

# Planning Report

Proposed Fixed Wireless Facility

166 Werribee Road

Wundowie WA 6560

NBN SITE REFERENCE:

Wundowie West [NBN-6PEZ-6BKH-5107]





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<b>Author</b>	Emma Storm
<b>Approver (owner)</b>	Senior Project Planner
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## Executive Summary

<b>Proposal</b>	<p><b>Nbn</b> propose to install a new fixed wireless facility at Wundowie West comprised of the following:</p> <ul style="list-style-type: none"> <li>▪ 40m monopole;</li> <li>▪ 3x panel antennas and 6x remote radio units;</li> <li>▪ 1x parabolic dish antenna;</li> <li>▪ 2x outdoor cabinets at ground level;</li> <li>▪ 2.4m high chain-link security compound fencing; and</li> <li>▪ ancillary equipment associated with operation of the facility, cabling, safe access methods, bird proofing, earthing and electrical works.</li> </ul>	
<b>Purposes</b>	<p>The proposed facility is necessary to provide <b>nbn</b><sup>TM</sup> fixed wireless coverage to approximately 186 premises and establish links between <b>nbn</b><sup>TM</sup> facilities at Wundowie in order to provide <b>nbn</b><sup>TM</sup> fixed wireless coverage to the wider area.</p>	
<b>Property Details</b>	<p><i>Lot and Plan No:</i> Lot 24013 on Deposited Plan 202075  <i>Street Address:</i> 166 Werribee Road, Wundowie 6560  <i>Overall Site Area:</i> 12.583ha  <i>Property Owner:</i> Gary Walter Mulder &amp; Jonine Marie Major</p>	
<b>Town Planning Scheme</b>	<p><i>Shire of Northam:</i> Local Planning Scheme No. 6  <i>Zone:</i> Rural  <i>Other Planning Controls:</i> Nil  <i>Use Definition:</i> Telecommunications Infrastructure</p>	
<b>Applicable Planning Policies</b>	<b>Relevant State &amp; Local Planning Policies</b>	<b>Complies</b>
	State Planning Policy 5.2 (Telecommunications Infrastructure) 2015	Yes
<b>Application</b>	<p>Use and development of the land for the purposes of construction and operation of a Telecommunications Facility (Fixed Wireless facility)</p>	
<b>Applicant</b>	<p><b>nbn</b>  c/- Aurecon Australasia Pty Ltd  Level 5, 863 Hay Street  Perth WA 6000  Contact: Emma Storm  Our Ref: NBN-6KAZ-6PNG-5101</p>	



# 1. INTRODUCTION

**Nbn** has engaged Ericsson as the equipment vendor and project manager to establish the infrastructure required to facilitate the fixed wireless component of the National Broadband Network (**nbn**<sup>™</sup>). Ericsson has in turn engaged Aurecon to act on its behalf in relation to the establishment of the required fixed wireless network infrastructure.

The **nbn**<sup>™</sup> is an upgrade to Australia’s existing telecommunications network. It is designed to provide Australians with access to fast, affordable and reliable internet services.

**Nbn** plans to upgrade the existing telecommunications network in the most cost-efficient way using best-fit technology and taking into consideration existing infrastructure.

To support the Fixed Wireless component of this network, **nbn** requires a fixed wireless transmission site to provide fixed wireless internet coverage to the broader region. The proposed site at Wundowie West will serve as a transmission end site with connectivity with the **nbn**<sup>™</sup> facility in Wundowie.

An in-depth site selection process was undertaken in the area prior to confirming the site as the preferred location. This process matched potential candidates against four key factors, namely:

- Town planning considerations (such as zoning, surrounding land uses, environmental significance and visual impact);
- The ability of the site to provide acceptable coverage levels to the area;
- Construction feasibility; and
- The ability for **nbn** to secure a lease agreement with the landowner.

Comment was additionally sought in July 2015 from the Shire’s Planning Department in relation to the proposed site. The Planning Department indicated the Shire can consider the application for Telecommunications Infrastructure on the site.

This application seeks planning consent for:

- A 40m high monopole;
- radio transmission equipment;
- outdoor cabinets; and
- ancillary works within a 99m<sup>2</sup> fenced compound.

The facility will be located at 166 Werribee Road, Wundowie 6560 formally known as Lot 24013 on Deposited Plan 202075 (volume 1893; folio 92).



This submission will provide assessment in respect of the relevant planning guidelines, and demonstrates site selection on the basis of:

- The site is designed so as to be appropriately located and sited so as to minimise visual impact on the immediate and surrounding area;
- The site is designed to achieve the required coverage objectives for the area;
- The proposal is designed to operate within the regulatory framework of Commonwealth, State and Local Government; and
- The facility is designed to operate within all current and relevant standards and is regulated by the ACMA (Australian Communications and Media Authority).



## 2. BACKGROUND

### 2.1 nbn and the National Broadband Network

**Nbn** is the organisation responsible for overseeing the upgrade of Australia’s existing telecommunications network and for providing wholesale services to retail service providers. The **nbn™** is designed to provide Australians with access to fast, affordable and reliable internet services.

**Nbn** plans to upgrade the existing telecommunications network in the most cost-efficient way using best-fit technology and taking into consideration existing infrastructure.

The **nbn™**’s fixed wireless network will use cellular technology to transmit signals to and from a small antenna fixed on the outside of a home or business, which is pointed directly towards the fixed wireless facility.

**Nbn™**’s fixed wireless network is designed to offer service providers with wholesale access speeds of up to 50Mbps for downloads and 20Mbps for uploads.<sup>1</sup>

### 2.2 What is Fixed Wireless and how is it different to Mobile Broadband?

The **nbn™**’s fixed wireless network, which uses advanced technology commonly referred to as LTE or 4G, is engineered to deliver services to a fixed number of premises within each coverage area. This means that the bandwidth per household is designed to be more consistent than mobile wireless, even in peak times of use.

Unlike a mobile wireless service where speeds can be affected by the number of people moving into and out of the area, the speed available in a fixed wireless network is designed to remain relatively steady.

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<sup>1</sup> **nbn** is designing the **nbn™** to provide these speeds to our wholesale customers, telephone and internet service providers. End user experience including the speeds actually achieved over the **nbn™** depends on some factors outside **nbn**’s control like equipment quality, software, broadband plans and how the end user’s service provider designs its network.





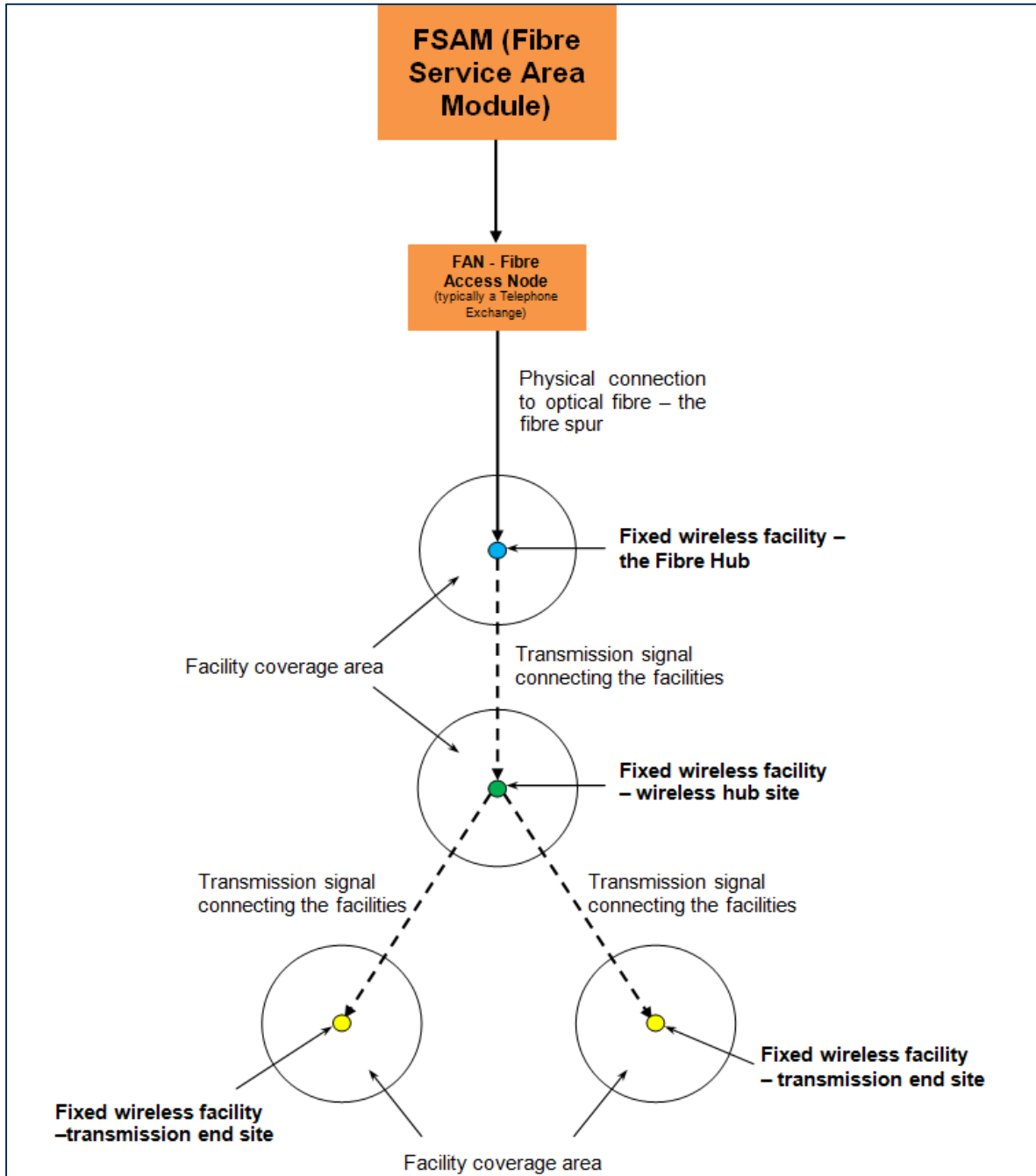
## 2.3 The Fixed Wireless Network – Interdependencies

Although fixed wireless facilities are submitted to the Shire as standalone developments from a planning perspective, they are highly interdependent. Each fixed wireless facility is connected to another to form a chain of facilities that link back to the fibre network. This is called the 'transmission network'.

The transmission network requires line of sight from facility to facility until it reaches the fibre network. The fixed wireless network will remain unconnected without the transmission network and a break in this chain can have flow on effects to multiple communities.

The proposed Fixed Wireless facility at Wundowie West is a transmission end site (refer to **Figure 1**). A transmission end site is proposed to provide fixed wireless internet services in the local area to approximately 186 premises in Wundowie.

The character of the Fixed Wireless network is visually demonstrated through **Figure 1** below.



**Figure 1 – The fixed wireless network**



## 3. SITE SELECTION

Planning for a new fixed wireless broadband facility is a complex process. **Nbn** undertakes a rigorous multi-stage scoping process as outlined below.

### 3.1 Identification of areas requiring Fixed Wireless coverage

**Nbn**<sup>™</sup>'s Fixed Wireless locations are determined by a number of factors including the availability of both the **nbn**<sup>™</sup> Fibre transit network and the availability of Point of Interconnect (POI) facilities to allow for the installation of **nbn**<sup>™</sup> fibre equipment. **Nbn** uses a number of methods to identify those parts of Australia that require Fixed Wireless coverage. When an area is identified as requiring Fixed Wireless coverage, investigations are undertaken to determine the measures required to provide this coverage.

**Nbn** has identified a requirement to provide a Fixed Wireless facility at 166 Werribee Road, Wundowie. The Wundowie West site is designed to link to the hub site in Wundowie and service the local area.

### 3.2 Site Selection Parameters

**Nbn** generally identifies an area where the requirement for a Fixed Wireless facility would be highest, a 'search area.' A preliminary investigation of the area is then undertaken, in conjunction with planning and property consultants, radiofrequency engineers and designers in order to identify possible locations to establish a facility.

Generally speaking, new sites must be located within, or immediately adjacent to, the identified search area in order to be technically feasible. However, while the operational and geographical aspects of deploying new facilities are primary factors, there are also many other issues that influence network design, which have to be resolved in parallel.

**Nbn** has applied the Precautionary Approach in the selection and design of the proposed site in accordance with Sections 4.1 and 4.2 of the *Communications Alliance Industry Code C564:2011 for Mobile Phone Base Station Deployment*.

In selecting this site, **nbn** has used industry best practice to assess potential candidate sites, taking into account technical and non-technical criteria including:

- service objectives;
- topographical constraints affecting network line of site;



- potential co-locate at an existing telecommunications facility or building structure;
- visual impact on the surrounding area;
- the need to obtain relevant planning approvals;
- the proximity to community-sensitive locations;
- the proximity to areas of environmental or heritage significance;
- the availability of secure tenure;
- the availability of public utilities, such as power;
- construction issues (including structural and loading feasibility and access for maintenance purposes);
- occupational health and safety; and
- other cost factors.

The number, type and height of facilities required to complete the Fixed Wireless network are largely determined by the above operational, geographical and other factors discussed that influence final network design. These compounding factors often severely restrict the available search area within which a facility can be established to provide Fixed Wireless internet services to a local community.

### 3.3 Candidate Sites

Following the identification of the search area, nine initial candidate sites were identified during a desktop assessment process and upon undertaking a site visit. Each candidate was assessed based on the ability to meet the coverage objectives and site considerations detailed above. **Figure 2** shows the location of the nine candidate sites identified.

**Nbn** endeavours to avoid locating search areas in close proximity to residential localities and potentially sensitive land uses, where practicable. Candidate H provides separation from residential land uses, as well as areas of historical or conservation value. The subject land is located in a rural zone which (in addition to industrial zones) is the preferred land use classification for telecommunications infrastructure to be sited in accordance with State Policy and Local Planning Scheme. As such, **nbn** considers Candidate H the best option as it provides an appropriate location for a facility given the separation from residential and other sensitive land uses, and the ability of vegetation and topography to screen ground level infrastructure.



Figure 2 – nbn initial candidate sites (Source: Google Earth)

A summary of the eight candidates not pursued is set out below, including a brief description of the opportunities and constraints for each site.

No	Address and Lot Number	Facility Type	Description
<b>A</b>	Lot 1, 187 Hawke Avenue, Wundowie 6560	45m monopole	Land tenure was unable to be obtained.
<b>B</b>	Lot 7, Hawke Avenue, Wundowie 6560	50m lattice tower	Ruled out on planning grounds due to visual impact.
<b>C</b>	189 Hawke Avenue, Wundowie 6560	60m lattice tower	Ruled out on planning grounds due to visual impact.
<b>D</b>	3897 Great Eastern Highway, Wundowie 6560	60m lattice tower	Ruled out on planning grounds due to visual impact.



<b>E</b>	152 Hawke Avenue, Wundowie 6560	60m lattice tower	Ruled out on planning grounds due to visual impact.
<b>F</b>	29 Vineyard Road, Wundowie 6560	60m lattice tower	Ruled out on planning grounds due to visual impact.
<b>G</b>	46 Olive Road, Wundowie 6560	50m lattice tower	Ruled out on planning grounds due to visual impact.
<b>I</b>	109 Burma Road, Wundowie 6560	40m monopole	Unable to contact landowner.

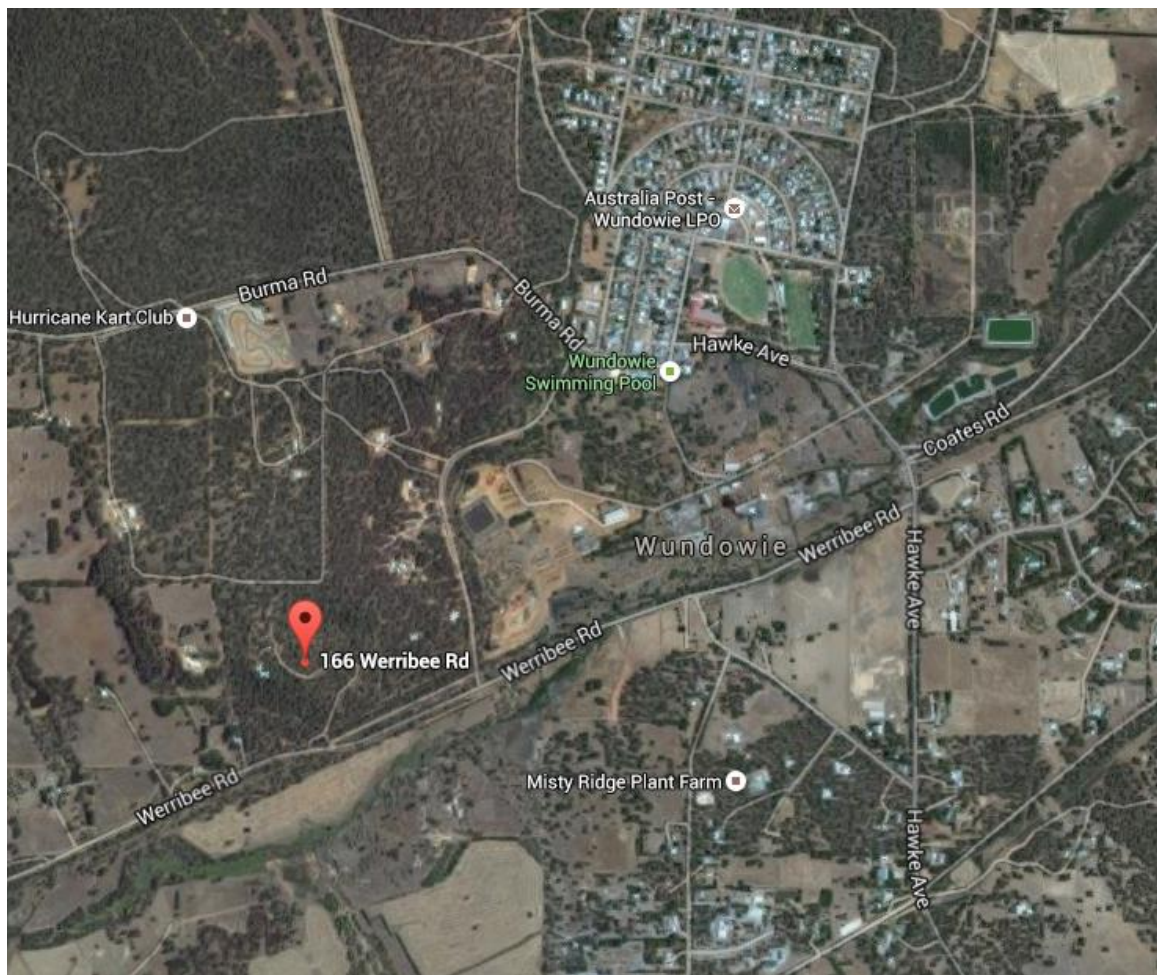
The three candidates considered to likely best meet all relevant criteria were ultimately short-listed for further analysis. Following detailed assessment that includes refining radio frequency (RF) and transmission (TX) modelling, the option (Candidate H) for which we now seek approval was preferred. For clarity, RF modelling relates to providing a service from the panel antennas to local premises and TX modelling relates to line of sight assessment from the parabolic (dish) antennas tower to tower.

## 4. SUBJECT SITE AND SURROUNDS

### 4.1 Site Description

The telecommunications facility is to be located at 166 Werribee Road, Wundowie (refer **Figure 3**). The land is formally described as Lot 24013 on Deposited Plan 202075. A copy of the Certificate of Title has been attached for information purposes (**Appendix A – Copy of Title**).

The subject property is located approximately 63km north east of Perth and 35km south west of Northam. The site is irregular in shape and has a total area of 12.583 hectares. The property is accessible via a driveway off Werribee Road.



**Figure 3 – Local Context subject site (source Google Earth)**

The subject property is a vacant rural lifestyle lot densely covered with natural vegetation with an existing gravel driveway traversing the lot. The property is



located on a hilltop, sloping to the east and south located west of an existing industrial area.

## 4.2 Surrounding Area

The surrounding area consists predominantly of rural and rural residentially zoned land with the main residential area of Wundowie approximately 1.5km to the north east. The built form and typical land uses on adjoining properties and surrounding areas are predominantly single detached dwellings on rural lots. Separation between the proposed development location on the subject property and the closest residential dwelling on an adjoining property is approximately 170m.

Where possible, **nbn** endeavours to co-locate with existing telecommunications facilities. In this instance, co-location could not be achieved as there are no telecommunications sites within the area.



Figure 4 – Local Context subject site from Werribee Road (source Google Streetview)



## 5. THE PROPOSAL

### 5.1 Facility and Equipment Details

#### 5.1.1 Equipment to be installed

The facility comprises a 40 metre high monopole and ancillary components including two outdoor cabinets and a distribution board enclosed within a secure compound being 99m<sup>2</sup> in area.

The compound will be located on an elevated portion of the rural lot which slopes downwards towards the south and east, setback 87.5m from the eastern adjoining boundary. The facility will be positioned towards the middle to rear of the property with the location selected in order to avoid extensive vegetation removal (refer to **Figure 5**).



**Figure 5 – View proposed location**

The proposed monopole will feature a circular headframe at the top containing three panel antennas measuring 750mm(H) x 300mm(W) x 115mm(D) and six (6) remote radio units measuring 381mm(H) x 291mm(W) x 115mm(D). One



parabolic dish antenna 600mm in diameter will also be located on the tower at 37m providing a link to the Wundowie facility. Please refer to **Appendix B – Proposed Plans** for further details.

#### 5.1.2 Landscaping

The **nbn** has not proposed additional landscaping given the facility will be screened from public view by existing vegetation and the topography of the area.

#### 5.1.3 Access and Parking Details

The **nbn™** network compound will be accessed via a new gravel track to be created as an extension of the existing gravel driveway. The existing entry point on Werribee Road will be used. The crossover provides adequate sightlines for vehicles entering or exiting the facility in forward gear. Once commissioned, it is planned to provide independent 24 hour access to the proposed facility.

**Nbn** considers the site access to be appropriate given the **nbn™** network facility will not be a significant generator of traffic. During the construction phase, a truck will be used to deliver the equipment and a crane will be utilised to lift most of the equipment into place. Any traffic impacts associated with construction will be of a short-term duration and are not anticipated to adversely impact on the surrounding road network. In the unlikely event that road closure will be required, **nbn** will apply to the relevant authorities for permission.

A total construction period of approximately ten weeks (including civil works and network integration and equipment commissioning) is anticipated. Construction activities will involve four basic stages:

- Stage 1 (Week 1) – Site preparation works, including field testing, excavation and construction of foundations;
- Stage 2 (Weeks 2, 3 and 4) – Construction of the monopole;
- Stage 3 (Weeks 5 and 6) – Construction of the equipment cabinets and fences;
- Stage 4 (Weeks 7 – 10) – Installation of antennas and radio equipment, as well as equipment testing.

Once operational, the facility will function on a continuously unstaffed basis and will typically only require maintenance works three times a year.

#### 5.1.4 Utility Service Details

The facility will be powered by a proposed underground power cable from the existing power connection at the highway to the proposed **nbn™** power distribution board adjacent to the cabinets.



### 5.1.5 Construction and Noise

Noise and vibration emissions associated with the proposed facility are expected to be limited to the construction phase outlined above. Noise generated during the construction phase is anticipated to be of short duration and accord with the standards outlined in the Department of Environment Regulation (DER) *Environmental Protection (Noise) Regulations 1997*. Construction works are planned only to occur between the hours of 7.00am and 6.00pm.

There is expected to be some low level noise from the ongoing operation of air conditioning equipment associated with the equipment cabinets, once installed. Noise emanating from the air conditioning equipment is expected to be at a comparable level to a domestic air conditioning installation, and should generally accord with the background noise levels prescribed by relevant guidelines.

## 5.2 Site Selection

The reasons for selecting this site are summarised as follows:

- The proposed site has been particularly targeted to provide the optimal required line of site as required by **nbn** to connect the Wundowie facility with the Wundowie West site;
- The proposed facility is located in a rural area, sited on the least densely vegetated area of the property minimising clearing;
- The surrounding landscape includes a number of agricultural buildings and structures, as well as mature trees, which will minimise visual impact;
- The impact on the physical environment is negligible;
- The site as far as practical provides sufficient spatial separation from sensitive land uses and the main residentially populated part of Wundowie;
- The site provides sufficient spatial separation from sensitive land uses with the nearest dwelling located approximately 170m from the proposed site on the adjoining lot; and
- The construction and land tenure costs are acceptable in the context of the locality.



## 6. CURRENT PLANNING CONTROLS

### 6.1 Commonwealth Legislation – The Telecommunications Act

Schedule 3 of the *Telecommunications Act 1997* empowers carriers to install low-impact facilities without participating in the planning approval process. The *Telecommunications (Low Impact Facilities) Determination 1997* defines which facilities are low-impact facilities.

The proposed facility is not low-impact under the definitions contained in the Commonwealth legislation. Development approval is therefore required for the proposed facility.

### 6.2 State Legislation

The revised State Planning Policy 5.2, prepared under Part Three of the *Planning and Development Act 2005*, was released in September 2015. The State Policy applies to all telecommunications infrastructure except that exempted by the *Telecommunications (Low Impact Facilities) Determination 1997*. The objectives of the policy are to:

- Facilitate the provision of telecommunications infrastructure in an efficient and environmentally responsible manner to meet community needs;
- Manage the environmental, cultural heritage, visual and social impacts of telecommunications infrastructure;
- Ensure that telecommunications infrastructure is included in relevant planning processes as essential infrastructure for business, personal and emergency reasons; and
- Promote a consistent approach in the preparation, assessment and determination of planning decisions for telecommunications infrastructure.

The State Policy provides directions that telecommunications infrastructure should not be prohibited in any zone in the zoning table and that, subject to guidance within a planning scheme, be designated as a permitted use in some zones. Furthermore, the State Policy acknowledges that telecommunications carriers are required to comply with the Australian Radiation and Nuclear Protection Safety Agency (ARPANSA) Electromagnetic Radiation - Human Exposure Standard such that buffer zones and/or setback distances are not to be included in planning schemes or local planning policies. The **nbn™** is now also referenced in the State Policy.

Further to reiterating recent State Administrative Tribunal rulings that health and safety matters are not a planning consideration, the State Policy defines



policy measures for local government to consider when determining development applications for telecommunications infrastructure. A response to the specific policy measures is provided below.

Policy Measure 1: Telecommunications infrastructure should be sited and designed to minimise visual impact	
<p>The proposal involves the erection of a new facility incorporating a 40 metre monopole and associated ground level equipment. The height and design of the proposed tower is considered to be the minimum required to achieve reasonable transmission objectives. <b>Nbn</b> considers that the proposed new facility will have minimal visual impact on the existing landscape setting as seen by local residents and people passing through the area.</p>	
Specific Policy Measures	Comment
a) Telecommunications Infrastructure should be located where it will not be prominently visible from significant viewing locations such as scenic routes, lookouts and recreation sites.	The site is located in a rural area, 1.5km to the south west of Wundowie and 186 metres setback from Werribee Road. The site will not be clearly visible from significant viewing locations, scenic routes, lookouts or recreation sites.
b) Telecommunications Infrastructure should be located to avoid detracting from a significant view of a heritage item or place, a landmark, a streetscape, vista or panorama, whether viewed from public or private land.	The facility is designed so as not to compromise any significant views or places of significance or local landmarks. Additionally, the subject site is considered to be located an adequate distance from existing residential development and community sensitive land uses.
c) Telecommunications Infrastructure should not be located where environmental, cultural heritage, social and visual landscape values may be compromised.	The construction area and overall compound area of the facility is designed to have minimal disturbance to the environmental characteristics of the site. The installation of the proposed facility can be undertaken at any time and is not anticipated to affect the use of the site or the surrounding area due to the accessibility of the site.
d) Telecommunications Infrastructure should display design features, including scale, materials, external colours and finishes that are sympathetic to the surrounding landscape.	To minimise the visual impact of the facility <b>nbn</b> have proposed the use of a monopole and selected a site that is located away from residential areas and other sensitive land uses. The proposed monopole is a structure that has a small profile and is considered the



	<p>least visually intrusive design option for a new base station.</p> <p>Furthermore, the tower will remain unpainted (galvanised steel), which over time has been demonstrated to most successfully blend with the uniform colours of the site’s rural setting.</p> <p>No landscaping is proposed due to significant setbacks to surrounding roads and dwellings.</p>
<p><b>Policy Measure 2: Telecommunications Facilities should be located where it will facilitate continuous network coverage and/or improved telecommunications services to the community.</b></p>	
<p><b>Nbn</b> through its strategic planning processes has identified this Wundowie West site as having the potential to provide the optimal required quality of service for 186 local premises, but also achieve a line of sight to link to the <b>nbn™</b> facility at Wundowie in order to provide <b>nbn™</b> fixed wireless broadband coverage in the broader area.</p>	
<p><b>Policy Measure 3: Telecommunications cables should be co-located whenever possible.</b></p>	
<p><b>Specific Policy Measures</b></p>	<p><b>Comment</b></p>
<p>a) Cables and lines should be located within an existing underground conduit or duct.</p>	<p>The connection to power is subject to be underground and is subject to Western Power recommendations.</p>
<p>b) Overhead lines and towers should be co-located with existing infrastructure and/or within existing infrastructure corridors and/or mounted on existing or proposed buildings.</p>	<p>There are no structures or buildings of sufficient height within the surrounding area that could facilitate <b>nbn™</b> infrastructure.</p>

With respect to the above policy measures this proposal through its siting, design and location has addressed the provisions as far as practical.

**6.2.1 Guiding Principles for the Location, Siting and Design of Telecommunications Infrastructure**

The Guiding Principles for the Location, Siting and Design of Telecommunications Infrastructure (Guiding Principles) is published by the Western Australian Planning Commission (WAPC) to underpin State Planning Policy 5.2. The Guiding Principles philosophy is also reiterated in Part Three of *Visual Landscape Planning*



in Western Australia – a manual for evaluation, assessment, siting and design which was also prepared by the WAPC. The guidelines were taken into consideration when selecting the site.

## 6.3 Local Legislation

### 6.3.1 Shire of Northam Local Planning Strategy

The Shire of Northam Local Planning Strategy vision is

*'to deliver responsive, sustainable services in a manner that preserves and enhances our environment and lifestyle'.*

The strategy states the Shire's objective is to provide

*"affordable, state of the art and equitable telecommunication services to the Shire in a timely manner that are sensitive to economic, social, environmental and technical conditions and help maximise opportunities for economic growth and development".*

In regards to telecommunications, the strategy indicates the Shire acknowledges the need to recognise the changing communications technology changing the way communities do business and ensuring the local government planning framework facilitates the effective and efficient development of new telecommunications infrastructure, and avoids length and litigious approval processes.

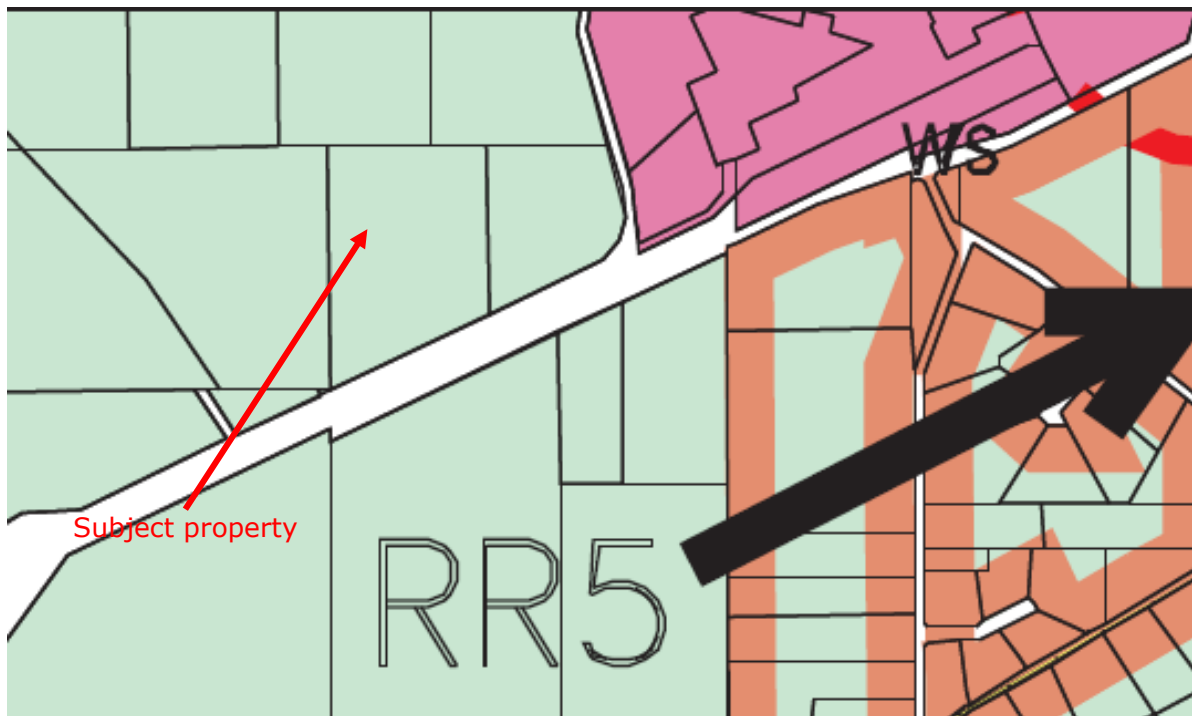
### 6.3.2 Shire of Northam Local Planning Scheme No.6

We consider that the **nbn** Wundowie West facility is consistent with the pertinent aims of the Scheme including to:

- *secure the amenity, health and convenience of the Scheme area and the inhabitants thereof.*
- *promote the sustainable use of rural land for agricultural purposes whilst accommodating other rural activities.*
- *protect, conserve and enhance the environmental values and natural resources of the Scheme area including the protection of remnant vegetation and the rehabilitation and revegetation of degraded land.*

The availability of wireless high speed internet enables rural living type areas to be serviced for which a cable service is not economically feasible. Services such as the transfer of medical images, marketing and research activities are all able to be performed more efficiently so as to allow more equitable competition with metropolitan businesses. These services also have the potential to allow people to stay in their homes longer by providing improved access to medical

professionals, or medical monitoring services.<sup>2</sup> The introduction of the **nbn™** within the community will allow for access to information and services which have the potential to provide a richer and more diverse experience for the end user. Furthermore, it is our view that the siting, location and design of the facility as far as practical minimises environmental impact.



**Figure 6 – Zoning map (Shire of Northam Local Planning Scheme No.6)**

**Nbn** considers that the proposal is therefore consistent with the objectives of the Shire of Northam Local Planning Scheme No.6 for the provision of services and infrastructure to meet the demands of the local residents, businesses and visitors to the town.

The site is located within the Rural zone (refer to **Figure 6**). Telecommunications infrastructure is a 'D' use in accordance with the Zoning Table. Council may, at its discretion, permit the use in the zone.

**Nbn** considers that the proposed facility is consistent with the objectives and development requirements of the zone for the following reasons:

- The local rural character of the zone is maintained as far as practical;

<sup>2</sup> End user experience including the speeds actually achieved over the **nbn™** depends on some factors outside **nbn's** control like the end user's equipment quality, software, broadband plans and how the end user's service provider designs its network.





- The viability of agricultural activities, other rural pursuits and secondary uses will not be compromised by the proposed development;
- The environmental qualities of the landscape, vegetation, soils and water bodies will not be damaged;
- The proposal does not seek to introduce a sensitive land use which would otherwise inhibit the operation and development of existing, future and potential rural land uses.

### **6.3.3 Structure Plans**

The subject site is not affected by a Structure Plan.



## 7. OTHER ENVIRONMENTAL CONSTRAINTS AND OPPORTUNITIES

### 7.1 Visual Impact

The siting of the proposed monopole on the subject property is considered appropriate. Critical to the site selection and decision making process was the potential impact of the structure in the visual landscape. The structure in the proposed location will not obscure an important view or vista. It has been strategically located amongst mature vegetation away from existing dwellings to minimise impact.

This application proposes additional earthworks and retaining structure in order to take advantage of the screening opportunities afforded by the topography of the site. The Department of Planning's *Visual Landscape Planning in Western Australia* manual (p. 138) recognises that for longer distance views it is better to position towers below ridgetops. As such the hill forms a backdrop when viewed from Werribee Road to the south.

The nearest dwelling not in the same ownership is located approximately 170m to the east. No additional landscaping is proposed as the existing vegetation is considered sufficient to screen the base of the facility from the dwelling and the surrounding area.

Note that the proposed 40m monopole is considered to be the smallest structure capable of meeting coverage and operational objectives. A monopole is a structure that has a small profile and is considered the least visually intrusive design option for a new base station. Furthermore, the pole will remain unpainted (galvanised steel), which over time has been demonstrated to most successfully blend with lighter backgrounds such as the sky.

Whilst the structure may be visible from some aspects, based on the siting the proposed development will not result in adverse impacts on visual amenity in the local area.



**Figure 7 – existing gravel vehicle access through the property**



**Figure 8 –showing typical density of vegetation at proposed location on property**



## 7.2 Heritage

In order to identify natural or cultural significance associated with the site, a desktop search of both the State Heritage Office’s ‘Inherit’ heritage register and the Department of Aboriginal Affairs Aboriginal Heritage Inquiry System was undertaken as part of an environmental constraints mapping process. The local planning scheme was also reviewed. The investigation did not identify any registered cultural, historical or environmental heritage significance in the immediate vicinity of the proposed site.

## 7.3 Bushfire

The proposed development is classified under the Building Code of Australia as Class 10b (non-habitable structures). As such firebreaks are not required, nor will the development result in any additional fire load or risk to occupants.

We have been further advised by the Western Australian Planning Commission that it is not the intent of State Planning Policy 3.7 Planning in Bushfire Prone Areas for Class 10 (Telecommunications Infrastructure) to require a BAL Bushfire Hazard Assessment in fire prone areas. We are currently seeking a written statement to this effect that we intend to submit with future **nbn** Development Applications in such circumstances.

## 7.4 Electrical Interference and Grounding of the Facility

The **nbn**<sup>™</sup> fixed wireless network is licensed by the Australian Communications and Media Authority (ACMA) for the exclusive use of the OFDMA9800 frequency band. As **nbn** is the exclusive licensee of this sub-band, emissions from **nbn**<sup>™</sup> equipment within the frequency band should not cause interference.

Filters will also help to ensure that each facility meets the ACMA specifications for emission of spurious signals outside the **nbn**<sup>™</sup> frequency allocations. **Nbn** intends to promptly investigate any interference issues that are reported.

The facility is also designed to be grounded to the relevant Australian Standards – that is, the facility will be ‘earthed’.

## 7.5 Erosion, Sedimentation Control and Waste Management

Notwithstanding that we are undertaking earthworks such that a retaining structure will be constructed, there will not be any notable change to the current flow of surface water following a rain event. As such there will be no concentrated discharge of stormwater otherwise requiring erosion control at the



point of discharge (outlet). In addition, contractors must comply with the 'nbn Construction Specification' that requires contractors to undertake the necessary erosion and sediment control measures in order to protect the surrounding environment during the construction process. On completion of the works, the site will be restored and reinstated to an appropriate standard. No waste which requires collection or disposal will be generated through the operation of the facility.

## 7.6 Flora and Fauna

In order to ascertain any conservation significance associated with the site, a desktop search was undertaken of the Department of Environment Regulation (DER) Environmentally Sensitive Areas mapping system. Our environmental constraints mapping process also identifies the location of Bush Forever sites. Additionally, a review of the local planning policy framework was undertaken to ensure compliance with any applicable structure plan or building envelope.

The site is not located within an 'Environmentally Sensitive Area' or a Bush Forever reservation. A clearing permit from the Department of Environment Regulation is not required, or a referral to the Department of Planning Bush Forever Office required. It is additionally noted that the monopole does not support any moving parts that have the potential to impact bird life.

Clause 5.30.11 of the City's Local Planning Policy states in relation to vegetation-

*No local native trees or shrubs shall be felled or removed from any lot classified Rural Residential or Rural Smallholding zone other than within an approved building envelope except where in the opinion of the local government –*

- (a) such trees and shrubs are dead, diseased or dangerous;*
- (b) the establishment or maintenance of a firebreak is required under a regulation or local law;*
- (c) it is necessary to allow for the construction or maintenance of vehicle access, fences or essential service infrastructure; or*
- (d) it is necessary to provide for the reduction of any existing or potential fire hazard.*

**Nbn** requests the consent of the Shire of Northam to undertake the proposed removal of a semi-mature grass tree, juvenile grass trees/groundcover within the 99m<sup>2</sup> compound for the infrastructure proposed in this application.

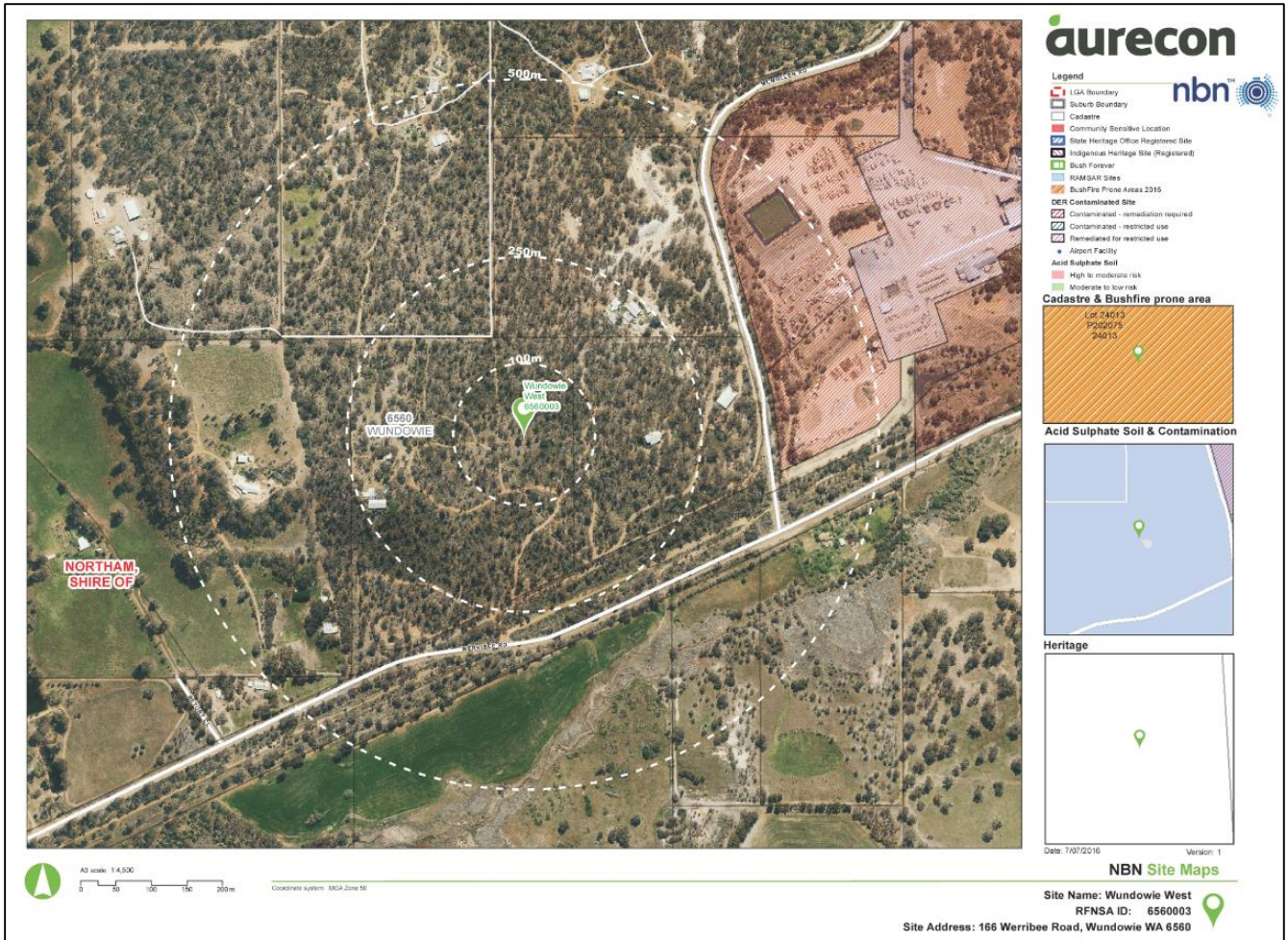


Figure 9: Land Use Constraints Map

## 7.7 Social and Economic Impacts

Access to fast internet is an essential service in modern society. Initially, small to medium business customers accounted for a significant part of the demand for broadband technology, but internet services have now been embraced by the general public. Usage of internet services continues to widen as new technologies become progressively more affordable and accessible for the wider community.

The proposed development should assist in providing significantly enhanced fixed wireless internet coverage to the locality of Wundowie. This is expected to be of particular benefit for residential premises in the area.

The new **nbn**<sup>TM</sup> network is designed to provide the community with access to fast and reliable internet services. A reliable internet service is important to help promote the economic growth of communities, and the facility is anticipated to have significant social and economic benefits for the local community.



## 7.8 Aviation Safety

Given the structure is not within 30km of an airport, or 45m or more above the natural ground level it does not require registration as a Tall Structure with the RAAF in accordance with CAAP 92-1.

## 7.9 Public Safety

### 7.9.1 Radiofrequency Emissions

In relation to public safety and specifically Electromagnetic Emissions (EME) and public health, **nbn**<sup>TM</sup> network operates within the operational standards set by the Australian Communication and Media Authority (ACMA) and Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). ARPANSA is a Federal Government agency incorporated under the Health and Ageing portfolio and is charged with the responsibility for protecting the health and safety of both people and the environment from the harmful effects of radiation (ionising and non-ionising).

All **nbn**<sup>TM</sup> network installations are designed and certified by qualified professionals in accordance with all relevant Australian Standards. This helps to ensure that the **nbn**<sup>TM</sup> facility does not result in any increase in the level of risk to the public. It is for this reason that the new Telecommunications Infrastructure State Planning Policy makes it clear that public health is not a matter for local government to consider when determining development applications.

This facility is to be operated in compliance with the mandatory standard for human exposure to EME – currently the Radio communications (Electromagnetic Radiation Human Exposure) Standard 2003. The EME Report associated with this site is attached in **Appendix C – EME Report**. The report shows that the maximum predicted EME will equate to 0.077% of the maximum exposure limit (where 100% of the limit is still considered to be safe).

Moreover, all **nbn**<sup>TM</sup> network equipment has the following features, all of which help to minimise the amounts of energy used and emitted:

- Dynamic/Adaptive Power Control is a network feature that automatically adjusts the power and hence minimises EME from the facility;
- Varying the facility's transmit power to the minimal required level, minimising EME from the network; and
- Discontinuous transmission, a feature that reduces EME emissions by automatically switching the transmitter off when no data is being sent.



### 7.9.1 Public Access

The proposed facility will have restrictions aimed at preventing public access, including a 2.4m secured compound fence with a locked gate and warning signs placed around the facility.

## 7.10 The Public Interest and the Benefits of Telecommunications

The proposed **nbn**<sup>TM</sup> facility is expected to have significant benefit for residents in the Wundowie area. **Nbn** believes that the public interest would be served by approval of the proposal, given benefits for enhanced internet coverage in the area. The facility is expected to have benefits for local residents and businesses within the district.

There are numerous other benefits of telecommunications connectivity, as follows:<sup>3</sup>

- There are many potential educational benefits justifying the implementation of the **nbn**<sup>TM</sup>. Curriculum and data sharing, increased availability and accessibility of research materials, and virtual classroom environments are good examples. Such elements are particularly beneficial within a tertiary education context.
- Businesses can, through internet usage, increase efficiency through time, resource and monetary savings. Improved internet services effectively remove physical distance and travel time as a barrier to business.
- Improvements to internet services may also be of benefit for local employees, by enabling telecommuting and home business. The telecommuting trend is heavily reliant on access to fast internet services, and is anticipated to continually increase in popularity.

The public benefits of access to fast internet have been widely acknowledged for many years. Reliable internet access is now more than ever an integral component of daily life, so much so that its absence is considered a social disadvantage.

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<sup>3</sup> End user experience including the speeds actually achieved over the **nbn**<sup>TM</sup> depends on some factors outside **nbn**<sup>TM</sup>'s control like the end user's equipment quality, software, broadband plans and how the end user's service providers designs its network.





## 8. CONCLUSION

**Nbn** considers that the proposed Wundowie West facility, comprising a 40 metre monopole and ground level infrastructure has been proposed in the least impactful location whilst ensuring adequate coverage is achieved.

The facility has been strategically sited and designed to minimise visibility within the surrounding environment and environmental disturbance as much as practicable. In this regard **nbn** considers that the proposal satisfies the requirements of the State Planning Policy and the accompanying *Guidelines for the Location, Siting and Design of Telecommunications*.

**Nbn** considers that the proposal is also consistent with the stated objectives and aims of the Shire of Northam Local Planning Scheme and should be supported.

The **nbn** looks forward to providing approximately 186 premises with fast, reliable and affordable broadband services from its Wundowie West facility.



## APPENDIX A – COPY OF TITLE

WESTERN



AUSTRALIA

REGISTER NUMBER <b>24013/DP202075</b>	
DUPLICATE EDITION <b>1</b>	DATE DUPLICATE ISSUED <b>15/7/2009</b>

**RECORD OF CERTIFICATE OF TITLE**  
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME  
**1893**

FOLIO  
**92**

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.



REGISTRAR OF TITLES

**LAND DESCRIPTION:**

LOT 24013 ON DEPOSITED PLAN 202075

**REGISTERED PROPRIETOR:**  
(FIRST SCHEDULE)

GARY WALTER MULDER  
JONINE MARIE MAJOR  
BOTH OF LOT 24013 WERRIBEE ROAD, WUNDOWIE  
AS JOINT TENANTS

(AN K991280 ) REGISTERED 29 JUNE 2009

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
(SECOND SCHEDULE)

- F507928 EASEMENT BURDEN SEE SKETCH ON VOL 1893 FOL 92. REGISTERED 7.4.1994.
- K991281 MORTGAGE TO BENDIGO AND ADELAIDE BANK LTD REGISTERED 29.6.2009.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.  
\* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.  
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1893-92 (24013/DP202075).  
PREVIOUS TITLE: 1452-115.  
PROPERTY STREET ADDRESS: 166 WERRIBEE RD, WUNDOWIE.  
LOCAL GOVERNMENT AREA: SHIRE OF NORTHAM.

NOTE 1: A000001A LAND PARCEL IDENTIFIER OF AVON LOCATION 24013 (OR THE PART THEREOF) ON SUPERSEDED PAPER CERTIFICATE OF TITLE CHANGED TO LOT 24013 ON DEPOSITED PLAN 202075 ON 14-SEP-02 TO ENABLE ISSUE OF A DIGITAL CERTIFICATE OF TITLE.

NOTE 2: THE ABOVE NOTE MAY NOT BE SHOWN ON THE SUPERSEDED PAPER CERTIFICATE OF TITLE OR ON THE CURRENT EDITION OF DUPLICATE CERTIFICATE OF TITLE.



## APPENDIX B – PROPOSED PLANS

DATE OF ISSUE		10.03.16							
DRAWING PACKAGE VERSION		1							
<b>GENERAL</b>									
6BKH-51-07-WUNO-T1	COVER SHEET		01						
6BKH-51-07-WUNO-C1	SITE SPECIFIC NOTES		01						
6BKH-51-07-WUNO-C2	OVERALL SITE PLAN		01						
6BKH-51-07-WUNO-C3	SITE SETOUT PLAN		01						
6BKH-51-07-WUNO-C4	SITE ELEVATION AND DETAILS		01						
<b>ELECTRICAL</b>									
<b>RF AND TX CONFIGURATIONS</b>									
6BKH-51-07-WUNO-A1	NBN ANTENNA CONFIGURATION & SETOUT PLAN		01						
<b>STRUCTURAL</b>									
<b>CIVIL</b>									
<b>MONOPOLE / LATTICE TOWER DOCUMENTATION</b>									
<b>LEASE / LICENCE</b>									
<b>DISTRIBUTION</b>									
SAED	CHRIS BRAYTON		1						
ERICSSON	CARLY FERGUSON		1						

SITE CODE: 6BKH-51-07-WUNO

# WUNDOWIE WEST

166 WERRIBEE ROAD

WUNDOWIE

6560

RFNSA No: 6560003



Australia's  
broadband  
network

## PROJECT SUMMARY

PROPOSED NBN 40m MONOPOLE WITH HEADFRAME  
PROPOSED NBN OUTDOOR CABINETS ON CONCRETE SLAB ON GROUND

Client:



Client:



Client:

Project:

NATIONAL BROADBAND NETWORK  
SITE No: 6BKH-51-07-WUNO  
WUNDOWIE WEST  
166 WERRIBEE ROAD  
WUNDOWIE  
6560

PRELIMINARY

01 10.03.16 PRELIMINARY ISSUE

Rev Date Revision Details



DESIGNER: LJM

CHECKED: RC

CBROVED: CB

Drawing Title:  
**COVER SHEET**

Drawing No. 6BKH-51-07-WUNO-T1 Revision 01

# SITE INFORMATION:

## 1. SITE ADDRESS

LOT 24013, 166 WERRIBEE ROAD, WUNDOWIE 6560

## 2. GENERAL

THE CONTRACTOR SHALL COMPLY WITH ALL RELEVANT NBN CONSTRUCTION STANDARDS, CURRENT AUSTRALIAN STANDARDS AND SPECIFICATIONS.

## 3. SITE ACCESS

FROM PERTH TRAVEL APPROX 32km ALONG GUILFORD RD AND GREAT EASTERN HIGHWAY TO MUNDARING. FROM MUNDARING TRAVEL ANOTHER 30.4km ALONG GREAT EASTERN HIGHWAY AND TURN LEFT INTO HAWKE AVE. GO TOWARDS WUNDOWIE FOR 1.8km AND TURN LEFT INTO WERRIBEE ROAD, THEN PROCEED FOR 1.6km TO A GRAVEL DRIVEWAY (400m PAST McMULLEN ROAD). TURN RIGHT ONTO GRAVEL DRIVEWAY (2WD) AND FOLLOW IT UP A STEEP HILL FOR 300m, THEN TURN RIGHT ONTO A ROCKY GRAVEL TRACK (4WD) AND GO ANOTHER 80m. AT THE INTERSECTION OF TWO TRACKS VEER RIGHT FOR 40m TO SITE.

## 4. EQUIPMENT

PROPOSED NEW NBN OUTDOOR CABINETS TO BE INSTALLED ON CONCRETE SLAB (<7.5m<sup>2</sup> GFA) WITHIN NBN LEASE AREA.

## 5. STRUCTURE

PROPOSED NBN 40m MONOPOLE WITH HEADFRAME.

## 6. ANTENNA ACCESS

PROPOSED ANTENNA ACCESS USING ACCESS LADDER WITH LAD-SAF OR EWP, BY QUALIFIED PERSONNEL ONLY.

## 7. EXISTING SERVICES

THE CONTRACTOR SHALL IDENTIFY AND CONFIRM THE LOCATION OF ALL RELEVANT EXISTING SERVICES AS REQUIRED PRIOR TO THE COMMENCEMENT OF WORKS.

## 8. EXISTING SITE HAZARDS

THE FOLLOWING HAZARDS ARE PRESENT ON THIS SITE:

- EXPOSURE TO ELEMENTS
- TRIP HAZARDS
- SNAKES, TICKS AND INSECTS

## 9. ELECTRICAL SUPPLY

REFER TO DRAWINGS 6BKH-51-07-WUNO-C2, C3 FOR DETAILS.

## 10. TRANSMISSION LINK & RF CONFIGURATION

REFER TABLE ON DRAWING 6BKH-51-07-WUNO-A1 FOR DETAILS.

## 11. SITE SPECIFIC INFORMATION

- PRIOR TO THE COMMENCEMENT OF WORKS, THE NBN CONTRACTOR SHALL CONFIRM ACCESS IS SUITABLE FOR CONSTRUCTION WORKS.
- RETAINING WALLS ARE PROPOSED.
- SITE REQUIRES EARTHWORKS AND LEVELING, WITH THE PROVISION OF SUITABLE BATTERS.
- HARD GROUND OF GRAVEL AND ROCK. ROCK BREAKER MAY BE REQUIRED FOR EXCAVATION.
- NO SIGNIFICANT CLEARING IS REQUIRED. ONE VERY SMALL GRASS TREE TO BE REMOVED.
- UPGRADE OF EXISTING ROCKY GRAVEL TRACK IS REQUIRED FOR APPROXIMATELY 120m.
- NO LANDSCAPING IS PROPOSED
- STORMWATER TO BE DISSIPATED THROUGH GRAVEL FINISH WITHIN COMPOUND
- NO EASEMENTS ARE EXISTING OR PROPOSED

## 12. WIND LOAD PARAMETERS

TBC

## 13. SITE SIGNAGE AND LOCATION

- SITE ENQUIRY SIGN, ON THE NBN ODC DOOR
- HAZARDOUS VOLTAGE SIGN, ON NBN METER PANEL/PDB
- CLIMBING FALL ARREST SIGNAGE, CLOSE TO CLIMBING RUNG OR TO LADDER LOCATION (REFER RAN HANDBOOK SECTION 15.4 FOR FURTHER DETAILS)
- EME SIGNAGE, REFER NBN-STD-0025

Client:



Client:



Client:

Project:

NATIONAL BROADBAND NETWORK  
SITE No: 6BKH-51-07-WUNO  
WUNDOWIE WEST  
166 WERRIBEE ROAD  
WUNDOWIE  
6560

PRELIMINARY

01 10.03.16 PRELIMINARY ISSUE

Rev Date Revision Details



DESIGNER: LJM

CHECKED: RC

CBROVED: CB

Drawing Title:

SITE SPECIFIC NOTES

Drawing No. 6BKH-51-07-WUNO-C1 Revision 01





PROPOSED NBN 75mm THICK SINGLE SIZED GRAVEL OVER WEED MAT WITH TIMBER EDGE

PROPOSED NBN 1x Ø600 PARABOLIC DISH (TO WUNDOWIE)

PROPOSED NBN MONOPOLE FOUNDATION (INDICATIVE ONLY)

PROPOSED NBN 4.0m MONOPOLE WITH CIRCULAR HEADFRAME

PROPOSED NBN PANEL ANTENNAS 3-OFF WITH NBN REMOTE RADIO UNITS 6-OFF TO BE FIXED BEHIND THE PANEL ANTENNAS

PROPOSED NBN 300 WIDE CABLE LADDER WITH (2-OFF) CABLE LADDER SUPPORT POSTS

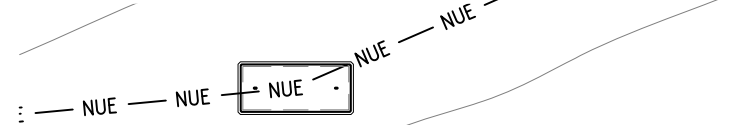
PROPOSED NBN GPS UNIT (1-OFF)

PROPOSED NBN POWER DISTRIBUTION BOARD/METER PANEL ON H-FRAME

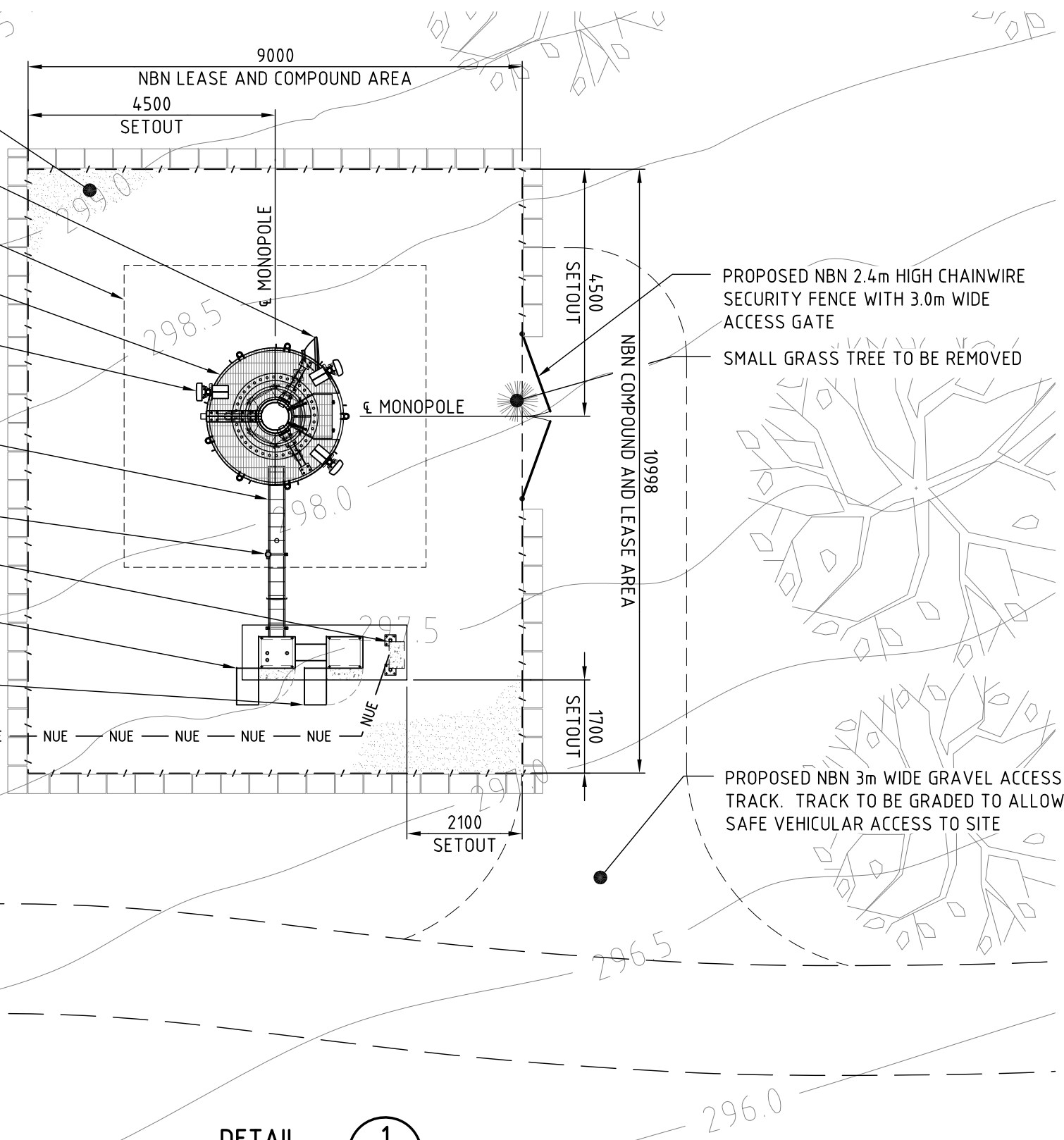
PROPOSED NBN OUTDOOR CABINET SSC-02 ON CONCRETE SLAB (FACTORY FINISH)

PROPOSED NBN OUTDOOR CABINET BBS-6101 ON CONCRETE SLAB (FACTORY FINISH)

PROPOSED NBN UNDERGROUND POWER ROUTE APPROX 270m. REFER NOTE 2



EXISTING 2m WIDE GRAVEL TRACK



PROPOSED NBN 2.4m HIGH CHAINWIRE SECURITY FENCE WITH 3.0m WIDE ACCESS GATE  
SMALL GRASS TREE TO BE REMOVED

PROPOSED NBN 3m WIDE GRAVEL ACCESS TRACK. TRACK TO BE GRADED TO ALLOW SAFE VEHICULAR ACCESS TO SITE

DETAIL SCALE 1:100 1  
C2

**NOTES:**

1. REFER STANDARD DRAWING NBN-STD-0026 FOR CONDUITS DEPTHS AND COVER AND FOR CLEARANCE FROM OTHER CARRIERS AND SERVICES.
2. THE NBN CONSUMERS MAINS AND NBN SUBMAIN ROUTE SHOWN ON THE DRAWINGS IS INDICATIVE ONLY. ELECTRICAL CONTRACTOR TO DETERMINE EXACT ROUTE. ELECTRICAL CONTRACTOR TO LOCATE AND IDENTIFY EXISTING U/G SERVICES PRIOR TO COMMENCEMENT OF WORK.
3. EXISTING U/G POWER SHOWN INDICATIVE ONLY. TO BE LOCATED PRIOR TO CONSTRUCTION AND RE-ROUTED IF NECESSARY TO AVOID NBN FACILITY.
4. NBN COMPOUND TO BE BENCHMARKED WITH CENTRE OF COMPOUND AT RL 298.2m. EARTHWORKS TO ALLOW MAXIMUM 1:25 FALL ACROSS SITE TO TIE IN WITH NATURAL SLOPE.
5. CUT & FILL BATTERS TO BE MINIMUM SLOPE 1:4 ADJUSTED LOCALLY TO SUIT SITE CONDITIONS.
6. CONTOUR INTERVAL 0.5m.
7. ALL HEIGHTS INDICATED ARE IN METERS TO A.H.D.

**LEGEND**

- NUE — NUE — PROPOSED NBN U/G POWER ROUTE
- / — / — PROPOSED NBN COMPOUND FENCE
- — — — — EXISTING 4WD GRAVEL FIREBREAK

Client:



Client:



Client:

Project:

NATIONAL BROADBAND NETWORK  
 SITE No: 6BKH-51-07-WUNO  
 WUNDOWIE WEST  
 166 WERRIBEE ROAD  
 WUNDOWIE  
 6560

PRELIMINARY

01 10.03.16 PRELIMINARY ISSUE  
 Rev Date Revision Details



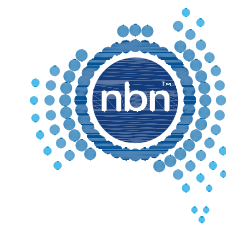
DESIGNER: LJM  
 CHECKED: RC  
 CBROVED: CB

Drawing Title:  
**SITE SETOUT PLAN**

Drawing No. 6BKH-51-07-WUNO-C3 Revision 01



Client:



Client:



Client:

Project:

NATIONAL BROADBAND NETWORK  
SITE No: 6BKH-51-07-WUNO  
WUNDOWIE WEST  
166 WERRIBEE ROAD  
WUNDOWIE  
6560

PRELIMINARY

01 10.03.16 PRELIMINARY ISSUE

Rev Date Revision Details



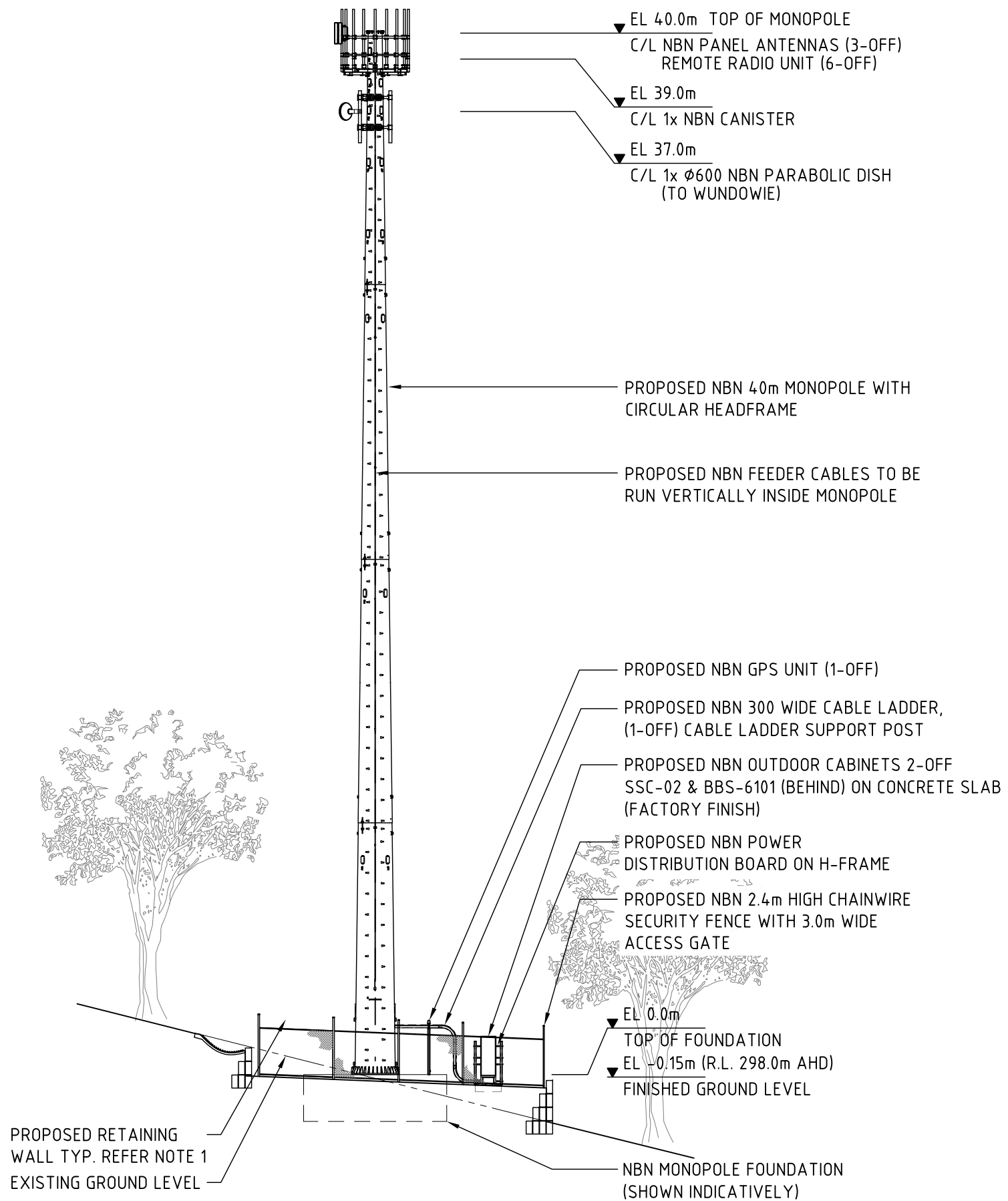
DESIGNER: LJM

CHECKED: RC

CBROVED: CB

Drawing Title:  
**SITE ELEVATION  
AND DETAILS**

Drawing No. 6BKH-51-07-WUNO-C4  
Revision 01



### WEST ELEVATION

SCALE 1:200

**NOTES:**

1. PROPOSED NBN LIMESTONE RETAINING WALL APPROX 1.0m WIDE x 1.5m HIGH TYPICAL. HEIGHT AND WITDTH SUBJECT TO GEOTECHNICAL REPORT.



11  
P 18042

24011  
DP 202075

313.28

89°57'45"

90°0'30"

142.87

NBN LEASE AREA  
SEE ENLARGEMENT

83.1

90°

(328.37)

16

P 18042

24013

DP 202075  
12.583 ha

185.5

115°7'45"

ROAD

345.76

WERRIBEE

64°54'

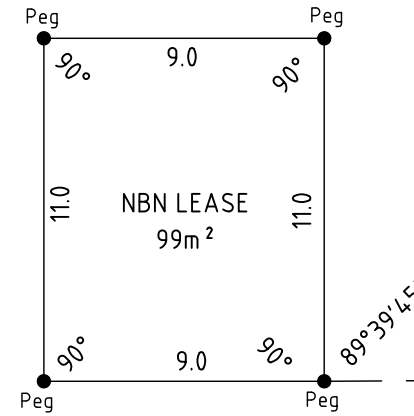
24014

DP 202075

475.05

LEASE PLAN

SCALE 1:2500



Not to Scale  
83.1

90°

142.87

(328.37)

16

P 18042

Not to Scale  
185.5

115°7'45"

ROAD

345.76

WERRIBEE

ENLARGEMENT

SCALE 1:250

NOTES:

1. ALL INTERNAL ANGLES OF NBN LEASE AREA ARE 90°. (LEASE AREA 11.0m x 9.0m).
2. REFER TO CERTIFICATE OF TITLE FOR ENCUMBRANCES.
3. REFER TO CERTIFICATE OF TITLE AND DEPOSITED PLAN 202075 FOR BOUNDARY AND TITLE INFORMATION.
4. WHITE WOODEN PEGS PLACED AT CORNERS OF LEASE AREA.
5. SURVEY CARRIED OUT USING RTK GPS. POSITION ACCURATE TO +/- 30mm.

Client:



Client:



Client:

Project:

NATIONAL BROADBAND NETWORK  
 SITE No: 6BKH-51-07-WUNO  
 WUNDOWIE WEST  
 166 WERRIBEE ROAD  
 WUNDOWIE  
 6560

PRELIMINARY

01	01.03.16	PRELIMINARY ISSUE
Rev	Date	Revision Details



DESIGNER: CGB

CHECKED: CEB

CBROVED: CEB

Drawing Title:

LEASE PLAN

Drawing No.  
6BKH-51-07-WUNO-C5

Revision  
01

# ANTENNA CONFIGURATION

Client:



Client:



Client:

Project:

NATIONAL BROADBAND NETWORK  
 SITE No: 6BKH-51-07-WUNO  
**WUNDOWIE WEST**  
 166 WERRIBEE ROAD  
 WUNDOWIE  
 6560

**PRELIMINARY**

01 10.03.16 PRELIMINARY ISSUE

Rev Date Revision Details



DESIGNER: LJM  
 CHECKED: RC  
 CBROVED: CB

Drawing Title:  
**NBN ANTENNA CONFIGURATION & SETOUT PLAN**

Drawing No. 6BKH-51-07-WUNO-A1 | Revision 01

## ANTENNA DETAIL

## MAIN FEEDER

## RRU DETAIL

## RF TAIL

## RET CABLE

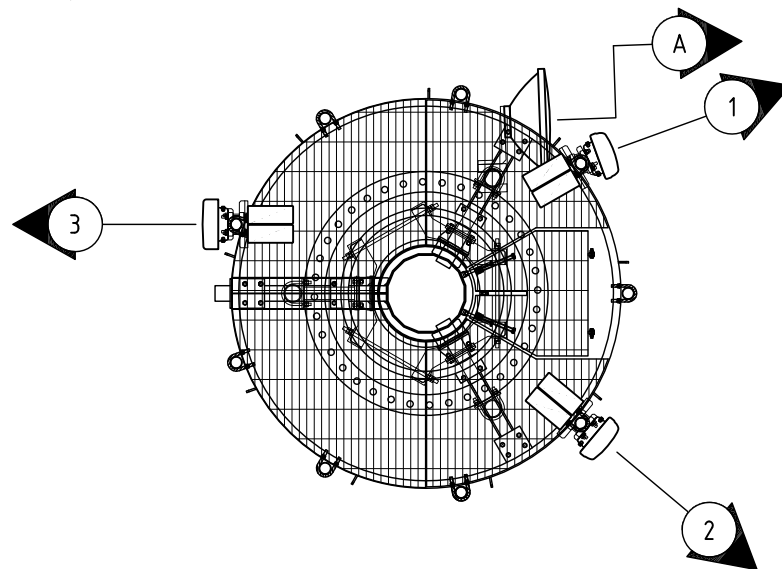
SECTOR	SYMBOL	TYPE	DIMENSION HxWxD	HEIGHT €	AZIMUTH (TN)	P1 & P2 eTILT	P3 & P4 eTILT	MECH DOWN TILT	TYPE	OVERALL LENGTH	CANISTER HEIGHT	CANISTER TO RRU LENGTH	TYPE	QTY	LOCATION	HEIGHT €	TYPE	LENGTH	TYPE	LENGTH
1		ARGUS SSPX310R	750x300x115	40m	70°	5°	5°	0°	H&S HYBRID MK II 6/8 Ø27.5mm	50m	39m	4.5m	RADIO 2218 B42	2 OFF	BEHIND ANTENNA	40m	H&S 1/2" BIRD PROOF LISCA CABLE	1.5m	1/TSR 484 21/2000	2.0m
2		ARGUS SSPX310R	750x300x115	40m	130°	5°	5°	0°				4.5m	RADIO 2218 B42	2 OFF	BEHIND ANTENNA	40m	H&S 1/2" BIRD PROOF LISCA CABLE	1.5m	1/TSR 484 21/2000	2.0m
3		ARGUS SSPX310R	750x300x115	40m	270°	6°	6°	0°				4.5m	RADIO 2218 B42	2 OFF	BEHIND ANTENNA	40m	H&S 1/2" BIRD PROOF LISCA CABLE	1.5m	1/TSR 484 21/2000	2.0m
GPS		KRE 1012082/1	ø69 x 96	2.5m					LDF1-50	5m										

## PARABOLIC

## FEEDER

## RAU

SECTOR	SYMBOL	TYPE	DIMENSION HxWxD	€ HEIGHT	AZIMUTH (TN)	LJMTINATION	TYPE	OVERALL LENGTH	QTY RAU
A		PARABOLIC	ø600	37m	88°	WUNDOWIE	LDF1-50	50m	1 OFF



## ANTENNA SETOUT PLAN

SCALE 1:50



## APPENDIX C – EME REPORT



# Environmental EME Report

## Wundowie West 166 Werribee Road, WUNDOWIE WA 6560

This report provides a summary of Calculated RF EME Levels around the wireless base station

Date 30/3/2016

RFNSA Site No. 6560003

### Introduction

The purpose of this report is to provide calculations of EME levels from the existing facilities at the site and any proposed additional facilities.

This report provides a summary of levels of radiofrequency (RF) electromagnetic energy (EME) around the wireless base station at Wundowie West 166 Werribee Road WUNDOWIE WA 6560 . These levels have been calculated by Ericsson using methodology developed by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

The maximum EME level calculated for the proposed systems at this site is 0.077% of the public exposure limit.

### The ARPANSA Standard

ARPANSA, an Australian Government agency in the Health and Ageing portfolio, has established a Radiation Protection Standard specifying limits for general public exposure to RF transmissions at frequencies used by wireless base stations. The Australian Communications and Media Authority (ACMA) mandates the exposure limits of the ARPANSA Standard.

### How the EME is calculated in this report

The procedure used for these calculations is documented in the ARPANSA Technical Report "Radio Frequency EME Exposure Levels - Prediction Methodologies" which is available at <http://www.arpansa.gov.au>.

RF EME values are calculated at 1.5m above ground at various distances from the base station, assuming level ground.

The estimate is based on worst-case scenario, including:

- wireless base station transmitters for mobile and broadband data operating at maximum power
- simultaneous telephone calls and data transmission
- an unobstructed line of sight view to the antennas.

In practice, exposures are usually lower because:

- the presence of buildings, trees and other features of the environment reduces signal strength
- the base station automatically adjusts transmit power to the minimum required.

Maximum EME levels are estimated in 360° circular bands out to 500m from the base station.

These levels are cumulative and take into account emissions from all mobile phone antennas at this site.

The EME levels are presented in three different units:

- volts per metre (V/m) – the electric field component of the RF wave
- milliwatts per square metre (mW/m<sup>2</sup>) – the power density (or rate of flow of RF energy per unit area)
- percentage (%) of the ARPANSA Standard public exposure limit (the public exposure limit = 100%).

### Results

The maximum EME level calculated for the proposed systems at this site is 1.71 V/m; equivalent to 7.74 mW/m<sup>2</sup> or 0.077% of the public exposure limit.

## Radio Systems at the Site

There are currently no existing radio systems for this site.

It is proposed that this base station will have equipment for transmitting the following services:

Carrier	Radio Systems
NBN Co	LTE3500 (proposed)

## Calculated EME Levels

This table provides calculations of RF EME at different distances from the base station for emissions from existing equipment alone and for emissions from existing equipment and proposed equipment combined.

Distance from the antennas at Wundowie West 166 Werribee Road in 360° circular bands	Maximum Cumulative EME Level – All carriers at this site					
	Existing Equipment			Proposed Equipment		
	Electric Field V/m	Power Density mW/m <sup>2</sup>	% ARPANSA exposure limits	Electric Field V/m	Power Density mW/m <sup>2</sup>	% ARPANSA exposure limits
0m to 50m				0.5	0.67	0.0067%
50m to 100m				0.72	1.37	0.014%
100m to 200m				1.21	3.9	0.039%
200m to 300m				1.71	7.74	0.077%
300m to 400m				1.66	7.33	0.073%
400m to 500m				1.34	4.77	0.048%
<b>Maximum EME level</b>				1.71	7.74	0.077
				273.58 m from the antennas at Wundowie West 166 Werribee Road		

## Calculated EME levels at other areas of interest

This table contains calculations of the maximum EME levels at selected areas of interest that have been identified through the consultation requirements of the Communications Alliance Ltd Deployment Code C564:2011 or via any other means. The calculations are performed over the indicated height range and include all existing and any proposed radio systems for this site.

Additional Locations	Height / Scan relative to location ground level	Maximum Cumulative EME Level All Carriers at this site Existing and Proposed Equipment		
		Electric Field V/m	Power Density mW/m <sup>2</sup>	% of ARPANSA exposure limits
No locations identified				

## RF EME Exposure Standard

The calculated EME levels in this report have been expressed as percentages of the ARPANSA RF Standard and this table shows the actual RF EME limits used for the frequency bands available. At frequencies below 2000 MHz the limits vary across the band and the limit has been determined at the Assessment Frequency indicated. The four exposure limit figures quoted are equivalent values expressed in different units – volts per metre (V/m), watts per square metre (W/m<sup>2</sup>), microwatts per square centimetre (μW/cm<sup>2</sup>) and milliwatts per square metre (mW/m<sup>2</sup>). Note: 1 W/m<sup>2</sup> = 100 μW/cm<sup>2</sup> = 1000 mW/m<sup>2</sup>.

Radio Systems	Frequency Band	Assessment Frequency	ARPANSA Exposure Limit (100% of Standard)
LTE 700	758 – 803 MHz	750 MHz	37.6 V/m = 3.75 W/m <sup>2</sup> = 375 μW/cm <sup>2</sup> = 3750 mW/m <sup>2</sup>
WCDMA850	870 – 890 MHz	900 MHz	41.1 V/m = 4.50 W/m <sup>2</sup> = 450 μW/cm <sup>2</sup> = 4500 mW/m <sup>2</sup>
GSM900, LTE900, WCDMA900	935 – 960 MHz	900 MHz	41.1 V/m = 4.50 W/m <sup>2</sup> = 450 μW/cm <sup>2</sup> = 4500 mW/m <sup>2</sup>
GSM1800, LTE1800	1805 – 1880 MHz	1800 MHz	58.1 V/m = 9.00 W/m <sup>2</sup> = 900 μW/cm <sup>2</sup> = 9000 mW/m <sup>2</sup>
LTE2100, WCDMA2100	2110 – 2170 MHz	2100 MHz	61.4 V/m = 10.00 W/m <sup>2</sup> = 1000 μW/cm <sup>2</sup> = 10000 mW/m <sup>2</sup>
LTE2300	2302 – 2400 MHz	2300 MHz	61.4 V/m = 10.00 W/m <sup>2</sup> = 1000 μW/cm <sup>2</sup> = 10000 mW/m <sup>2</sup>
LTE2600	2620 – 2690 MHz	2600 MHz	61.4 V/m = 10.00 W/m <sup>2</sup> = 1000 μW/cm <sup>2</sup> = 10000 mW/m <sup>2</sup>
LTE3500	3425 – 3575 MHz	3500 MHz	61.4 V/m = 10.00 W/m <sup>2</sup> = 1000 μW/cm <sup>2</sup> = 10000 mW/m <sup>2</sup>

## Further Information

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) is a Federal Government agency incorporated under the Health and Ageing portfolio. ARPANSA is charged with responsibility for protecting the health and safety of people, and the environment, from the harmful effects of radiation (ionising and non-ionising).

Information about RF EME can be accessed at the ARPANSA website, <http://www.arpansa.gov.au>, including:

- Further explanation of this report in the document “Understanding the ARPANSA Environmental EME Report”
- The procedure used for the calculations in this report is documented in the ARPANSA Technical Report; “Radio Frequency EME Exposure Levels - Prediction Methodologies”
- the current RF EME exposure standard  
Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), 2002, ‘Radiation Protection Standard: Maximum Exposure Levels to Radiofrequency Fields — 3 kHz to 300 GHz’, Radiation Protection Series Publication No. 3, ARPANSA, Yallambie Australia.  
[Printed version: ISBN 0-642-79400-6 ISSN 1445-9760] [Web version: ISBN 0-642-79402-2 ISSN 1445-9760]

The Australian Communications and Media Authority (ACMA) is responsible for the regulation of broadcasting, radiocommunications, telecommunications and online content. Information on EME is available at <http://emr.acma.gov.au>

The Communications Alliance Ltd Industry Code C564:2011 ‘Mobile Phone Base Station Deployment’ is available from the Communications Alliance Ltd website, <http://commsalliance.com.au> .

Contact details for the Carriers (mobile phone companies) present at this site and the most recent version of this document are available online at the Radio Frequency National Site Archive, <http://www.rfnsa.com.au>.