boring, etc)
SWM 01.004am01	Deep Earth Boring
SWM 01.008	Working at Heights (use of work platforms, Guardrails, Fall Arrest Systems, etc.)
SWM 01.015	Construct Single Pole Substation
SWM 03.008am01	Earth Testing (Separate, Common, SWER)
SWM 03.011am01	Install/Replace Cable Guard
SWM 05.008	Install / Replace Underground Cables (including cut and cap)
SWM 05.010am02	Termination of Underground Cables
SWM 05.011	Erect New / Change Pole (Includes all Comdemned Poles)
SWM 06.005am03	Transmission and Distribution Switching (Overhead Mains)
SWM 07.001am01	Recording of Underground Assets (Cables & Ducts)
SWM 13.001am01	Inspection & Commissioning of Network Assets (Overhead)
SWM 13.002am01	Inspection and Commissioning of Network Assets (Underground)
SWM 13.003am01	

WORKS COMPLETED/FIELD BOOK

CONSTRUCTED BY: _____
 WORKS COMPLETED: _____
 SIGNATURE: _____ DATE: _____
 INSPECTED BY: _____
 SIGNATURE: _____ DATE: _____
ASSET RECORDING
 I: _____
 OF: _____
 CONTACT No.: _____
 HEREBY CERTIFY THAT ASSETS MARKED AS BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOUR ENERGY STANDARD S4D 0004.
 SIGNATURE: _____
 DATE: _____

NOTE
ACCESS TO WORKSITE VIA SYDNEY WATER GATES G1 OR J2 REQUIRE ENDEAVOUR ENERGY ABLOY KEY

PERMANENT SURVEY MARKS MAY EXIST IN THIS AREA. THESE ARE TO BE LOCATED BY SURVEY PRIOR TO COMMENCEMENT OF WORK.

ESTABLISH 33kV/400V SINGLE POLE MOUNTED SUBSTATION No - 96001: 100kVA 3 PH (SINGLE CUSTOMER) (Dyn11, KNAN FR3 Natural Ester Oil) EARTHING REQUIREMENT : REFER EARTHING . TR FUSES: 5A - BORIC ACID TYPE LV FUSES: 200A (1 SET OF LV DISTRIBUTOR)

WARNING
LIVE ENDEAVOUR ENERGY CABLES & OTHER SERVICES IN THIS AREA. PLEASE CONTACT DIAL BEFORE YOU DIG ON TEL: 1100 FOR SEARCHES TWO DAYS PRIOR TO EXCAVATION.

NOTE:
NO JEMENA GAS WEST/NBN/TELECOMMUNICATION /SYDNEY WATER ASSETS ARE BEING AFFECTED BY THE ELECTRICAL WORKS. THERE IS A CONCRETE AND STEEL 100MM DICI PIPE RUNNING THROUGH UNDERNEATH THE TOWER SITE TOWARDS THE PROPOSED POLE SUBSTATION SITE. NOT SHOWN IN DIAL BEFORE YOU DIG SEARCHES.

DUCT BREAKDOWN TABLE		
ALL TRENCH SECTIONS ARE TO BE READ & VIEWED FROM NODE TO NODE AS NOMINATED		
Route	Configuration	Route Length (m)
A - B	(New Duct) TRENCH & INSTALL 2 x 125mm PVC & 2 x 50mm PVC DUCTS	7m
B - C	(New Duct) TRENCH & INSTALL 2 x 125mm PVC & 2 x 50mm PVC DUCTS	63m
TOTAL		70m

LEGEND

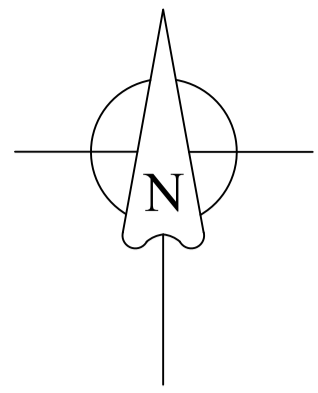
- SPARE DUCT
- DUCT WITH NEW CABLE
- ⊙ DUCT WITH EXISTING CABLE
- DIRECT BURIED CABLE
- ABANDONED CABLE
- ⊕ NEW TRENCH
- ⊕ EXISTING TRENCH
- UNDERBORE

WARNING
LIVE ELECTRICAL CABLES IN THIS AREA
CONTACT NETWORK DATA, HUNTINGWOOD DR, HUNTINGWOOD TELEPHONE 9853-4161 FOR CABLE SEARCHES PRIOR TO EXCAVATION

REFER SHEET 3

306909.2660	6255578.2840	1001686		7m	20°	66T+POLE SUB	TYPE 4 OHEW	SUB-SINGLE CUSTOMER	750	2.5	17m/12kN (TIMBER)	-	C	-	-	X	-	-	2
			728305			33UGOH(EX)+TEE	EX+TYPE 4 OHEW	-				EX	-	-	-	X	-	-	1
EASTING	NORTHING	NEW	EXISTING	SPAN LENGTH	LINE DEV DEGREES	33kV	OHEW/OPGW	LV	DIA mm	DEPTH m	TYPE (LENGTH /STRENGTH)	STAY	FOOTING	RELOCATE	REPLACE	NEW	EXISTING	REMOVE	DESIGN NUMBER
STAKING (CO-ORDINATES IN MGA56)			FIELD POLE NUMBER	CONSTRUCTION				HOLE		POLE									

AMENDMENTS	ORIGINAL	FOR CONSTRUCTION	REFERENCE DRAWING'S	WORK ORDERS	CAMS File No.	ORIGINAL SCALE	DO NOT SCALE DIMENSIONS IN METRES	WILLIAM LAWSON DRIVE PROSPECT NCC-000742-001 ESTABLISH POLE MOUNTED SUBSTATION HUNTINGWOOD COMMS TOWER RELOCATION	Endeavour Energy
	DRAFT No. 01				GENERAL				
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FINAL 33kV CIRCUIT

NOT TO SCALE

- EXISTING TR OVERHEAD MAINS FDR 435 - BLACKTOWN TO BOSSLEY PARK TEE QUARRIES
- - - EXISTING TR UNDERGROUND MAINS FDR 435 - BLACKTOWN TO BOSSLEY PARK TEE QUARRIES
- - - ERECT 3 x 7/4.50 AAC 'MERCURY' CONDUCTOR (BETWEEN POLES '1' AND '2')
R.L. 7m C.L. 30m. SLACK SPAN (TENSION @ 2% CBL @ 5°C TABLE 1)

SAP DATA URBAN OH SUB 96001	
HV DOF	231947
TRF 1	10004450
LV ISOLATOR	231948
LV BUSBAR	37528
F1 - FUSE LABEL	403332
F2 - FUSE LABEL	-----

TR CONDUCTOR REFERENCE	
CODE	SIZE & TYPE
J74	2 x 19/3.25 AAC (2 x 19/0.128) 2 x (OH) 33 kV
W81	630mm ² Cu 1C XLPE/PVC/HDPE Screened (UG) 33kV

FINAL LV CIRCUIT

NOT TO SCALE

- x - x - INSTALL 1kV 240mm sq Al 4C XLPE/PVC
R.L.63m CL.80m

CONDUCTOR STRINGING TABLE 1										
STRAIN SECTION	POLE '1' TO '2'		TENSION (%CBL) @ 5°C							2%
DESIGN SPAN	POLE '1' TO '2'		RULING SPAN (m)							7.0
CONDUCTOR	1 x 7/4.50 AAC 'MERCURY' (NO CREEP COMPENSATION REQUIRED)									
TEMPERATURE (°C)	0	5	10	15	20	25	30	35	40	
TENSION (kN)	0.65	0.34	0.24	0.19	0.16	0.15	0.13	0.12	0.11	
SAG (m)	0.03	0.05	0.07	0.08	0.10	0.11	0.12	0.13	0.14	

ATTENTION
REGIONAL STAFF TO NOTIFY NETWORK DATA DAILY WHEN CABLE WORK IS IN PROGRESS.
TELEPHONE: EXT. - 0298536664 or 0478403699

FINAL OHEW & EARTHING CIRCUIT

NOT TO SCALE

- EXISTING OHEW
- - - ERECT 1 x 7/4.50 AAC 'MERCURY' OHEW CONDUCTOR (BETWEEN POLES '1' AND '2') R.L. 7m C.L. 10m
TENSION @ 2% CBL @ 5°C TABLE 1
- + INSTALL 33kV POLE/SUBSTATION EARTH (REFER EARTHING DIAGRAM)

OHEW CONDUCTOR REFERENCE	
CODE	SIZE & TYPE
N90	18.1mm dia 48 fibre OPGW 185mm ² (OH)

ADSS/COMMS CONDUCTOR REFERENCE	
CODE	SIZE & TYPE
M9	48 core OPGW (18.1mm dia)
Z45	60 core UGFO pilot

FINAL FIBRE CIRCUIT

NOT TO SCALE

- x - x - INSTALL FIBRE OPTIC 144 CORE CABLE FROM:
UGOH POLE 1 TO PROPOSED COMMS HUT
R.L - 70 m C.L - 220m
- JOINT/SPLICE

TERMINATE AT FIBRE PANEL.
(TO BE TERMINATED BY OTHERS)

ESTABLISH FIBRE UGFOH ON POLE 1, RE-TERMINATE IN EXISTING SPLICE JOINT BOX TO EXISTING OH OPGW

DISCONNECT EX UGFO PILOT CABLE FROM BOSSLEY PARK TS ON POLE 1 SPLICE JOINT BOX. DROP DOWN CABLE & LAY IN NEW TRENCH TOWARDS POLE SUB & ESTABLISH JOINT IN UG P8 PIT, EXTEND NEW UGFO CABLE TO HUT.

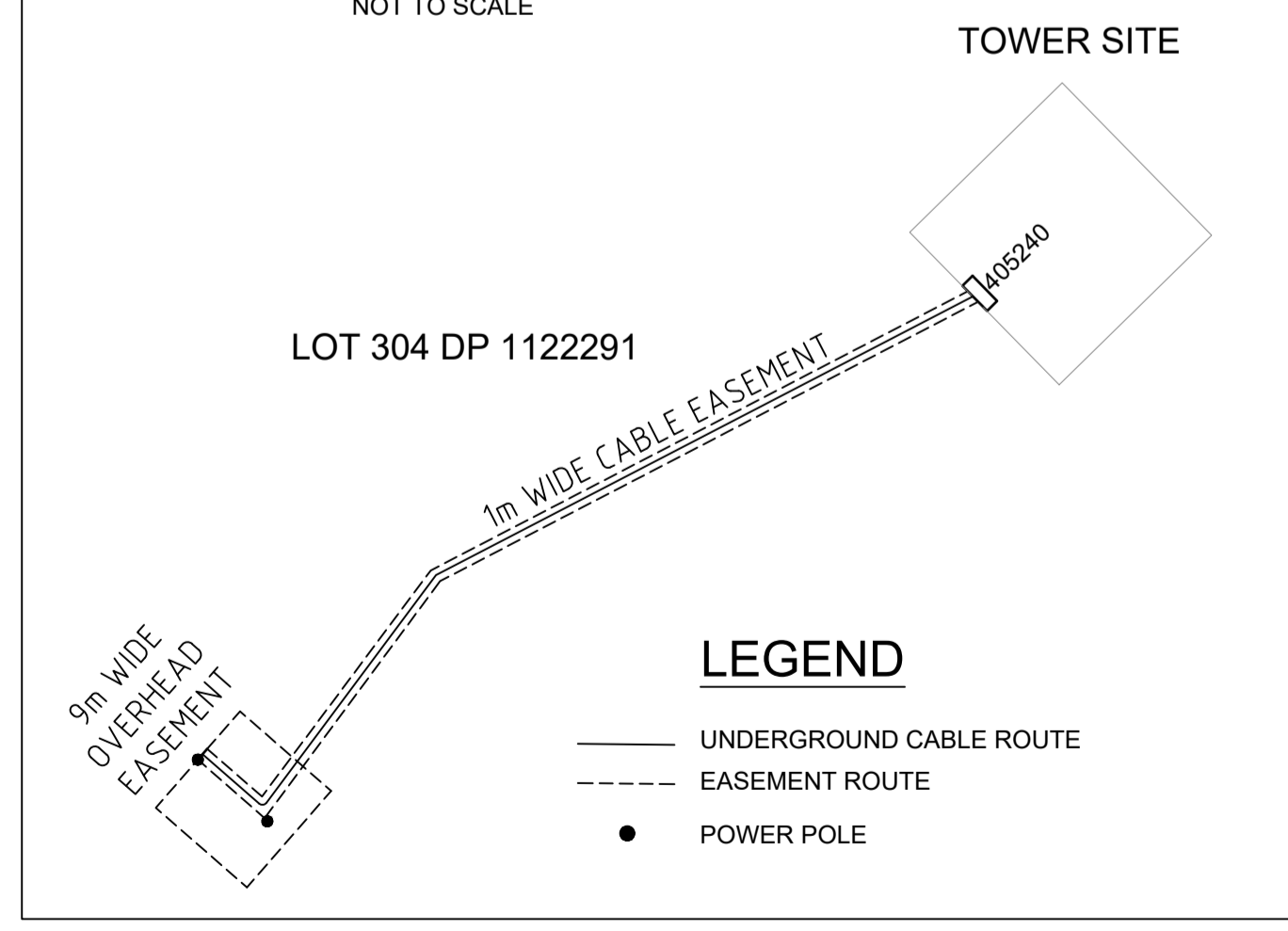
- P8 PIT CAN BE ORDERED FROM VINIDEX OR MASCOT ENGINEERING.
- LID TO BE STEEL LOCKABLE TYPE.
- USE MIN 50mm HD PVC DUCTS TO DIRECT CABLES INTO PIT.

WORKS COMPLETED/FIELD BOOK

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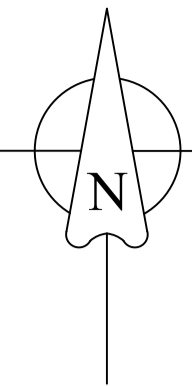
OH & UG EASEMENT DIAGRAM

NOT TO SCALE



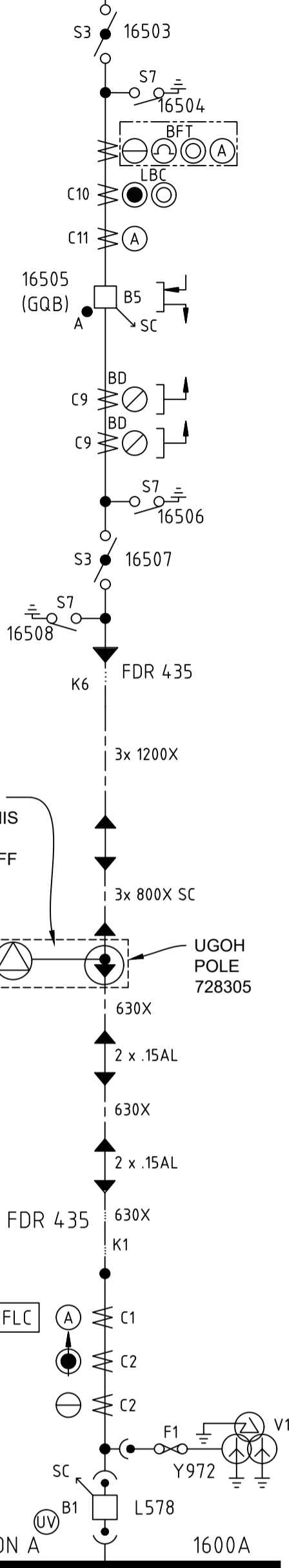
Cadastr: © Land and Property Information 2016

AMENDMENTS ORIGINAL ISSUE DRAFT No. 01	FOR CONSTRUCTION	TEMPLATE VERSION No. 5.20 © THIS DRAWING AND THE COPYRIGHT THEREIN IS THE PROPERTY OF ENDEAVOUR ENERGY AND MAY NOT BE COPIED, REPRODUCED, DISTRIBUTED, LOANED OR USED WITHOUT THE WRITTEN CONSENT OF ENDEAVOUR ENERGY	REFERENCE DRAWING'S	WORK ORDERS	CAMS File No.	ORIGINAL SCALE 1:500	DO NOT SCALE DIMENSIONS IN METRES	WILLIAM LAWSON DRIVE PROSPECT NCC-000742-001 ESTABLISH POLE MOUNTED SUBSTATION HUNTINGWOOD COMMS TOWER RELOCATION	Endeavour Energy			
				GENERAL	EE DEPOT					KINGS PARK	DRAWN	MJ
				OVERHEAD	EE REGION					BLACKTOWN TS/T8	DATE	19/10/22
				UNDERGROUND	LOCAL GOV AREA					BLACKTOWN	CHD	J.V.S(15/12/22)
	SUBSTATIONS			DESIGN	MJ							



33kV FDR 435 LLD
NTS

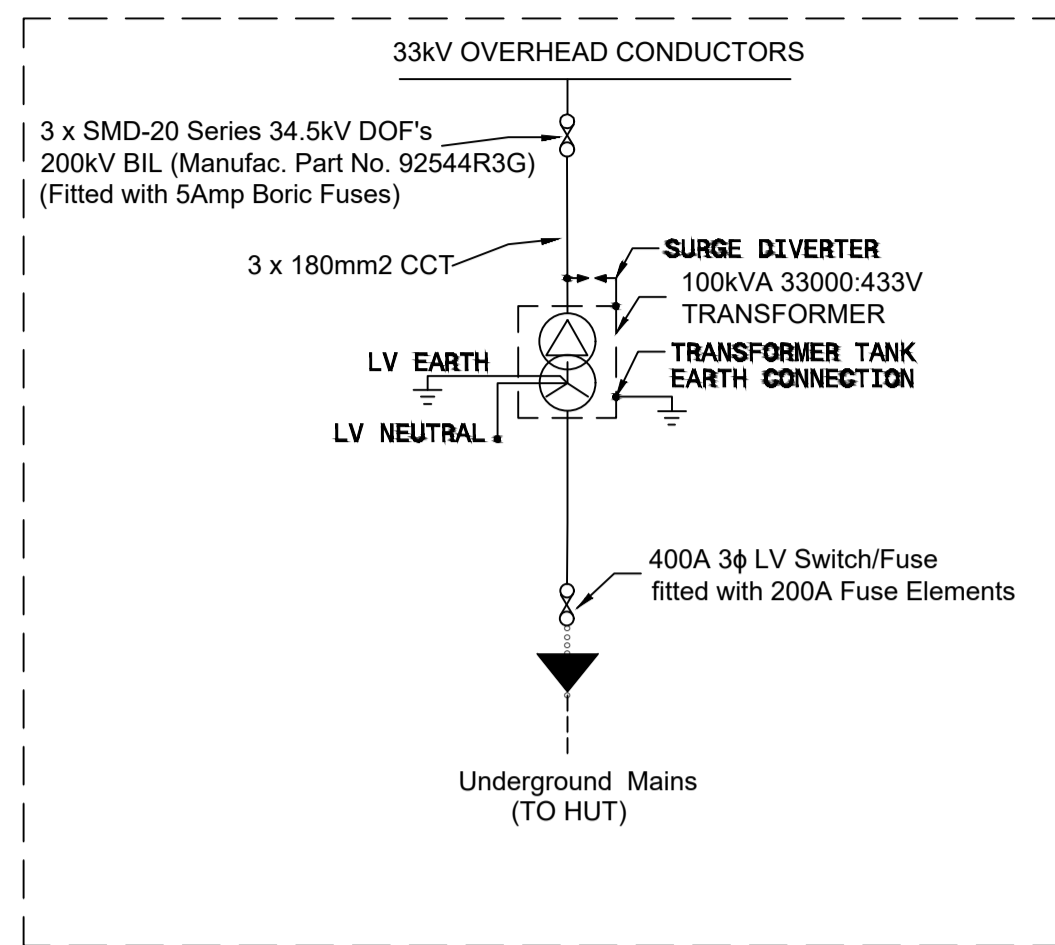
BLACKTOWN TS 33kV
BUS SECTION 3



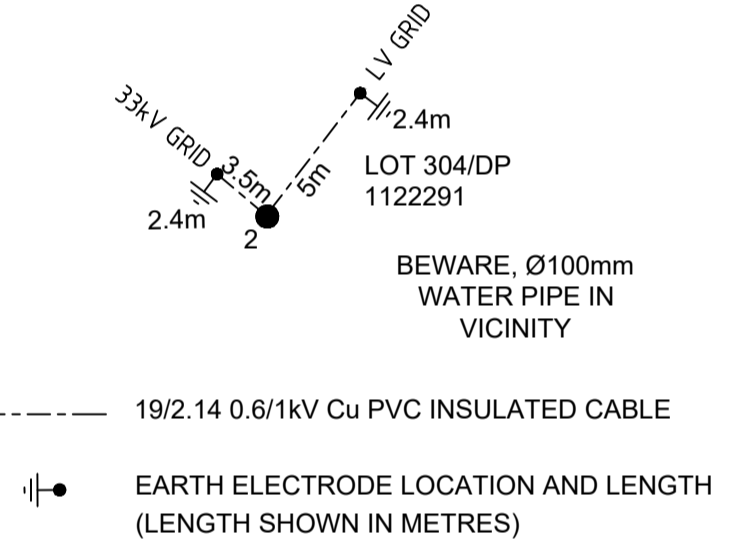
SCOPE OF WORKS IN THIS SECTION
7/4.5AAC T-OFF TO SUB
NEW POLE SUB 96001

BOSSLEY PARK ZS
33kV
BUS SECTION A

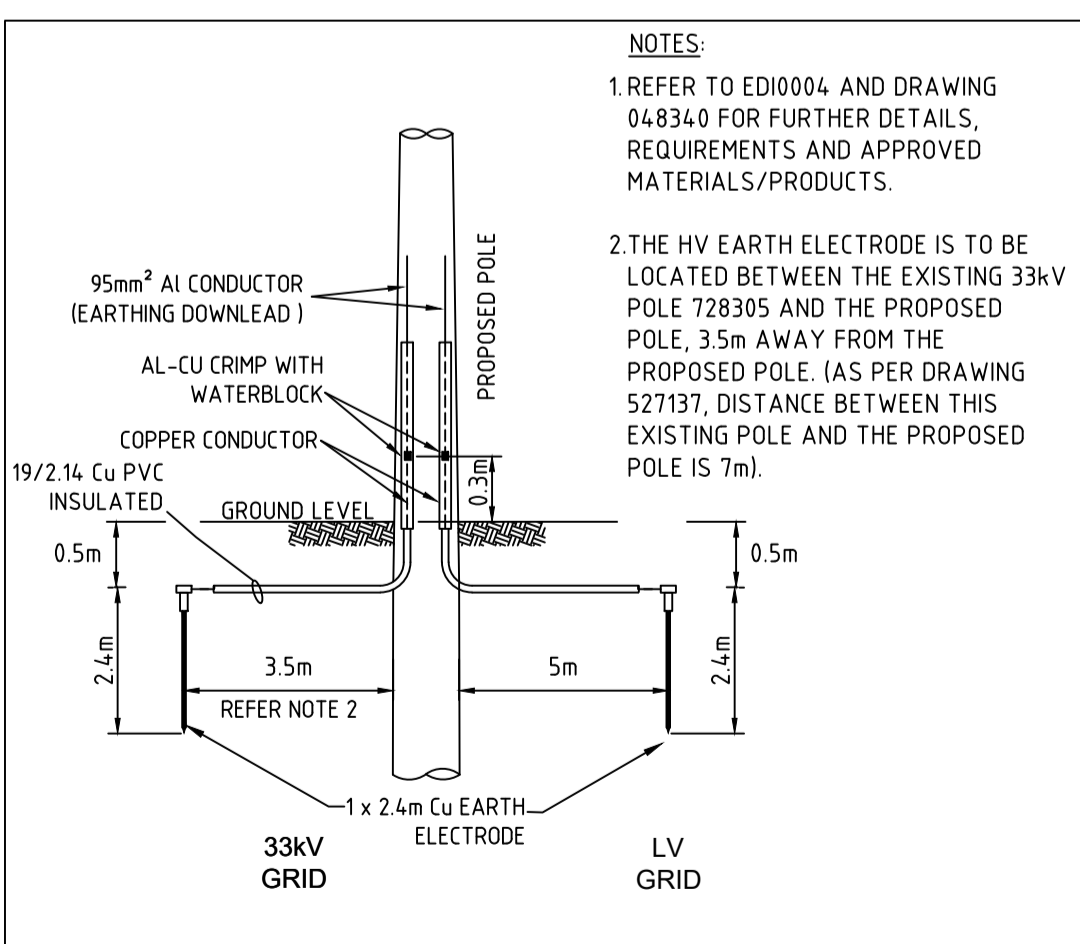
Pole Substation Single Line Diagram



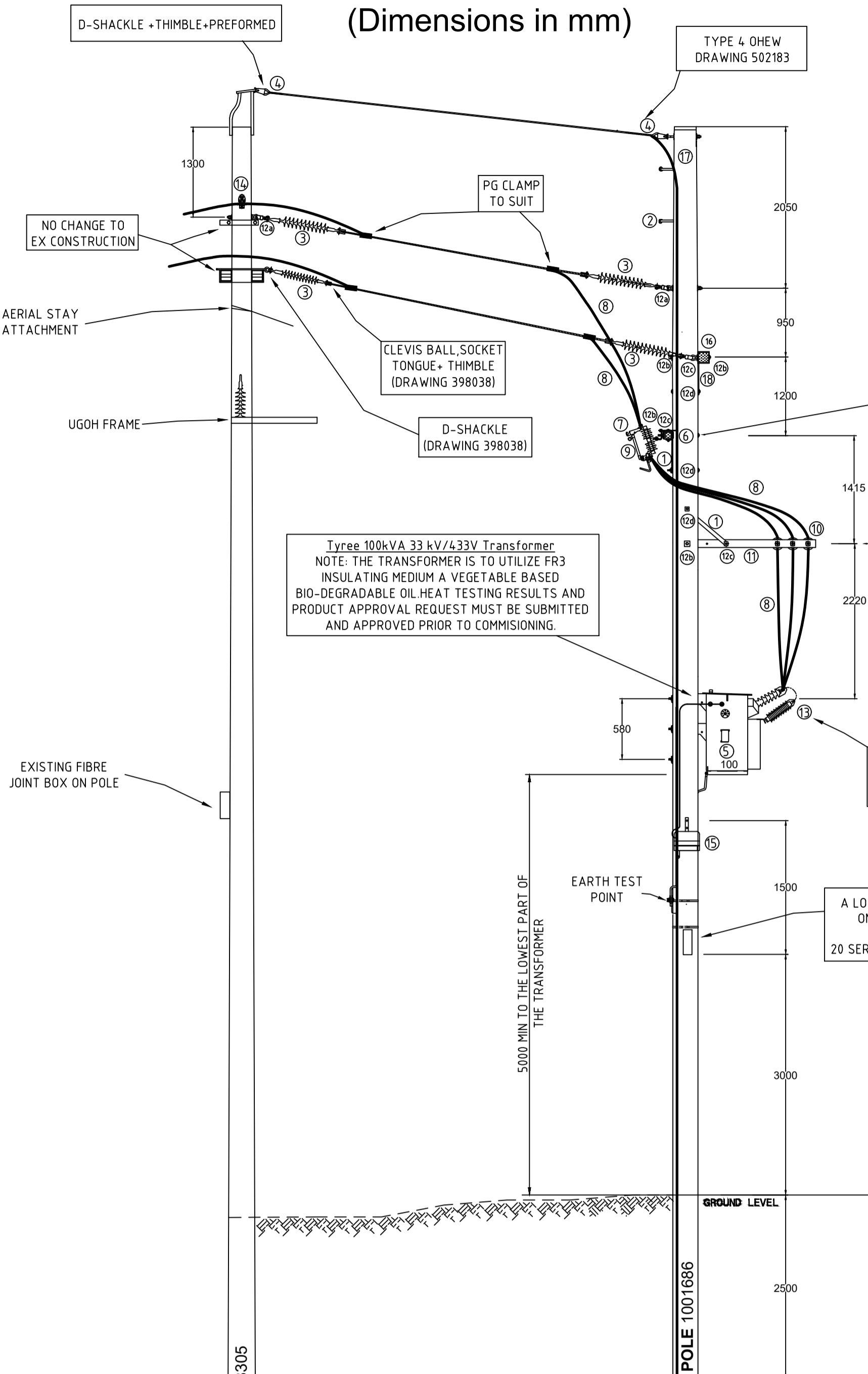
EARTHING PLAN POLE '2'
NOT TO SCALE



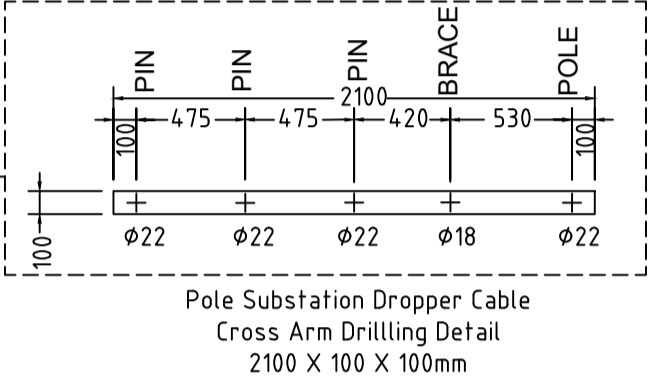
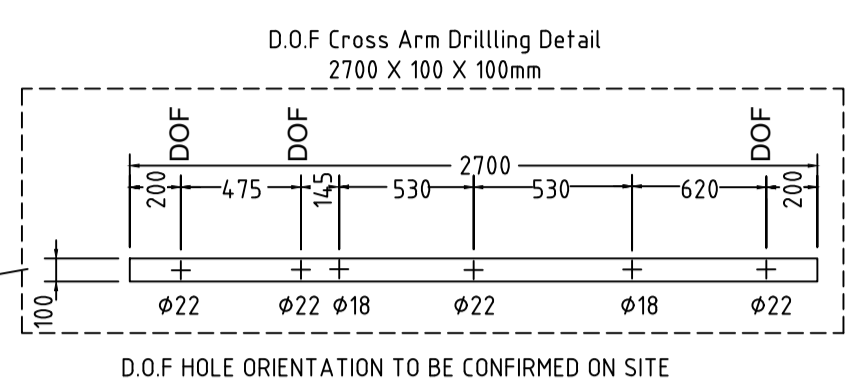
SEPARATE EARTH ROD LAYOUT (INDICATIVE)
NOT TO SCALE



Side Elevation- NTS
(Dimensions in mm)



Note
A MINIMUM OF 380mm MUST BE MAINTAINED BETWEEN ALL EXPOSED ACTIVE COMPONENTS AND EARTHED PARTS OF THE POLE OR STRUCTURE MEASURED TO THE CLOSEST POINT AS PER MDI0031 TABLE 17.5.4.2 TO PREVENT FLASHOVER



Tyree 100kVA 33 kV/433V Transformer
NOTE: THE TRANSFORMER IS TO UTILIZE FR3 INSULATING MEDIUM A VEGETABLE BASED BIO-DEGRADABLE OIL HEAT TESTING RESULTS AND PRODUCT APPROVAL REQUEST MUST BE SUBMITTED AND APPROVED PRIOR TO COMMISSIONING.

MODIFICATIONS REQUIRED FOR THE S.A BRACKET TO SUIT ON POLE & THE BASE TO BE REMOVED.

A LOCKABLE BOX IS TO BE MOUNTED ON POLE 3.0m ABOVE GROUND CONTAINING THE 3 SPARE 20 SERIES 5AMP FUSE LINK CARTRIDGES

SUBSTATION SEPARATE EARTHING DETAIL
SCALE: NTS

HV EARTHING DETAILS			
Soil Resistivity	Layer 1	11.52	Depth (m)
	Layer 2	144.95	∞
Designed Earth Resistance Limit (Ohm)	4-10		
Measured Earth Resistance (Ohm)	1		
Number of Electrodes	1		
Insulated Depth (m)	0.5		
Length of Bare Electrode (m)	2.4		
Connector Type (CAD or Crimp)	Crimp		
Location Category: F- Frequented, R-Remote, S-Sp	Re mote		
What Design Tool Used?	CDEGS		
Fault Level (kA)	7.33		
LV EARTHING DETAILS			
Designed Maximum Earth Resistance (Ohm)	4-10		
Measured Earth Resistance (Ohm)	1		
Number of Electrodes	1		
Length of Bare Electrode (m)	2.4		
Connector Type (CAD or Crimp)	Crimp		

HV EARTH MINIMUM SEPARATION (m)				
	Design	Actual	Design	Actual
TD/MEN	5		Telecom	90
TDB	4		Pipes	5
TDU	3.5		HV-LV	5

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Components in Addition to Standards Pole Substation

ITEM	PART No.	DWG No	DESCRIPTION	QUANTITY
1	SB14.34.2	011962	BRACE CROSSARM (750mm x 6mm)	3
2	1561802	370399	POLE STEP	A/R
3	ALR002	398038	INSULATOR LONG ROD ASSEMBLY	6
4	-	502183	OHEW ASSEMBLY TYPE 4	2
5	-	-	33kV/433V POLE MOUNTED TRANSFORMER (100kVA)	1
6	-	-	TIMBER CROSSARM 2700X100X100mm (UNDRILLED)	1
7	1000002154	-	S&C 20 SERIES DOF'S PART NO. 92544R3G	3
8	11000001028	-	WIRE, 7/4.75 CCT, 120MM2, GREY, 6.35/11KV	A/R
9	1000002265	20 SERIES	FUSE ELEMENT 5A (PART NO. 614.006) "INCLUDES 3 SPARES"	6
10	1014559/1017639	015366C	33kV PIN INSULATOR & PIN	3/3
11	-	-	TIMBER CROSSARM 2100X100X100mm (UNDRILLED)	1
12a	ATP007	054798	M20 EYEBOLT ASSEMBLY FOR POLE	2
12b	ATP009	054798	M20 EYEBOLT ASSEMBLY FOR CROSSARM	3
12c	ATP010	054798	M16 BOLT ASSEMBLY FOR CROSSARM BRACE	5
12d	ATP011	054798	M16 COACH SCREW ASSEMBLY FOR CROSSARM BRACE	3
13	1550516		33KV SURGE ARRESTER	3
14	ALP004	398035	66kV POST INSULATOR	1
15	1548841/1143866	332001	400A 3 φ LV SWITCH FUSE F/W 3 x 200A FUSE ELEMENTS	1/3
16	SC14.819	052796	CROSSARM TYPE C3 STEEL RHS 152x 152 x 3000 LG	1
17	6000000197		POLE - WOOD IMPREGNATED 17m/12kN	1
18	1018620	054790	BRACE CROSSARM 915 LG	2

VEGETATION MANAGEMENT PLAN

**Prospect Reservoir
Endeavour Energy Communications Tower**

January 2023.

**Prepared for Endeavour Energy by
Roger Lembit B.Sc.Agr
Gingra Ecological Surveys**

**Gingra Ecological Surveys
P.O. Box 1
Canterbury NSW 2193**

1. INTRODUCTION

Endeavour Energy is planning construct a communications tower within the Prospect Reservoir precinct. The precinct has heritage significance, and a Visual Impact Assessment (VIA) has been completed in response to a submission by the NSW Heritage Council. Following consideration of the VIA the Heritage Council have requested the preparation of a Vegetation Rehabilitation Strategy. As this report identifies bush regeneration and tree planting options it was considered that titling it as a Vegetation Management Plan was more appropriate.

The VIA indicated that existing vegetation would mitigate the visual impact of tower construction to a large degree. Endeavour Energy now wish to develop a Vegetation Management Plan (VMP) to identify measures such as plantings or bush regeneration which can be undertaken to further reduce the visual impact of the proposal and to protect the heritage landscape.

The objectives of this VMP are:

- The establishment of an Asset Protection Zone (APZ) by the selective removal of vegetation components in a manner that is consistent with Rural Fire Service (RFS) requirements;
- Management of vegetation to allow for native trees in sightlines to mature and attain a height which will mitigate visual impact;
- Selective planting of appropriate tree species to reduce visual impact at key viewing locations, and;
- The retention of vegetation and trees that contribute to wildlife corridors and provide habitat for native fauna.

2. PLANNING CONTEXT

The proposal takes place at a site with a complex layer of interests. The land on which the tower is to be constructed is managed by Sydney Water which operate Prospect Reservoir. Management of land within the Prospect Reservoir precinct is subject to the Property Environmental Management Plan (PEMP) Prospect Reservoir, Reservoir Road WS0095 (Sydney Water 2001). The PEMP deals with the Reservoir lands in different sections. The sites discussed in this VMP include parts of the areas identified as the southern and eastern sides.

The following planning instruments are relevant to the subject area:

- Blacktown Local Environmental Plan 2015
- State Environmental Planning Policy (Western Sydney Employment Area) 2009 (SEPP (WSEA))
- State Environmental Planning Policy (Western Sydney Parklands) 2009 (SEPP (WSP))

Prospect Reservoir Site and associated works is one of the 59 assets owned by Sydney Water Corporation that is listed on the State Heritage Register. Sydney Water commissioned the preparation of a Conservation Management Plans (CMP) which was completed in 2005 and then approved by NSW Heritage in 2006 (Sydney Water Corporation 2005).

As indicated above NSW Heritage have expressed concerns relating to the visual impact of the proposed 60 m high communications tower. Endeavour Energy responded to this by commissioning a Visual Impact Assessment (EMM 2022).

This VMP seeks to ensure any proposed vegetation management is consistent with the PEMP and to ensure any planting scheme has regard to the CMP and additional elements of heritage significance such as historic plantings which are associated with key themes identified in the CMP. A meeting was held with Sydney Water staff during the preparation of this VMP and elements of the meeting discussion have been incorporated in the approach adopted in this report.

3. SITE DESCRIPTION

The site for construction of the communications tower is on a high ridge near the top of Prospect Hill and close to the eastern boundary of the Prospect Reservoir lands. The site is to the south of existing water reservoirs. To the east is the former quarry, now being redeveloped. Access to the site is via William Lawson Drive, which is also the access road for Sydney Water staff and members of the public using facilities provided with the Prospect Reservoir lands including picnic areas and lookouts.

The land is gently inclined along the ridge crest, dropping more steeply to the west towards William Lawson Drive.

The eastern side of the Prospect Hill ridge drains into Girraween Creek, a tributary of Toongabbie Creek and the Parramatta River. Western Slopes are in the catchment of Prospect Reservoir, an artificial impoundment in the head catchment of Prospect Creek, a tributary of the Georges River.

Whilst the majority of the Prospect Reservoir lands are within the Blacktown soil landscape, Prospect Hill is mapped as being within the Volcanic soil landscape (Hazelton, Bannerman & Tillie 1989). The Volcanic soil landscape features red podzolic soils associated with the Jurassic dolerite intrusion found at Prospect (Australian Museum 2018).

Whilst the primary function of the Prospect Reservoir lands is as an intermediate water storage fed by pipes and canals from Warragamba Dam and the Metropolitan catchments, the lands also serve as a workplace and recreational site.

The areas of land subject to this VMP fall within the Blacktown local government area. The land lies within the Central Coast botanical subdivision.

3.1 Existing Vegetation and Habitat

Vegetation patterns across the Prospect Reservoir lands have been mapped by Total Earth Care (2018).

The vicinity of the tower location includes areas classed as Native/Exotic Grassland and Exotic Shrubland. These vegetation classes appear to also include stands of native trees with a disturbed understorey. Tree species include Forest Red Gum (*Eucalyptus tereticornis*), Coastal Grey Box (*E. moluccana*) and Narrow-leaved Ironbark (*E. crebra*). The dominant exotic shrubs are Large-leaved Privet (*Ligustrum lucidum*), African Olive (*Olea europaea* subsp. *cuspidata*) and Lantana (*Lantana camara*).

The PEMP divides the Prospect Reservoir lands into a set of management zones. The vicinity of the communications tower is classed as Zone W Weed Management as is the entrance precinct along William Lawson Drive.

4. VEGETATION MANAGEMENT OPTIONS

The strategy for reduced visual impact of the communications tower is to provide conditions conducive to the growth and survival of native trees in the vicinity of the tower in order that they increase in height, together with selective plantings to screen the tower from viewing points.

A number of viewing points were assessed to allow consideration of vegetation management options which would address visual impact. These included the entrance along William Lawson Drive, the tower location itself and the Prospect Hill ridgeline, William Lawson Drive near the Sydney Water Offices, the Valve House and Maunder Lookout and the associated picnic area. Options for vegetation management are discussed below. A plan identifying preferred locations is included as Figure 1.



Figure 1. Vegetation Management locations

Tower Location

The vegetation in this area includes native tree species and exotic shrubs and grasses.

The preferred management of this area is implementation of bush regeneration works to remove exotic shrubs which are competing with the native tree species.

This management approach is consistent with the PEMP.

A separate bushfire management report is recommending the creation of a 10 m radius Asset Protection Zone (APZ) around the edge of the fenced tower footprint. Achievement of this APZ is possible through selective removal of exotic shrubs. Lopping of branches of native trees may also be necessary to achieve crown separation. A small dead eucalypt tree to the south-west of the tower is recommended for removal. The tree should be laid on the ground across not down the slope to provide habitat.

Sightline from South

Figure 2 shows that there is a gap in tree cover when viewing the tower location from the south.



Figure 2. View of tower location from northern end of Maunder Lookout car park

This gap can be filled by planting of up to 10 trees in the somewhat more clear area seen in the centre of Figure 2. The tree species to be used would be Forest Red Gum (*E. tereticornis*) and Coastal Grey Box (*E. moluccana*). Stock in 15 to 20 cm pots is recommended as these are likely to have a higher survival rate than advanced stock.

Supplementary planting of up to 50 Cumberland Plain Woodland Shrubs is recommended in this area. The shrub species to be used are Hop Bush (*Dodonaea viscosa* subsp. *cuneata*), Native Indigo (*Indigofera australis*) and Sickle Wattle (*Acacia falcata*).

These plantings would need protection to prevent damage from browsing animals. It is also recommended the area around the plantings be periodically mown or slashed to reduce competition. The plantings should be maintained for five years.

Sightlines from West

Consideration was given to potential for screening of the tower from the area around the Sydney Water offices along William Lawson Drive (see Figure 3). Such an approach was not considered appropriate as the lower area has historically been cleared and there are utilities in the area including water pipelines and electricity supply lines.



Figure 3. View of tower location from vicinity of Sydney Water offices

Another potential viewing point assessed was the Valve House area. It was determined that existing vegetation and the intervening landform provided effective screening from this location (Figure 4).



Figure 4. View towards tower location from Valve House

William Lawson Drive

Whilst views of the tower from William Lawson Drive in the vicinity of Andrew Campbell Reserve are not likely to be of high impact planting along the eastern side of the Drive is proposed. Consideration was given to an extension to the existing Hoop Pine avenue, consistent with the historic nature of the avenue. An aerial photograph from January 1956 shows that the avenue then extended to a point north-east of a house on the western side of William Lawson Drive (Figure 5). It is not considered appropriate to extend planting of Hoop Pine beyond the limit seen in the historic evidence, but replacement of trees which have died along the historic section could be undertaken.



Figure 5. Northern end, William Lawson Drive 1/1/1956

Figure 5 shows additional plantings along William Lawson Drive to a point opposite Prospect History Cottage, including what is now a large Lemon-scented Gum (*E. citriodora*). In the early 1980s secondary plants occurring to the east of the Drive in two rows using species including Hoop Pine and Monterey Pine (Figure 6). Some of the Monterey Pines have now died, possibly due to the 2018-19 drought. Hoop Pine saplings have now established as a tertiary tree layer along the rows in the north.

It is proposed to undertake infill planting along the two rows of trees, avoiding infrastructure such as a water main, electricity supply line, fencing and an access way to the paddock. The area may be prone to saturated soil profiles during wet conditions so careful tree species selection may be required.

Suitable local native tree species would include Spotted Gum (*Corymbia maculata*), Forest Red Gum (*E. tereticornis*) and Cabbage Gum. Additional planting of Lemon-scented Gum is not recommended as this species seeds readily and has the potential to become a future management problem.



Figure 6. Eastern side of William Lawson Drive

5. RECOMMENDED MANAGEMENT

This section includes a summary of the management actions proposed for this Vegetation Management Plan. Action and timing seeks to align with actions in Table 4-1 of the PEMP. Works may be undertaken by Endeavour Energy or outsourced and incorporated in a site wide vegetation management plan subject to agreement with Sydney Water and subject to the discussion and recommended actions in this Plan.

Location	Action	Timing
Vicinity of Tower	Establishment of APZ	Within 3 months of tower construction
	Bush regeneration ¹	5 years from construction completion
Ridgeline to south of Tower	Tree planting & protection	Spring 2023
	Mowing/slashing	Monthly from September – March 2023-2028
William Lawson Drive ²	Infill tree planting	Spring 2023, annual assessment of planting success in spring

NOTES

- 1 Contribute to Sydney Water bush regeneration works subject to agreement between Endeavour Energy & Sydney Water
- 2 Section between Andrew Campbell Reserve and Prospect Heritage Cottage (eastern side)

REFERENCES

- Australian Museum (2018) *The Sydney Basin. Igneous Activity*. website
<https://australian.museum/learn/minerals/shaping-earth/the-sydney-basin/> accessed
26/01/2023.
- EMM Consulting (2022) *Visual Impact Assessment for Heritage Council of NSW. 60m
Communications Tower, Prospect Reservoir*. Endeavour Energy, Minchinbury.
- Rural Fire Service (2019) *Planning for Bushfire Protection*.
- Sydney Water Corporation (2005) *Prospect Reservoir Site. Conservation Management Plan*.
Sydney Water, Sydney.
- Sydney Water (2021) *Property Environmental Management Plan (PEMP) Prospect Reservoir,
Reservoir Road WS0095*. Sydney Water, Sydney.
- Total Earth Care (2018) *Biodiversity Assessment – Prospect Reservoir*. Total Earth Care,
Warriewood.

Roweena Dsouza

From: Rhonda Tang <RHONDA.TANG@sydneywater.com.au >
Sent: Monday, 30 January 2023 2:47 PM
To: Phil Bennett; Roweena Dsouza; Nick Stroinovsky
Cc: gingra@ozemail.com.au
Subject: RE: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

Hi Roweena

I also have no issues with the proposal from the property environmental management perspective. I am satisfied that your plans have taken into account the environmental and heritage values discussed with Nick and Phil. I suggest that you note in your VMP that the plantings may be “outsourced” and incorporated in a site wide vegetation management plan, but will be in keeping with your main objectives.

We still need to consult with SW Property Leasing about impacts to the access of the grassed area (opposite the cottage), which they have been known to lease out. From our experience, it’s unlikely to be a big issue, they may ask for plantings to be excluded from a small corridor or from the tops of unmarked pipes.

SW Property Management will also need to be consulted to discuss with you on APZ issues. Hence I’ve made some corrections to the dot point on:

- APZ maintenance – Similarly, SW have an APZ management area that they are required to maintain. Rhonda will consult SW Property Management on the proposed towers APZ, to understand the interaction of Lease areas with SW APZ. SW to clarify extent and maintenance and get back to Endeavour for discussion.

Other corrections:

- Planting near eastern edge of William Lawson Drive:
EE recommended planting of Hoop Pine in the gap between the Pine trees as shown in the image. SW advises that we need to demarcate Heritage trees from the new plantings. SW advice to plant native, fast growing trees with potential to bear hollows/become habitat trees in the future along the William Lawson Drive proposed planting area. This would assist with quicker screening for the visual aspect and also in the long term contribute to wildlife corridors and provide habitat for native fauna.
- The plantings should be placed more than 5 m away from the roadside, and avoid infrastructure such as a water main, fencing and any access gates

I don’t think any of these comments will affect your submission, if you think otherwise, or would like further clarification feel free to call me.

Regards

Rhonda Tang

Project Manager – Property Environmental
Management Plans (PEMP) Program
Property Services, Asset Lifecycle

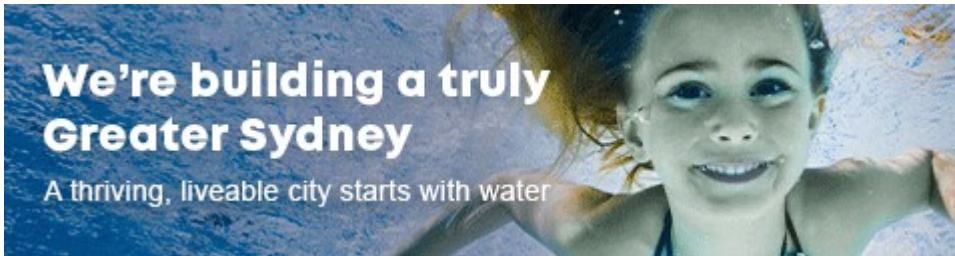
Mobile 0438 687 681

Rhonda.Tang@sydneywater.com.au

“If I had more time, I would have written a shorter letter.”

Level 10, 1 Smith Street
Parramatta NSW 2150

Sydney
W A T



Sydney Water respectfully acknowledges the land and waters on which we work with respect to Elders past and present



From: Phil Bennett <PHIL.BENNETT@sydneywater.com.au>

Sent: Monday, 30 January 2023 1:10 PM

To: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>; Rhonda Tang <RHONDA.TANG@sydneywater.com.au>; Nick Stroinovskiy <Nick.Stroinovskiy@sydneywater.com.au>

Cc: gingra@ozemail.com.au

Subject: RE: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

Hi Rowena

I am happy with the landscape outcomes.

No other comments.

Accepted.

Thanks

Phil Bennett
Lead Heritage Adviser
Environment & Heritage

0407 455 937
philip.bennett@sydneywater.com.au

From: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>

Sent: Monday, 30 January 2023 12:28 PM

To: Rhonda Tang <RHONDA.TANG@sydneywater.com.au>; Phil Bennett <PHIL.BENNETT@sydneywater.com.au>; Nick Stroinovskiy <Nick.Stroinovskiy@sydneywater.com.au>

Cc: Phil Bennett <PHIL.BENNETT@sydneywater.com.au>; gingra@ozemail.com.au

Subject: RE: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

Hi,

@'Rhonda Tang', thanks for your quick response and initial comment.

Rhonda and Phil,

Could you let me know if there are any further comments/clarifications that you would like us to address? If not, Roger can send through the final version for your review and approval and I shall notify Nick once you both have approved (I understand he is on leave today).

Once HNSW give their approval, I shall organise a meeting between key stakeholders from Endeavour and Sydney Water so we can nut out the commercial aspects and the arrangements to carry out the works.

Regards
Row

From: gingra@ozemail.com.au <gingra@ozemail.com.au>
Sent: Monday, 30 January 2023 10:38 AM
To: 'Rhonda Tang' <RHONDA.TANG@sydneywater.com.au>; Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>; 'Phil Bennett' <PHIL.BENNETT@sydneywater.com.au>; 'Nick Stroinovsky' <Nick.Stroinovsky@sydneywater.com.au>
Cc: 'Phil Bennett' <PHIL.BENNETT@sydneywater.com.au>
Subject: RE: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

Hi,
The implication is infill of the 1980s treelines, rather than new planting.
There is no need to worry about access, as access to the paddock is provided by Gate 2, and you just need to locate plantings away from this line.
Tree spacing in the existing lines is about 9 m,
for the Hoop Pines its about 11 m, was probably 12 yards.

Just a change in wording.

Regards,
Roger.

Roger Lembit B.Sc.Agr
Principal Ecologist
Gingra Ecological Surveys
P.O. Box 1
Canterbury NSW 2193
gingra@ozemail.com.au
0427 779925

From: Rhonda Tang <RHONDA.TANG@sydneywater.com.au>
Sent: Monday, 30 January 2023 10:32 AM
To: gingra@ozemail.com.au; 'Roweena Dsouza' <Roweena.Dsouza@endeavourenergy.com.au>; Phil Bennett <PHIL.BENNETT@sydneywater.com.au>; Nick Stroinovsky <Nick.Stroinovsky@sydneywater.com.au>
Cc: Phil Bennett <PHIL.BENNETT@sydneywater.com.au>
Subject: RE: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

I hope you all had a great weekend =)

Thanks for sharing your insights Roger, and I also enjoy getting information from a good aerial.

Do you think there might be any changes to the approach forward, compared to what we had discussed last week?

Regards

Rhonda Tang

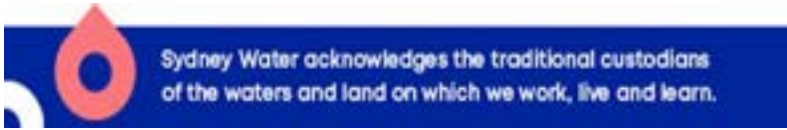
Asset Lifecycle

Sydney Water, 1 Smith Street, Parramatta NSW 2150



Mobile 0438 687 681

rhonda.tang@sydneywater.com.au



From: gingra@ozemail.com.au <gingra@ozemail.com.au>

Sent: Monday, 30 January 2023 8:02 AM

To: 'Roweena Dsouza' <Roweena.Dsouza@endeavourenergy.com.au>; Phil Bennett <PHIL.BENNETT@sydneywater.com.au>; Nick Stroinovsky <Nick.Stroinovsky@sydneywater.com.au>; Rhonda Tang <RHONDA.TANG@sydneywater.com.au>

Cc: Phil Bennett <PHIL.BENNETT@sydneywater.com.au>

Subject: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

CAUTION: This email originated from outside the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Hi,

I've done some further work over the weekend I thought I should share.

I had a look at the area along William Lawson Drive, from the Hoop Pine avenue southwards.

Many of the trees beyond (east) of the fence are plantings in a double row. There are also younger trees which have regenerated more recently. The main plantings appear to be Radiata Pine and Hoop Pine. There are also sapling Lemon-scented Gum and a number of Spotted Gum trees.

Lemon-scented Gum were commonly planted in western Sydney in the 1970s, examples are at St Marys and Mawson Park at Campbelltown.

The attached aerial photograph from the NSW Government Historical Imagery webpages seems to be the first in the time sequence which shows planting in this area.

I will be amending the wording relevant to this area to reflect this.

Regards,
Roger.

Roger Lembit B.Sc.Agr
Principal Ecologist
Gingra Ecological Surveys
P.O. Box 1

Canterbury NSW 2193
gingra@ozemail.com.au
0427 779925

From: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>
Sent: Friday, 27 January 2023 4:45 PM
To: PHILIP.BENNETT@sydneywater.com.au; gingra@ozemail.com.au; nick.stroinovsky@sydneywater.com.au;
Rhonda Tang <RHONDA.TANG@sydneywater.com.au>
Cc: Phil Bennett <PHIL.BENNETT@sydneywater.com.au>
Subject: RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

Hi All,

Thank you for meeting with us on the 24th January.

Key notes from the meeting:

Aim: To discuss the draft Veg Management Plan at Prospect Reservoir with Sydney Water and determine their requirements and address any concerns.

Attendees:

- Roweena D'Souza – Environmental Specialist, Endeavour Energy
- Roger Lembit – Ecologist, Gingra Ecological Surveys
- Rhonda Tang – Project Manager – Property Environmental Management Plans (PEMP) Program, Sydney Water
- Philip Bennett – Heritage Advisor, Sydney Water
- Nikolai Stroïnovsky - Lead Environmental Advisor, Customer Delivery, Sydney Water

Notes and action items:

- Endeavour Energy discussed the draft Veg Mgmt Plan with Sydney Water (SW) and advised that this plan was developed to compliment SW PEMP and the CMP.
- Planting near eastern edge of William Lawson Drive:
EE recommended planting of Hoop Pine in the gap between the Pine trees as shown in the image. SW advices that we need to demarcate Heritage trees from the new plantings. SW advice to plant native, fast growing trees with potential to bear hollows in the future along the William Lawson Drive proposed planting area. This would assist with quicker screening for the visual aspect and also in the long term contribute to wildlife corridors and provide habitat for native fauna.
- The plantings should be placed more than 5 m away from the roadside to avoid infrastructure such as a water main, fencing and any access gates
- Endeavour Energy advised that they might need to create an Asset Protection Zone for bushfire protection. This would involve clearing 10m ground cover around the proposed Telco infrastructure (which is composed of weeds such as African Olives, Privet, Lantana), lopping of branches of native trees to achieve crown separation and the removal of a small dead eucalypt tree to the south-west of the tower. SW advise they have no objection as long as they trees are not hollow bearing and the dead tree is laid on the ground across not down the slope to provide habitat.
- Sightline from South - there is a gap in tree cover when viewing the tower location from the south. EE advise that this gap can be filled by planting a few trees in a clear area and away from the overhead main easement. These plantings would need protection to prevent damage from browsing animals. It is also recommended the area around the plantings be mown or slashed to reduce competition. The plantings should be maintained for five years. SW agree and recommend planting native trees in this area.
- Maintenance –EE proposed that they could pay SW a \$/m2 area requiring weed management until the plants establish themselves or as will be captured in the Veg Mgmt Plan. SW agreed that this could be a better option considering the contractors need to meet specific requirements and they have existing contractors that maintain the site on a regular basis. EE and SW agree to separately discuss maintenance of the above areas.
- APZ maintenance – Similarly, SW have an APZ management area that they are required to maintain. SW will look into updating this map as it doesn't include the SW water reservoirs that need APZ maintenance. It is

likely that proposed towers APZ will be a subset of the overall SW APZ. SW to clarify extent and maintenance and get back to Endeavour.

- Endeavour to clarify if it's a lease or licence and send SW a copy of the extent.
- Endeavour advise that the submission to HNSW is scheduled for 31st Jan and will submit a draft for SW review on 27th Jan.

Please let me know if I have missed any item or if there are any corrections.

Else this can be considered as the Minutes of the Meeting.

Thanks
Roweena

Post meeting –

- Endeavour have obtained an easement and will send over the documents on Monday 30th Jan.
- Endeavour submits the draft Veg Management Plan with this email for SW review.

-----Original Appointment-----

From: Roweena Dsouza

Sent: Tuesday, 24 January 2023 4:16 PM

To: Roweena Dsouza; philip.bennett@sydneywater.com.au; gingra@ozemail.com.au; nick.stroinovsky@sydneywater.com.au; Rhonda Tang

Cc: Phil Bennett

Subject: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

When: Wednesday, 25 January 2023 3:30 PM-4:15 PM (UTC+10:00) Canberra, Melbourne, Sydney.

Where: Microsoft Teams Meeting

Hi All,

Rescheduling to meet Rhondas availability.

Also, I have attached the proposed strategy below that we will discuss at the meeting.



Hi All,

Could we meet to discuss EE's proposal re the Veg Rehab Plan at Prospect Reservoir and its alignment with Sydney Water management plans.

Thanks
Row

Roweena D'Souza | Environmental Specialist

M 0447 919 365
51 Huntingwood Drive, Huntingwood NSW 2148.

Dharug Country

endeavourenergy.com.au |



Endeavour Energy respectfully acknowledges the Traditional Custodians on whose lands we live, work, and operate and their Elders past, present and emerging.

Microsoft Teams meeting

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Passcode: KrFWnv

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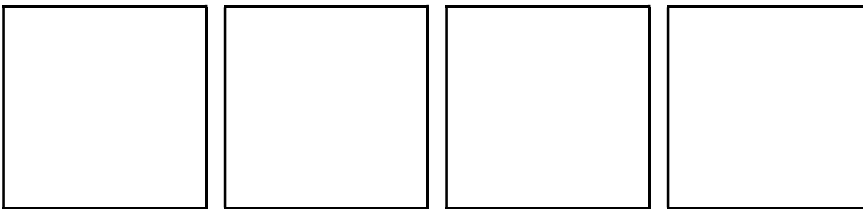
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Visual Impact Assessment for Heritage Council of NSW

60 m Communications Tower, Prospect Reservoir

31/01/23






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Document Approval

To the best of the knowledge of the below signatories, this REF has been prepared to be neither false nor misleading and is in accordance with The Code of practice for Authorised Network Operators approved under section 171 of the Environmental Planning and Assessment Regulation 2021.

Prepared by	Verity Blair and Tadd Andersen, EMM Consulting
Signed	
Date	21/12/ 2022, 24/01/23
Title	Associate Director, EMM Consulting Pty Ltd
Reviewed by	Dave Kelly, EMM Consulting
Signed	
Date	24/1/2023
Title	Associate Director, EMM Consulting Pty Ltd
Approved By	Peter Oxnam
Signed	
Date	31/01/2023
Title	Environmental Services Manager, Endeavour Energy

Document Control

Revision	Prepared by and Company Name	Date	Reviewed by and Company Name	Comments
V1	Verity Blair, EMM Consulting Pty Ltd	16 December 2022	Roweena D Souza Endeavour Energy	Review comments to be addressed
V2	Verity Blair, EMM Consulting Pty Ltd	21 December 2022	Peter Oxnam Endeavour Energy	Approved
V3	Tadd Anderson	24 January 2023	Roweena D Souza Endeavour Energy	Final review
V4	Lia Zwolinski	31 January	Peter Oxnam Endeavor Energy	Final approval

1 Introduction

1.1 Background

Endeavour Energy (EE) is an electricity distribution system operator servicing over 2.5 million people living and working across Sydney's Greater West, the Blue Mountains, the Southern Highlands, Illawarra and the South Coast of New South Wales (NSW).

In March 2023 the main EE office in Sydney will move from its current location at Huntingwood to a new premises in Parramatta. EE have a communications tower within the Huntingwood site and it is a critical component of EE's wide area network (WAN). The tower provides connectivity and redundancy for several depots, including both EE's Information Technology and Operational Technology data centres as well as for Supervisory Control and Data Acquisition (SCADA) sites which are vital to keep EE's power grid active and managed. As a result of this move, the existing EE communications tower will no longer be accessible and there is a need for a new communications tower.

EE have considered various options for a practicable solution and the site adjacent to the Sydney Water tanks at Prospect Reservoir was deemed as a suitable location for this purpose in terms of microwave links, line of sight and coverage which can provide connectivity to 98 SCADA field assets and one substation that are currently directly connected to the Huntingwood site.

Key features of this proposal include installation of:

- a 60m free-standing heavy duty lattice tower with self-supporting concrete footings;
- an external ladder, approximately 57m in height;
- a new equipment shelter (6m by 3m) on concrete footing foundations;
- a new 600mm cable tray support system from the tower to the equipment hut and support posts;
- a compound area 15m by 15m around the tower and associated infrastructure, including a 2.8 m high security fence with 4.8m wide double access gate;
- a new 17m pole with substation and overhead lines; and
- power supply works and underground cabling.

No trees are required to be removed as part of this proposal.

The site is located on the southern side of Reservoir Road and is part of the larger Prospect Reservoir site. As the proposal is located on land that is within the curtilage of two items on the NSW State Heritage Register namely, Prospect reservoir and surrounding area and the Prospect Reservoir Valve House and in the general vicinity of the NSW State Heritage listed item namely Veteran Hall – House remains, section 60 of the NSW *Heritage Act 1977* is triggered and approval from Heritage Council of NSW (HNSW) is required. EE submitted a Statement of Heritage Impact (SOHI) to HNSW in October 2022 and an updated version in November 2022.

1.2 Purpose of this report

This Visual Impact Assessment (VIA) has been prepared by EMM on behalf of Endeavour Energy. The purpose of this report is to provide an assessment of the visual impact of the proposed tower on key heritage-listed items in response to the clarifications sought by HNSW:

The reservoir is identified as being of state significance as aesthetically significant as a picturesque site (SoS). The proposed erection of a 60m high electrical tower at a high point within the picturesque landscape will impact these values.

- *The impact on the picturesque landscape identified in the SoS is not adequately addressed and requires more consideration, details and with options explored.*
- *A Visual Impact Assessment (VIA) of the proposed development is required. The views are to be located on a plan to indicate the location from which they were taken and why that location is significant.*
- *Include a photomontage of the proposed development as seen from significant locations.*

1.3 Applicable environmental planning instruments and guidelines

The proposal requires assessment and approval under Division 5.1, section 5.5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

Clause 171(2) of the NSW Environmental Planning and Assessment Regulation 2021 requires consideration of environmental factors, including:

- d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality
- e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations

This report also considers the Guidelines for Division 5.1 assessments (DPE June 2022). These guidelines support the assessment of environmental effects noted in Clause 171(2) of the EP&A Regulation.

2 Methodology

The following is an overview of the methodology adopted for the visual assessment.

2.1 Existing visual environment

2.1.1 Desktop analysis

A review of key planning requirements, policies and guidance was undertaken in relation to the visual environment within the heritage curtilage. The review identified elements outlined in legislation, policy and planning documents relevant to the visual character of the area. Existing environment data and project information was gathered and reviewed, including:

- project design information and site photographs;
- topography, land use, and vegetation maps;
- Google Earth and Google Street View; and
- LiDAR (light detection and ranging) data.

Using this data, a preliminary assessment of the visual environment was undertaken to inform the site inspection.

2.1.2 Site Inspection

Site inspections were undertaken by an environmental specialist from EMM consulting on 12 August and 13 November 2022 and 23 January 2023. The purpose of the inspections was to:

- identify visual receiver locations;
- inspect the site and appreciate views to / from sensitive heritage items;
- inspect publicly accessible locations identified during the desktop analysis as likely to provide views of the proposal, including roads, footpaths, infrastructure, etc; and
- take photographs for preparation of photomontages.

2.1.3 Definition of existing visual environment

An assessment of existing visual conditions was undertaken to establish the key views, topography, vegetation and other visual features relevant to the proposal. Refer to Section 4 for an assessment of the existing visual environment.

2.1.4 Viewpoint selection

Visual receivers were considered in terms of the views they are likely to have of the proposal from within and outside the heritage curtilage including consideration of any key vantage points, such as picnic areas and lookouts.

Refer to Section 5 for viewpoint locations.

2.2 Impact assessment

2.2.1 Visual effects

The evaluation of potential impacts on the visual environment is based on the sensitivity of the viewpoint (and the visual receiver it represents) to change, and the magnitude of change that is likely to occur. The sensitivity of each viewpoint is considered to be dependent on:

- the importance of the view, its existing scenic qualities and the presence of other existing man-made elements in the view; and
- the type of visual receiver and their likely interest in the view.

The assessment considers the likely impacts of the project. To measure the visual sensitivity and the visual effect of the site, specific locations known as viewpoints are chosen as representative views. In this instance, the viewpoints have been chosen to demonstrate any visual impacts on the heritage. The effect on a view depends on factors such as the extent of visibility, degree of obstruction of existing features, degree of contrast with the existing view, angle of view, duration of view and distance from the project. The steps that were undertaken to assess the visual effects of the project included:

- identifying and mapping viewpoint locations close to key heritage items; and
- undertaking an assessment of visual effects, comprising:
 - sensitivity of visual receivers to proposed change and value attached to views; and
 - magnitude of visual effect, based on: size or scale of change; geographical extent of effects, and duration and reversibility of effects.

An assessment was undertaken of the overall level of significance of the visual effects from the project in relation to the existing view.

2.3 Assumptions

This VIA has been prepared in response to comments from Heritage NSW and therefore only assesses the visual effects the proposal will have on heritage listed items including Prospect Reservoir and curtilage, the Valve House and former Veterans Hall (refer Figure 8) as agreed with Heritage NSW.

It is assumed that the visual sensitivity is high within the heritage curtilage, given the proximity of heritage items to the proposed tower. This high visual sensitivity triggers the need for this VIA in order to determine the level of visual impact of the proposed tower.

Further, it is noted that impacts associated with the construction of the proposed tower and associated infrastructure have not been as assessed as they are considered temporary in nature.

2.3.1 Photography

Photographs were taken from the seven viewpoints shown in Figure 7. Photomontages were prepared using WindPro, a program designed to accurately generate photomontages using digital terrain data, 3D models of the proposed tower and site photographs. In order to validate the photomontages, a program called Neara was used to create a similar looking tower and assess the location of the tower from the three viewpoints using LIDAR data.

3 Project Description

3.1 Location of the study area

The proposal site is located off William Lawson Drive, Prospect on the southern side of Reservoir Road and is part of the larger Prospect Reservoir site (refer Figures 1 and 2). The site is located on part of Prospect Hill in the vicinity of existing water tanks to its northeast and within Lot 304 Deposited Plan (DP) 1122291. It is noted that the larger Prospect Hill site takes in a larger area, including the former quarry and second summit to the east. For the purposes of this report, the site location is referred to as Prospect Hill and is defined as the western summit of the wider Prospect Hill site. Prospect Reservoir and surrounds is located across Cumberland, Fairfield and Blacktown Local Government Areas (LGAs), while the proposal site is located solely within Blacktown LGA (refer Figure 3). The proposal site is located at the top of Prospect Hill, on the second highest summit known as Water Tower Hill, which is located within the curtilage of the Prospect Reservoir. The reservoir and its surrounds, along with the Prospect Reservoir Valve House, are listed on the State Heritage Register. Water Tower Hill is not accessible to the public and access to the tower would be via an existing gated access track.



Figure 1: Aerial view of the Prospect reservoir site highlighted in yellow (source: sixmaps).

Sensitive visual receivers in the area include recreational users accessing the picnic, open space and lookout areas and Sydney Water staff working in the Sydney Water offices. There is only a relatively small area of the reservoir and surrounds, in the south-east corner, that is accessible to the public, due to access restrictions for Prospect Nature Reserve and some Sydney Water land.

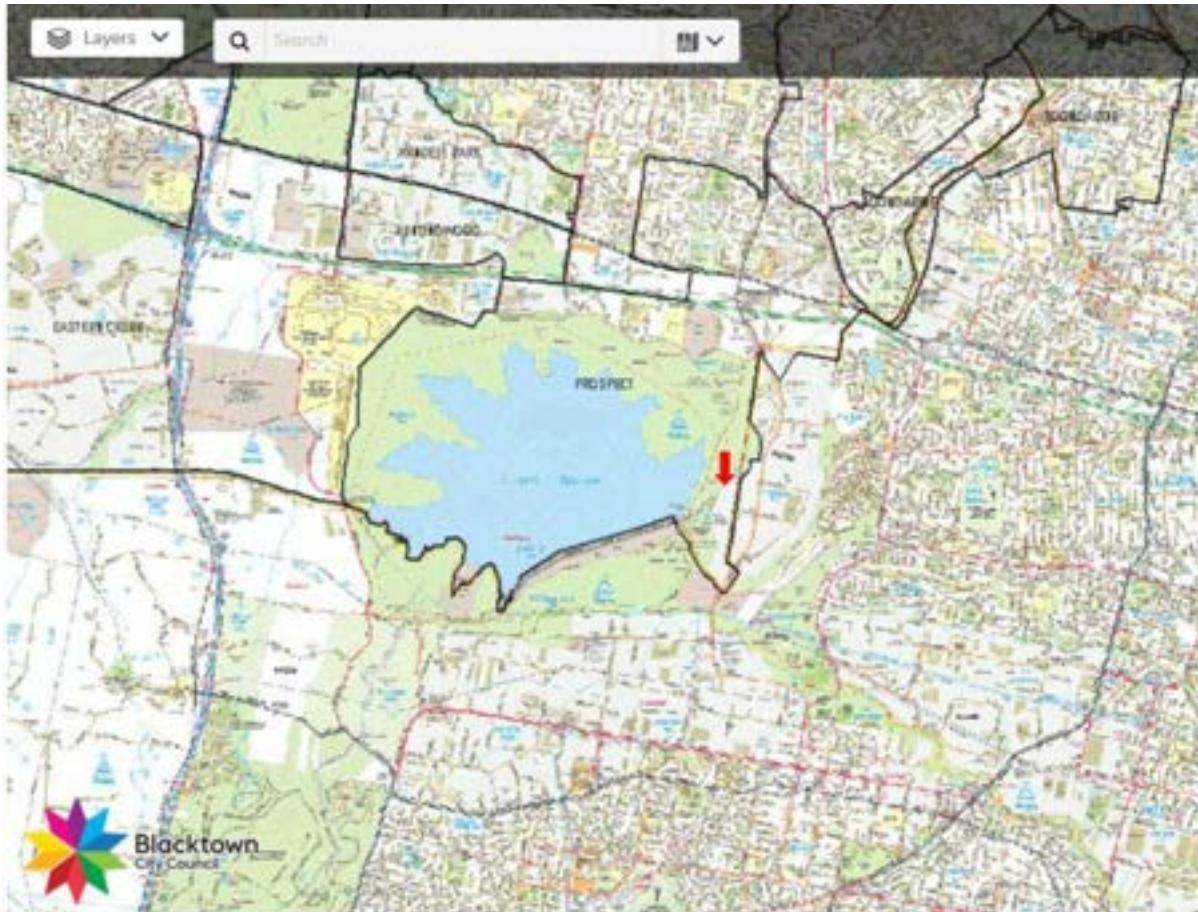


Figure 2: Location of proposal within Blacktown LGA wherein LGA extent is shown by a black border (source: Blacktown City Council)

3.2 Site layout components

Key components that will need to be constructed and installed are listed below:

- a 60m free-standing heavy duty lattice tower with self-supporting concrete footings (constructed in matt galvanised steel to reduce reflectivity);
- an external ladder, approximately 57m in height;
- a new equipment shelter (6m by 3m) on concrete footing foundations;
- a new 600mm cable tray support system from the tower to the equipment hut and support posts;
- a compound area 15m by 15m around the tower and associated infrastructure, including a 2.8m high security fence with 4.8m wide double access gate;
- a new pole with substation and overhead lines; and

- power supply works and underground cabling.

The overall site plan in Figure 3 shows the location of the tower in relation to the existing water towers and quarry edge, while Figures 6 and 7 show detailed elevations of the tower and associated infrastructure.



Figure 3 - Overall Site Plan

4 Existing Visual Landscape

The area surrounding Prospect Reservoir is characterised by a number of land uses including Eastern Creek Raceway and Western Sydney Dragway to the north and Raging Waters theme park to the west. A former quarry now developed as an industrial park adjoins the east while Austral bricks and other various industrial development is located to the south (refer Figure 4). In addition, there are a number of guyed masts, towers and electricity pylons in the surrounding area.

It is noted that there are no permanent residential dwellings in close proximity to the site for the proposed tower.



Figure 4 - Overview of the key land uses in the vicinity of the proposal

Prospect Nature Reserve occupies the northern and western area immediately surrounding Prospect Reservoir. It is noted that this nature reserve is not publicly accessible and views into the site from the local road network and adjoining land are very limited given Prospect Nature Reserve and other existing vegetation that surrounds the reservoir. There are no views to the proposed tower location from publicly accessible area on the northern, western and south western edges of Prospect Reservoir.

Land within the Prospect Reservoir heritage curtilage is characterised by open grassed areas, with scattered picnic spots, stands of mature vegetation (primarily Cumberland Plain Woodland) and a number of State heritage-listed buildings associated with the reservoir including the Prospect Reservoir Valve House. There are also a few single-storey modern buildings that house Sydney Water site offices. The visual catchment of Prospect Reservoir is limited primarily to views from publicly accessible areas, including William Lawson Drive, picnic areas in the south-east corner of the Reservoir and picnic areas/lookouts on Prospect Hill.

The site for the proposed tower is a gently sloping grassed area surrounded by mature vegetation, predominantly comprised of Eucalyptus species, which are between 15m and 25m in height. There are a number of picnic areas and car parks at various levels on Prospect Hill and around the edge of the reservoir. George Maunders lookout affords views over the reservoir itself. It is noted that there are two large water tanks/reservoirs at the top of Prospect Hill, which are around 20m in height. Views of these tanks from within

Prospect Reservoir curtilage are very limited given the topography of the site and the mature vegetation along the ridgeline and further down Prospect Hill.

Views to the western side of Prospect Hill comprise a vegetated slope, with power lines visible. Views to the south of Prospect Hill are steeper, with vegetation above the wall of a disused quarry.

While the reservoir and northern vegetated areas provide a naturalistic landscape with remnant bushland, it sits within an urban context and this is demonstrated by visual elements including the rides and infrastructure of Raging Waters theme park and other communications towers that make up part of the general urban landscape.

There is one public lookout (George Maunder Lookout) located within the curtilage of Prospect Reservoir. Views from this lookout are predominantly over the reservoir towards the west and south-west whereas the proposed tower is towards the northeast of this lookout. In addition, the undulating landform character and tree cover surrounding the proposed tower, effectively screen views of the proposed tower, thereby preserving the scenic quality of views from the lookout.

In order to identify the visual character of the area, a number of photos were taken from various viewpoints (refer Figure 7) within the State Heritage item curtilage and from a highpoint on Prospect Hill Lookout, adjacent to the industrial park, looking towards the proposed tower location. The photos demonstrate that this location is characterised by open, grassy fields that are lined with trees that obscure distant views. These photos are provided in Attachment B.

5 Visual impact assessment

The proposed tower is located towards the high point within the landscape to maximise line of site and coverage. Given that the tower is 60 m in height, there is a potential for a visual impact on the surrounding area, including key heritage items within the heritage curtilage.

In order to address the effect of the proposed tower on the relevant heritage-listed items, an assessment of the visual effects the proposed tower will have, particularly on heritage-listed items, has been undertaken.

The predominant views of the tower will be from the adjoining industrial site to the northeast, with limited vegetation between the tower and the cliff edge above the industrial estate. Notwithstanding, the character of the industrial area, with large scale warehouses, means that the visual impacts from this viewpoint will not be significant or out of character.

It is noted that the key heritage viewpoints are located near the edge of the reservoir, at the toe of Prospect Hill. The sections provided in Figures 5 and 6 below (also included in Attachment A) show how the topography of the land and existing mature vegetation screen views of the tower when viewed from William Lawson Drive and the edge of the reservoir.

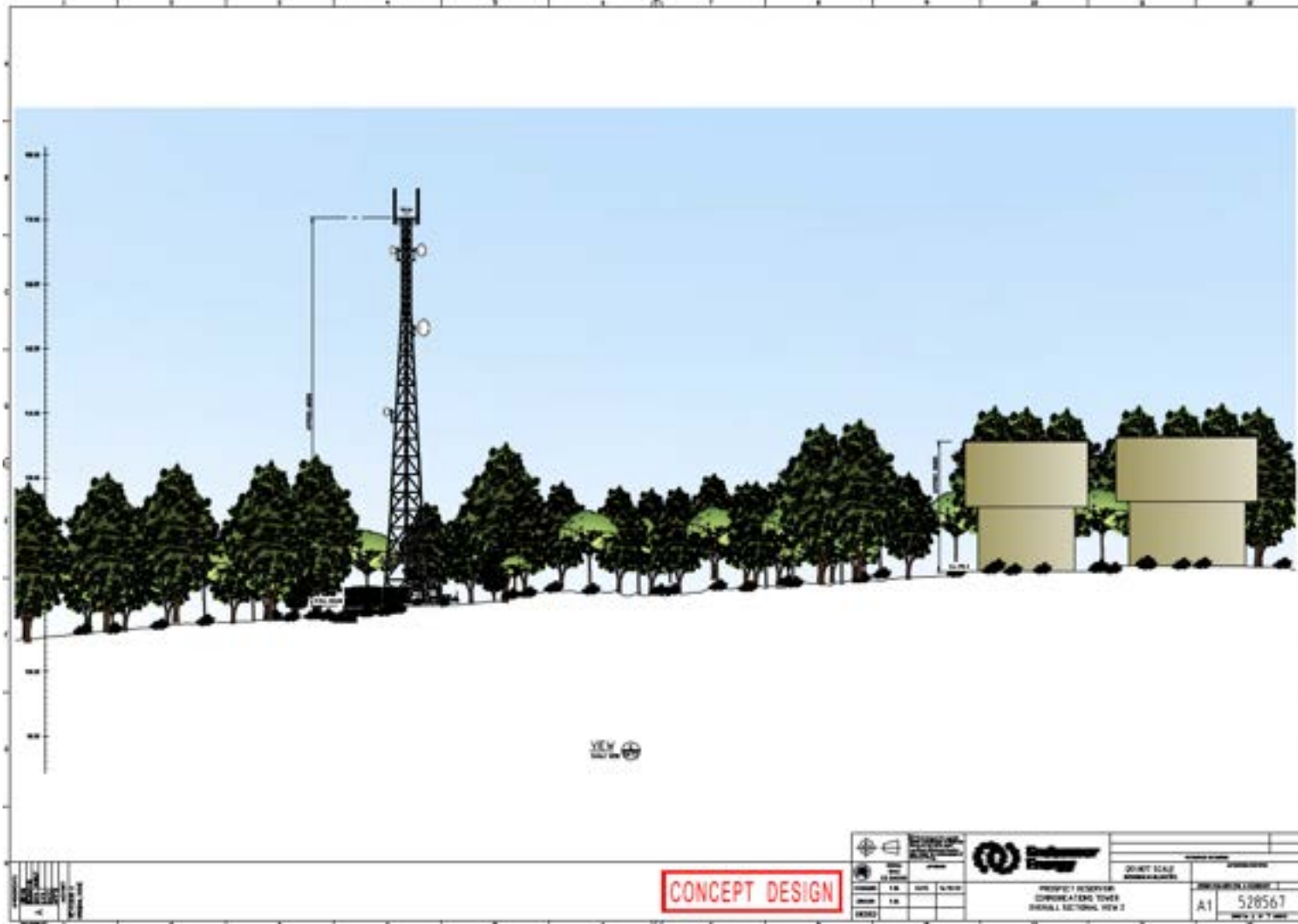


Figure 5 - Section showing proposed tower and existing water towers (refer Figure 3 for section location)

In order to assess the visual impact on key heritage items within the curtilage of Prospect Reservoir, Endeavour Energy met with Heritage NSW on 19th January 2023 (meeting notes in Attachment C) and presented the Neara model and key viewpoints. This VIA captures all the viewpoints discussed at the meeting with the following exception/deviations:

- 1) The areas west of the reservoir were heavily vegetated with limited access. Based on site inspections, there were no locations with views to Prospect Hill and the proposed tower along the western and northern sides of the reservoir. Therefore, there were no viewpoints chosen in these areas.
- 2) Prospect Lookout – during the meeting the viewpoint discussed was within the north western end towards Clunie Ross Street on land to which the Plan of Management, Cumberland Council March 2019 applies. During the site visit to capture photos for the photomontage at this point, it was noticed that the dense vegetation, industrial area and the steep slope on the western side of a pathway from Clunie Ross St to the high point screened most of the views past the ridgeline. It was only at a specific point on the hilltop that had some view towards the proposed tower and this point is captured as Viewpoint 7 in this report.

Seven photomontages were prepared to demonstrate the visibility of the tower. These were based on selected viewpoints in discussion with HNSW, which are locations chosen to represent the view of a development from that area.

Five viewpoints illustrate views from within the heritage curtilage. These are views from locations with public views or from heritage items. The remaining two viewpoints were from further afield in the surrounding community. These were chosen due to their significance as a lookout location and accessibility to people. Figure 7 indicates the locations of the viewpoints.

The photomontages were prepared using WindPro, a specific visual impact modelling program and a 3D model of the proposed tower. In order to validate the photomontages, a program called Neara was used to create a similar looking tower and assess the location of the tower from three viewpoints using LIDAR data. Both the original photomontages and Neara validations are shown as part of the analysis for viewpoints 1-3 below.

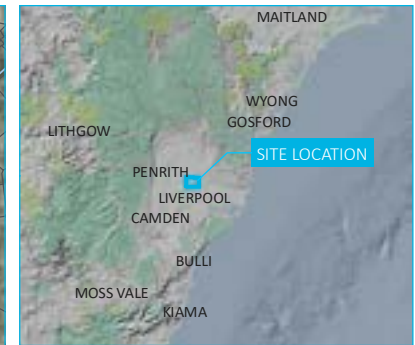
As a tower structure is not available in Neara, a pole that represents the tower, and with dimensions similar to that of the proposed tower was used:

- pole base: 650 cm
- pole top: 150
- pole height: 60 m
- pole material (the aesthetic look): steel

For the LiDAR accuracy specs below are the contract accuracy requirements for the full network scan.

	Vertical accuracy 95% confidence	Horizontal accuracy 95% confidence
LiDAR surveys	+/- 0.15 m	+/- 0.20 m

	Relative accuracy 95% confidence
LiDAR surveys	+/- 0.05 m



- KEY**
- Proposed Tower Location
 - Viewpoint
 - Prospect Reservoir and surrounding area as listed on the SHR (no. 01370)
 - Prospect Reservoir Valve House as listed on the SHR (no. 01371)
 - Veteran Hall – House Remains as listed on the SHR (no. 01351)
 - Major road
 - Minor road
 - Named watercourse
 - Named waterbody
- INSET**
- NPWS Reserve

Viewpoint locations

Endeavor Energy
Prospect Tower
Figure 7



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Source: EMM (2023); ABS (2021); DFSI (2017, 2020); GA (2011); Metromap (2023)

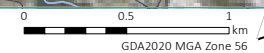




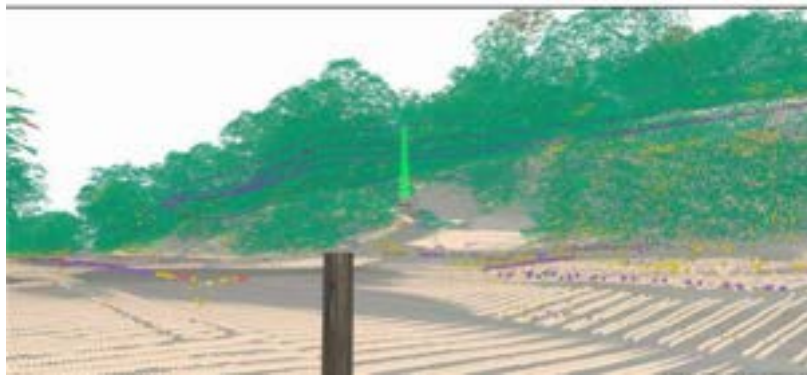
Table 1 – Viewpoint 1 Photomontage



Criteria	Comments
Location	Located just outside the heritage curtilage on William Lawson Drive. It is approximately 400 m from the proposed tower and located just outside the heritage curtilage. This view south-east towards the proposed tower is representative of views to site users driving to the reservoir edge and picnic areas along William Lawson Drive.
Description of existing view	The existing view is characterised by open grassed areas on either side of William Lawson Drive, with mature vegetation on the slopes of Prospect Hill enhancing the natural quality of the view. The view is important as it forms part of the main public access to Prospect Reservoir however the presence of power-lines, chain wire fencing and Sydney water offices and vehicles (parked on the road edge) diminish the natural quality of the view. Given this, it is considered that this view has a low to medium value.
Anticipated change to view	The upper portion of the tower is visible from viewpoint 1, with existing vegetation and the slope of the land screening views to the lower part of the tower and associated infrastructure. While the view is scenic in nature, the proposed tower will not significantly impact any specific heritage items. The anticipated change to viewpoint 1 would be negligible. While part of the proposed tower would be visible on the treed ridgeline, it does not impact any heritage items (the reservoir is not visible from this point, nor any of the other key heritage items), the proposed tower would be a distant feature and the natural quality of the landscape is already impacted by man-made infrastructure.
Validation of photomontage using Neara.	
Significance of impact	Given the location of viewpoint 1 outside the heritage curtilage and the interruption of the natural landscape by existing man-made infrastructure, it is not considered that this viewpoint is particularly sensitive to change.

Mitigation measures	<p>The landscape plan (Figure 9) proposes planting native, fast growing trees with potential to bear hollows in the future along the William Lawson Drive proposed planting area. This would assist with quicker screening and also in the long term contribute to wildlife corridors and provide habitat for native fauna.</p> <p>The plan also identifies a Bush Regeneration area in the vicinity of the proposed tower to remove exotic shrubs which are competing with the native tree species. This would assist in growth of the native trees improving overall vegetation quality and in further screening.</p>
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Table 2 - Viewpoint 2 Photomontage

	
Criteria	Comments
Location	This photomontage is taken from just outside the gate near the existing submerged tower within the reservoir, at the base of the road up Prospect Hill looking north-east towards the proposed tower. The red arrow indicates the location of the top of the tower.
Description of existing view	This viewpoint is publicly accessible and while there are elements of modern infrastructure, such as power lines and road signs, the view incorporates heritage elements such as the former residential dwelling, post-and-rail fencing and palm trees along the road edge. The mature vegetation on the slopes of Prospect Hill lends a natural quality to the view.
Anticipated change to view	The anticipated change to this view is negligible as the topography of the land and existing vegetation mean that any views of the tower from this viewpoint are obscured.
Validation of photomontage using Neara.	
Tower highlighted (for reference only) in green to indicate location	


Tower is obscured by the vegetation and topography	
Significance of impact	The significance of change in this location, resulting from the proposed tower, is considered to be negligible, as views of the tower are screened by the vegetation and topography.
Mitigation measures	None required.

Table 3 - Viewpoint 3 Photomontage



Criteria	Comments
Location	This photomontage is taken from William Lawson Drive in the vicinity of the Prospect Reservoir Valve House looking north-east towards the proposal. The red arrow indicates the location of the top of the tower.
Description of existing view	This view is important as receivers see the heritage-listed Valve House in the foreground, with the vegetated Prospect Hill in the background. Views to the opposite site of William Lawson Drive are quite natural in character, comprising the open grassed slope below the reservoir. It is considered that this view is of high value aesthetically given the unusual and detailed design of the Valve House with the vegetated backdrop of Prospect Hill.



Anticipated change to view	The anticipated change to this view is negligible as the topography of the land and existing vegetation mean that any views of the tower from this viewpoint are obscured.
Validation of photomontage using Neara.	
Tower highlighted in green (for readers reference only) to indicate location	
Tower is obscured by the vegetation and topography	
Significance of impacts	The significance of change in this location, resulting from the proposed tower, is considered to be negligible, as views of the tower are screened by the vegetation and topography.
Mitigation measures	None required.

Table 4 – Viewpoint 4 Photomontage



Criteria	Comments
Location	<p>This view is from the picnic area at Walder Park. It is a popular area for picnicking and recreation use with the public. Prospect Dam rises to the west of this view. Views to the tower location are to the northeast, up the existing hill and past the Valve House.</p> <p>The red arrow indicates the location of the top of the tower.</p>
Description of existing view	<p>This viewpoint is publicly accessible. The view incorporates heritage elements such as the Valve House, former residential dwelling, post-and-rail fencing and palm trees along the road edge. The mature vegetation on the slopes of Prospect Hill lends a natural quality to the view.</p>
Anticipated change to view	<p>The anticipated change to this view is negligible as the topography of the land and existing vegetation mean that any views of the tower from this viewpoint are obscured.</p>
Significance of impact	<p>The significance of change in this location, resulting from the proposed tower, is considered to be negligible, as views of the tower are screened by the vegetation and topography.</p>
Mitigation measures	<p>None required.</p>

Table 5 – Viewpoint 5 Photomontage



Criteria	Comments
Location	This view is from the George Maunder Lookout, which is located 350 m south of the tower location. There is significant, mature tree canopy within the picnic area and the parking lot.
Description of existing view	<p>This area is publicly accessible, and even though this viewpoint is relatively close to the tower, the view focus is towards the west and south (as demonstrated in the image below) whereas the proposed tower is towards the north.</p> <p>The mature vegetation on the slopes of Prospect Hill lends a natural quality to the view. These trees along with trees in the parking area screen much of the view toward the tower.</p>



Photograph from Viewpoint 6 showing the dominant views to west (Reservoir) from the picnic area.

Anticipated change to view	The anticipated change to this view is negligible as the topography of the land and existing vegetation mean that any views of the tower from this viewpoint are obscured.
Significance of impact	The significance of the change to views from this location is low due to the existing tree canopy, and the main direction of views is away from the tower.
Mitigation measures	Although the significance of impact is low, Endeavour Energy propose to carry out tree planting within the gated area to further reduce the visual impact.


Table 6 – Viewpoint 6 Photomontage



Criteria	Comments
Location	<p>This view is from Reservoir Road, approximately 1.4 km north of the tower location. Very few views of the tower are available near this location due to large expanses of bushland and roadside vegetation.</p> <p>The red arrow indicates the top of the tower.</p>
Description of existing view	<p>The tower is south of this viewing location. Bushland trees and roadside planting screen views of the tower site. Since this is a public road, viewing times would be short and fairly distant.</p>
Anticipated change to view	<p>The anticipated change to this view is negligible due to the trees that screen views toward the tower site, and the short time-frame any viewer would have to absorb the change.</p>
Significance of impact	<p>The significance of the change to views from this location is negligible due to the existing tree canopy and short duration of views.</p>
Mitigation measures	<p>None required.</p>

Table 7 – Viewpoint 7 Photomontage



Criteria	Comments
Location	<p>This view is from the highest point on Prospect Lookout, approximately 1.45 km northeast of the tower location. This site is known as an important Aboriginal site and is part of the Prospect Hill Plan of Management (Cumberland Council March 2019). It offers panoramic views across the landscape predominantly to the east and south (refer to image below).</p>  <p>Views from Viewpoint 7 looking toward Parramatta and Sydney</p> <p>Access to this summit is from the Clunies Ross Street, although the gates have been closed since 2017. This location is situated atop a ridge that runs north-south, screening views of the tower from further east. The vegetation is characterised by a row of planted trees adjacent to boundary lines, scattered shrubs, weeds obscuring the views to the west and south-west and</p>

	<p>makes the western slope inaccessible. There is extensive pasture grassland on the north-eastern slope which is accessible.</p>
<p>Description of existing view</p>	<p>The tower is southwest of this viewing location. The view towards the tower is across planted vegetation, an industrial development that sits in an old quarry site and electrical infrastructure.</p>
<p>Anticipated change to view</p>	<p>The tower is predicted to be visible from this specific location where the photograph was taken. Moving away from this immediate location, views to the tower location are obscured by trees, vegetation, electricity poles, overhead mains, industrial buildings between the viewpoint and the proposed tower that screen the view. As indicated in the photomontage, the water tower is visible over the trees as is the tower from this viewpoint, however, it is only the elevated nature of this viewpoint that allow views to the tower. The land drops away steeply from this point and views quickly become obscured in the immediate vicinity of this location.</p> <p>The Plan of Management also identifies that the views to the west is impacted by the industrial area and existing infrastructures and hence has measures to:</p> <p><i>retain and add to existing trees on Prospect Hill, consistent with the Prospect Hill Conservation Management Plan, thereby forming large stands of trees to provide a visual buffer to built form when viewed from the top of Prospect Hill.</i></p> <p>Construct unobtrusive viewing areas at Prospect Hill, and south of the hill looking south-east using low maintenance materials.</p> <p><i>Plant scattered trees and shrubs on the western boundary to screen industrial areas.</i></p> <p>These measures would further obscure the tower from potential visual impact.</p>
<p>Significance of impact</p>	<p>The significance of the change to views from this location is low due to the existing vegetation and industrial nature of the view towards the tower. This view is only available from the hilltop that is only accessible by foot. While the site is an important Aboriginal site, the key views are to the east and south, away from the tower location. Existing trees screen views to the tower location away from the location of this viewpoint.</p>
<p>Mitigation measures</p>	<p>None required.</p>

5.1 Mitigation measures

A range of visual impact mitigation methods are available to reduce the impact of a development. As a general rule, mitigation should aim first at reducing the visible changes to the landscape. Secondly, mitigation should screen new infrastructure introduced by the project to present a landscape that is as similar to the existing landscape as possible.

In order to reduce any visual impacts, it is proposed that the tower will be constructed using matt steel, to decrease reflectivity.

Endeavour Energy, in consultation with Sydney Water, will consider the option to undertake revegetation works to support the aesthetics of the visual landscape ensuring access and maintenance requirements met. Endeavour Energy have had a Vegetation Management Plan (VMP) prepared to assess and make recommendations for areas proposed as revegetation areas . Figure 8 (taken from the VMP) indicates locations proposed for infill planting and bush regeneration. This will extend the remnant bushland vegetation further around the reservoir and in doing so, create a visual screen that is consistent with the existing landscape character.

A second recommendation indicated on the landscape plan (refer Figure 8), is the continuation of the street tree planting along William Lawson Drive. This extends the roadside tree planting and will screen views of the tower as vehicles travel south on William Lawson Drive.



Figure 8: Vegetation Management Plan

6 Conclusion

This VIA has been undertaken to understand effect of the proposed tower on the visual amenity of the heritage listed items (Prospect Reservoir, including the Valve House and remains of the Veterans Hall) and respective curtilage, in addition to surrounding industrial and residential land uses, as shown in Figure 5. The proposal is located towards a high point on Prospect Hill, approximately 75 m southwest from the existing Sydney Water tanks. The site is surrounded by mature vegetation to its west, a picnic area to the south, an industrial area to the east and Sydney Water tanks to the north.

Five viewpoints (viewpoints 1 to 5) were chosen to assess the visual impact of the proposal on key heritage items and receivers within the heritage curtilage area. Visual receivers in the area include recreational users accessing the picnic areas, open space and lookout areas and Sydney Water staff working in the Sydney Water offices. Two viewpoints were chosen to assess the impacts onto road users and a recognised important Aboriginal site which may have a line of sight onto the heritage curtilage area, including viewpoints 6 and 7.

Based on the heritage viewpoints and surrounding visual receivers assessed the following outcomes were identified:

- Viewpoint 1 – Given the location of viewpoint 1 outside the heritage curtilage and the interruption of the natural landscape by existing man-made infrastructure, it is not considered that this viewpoint is particularly sensitive to change.
- Viewpoint 2 - The significance of change in this location, resulting from the proposed tower, is considered to be negligible, as views of the tower are screened by the vegetation and topography.
- Viewpoint 3 - The significance of change in this location, resulting from the proposed tower, is considered negligible, as views of the tower are screened by the vegetation and topography.
- Viewpoint 4 – The significance of change in this location, resulting from the proposed tower, is considered to be negligible, as views of the tower are screened by the vegetation and topography.
- Viewpoint 5 – The significance of the change to views from this location is low due to the existing tree canopy, and the main direction of views is away from the tower.
- Viewpoint 6 – The significance of the change to views from this location is negligible due to the existing tree canopy and short duration of views.
- Viewpoint 7 – the significance of the change to views from this location is low due to the existing trees screening views and the industrial nature of the view toward the tower.

Overall, it is considered that the visual impact on Prospect Reservoir and key heritage items will be low to negligible.

Attachment A – Design Drawings

PROSPECT RESERVOIR - COMMUNICATIONS TOWER

DWG No.	DWG TITLE
SHEET 1	DRAWING TITLE AND LOCATION PLAN
SHEET 2	OVERALL SITE PLAN
SHEET 3	OVERALL SECTIONAL VIEW 1
SHEET 4	OVERALL SECTIONAL VIEW 2
SHEET 5	DETAILED SITE PLAN
SHEET 6	DETAILED SITE PLAN - ELEVATIONS
SHEET 7	SITE PLAN - CUT & FILL



PROSPECT RESERVOIR

LOCATION OF WORKS

LOCATION PLAN

AMENDMENTS								
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NO.	DATE	BY	REASON					

DESIGNER

CHECKED

DATE

SCALE

PROJECT

REVISION

ORIGINAL ISSUE

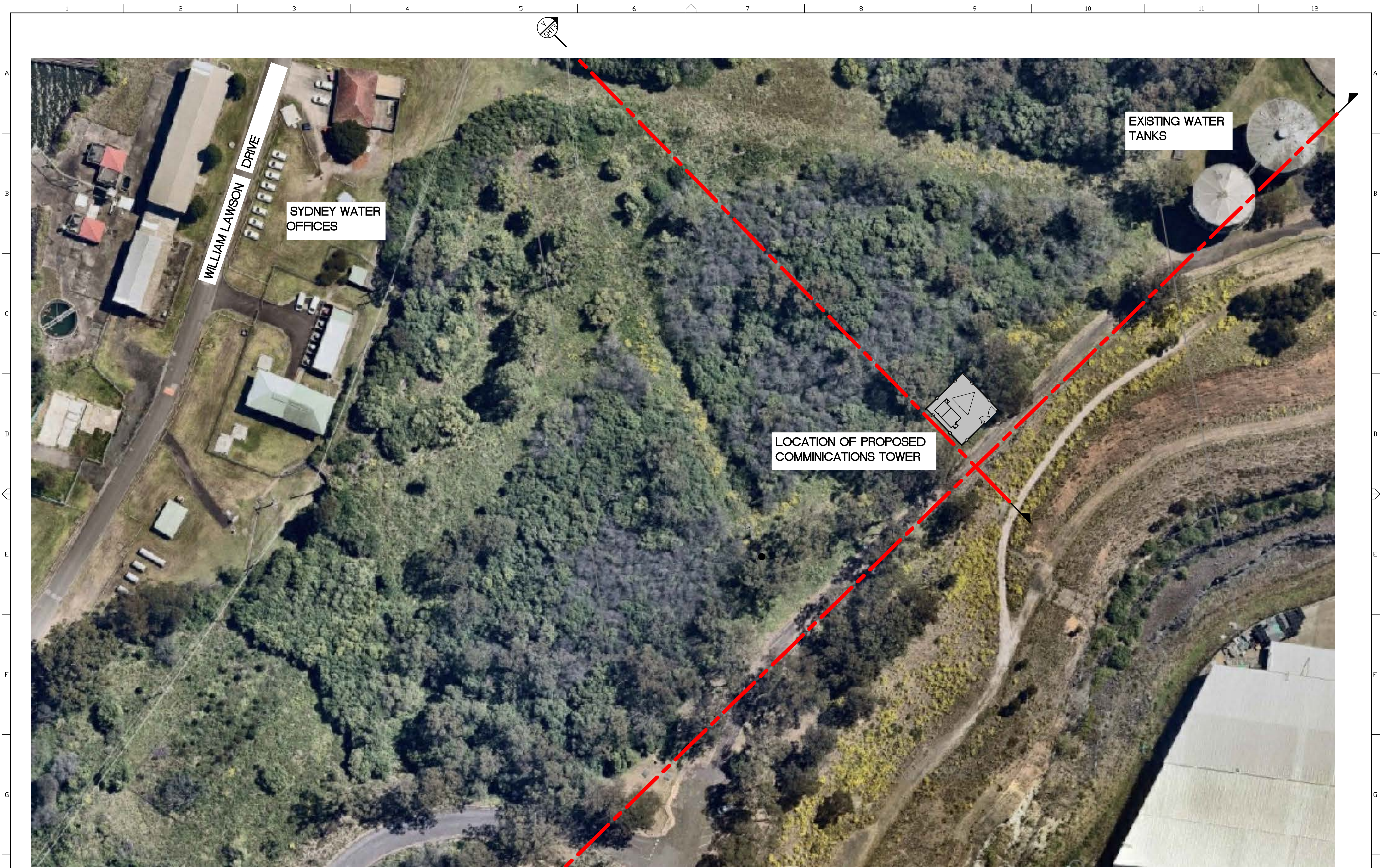
CONCEPT DESIGN

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	APPROVED
ORIGINAL SCALE AS SHOWN	DATE 14/12/22
DESIGNED PJB	DRAWN PJB
CHECKED	DATE

Endeavour Energy

PROSPECT RESERVOIR COMMUNICATIONS TOWER DRAWING TITLE AND LOCATION PLAN

REFERENCE DRAWINGS	
DO NOT SCALE DIMENSIONS IN MILLIMETRES	AUTHORISED/CERTIFIED
DESIGN MANAGER CIVIL & SECONDARY	A1
528567	SHEET No 1 OF 7 SHEETS



OVERALL SITE PLAN
SCALE 1:500

CONCEPT DESIGN

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DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			

Endeavour Energy

PROSPECT RESERVOIR COMMUNICATIONS TOWER OVERALL SITE PLAN

REFERENCE DRAWINGS		AUTHORISED/CERTIFIED	
DO NOT SCALE DIMENSIONS IN MILLIMETRES		DESIGN MANAGER CIVIL & SECONDARY	
A1	528567	SHEET No 2 OF 7 SHEETS	

AMENDMENTS	DESIGN JOB	DESIGNER	DATE
A	PROSPECT RESERVOIR COMMUNICATIONS TOWER	PJB	14/12/22



VIEW
SCALE 1:250

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CHKD	CHKD
APPD	APPD
HISTORY	
REVISION A	ORIGINAL ISSUE

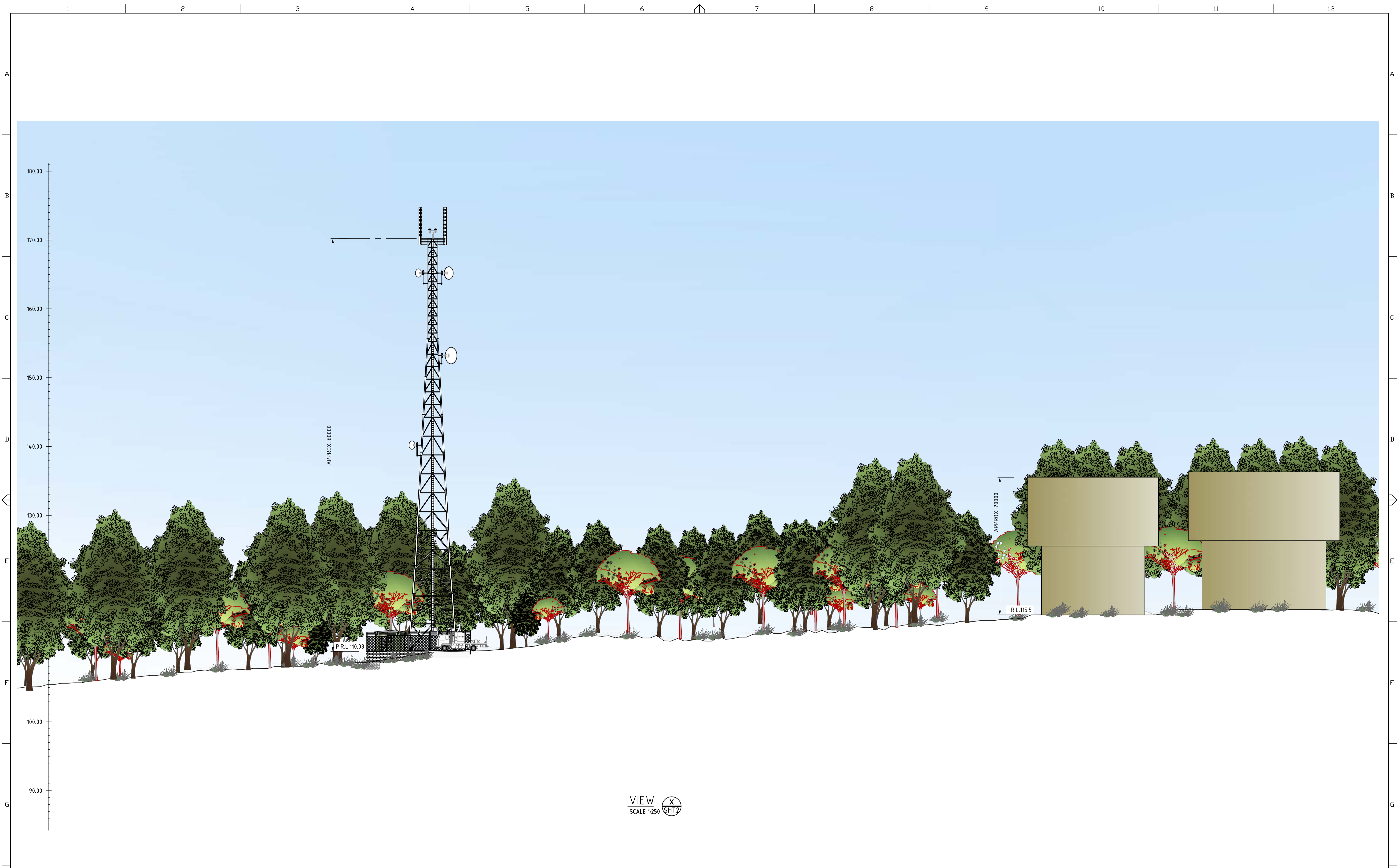
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DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			

Endeavour Energy

PROSPECT RESERVOIR
COMMUNICATIONS TOWER
OVERALL SECTIONAL VIEW 1

REFERENCE DRAWINGS		AUTHORISED/CERTIFIED	
DO NOT SCALE DIMENSIONS IN MILLIMETRES		DESIGN MANAGER CIVIL & SECONDARY	
A1	528567	SHEET No 3 OF 7 SHEETS	



VIEW X
SCALE 1:250

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DRN	DRN
CHKD	CHKD
APPD	APPD
HISTORY	
REVISION A	ORIGINAL ISSUE

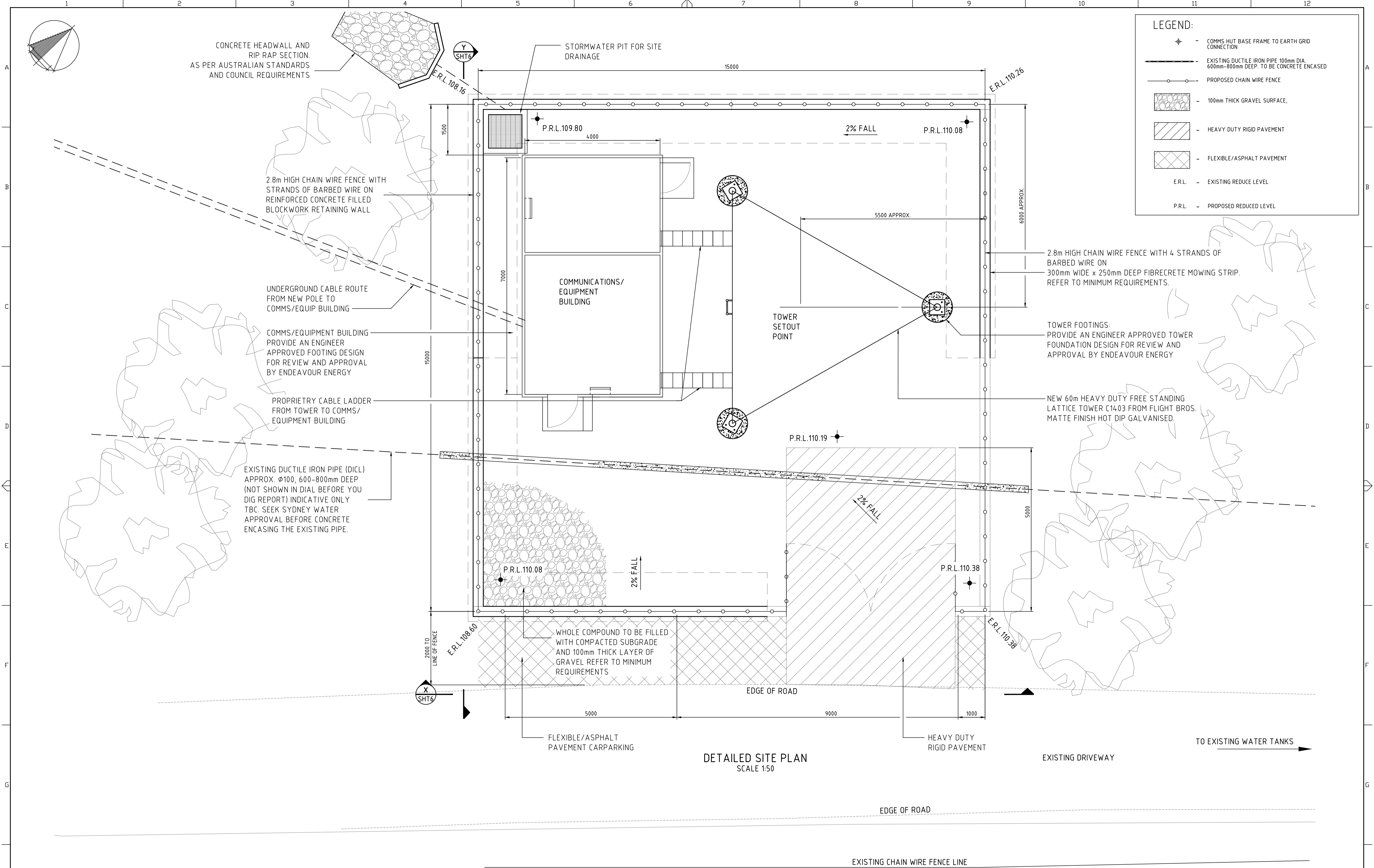
CONCEPT DESIGN

		<small>This drawing and the copyright therein is the property of Endeavour Energy and may not be copied, reproduced, distributed, loaned or used without the written consent of Endeavour Energy.</small>	
DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			

Endeavour Energy

PROSPECT RESERVOIR COMMUNICATIONS TOWER OVERALL SECTIONAL VIEW 2

REFERENCE DRAWINGS		AUTHORISED/CERTIFIED	
DO NOT SCALE DIMENSIONS IN MILLIMETRES			
DESIGN MANAGER CIVIL & SECONDARY			
A1	528567	SHEET No 4 OF 7 SHEETS	



LEGEND:

- COMMS HUT BASE FRAME TO EARTH GRID CONNECTION
- EXISTING DUCTILE IRON PIPE 100mm DIA. 600mm-800mm DEEP. TO BE CONCRETE ENCASED
- PROPOSED CHAIN WIRE FENCE
- 100mm THICK GRAVEL SURFACE,
- HEAVY DUTY RIGID PAVEMENT
- FLEXIBLE/ASPHALT PAVEMENT
- E.R.L. - EXISTING REDUCE LEVEL
- P.R.L. - PROPOSED REDUCED LEVEL

DETAILED SITE PLAN
SCALE 1:50

AMENDMENTS	
NO.	DESCRIPTION
1	DESIGN
2	DRN
3	CHKD.
4	APPD.
HISTORY	
REVISION A	
ORIGINAL ISSUE	

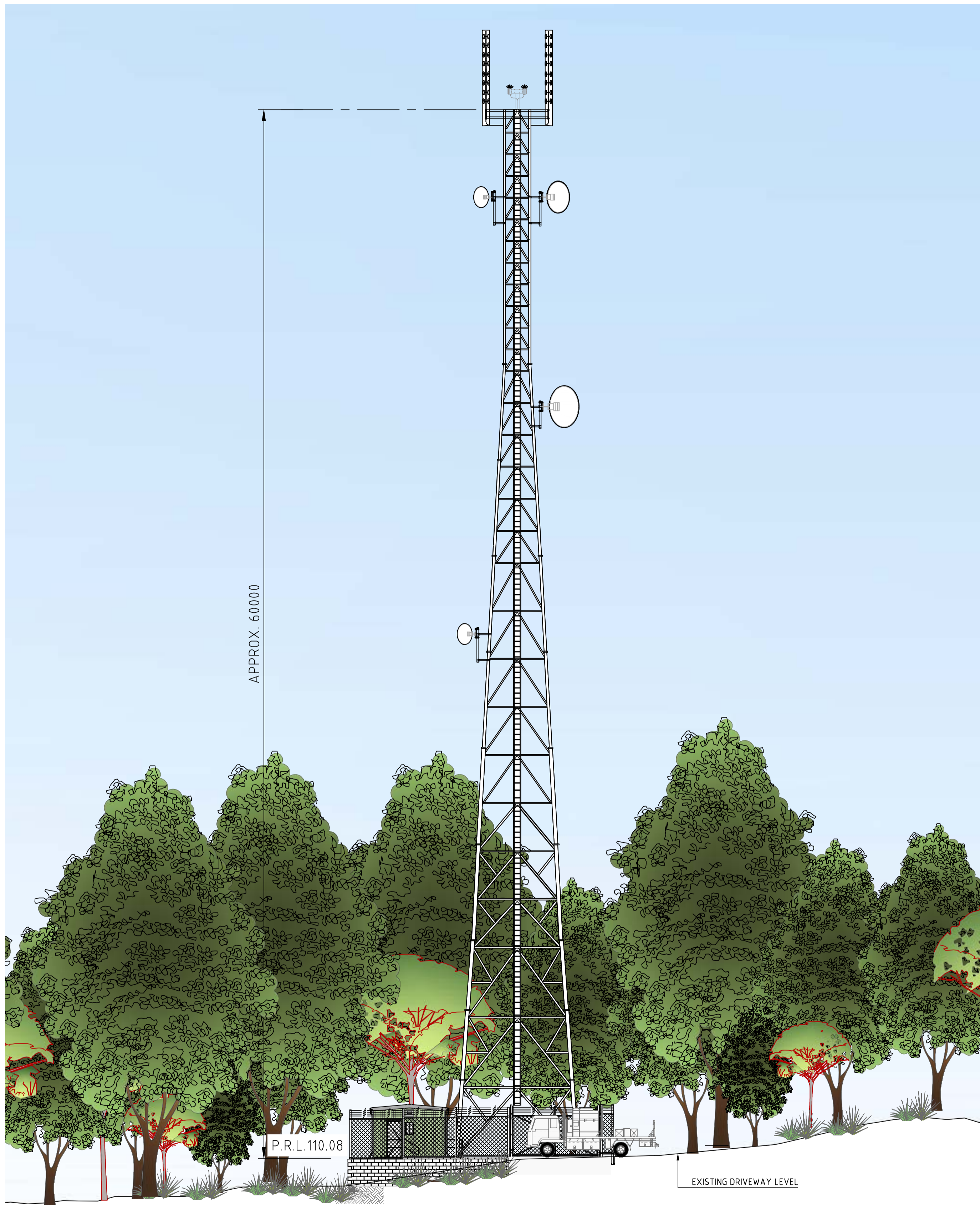
CONCEPT DESIGN

DESIGNED	PJB	DATE 14/12/22
DRAWN	PJB	
CHECKED		

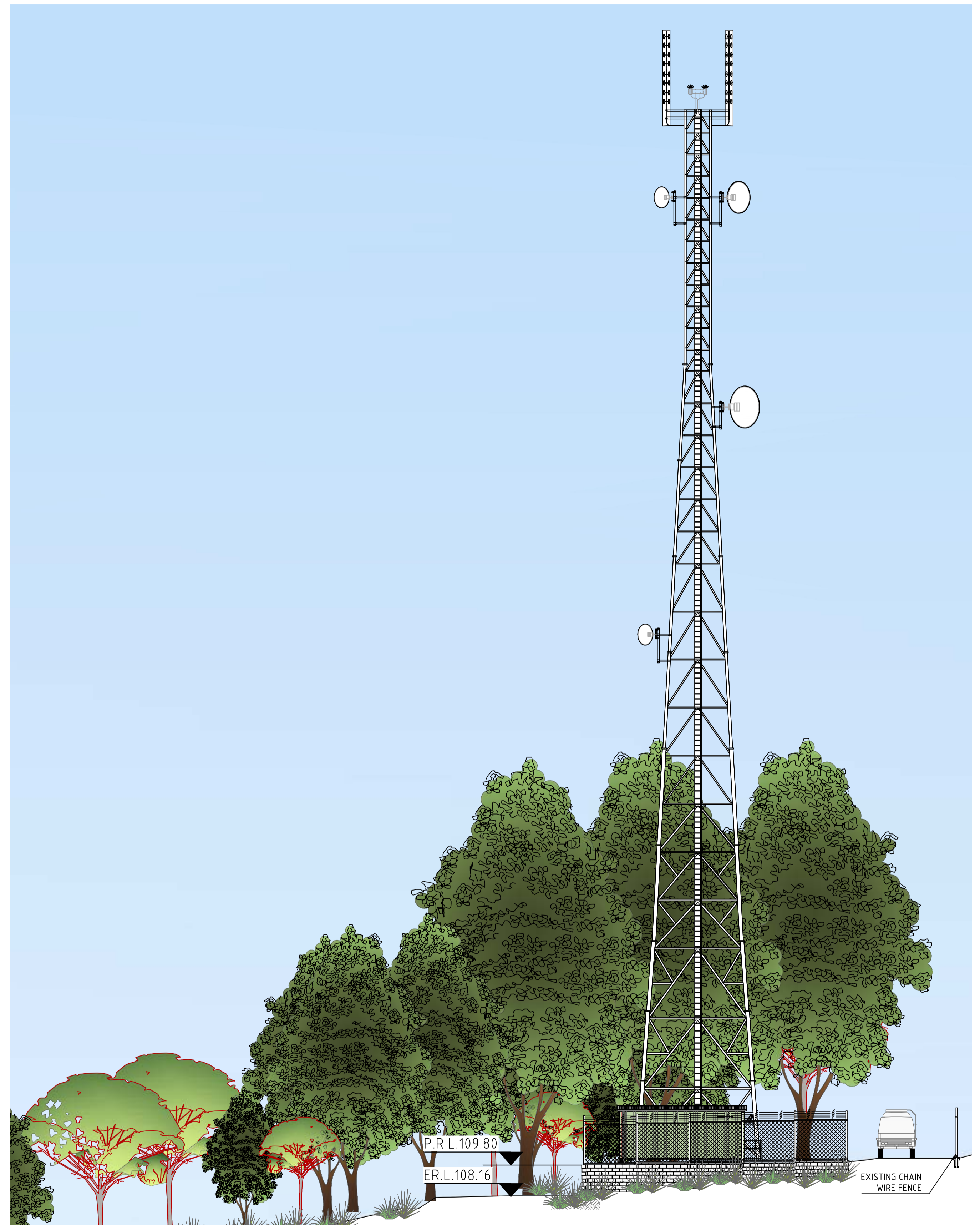
Endeavour Energy

PROSPECT RESERVOIR
COMMUNICATIONS TOWER
DETAILED SITE PLAN

REFERENCE DRAWINGS		AUTHORISED/CERTIFIED	
DO NOT SCALE DIMENSIONS IN MILLIMETRES		DESIGN MANAGER CIVIL & SECONDARY	
A1		528567	
SHEET No 5 OF 7 SHEETS			



VIEW X
SCALE 1:150



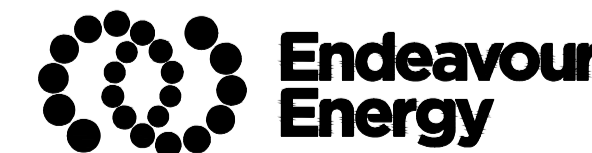
VIEW Y
SCALE 1:150

AMENDMENTS	DESIGNER	CHECKED	DATE
1	DRN	DRN	14/12/22
2	DRN	DRN	14/12/22
3	DRN	DRN	14/12/22
4	DRN	DRN	14/12/22
5	DRN	DRN	14/12/22
6	DRN	DRN	14/12/22
7	DRN	DRN	14/12/22
8	DRN	DRN	14/12/22
9	DRN	DRN	14/12/22
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11	DRN	DRN	14/12/22
12	DRN	DRN	14/12/22

Civil version 3.0

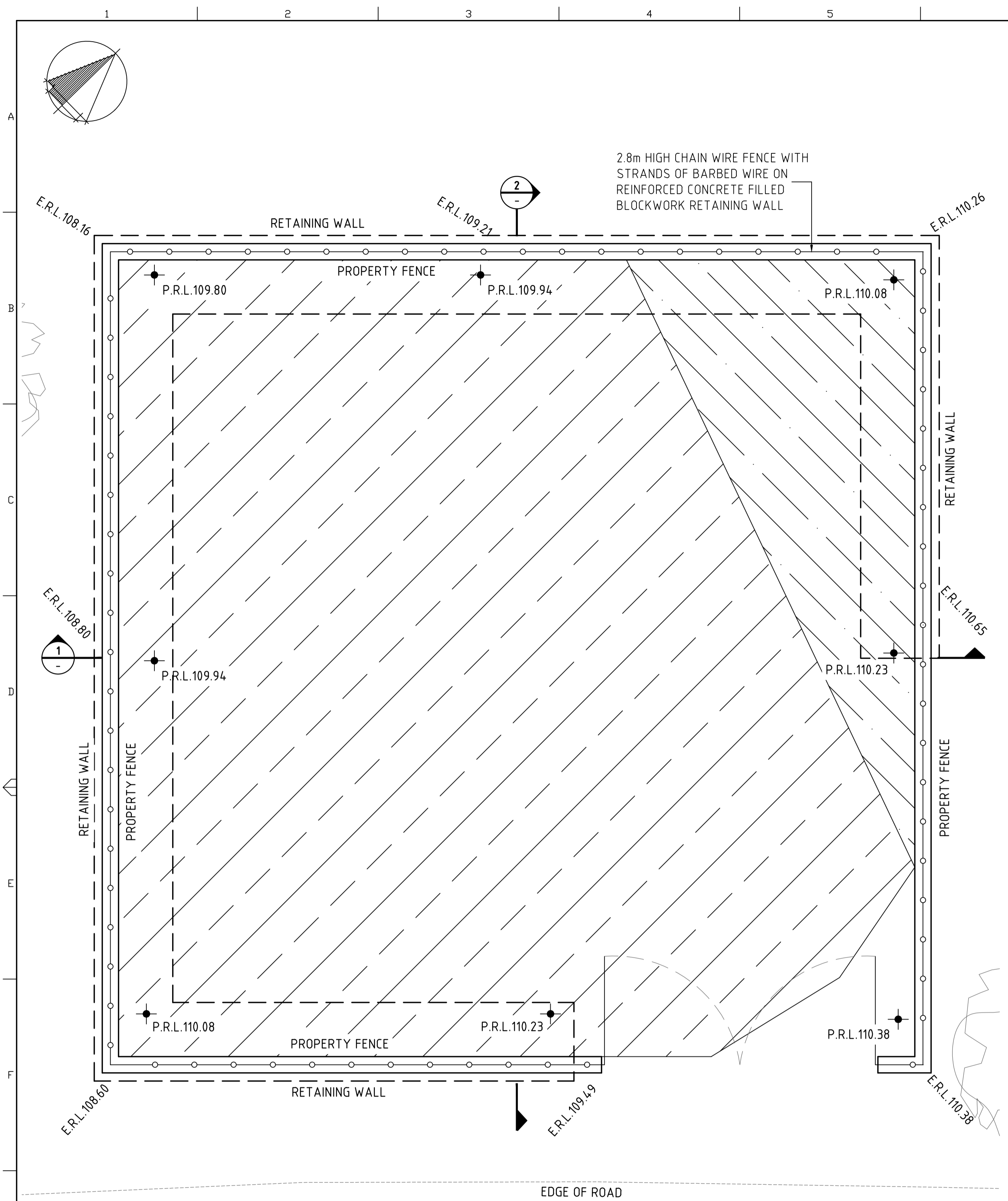
CONCEPT DESIGN

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DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			



PROSPECT RESERVOIR
COMMUNICATIONS TOWER
DETAILED SITE PLAN - ELEVATIONS

DO NOT SCALE DIMENSIONS IN MILLIMETRES		REFERENCE DRAWINGS	
DESIGN MANAGER CIVIL & SECONDARY		AUTHORISED/CERTIFIED	
A1	528567	SHEET No 6 OF 7 SHEETS	



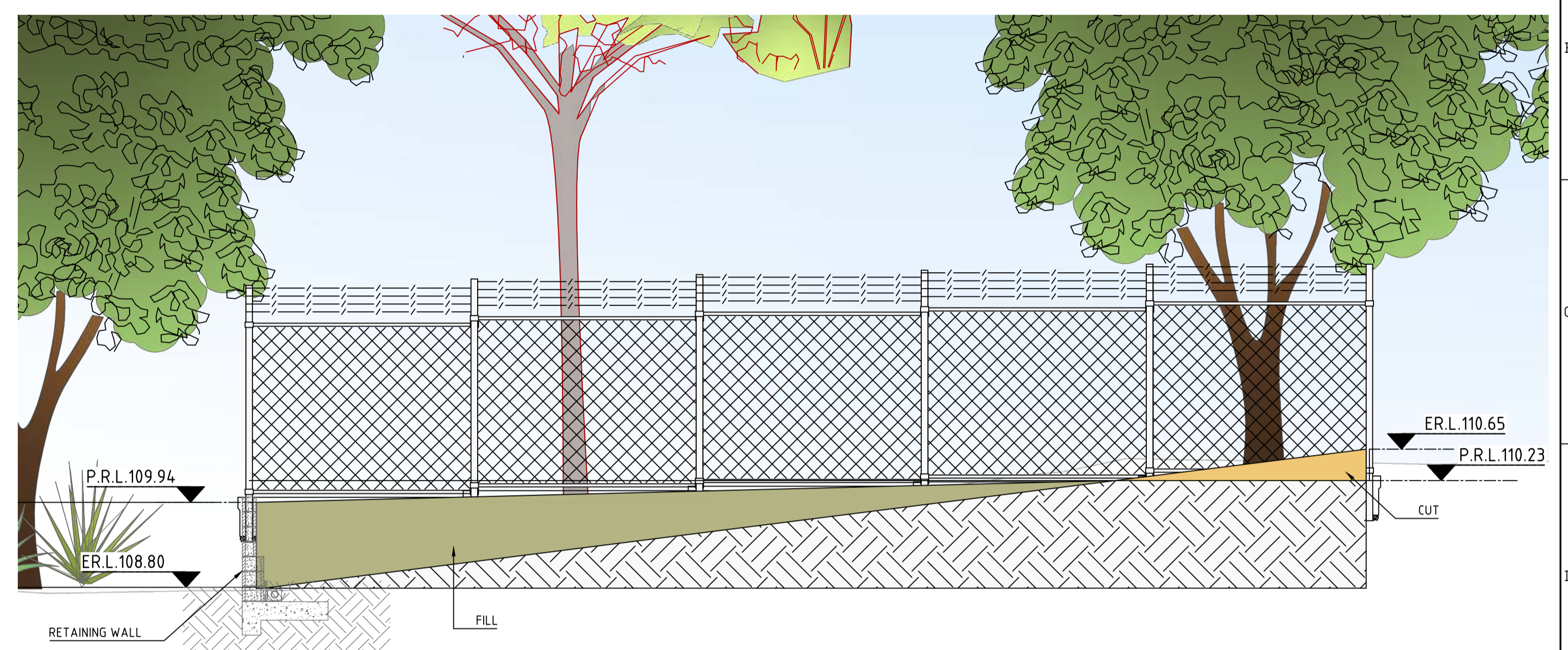
LEGEND:

CUT

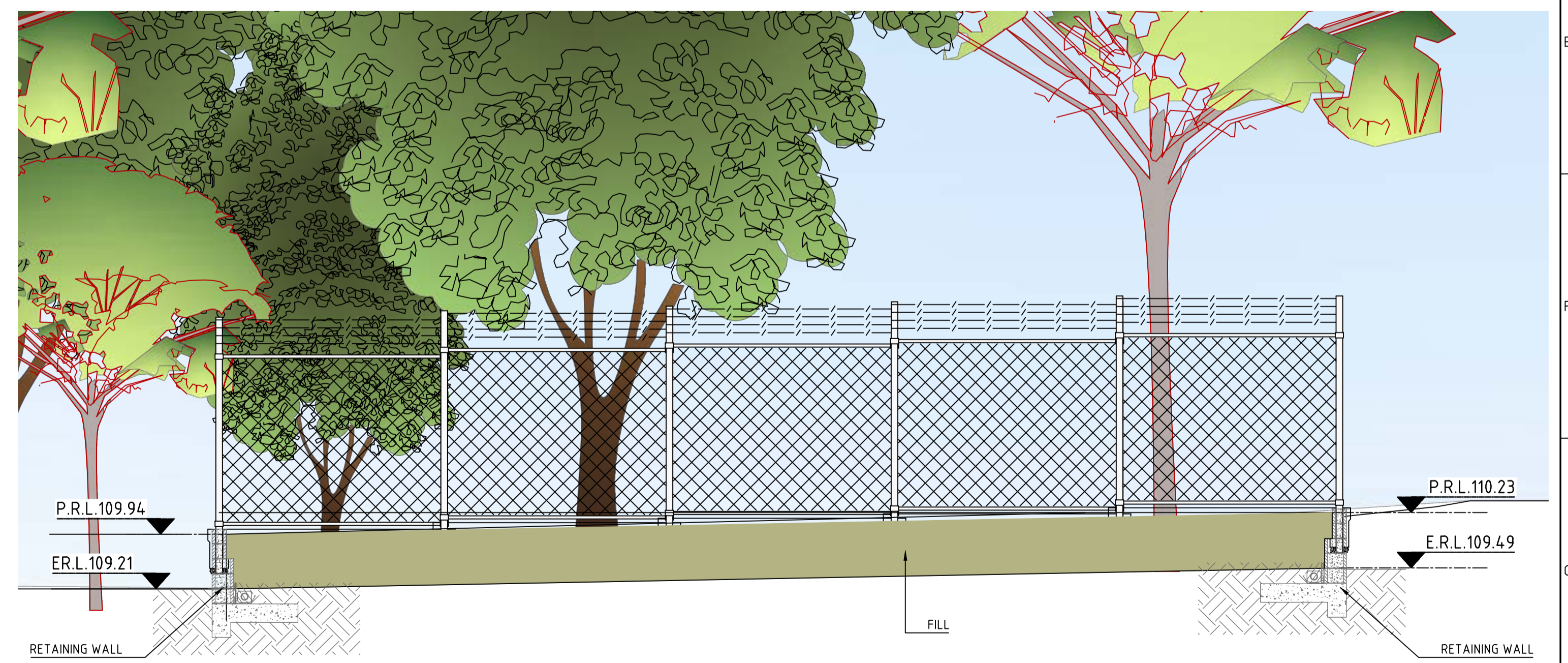
FILL

E.R.L. - EXISTING REDUCE LEVEL

P.R.L. - PROPOSED REDUCED LEVEL



SECTION 1
SCALE 1:50



SECTION 2
SCALE 1:50

AMENDMENTS

NO.	DATE	BY	REASON
1			

HISTORY

NO.	DATE	BY	REASON
1			

REVISION A

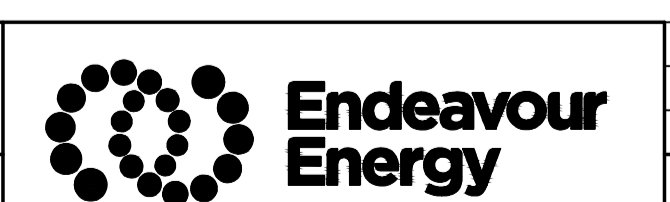
NO.	DATE	BY	REASON
1			

ORIGINAL ISSUE

NO.	DATE	BY	REASON
1			

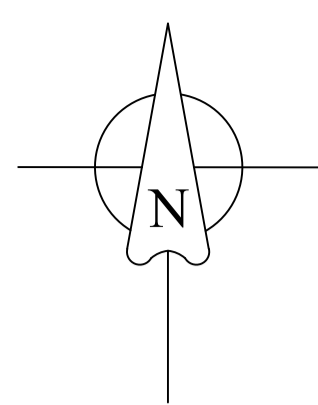
CONCEPT DESIGN

DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			



PROSPECT RESERVOIR COMMUNICATIONS TOWER
SITE PLAN - CUT & FILL

REFERENCE DRAWINGS		AUTHORISED/CERTIFIED	
DO NOT SCALE DIMENSIONS IN MILLIMETRES		DESIGN MANAGER CIVIL & SECONDARY	
A1	528567	SHEET No 7 OF 7 SHEETS	



ENDEAVOUR ENERGY CONTACT	
NAME	CONTACT No.
DESIGN: M JANIF	0472723705
CONSTRUCTION: T.KIDD	0401470936



LOCALITY PLAN
NTS

OPERATIONAL LIMITATIONS
UNLESS APPROVED OTHERWISE, INTERRUPTIONS TO ANY CUSTOMERS SUPPLY MUST BE AVOIDED.
THE FOLLOWING ALTERNATIVES SHOULD BE CONSIDERED:
- LIVE LINE WORK;
- DESIGN ALTERNATIVES;
- WORK PRACTICES / STANDARDS;
- LOW VOLTAGE PARALLELS
THIS COST TO BE FUNDED BY THE DEVELOPER.

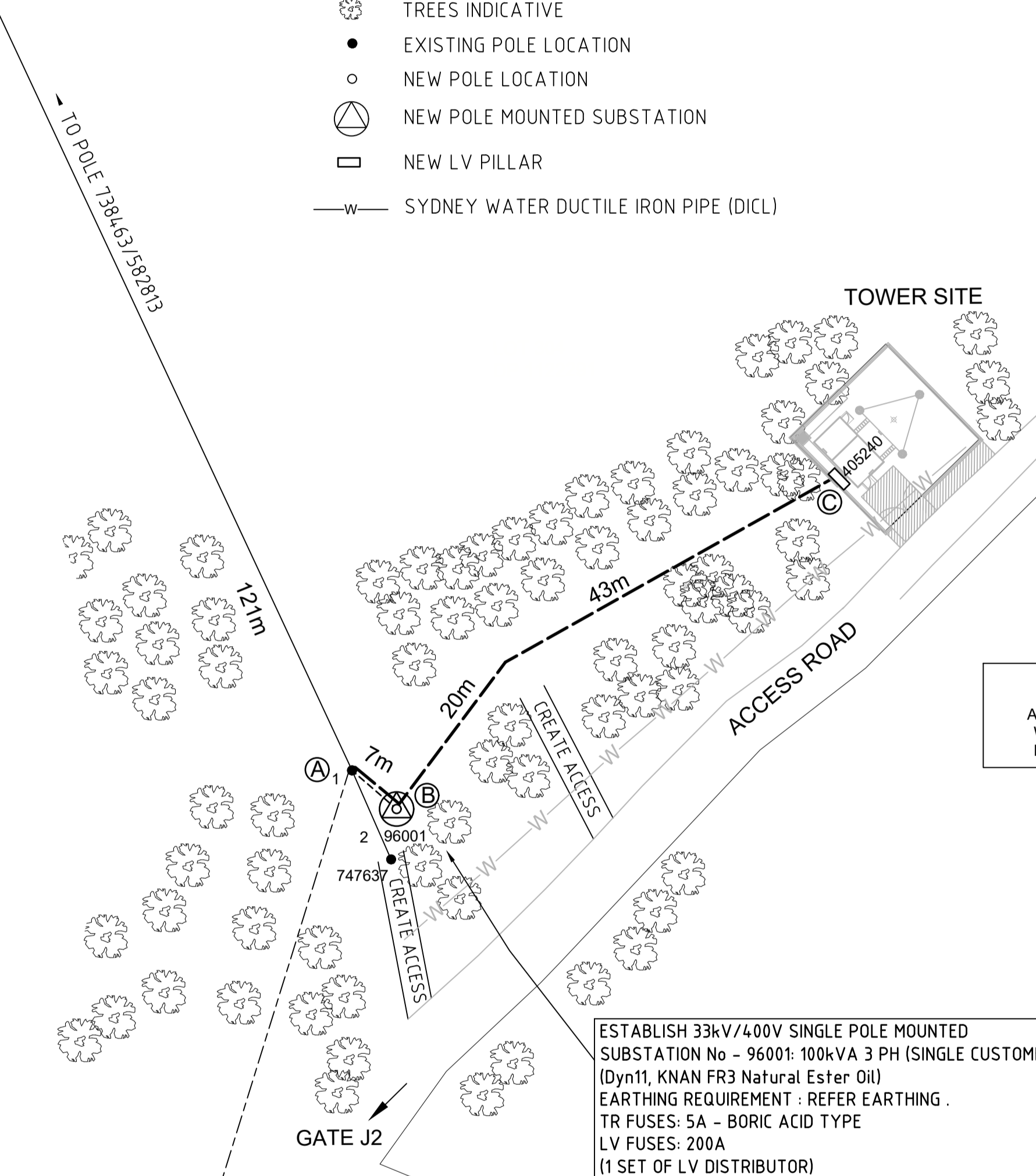
ATTENTION
ALL SERVICES SEARCHES MUST BE CHECKED BEFORE CONSTRUCTION.

NOTES

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT ENDEAVOUR ENERGY NETWORK STANDARDS AND CONNECTION POLICY.
- DO NOT PLACE ANY RELIANCE ON ANY QUANTITIES OR DIMENSIONS GIVEN IN THIS DRAWING. QUANTITIES AND DIMENSIONS GIVEN ON THIS DRAWING ARE BASED ON DESIGN INFORMATION AND SITE CONDITIONS AT THE TIME OF DESIGN. AS QUANTITIES AND DIMENSIONS ARE SUBJECT TO CHANGE, THE BUILDER OF THIS PROJECT MUST CHECK ALL QUANTITIES AND DIMENSIONS ON SITE PRIOR TO TENDERING AND PRIOR TO CONSTRUCTION.
- ATTENTION:
THE PREPARATION OF THIS DESIGN HAS BEEN UNDERTAKEN GIVING DUE CONSIDERATION TO THE EXISTING SERVICES. THE PROJECT CONSTRUCTOR IS, HOWEVER, WHOLLY RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF EXISTING SERVICES AND PERMANENT SURVEY MARKS BEFORE CONSTRUCTION COMMENCES, AND NO RESPONSIBILITY NOR LIABILITY WILL BE ACCEPTED BY THE DESIGNER OF THIS PROJECT FOR DAMAGE TO EXISTING SERVICES AS A RESULT OF THIS DESIGN AND/OR POLE PEGGING.
- REDUNDANT ENDEAVOUR ENERGY MATERIALS TO BE RETURNED TO CLOSEST ENDEAVOUR ENERGY DEPOT.
- PROPERTY OWNERS(SYDNEY WATER) ARE TO BE CONSULTED REGARDING SITE ACCESS PRIOR TO WORK COMMENCING.
- ALL CUSTOMERS ARE TO BE CONTACTED REGARDING OUTAGE ARRANGEMENTS PRIOR TO CONSTRUCTION WORK COMMENCING. THE REQUIRED NOTICE IS TO BE IN ACCORDANCE WITH THE NATIONAL ENERGY CUSTOMER FRAMEWORK (NECF) TIME FRAMES
- CUSTOMER TO ARRANGE FOR THE INSTALLATION & CONNECTION OF NEW SERVICE MAINS & DISCONNECTION OF EXISTING SERVICE MAINS BY A LEVEL 2 ACCREDITED SERVICE PROVIDER. ALL SERVICE WORK TO BE INSTALLED IN ACCORDANCE WITH AS3000:2007 AND THE NSW SERVICE AND INSTALLATION RULES.
- IF FOR ANY REASON, THE PROPOSED POLE LOCATION OR UG ASSETS REQUIRE ADJUSTMENT, PLEASE CONTACT MAINS DESIGN FOR ADVICE. THIS IS CRUCIAL TO ENSURE APPROPRIATE SEPARATIONS / CLEARANCES ARE MAINTAINED WITHIN EXISTING EASEMENTS.
- AN EASEMENT FOR UNDERGROUND CABLES 1 METER WIDE IS REQUIRED OVER THE LOT 304/DP 1122291. REFER SHEET 2
- AN EASEMENT FOR 33KV OVERHEAD POWER LINES 9 METER WIDE IS REQUIRED OVER THE LOT 304/DP 1122291. REFER SHEET 2.
- CONTRACTOR SHALL PEG THE UG ALIGNMENT PRIOR TO WORKS. DESIGN TEAM CAN BE CONTACTED FOR DESIGN ALIGNMENT IN CAD.

SITE PLAN LEGEND **SITE PLAN:**
(SCALE - 1:500)

- EXISTING OVERHEAD MAINS 33kV FDR 4/35
- EXISTING UNDERGROUND MAINS
- - - NEW OVERHEAD MAINS
- - - NEW LV TRENCH
- ⊗ TREES INDICATIVE
- EXISTING POLE LOCATION
- NEW POLE LOCATION
- ⊕ NEW POLE MOUNTED SUBSTATION
- NEW LV PILLAR
- w- SYDNEY WATER DUCTILE IRON PIPE (DICI)



EXISTING SYDNEY WATER TANKS

WARNING
UNDERGROUND SERVICES ARE LOCATED IN THE VICINITY OF THE PROPOSED WORKS. A DIAL-BEFORE-YOU-DIG SEARCH IS TO BE PERFORMED 2 DAYS PRIOR TO CONSTRUCTION. IT IS RECOMMENDED THAT ALL SERVICES SHOULD BE LOCATED USING NON-DESTRUCTIVE TECHNIQUES BEFORE WORKS BEGIN.

ENVIRONMENTAL AWARENESS
WORKS TO BE COMPLETED IN CONJUNCTION WITH ENDEAVOUR ENERGY'S ENVIRONMENTAL GUIDELINES HANDBOOK 2017. ALL PROJECT MANAGERS, CONTRACT INSPECTORS AND CONSTRUCTION CREWS ARE TO BE MADE AWARE OF THE CONTENTS PRIOR TO ANY SITE VISITS OR CONSTRUCTION WORKS COMMENCING. COPIES OF THE DOCUMENTATION ARE TO BE AVAILABLE ON SITE AND ACCESSIBLE AT ALL TIMES FOR THE DURATION OF THE PROJECT.
USE SILT TRAPS/SOCKS OR OTHER APPROVED METHODS TO PREVENT RUN-OFF ENTERING DRAINS AND STORMWATER CHANNELS. REFER EMS 0002-POLLUTION CONTROL PROCEDURE

NOTE
ACCESS TO WORKSITE VIA SYDNEY WATER GATES G1 OR J2 REQUIRE ENDEAVOUR ENERGY ABLOY KEY

PERMANENT SURVEY MARKS MAY EXIST IN THIS AREA. THESE ARE TO BE LOCATED BY SURVEY PRIOR TO COMMENCEMENT OF WORK.

ESTABLISH 33kV/400V SINGLE POLE MOUNTED SUBSTATION No - 96001: 100kVA 3 PH (SINGLE CUSTOMER) (Dyn11, KNAN FR3 Natural Ester Oil)
EARTHING REQUIREMENT : REFER EARTHING .
TR FUSES: 5A - BORIC ACID TYPE
LV FUSES: 200A
(1 SET OF LV DISTRIBUTOR)

WARNING
LIVE ENDEAVOUR ENERGY CABLES & OTHER SERVICES IN THIS AREA. PLEASE CONTACT DIAL BEFORE YOU DIG ON TEL: 1100 FOR SEARCHES TWO DAYS PRIOR TO EXCAVATION.

NOTE:
NO JEMENA GAS WEST/NBN/TELECOMMUNICATION /SYDNEY WATER ASSETS ARE BEING AFFECTED BY THE ELECTRICAL WORKS. THERE IS A CONCRETE AND STEEL 100MM DICI PIPE RUNNING THROUGH UNDERNEATH THE TOWER SITE TOWARDS THE PROPOSED POLE SUBSTATION SITE. NOT SHOWN IN DIAL BEFORE YOU DIG SEARCHES.

WORK SITE TRAFFIC MANAGEMENT:
A TRAFFIC CONTROL PLAN AS WELL AS ADVANCED WARNING AREAS ARE TO BE IN PLACE BEFORE CONSTRUCTION WORK COMMENCES. REFER ENDEAVOUR ENERGY TRAFFIC MANAGEMENT MANUAL TMM0001

WORK METHOD STATEMENT REFERENCE
The contents of this table are an indication only, and the required Work Method Statements may not be limited to those listed here.

WMS No.	TASK NAME
Index of SWMS	Index of Safe Work Method Statements
SRMH 12	Traffic Management
SWM 01.001	Excavation Work (Trenching, Boring, etc)
SWM 01.004am01	Deep Earth Boring
SWM 01.008	Working at Heights (use of work platforms, Guardrails, Fall Arrest Systems, etc.)
SWM 01.015	Construct Single Pole Substation
SWM 03.008am01	Earth Testing (Separate, Common, SWER)
SWM 03.011am01	Install/Replace Cable Guard
SWM 05.008	Install / Replace Underground Cables (including cut and cap)
SWM 05.010am02	Termination of Underground Cables
SWM 05.011	Erect New / Change Pole (Includes all Comdemned Poles)
SWM 06.005am03	Transmission and Distribution Switching (Overhead Mains)
SWM 07.001am01	Recording of Underground Assets (Cables & Ducts)
SWM 13.001am01	Inspection & Commissioning of Network Assets (Overhead)
SWM 13.002am01	Inspection and Commissioning of Network Assets (Underground)
SWM 13.003am01	

WORKS COMPLETED/FIELD BOOK

CONSTRUCTED BY: _____

WORKS COMPLETED: _____

SIGNATURE: _____ DATE: _____

INSPECTED BY: _____

SIGNATURE: _____ DATE: _____

ASSET RECORDING

I: _____

OF: _____

CONTACT No.: _____

HEREBY CERTIFY THAT ASSETS MARKED AS BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOUR ENERGY STANDARD S4D 0004

SIGNATURE: _____

DATE: _____

DESIGN COMPLIANCE AND INDEMNITY

This design complies with Endeavour Energy's relevant standards as current at this time and as listed on the Endeavour Energy Accredited Service Provider's Internet site. These standards include, but are not limited to:

CP: Connection Policy
EMS: Environmental Management Standard
MCI: Mains Construction Instruction
MDI: Mains Design Instruction
PDI: Protection Design Instruction
SDI: Substation Design Instruction
S4D 0001: Design Drawing Standard
MMI: Mains Maintenance Instruction
SMI: Substation Maintenance Instruction
LDI 0001: Public Lighting Electrical Design Element

Additionally, where relevant, the design complies with AS/NZS 7000 'Overhead Line Design - Detailed Procedures' published by The Australian Standards.

ENDEAVOUR ENERGY indemnifies Endeavour Energy for any loss or damage resulting from non-compliance of the design with the above standards.

Signed: _____
Name: MOHAMMED JANIF
Service Provider Number: 1149 Date: 19/10/22

DUCT BREAKDOWN TABLE
ALL TRENCH SECTIONS ARE TO BE READ & VIEWED FROM NODE TO NODE AS NOMINATED

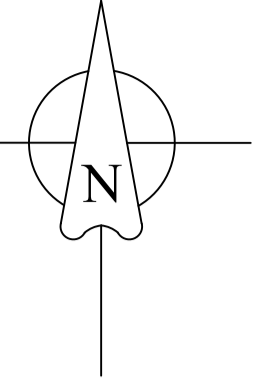
Route	Configuration	Route Length (m)
A - B	(New Duct) TRENCH & INSTALL 2 x 125mm PVC & 2 x 50mm PVC DUCTS	7m
B - C	(New Duct) TRENCH & INSTALL 2 x 125mm PVC & 2 x 50mm PVC DUCTS	63m
TOTAL		70m

LEGEND

- SPARE DUCT
- DUCT WITH NEW CABLE
- ◐ DUCT WITH EXISTING CABLE
- DIRECT BURIED CABLE
- ABANDONED CABLE
- ⊕ NEW TRENCH
- ⊗ EXISTING TRENCH
- UNDERBORE

WARNING
LIVE ELECTRICAL CABLES IN THIS AREA
CONTACT NETWORK DATA,
HUNTINGWOOD DR, HUNTINGWOOD
TELEPHONE 9853-4161 FOR
CABLE SEARCHES PRIOR TO EXCAVATION

306909.2660	6255578.2840	1001686	7m	20°	66T+POLE SUB	TYPE 4 OHEW	SUB-SINGLE CUSTOMER	750	2.5	17m/12kN	-	C	-	-	X	-	-	2	
			728305		33UGOH(EX)+TEE	EX+TYPE 4 OHEW	-					EX	-	-	-	X	-	1	
EASTING	NORTHING	NEW	EXISTING	SPAN LENGTH	LINE DEV DEGREES	33kV	OHEW/OPGW	LV	DIA mm	DEPTH m	TYPE (LENGTH /STRENGTH)	STAY	FOOTING	RELOCATE	REPLACE	NEW	EXISTING	REMOVE	DESIGN NUMBER
STAKING (CO-ORDINATES IN MGA56)			FIELD POLE NUMBER	CONSTRUCTION				HOLE		POLE									



FINAL 33kV CIRCUIT

NOT TO SCALE

- EXISTING TR OVERHEAD MAINS FDR 435 - BLACKTOWN TO BOSSLEY PARK TEE QUARRIES
- - - EXISTING TR UNDERGROUND MAINS FDR 435 - BLACKTOWN TO BOSSLEY PARK TEE QUARRIES
- - - ERECT 3 x 7/4.50 AAC 'MERCURY' CONDUCTOR (BETWEEN POLES '1' AND '2')
R.L. 7m C.L. 30m. SLACK SPAN (TENSION @ 2% CBL @ 5°C TABLE 1)

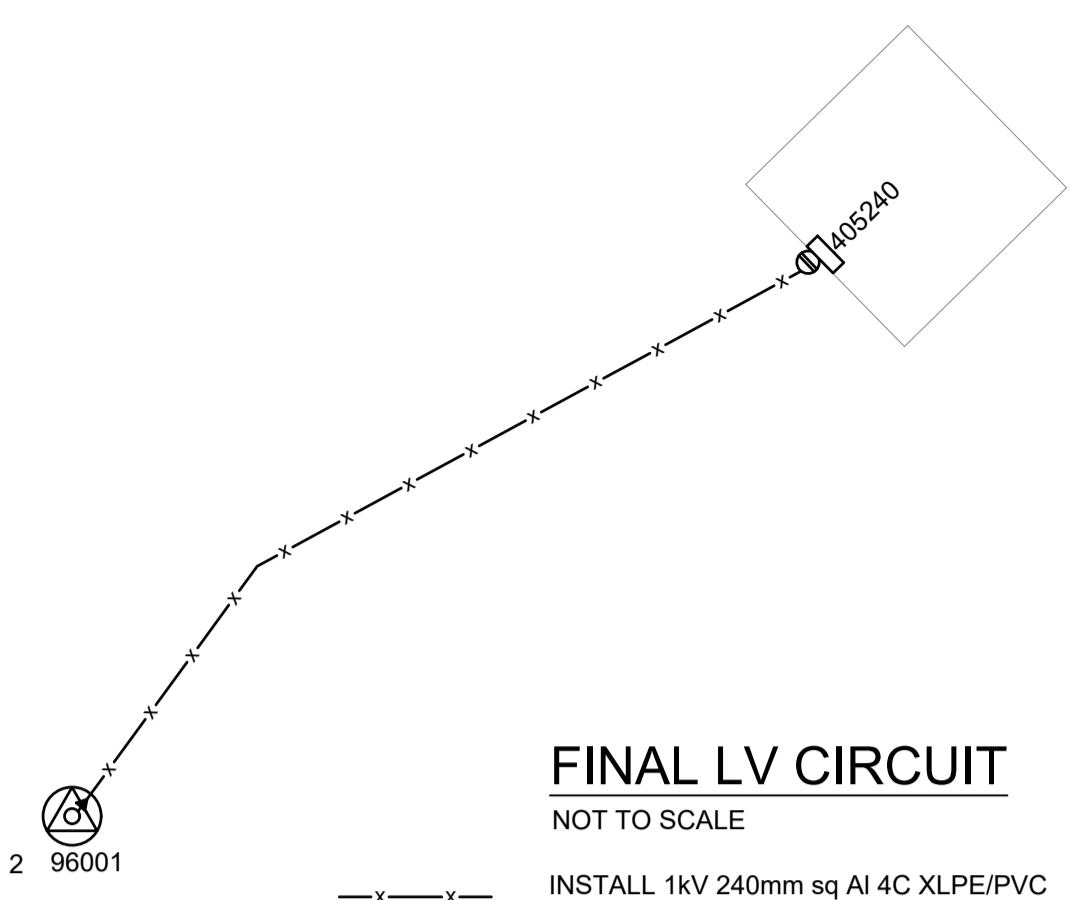
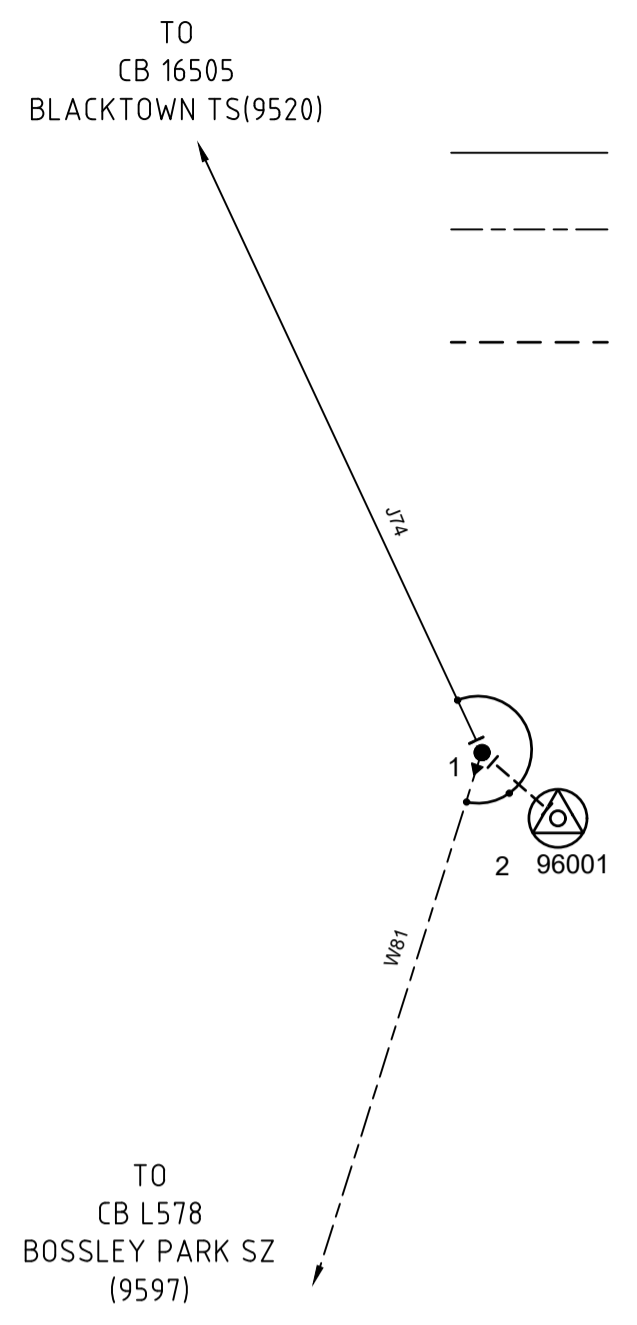
SAP DATA URBAN OH SUB 96001	
HV DOF	231947
TRF 1	10004450
LV ISOLATOR	231948
LV BUSBAR	37528
F1 - FUSE LABEL	403332
F2 - FUSE LABEL	-----

TR CONDUCTOR REFERENCE	
CODE	SIZE & TYPE
J74	2 x 19/3.25 AAC (2 x 19/0.128) 2 x (OH) 33 kV
W81	630mm ² Cu 1C XLPE/PVC/HDPE Screened (UG) 33kV

FINAL LV CIRCUIT

NOT TO SCALE

- x-x- INSTALL 1kV 240mm sq Al 4C XLPE/PVC
R.L. 63m CL 80m



CONDUCTOR STRINGING TABLE 1										
STRAIN SECTION	POLE '1' TO '2'		TENSION (%CBL) @ 5°C							2%
DESIGN SPAN	POLE '1' TO '2'		RULING SPAN (m)							7.0
CONDUCTOR	1 x 7/4.50 AAC 'MERCURY'(NO CREEP COMPENSATION REQUIRED)									
TEMPERATURE (°C)	0	5	10	15	20	25	30	35	40	
TENSION (kN)	0.65	0.34	0.24	0.19	0.16	0.15	0.13	0.12	0.11	
SAG (m)	0.03	0.05	0.07	0.08	0.10	0.11	0.12	0.13	0.14	

ATTENTION
REGIONAL STAFF TO NOTIFY NETWORK DATA DAILY WHEN CABLE WORK IS IN PROGRESS.
TELEPHONE: EXT. - 0298536664 or 0478403699

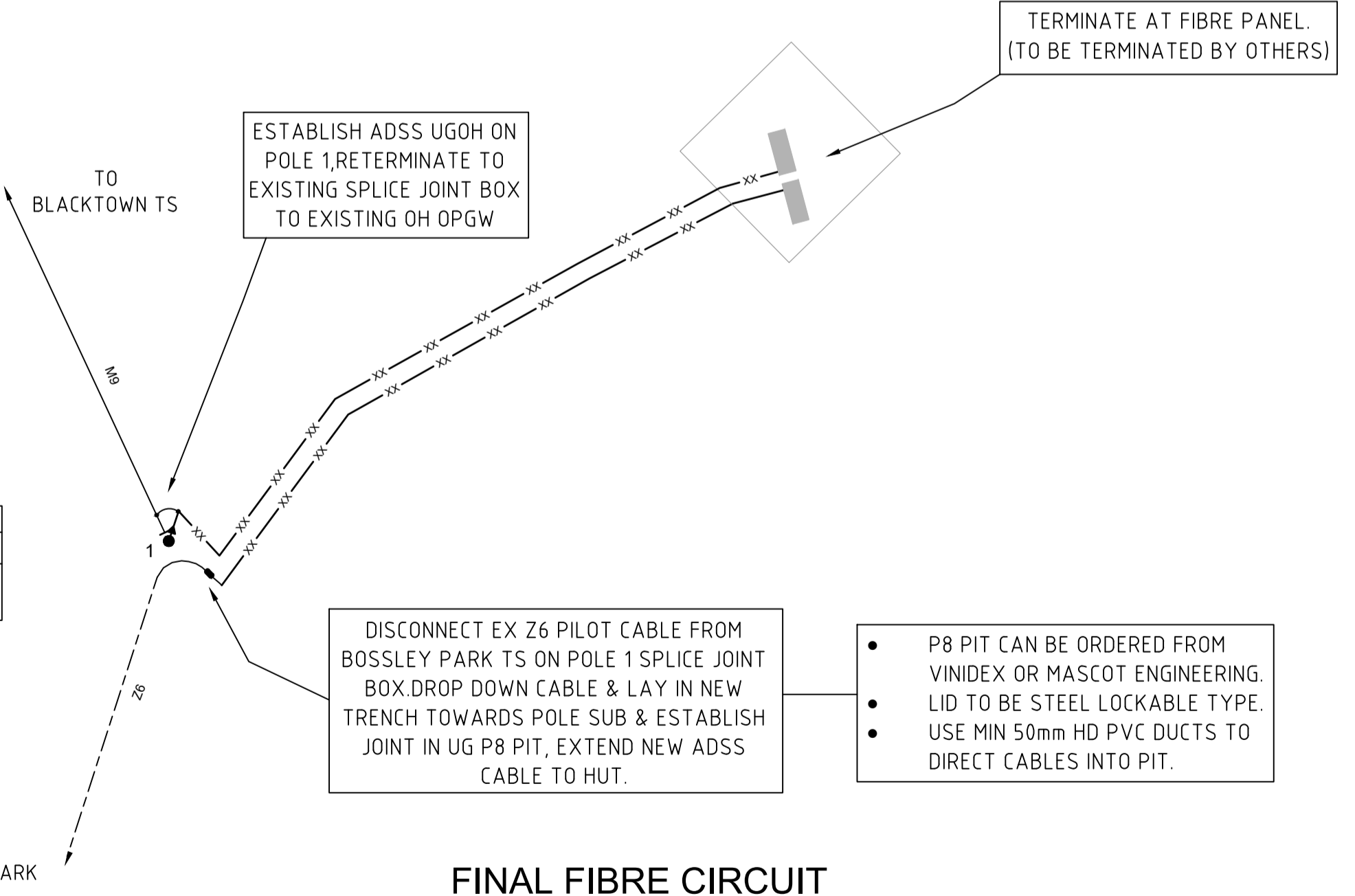
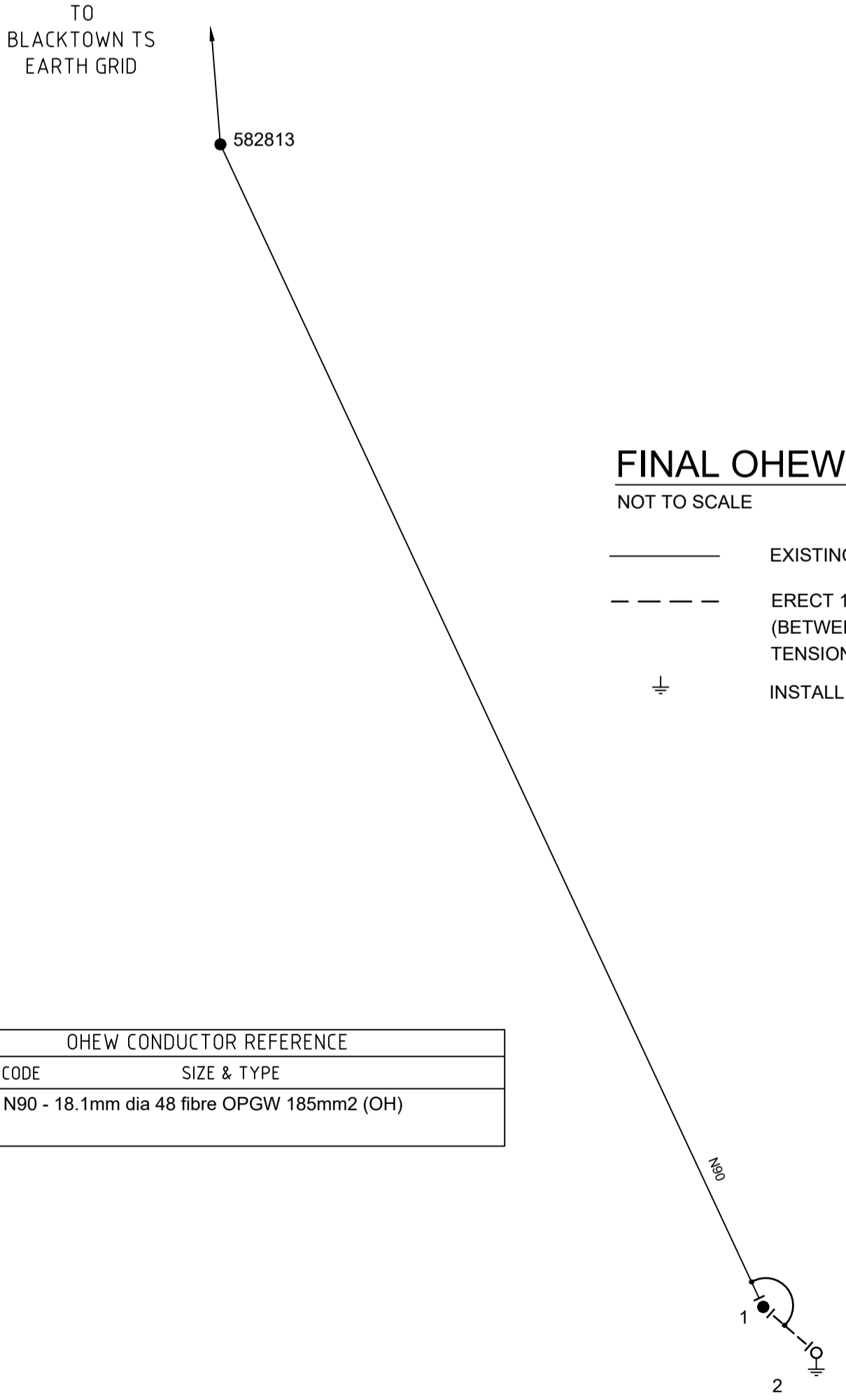
FINAL OHEW & EARTHING CIRCUIT

NOT TO SCALE

- EXISTING OHEW
- - - ERECT 1 x 7/4.50 AAC 'MERCURY' OHEW CONDUCTOR (BETWEEN POLES '1' AND '2') R.L. 7m C.L. 10m
TENSION @ 2% CBL @ 5°C TABLE 1
- + INSTALL 33kV POLE/SUBSTATION EARTH (REFER EARTHING DIAGRAM)

OHEW CONDUCTOR REFERENCE	
CODE	SIZE & TYPE
N90	18.1mm dia 48 fibre OPGW 185mm ² (OH)

ADSS/COMMS CONDUCTOR REFERENCE	
CODE	SIZE & TYPE
M9	48 core OPGW (18.1mm dia)
Z6	60 core UGFO pilot



FINAL FIBRE CIRCUIT

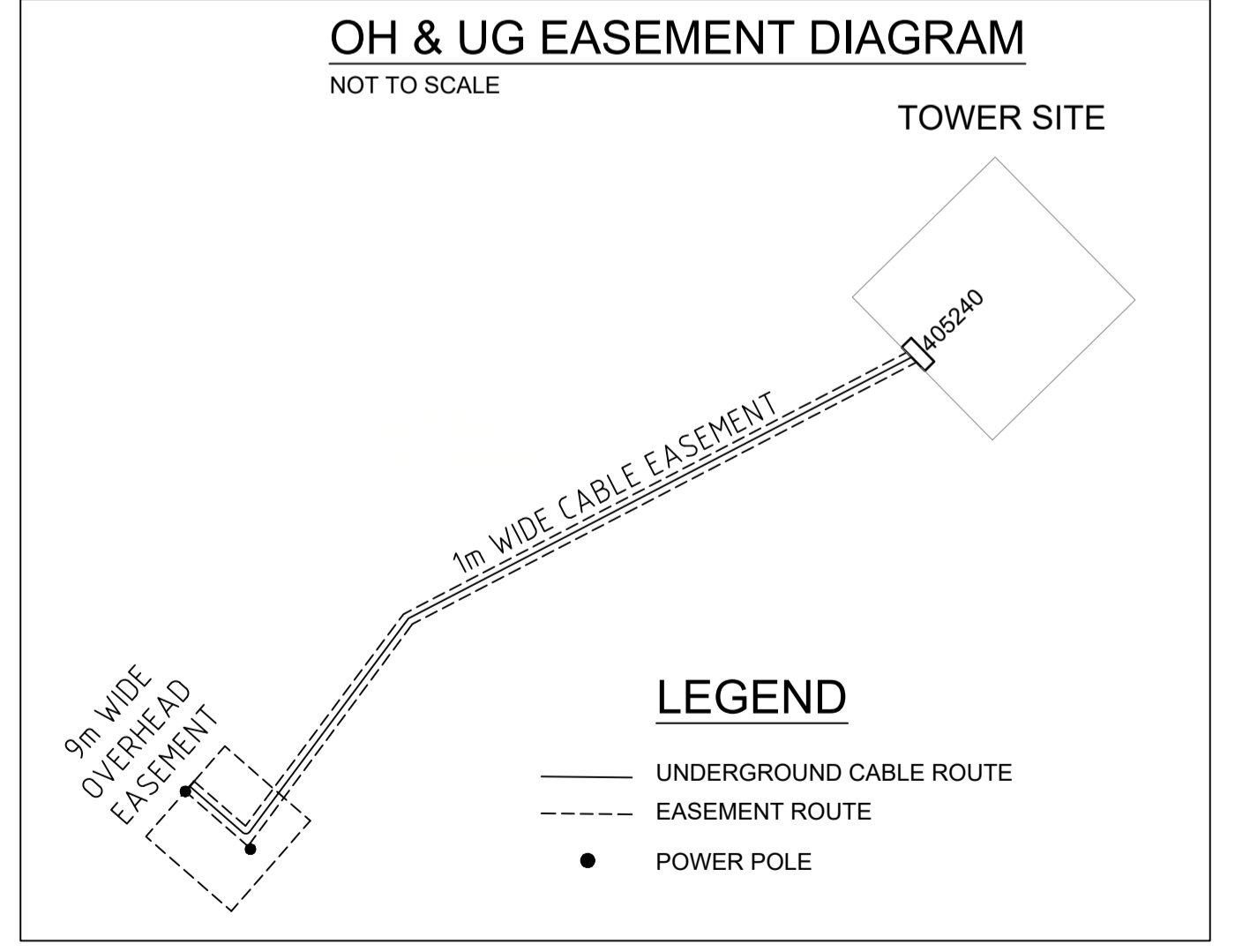
NOT TO SCALE

- x-x- INSTALL FIBRE OPTIC 144 CORE CABLE FROM: UGOW POLE 1 TO PROPOSED COMMS HUT
R.L. - 70 m C.L. - 220m

TERMINATE AT FIBRE PANEL.
(TO BE TERMINATED BY OTHERS)

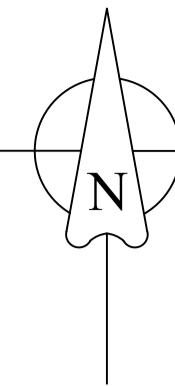
- P8 PIT CAN BE ORDERED FROM VINIDEX OR MASCOT ENGINEERING.
- LID TO BE STEEL LOCKABLE TYPE.
- USE MIN 50mm HD PVC DUCTS TO DIRECT CABLES INTO PIT.

WORKS COMPLETED/FIELD BOOK	
CONSTRUCTED BY: _____	
WORKS COMPLETED: _____	
SIGNATURE: _____ DATE: _____	
INSPECTED BY: _____	
SIGNATURE: _____ DATE: _____	
ASSET RECORDING	
I: _____	
OF: _____	
CONTACT No.: _____	
HEREBY CERTIFY THAT ASSETS MARKED AS-BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOUR ENERGY STANDARD SAD 0004.	
SIGNATURE: _____	
DATE: _____	

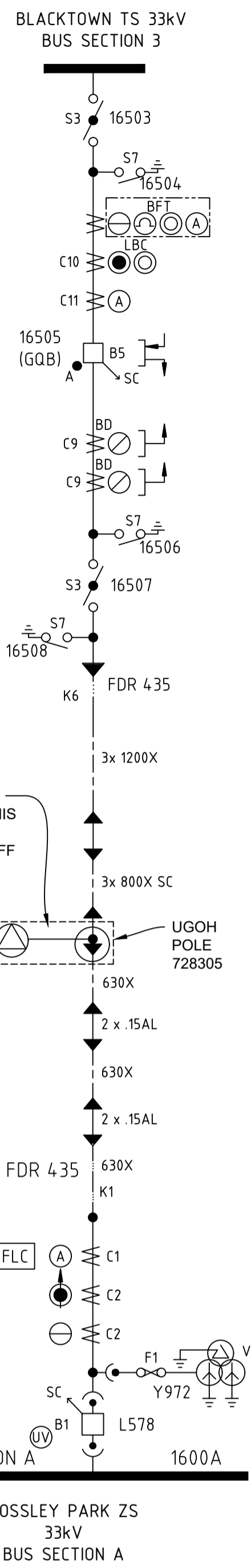


LEGEND

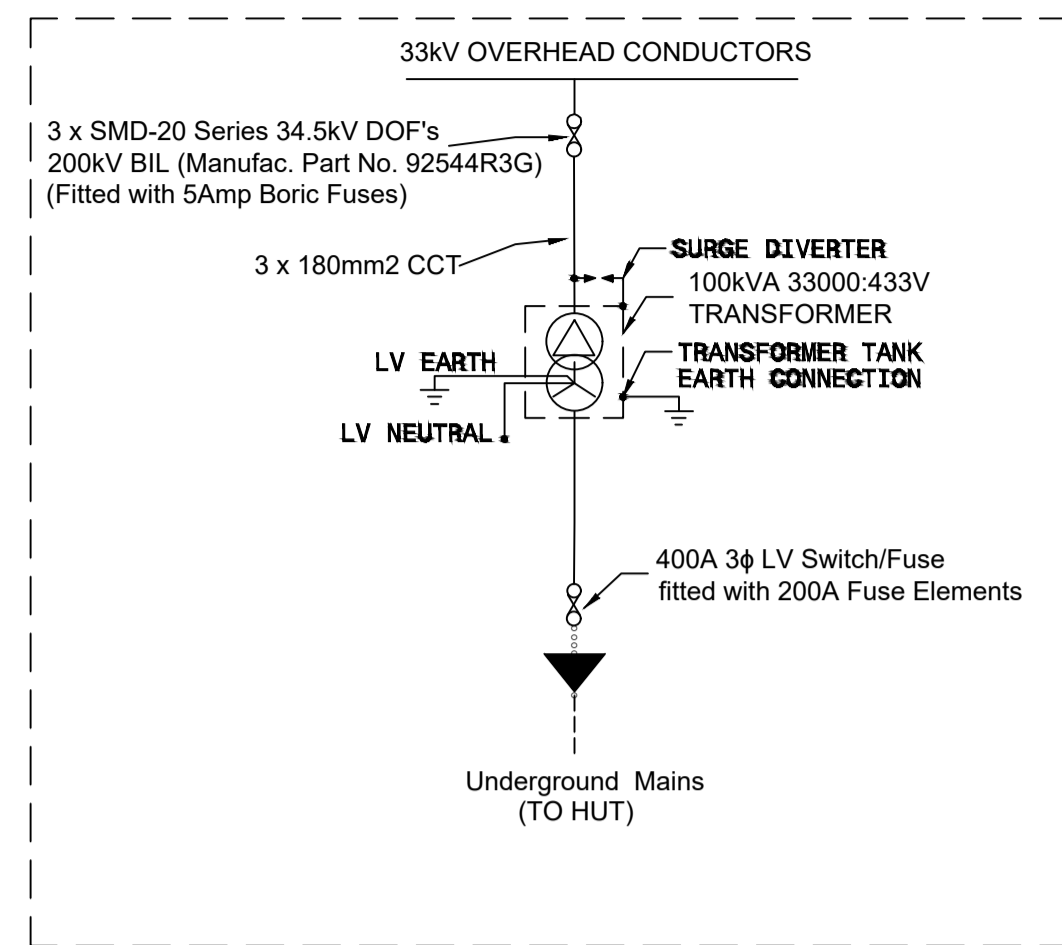
- UNDERGROUND CABLE ROUTE
- - - EASEMENT ROUTE
- POWER POLE



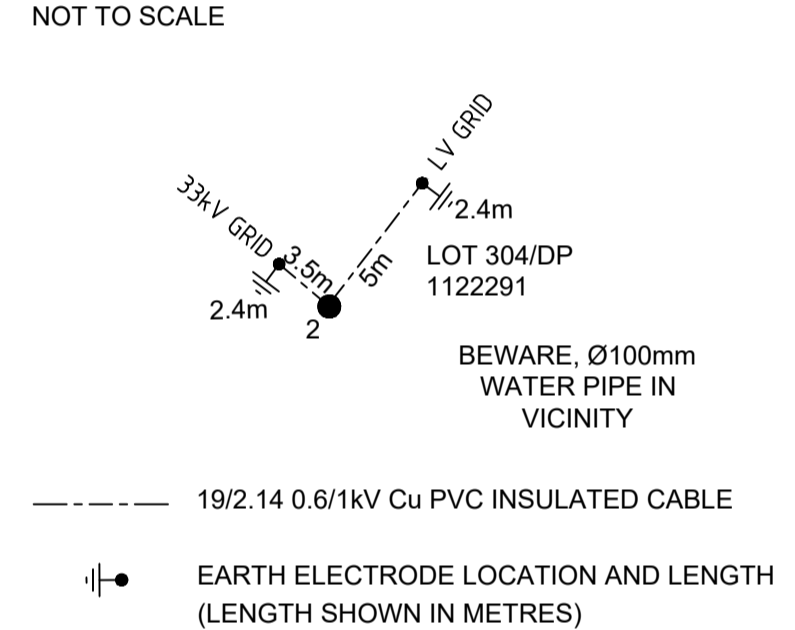
33kV FDR 435 SLD



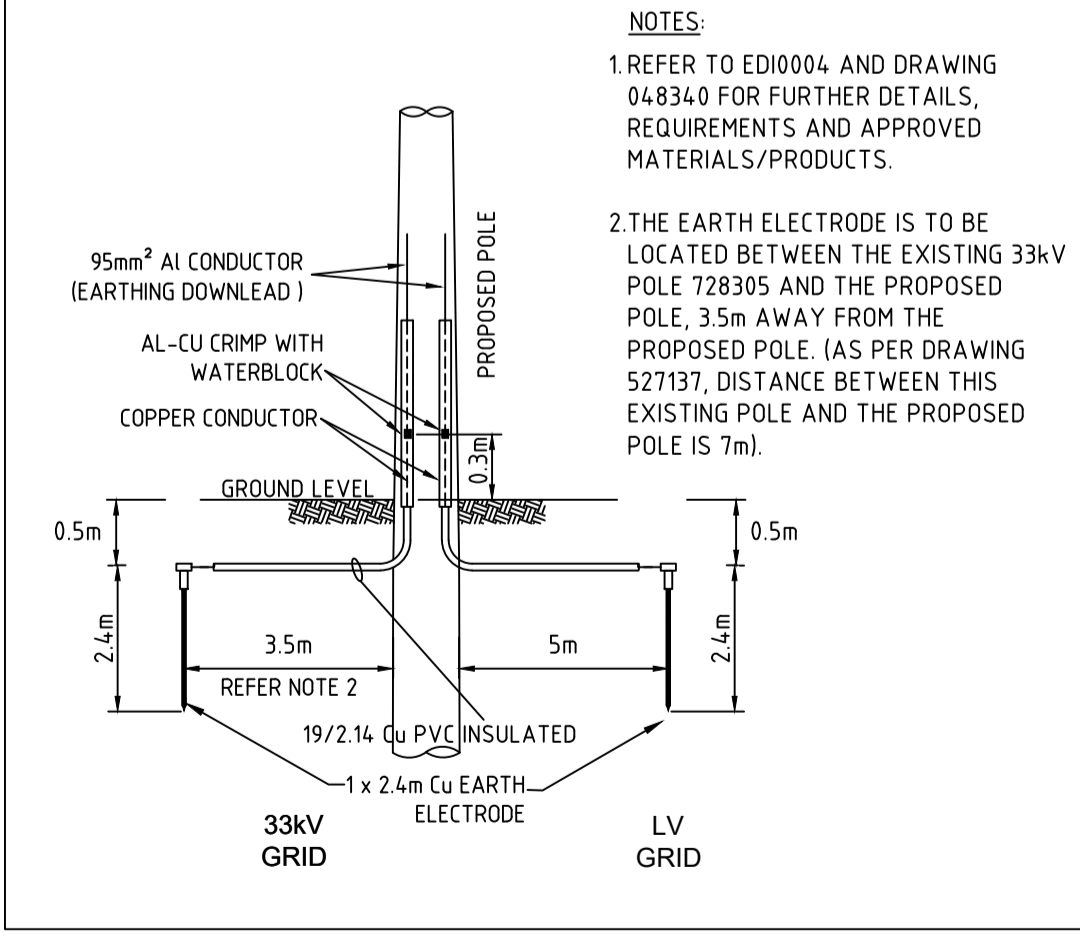
Pole Substation Single Line Diagram



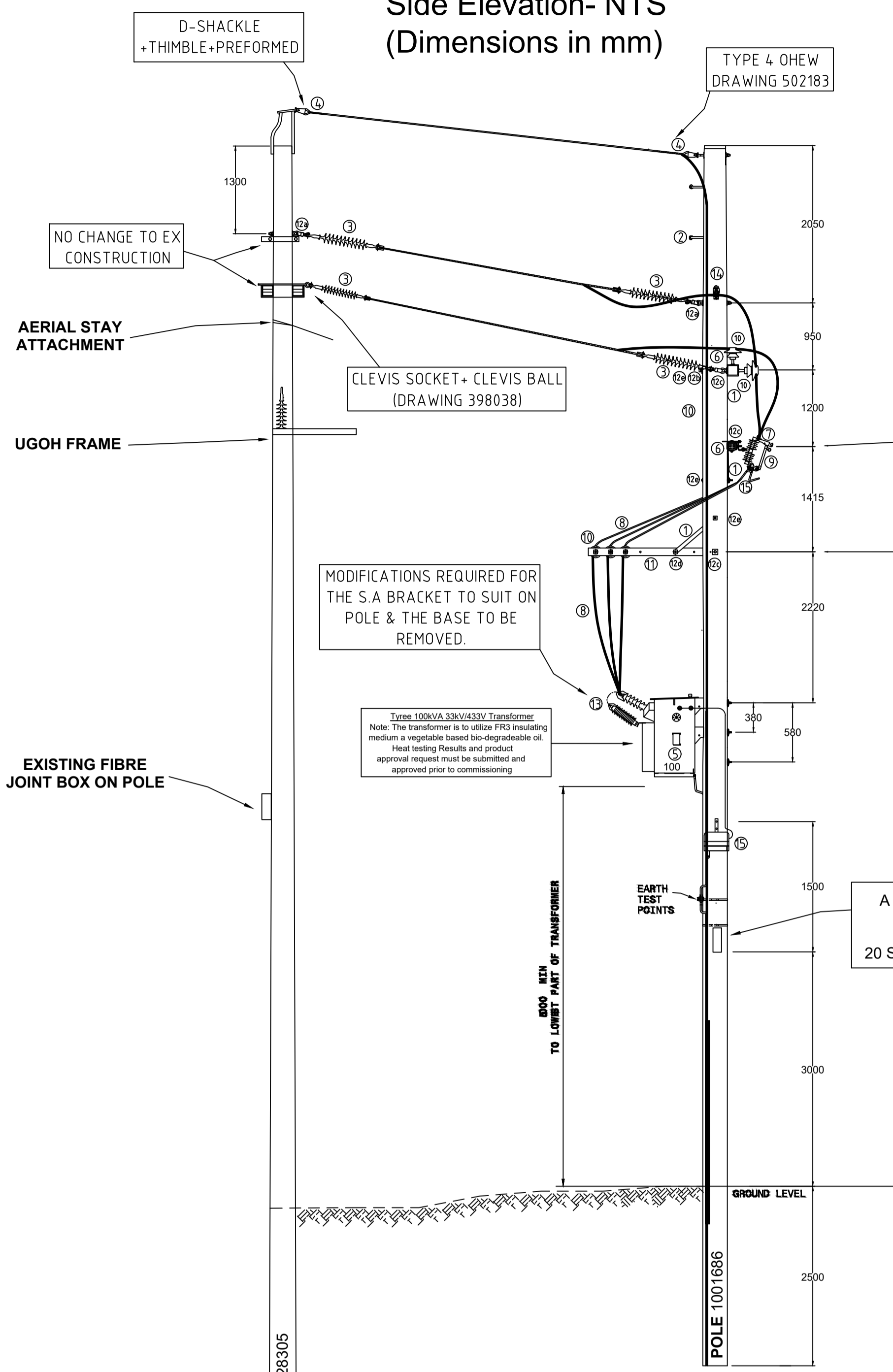
EARTHING PLAN POLE '2'



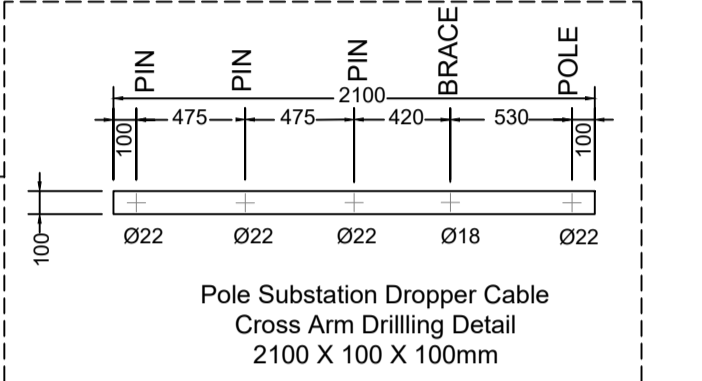
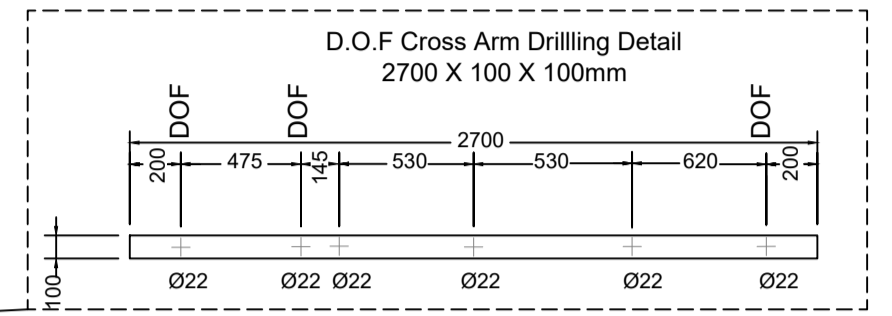
SEPARATE EARTH ROD LAYOUT (INDICATIVE)



Side Elevation- NTS
(Dimensions in mm)



Note
A MINIMUM OF 380mm MUST BE MAINTAINED BETWEEN ALL EXPOSED ACTIVE COMPONENTS AND EARTHED PARTS OF THE POLE OR STRUCTURE MEASURED TO THE CLOSEST POINT AS PER MDI0031 TABLE 17.5.4.2 TO PREVENT FLASHOVER



SUBSTATION SEPARATE EARTHING DETAIL
SCALE: NTS

HV EARTHING DETAILS				
Soil Resistivity	Layer 1	11.52	Depth (m)	2.24
	Layer 2	144.95		∞
Designed Earth Resistance Limit (Ohm)	4-10			
Measured Earth Resistance (Ohm)				
Number of Electrodes	1			
Insulated Depth (m)	0			
Length of Bare Electrode (m)	2.4			
Connector Type (CAD or Crimp)	Crimp			
Location Category: F- Frequented, R-Remote, S-Sp	Remote			
What Design Tool Used?	CDEGS			
Fault level (kA)	7.33			
LV EARTHING DETAILS				
Designed Maximum Earth Resistance (Ohm)	4-10			
Measured Earth Resistance (Ohm)				
Number of Electrodes	1			
Length of Bare Electrode (m)	2.4			
Connector Type (CAD or Crimp)	Crimp			

HV EARTH MINIMUM SEPARATION (m)				
	Design	Actual	Design	Actual
TDMEN	5		Telecom	90
TDB	4		Pipes	5
TDU	3.5		HV-LV	5

Components in Addition to Standards Pole Substation

ITEM	PART No.	DWG No	DESCRIPTION	QUANTITY
1	SB14342	011962	BRACE CROSSARM (750mm x 6mm)	5
2	1561802	370399	POLE STEP	A/R
3	ALR002	398038	INSULATOR LONG ROD ASSEMBLY	6
4	-	502183	OHEW ASSEMBLY TYPE 4	2
5	-	-	33kV/433V POLE MOUNTED TRANSFORMER (100kVA)	1
6	-	-	TIMBER CROSSARM 2700X100X100mm (UNDRILLED)	2
7	100002154	-	S&C 20 SERIES DOF'S PART NO. 92544R3G	3
8	1116540	-	180mm2 (19/3.50AAAC) COVERED CONDUCTOR THICK	A/R
9	1000002265	20 SERIES	FUSE ELEMENT 5A (PART NO. 614.006) "INCLUDES 3 SPARES"	6
10	1014559/1017639	015366C	33kV PIN INSULATOR & PIN	6
11	-	-	TIMBER CROSSARM 2100X100X100mm (UNDRILLED)	1
12a	ACP005	240600	M20 EYEBOLT ASSEMBLY FOR POLE	2
12b	ACP006	240600	M20 EYEBOLT ASSEMBLY FOR CROSSARM	2
12c	ACP007	240600	M20 BOLT ASSEMBLY FOR CROSSARM	3
12d	ACP009	240600	M16 BOLT ASSEMBLY FOR CROSSARM	1
12e	ACP010	240600	M16 BOLT ASSEMBLY FOR POLE	4
13	1550516	-	33KV SURGE ARRESTER	3
14	ALP004	-	33kV POST INSULATOR	2
15	1143866	-	400A 3 φ LV SWITCH FUSE F/W 3 x 200A FUSE ELEMENTS	1

WORKS COMPLETED/FIELD BOOK

CONSTRUCTED BY: _____
 WORKS COMPLETED: _____
 SIGNATURE: _____ DATE: _____
 INSPECTED BY: _____
 SIGNATURE: _____ DATE: _____
ASSET RECORDING
 I: _____
 OF: _____
 CONTACT No.: _____
 HEREBY CERTIFY THAT ASSETS MARKED AS-BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOUR ENERGY STANDARD SAD 0004.
 SIGNATURE: _____
 DATE: _____

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Attachment B – Photos of existing landscape

Photos depicting visual character of proposal site

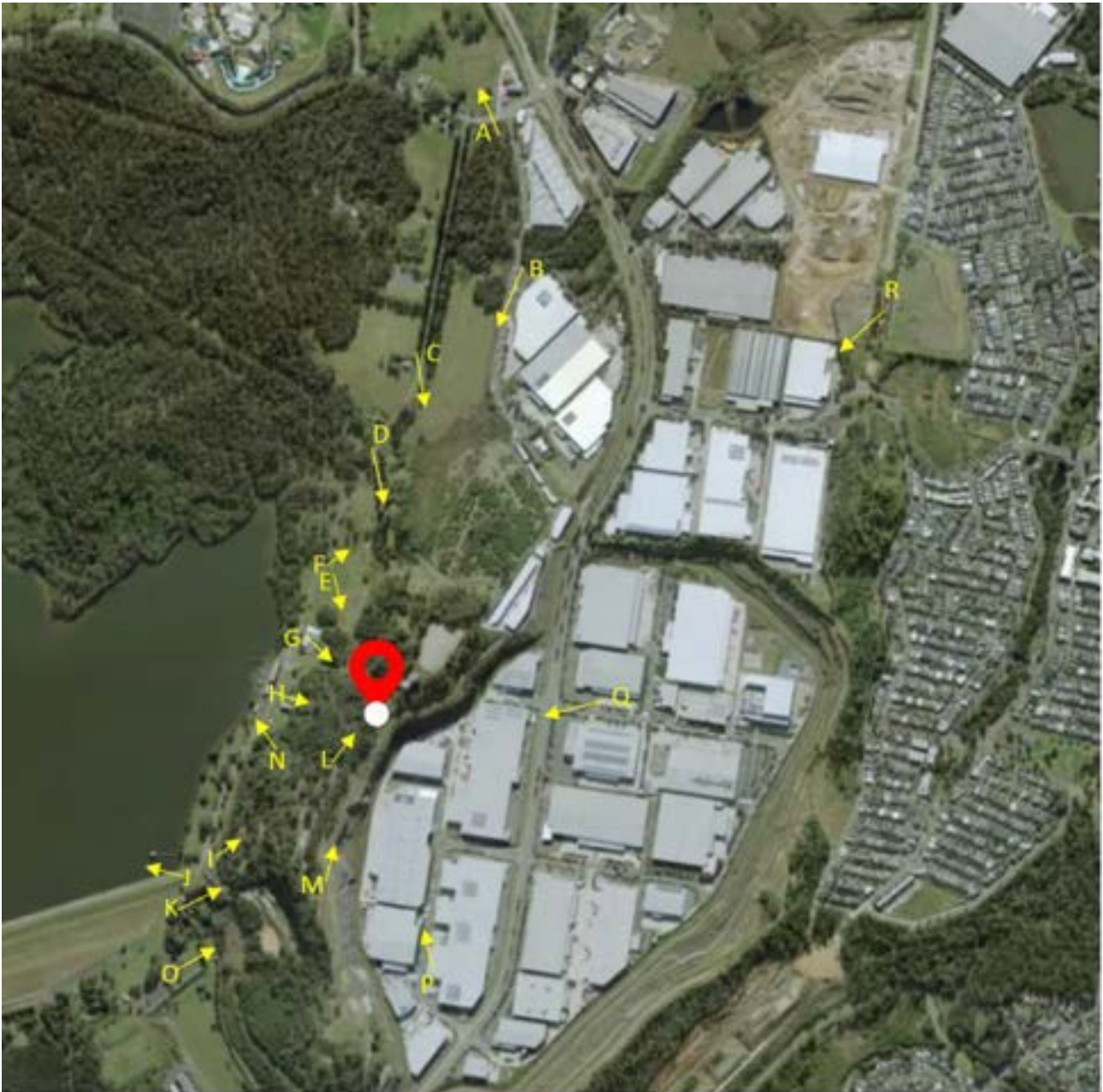


Photo A –
guyed masts
on corner
Prospect
Highway and
Reservoir
Road.



Photo B –
View towards
site from
industrial park
at Picrite
Close.



Photo C –
Towards the site from house on William Lawson Drive (tower will be predominantly obscured by vegetation).



Photo D –
View towards proposed tower from start of access track (not accessible by public). View of tower obscured by vegetation.



Photo E –
view to
proposed
tower from
William
Lawson Drive.
Tower will be
partially
obscured by
vegetation.



Photo F –
view towards
existing power
lines from
William
Lawson Drive.



Photo G – view to proposed tower from Water NSW offices.



Photo H – view to proposed tower from heritage information area on William Lawson Drive. View will be predominantly obscured by existing vegetation.



Photo I – View from gateway adjacent submerged tower and in close proximity to Prospect Reservoir Valve House, looking up road to picnic areas and George Maunder Lookout on Prospect Hill.



Photo J – View from Reservoir wall

to existing communications towers and electricity pylons in the surrounding area.



Photo K – view to proposed tower from heritage listed Prospect Reservoir Valve House. Tower will be obscured by former quarry wall and existing vegetation.



Photo L –
View to
proposed
tower from
Maunder
picnic area.
Tower will be
predominantly
obscured by
existing
vegetation.



Photo M –
view to
proposed
tower from top
of former
quarry wall
(not publicly
accessible).



Photo N – view to existing guyed towers next to Raging Waters theme park and existing electricity pylons.



Photo O – view to proposed tower from lower car park. Views to the tower will be partially obscured by vegetation and former quarry wall.



Photo P – view towards proposed tower from Dolerite Way in former quarry industrial park. Tower will be partially obscured by existing industrial buildings.



Photo Q – View to proposed tower from Belleview Circuit in former quarry industrial park.



Photo R –
View to the
proposed
tower from
Prospect
Lookout.



Attachment C – Consultation with Heritage NSW

Lia Zwolinski

From: James Quoyle <James.Quoyle@environment.nsw.gov.au>
Sent: Thursday, 19 January 2023 10:51 AM
To: Roweena Dsouza
Cc: Michael Ellis
Subject: RE: Comms Tower at Prospect (HMS1632)

Hi Roweena

Thank you for meeting with HNSW today.

The demonstration of the data and modelling to verify the accuracy of the visual impact from key significant areas across the site and from the top of Prospect Hill to the east provided a fuller understanding of the terrain and was effective.

Also, the proposed mitigation measure to reduce the visual impact by improving and rehabilitating the vegetation in this area of the site has benefit and this needs to be part of the application and in a form that may be included in Schedule 1 – APPROVED DOCUMENTS.

Based on your presentation, HNSW are of the opinion that the proposed tower in that location is not likely to materially affect the aesthetic values of the item. Therefore, the application will not be exhibited by HNSW and the approval will be completed under delegation.

What is required:

- Updated VIA
- Updated SoHI
- Updated architectural drawings (extracted from the REF)
- Details of the vegetation rehabilitation plan.

I will initiate a task request in HMS and this will stop the clock to enable you the time to consult with Sydney Water and prepare a vegetation rehabilitation plan. Could you provide an estimate of the time required to finalise this component?

Regards James

James Quoyle (he/him)
Senior Assessments Officer
Heritage NSW
Department of Planning and Environment

T 9873 8612 E james.quoyle@environment.nsw.gov.au

dpie.nsw.gov.au heritage.nsw.gov.au

4 Parramatta Square 12 Darcy Street Parramatta
Locked Bag 5020 Parramatta 2124

Working days Monday to Thursday



I acknowledge the traditional custodians of the land and pay respects to Elders past and present. I also acknowledge all the Aboriginal and Torres Strait Islander staff working with NSW Government at this time.

Please consider the environment before printing this email.

From: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>
Sent: Wednesday, 18 January 2023 4:14 PM
To: James Quoyle <James.Quoyle@environment.nsw.gov.au>
Subject: RE: Comms Tower at Prospect (HMS1632)

Hi James,

We are preparing a detailed response to answer your queries. In light of time, I would like to have a quick call with you today to explain what I'm proposing and schedule a meeting to demonstrate visibility of the tower from all the viewpoints that have been suggested. This would really help your understanding of our proposal.

Please call me or let me know your thoughts.

Thanks
Row

From: James Quoyle <James.Quoyle@environment.nsw.gov.au>
Sent: Monday, 16 January 2023 11:26 AM
To: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>
Subject: RE: Comms Tower at Prospect (HMS1632)

Hi Roweena
Would you have some time today to go through the submission and address any immediate queries?
Regards
James

From: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>
Sent: Wednesday, 11 January 2023 3:56 PM
To: James Quoyle <James.Quoyle@environment.nsw.gov.au>
Subject: RE: Comms Tower at Prospect (HMS1632)

Hi James,

Sorry about that. I have resent the submission and if you have any issue downloading it, let me know. The combined file size is huge, but if there are particular documents you require, I can extract them from the submission and send them separately which would be easier to review.

In addition, as this project is at a critical stage for Endeavour Energy, I would appreciate if you have 10-15 minutes tomorrow so I can go through the submission with you and address any immediate queries that you may have?

Look forward to hearing from you.

Regards

Roweena D'Souza | Environmental Specialist

M 0447 919 365
51 Huntingwood Drive, Huntingwood NSW 2148.

Dharug Country

endeavourenergy.com.au



Endeavour Energy respectfully acknowledges the Traditional Custodians on whose lands we live, work, and operate and their Elders past, present and emerging.

From: James Quoye <James.Quoye@environment.nsw.gov.au>
Sent: Wednesday, 11 January 2023 3:26 PM
To: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>
Subject: RE: Comms Tower at Prospect (HMS1632)

Hello Roweena

Could you resend this document – I thought I had downloaded it but cannot retrieve it - and I did not save my password because I didn't think I would need it.

Sorry for the inconvenience.

Regards

James

James Quoye (he/him)

Senior Assessments Officer

Heritage NSW

Department of Planning and Environment

T 9873 8612 E james.quoye@environment.nsw.gov.au

dpie.nsw.gov.au heritage.nsw.gov.au

4 Parramatta Square 12 Darcy Street Parramatta
Locked Bag 5020 Parramatta 2124

Working days Monday to Thursday



I acknowledge the traditional custodians of the land and pay respects to Elders past and present. I also acknowledge all the Aboriginal and Torres Strait Islander staff working with NSW Government at this time.

Please consider the environment before printing this email.

From: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>

Sent: Monday, 9 January 2023 10:38 AM

To: James Quoye <James.Quoye@environment.nsw.gov.au>

Subject: Comms Tower at Prospect (HMS1632)

Your files are ready for pickup

The following file(s) have been sent to you from
Roweena.Dsouza@endeavourenergy.com.au:

EE Letter to HNSW _22122022.pdf 62.75 MB

[Download Files](#)

The secure message expires on 23/1/23 10:38:09 AM

If the link above does not open, please copy and paste the following URL into your browser:
<https://mft.endeavourenergy.com.au/register?token=c386b9e2-68b7-4044-8a9d-b61b983c306a>

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authority states them to be the views of the NSW Office of Environment, Energy and Science.

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Lia Zwolinski

From: Roweena Dsouza
Sent: Thursday, 19 January 2023 10:51 AM
To: Chris Maddocks; James Quoyle; Michael Ellis; Hooman Goodarznia; Tadd Andersen
Cc: Emily@Heritage21; philip.bennett@sydneywater.com.au
Subject: RE: Prospect Reservoir HMS 1632 Visualisation

Hi All,

Thank you for meeting this morning and running through the various viewpoints.

Key notes from today's meeting:

- Aim: To go through the various viewpoints in Neara to understand visual context of the proposed tower and validate the photomontages in the VIA submitted to HNSW on 23rd Dec 2022.
- Agenda:
 - Introductions – Row (5 minutes)
 - Neara Model – setup – Chris (10 Minutes)
 - Viewpoints – Chris and HNSW (20 minutes)
 - Questions, conclusion, way forward - ALL (10 minutes)
- Conclusion
 - HNSW are satisfied with the validity of the photomontages and do not require Endeavour Energy to further validate the photomontages i.e. no crane required onsite
 - HNSW acknowledge the effort put into careful site selection to minimise visual and heritage impact
 - HNSW acknowledge that Endeavour Energy in discussions with Sydney Water propose to have a veg management plan or strategy that would benefit the aesthetic value of the site
 - Endeavour Energy will provide an updated VIA to include additional photomontages as discussed in the meeting today by Monday 23rd Jan
 - Endeavour Energy will provide an updated SOHI that will capture the updated VIA and design by Monday 23rd Jan
 - Endeavour Energy are in the process of updating the REF and shall advertise it on their website when discussions with HNSW are satisfactorily completed
 - HNSW, in lieu of the above, will reconsider the potential impact of the proposal and will get back to Endeavour Energy if the proposal needs to go to advertisement

Please let me know if I have missed any item or if there are any corrections.

Else this can be considered as the Minutes of the Meeting.

Thanks
Roweena

-----Original Appointment-----

From: Roweena Dsouza
Sent: Wednesday, 18 January 2023 4:58 PM
To: Roweena Dsouza; Chris Maddocks; James Quoyle; Michael Ellis; Emily@Heritage21; Hooman Goodarznia; tandersen@emmconsulting.com.au; philip.bennett@sydneywater.com.au
Subject: Prospect Reservoir HMS 1632 Visualisation

When: Saturday, 21 January 2023 9:30 AM-10:15 AM (UTC+10:00) Canberra, Melbourne, Sydney.

Where: Microsoft Teams Meeting

Hi All,

Setting up a meeting to run through Near and go through the various viewpoints at Prospect reservoir looking towards the proposed tower.

Regards

Roweena D'Souza | Environmental Specialist

M 0447 919 365

51 Huntingwood Drive, Huntingwood NSW 2148.

Dharug Country

endeavourenergy.com.au



Endeavour Energy respectfully acknowledges the Traditional Custodians on whose lands we live, work, and operate and their Elders past, present and emerging.

Microsoft Teams meeting

Join on your computer, mobile app or room device

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PROSPECT RESERVOIR - COMMUNICATIONS TOWER

DWG No.	DWG TITLE
SHEET 1	DRAWING TITLE AND LOCATION PLAN
SHEET 2	OVERALL SITE PLAN
SHEET 3	OVERALL SECTIONAL VIEW 1
SHEET 4	OVERALL SECTIONAL VIEW 2
SHEET 5	DETAILED SITE PLAN
SHEET 6	DETAILED SITE PLAN - ELEVATIONS
SHEET 7	SITE PLAN - CUT & FILL



LOCATION PLAN

AMENDMENTS	
NO.	DESCRIPTION
1	ORIGINAL ISSUE

CONCEPT DESIGN

DESIGNED	PJB	DATE	14/12/22
DRAWN	PJB		
CHECKED			

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PROSPECT RESERVOIR
COMMUNICATIONS TOWER
DRAWING TITLE AND LOCATION PLAN

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SHEET No 1 OF 7 SHEETS	



OVERALL SITE PLAN
SCALE 1:500

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PROSPECT RESERVOIR COMMUNICATIONS TOWER OVERALL SITE PLAN

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A	BONHELP		ORIGINAL ISSUE



VIEW
SCALE 1:250

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CHECKED	CHECKED
DATE	DATE
BY	BY
REVISION A	ORIGINAL ISSUE

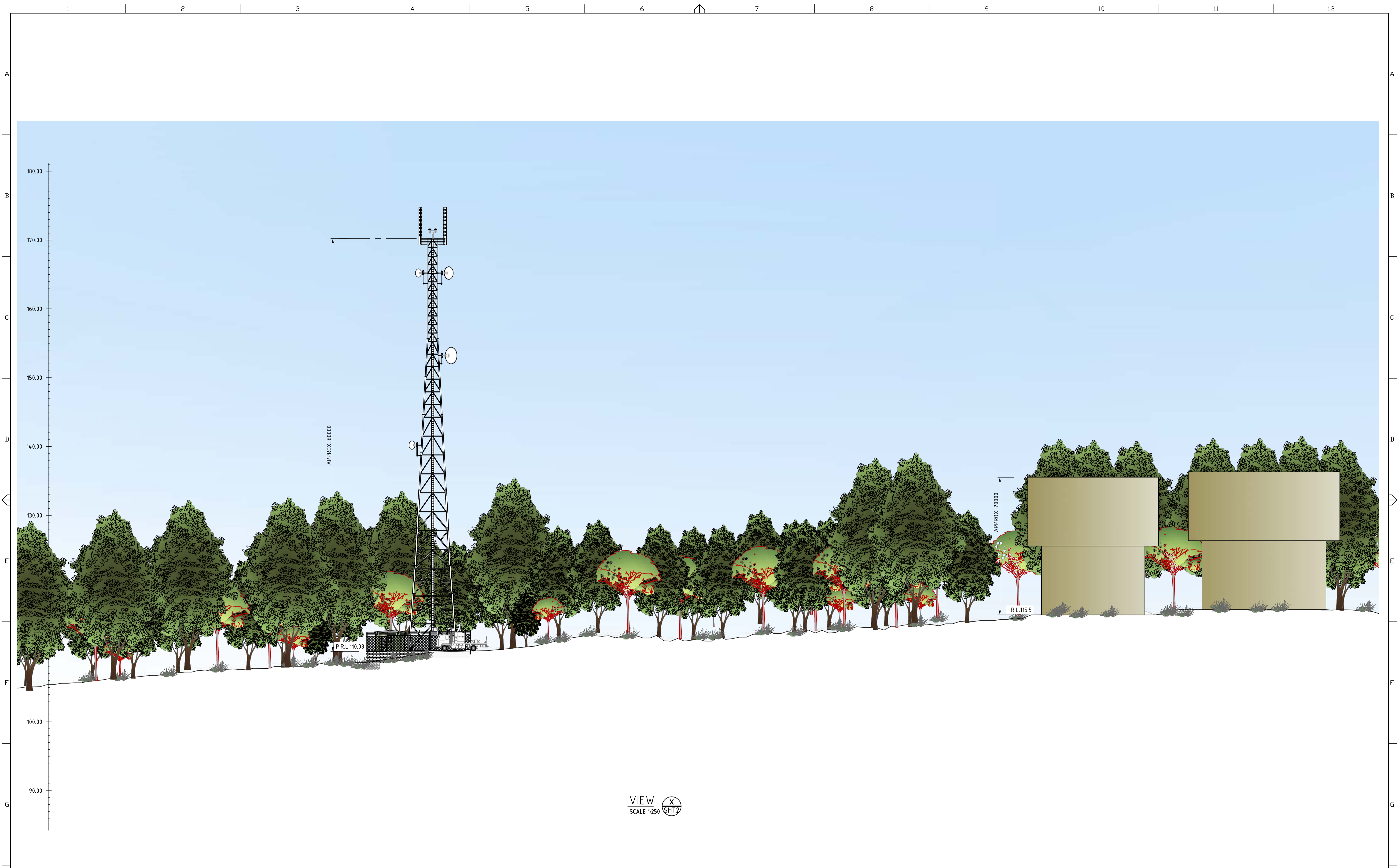
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PROSPECT RESERVOIR
COMMUNICATIONS TOWER
OVERALL SECTIONAL VIEW 1

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DESIGN MANAGER CIVIL & SECONDARY		A1	
		528567	
		SHEET No 3 OF 7 SHEETS	



VIEW X
SCALE 1:250

AMENDMENTS								
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1	PJB	14/12/22	ORIGINAL ISSUE					

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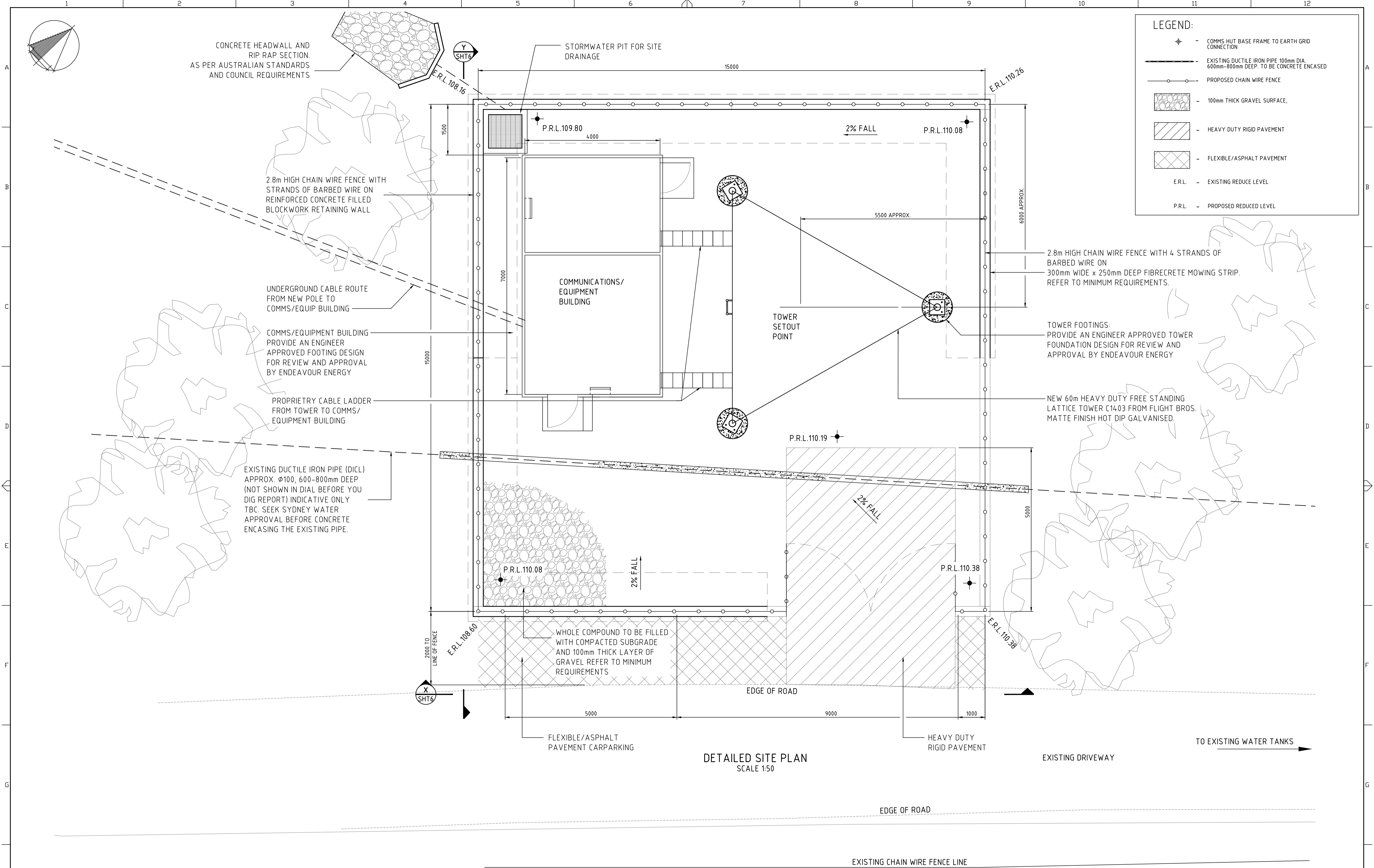
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PROSPECT RESERVOIR
COMMUNICATIONS TOWER
OVERALL SECTIONAL VIEW 2

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LEGEND:

- COMMS HUT BASE FRAME TO EARTH GRID CONNECTION
- EXISTING DUCTILE IRON PIPE 100mm DIA. 600mm-800mm DEEP. TO BE CONCRETE ENCASED
- PROPOSED CHAIN WIRE FENCE
- 100mm THICK GRAVEL SURFACE,
- HEAVY DUTY RIGID PAVEMENT
- FLEXIBLE/ASPHALT PAVEMENT
- E.R.L. - EXISTING REDUCE LEVEL
- P.R.L. - PROPOSED REDUCED LEVEL

DETAILED SITE PLAN
SCALE 1:50

CONCEPT DESIGN

AMENDMENTS	DESIGN JOB	DESIGNER	DATE	REVISION

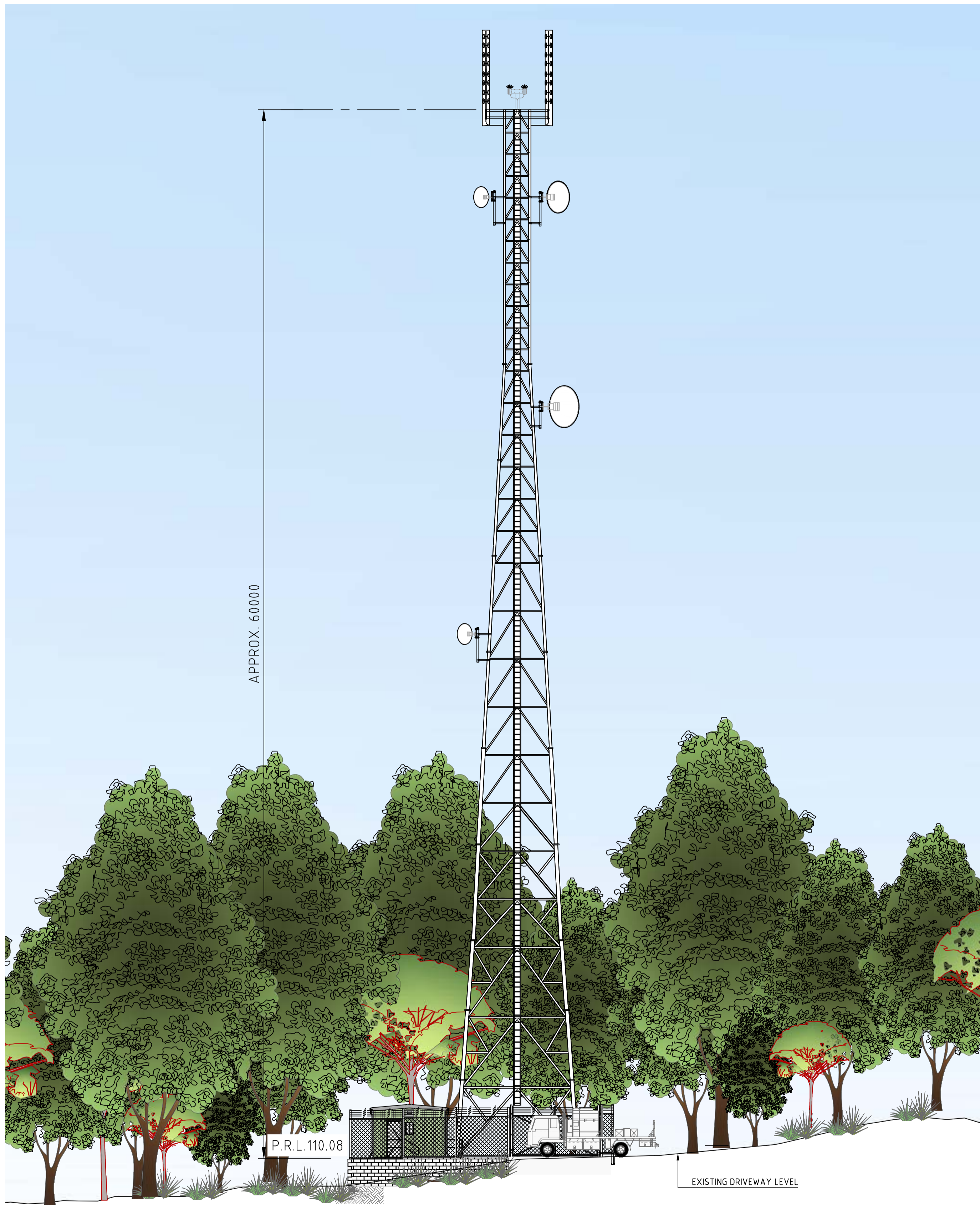
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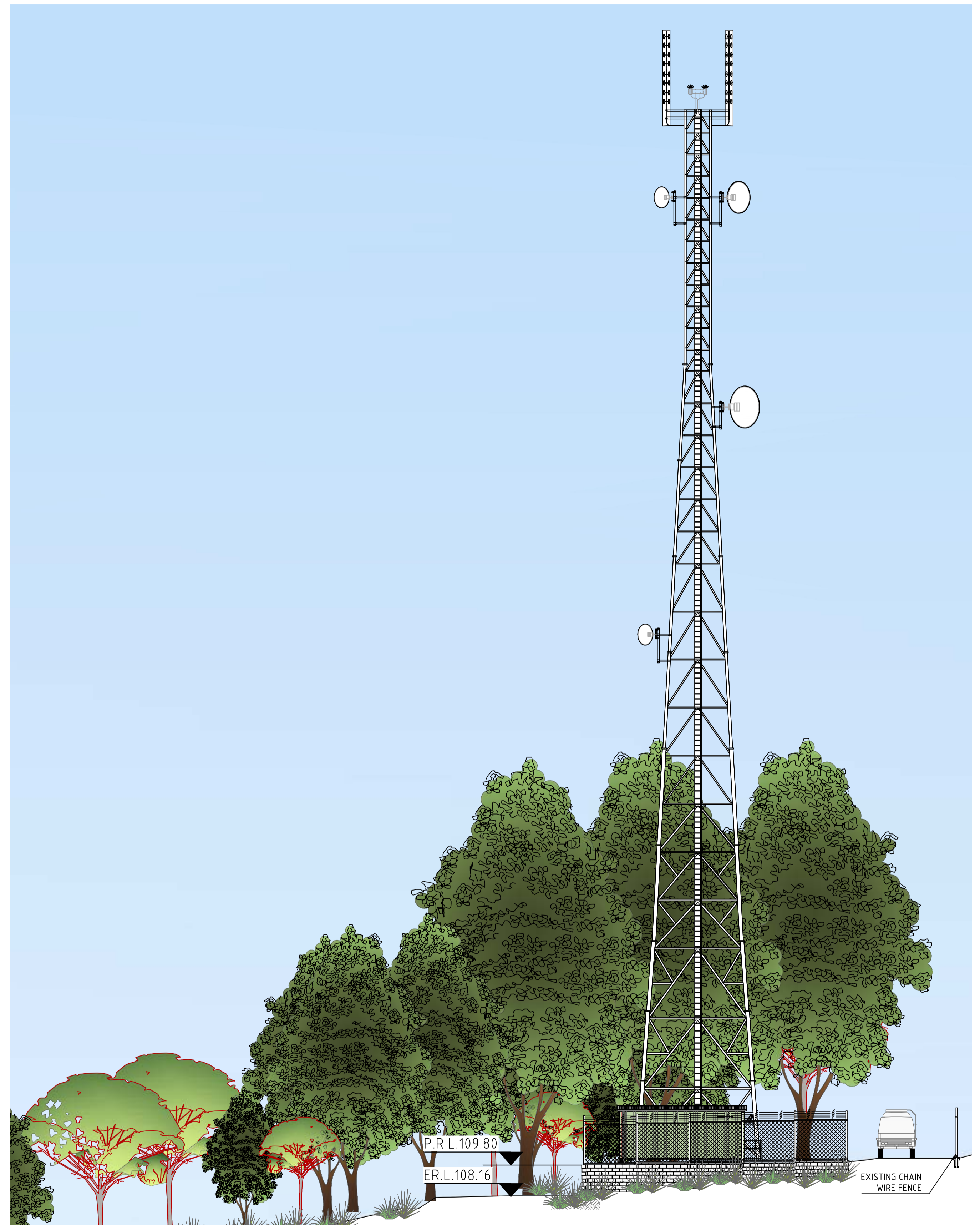
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PROSPECT RESERVOIR
COMMUNICATIONS TOWER
DETAILED SITE PLAN

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SHEET No 5 OF 7 SHEETS			



VIEW X
SCALE 1:150



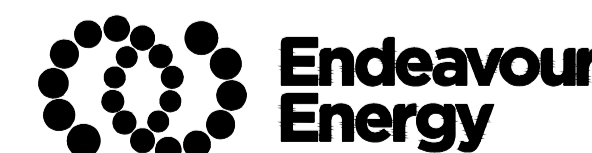
VIEW Y
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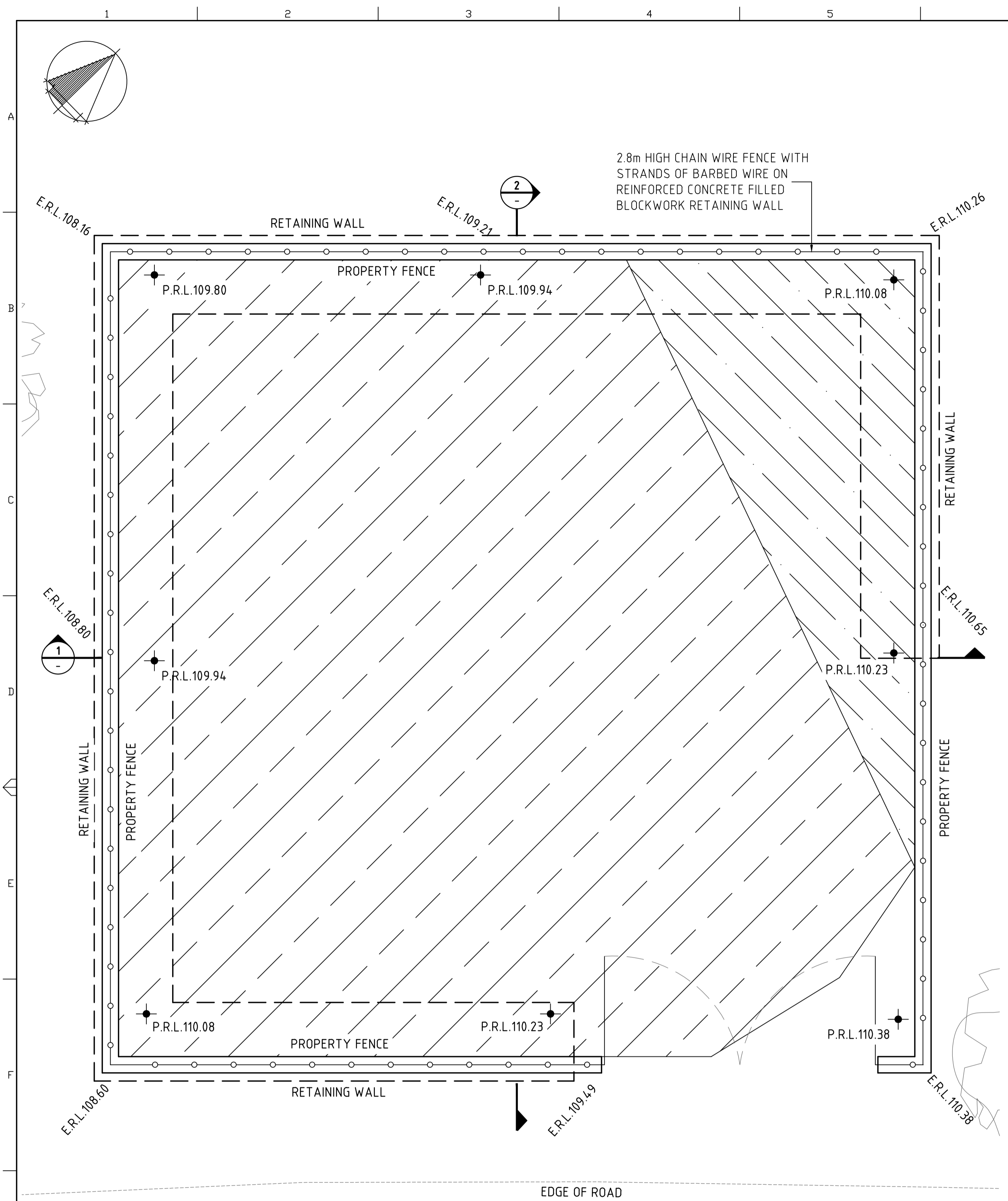
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PROSPECT RESERVOIR
COMMUNICATIONS TOWER
DETAILED SITE PLAN - ELEVATIONS

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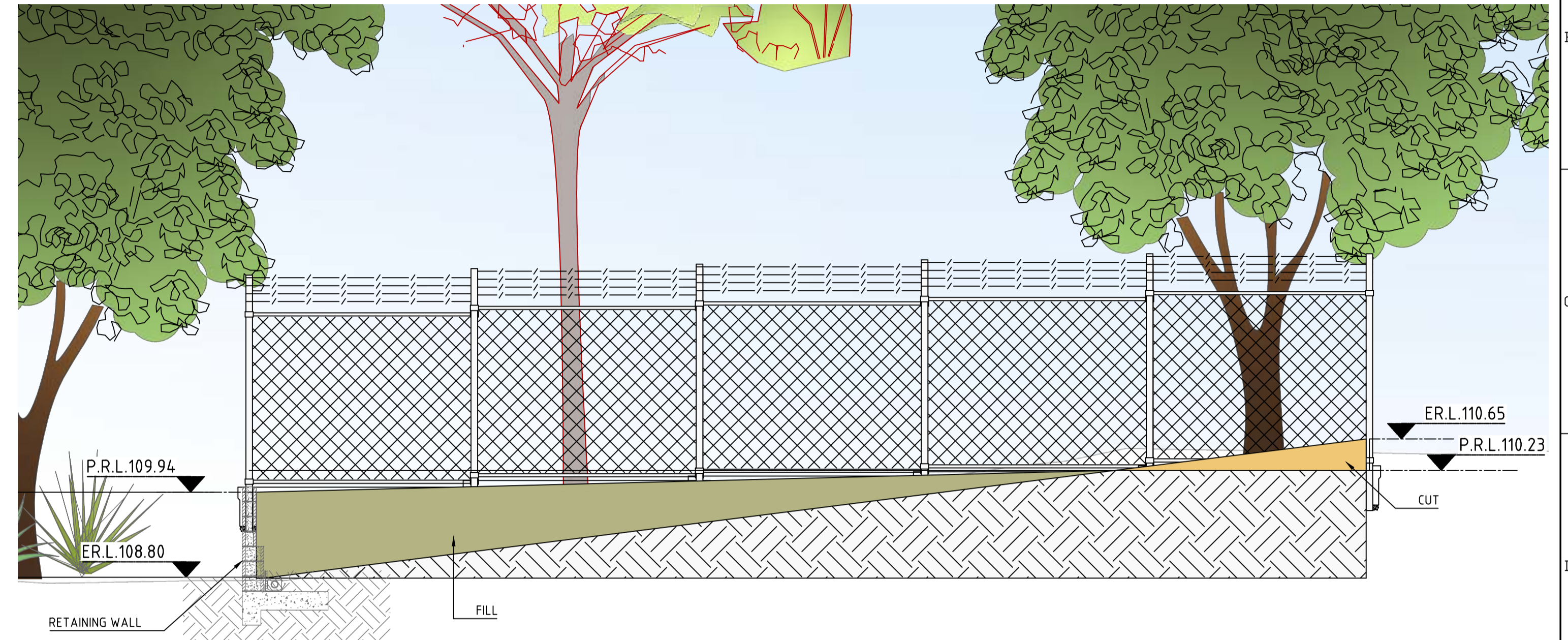
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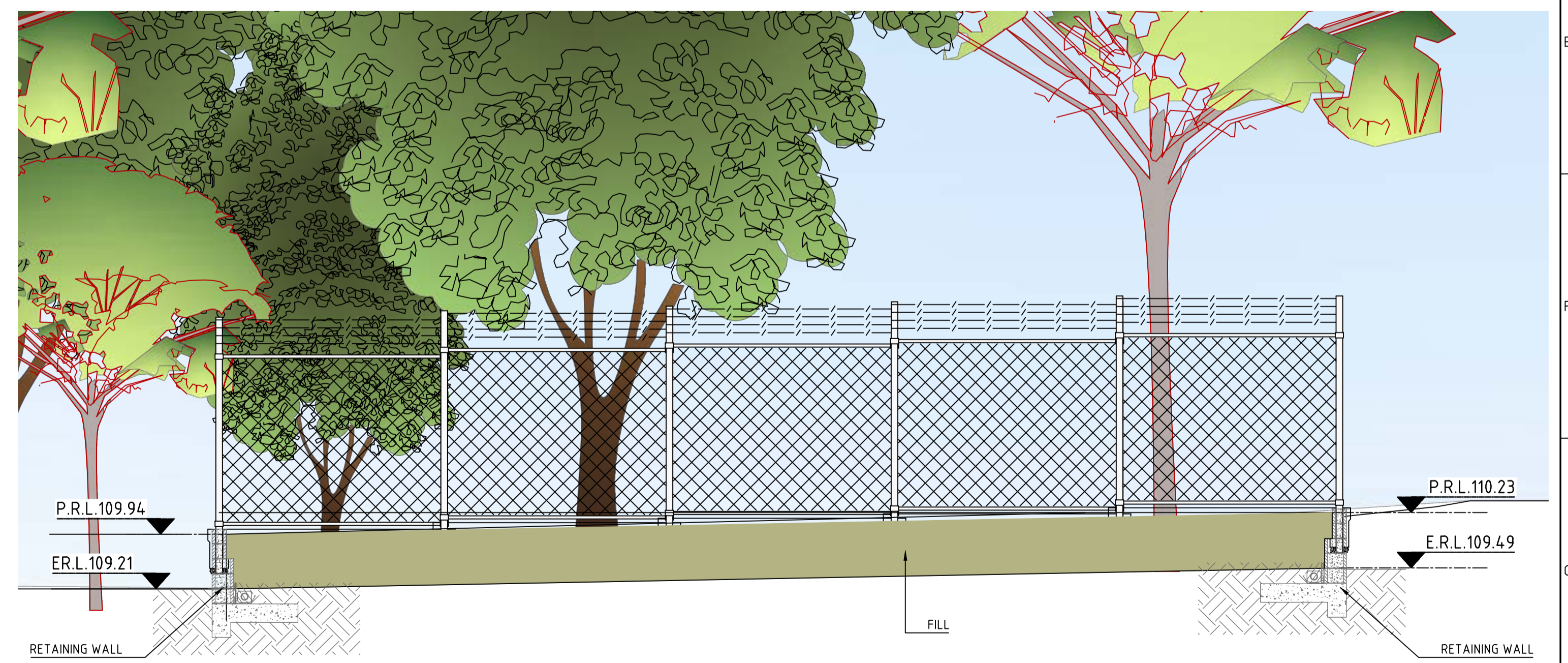
FILL

E.R.L. - EXISTING REDUCE LEVEL

P.R.L. - PROPOSED REDUCED LEVEL



SECTION 1
SCALE 1:50



SECTION 2
SCALE 1:50

AMENDMENTS

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3		PJB	APPROVED

HISTORY

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3		PJB	APPROVED

REVISION A

NO.	DATE	BY	REASON
1		PJB	DESIGN
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3		PJB	APPROVED

ORIGINAL ISSUE

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3		PJB	APPROVED

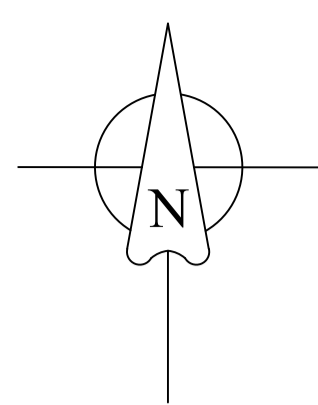
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PROSPECT RESERVOIR COMMUNICATIONS TOWER
SITE PLAN - CUT & FILL

REFERENCE DRAWINGS		AUTHORISED/CERTIFIED	
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CONCEPT DESIGN



ENDEAVOUR ENERGY CONTACT	
NAME	CONTACT No.
DESIGN: M JANIF	0472723705
CONSTRUCTION: T.KIDD	0401470936



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NTS

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UNLESS APPROVED OTHERWISE, INTERRUPTIONS TO ANY CUSTOMERS SUPPLY MUST BE AVOIDED. THE FOLLOWING ALTERNATIVES SHOULD BE CONSIDERED:
- LIVE LINE WORK;
- DESIGN ALTERNATIVES;
- WORK PRACTICES / STANDARDS;
- LOW VOLTAGE PARRALLELS
THIS COST TO BE FUNDED BY THE DEVELOPER.

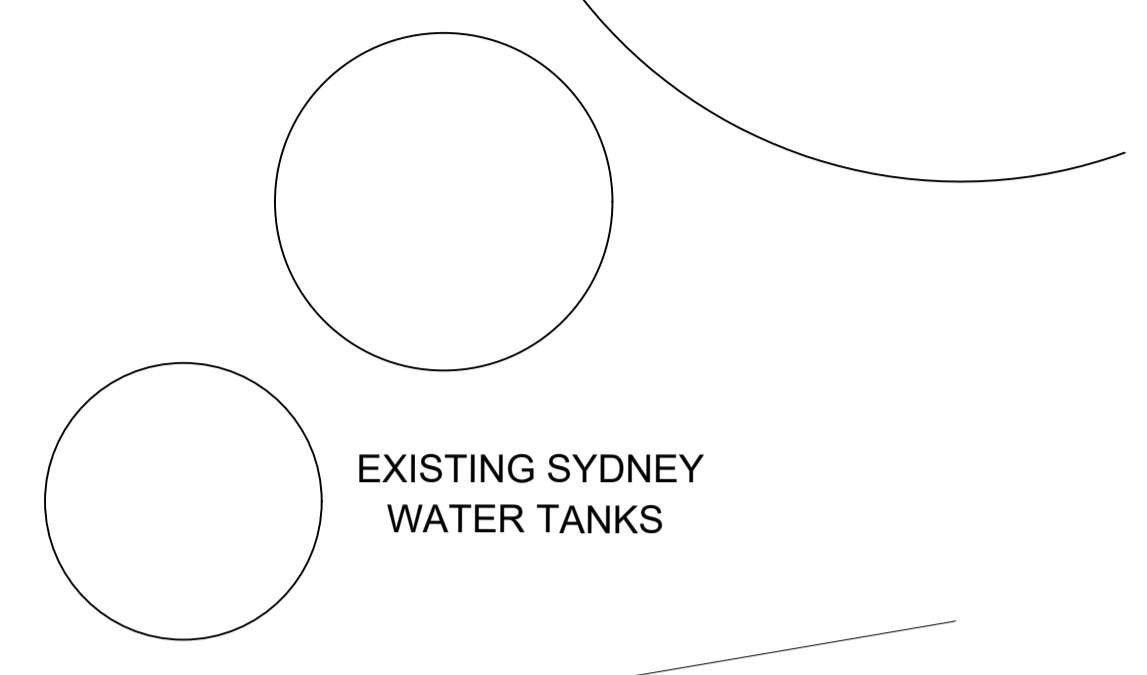
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- REDUNDANT ENDEAVOUR ENERGY MATERIALS TO BE RETURNED TO CLOSEST ENDEAVOUR ENERGY DEPOT.
- PROPERTY OWNERS(SYDNEY WATER) ARE TO BE CONSULTED REGARDING SITE ACCESS PRIOR TO WORK COMMENCING.
- ALL CUSTOMERS ARE TO BE CONTACTED REGARDING OUTAGE ARRANGEMENTS PRIOR TO CONSTRUCTION WORK COMMENCING. THE REQUIRED NOTICE IS TO BE IN ACCORDANCE WITH THE NATIONAL ENERGY CUSTOMER FRAMEWORK (NECF) TIME FRAMES
- CUSTOMER TO ARRANGE FOR THE INSTALLATION & CONNECTION OF NEW SERVICE MAINS & DISCONNECTION OF EXISTING SERVICE MAINS BY A LEVEL 2 ACCREDITED SERVICE PROVIDER. ALL SERVICE WORK TO BE INSTALLED IN ACCORDANCE WITH AS3000:2007 AND THE NSW SERVICE AND INSTALLATION RULES.
- IF FOR ANY REASON, THE PROPOSED POLE LOCATION OR UG ASSETS REQUIRE ADJUSTMENT, PLEASE CONTACT MAINS DESIGN FOR ADVICE. THIS IS CRUCIAL TO ENSURE APPROPRIATE SEPARATIONS / CLEARANCES ARE MAINTAINED WITHIN EXISTING EASEMENTS.
- AN EASEMENT FOR UNDERGROUND CABLES 1 METER WIDE IS REQUIRED OVER THE LOT 304/DP 1122291. REFER SHEET 2
- AN EASEMENT FOR 33KV OVERHEAD POWER LINES 9 METER WIDE IS REQUIRED OVER THE LOT 304/DP 1122291. REFER SHEET 2.
- CONTRACTOR SHALL PEG THE UG ALIGNMENT PRIOR TO WORKS. DESIGN TEAM CAN BE CONTACTED FOR DESIGN ALIGNMENT IN CAD.

SITE PLAN LEGEND **SITE PLAN:**
(SCALE - 1:500)

- EXISTING OVERHEAD MAINS 33kV FDR 4/35
- EXISTING UNDERGROUND MAINS
- - - NEW OVERHEAD MAINS
- - - NEW LV TRENCH
- ⊗ TREES INDICATIVE
- EXISTING POLE LOCATION
- NEW POLE LOCATION
- ⊕ NEW POLE MOUNTED SUBSTATION
- NEW LV PILLAR
- w— SYDNEY WATER DUCTILE IRON PIPE (DICI)



WORK SITE TRAFFIC MANAGEMENT:

A TRAFFIC CONTROL PLAN AS WELL AS ADVANCED WARNING AREAS ARE TO BE IN PLACE BEFORE CONSTRUCTION WORK COMMENCES. REFER ENDEAVOUR ENERGY TRAFFIC MANAGEMENT MANUAL TMM0001

WARNING
UNDERGROUND SERVICES ARE LOCATED IN THE VICINITY OF THE PROPOSED WORKS. A DIAL-BEFORE-YOU-DIG SEARCH IS TO BE PERFORMED 2 DAYS PRIOR TO CONSTRUCTION. IT IS RECOMMENDED THAT ALL SERVICES SHOULD BE LOCATED USING NON-DESTRUCTIVE TECHNIQUES BEFORE WORKS BEGIN.

ENVIRONMENTAL AWARENESS
WORKS TO BE COMPLETED IN CONJUNCTION WITH ENDEAVOUR ENERGY'S ENVIRONMENTAL GUIDELINES HANDBOOK 2017. ALL PROJECT MANAGERS, CONTRACT INSPECTORS AND CONSTRUCTION CREWS ARE TO BE MADE AWARE OF THE CONTENTS PRIOR TO ANY SITE VISITS OR CONSTRUCTION WORKS COMMENCING. COPIES OF THE DOCUMENTATION ARE TO BE AVAILABLE ON SITE AND ACCESSIBLE AT ALL TIMES FOR THE DURATION OF THE PROJECT. USE SILT TRAPS/SOCKS OR OTHER APPROVED METHODS TO PREVENT RUN-OFF ENTERING DRAINS AND STORMWATER CHANNELS. REFER EMS 0002-POLLUTION CONTROL PROCEDURE

NOTE
ACCESS TO WORKSITE VIA SYDNEY WATER GATES G1 OR J2 REQUIRE ENDEAVOUR ENERGY ABLOY KEY

PERMANENT SURVEY MARKS MAY EXIST IN THIS AREA. THESE ARE TO BE LOCATED BY SURVEY PRIOR TO COMMENCEMENT OF WORK.

WARNING
LIVE ELECTRICAL CABLES IN THIS AREA
CONTACT NETWORK DATA,
HUNTINGWOOD DR, HUNTINGWOOD
TELEPHONE 9853-4161 FOR
CABLE SEARCHES PRIOR TO EXCAVATION

ESTABLISH 33kV/400V SINGLE POLE MOUNTED SUBSTATION No - 96001: 100kVA 3 PH (SINGLE CUSTOMER) (Dyn11, KNAN FR3 Natural Ester Oil)
EARTHING REQUIREMENT : REFER EARTHING .
TR FUSES: 5A - BORIC ACID TYPE
LV FUSES: 200A
(1 SET OF LV DISTRIBUTOR)

WARNING
LIVE ENDEAVOUR ENERGY CABLES & OTHER SERVICES IN THIS AREA. PLEASE CONTACT DIAL BEFORE YOU DIG ON TEL: 1100 FOR SEARCHES TWO DAYS PRIOR TO EXCAVATION.

NOTE:
NO JEMENA GAS WEST/NBN/TELECOMMUNICATION /SYDNEY WATER ASSETS ARE BEING AFFECTED BY THE ELECTRICAL WORKS. THERE IS A CONCRETE AND STEEL 100MM DICI PIPE RUNNING THROUGH UNDERNEATH THE TOWER SITE TOWARDS THE PROPOSED POLE SUBSTATION SITE. NOT SHOWN IN DIAL BEFORE YOU DIG SEARCHES.

WORK METHOD STATEMENT REFERENCE
The contents of this table are an indication only, and the required Work Method Statements may not be limited to those listed here.

WMS No.	TASK NAME
Index of SWMS	Index of Safe Work Method Statements
SRMH 12	Traffic Management
SWM 01.001	Excavation Work (Trenching, Boring, etc)
SWM 01.004am01	Deep Earth Boring
SWM 01.008	Working at Heights (use of work platforms, Guardrails, Fall Arrest Systems, etc.)
SWM 01.015	Construct Single Pole Substation
SWM 03.008am01	Earth Testing (Separate, Common, SWER)
SWM 03.011am01	Install/Replace Cable Guard
SWM 05.008	Install / Replace Underground Cables (including cut and cap)
SWM 05.010am02	Termination of Underground Cables
SWM 05.011	Erect New / Change Pole (Includes all Comdemned Poles)
SWM 06.005am03	Transmission and Distribution Switching (Overhead Mains)
SWM 07.001am01	Recording of Underground Assets (Cables & Ducts)
SWM 13.001am01	Inspection & Commissioning of Network Assets (Overhead)
SWM 13.002am01	Inspection and Commissioning of Network Assets (Underground)
SWM 13.003am01	

WORKS COMPLETED/FIELD BOOK

CONSTRUCTED BY: _____
 WORKS COMPLETED: _____
 SIGNATURE: _____ DATE: _____
 INSPECTED BY: _____
 SIGNATURE: _____ DATE: _____
ASSET RECORDING
 I: _____
 OF: _____
 CONTACT No.: _____
 HEREBY CERTIFY THAT ASSETS MARKED AS BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOUR ENERGY STANDARD S4D 0004.
 SIGNATURE: _____
 DATE: _____

DESIGN COMPLIANCE AND INDEMNITY

This design complies with Endeavour Energy's relevant standards as current at this time and as listed on the Endeavour Energy Accredited Service Provider's Internet site. These standards include, but are not limited to:
 CP: Connection Policy
 EMS: Environmental Management Standard
 MCI: Mains Construction Instruction
 MDI: Mains Design Instruction
 PDI: Protection Design Instruction
 SDI: Substation Design Instruction
 S4D 0001: Design Drawing Standard
 MMI: Mains Maintenance Instruction
 SMI: Substation Maintenance Instruction
 LDI 0001: Public Lighting Electrical Design Element
 Additionally, where relevant, the design complies with AS/NZS 7000 "Overhead Line Design - Detailed Procedures" published by The Australian Standards.
 ENDEAVOUR ENERGY indemnifies Endeavour Energy for any loss or damage resulting from non-compliance of the design with the above standards.
 Signed: _____
 Name: MOHAMMED JANIF
 Service Provider Number: 1149 Date: 19/10/22

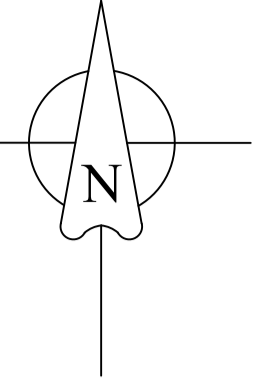
DUCT BREAKDOWN TABLE		
ALL TRENCH SECTIONS ARE TO BE READ & VIEWED FROM NODE TO NODE AS NOMINATED		
Route	Configuration	Route Length (m)
A - B	(New Duct) TRENCH & INSTALL 2 x 125mm PVC & 2 x 50mm PVC DUCTS	7m
B - C	(New Duct) TRENCH & INSTALL 2 x 125mm PVC & 2 x 50mm PVC DUCTS	63m
TOTAL		70m

LEGEND

- SPARE DUCT
- DUCT WITH NEW CABLE
- DIRECT BURIED CABLE
- DUCT WITH EXISTING CABLE
- ABANDONED CABLE
- ⊕ NEW TRENCH
- ⊕ EXISTING TRENCH
- UNDERBORE

306909.2660	6255578.2840	1001686	7m	20°	66T+POLE SUB	TYPE 4 OHEW	SUB-SINGLE CUSTOMER	750	2.5	17m/12kN (TIMBER)	-	C	-	-	X	-	-	2	
		728305			33UGOH(EX)+TEE	EX+TYPE 4 OHEW	-				EX	-	-	-	X	-	-	1	
EASTING	NORTHING	NEW	EXISTING	SPAN LENGTH	LINE DEV DEGREES	33kV	OHEW/OPGW	LV	DIA mm	DEPTH m	TYPE (LENGTH /STRENGTH)	STAY	FOOTING	RELOCATE	REPLACE	NEW	EXISTING	REMOVE	DESIGN NUMBER
STAKING (CO-ORDINATES IN MGA56)		FIELD POLE NUMBER		CONSTRUCTION				HOLE		POLE									

AMENDMENTS	ORIGINAL ISSUE	DRAFT No. 01	FOR CONSTRUCTION	REFERENCE DRAWING'S	WORK ORDERS	CAMS File No.	AM PROJ. No.	HV SWITCHING	ORIGINAL SCALE	DO NOT SCALE DIMENSIONS IN METRES	WILLIAM LAWSON DRIVE PROSPECT NCC-000742-001 ESTABLISH POLE MOUNTED SUBSTATION HUNTINGWOOD COMMS TOWER RELOCATION	Endeavour Energy	A1	527137	A	SHEET No 1 OF 3 SHEETS
									1:500							
									19/10/22							
									J.V.S(15/12/22)							



FINAL 33kV CIRCUIT

NOT TO SCALE

- EXISTING TR OVERHEAD MAINS FDR 435 - BLACKTOWN TO BOSSLEY PARK TEE QUARRIES
- - - EXISTING TR UNDERGROUND MAINS FDR 435 - BLACKTOWN TO BOSSLEY PARK TEE QUARRIES
- - - ERECT 3 x 7/4.50 AAC 'MERCURY' CONDUCTOR (BETWEEN POLES '1' AND '2')
R.L. 7m C.L. 30m. SLACK SPAN (TENSION @ 2% CBL @ 5°C TABLE 1)

SAP DATA URBAN OH SUB 96001	
HV DOF	231947
TRF 1	10004450
LV ISOLATOR	231948
LV BUSBAR	37528
F1 - FUSE LABEL	403332
F2 - FUSE LABEL	

TR CONDUCTOR REFERENCE	
CODE	SIZE & TYPE
J74	2 x 19/3.25 AAC (2 x 19/0.128) 2 x (OH) 33 kV
W81	630mm ² Cu 1C XLPE/PVC/HDPE Screened (UG) 33kV

CONDUCTOR STRINGING TABLE 1										
STRAIN SECTION	POLE '1' TO '2'		TENSION (%CBL) @ 5°C							2%
DESIGN SPAN	POLE '1' TO '2'		RULING SPAN (m)							7.0
CONDUCTOR	1 x 7/4.50 AAC 'MERCURY' (NO CREEP COMPENSATION REQUIRED)									
TEMPERATURE (°C)	0	5	10	15	20	25	30	35	40	
TENSION (kN)	0.65	0.34	0.24	0.19	0.16	0.15	0.13	0.12	0.11	
SAG (m)	0.03	0.05	0.07	0.08	0.10	0.11	0.12	0.13	0.14	

ATTENTION
REGIONAL STAFF TO NOTIFY NETWORK DATA DAILY WHEN CABLE WORK IS IN PROGRESS.
TELEPHONE: EXT. - 0298536664 or 0478403699

FINAL LV CIRCUIT

NOT TO SCALE

- x - x - x - INSTALL 1kV 240mm sq Al 4C XLPE/PVC
R.L. 63m CL: 80m

FINAL OHEW & EARTHING CIRCUIT

NOT TO SCALE

- EXISTING OHEW
- - - ERECT 1 x 7/4.50 AAC 'MERCURY' OHEW CONDUCTOR (BETWEEN POLES '1' AND '2') R.L. 7m C.L. 10m
TENSION @ 2% CBL @ 5°C TABLE 1
- + INSTALL 33kV POLE/SUBSTATION EARTH (REFER EARTHING DIAGRAM)

OHEW CONDUCTOR REFERENCE	
CODE	SIZE & TYPE
N90	18.1mm dia 48 fibre OPGW 185mm ² (OH)

ADSS/COMMS CONDUCTOR REFERENCE	
CODE	SIZE & TYPE
M9	48 core OPGW (18.1mm dia)
Z45	60 core UGFO pilot

FINAL FIBRE CIRCUIT

NOT TO SCALE

- x - x - x - INSTALL FIBRE OPTIC 144 CORE CABLE FROM:
UGOH POLE 1 TO PROPOSED COMMS HUT
R.L. - 70 m C.L. - 220m
- JOINT/SPLICE

TERMINATE AT FIBRE PANEL.
(TO BE TERMINATED BY OTHERS)

ESTABLISH FIBRE UGFOH ON
POLE 1, RE-TERMINATE IN
EXISTING SPLICE JOINT BOX
TO EXISTING OH OPGW

DISCONNECT EX UGFO PILOT CABLE FROM
BOSSLEY PARK TS ON POLE 1 SPLICE JOINT
BOX. DROP DOWN CABLE & LAY IN NEW
TRENCH TOWARDS POLE SUB & ESTABLISH
JOINT IN UG P8 PIT, EXTEND NEW UGFO
CABLE TO HUT.

- P8 PIT CAN BE ORDERED FROM VINIDEX OR MASCOT ENGINEERING.
- LID TO BE STEEL LOCKABLE TYPE.
- USE MIN 50mm HD PVC DUCTS TO DIRECT CABLES INTO PIT.

WORKS COMPLETED/FIELD BOOK

CONSTRUCTED BY: _____
WORKS COMPLETED: _____
SIGNATURE: _____ DATE: _____
INSPECTED BY: _____
SIGNATURE: _____ DATE: _____

ASSET RECORDING

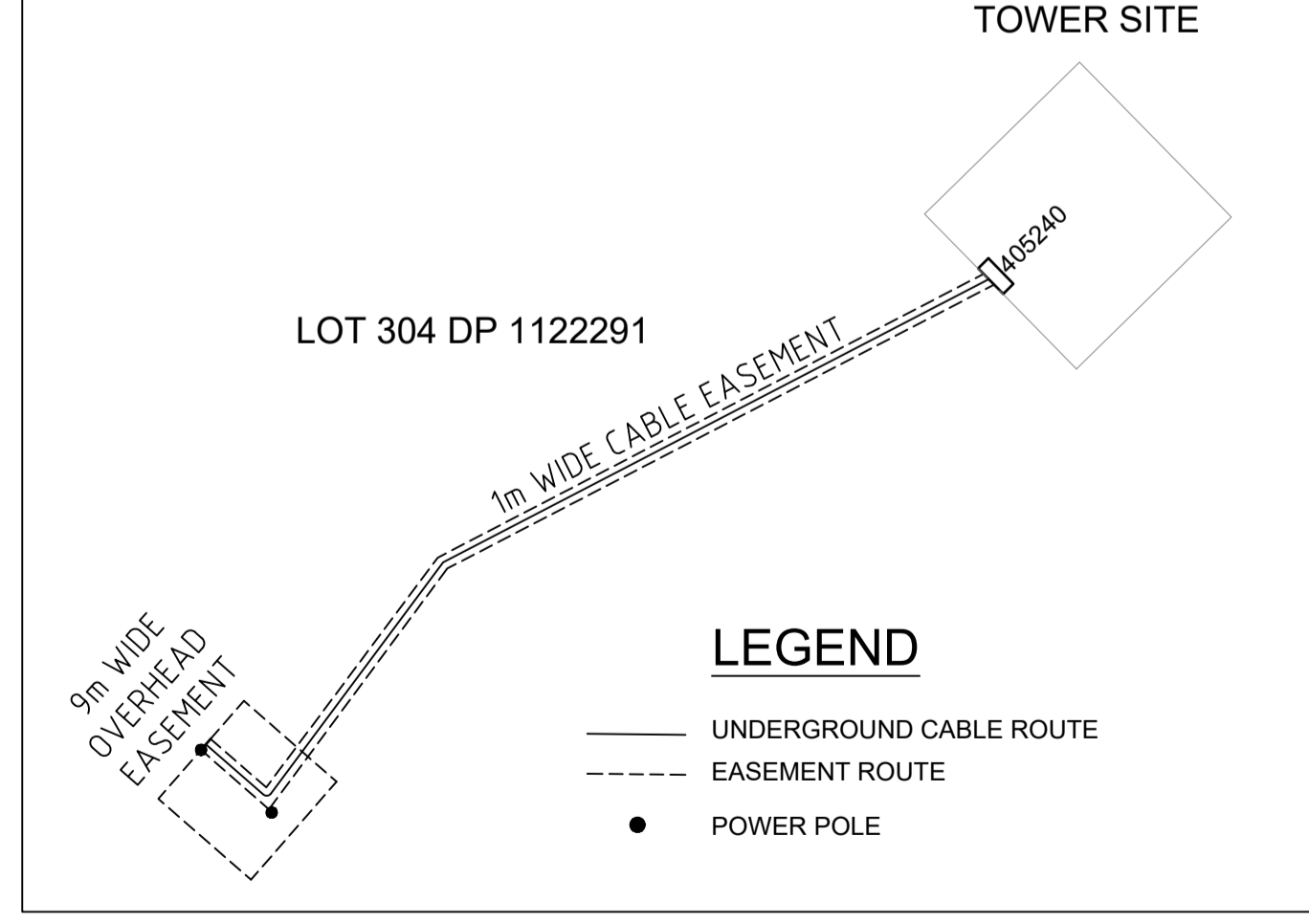
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OF: _____
CONTACT No.: _____

HEREBY CERTIFY THAT ASSETS MARKED AS-BUILT ON THIS DRAWING HAVE BEEN RECORDED AS PER ENDEAVOUR ENERGY STANDARD SAD 0004.

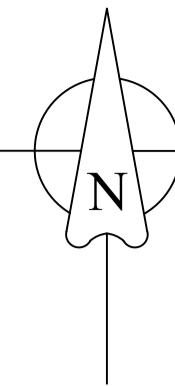
SIGNATURE: _____
DATE: _____

OH & UG EASEMENT DIAGRAM

NOT TO SCALE

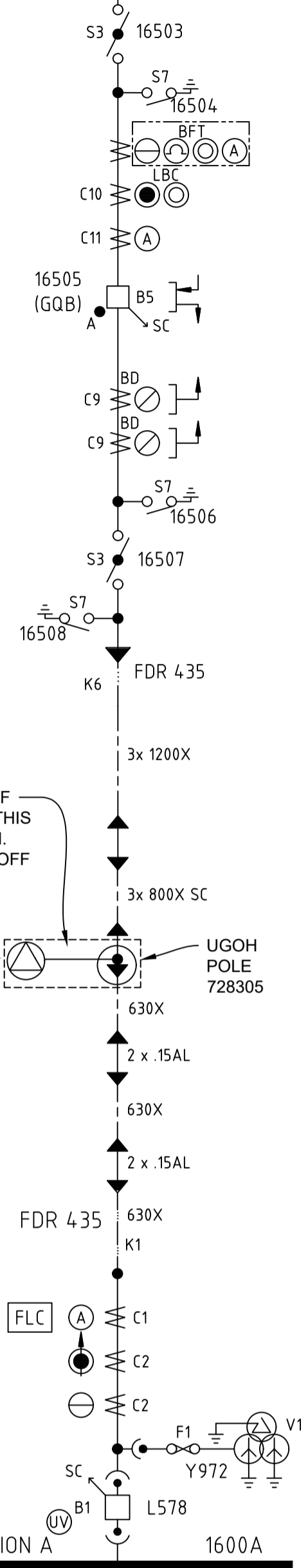


AMENDMENTS ORIGINAL ISSUE DRAFT No. 01	FOR CONSTRUCTION	TEMPLATE VERSION No. 5.20 <small>THIS DRAWING AND THE COPYRIGHT THEREIN IS THE PROPERTY OF ENDEAVOUR ENERGY AND MAY NOT BE COPIED, REPRODUCED, DISTRIBUTED, LOANED OR USED WITHOUT THE WRITTEN CONSENT OF ENDEAVOUR ENERGY</small>	REFERENCE DRAWING'S	WORK ORDERS	CAMS File No.	ORIGINAL SCALE 1:500	DO NOT SCALE DIMENSIONS IN METRES	WILLIAM LAWSON DRIVE PROSPECT NCC-000742-001 ESTABLISH POLE MOUNTED SUBSTATION HUNTINGWOOD COMMS TOWER RELOCATION	Endeavour Energy																				
			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>													<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>									<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>				



33kV FDR 435 LLD
NTS

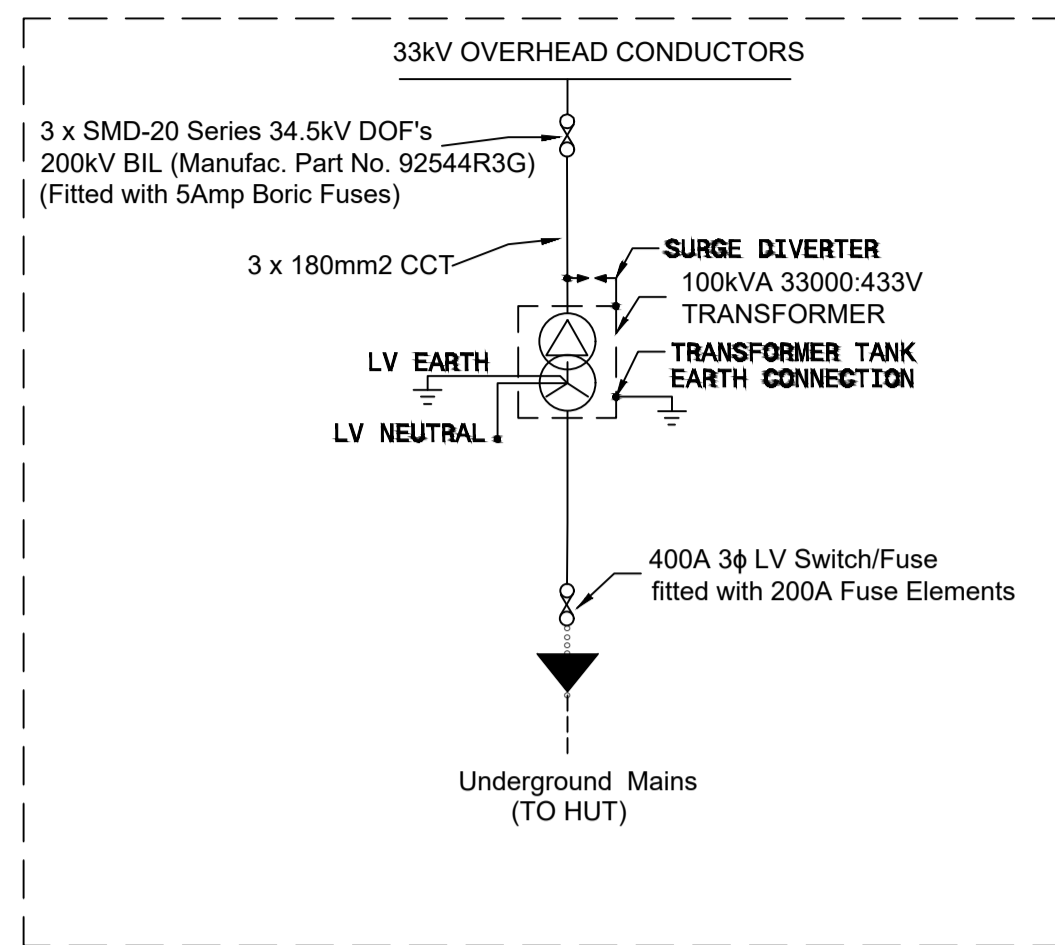
BLACKTOWN TS 33kV
BUS SECTION 3



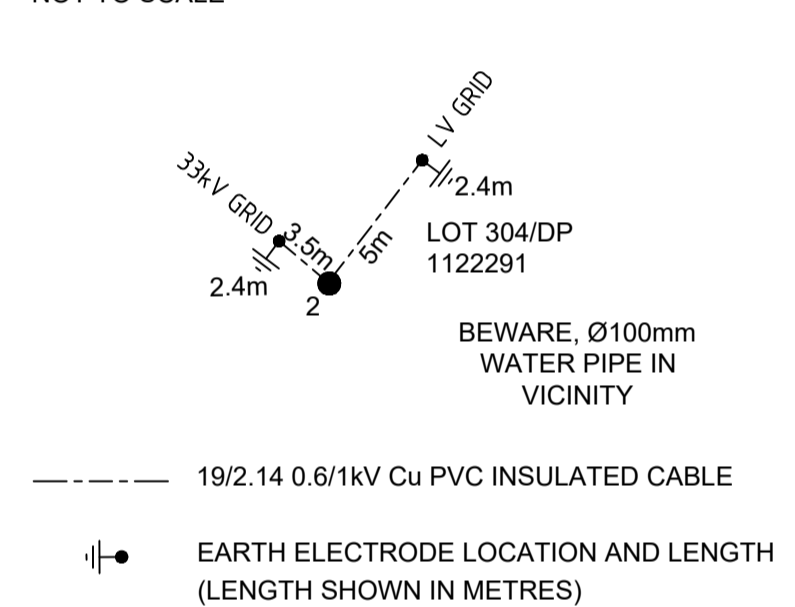
SCOPE OF WORKS IN THIS SECTION
7/4.5AAC T-OFF TO SUB
NEW POLE SUB 96001

BOSSLEY PARK ZS
33kV
BUS SECTION A

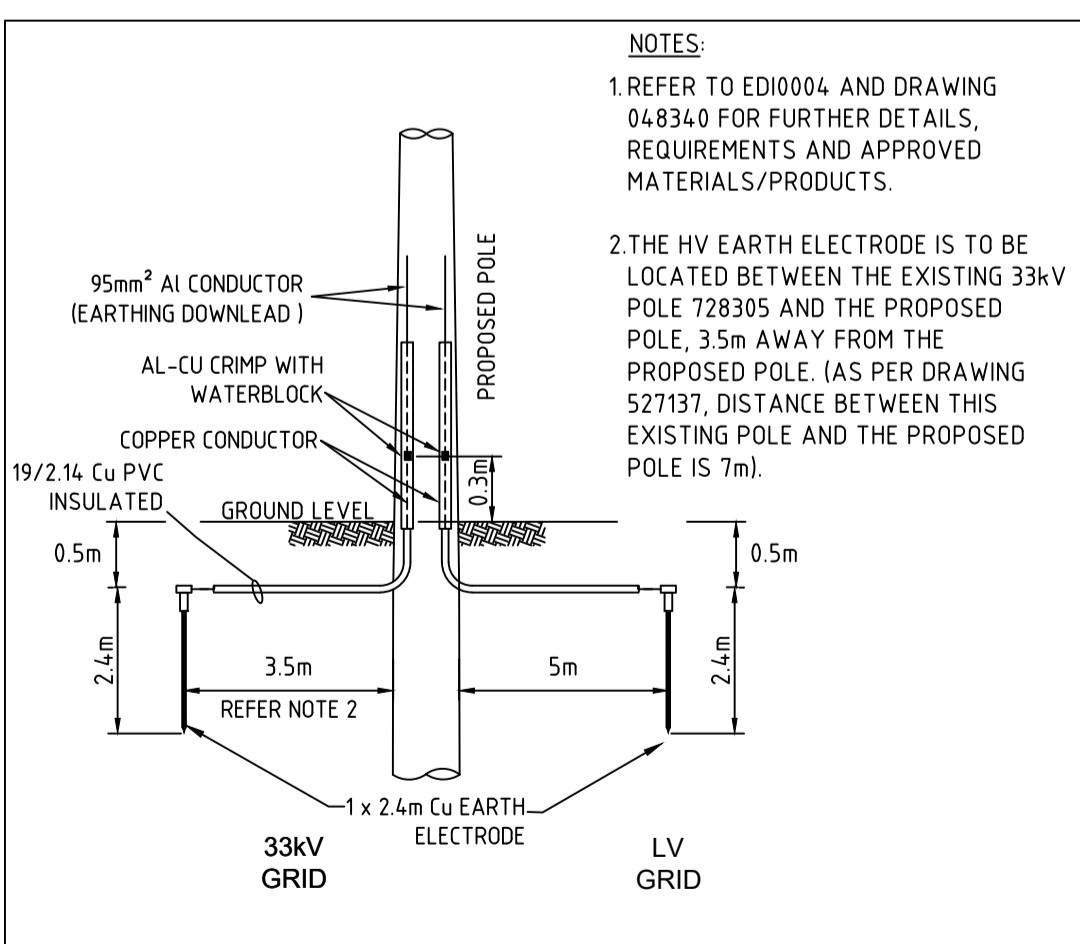
Pole Substation Single Line Diagram



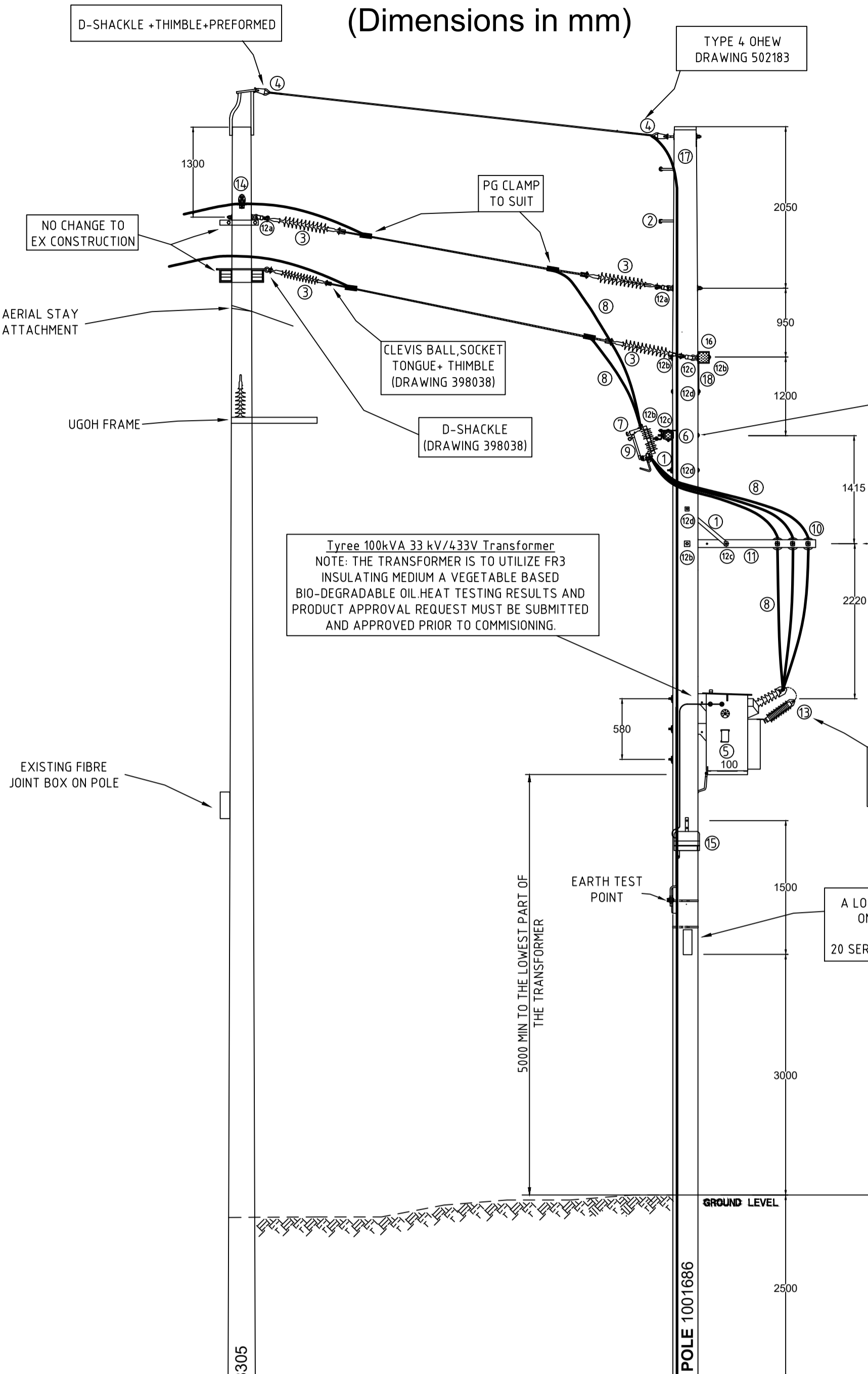
EARTHING PLAN POLE '2'
NOT TO SCALE



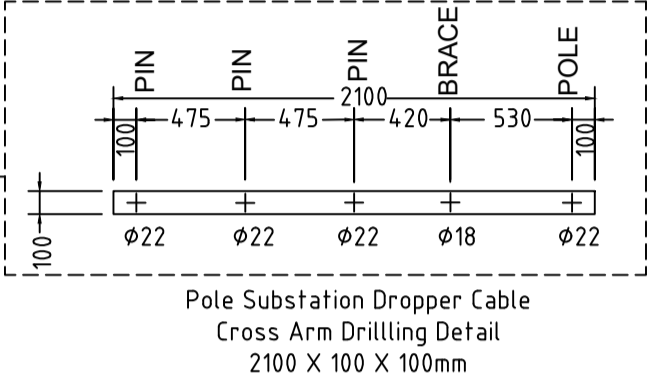
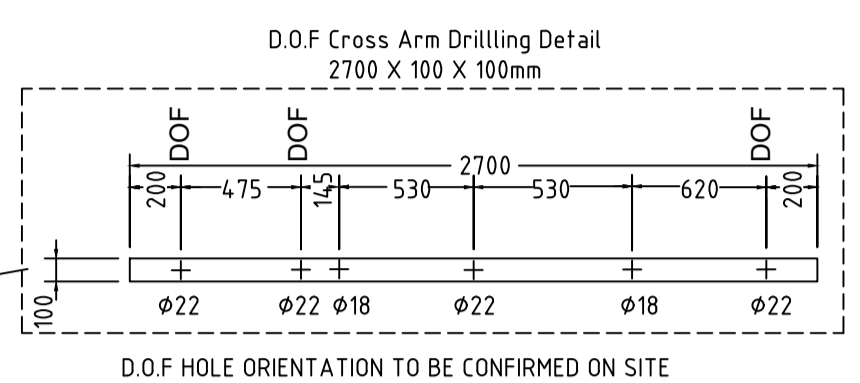
SEPARATE EARTH ROD LAYOUT (INDICATIVE)
NOT TO SCALE



Side Elevation- NTS
(Dimensions in mm)



Note
A MINIMUM OF 380mm MUST BE MAINTAINED BETWEEN ALL EXPOSED ACTIVE COMPONENTS AND EARTHED PARTS OF THE POLE OR STRUCTURE MEASURED TO THE CLOSEST POINT AS PER MDI0031 TABLE 17 5.4.2 TO PREVENT FLASHOVER



Tyree 100kVA 33 kV/433V Transformer
NOTE: THE TRANSFORMER IS TO UTILIZE FR3 INSULATING MEDIUM A VEGETABLE BASED BIO-DEGRADABLE OIL HEAT TESTING RESULTS AND PRODUCT APPROVAL REQUEST MUST BE SUBMITTED AND APPROVED PRIOR TO COMMISSIONING.

MODIFICATIONS REQUIRED FOR THE S.A BRACKET TO SUIT ON POLE & THE BASE TO BE REMOVED.

A LOCKABLE BOX IS TO BE MOUNTED ON POLE 3.0m ABOVE GROUND CONTAINING THE 3 SPARE 20 SERIES 5AMP FUSE LINK CARTRIDGES

SUBSTATION SEPARATE EARTHING DETAIL
SCALE: NTS

HV EARTHING DETAILS			
Soil Resistivity	Layer 1	11.52	Depth (m)
	Layer 2	144.95	∞
Designed Earth Resistance Limit (Ohm)			4-10
Measured Earth Resistance (Ohm)			
Number of Electrodes			1
Insulated Depth (m)			0.5
Length of Bare Electrode (m)			2.4
Connector Type (CAD or Crimp)			Crimp
Location Category: F- Frequented, R-Remote, S-Sp			Re mote
What Design Tool Used?			CDEGS
Fault Level (kA)			7.33
LV EARTHING DETAILS			
Designed Maximum Earth Resistance (Ohm)			4-10
Measured Earth Resistance (Ohm)			
Number of Electrodes			1
Length of Bare Electrode (m)			2.4
Connector Type (CAD or Crimp)			Crimp

HV EARTH MINIMUM SEPARATION (m)				
	Design	Actual	Design	Actual
TD/MEN	5		Telecom	90
TDB	4		Pipes	5
TDU	3.5		HV-LV	5

Components in Addition to Standards Pole Substation

ITEM	PART No.	DWG No	DESCRIPTION	QUANTITY
1	SB14.34.2	011962	BRACE CROSSARM (750mm x 6mm)	3
2	1561802	370399	POLE STEP	A/R
3	ALR002	398038	INSULATOR LONG ROD ASSEMBLY	6
4	-	502183	OHEW ASSEMBLY TYPE 4	2
5	-	-	33kV/433V POLE MOUNTED TRANSFORMER (100kVA)	1
6	-	-	TIMBER CROSSARM 2700X100X100mm (UNDRILLED)	1
7	1000002154	-	S&C 20 SERIES DOF'S PART NO. 92544R3G	3
8	11000001028	-	WIRE, 7/4.75 CCT, 120MM2, GREY, 6.35/11KV	A/R
9	1000002265	20 SERIES	FUSE ELEMENT 5A (PART NO. 614.006) "INCLUDES 3 SPARES"	6
10	1014559/1017639	015366C	33kV PIN INSULATOR & PIN	3/3
11	-	-	TIMBER CROSSARM 2100X100X100mm (UNDRILLED)	1
12a	ATP007	054798	M20 EYEBOLT ASSEMBLY FOR POLE	2
12b	ATP009	054798	M20 EYEBOLT ASSEMBLY FOR CROSSARM	3
12c	ATP010	054798	M16 BOLT ASSEMBLY FOR CROSSARM BRACE	5
12d	ATP011	054798	M16 COACH SCREW ASSEMBLY FOR CROSSARM BRACE	3
13	1550516		33KV SURGE ARRESTER	3
14	ALP004	398035	66kV POST INSULATOR	1
15	1548841/1143866	332001	400A 3 φ LV SWITCH FUSE F/W 3 x 200A FUSE ELEMENTS	1/3
16	SC14.819	052796	CROSSARM TYPE C3 STEEL RHS 152x 152 x 3000 LG	1
17	6000000197		POLE - WOOD IMPREGNATED 17m/12kN	1
18	1018620	054790	BRACE CROSSARM 915 LG	2

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 WORKS COMPLETED: _____
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 SIGNATURE: _____
 DATE: _____

VEGETATION MANAGEMENT PLAN

**Prospect Reservoir
Endeavour Energy Communications Tower**

January 2023.

**Prepared for Endeavour Energy by
Roger Lembit B.Sc.Agr
Gingra Ecological Surveys**

**Gingra Ecological Surveys
P.O. Box 1
Canterbury NSW 2193**

1. INTRODUCTION

Endeavour Energy is planning construct a communications tower within the Prospect Reservoir precinct. The precinct has heritage significance, and a Visual Impact Assessment (VIA) has been completed in response to a submission by the NSW Heritage Council. Following consideration of the VIA the Heritage Council have requested the preparation of a Vegetation Rehabilitation Strategy. As this report identifies bush regeneration and tree planting options it was considered that titling it as a Vegetation Management Plan was more appropriate.

The VIA indicated that existing vegetation would mitigate the visual impact of tower construction to a large degree. Endeavour Energy now wish to develop a Vegetation Management Plan (VMP) to identify measures such as plantings or bush regeneration which can be undertaken to further reduce the visual impact of the proposal and to protect the heritage landscape.

The objectives of this VMP are:

- The establishment of an Asset Protection Zone (APZ) by the selective removal of vegetation components in a manner that is consistent with Rural Fire Service (RFS) requirements;
- Management of vegetation to allow for native trees in sightlines to mature and attain a height which will mitigate visual impact;
- Selective planting of appropriate tree species to reduce visual impact at key viewing locations, and;
- The retention of vegetation and trees that contribute to wildlife corridors and provide habitat for native fauna.

2. PLANNING CONTEXT

The proposal takes place at a site with a complex layer of interests. The land on which the tower is to be constructed is managed by Sydney Water which operate Prospect Reservoir. Management of land within the Prospect Reservoir precinct is subject to the Property Environmental Management Plan (PEMP) Prospect Reservoir, Reservoir Road WS0095 (Sydney Water 2001). The PEMP deals with the Reservoir lands in different sections. The sites discussed in this VMP include parts of the areas identified as the southern and eastern sides.

The following planning instruments are relevant to the subject area:

- Blacktown Local Environmental Plan 2015
- State Environmental Planning Policy (Western Sydney Employment Area) 2009 (SEPP (WSEA))
- State Environmental Planning Policy (Western Sydney Parklands) 2009 (SEPP (WSP))

Prospect Reservoir Site and associated works is one of the 59 assets owned by Sydney Water Corporation that is listed on the State Heritage Register. Sydney Water commissioned the preparation of a Conservation Management Plans (CMP) which was completed in 2005 and then approved by NSW Heritage in 2006 (Sydney Water Corporation 2005).

As indicated above NSW Heritage have expressed concerns relating to the visual impact of the proposed 60 m high communications tower. Endeavour Energy responded to this by commissioning a Visual Impact Assessment (EMM 2022).

This VMP seeks to ensure any proposed vegetation management is consistent with the PEMP and to ensure any planting scheme has regard to the CMP and additional elements of heritage significance such as historic plantings which are associated with key themes identified in the CMP. A meeting was held with Sydney Water staff during the preparation of this VMP and elements of the meeting discussion have been incorporated in the approach adopted in this report.

3. SITE DESCRIPTION

The site for construction of the communications tower is on a high ridge near the top of Prospect Hill and close to the eastern boundary of the Prospect Reservoir lands. The site is to the south of existing water reservoirs. To the east is the former quarry, now being redeveloped. Access to the site is via William Lawson Drive, which is also the access road for Sydney Water staff and members of the public using facilities provided with the Prospect Reservoir lands including picnic areas and lookouts.

The land is gently inclined along the ridge crest, dropping more steeply to the west towards William Lawson Drive.

The eastern side of the Prospect Hill ridge drains into Girraween Creek, a tributary of Toongabbie Creek and the Parramatta River. Western Slopes are in the catchment of Prospect Reservoir, an artificial impoundment in the head catchment of Prospect Creek, a tributary of the Georges River.

Whilst the majority of the Prospect Reservoir lands are within the Blacktown soil landscape, Prospect Hill is mapped as being within the Volcanic soil landscape (Hazelton, Bannerman & Tillie 1989). The Volcanic soil landscape features red podzolic soils associated with the Jurassic dolerite intrusion found at Prospect (Australian Museum 2018).

Whilst the primary function of the Prospect Reservoir lands is as an intermediate water storage fed by pipes and canals from Warragamba Dam and the Metropolitan catchments, the lands also serve as a workplace and recreational site.

The areas of land subject to this VMP fall within the Blacktown local government area. The land lies within the Central Coast botanical subdivision.

3.1 Existing Vegetation and Habitat

Vegetation patterns across the Prospect Reservoir lands have been mapped by Total Earth Care (2018).

The vicinity of the tower location includes areas classed as Native/Exotic Grassland and Exotic Shrubland. These vegetation classes appear to also include stands of native trees with a disturbed understorey. Tree species include Forest Red Gum (*Eucalyptus tereticornis*), Coastal Grey Box (*E. moluccana*) and Narrow-leaved Ironbark (*E. crebra*). The dominant exotic shrubs are Large-leaved Privet (*Ligustrum lucidum*), African Olive (*Olea europaea* subsp. *cuspidata*) and Lantana (*Lantana camara*).

The PEMP divides the Prospect Reservoir lands into a set of management zones. The vicinity of the communications tower is classed as Zone W Weed Management as is the entrance precinct along William Lawson Drive.

4. VEGETATION MANAGEMENT OPTIONS

The strategy for reduced visual impact of the communications tower is to provide conditions conducive to the growth and survival of native trees in the vicinity of the tower in order that they increase in height, together with selective plantings to screen the tower from viewing points.

A number of viewing points were assessed to allow consideration of vegetation management options which would address visual impact. These included the entrance along William Lawson Drive, the tower location itself and the Prospect Hill ridgeline, William Lawson Drive near the Sydney Water Offices, the Valve House and Maunder Lookout and the associated picnic area. Options for vegetation management are discussed below. A plan identifying preferred locations is included as Figure 1.



Figure 1. Vegetation Management locations

Tower Location

The vegetation in this area includes native tree species and exotic shrubs and grasses.

The preferred management of this area is implementation of bush regeneration works to remove exotic shrubs which are competing with the native tree species.

This management approach is consistent with the PEMP.

A separate bushfire management report is recommending the creation of a 10 m radius Asset Protection Zone (APZ) around the edge of the fenced tower footprint. Achievement of this APZ is possible through selective removal of exotic shrubs. Lopping of branches of native trees may also be necessary to achieve crown separation. A small dead eucalypt tree to the south-west of the tower is recommended for removal. The tree should be laid on the ground across not down the slope to provide habitat.

Sightline from South

Figure 2 shows that there is a gap in tree cover when viewing the tower location from the south.



Figure 2. View of tower location from northern end of Maunder Lookout car park

This gap can be filled by planting of up to 10 trees in the somewhat more clear area seen in the centre of Figure 2. The tree species to be used would be Forest Red Gum (*E. tereticornis*) and Coastal Grey Box (*E. moluccana*). Stock in 15 to 20 cm pots is recommended as these are likely to have a higher survival rate than advanced stock.

Supplementary planting of up to 50 Cumberland Plain Woodland Shrubs is recommended in this area. The shrub species to be used are Hop Bush (*Dodonaea viscosa* subsp. *cuneata*), Native Indigo (*Indigofera australis*) and Sickle Wattle (*Acacia falcata*).

These plantings would need protection to prevent damage from browsing animals. It is also recommended the area around the plantings be periodically mown or slashed to reduce competition. The plantings should be maintained for five years.

Sightlines from West

Consideration was given to potential for screening of the tower from the area around the Sydney Water offices along William Lawson Drive (see Figure 3). Such an approach was not considered appropriate as the lower area has historically been cleared and there are utilities in the area including water pipelines and electricity supply lines.



Figure 3. View of tower location from vicinity of Sydney Water offices

Another potential viewing point assessed was the Valve House area. It was determined that existing vegetation and the intervening landform provided effective screening from this location (Figure 4).



Figure 4. View towards tower location from Valve House

William Lawson Drive

Whilst views of the tower from William Lawson Drive in the vicinity of Andrew Campbell Reserve are not likely to be of high impact planting along the eastern side of the Drive is proposed. Consideration was given to an extension to the existing Hoop Pine avenue, consistent with the historic nature of the avenue. An aerial photograph from January 1956 shows that the avenue then extended to a point north-east of a house on the western side of William Lawson Drive (Figure 5). It is not considered appropriate to extend planting of Hoop Pine beyond the limit seen in the historic evidence, but replacement of trees which have died along the historic section could be undertaken.



Figure 5. Northern end, William Lawson Drive 1/1/1956

Figure 5 shows additional plantings along William Lawson Drive to a point opposite Prospect History Cottage, including what is now a large Lemon-scented Gum (*E. citriodora*). In the early 1980s secondary plants occurring to the east of the Drive in two rows using species including Hoop Pine and Monterey Pine (Figure 6). Some of the Monterey Pines have now died, possibly due to the 2018-19 drought. Hoop Pine saplings have now established as a tertiary tree layer along the rows in the north.

It is proposed to undertake infill planting along the two rows of trees, avoiding infrastructure such as a water main, electricity supply line, fencing and an access way to the paddock. The area may be prone to saturated soil profiles during wet conditions so careful tree species selection may be required.

Suitable local native tree species would include Spotted Gum (*Corymbia maculata*), Forest Red Gum (*E. tereticornis*) and Cabbage Gum. Additional planting of Lemon-scented Gum is not recommended as this species seeds readily and has the potential to become a future management problem.



Figure 6. Eastern side of William Lawson Drive

5. RECOMMENDED MANAGEMENT

This section includes a summary of the management actions proposed for this Vegetation Management Plan. Action and timing seeks to align with actions in Table 4-1 of the PEMP. Works may be undertaken by Endeavour Energy or outsourced and incorporated in a site wide vegetation management plan subject to agreement with Sydney Water and subject to the discussion and recommended actions in this Plan.

Location	Action	Timing
Vicinity of Tower	Establishment of APZ	Within 3 months of tower construction
	Bush regeneration ¹	5 years from construction completion
Ridgeline to south of Tower	Tree planting & protection	Spring 2023
	Mowing/slashing	Monthly from September – March 2023-2028
William Lawson Drive ²	Infill tree planting	Spring 2023, annual assessment of planting success in spring

NOTES

- 1 Contribute to Sydney Water bush regeneration works subject to agreement between Endeavour Energy & Sydney Water
- 2 Section between Andrew Campbell Reserve and Prospect Heritage Cottage (eastern side)

REFERENCES

- Australian Museum (2018) *The Sydney Basin. Igneous Activity*. website
<https://australian.museum/learn/minerals/shaping-earth/the-sydney-basin/> accessed
26/01/2023.
- EMM Consulting (2022) *Visual Impact Assessment for Heritage Council of NSW. 60m
Communications Tower, Prospect Reservoir*. Endeavour Energy, Minchinbury.
- Rural Fire Service (2019) *Planning for Bushfire Protection*.
- Sydney Water Corporation (2005) *Prospect Reservoir Site. Conservation Management Plan*.
Sydney Water, Sydney.
- Sydney Water (2021) *Property Environmental Management Plan (PEMP) Prospect Reservoir,
Reservoir Road WS0095*. Sydney Water, Sydney.
- Total Earth Care (2018) *Biodiversity Assessment – Prospect Reservoir*. Total Earth Care,
Warriewood.

Roweena Dsouza

From: Rhonda Tang <RHONDA.TANG@sydneywater.com.au>
Sent: Monday, 30 January 2023 2:47 PM
To: Phil Bennett; Roweena Dsouza; Nick Stroinovsky
Cc: gingra@ozemail.com.au
Subject: RE: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

Hi Roweena

I also have no issues with the proposal from the property environmental management perspective. I am satisfied that your plans have taken into account the environmental and heritage values discussed with Nick and Phil. I suggest that you note in your VMP that the plantings may be “outsourced” and incorporated in a site wide vegetation management plan, but will be in keeping with your main objectives.

We still need to consult with SW Property Leasing about impacts to the access of the grassed area (opposite the cottage), which they have been known to lease out. From our experience, it’s unlikely to be a big issue, they may ask for plantings to be excluded from a small corridor or from the tops of unmarked pipes.

SW Property Management will also need to be consulted to discuss with you on APZ issues. Hence I’ve made some corrections to the dot point on:

- APZ maintenance – Similarly, SW have an APZ management area that they are required to maintain. Rhonda will consult SW Property Management on the proposed towers APZ, to understand the interaction of Lease areas with SW APZ. SW to clarify extent and maintenance and get back to Endeavour for discussion.

Other corrections:

- Planting near eastern edge of William Lawson Drive:
EE recommended planting of Hoop Pine in the gap between the Pine trees as shown in the image. SW advises that we need to demarcate Heritage trees from the new plantings. SW advice to plant native, fast growing trees with potential to bear hollows/become habitat trees in the future along the William Lawson Drive proposed planting area. This would assist with quicker screening for the visual aspect and also in the long term contribute to wildlife corridors and provide habitat for native fauna.
- The plantings should be placed more than 5 m away from the roadside, and avoid infrastructure such as a water main, fencing and any access gates

I don’t think any of these comments will affect your submission, if you think otherwise, or would like further clarification feel free to call me.

Regards

Rhonda Tang

Project Manager – Property Environmental
Management Plans (PEMP) Program
Property Services, Asset Lifecycle

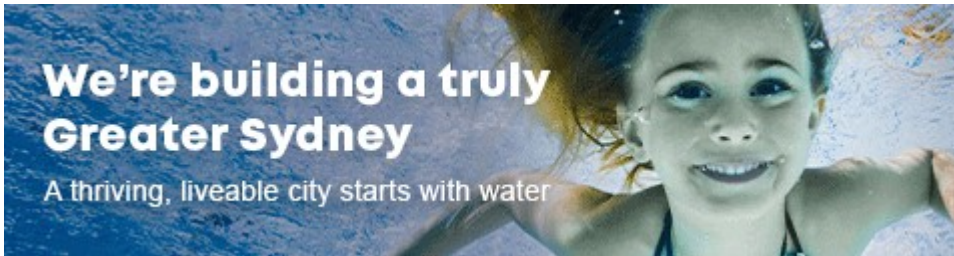
Mobile 0438 687 681

Rhonda.Tang@sydneywater.com.au

“If I had more time, I would have written a shorter letter.”

Level 10, 1 Smith Street
Parramatta NSW 2150

Sydney
W A T



Sydney Water respectfully acknowledges the land and waters on which we work with respect to Elders past and present



From: Phil Bennett <PHIL.BENNETT@sydneywater.com.au>

Sent: Monday, 30 January 2023 1:10 PM

To: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>; Rhonda Tang <RHONDA.TANG@sydneywater.com.au>; Nick Stroinovskiy <Nick.Stroinovskiy@sydneywater.com.au>

Cc: gingra@ozemail.com.au

Subject: RE: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

Hi Rowena

I am happy with the landscape outcomes.

No other comments.

Accepted.

Thanks

Phil Bennett
Lead Heritage Adviser
Environment & Heritage

0407 455 937
philip.bennett@sydneywater.com.au

From: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>

Sent: Monday, 30 January 2023 12:28 PM

To: Rhonda Tang <RHONDA.TANG@sydneywater.com.au>; Phil Bennett <PHIL.BENNETT@sydneywater.com.au>; Nick Stroinovskiy <Nick.Stroinovskiy@sydneywater.com.au>

Cc: Phil Bennett <PHIL.BENNETT@sydneywater.com.au>; gingra@ozemail.com.au

Subject: RE: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

Hi,

@'Rhonda Tang', thanks for your quick response and initial comment.

Rhonda and Phil,

Could you let me know if there are any further comments/clarifications that you would like us to address? If not, Roger can send through the final version for your review and approval and I shall notify Nick once you both have approved (I understand he is on leave today).

Once HNSW give their approval, I shall organise a meeting between key stakeholders from Endeavour and Sydney Water so we can nut out the commercial aspects and the arrangements to carry out the works.

Regards
Row

From: gingra@ozemail.com.au <gingra@ozemail.com.au>
Sent: Monday, 30 January 2023 10:38 AM
To: 'Rhonda Tang' <RHONDA.TANG@sydneywater.com.au>; Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>; 'Phil Bennett' <PHIL.BENNETT@sydneywater.com.au>; 'Nick Stroinovsky' <Nick.Stroinovsky@sydneywater.com.au>
Cc: 'Phil Bennett' <PHIL.BENNETT@sydneywater.com.au>
Subject: RE: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

Hi,
The implication is infill of the 1980s treelines, rather than new planting.
There is no need to worry about access, as access to the paddock is provided by Gate 2, and you just need to locate plantings away from this line.
Tree spacing in the existing lines is about 9 m,
for the Hoop Pines its about 11 m, was probably 12 yards.

Just a change in wording.

Regards,
Roger.

Roger Lembit B.Sc.Agr
Principal Ecologist
Gingra Ecological Surveys
P.O. Box 1
Canterbury NSW 2193
gingra@ozemail.com.au
0427 779925

From: Rhonda Tang <RHONDA.TANG@sydneywater.com.au>
Sent: Monday, 30 January 2023 10:32 AM
To: gingra@ozemail.com.au; 'Roweena Dsouza' <Roweena.Dsouza@endeavourenergy.com.au>; Phil Bennett <PHIL.BENNETT@sydneywater.com.au>; Nick Stroinovsky <Nick.Stroinovsky@sydneywater.com.au>
Cc: Phil Bennett <PHIL.BENNETT@sydneywater.com.au>
Subject: RE: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

I hope you all had a great weekend =)

Thanks for sharing your insights Roger, and I also enjoy getting information from a good aerial.

Do you think there might be any changes to the approach forward, compared to what we had discussed last week?

Regards

Rhonda Tang

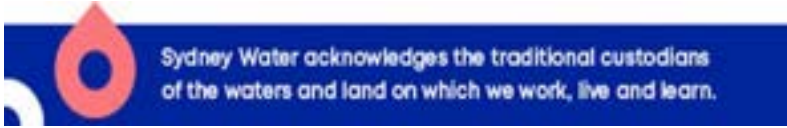
Asset Lifecycle

Sydney Water, 1 Smith Street, Parramatta NSW 2150



Mobile 0438 687 681

rhonda.tang@sydneywater.com.au



From: gingra@ozemail.com.au <gingra@ozemail.com.au>

Sent: Monday, 30 January 2023 8:02 AM

To: 'Roweena Dsouza' <Roweena.Dsouza@endeavourenergy.com.au>; Phil Bennett <PHIL.BENNETT@sydneywater.com.au>; Nick Stroinovsky <Nick.Stroinovsky@sydneywater.com.au>; Rhonda Tang <RHONDA.TANG@sydneywater.com.au>

Cc: Phil Bennett <PHIL.BENNETT@sydneywater.com.au>

Subject: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

CAUTION: This email originated from outside the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Hi,

I've done some further work over the weekend I thought I should share.

I had a look at the area along William Lawson Drive, from the Hoop Pine avenue southwards.

Many of the trees beyond (east) of the fence are plantings in a double row. There are also younger trees which have regenerated more recently. The main plantings appear to be Radiata Pine and Hoop Pine. There are also sapling Lemon-scented Gum and a number of Spotted Gum trees.

Lemon-scented Gum were commonly planted in western Sydney in the 1970s, examples are at St Marys and Mawson Park at Campbelltown.

The attached aerial photograph from the NSW Government Historical Imagery webpages seems to be the first in the time sequence which shows planting in this area.

I will be amending the wording relevant to this area to reflect this.

Regards,
Roger.

Roger Lembit B.Sc.Agr
Principal Ecologist
Gingra Ecological Surveys
P.O. Box 1

Canterbury NSW 2193
gingra@ozemail.com.au
0427 779925

From: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>
Sent: Friday, 27 January 2023 4:45 PM
To: PHILIP.BENNETT@sydneywater.com.au; gingra@ozemail.com.au; nick.stroinovsky@sydneywater.com.au;
Rhonda Tang <RHONDA.TANG@sydneywater.com.au>
Cc: Phil Bennett <PHIL.BENNETT@sydneywater.com.au>
Subject: RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

Hi All,

Thank you for meeting with us on the 24th January.

Key notes from the meeting:

Aim: To discuss the draft Veg Management Plan at Prospect Reservoir with Sydney Water and determine their requirements and address any concerns.

Attendees:

- Roweena D'Souza – Environmental Specialist, Endeavour Energy
- Roger Lembit – Ecologist, Gingra Ecological Surveys
- Rhonda Tang – Project Manager – Property Environmental Management Plans (PEMP) Program, Sydney Water
- Philip Bennett – Heritage Advisor, Sydney Water
- Nikolai Stroïnovsky - Lead Environmental Advisor, Customer Delivery, Sydney Water

Notes and action items:

- Endeavour Energy discussed the draft Veg Mgmt Plan with Sydney Water (SW) and advised that this plan was developed to compliment SW PEMP and the CMP.
- Planting near eastern edge of William Lawson Drive:
EE recommended planting of Hoop Pine in the gap between the Pine trees as shown in the image. SW advises that we need to demarcate Heritage trees from the new plantings. SW advice to plant native, fast growing trees with potential to bear hollows in the future along the William Lawson Drive proposed planting area. This would assist with quicker screening for the visual aspect and also in the long term contribute to wildlife corridors and provide habitat for native fauna.
- The plantings should be placed more than 5 m away from the roadside to avoid infrastructure such as a water main, fencing and any access gates
- Endeavour Energy advised that they might need to create an Asset Protection Zone for bushfire protection. This would involve clearing 10m ground cover around the proposed Telco infrastructure (which is composed of weeds such as African Olives, Privet, Lantana), lopping of branches of native trees to achieve crown separation and the removal of a small dead eucalypt tree to the south-west of the tower. SW advise they have no objection as long as they trees are not hollow bearing and the dead tree is laid on the ground across not down the slope to provide habitat.
- Sightline from South - there is a gap in tree cover when viewing the tower location from the south. EE advise that this gap can be filled by planting a few trees in a clear area and away from the overhead main easement. These plantings would need protection to prevent damage from browsing animals. It is also recommended the area around the plantings be mown or slashed to reduce competition. The plantings should be maintained for five years. SW agree and recommend planting native trees in this area.
- Maintenance –EE proposed that they could pay SW a \$/m2 area requiring weed management until the plants establish themselves or as will be captured in the Veg Mgmt Plan. SW agreed that this could be a better option considering the contractors need to meet specific requirements and they have existing contractors that maintain the site on a regular basis. EE and SW agree to separately discuss maintenance of the above areas.
- APZ maintenance – Similarly, SW have an APZ management area that they are required to maintain. SW will look into updating this map as it doesn't include the SW water reservoirs that need APZ maintenance. It is

likely that proposed towers APZ will be a subset of the overall SW APZ. SW to clarify extent and maintenance and get back to Endeavour.

- Endeavour to clarify if it's a lease or licence and send SW a copy of the extent.
- Endeavour advise that the submission to HNSW is scheduled for 31st Jan and will submit a draft for SW review on 27th Jan.

Please let me know if I have missed any item or if there are any corrections.

Else this can be considered as the Minutes of the Meeting.

Thanks
Roweena

Post meeting –

- Endeavour have obtained an easement and will send over the documents on Monday 30th Jan.
- Endeavour submits the draft Veg Management Plan with this email for SW review.

-----Original Appointment-----

From: Roweena Dsouza

Sent: Tuesday, 24 January 2023 4:16 PM

To: Roweena Dsouza; philip.bennett@sydneywater.com.au; gingra@ozemail.com.au; nick.stroinovsky@sydneywater.com.au; Rhonda Tang

Cc: Phil Bennett

Subject: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

When: Wednesday, 25 January 2023 3:30 PM-4:15 PM (UTC+10:00) Canberra, Melbourne, Sydney.

Where: Microsoft Teams Meeting

Hi All,

Rescheduling to meet Rhondas availability.

Also, I have attached the proposed strategy below that we will discuss at the meeting.



Hi All,

Could we meet to discuss EE's proposal re the Veg Rehab Plan at Prospect Reservoir and its alignment with Sydney Water management plans.

Thanks
Row

Roweena D'Souza | Environmental Specialist

M 0447 919 365
51 Huntingwood Drive, Huntingwood NSW 2148.

Dharug Country

endeavourenergy.com.au |



Endeavour Energy respectfully acknowledges the Traditional Custodians on whose lands we live, work, and operate and their Elders past, present and emerging.

Microsoft Teams meeting

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Passcode: KrFWnv

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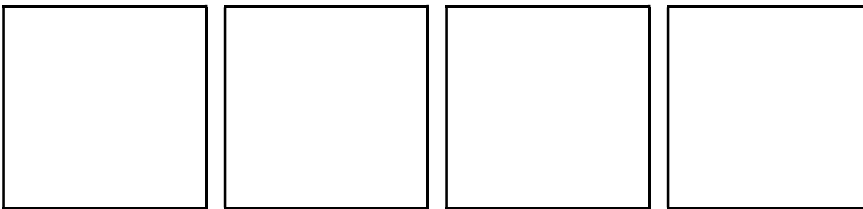
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VEGETATION MANAGEMENT PLAN

**Prospect Reservoir
Endeavour Energy Communications Tower**

January 2023.

**Prepared for Endeavour Energy by
Roger Lembit B.Sc.Agr
Gingra Ecological Surveys**

**Gingra Ecological Surveys
P.O. Box 1
Canterbury NSW 2193**

1. INTRODUCTION

Endeavour Energy is planning construct a communications tower within the Prospect Reservoir precinct. The precinct has heritage significance, and a Visual Impact Assessment (VIA) has been completed in response to a submission by the NSW Heritage Council. Following consideration of the VIA the Heritage Council have requested the preparation of a Vegetation Rehabilitation Strategy. As this report identifies bush regeneration and tree planting options it was considered that titling it as a Vegetation Management Plan was more appropriate.

The VIA indicated that existing vegetation would mitigate the visual impact of tower construction to a large degree. Endeavour Energy now wish to develop a Vegetation Management Plan (VMP) to identify measures such as plantings or bush regeneration which can be undertaken to further reduce the visual impact of the proposal and to protect the heritage landscape.

The objectives of this VMP are:

- The establishment of an Asset Protection Zone (APZ) by the selective removal of vegetation components in a manner that is consistent with Rural Fire Service (RFS) requirements;
- Management of vegetation to allow for native trees in sightlines to mature and attain a height which will mitigate visual impact;
- Selective planting of appropriate tree species to reduce visual impact at key viewing locations, and;
- The retention of vegetation and trees that contribute to wildlife corridors and provide habitat for native fauna.

2. PLANNING CONTEXT

The proposal takes place at a site with a complex layer of interests. The land on which the tower is to be constructed is managed by Sydney Water which operate Prospect Reservoir. Management of land within the Prospect Reservoir precinct is subject to the Property Environmental Management Plan (PEMP) Prospect Reservoir, Reservoir Road WS0095 (Sydney Water 2001). The PEMP deals with the Reservoir lands in different sections. The sites discussed in this VMP include parts of the areas identified as the southern and eastern sides.

The following planning instruments are relevant to the subject area:

- Blacktown Local Environmental Plan 2015
- State Environmental Planning Policy (Western Sydney Employment Area) 2009 (SEPP (WSEA))
- State Environmental Planning Policy (Western Sydney Parklands) 2009 (SEPP (WSP))

Prospect Reservoir Site and associated works is one of the 59 assets owned by Sydney Water Corporation that is listed on the State Heritage Register. Sydney Water commissioned the preparation of a Conservation Management Plans (CMP) which was completed in 2005 and then approved by NSW Heritage in 2006 (Sydney Water Corporation 2005).

As indicated above NSW Heritage have expressed concerns relating to the visual impact of the proposed 60 m high communications tower. Endeavour Energy responded to this by commissioning a Visual Impact Assessment (EMM 2022).

This VMP seeks to ensure any proposed vegetation management is consistent with the PEMP and to ensure any planting scheme has regard to the CMP and additional elements of heritage significance such as historic plantings which are associated with key themes identified in the CMP. A meeting was held with Sydney Water staff during the preparation of this VMP and elements of the meeting discussion have been incorporated in the approach adopted in this report.

3. SITE DESCRIPTION

The site for construction of the communications tower is on a high ridge near the top of Prospect Hill and close to the eastern boundary of the Prospect Reservoir lands. The site is to the south of existing water reservoirs. To the east is the former quarry, now being redeveloped. Access to the site is via William Lawson Drive, which is also the access road for Sydney Water staff and members of the public using facilities provided with the Prospect Reservoir lands including picnic areas and lookouts.

The land is gently inclined along the ridge crest, dropping more steeply to the west towards William Lawson Drive.

The eastern side of the Prospect Hill ridge drains into Girraween Creek, a tributary of Toongabbie Creek and the Parramatta River. Western Slopes are in the catchment of Prospect Reservoir, an artificial impoundment in the head catchment of Prospect Creek, a tributary of the Georges River.

Whilst the majority of the Prospect Reservoir lands are within the Blacktown soil landscape, Prospect Hill is mapped as being within the Volcanic soil landscape (Hazelton, Bannerman & Tillie 1989). The Volcanic soil landscape features red podzolic soils associated with the Jurassic dolerite intrusion found at Prospect (Australian Museum 2018).

Whilst the primary function of the Prospect Reservoir lands is as an intermediate water storage fed by pipes and canals from Warragamba Dam and the Metropolitan catchments, the lands also serve as a workplace and recreational site.

The areas of land subject to this VMP fall within the Blacktown local government area. The land lies within the Central Coast botanical subdivision.

3.1 Existing Vegetation and Habitat

Vegetation patterns across the Prospect Reservoir lands have been mapped by Total Earth Care (2018).

The vicinity of the tower location includes areas classed as Native/Exotic Grassland and Exotic Shrubland. These vegetation classes appear to also include stands of native trees with a disturbed understorey. Tree species include Forest Red Gum (*Eucalyptus tereticornis*), Coastal Grey Box (*E. moluccana*) and Narrow-leaved Ironbark (*E. crebra*). The dominant exotic shrubs are Large-leaved Privet (*Ligustrum lucidum*), African Olive (*Olea europaea* subsp. *cuspidata*) and Lantana (*Lantana camara*).

The PEMP divides the Prospect Reservoir lands into a set of management zones. The vicinity of the communications tower is classed as Zone W Weed Management as is the entrance precinct along William Lawson Drive.

4. VEGETATION MANAGEMENT OPTIONS

The strategy for reduced visual impact of the communications tower is to provide conditions conducive to the growth and survival of native trees in the vicinity of the tower in order that they increase in height, together with selective plantings to screen the tower from viewing points.

A number of viewing points were assessed to allow consideration of vegetation management options which would address visual impact. These included the entrance along William Lawson Drive, the tower location itself and the Prospect Hill ridgeline, William Lawson Drive near the Sydney Water Offices, the Valve House and Maunder Lookout and the associated picnic area. Options for vegetation management are discussed below. A plan identifying preferred locations is included as Figure 1.



Figure 1. Vegetation Management locations

Tower Location

The vegetation in this area includes native tree species and exotic shrubs and grasses.

The preferred management of this area is implementation of bush regeneration works to remove exotic shrubs which are competing with the native tree species.

This management approach is consistent with the PEMP.

A separate bushfire management report is recommending the creation of a 10 m radius Asset Protection Zone (APZ) around the edge of the fenced tower footprint. Achievement of this APZ is possible through selective removal of exotic shrubs. Lopping of branches of native trees may also be necessary to achieve crown separation. A small dead eucalypt tree to the south-west of the tower is recommended for removal. The tree should be laid on the ground across not down the slope to provide habitat.

Sightline from South

Figure 2 shows that there is a gap in tree cover when viewing the tower location from the south.



Figure 2. View of tower location from northern end of Maunder Lookout car park

This gap can be filled by planting of up to 10 trees in the somewhat more clear area seen in the centre of Figure 2. The tree species to be used would be Forest Red Gum (*E. tereticornis*) and Coastal Grey Box (*E. moluccana*). Stock in 15 to 20 cm pots is recommended as these are likely to have a higher survival rate than advanced stock.

Supplementary planting of up to 50 Cumberland Plain Woodland Shrubs is recommended in this area. The shrub species to be used are Hop Bush (*Dodonaea viscosa* subsp. *cuneata*), Native Indigo (*Indigofera australis*) and Sickle Wattle (*Acacia falcata*).

These plantings would need protection to prevent damage from browsing animals. It is also recommended the area around the plantings be periodically mown or slashed to reduce competition. The plantings should be maintained for five years.

Sightlines from West

Consideration was given to potential for screening of the tower from the area around the Sydney Water offices along William Lawson Drive (see Figure 3). Such an approach was not considered appropriate as the lower area has historically been cleared and there are utilities in the area including water pipelines and electricity supply lines.



Figure 3. View of tower location from vicinity of Sydney Water offices

Another potential viewing point assessed was the Valve House area. It was determined that existing vegetation and the intervening landform provided effective screening from this location (Figure 4).



Figure 4. View towards tower location from Valve House

William Lawson Drive

Whilst views of the tower from William Lawson Drive in the vicinity of Andrew Campbell Reserve are not likely to be of high impact planting along the eastern side of the Drive is proposed. Consideration was given to an extension to the existing Hoop Pine avenue, consistent with the historic nature of the avenue. An aerial photograph from January 1956 shows that the avenue then extended to a point north-east of a house on the western side of William Lawson Drive (Figure 5). It is not considered appropriate to extend planting of Hoop Pine beyond the limit seen in the historic evidence, but replacement of trees which have died along the historic section could be undertaken.



Figure 5. Northern end, William Lawson Drive 1/1/1956

Figure 5 shows additional plantings along William Lawson Drive to a point opposite Prospect History Cottage, including what is now a large Lemon-scented Gum (*E. citriodora*). In the early 1980s secondary plants occurring to the east of the Drive in two rows using species including Hoop Pine and Monterey Pine (Figure 6). Some of the Monterey Pines have now died, possibly due to the 2018-19 drought. Hoop Pine saplings have now established as a tertiary tree layer along the rows in the north.

It is proposed to undertake infill planting along the two rows of trees, avoiding infrastructure such as a water main, electricity supply line, fencing and an access way to the paddock. The area may be prone to saturated soil profiles during wet conditions so careful tree species selection may be required.

Suitable local native tree species would include Spotted Gum (*Corymbia maculata*), Forest Red Gum (*E. tereticornis*) and Cabbage Gum. Additional planting of Lemon-scented Gum is not recommended as this species seeds readily and has the potential to become a future management problem.



Figure 6. Eastern side of William Lawson Drive

5. RECOMMENDED MANAGEMENT

This section includes a summary of the management actions proposed for this Vegetation Management Plan. Action and timing seeks to align with actions in Table 4-1 of the PEMP. Works may be undertaken by Endeavour Energy or outsourced and incorporated in a site wide vegetation management plan subject to agreement with Sydney Water and subject to the discussion and recommended actions in this Plan.

Location	Action	Timing
Vicinity of Tower	Establishment of APZ	Within 3 months of tower construction
	Bush regeneration ¹	5 years from construction completion
Ridgeline to south of Tower	Tree planting & protection	Spring 2023
	Mowing/slashing	Monthly from September – March 2023-2028
William Lawson Drive ²	Infill tree planting	Spring 2023, annual assessment of planting success in spring

NOTES

- 1 Contribute to Sydney Water bush regeneration works subject to agreement between Endeavour Energy & Sydney Water
- 2 Section between Andrew Campbell Reserve and Prospect Heritage Cottage (eastern side)

REFERENCES

- Australian Museum (2018) *The Sydney Basin. Igneous Activity*. website
<https://australian.museum/learn/minerals/shaping-earth/the-sydney-basin/> accessed
26/01/2023.
- EMM Consulting (2022) *Visual Impact Assessment for Heritage Council of NSW. 60m
Communications Tower, Prospect Reservoir*. Endeavour Energy, Minchinbury.
- Rural Fire Service (2019) *Planning for Bushfire Protection*.
- Sydney Water Corporation (2005) *Prospect Reservoir Site. Conservation Management Plan*.
Sydney Water, Sydney.
- Sydney Water (2021) *Property Environmental Management Plan (PEMP) Prospect Reservoir,
Reservoir Road WS0095*. Sydney Water, Sydney.
- Total Earth Care (2018) *Biodiversity Assessment – Prospect Reservoir*. Total Earth Care,
Warriewood.

Roweena Dsouza

From: Rhonda Tang <RHONDA.TANG@sydneywater.com.au >
Sent: Monday, 30 January 2023 2:47 PM
To: Phil Bennett; Roweena Dsouza; Nick Stroinovsky
Cc: gingra@ozemail.com.au
Subject: RE: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

Hi Roweena

I also have no issues with the proposal from the property environmental management perspective. I am satisfied that your plans have taken into account the environmental and heritage values discussed with Nick and Phil. I suggest that you note in your VMP that the plantings may be “outsourced” and incorporated in a site wide vegetation management plan, but will be in keeping with your main objectives.

We still need to consult with SW Property Leasing about impacts to the access of the grassed area (opposite the cottage), which they have been known to lease out. From our experience, it’s unlikely to be a big issue, they may ask for plantings to be excluded from a small corridor or from the tops of unmarked pipes.

SW Property Management will also need to be consulted to discuss with you on APZ issues. Hence I’ve made some corrections to the dot point on:

- APZ maintenance – Similarly, SW have an APZ management area that they are required to maintain. Rhonda will consult SW Property Management on the proposed towers APZ, to understand the interaction of Lease areas with SW APZ. SW to clarify extent and maintenance and get back to Endeavour for discussion.

Other corrections:

- Planting near eastern edge of William Lawson Drive:
EE recommended planting of Hoop Pine in the gap between the Pine trees as shown in the image. SW advises that we need to demarcate Heritage trees from the new plantings. SW advice to plant native, fast growing trees with potential to bear hollows/become habitat trees in the future along the William Lawson Drive proposed planting area. This would assist with quicker screening for the visual aspect and also in the long term contribute to wildlife corridors and provide habitat for native fauna.
- The plantings should be placed more than 5 m away from the roadside, and avoid infrastructure such as a water main, fencing and any access gates

I don’t think any of these comments will affect your submission, if you think otherwise, or would like further clarification feel free to call me.

Regards

Rhonda Tang

Project Manager – Property Environmental
Management Plans (PEMP) Program
Property Services, Asset Lifecycle

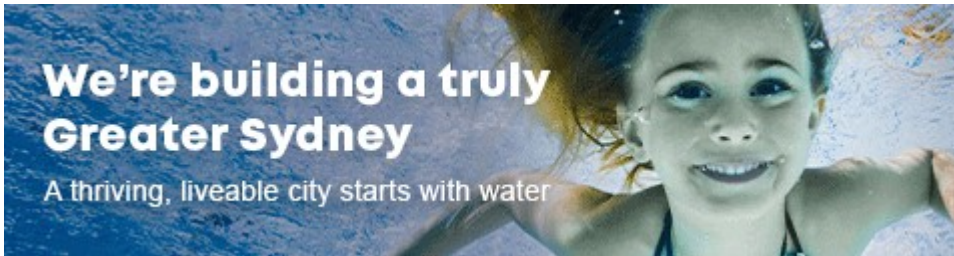
Mobile 0438 687 681

Rhonda.Tang@sydneywater.com.au

“If I had more time, I would have written a shorter letter.”

Level 10, 1 Smith Street
Parramatta NSW 2150

Sydney
W A T



Sydney Water respectfully acknowledges the land and waters on which we work with respect to Elders past and present



From: Phil Bennett <PHIL.BENNETT@sydneywater.com.au>

Sent: Monday, 30 January 2023 1:10 PM

To: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>; Rhonda Tang <RHONDA.TANG@sydneywater.com.au>; Nick Stroinovskiy <Nick.Stroinovskiy@sydneywater.com.au>

Cc: gingra@ozemail.com.au

Subject: RE: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

Hi Rowena

I am happy with the landscape outcomes.

No other comments.

Accepted.

Thanks

Phil Bennett
Lead Heritage Adviser
Environment & Heritage

0407 455 937
philip.bennett@sydneywater.com.au

From: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>

Sent: Monday, 30 January 2023 12:28 PM

To: Rhonda Tang <RHONDA.TANG@sydneywater.com.au>; Phil Bennett <PHIL.BENNETT@sydneywater.com.au>; Nick Stroinovskiy <Nick.Stroinovskiy@sydneywater.com.au>

Cc: Phil Bennett <PHIL.BENNETT@sydneywater.com.au>; gingra@ozemail.com.au

Subject: RE: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

Hi,

@'Rhonda Tang', thanks for your quick response and initial comment.

Rhonda and Phil,

Could you let me know if there are any further comments/clarifications that you would like us to address? If not, Roger can send through the final version for your review and approval and I shall notify Nick once you both have approved (I understand he is on leave today).

Once HNSW give their approval, I shall organise a meeting between key stakeholders from Endeavour and Sydney Water so we can nut out the commercial aspects and the arrangements to carry out the works.

Regards
Row

From: gingra@ozemail.com.au <gingra@ozemail.com.au>
Sent: Monday, 30 January 2023 10:38 AM
To: 'Rhonda Tang' <RHONDA.TANG@sydneywater.com.au>; Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>; 'Phil Bennett' <PHIL.BENNETT@sydneywater.com.au>; 'Nick Stroinovsky' <Nick.Stroinovsky@sydneywater.com.au>
Cc: 'Phil Bennett' <PHIL.BENNETT@sydneywater.com.au>
Subject: RE: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

Hi,
The implication is infill of the 1980s treelines, rather than new planting.
There is no need to worry about access, as access to the paddock is provided by Gate 2, and you just need to locate plantings away from this line.
Tree spacing in the existing lines is about 9 m,
for the Hoop Pines its about 11 m, was probably 12 yards.

Just a change in wording.

Regards,
Roger.

Roger Lembit B.Sc.Agr
Principal Ecologist
Gingra Ecological Surveys
P.O. Box 1
Canterbury NSW 2193
gingra@ozemail.com.au
0427 779925

From: Rhonda Tang <RHONDA.TANG@sydneywater.com.au>
Sent: Monday, 30 January 2023 10:32 AM
To: gingra@ozemail.com.au; 'Roweena Dsouza' <Roweena.Dsouza@endeavourenergy.com.au>; Phil Bennett <PHIL.BENNETT@sydneywater.com.au>; Nick Stroinovsky <Nick.Stroinovsky@sydneywater.com.au>
Cc: Phil Bennett <PHIL.BENNETT@sydneywater.com.au>
Subject: RE: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

I hope you all had a great weekend =)

Thanks for sharing your insights Roger, and I also enjoy getting information from a good aerial.

Do you think there might be any changes to the approach forward, compared to what we had discussed last week?

Regards

Rhonda Tang

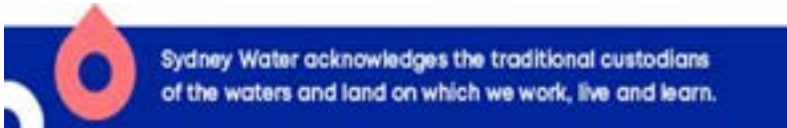
Asset Lifecycle

Sydney Water, 1 Smith Street, Parramatta NSW 2150



Mobile 0438 687 681

rhonda.tang@sydneywater.com.au



From: gingra@ozemail.com.au <gingra@ozemail.com.au>

Sent: Monday, 30 January 2023 8:02 AM

To: 'Roweena Dsouza' <Roweena.Dsouza@endeavourenergy.com.au>; Phil Bennett <PHIL.BENNETT@sydneywater.com.au>; Nick Stroinovsky <Nick.Stroinovsky@sydneywater.com.au>; Rhonda Tang <RHONDA.TANG@sydneywater.com.au>

Cc: Phil Bennett <PHIL.BENNETT@sydneywater.com.au>

Subject: [External] RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

CAUTION: This email originated from outside the organisation. Do not click links or open attachments unless you recognise the sender and know the content is safe.

Hi,

I've done some further work over the weekend I thought I should share.

I had a look at the area along William Lawson Drive, from the Hoop Pine avenue southwards.

Many of the trees beyond (east) of the fence are plantings in a double row. There are also younger trees which have regenerated more recently. The main plantings appear to be Radiata Pine and Hoop Pine. There are also sapling Lemon-scented Gum and a number of Spotted Gum trees.

Lemon-scented Gum were commonly planted in western Sydney in the 1970s, examples are at St Marys and Mawson Park at Campbelltown.

The attached aerial photograph from the NSW Government Historical Imagery webpages seems to be the first in the time sequence which shows planting in this area.

I will be amending the wording relevant to this area to reflect this.

Regards,
Roger.

Roger Lembit B.Sc.Agr
Principal Ecologist
Gingra Ecological Surveys
P.O. Box 1

Canterbury NSW 2193
gingra@ozemail.com.au
0427 779925

From: Roweena Dsouza <Roweena.Dsouza@endeavourenergy.com.au>
Sent: Friday, 27 January 2023 4:45 PM
To: PHILIP.BENNETT@sydneywater.com.au; gingra@ozemail.com.au; nick.stroinovsky@sydneywater.com.au;
Rhonda Tang <RHONDA.TANG@sydneywater.com.au>
Cc: Phil Bennett <PHIL.BENNETT@sydneywater.com.au>
Subject: RE: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

Hi All,

Thank you for meeting with us on the 24th January.

Key notes from the meeting:

Aim: To discuss the draft Veg Management Plan at Prospect Reservoir with Sydney Water and determine their requirements and address any concerns.

Attendees:

- Roweena D'Souza – Environmental Specialist, Endeavour Energy
- Roger Lembit – Ecologist, Gingra Ecological Surveys
- Rhonda Tang – Project Manager – Property Environmental Management Plans (PEMP) Program, Sydney Water
- Philip Bennett – Heritage Advisor, Sydney Water
- Nikolai Stroïnovsky - Lead Environmental Advisor, Customer Delivery, Sydney Water

Notes and action items:

- Endeavour Energy discussed the draft Veg Mgmt Plan with Sydney Water (SW) and advised that this plan was developed to compliment SW PEMP and the CMP.
- Planting near eastern edge of William Lawson Drive:
EE recommended planting of Hoop Pine in the gap between the Pine trees as shown in the image. SW advices that we need to demarcate Heritage trees from the new plantings. SW advice to plant native, fast growing trees with potential to bear hollows in the future along the William Lawson Drive proposed planting area. This would assist with quicker screening for the visual aspect and also in the long term contribute to wildlife corridors and provide habitat for native fauna.
- The plantings should be placed more than 5 m away from the roadside to avoid infrastructure such as a water main, fencing and any access gates
- Endeavour Energy advised that they might need to create an Asset Protection Zone for bushfire protection. This would involve clearing 10m ground cover around the proposed Telco infrastructure (which is composed of weeds such as African Olives, Privet, Lantana), lopping of branches of native trees to achieve crown separation and the removal of a small dead eucalypt tree to the south-west of the tower. SW advise they have no objection as long as they trees are not hollow bearing and the dead tree is laid on the ground across not down the slope to provide habitat.
- Sightline from South - there is a gap in tree cover when viewing the tower location from the south. EE advise that this gap can be filled by planting a few trees in a clear area and away from the overhead main easement. These plantings would need protection to prevent damage from browsing animals. It is also recommended the area around the plantings be mown or slashed to reduce competition. The plantings should be maintained for five years. SW agree and recommend planting native trees in this area.
- Maintenance –EE proposed that they could pay SW a \$/m2 area requiring weed management until the plants establish themselves or as will be captured in the Veg Mgmt Plan. SW agreed that this could be a better option considering the contractors need to meet specific requirements and they have existing contractors that maintain the site on a regular basis. EE and SW agree to separately discuss maintenance of the above areas.
- APZ maintenance – Similarly, SW have an APZ management area that they are required to maintain. SW will look into updating this map as it doesn't include the SW water reservoirs that need APZ maintenance. It is

likely that proposed towers APZ will be a subset of the overall SW APZ. SW to clarify extent and maintenance and get back to Endeavour.

- Endeavour to clarify if it's a lease or licence and send SW a copy of the extent.
- Endeavour advise that the submission to HNSW is scheduled for 31st Jan and will submit a draft for SW review on 27th Jan.

Please let me know if I have missed any item or if there are any corrections.

Else this can be considered as the Minutes of the Meeting.

Thanks
Roweena

Post meeting –

- Endeavour have obtained an easement and will send over the documents on Monday 30th Jan.
- Endeavour submits the draft Veg Management Plan with this email for SW review.

-----Original Appointment-----

From: Roweena Dsouza

Sent: Tuesday, 24 January 2023 4:16 PM

To: Roweena Dsouza; philip.bennett@sydneywater.com.au; gingra@ozemail.com.au; nick.stroinovsky@sydneywater.com.au; Rhonda Tang

Cc: Phil Bennett

Subject: Bush regeneration at Prospect Reservoir, re Endeavour Energy Proposed comms tower

When: Wednesday, 25 January 2023 3:30 PM-4:15 PM (UTC+10:00) Canberra, Melbourne, Sydney.

Where: Microsoft Teams Meeting

Hi All,

Rescheduling to meet Rhondas availability.

Also, I have attached the proposed strategy below that we will discuss at the meeting.



Hi All,

Could we meet to discuss EE's proposal re the Veg Rehab Plan at Prospect Reservoir and its alignment with Sydney Water management plans.

Thanks
Row

Roweena D'Souza | Environmental Specialist

M 0447 919 365
51 Huntingwood Drive, Huntingwood NSW 2148.

Dharug Country

endeavourenergy.com.au |



Endeavour Energy respectfully acknowledges the Traditional Custodians on whose lands we live, work, and operate and their Elders past, present and emerging.

Microsoft Teams meeting

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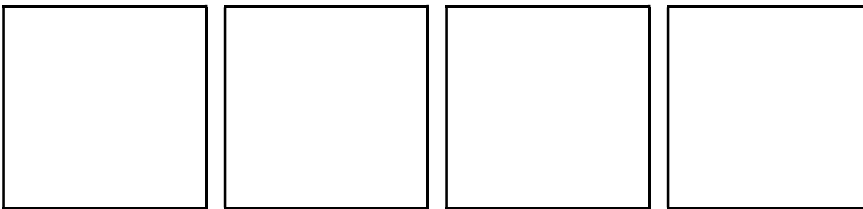
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