



Infrastructure Delivery Plan

Patyegarang Project, Morgan Road, Belrose

For Metropolitan Local Aboriginal Land Council, July 2023

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On 9th June 2023, the Department of Planning and Environment issued a Gateway determination for the planning proposal. Following the issue of the Gateway determination, the Metropolitan Aboriginal Land Council resolved to adopt an alternative name for the project to reflect the Aboriginal cultural heritage of the site. This report has accordingly been updated to reference the Patyegarang Project. No other changes have been made to the content of this report.

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Executive Summary

Craig & Rhodes has been engaged by the Metropolitan Local Aboriginal Land Council to prepare an Infrastructure Delivery Plan to inform the rezoning process for the Morgan Road, Belrose Precinct under a Planning Proposal in accordance with Chapter 3, State Environmental Planning Policy (Planning Systems) 2021.

The Belrose Precinct is in the Northern Beaches Local Government Area and covers an area of approximately 70 hectares. Preliminary estimates suggest that the Belrose Precinct could yield approximately 450 dwellings.

The Infrastructure Delivery Plan is reliant upon traditional suppliers of utility infrastructure.

In preparing the Infrastructure Delivery Plan it is confirmed that the **project can be adequately serviced** with;

- Sydney Water - potable water,
- Sydney Water – waste water,
- Ausgrid - electricity
- NBN - telecommunications
- Jemena – gas

All services are subject to the upgrade and provision of lead in services to facilitate development of the site.

Further information is needed to conduct an adequate opinion of probable costs, however various service adjustments will be assessed for their cost-effectiveness.

Details of each individual service availability is outlined below.

1 Introduction

Craig & Rhodes has been engaged by the Metropolitan Local Aboriginal Land Council to provide engineering services to assist in the preparation of an Infrastructure Delivery Plan (IDP) for the Morgan Road, Belrose Precinct (the Precinct). The primary objective of the IDP is to inform the rezoning process & to facilitate the urban development of the Precinct.

The Precinct is located within the Northern Beaches Local Government Area and covers an area of approximately 70 hectares at Morgan Rd Belrose and land owned by the Metropolitan Local Aboriginal Land Council (MLALC).

The Precinct is bound by residential land to the west. Various aged care facilities (including Uniting Wesley Gardens and Wesley Gardens Aged Care facility) adjoin the site to the north west and is bounded by large rural land holdings to the north east and vacant land to the east and south.

Snake Creek is in the center of the site.

The land is a deferred zoning under Northern Beaches LEP.

A Site Locality Sketch land edged blue is included as **Figure 1-1**.

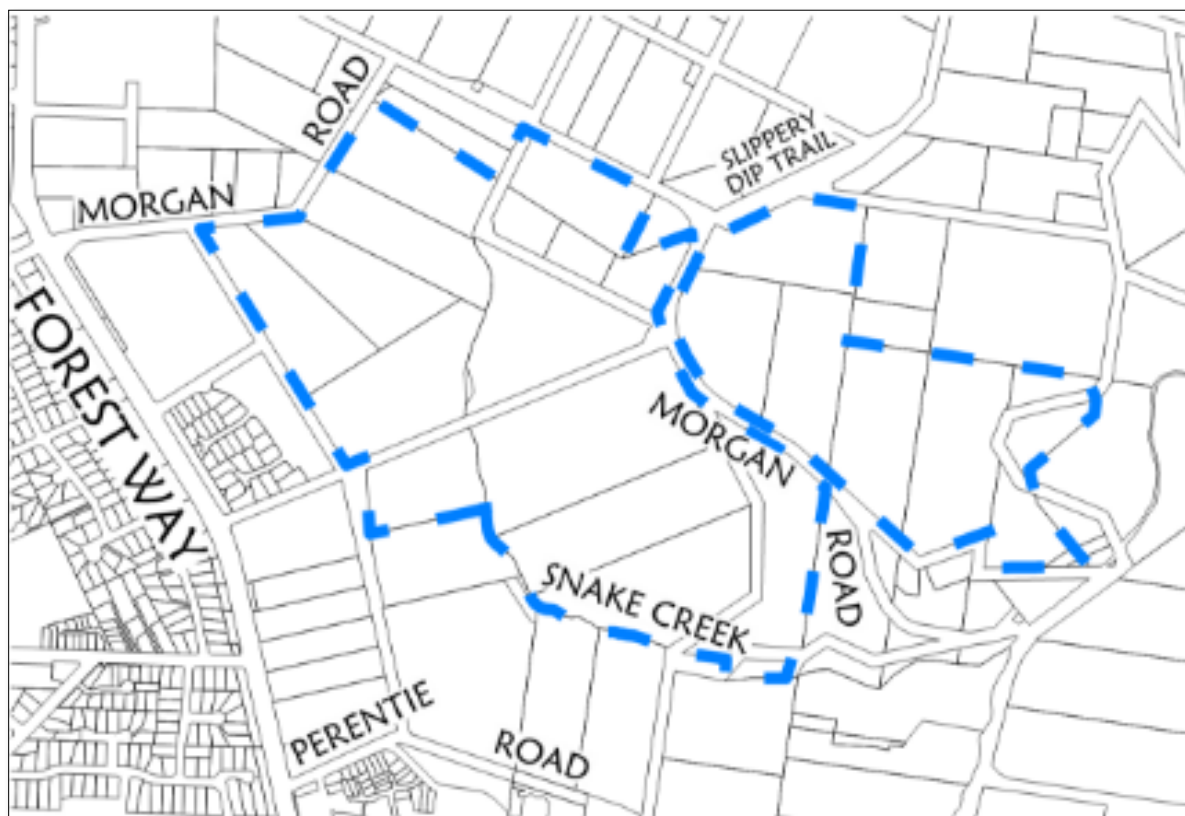


Figure 1-1 Site Locality Sketch

To inform the rezoning process, a Draft Structure Plan has been prepared by Cox for the Precinct. This is included at **Figure 2-1**.

In preparing the IDP, Craig & Rhodes has relied upon the Structure Plan as a basis of all discussions with utility infrastructure providers, including:

- Sydney Water
- Ausgrid
- Jemena
- NBN Co.

2 Structure Plan

2.1 Overview

The Draft Structure Plan prepared by Cox is included as **Annexure A**. The projected dwelling yield across the precinct is estimated to be approximately 450 dwellings.

2.2 Staging

There are several matters that must be taken into consideration when identifying the preferred staging strategy for the rezoning of the development of the Precinct.

Given the size of the development it is likely that construction will be undertaken in several stages that is yet to be resolved and will be dependent on both commercial and physical considerations of the project.

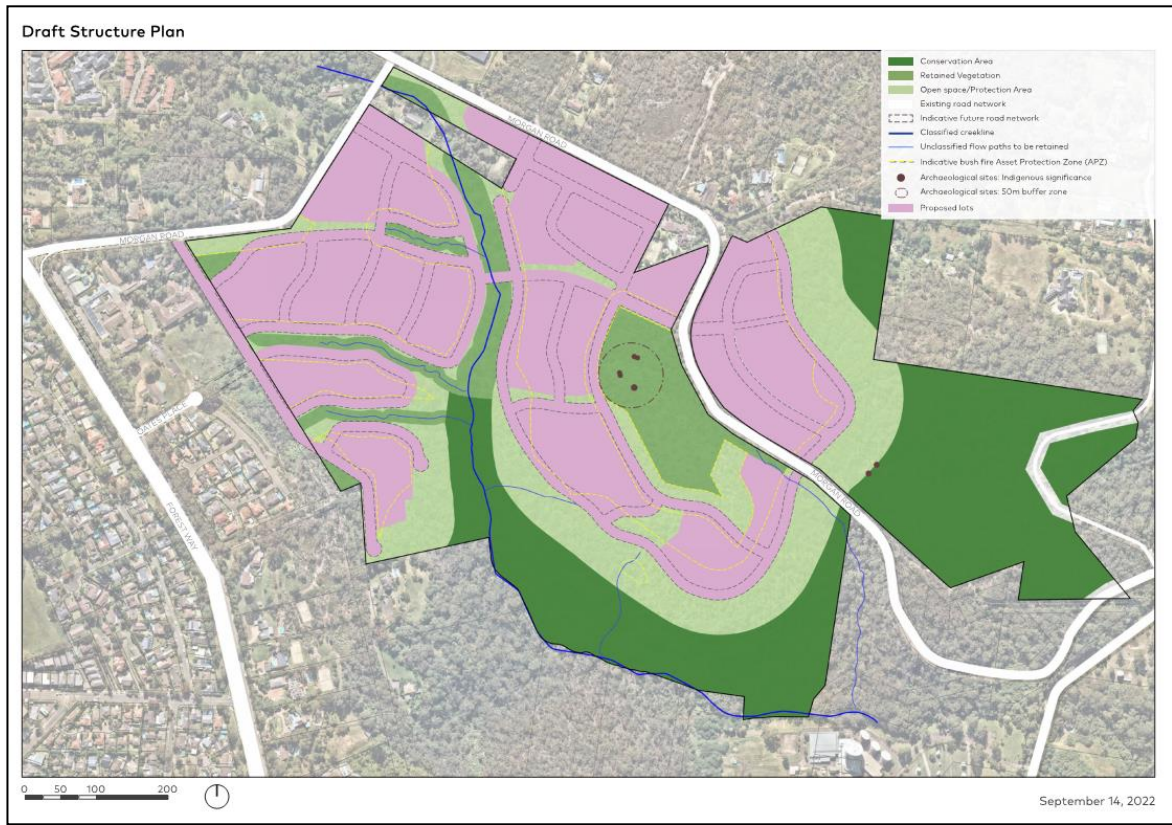


Figure 2-1 Draft Structure Plan

3 Existing Utility Infrastructure

3.1 Sydney Water

Sydney Water issued Feasibility Letters under Case 160354 9 March 2017 & Case 186126 dated 31 August 2020, included in Annexure B & D

These feasibility letters outlined the availability of wastewater & potable water in the locality as follows. The relevant Sydney Water Supply Zone can be seen in **Figure 3-1**.



Figure 3-1 Water Supply Zone

3.2 Wastewater

The Precinct is not currently connected to the Sydney Water wastewater network.

The site drains to Sydney Water's – Warriewood Wastewater Treatment Plant (WWTP) located approximately 7 kilometers to the north-east of the Precinct boundary.

The location of the Warriewood WWTP in relation to the Precinct is illustrated in **Figure 3-2**.

The Feasibility Letter confirms treatment capacity is available at the Warriewood WWTP to service the proposed development of the Precinct.

To service the precinct, it will be necessary to install new wastewater infrastructure as well as upgrade existing infrastructure.

Various options will need to be considered to provide effective wastewater servicing to the Precinct.

Nearby Sewage Pumping Stations include SP0941 located north of the development site along Morgan Road & SP0999 located to the east of the precinct on Morgan Rd in a position to service the site. **Refer to Figure 3.3.**

These pumping stations connect to the Wakehurst Parkway Carrier that drains to the WWTP.

The site is currently restricted from connecting to nearby wastewater pressure mains along Morgan Road by Sydney Water, as these mains do not have the capacity to receive additional flows from the

development.

A hydraulic consultant will be required to investigate wastewater connection option, and the waste water connection will be identified as part of the detailed planning phase.

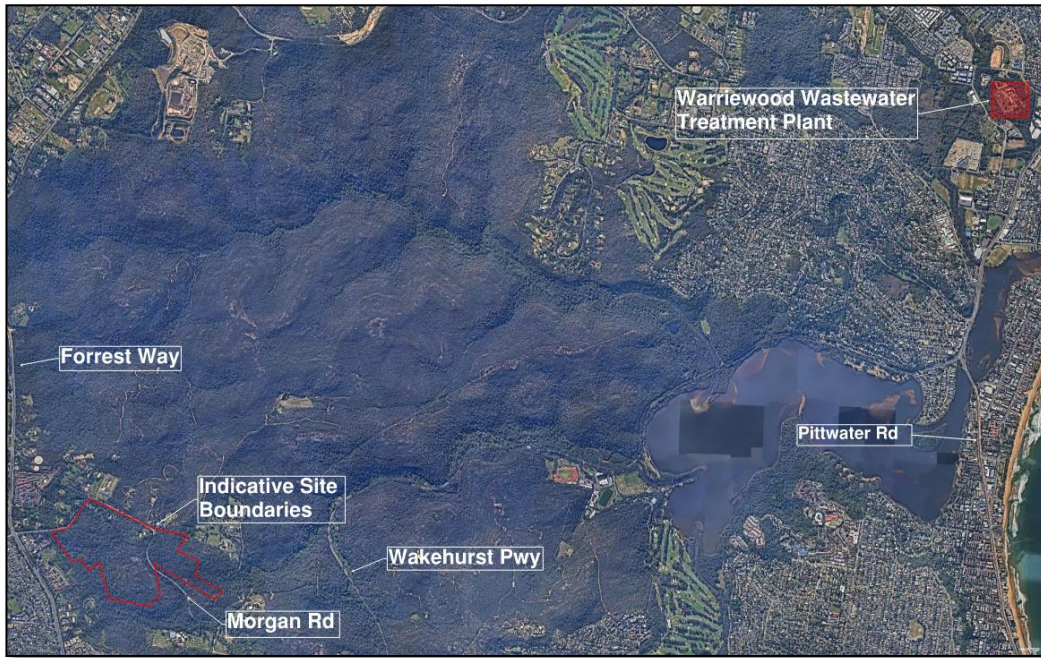


Figure 3-2 Warriewood STP Location

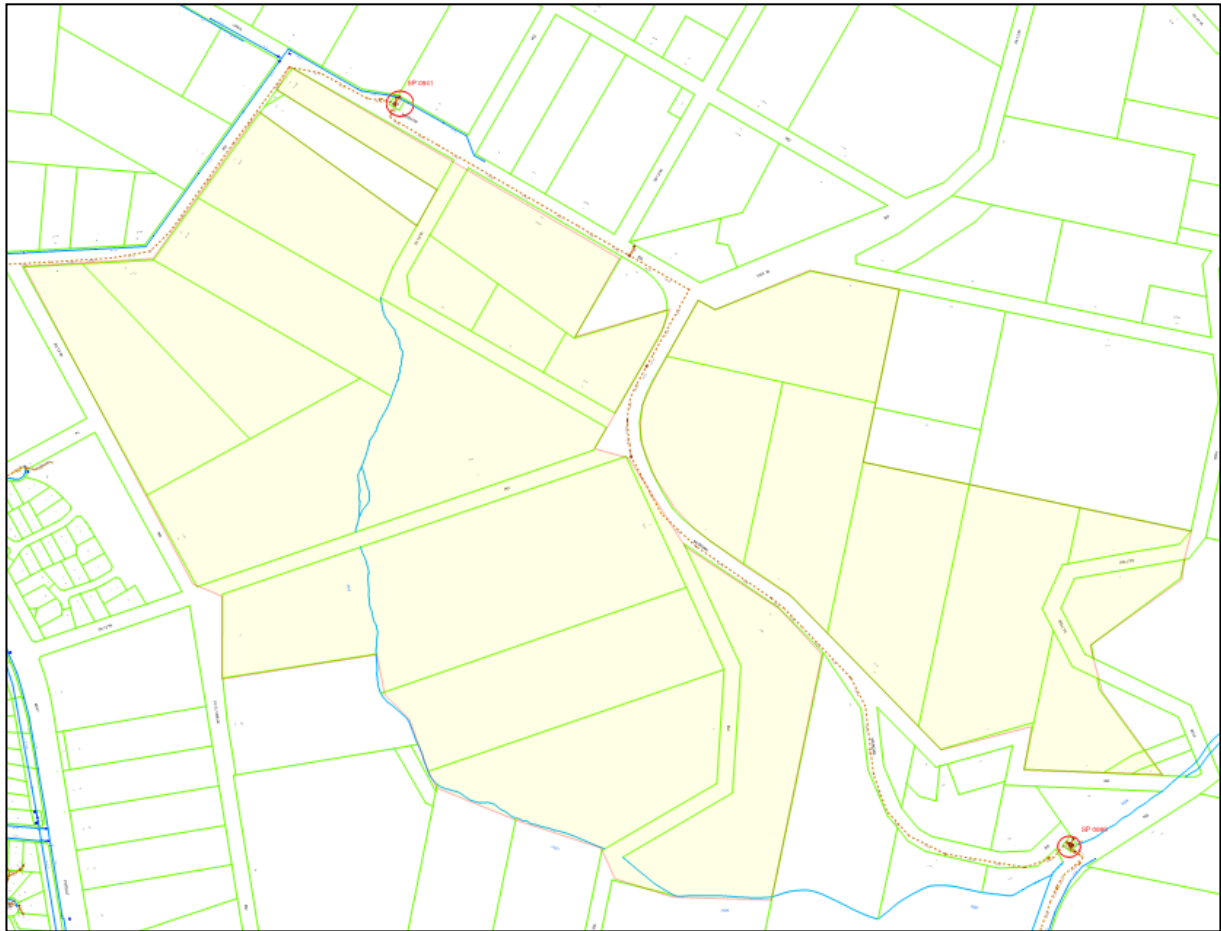


Figure 3-3 Belrose SP 0941 & SP 0999 Locations

3.3 Potable Water

The water supply zone available for servicing the precinct is the Ryde Water Supply zone through an existing DN100 watermain connection on Morgan Road as well as an additional connection potentially from Forest Way. The additional connection will be identified as part of the detailed planning phase.

An illustration of the relevant water supply zones is included as **Figure**

3-1.

The existing DN100 infrastructure lacks sufficient capacity to service the precinct, therefore augmentations are required of these local water supply mains. The existing 500mm water main in Forest Way has sufficient capacity to service the development of the site. The extent of the existing potable water network surrounding the Precinct is illustrated in **Figure 3-4**.

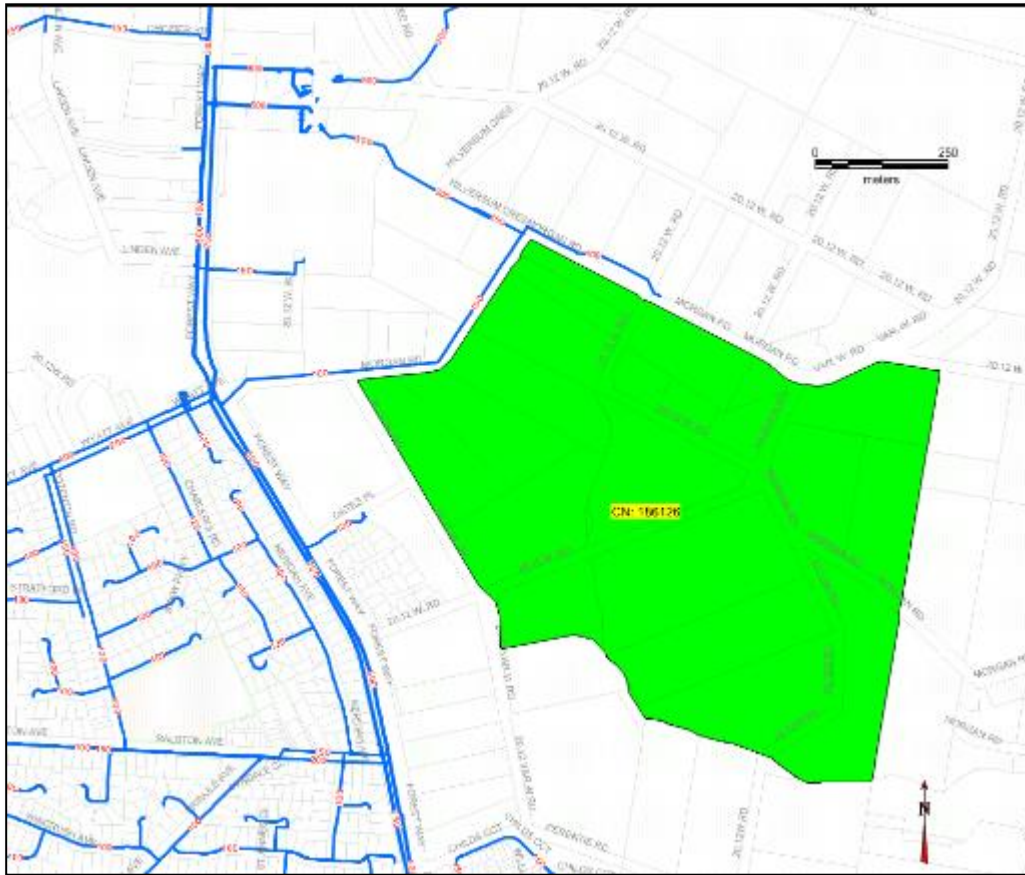


Figure 3-4 Existing Potable Water Network

3.4 Electricity

Under existing conditions, the Precinct contains a network of low voltage overhead power lines. There are a number of substations nearby which can provide electricity to the Precinct. The closest connection is Belrose Panel 10 however it does not currently have the capacity for the predicted power requirement of the development. Craig & Rhodes have been advised that if the switch configurations of two substations are altered (Switch A S.17155 and Switch B S.16339) the load on panel 10 can be transferred. This would provide up to 4.5mVA for the development, which is more than sufficient.

The location of the electrical infrastructure relative to the Precinct are illustrated in **Annexure C**. The existing electrical infrastructure within the Precinct would not have sufficient capacity to service the proposed development of the Precinct.

3.5 Telecommunications

NBN is not currently available within the Precinct.

NBN have advised that is possible to undertake an NBN backhaul operation to provide an NBN service to the development given the scale of the project.

NBN will fund the cost of the back haul operation.

3.6 Gas

Under existing conditions there is no gas infrastructure in the immediate Precinct. An existing 160mm gas main is located in close proximity to the Belrose Precinct, in Forest Way on the corner of Morgan Road. All existing gas infrastructure is owned and operated by Jemena. The location of the gas main in relation to the site is included in **Figure 3-5**.

Through the extension of the nearby existing gas infrastructure there is the potential to service the Precinct with gas. Appropriate pressure reducing stations may be required at strategic locations throughout the Precinct.

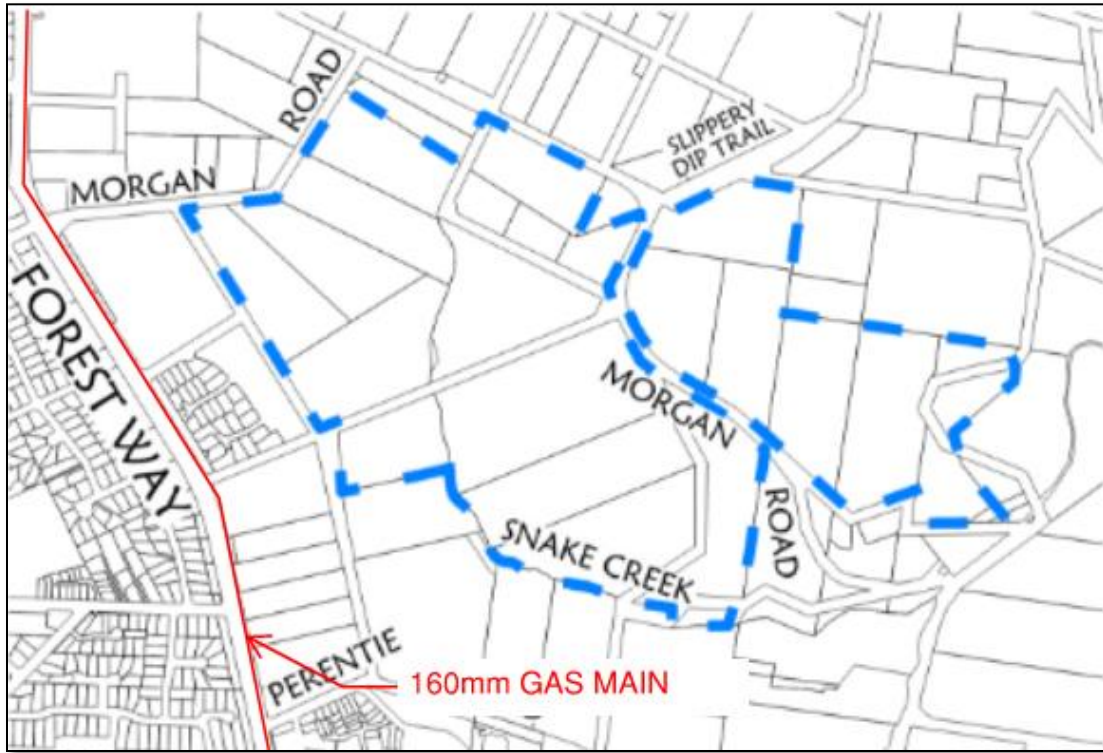


Figure 3-5 Existing Gas Infrastructure

4 Precinct Utility Infrastructure Servicing Strategy

4.1 Potable Water

Sydney Water has been consulted to determine the likely configuration of the potable water servicing strategy for the Precinct. The strategy outlined below is based on advice provided by Sydney Water through its Growth Servicing Strategy and preliminary advice on the specific infrastructure requirements of the Precinct based on the feasibility letters and the estimated development yields. Further detailed planning is required to determine the infrastructure and staging of servicing to the Precinct.

The Belrose precinct can potentially be serviced via lead-in main connections to the existing DN100 watermain in Morgan Road. Preliminary investigations by Sydney Water indicate that the existing watermain would not have capacity to service the entire Precinct and amplification of the watermain will be required. This amplification will be required from its connection to the existing 500mm trunk water main in Forest Way. The trunk water main has adequate capacity to service the development. However, Sydney Water has indicated they will not support a proposal without a secondary water supply connection for reliability. A secondary water supply could be via a new water main in a potential road located adjacent to the Northern boundary of 181 Forest Way (located South of the development). It is currently an unformed road. This information must be incorporated in the development rezoning proposal.

Due to the substantial elevation changes across the Precinct, Sydney Water requires that a hydraulic assessment be conducted to identify if the minimum and maximum pressures in the development reticulation network are within acceptable thresholds.

Detailed planning would need to be carried out to identify the preferred servicing option, infrastructure required and staging of services to the Precinct.

Under Sydney Water's *Funding Infrastructure to Service Growth* policy, Sydney Water would fund the design and construction of trunk potable water infrastructure. Developers of land would be required to connect to trunk infrastructure by constructing the necessary lead-in works and reticulated network to meet the demands of the proposed development.

Developers may have the opportunity to accelerate the delivery of trunk infrastructure by negotiating a commercial agreement with Sydney Water. The preparation of a commercial agreement would require consolidation or agreement between a large number of land owners.

The strategy for servicing put forward by Sydney Water has been reviewed by Craig & Rhodes as part of this scope of work and it can be confirmed that the Sydney Water strategy for servicing the Precinct is considered to be reasonable and feasible based on the information currently available.

The strategy will be subject to evolution and refinement as details regarding the development occupation forecast of the Precinct are more clearly understood. Detailed planning would be required to establish the preferred servicing option for the Precinct.

Correspondence from Sydney Water is included in **Annexures B and D**.

4.2 Wastewater

Sydney Water has been consulted to determine the likely configuration of the wastewater servicing strategy for the Precinct. The high level servicing strategy outlined below is based on the advice provided by Sydney Water and is subject to further detailed planning.

The Warriewood Wastewater Treatment Plant and ocean outfall has sufficient capacity to accommodate the increased loads associated with the proposed development of the Precinct. Trunk infrastructure will need to be extended to the Precinct to connect it to Sydney Water's existing network. A number of sewer pumping stations are likely to be required to overcome the topographical challenges present within the Precinct.

Sydney Water will not allow connection to the adjacent pressure mains along Morgan Road. Connections can be potentially made to SP0941 and SP0999 however both pumps have limited capacity to receive additional flows from the development. Hence a capacity assessment of the pump station and rising main will be required.

The precinct can potentially be serviced through a connection to the Wearden Road carrier however a new pumping station and rising main will be required. The distance from the Wearden Road carrier to the site makes it unlikely that this option will be cost-effective.

Sydney Water requires a waste water main extension to be constructed to serve the proposed lots. The waste water main extension must abide by Sydney Water's new *Technical Specifications for Leak Tight Sewer Systems*.

Sydney Water also requires that a hydraulic consultant must be engaged to investigate and identify the best option to service the development. This investigation should consider impacts to existing assets, system performance, augmentation options and new assets sizing. Sydney Water will allow the same consultant to be used for the Water and Wastewater hydraulic assessment.

Sydney Water would fund the design and construction of trunk wastewater infrastructure. Developers of land would be required to connect to trunk infrastructure by constructing the necessary lead-in works and reticulated network to meet the demands of the proposed development.

Developers may have the opportunity to accelerate the delivery of trunk infrastructure by negotiating a commercial agreement with Sydney Water. Typically, a commercial agreement would see the developer fund the delivery of trunk infrastructure to be reimbursed at agreed milestones on the delivery of lots. The preparation of a commercial agreement would require consolidation or agreement between a large number of land owners.

The strategy for servicing put forward by Sydney Water has been reviewed by Craig & Rhodes as part of this scope of work and it can be confirmed that the Sydney Water strategy for servicing the Precinct is considered to be reasonable and feasible based on the information currently available.

Detailed planning will need to be carried out to confirm the preferred servicing option, the infrastructure required and the staging of servicing to the Precinct.

Correspondence from Sydney Water is included at **Annexures B and D**.

4.3 Electricity

Ausgrid has been consulted to determine the likely configuration of the electricity servicing strategy for the Precinct. The strategy detailed below is based upon the advice provided by Ausgrid and is subject to evolution and refinement as details regarding the development staging of the Precinct are better understood.

Based on the proposed lot yield, Ausgrid has estimated that the load required from the Precinct would be approximately 1.363 MVA. The closest point of connection is the Belrose Panel 10 feeder (S.65242 Morgans Forest) however the connection is limited by trunk capacity and Panel 10 itself only has 1 MVA spare capacity, which is insufficient for the development. Panel 10 is interconnected with Terrey Hills Panel 8 feeder, which has 4MMVA spare capacity. Ausgrid has been able to confirm that a portion of the Belrose Panel 10 feeder can be moved to the Terrey Hills Panel 8 feeder, enabling Panel 10 to supply the entire development. Ausgrid has proposed to move the open point located at Switch A S.17155 Optus Crozier to Switch B S.16339 Forest way 207. This relocation would provide up to 4.5 MVA spare capacity at the Panel 10 feeder, which is more than sufficient for the proposed development.

The Panel 10 feeder is located on the corner of Morgan Road and Forest Way and is approximately 0.4 km from the western boundary of the Precinct via the existing road network.

The relocation would also allow for an alternative point of entry in the vicinity of PT15614 Snake Creek which is located approximately 1km away from the south-eastern boundary of the site. However, the relocation of the switches and connection to panel 10 is likely the most cost-effective option, given the current information.

Current best practice will likely result in the lead-in infrastructure and local reticulation being located underground in a shared services trench which would also be used for gas and telecommunications services. The installation of ducts and feeders would not be funded by Ausgrid and would need to be funded by developers.

The development of the Precinct would not be dictated by the lead-in requirements associated with electrical works. However, it should be noted that development commencing near the boundaries of the Precinct would be preferable to developers as it would reduce the extent of required lead-in infrastructure.

An electrical servicing strategy for the Precinct is illustrated in **Figure 4-3**.

During consultation, Ausgrid has stated that the proposed servicing strategy is based upon the capacity currently available within the network and is subject to change as a result of future customer connections and/or future Ausgrid capital projects.

It should also be noted that Ausgrid will not allocate available capacity to customers until a formal application to connect is received. Correspondence from Ausgrid is included at **Annexure E**.

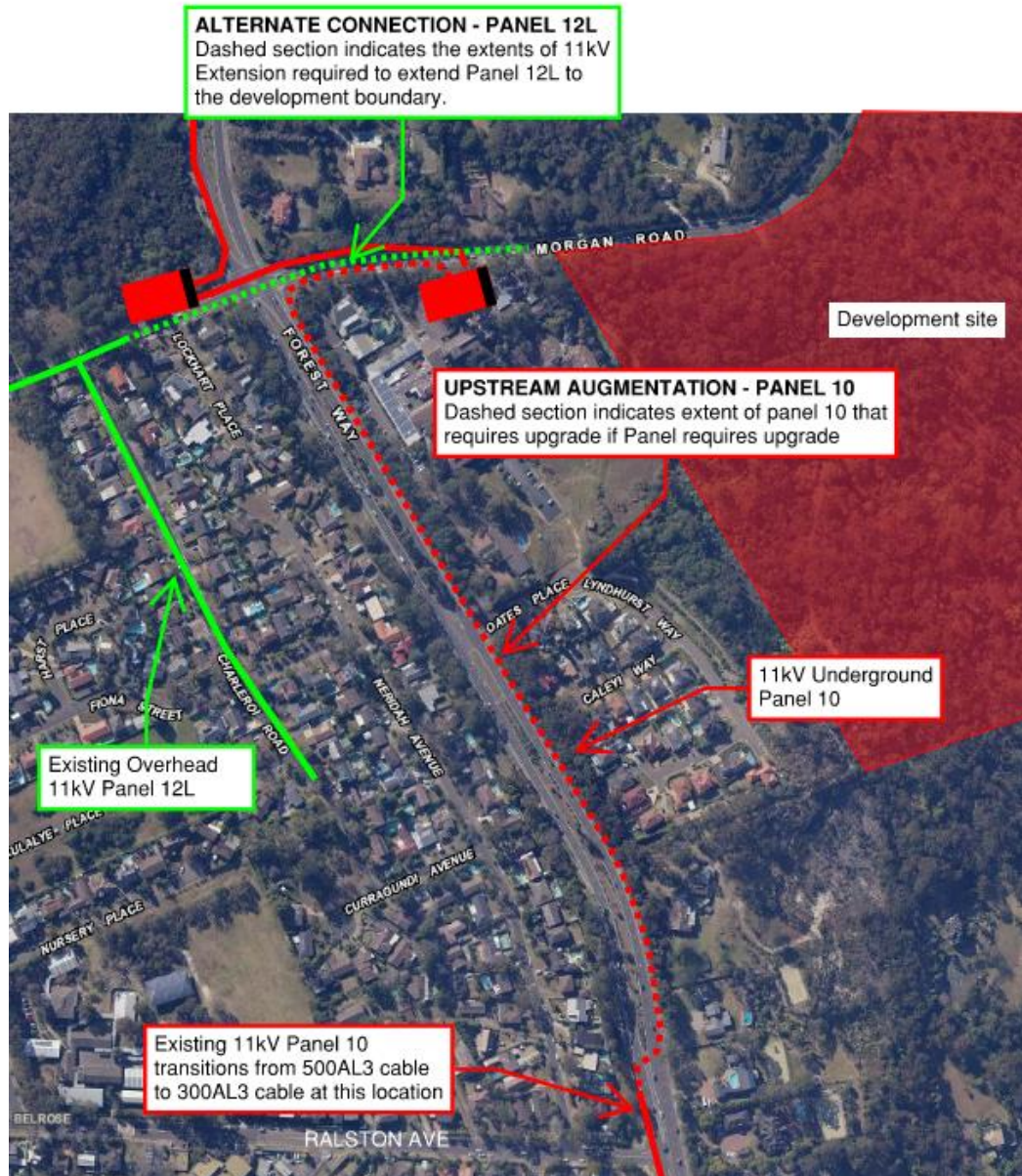


Figure 4-3 Morgan Road Electrical Servicing Strategy

4.4 Telecommunications

As a minimum, telecommunication infrastructure will be provided to the Precinct under the *Telecommunications Act (1997)*.

Recent changes to the Australian Federal Government policy, *Telecommunications Infrastructure in New Developments*, (December 2014) will result in the provision of fibre throughout the Precinct being subject to competition between potential providers. Whilst preferable, the provision of fibre to the premise is not essential infrastructure required to substantiate a rezoning.

It is important to note that the changes to the policy have impacted the funding mechanism for NBN Co. If developers choose supply through the NBN, the developers will now be responsible for funding the lead-in works and local reticulation for the NBN.

A preliminary feasibility assessment indicates NBN's approval to service the development with no backhaul costs required. A detailed assessment to identify the preferred servicing option will be carried out in the detailed planning phase.

4.5 Gas

The extension of the existing gas network throughout the Precinct will be subject to a commercial assessment undertaken by Jemena.

The premise of the commercial assessment will be the capital expenditure to extend the network relative to the capability to recuperate the investment through an increased customer base. In the instance where Jemena determines that there are commercial grounds for the extension of the network, the provision of gas infrastructure will be funded by Jemena.

In the unlikely event that Jemena determines that the outcomes of the commercial assessment are unsatisfactory, then the developer could choose to extend the network at its own cost.

A simulated load profile conducted by Jemena indicates that an extension of the 160mm existing gas main in Forest Way, on the corner of Morgan Road through to the site will be required to service the development. No formal costs have been investigated by Jemena at this point in time.

4.6 Opinion of Probable Costs

A preliminary opinion of probable costs will be prepared for the provision of utility infrastructure throughout the Precinct once further information has been obtained. A hydraulic assessment must be conducted before appropriate estimates can be determined for water and wastewater services. Infrastructure cost estimates should be reviewed as design evolves.

Infrastructure cost estimates for gas will likely be funded by Jemena pending the outcomes of a commercial assessment to establish if servicing the Precinct with gas is commercially feasible.

Infrastructure cost estimates for telecommunications will be funded by the developer and would vary depending upon the preferred provider and the service sought.

4.7 Services Upgrades

MLALC undertakes to fund the cost of any services upgrades associated with the future rezoning of the site in conjunction with the relative service authority.

This undertaking is provided on a no cost to Government or community basis.

These upgrades may involve new sewer & water infrastructure, electrical upgrades and relocation, new nbn services & extended Jemena gas mains.

All works will be subject to detailed design and investigations post planning proposal.

5 Conclusion

The IDP has been prepared based on the likely development of the Precinct. The IDP relies upon the provision of traditional servicing strategies and utility providers. The traditional servicing strategy serves as an appropriate mechanism to facilitate a rezoning of the Precinct to support the likely development. This report demonstrates that the likely development of the Belrose Precinct can be serviced adequately for potable water, wastewater electricity and telecommunications.

The IDP has not been prepared as a prescriptive guide on the utility infrastructure required within the Precinct. Rather, it has been prepared to facilitate rezoning and to inform developers of the infrastructure requirements to provide a traditional servicing approach to future development. Alternative servicing strategies can be pursued by developers or land owners at the Development Application stage to assist in the forward progression of their development ahead of programming of traditional servicing infrastructure or where traditional servicing is unavailable. Funding and maintenance of any alternative strategy would be borne by the developer or land owner.

The extension of Sydney Water infrastructure into the Belrose Precinct (wastewater and potable water) will require a hydraulic assessment of the development and evaluation of the capital expenditure to service the development.

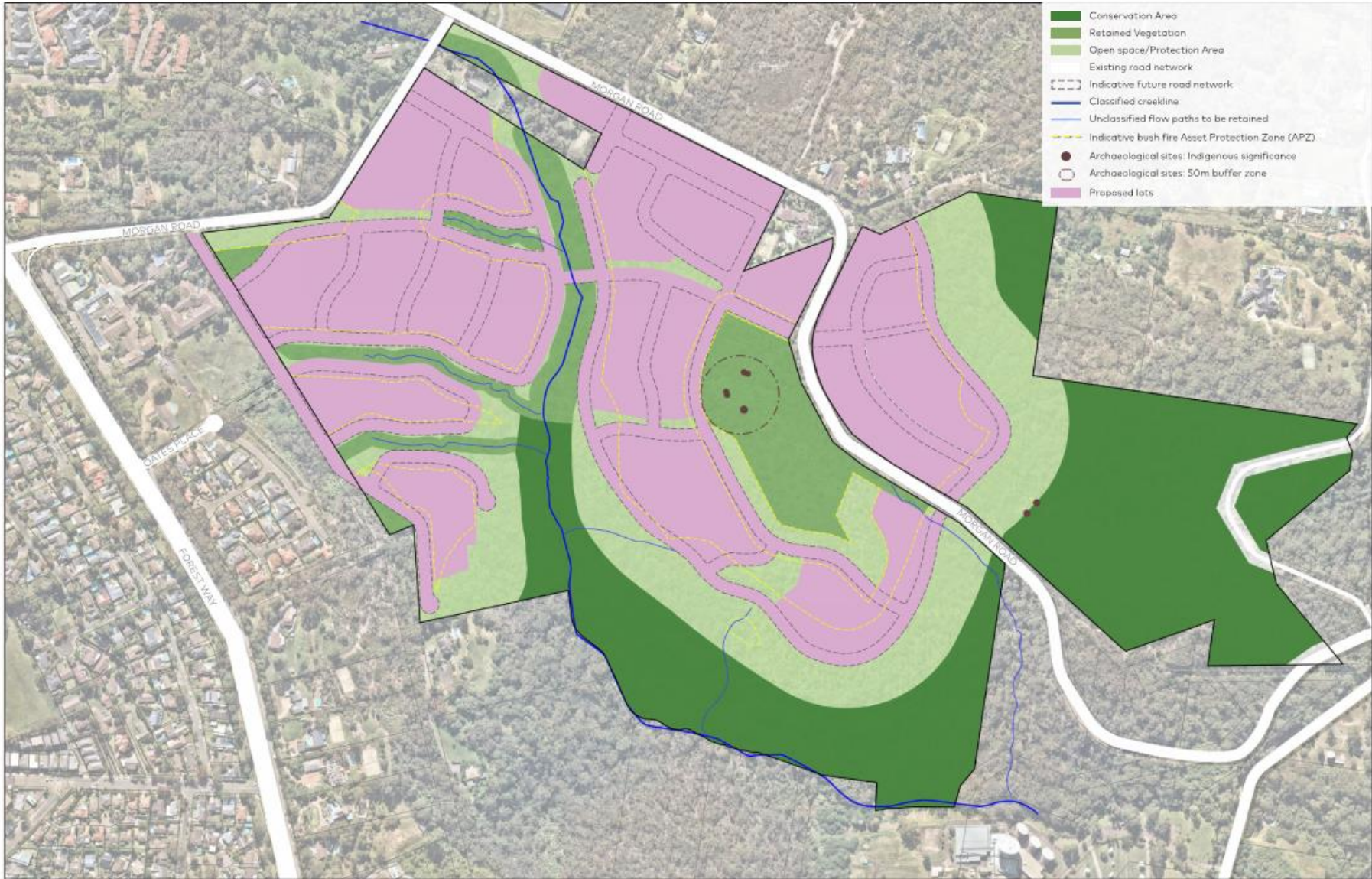
The provision of gas services throughout the Precinct will be subject to a commercial assessment by Jemena.

The provision of fibre to the premise throughout the Precinct will not be funded by NBN Co. Fibre to the premise will need to be funded by the developer. Whilst the provision of fibre to the premise is considered preferable, it is not a requirement of essential infrastructure to justify the proposed rezoning.



Annexure A – Draft Structure Plan

Draft Structure Plan



0 50 100 200



September 14, 2022



Annexure B – Feasibility Letter Case 186126

31 August 2020

Andrew Halmarick
c/- METROWATER MANAGEMENT

FEASIBILITY LETTER

Developer: Andrew Halmarick
Your reference: 096/16 Feaso
Development: Lot 947 DP752038 MORGAN RD, Belrose
Development Description: Proposed development 500 residential lot yield based on the attached plan.

Your application date: 20 July 2020
Specific questions attached in additional information.

Note: Level 1 water restrictions are now in place, which limits how and when water can be used outdoors. This can impact you and your contractors in the activities they need to undertake for this proposal.

Using water to suppress dust is not restricted, but this does mean that you/your contractors will need to apply for an exemption permit to use water for most outdoor uses including:

- Cleaning equipment and the exterior of new buildings
- Drilling and boring, and
- Batching concrete on-site

Fines for deliberate breaches of restriction rules apply from 1 September 2019.

For more information on the restrictions and for applying for an exemption, visit our web site at <http://www.sydneywater.com.au/SW/water-the-environment/what-we-re-doing/water-restrictions/index.htm>

The more water everyone saves, the longer we can stave off the progression to stricter restrictions or emergency measures.

Please provide this information to your contractors and delivery partners to inform them of their obligations.

Dear Applicant

This Feasibility Letter (Letter) is a guide only. It provides general information about what Sydney Water's requirements could be if you applied to us for a Section 73 Certificate (Certificate) for your proposed subdivision. **The information is accurate at today's date only.**

If you obtain development consent for that subdivision from your consent authority (this is usually your local Council) they will require you to apply to us for a Section 73 Certificate. You will need to submit a new application (and pay another application fee) to us for that Certificate by using your current or another Water Servicing Coordinator (Coordinator).

Sydney Water will then send you either a:

- Notice of Requirements (Notice) and Developer Works Deed (Deed) or
- Certificate.

These documents will be the definitive statement of Sydney Water's requirements.

There may be changes in Sydney Water's requirements between the issue dates of this Letter and the Notice or Certificate. The changes may be:

- if you change your proposed development eg the development description or the plan/site layout, after today, the requirements in this Letter could change when you submit your new application; and
- if you decide to do your development in stages then you must submit a new application (and pay another application fee) for each stage.

No warranties or assurances can be given about the suitability of this document or any of its provisions for any specific transaction. It does not constitute an approval from Sydney Water and to the extent that it is able, Sydney Water limits its liability to the reissue of this Letter or the return of your application fee. You should rely on your own independent professional advice.

What You Must Do To Get A Section 73 Certificate In The Future.

To get a Section 73 Certificate you must do the following things. You can also find out about this process by visiting www.sydneywater.com.au > Plumbing, building & developing > Developing > Land development.

1. **Obtain Development Consent from the consent authority for your subdivision proposal.**
2. **Engage a Water Servicing Coordinator (Coordinator).**

You must engage your current or another authorised Coordinator to manage the design and construction of works that you must provide, at your cost, to service your subdivision. If you wish to engage another Coordinator (at any point in this process) you must write and tell Sydney Water.

For a list of authorised Coordinators, either visit www.sydneywater.com.au > Plumbing, building & developing > Developing > Providers > Lists or call **13 20 92**.

The Coordinator will be your point of contact with Sydney Water. They can answer most questions that you might have about the process and developer charges and can give you a quote or information about costs for services/works (including Sydney Water costs).

3. **Developer Works Deed**

After the Coordinator has submitted your new application, they will receive the Sydney Water Notice and Developer Works Deed. You and your accredited Developer Infrastructure Providers (Providers) will need to sign and lodge both copies of the Deed with your nominated Coordinator. After Sydney Water has signed the documents, one copy will be returned to the Coordinator.

The Deed sets out for this project:

- your responsibilities;
- Sydney Water's responsibilities; and
- the Provider's responsibilities.

You must do all the things that we ask you to do in that Deed. This is because lots in your subdivision do not have water and sewer services and you must construct and pay for the following works extensions under this Deed to provide these services.

Note: The Coordinator must be fully authorised by us for the whole time of the agreement.

4. Water and Sewer Works

You have made an application for specific information. Sydney Water's possible requirements are:

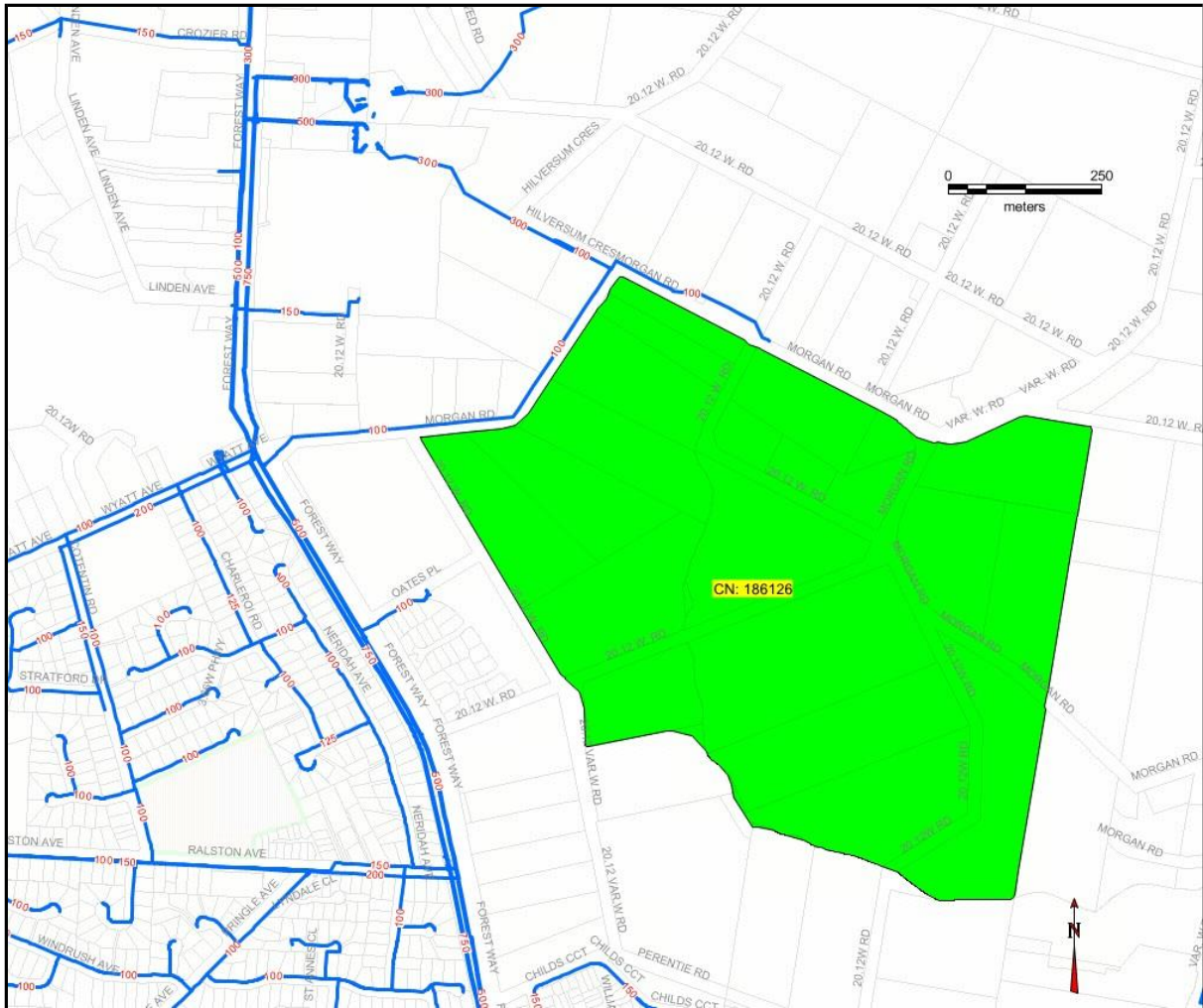
Waste Water –

- Sydney Water will not allow connection to the adjacent pressure mains along Morgan Road. The previous advice, Case 160354, regarding connection to SP0941 and SP0999 is still valid. SP0999 receives flow from SP941 and SP0941 pumps to Parkway carrier. Both pumps have limited capacity to receive additional flows from the development and thus capacity assessment of the pump station and rising main will be required in consultation with Sydney Water's internal stakeholders. Connection to Wearden Rd carrier, though it is far, can be an option but will require a new pump station and rising main. As wastewater servicing for this development is complex and require assessment of multiple options. Hence developer will require to engage a hydraulic consultant to investigate and identify the best option to service the development. The investigation should include impacts to existing assets, system performance, augmentation options and new assets sizing. For efficiency or effectiveness, same consultant can be used for both water and wastewater hydraulic assessment.

Potable Water –

- Existing DN100 watermain is available in Morgan Rd. However, this main was not initially designed for this development. Hence amplification of this main will be required. In addition to this, for reliability/resilience of supply, a second supply is also required to be connected to this development. The ground elevation of the development ranges from 160m AHD to 90m AHD. Thus, a hydraulic assessment is required to check if minimum and maximum pressures in the development reticulation network are within acceptable thresholds. Hence, developer is required to engage a hydraulic consultant to assess the water servicing for the development to meet above requirements. The assessment should consider future growth in the vicinity.

Figure 1: Preliminary Servicing Water servicing option (existing 100mm may require upsizing)



Specific Questions as requested by WSC and Developer

Q1. Please confirm availability of sewer and water infrastructure.

See advise above.

Q2. Does Warriewood Treatment Plant (north of site) have capacity to service an additional 500 lots?

Additional flow from 500 lots (0.2 MLD) can be accommodated (based on current projection).

Q3. Do the surrounding sewer pumping stations have the capacity to deal with an additional 500 lots?

No – See advise above.

Q4. Does the site need further pumping stations?

Potential Pump to Sewer option can be considered which will require privately owned pump (adequate for the proposed 500 lots). A hydraulic planner consultant is required to be engaged by the developer to assess the best wastewater servicing required.

Q5. Do the adjacent sewer carriers have capacity to deal with an additional 500 lots?

A hydraulic consultant needs to be engaged to finalized sizing

Q6. Do the water mains in Forest Way have capacity to service an additional 500 lots? Applicable developer planning investigation requirements.

See advise above.

Funding of works

Under Sydney Water's 'Funding of infrastructure to service growth' policy we may agree to contribute towards a portion of the cost of the works you are required to build. This is done either by Sydney Waters Schedule of Rates or via the Procurement process. Your Water Service Coordinator can advise you in relation to this policy, the likelihood of Sydney Water sharing a portion of the cost and the process you need to satisfy Sydney Water's probity requirements.

If you do choose to request a quote through the Schedule of Rates for Sydney Water's contribution you will avoid going through the full procurement process. Your WSC can advise you of this option.

The funding assessment will be made at the detailed design stage, prior to any construction works commencing. A firm commitment would not be made by Sydney Water until we:

- Have reviewed the detailed design and;
- Have reviewed the detailed construction quotations needed to meet our probity requirements and;
- Come to an agreement on the amount.

5. Ancillary Matters

5.1 Asset adjustments

After Sydney Water issues this Notice (and more detailed designs are available), Sydney Water may require that the water main/sewer main/stormwater located in the footway/your property needs to be adjusted/deviated. If this happens, you will need to do this work as well

as the extension we have detailed above at your cost. The work must meet the conditions of this Notice and you will need to complete it **before we can issue the Certificate**. Sydney Water will need to see the completed designs for the work and we will require you to lodge a security. The security will be refunded once the work is completed.

5.2 Entry onto neighbouring property

If you need to enter a neighbouring property, you must have the written permission of the relevant property owners and tenants. You must use Sydney Water's **Permission to Enter** form(s) for this. You can get copies of these forms from your Coordinator or the Sydney Water website. Your Coordinator can also negotiate on your behalf. Please make sure that you address all the items on the form(s) including payment of compensation and whether there are other ways of designing and constructing that could avoid or reduce their impacts. You will be responsible for all costs of mediation involved in resolving any disputes. Please allow enough time for entry issues to be resolved.

5.3 Costs

Construction of these **future** works will require you to pay project management, survey, design and construction costs **directly to your suppliers**. Additional costs payable to Sydney Water may include:

- water main shutdown and disinfection;
- connection of new water mains to Sydney Water system(s);
- design and construction audit fees;
- contract administration, Operations Area Charge & Customer Redress prior to project finalisation;
- creation or alteration of easements etc; and
- water usage charges where water has been supplied for building activity purposes prior to disinfection of a newly constructed water main.

Note: Payment for any Goods and Services (including Customer Redress) provided by Sydney Water will be required prior to the issue of the Section 73 Certificate or release of the Bank Guarantee or Cash Bond.

Your Coordinator can tell you about these costs.

OTHER THINGS YOU MAY NEED TO DO

Shown below are other things you need to do that are NOT a requirement for the Certificate. They may well be a requirement of Sydney Water in the future because of the

impact of your development on our assets. You must read them before you go any further.

Approval of your building plans

Please note that the building plans must be approved when each lot is developed. This can be done at Sydney Water Tap in™. Visit www.sydneywater.com.au > Plumbing, building & developing > Building > Sydney Water Tap in™.

This is not a requirement for the Certificate

Please note that your building plans must be approved. This can be done at Sydney Water Tap in™. Visit www.sydneywater.com.au > Plumbing, building & developing > Building > Sydney Water Tap in™ or call 13 20 92.

This is not a requirement of the Certificate but the approval is needed because construction/building works may impact on existing Sydney Water assets (e.g. water and sewer mains). In any case, these works MUST NOT commence until Sydney Water has granted approval.

Your Coordinator can tell you about the approval process including:

- Possible requirements;
- Costs; and
- Timeframes.

Note: You must obtain our written approval before you do any work on Sydney Water's systems. Sydney Water will take action to have work stopped on the site if you do not have that approval. We will apply Section 44 of the *Sydney Water Act 1994*.

Backflow Prevention Water supply connections

A backflow prevention containment device appropriate to the property's hazard rating must be installed at the property boundary. The device is to be installed on all water supplies entering the property, regardless of the supply type or metering arrangements. It is needed to reduce the risk of contamination by backflow from these supplies.

A licensed plumber with backflow accreditation can advise you of the correct requirements for your property. To view a copy of Sydney Water's Backflow Prevention Policy and a list of backflow accredited plumbers visit www.sydneywater.com.au > Plumbing, building & developing > Plumbing > Backflow prevention.

Fire Fighting

Definition of fire fighting systems is the responsibility of the developer and is not part of the Section 73 process. It is recommended that a consultant should advise the developer regarding the fire fighting flow of the subdivision and the ability of Sydney Water's system to provide that flow in an emergency. Sydney Water's Operating Licence directs that Sydney Water's mains are only required to provide domestic supply at a minimum pressure of 15 m head.

Disused Water Service Sealing

You must pay to disconnect all disused private water services and seal them at the point of connection to a Sydney Water water main. This work must meet Sydney Water's standards in the Plumbing Code of Australia (the Code) and be done by a licensed plumber. The licensed plumber must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection

Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this.

Disused Sewerage Service Sealing

Please do not forget that you must pay to disconnect all disused private sewerage services and seal them at the point of connection to a Sydney Water sewer main. This work must meet Sydney Water's standards in the Plumbing Code of Australia (the Code) and be done by a licensed drainer. The licensed drainer must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this.

Soffit Requirements

Please be aware that floor levels must be able to meet Sydney Water's soffit requirements for property connection and drainage.

Other fees and requirements

The requirements in this Notice relate to your Certificate application only. Sydney Water may be involved with other aspects of your development and there may be other fees or requirements. These include:

- plumbing and drainage inspection costs;
- the installation of backflow prevention devices; and
- council fire fighting requirements. (It will help you to know what the fire fighting requirements are for your subdivision as soon as possible. Your hydraulic consultant can help you here.)

No warranties or assurances can be given about the suitability of this document or any of its provisions for any specific transaction. It does not constitute an approval from Sydney Water and to the extent that it is able, Sydney Water limits its liability to the reissue of this Letter or the return of your application fee. You should rely on your own independent professional advice.

END



Annexure C – Surrounding Electrical Infrastructure

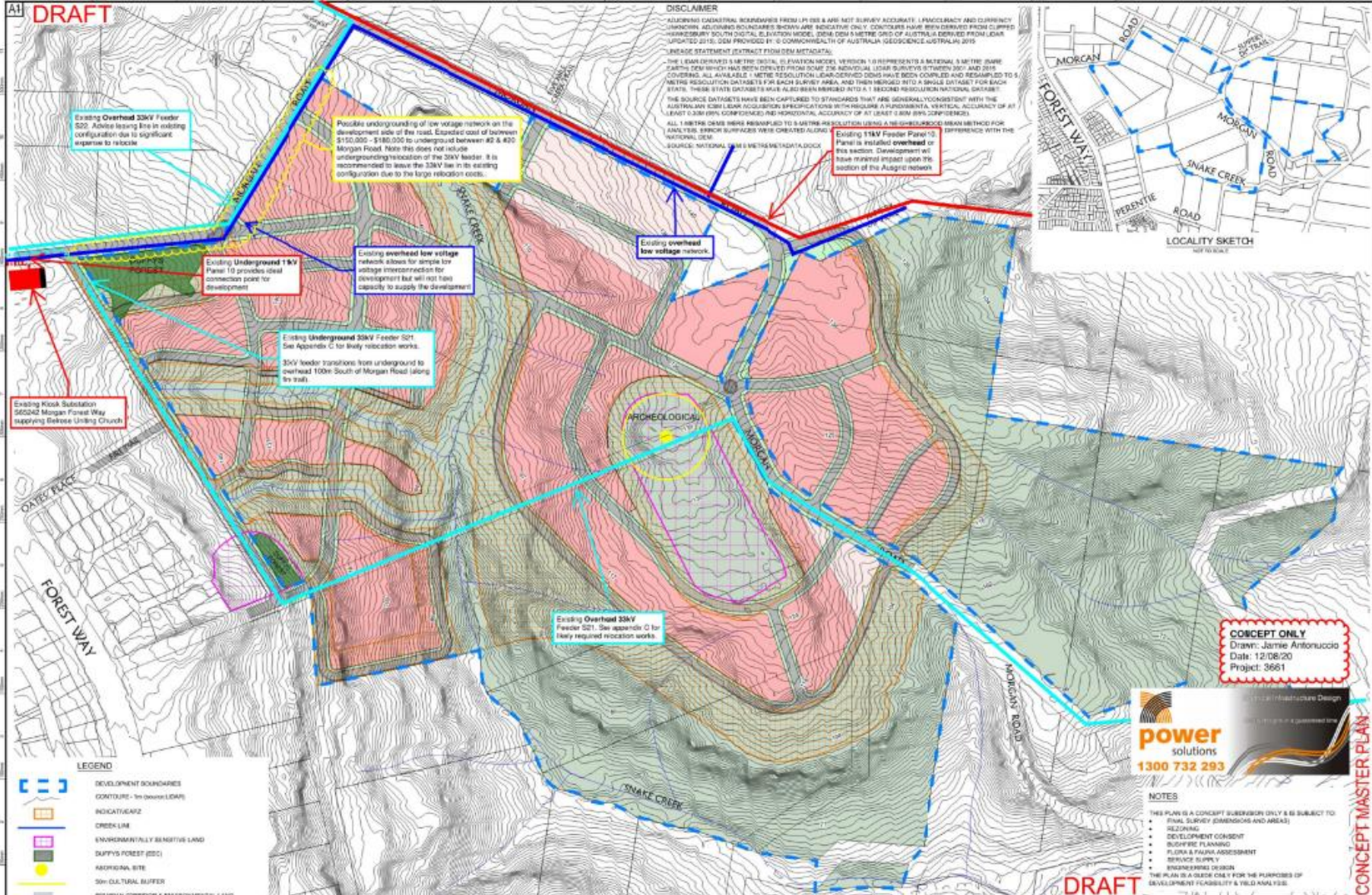
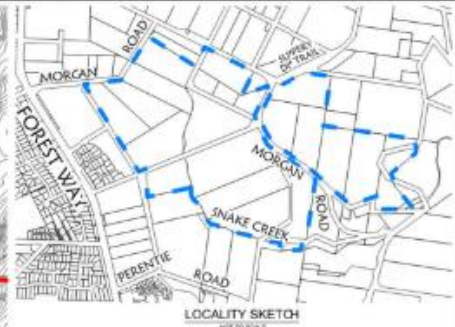
A1 DRAFT

DISCLAIMER
 ALL DRAWING INFORMATION FROM THIS PLAN IS NOT SURVEY ACCURATE. IMPRECISE AND CURRENTLY UNAVAILABLE ADJOINING BOUNDARIES SHOWN ARE INDICATIVE ONLY. CONTOURS HAVE BEEN DERIVED FROM CLIPPED DEMOGRAPHY SOUTH DIGITAL ELEVATION MODEL (DEM) DATA A METRE GRID OF AUSTRALIA DERIVED FROM LEARN (UPDATED 2015). DEM PROVIDED BY © COMMONWEALTH OF AUSTRALIA (GEOSCIENCE AUSTRALIA) 2015.

UNRAID STATEMENT (EXTRACT FROM DEM METADATA):
 THE LEARN DATASET USES THE DIGITAL ELEVATION MODEL VERSION 1.0 REPRESENTS A METRE 3 METRE SQUARE GRID WHICH HAS BEEN DERIVED FROM SOME OF THE INDIVIDUAL LEARN SURVEYS BETWEEN 2001 AND 2015 COVERING ALL AVAILABLE 1 METRE RESOLUTION LEARN-DERIVED DEMS THAT HAVE BEEN COMPILED AND RESAMPLED TO 5 METRE RESOLUTION DATASETS FOR EACH SURVEY AREA AND THEN MERGED INTO A SINGLE DATASET FOR EACH STATE. THESE STATE DATASETS HAVE ALSO BEEN MERGED INTO A SECOND RESOLUTION NATIONAL DATASET. THE SOURCE DATASETS HAVE BEEN CAPTURED TO STANDARDS THAT ARE GENERALLY CONSISTENT WITH THE AUSTRALIAN 1:50M LEARN ACCURACY REQUIREMENTS WITH A HORIZONTAL, VERTICAL, ACCURACY OF AT LEAST 0.30M (95% CONFIDENCE) AND HORIZONTAL ACCURACY OF AT LEAST 0.30M (95% CONFIDENCE).

ALL 1 METRE DEMS WERE RESAMPLED TO 5 METRE RESOLUTION USING A NEIGHBOURHOOD MEAN METHOD FOR ANALYSIS. SPOKE SURFACES WERE CREATED ALONG:

SOURCE: NATIONAL 5M 5 METRE METADATA LOGS



Existing Overhead 33kV Feeder S22. Advise leaving line in existing configuration due to significant expense to relocate.

Possible undergrounding of low voltage network on the development side of the road. Estimated cost of between \$150,000 - \$180,000 to underground between #2 & #20 Morgan Road. Note this does not include undergrounding relocation of the 33kV feeder. It is recommended to leave the 33kV line in its existing configuration due to the large relocation costs.

Existing 11kV Feeder Panel 10. Panel is installed overhead at this location. Development will have minimal impact upon the location of this Augmented network.

Existing Underground 11kV Panel 10 provides ideal connection point for development.

Existing overhead low voltage network allows for simple low voltage interconnection for development but will not have capacity to supply the development.

Existing Underground 33kV Feeder S01. See Appendix C for likely relocation works. 33kV feeder transitions from underground to overhead 100m South of Morgan Road (along the trail).

Existing Kiosk Substation S02&2 Morgan Forest Way supplying Release Uniting Church.

Existing Overhead 33kV Feeder S01. See appendix C for likely required relocation works.

CONCEPT ONLY
 Drawn: Jamie Antonuccio
 Date: 12/08/20
 Project: 3661

power solutions
 1300 732 293
 Infrastructure Design
 Power solutions is a registered business name of Power Solutions Pty Ltd

- NOTES**
- THIS PLAN IS A CONCEPT SUBMISSION ONLY & IS SUBJECT TO FINAL SURVEY (DIMENSIONS AND AREAS)
 - RELAYING
 - DEVELOPMENT CONSENT
 - BUSHPRE PLANNING
 - FLORA & FAUNA ASSESSMENT
 - RELIANCE SUPPLY
 - ENGINEERING DESIGN
- THE PLAN IS A CONCEPT ONLY FOR THE PURPOSES OF DEVELOPMENT FEASIBILITY & YIELD ANALYSIS.

LEGEND

- DEVELOPMENT BOUNDARIES
- CONTOUR - 1m (derived LEARN)
- INDICATIVE
- CREEK LINE
- ENVIRONMENTALLY SENSITIVE LAND
- DUFFYS FOREST (DFC)
- ABORIGINAL SITE
- 50m CULTURAL BUFFER
- RIPARIAN CORRIDOR & ENVIRONMENTAL LAND
- PROPOSED ROAD
- RESIDENTIAL LAND



CONCEPT MASTER PLAN
 MORGAN ROAD BELROSE
 MILD LANDS

BELROSE LAND PTY LTD	
Scale: 1:5000	Date: 12/08/2020
Drawn: JAM	Checked: JAM
Disc: A1	Sheet: 010

DRAFT
CRAIG & RHODES
 TAKE THE LEAD

Plan No: 095-16	Scale: 1:5000
Project No: 3661	Date: 12/08/20
Client: BELROSE LAND PTY LTD	Location: MILD LANDS

CONCEPT MASTER PLAN



Annexure D – Feasibility Letter Case 160354



Case Number: 160354

9 March 2017

CRAIG AND RHODES DEVELOPMENTS
c/- METROWATER MANAGEMENT

FEASIBILITY LETTER

Developer: CRAIG AND RHODES DEVELOPMENTS
Your reference: 96/16
Development: Various Lots, MORGAN RD, Belrose
Development Description: Proposed development of 400 residential lots as per location
plan provided.
Your application date: 12 January
2017

Dear Applicant

This Feasibility Letter (Letter) is a guide only. It provides general information about what Sydney Water's requirements could be if you applied to us for a Section 73 Certificate (Certificate) for your proposed subdivision. **The information is accurate at today's date only.**

If you obtain development consent for that subdivision from your consent authority (this is usually your local Council) they will require you to apply to us for a Section 73 Certificate. You will need to submit a new application (and pay another application fee) to us for that Certificate by using your current or another Water Servicing Coordinator (Coordinator).

Sydney Water will then send you either a:

- Notice of Requirements (Notice) and Developer Works Deed (Deed) or
- Certificate.

These documents will be the definitive statement of Sydney Water's requirements.

There may be changes in Sydney Water's requirements between the issue dates of this Letter and the Notice or Certificate. The changes may be:

- if you change your proposed development eg the development description or the plan/ site layout, after today, the requirements in this Letter could change when you submit your new application; and
- if you decide to do your development in stages then you must submit a new application (and pay another application fee) for each stage.

No warranties or assurances can be given about the suitability of this document or any of its provisions for any specific transaction. It does not constitute an approval from Sydney Water and to the extent that it is able, Sydney Water limits its liability to the reissue of this Letter or the return of your application fee. You should rely on your own independent professional advice.

What You Must Do To Get A Section 73 Certificate In The Future.

To get a Section 73 Certificate you must do the following things. You can also find out about this process by visiting www.sydneywater.com.au > Plumbing, building & developing > Developing > Land development.

1. **Obtain Development Consent from the consent authority for your subdivision proposal.**
2. **Engage a Water Servicing Coordinator (Coordinator).**

You must engage your current or another authorised Coordinator to manage the design and construction of works that you must provide, at your cost, to service your subdivision. If you wish to engage another Coordinator (at any point in this process) you must write and tell Sydney Water.

For a list of authorised Coordinators, either visit www.sydneywater.com.au > Plumbing, building & developing > Developing > Providers > Lists or call **13 20 92**.

The Coordinator will be your point of contact with Sydney Water. They can answer most questions that you might have about the process and developer charges and can give you a quote or information about costs for services/works (including Sydney Water costs).

3. **Developer Works Deed**

After the Coordinator has submitted your new application, they will receive the Sydney Water Notice and Developer Works Deed. You and your accredited Developer Infrastructure Providers (Providers) will need to sign and lodge both copies of the Deed with your nominated Coordinator. After Sydney Water has signed the documents, one copy will be returned to the Coordinator.

The Deed sets out for this project:

- your responsibilities;
- Sydney Water's responsibilities; and
- the Provider's responsibilities.

You must do all the things that we ask you to do in that Deed. This is because lots in your subdivision do not have water and sewer services and you must construct and pay for the following works extensions under this Deed to provide these services.

Note: The Coordinator must be fully authorised by us for the whole time of the agreement.

4. **Water and Sewer Works**

4.1 Water

Each lot in your subdivision must have:

- a frontage to a drinking water main that is the right size and can be used for connection; and
- its own connection to that water main and a property service (main to meter) that is available for the fitting of a meter.

Sydney Water has assessed your application and found that:

- The following information is provided to assist in planning the water servicing needs of the development, based on the information supplied:
- The existing 500mm trunk water main in Forest Way has adequate capacity to service the 400 residential lot development under the potential rezoning proposal.
- The development site is serviced by an existing 100mm water main which located in Morgan Road. This main was not designed to service the proposed increase in dwellings under the future rezoning proposal.
- As a minimum requirement to service the potential 400 residential lots, an amplification of the existing main in Morgan Avenue will be required. In addition to the amplified main in Morgan Avenue, a second supply to the 400 residential lots will required from the existing 500mm main in Forest Way. Sydney Water would not generally support a proposal without this second water supply connection to the development proposal
- An opportunity to facilitate a second supply to the development area would be via a new water main in a potential road located adjacent to the Northern boundary of 181 Forest Way. It is understood that this is an unformed road which a developer would need to incorporate within their requirements of the development rezoning proposal.
- The drinking water infrastructure for this development will be sized & configured according to the Water Supply Code of Australia WSA 03-2011-3.1 (Sydney Water Edition - 2014).
- **You must construct a water main extension to serve the proposed lots.** These works must be constructed by a constructor with the appropriate capability. Your Coordinator will be able to provide further advice about this.

4.2 Sewer

Each lot in your subdivision must have a sewer main that is the right size and can be

used for connection. That sewer must also have a connection point within each lot's boundaries.

Sydney Water has assessed your application and found that:

- The following information is provided to assist you in planning the water related servicing

needs for the development, based on the information supplied:

- The development site is located adjacent to the Warriewood wastewater system.
- Sydney Water is currently initiating an option assessment investigation for servicing Ingleside Precincts (anticipated completion by Dec 2017). This investigation will confirm the available capacity within the Warriewood Treatment Plant to receive the flows from forecasted growth within the service area.
- Servicing the development site with a Sydney Water reticulated wastewater network will require detail wastewater planning investigation to determine a preferred servicing option.
- A high level review of catchment within which the development site is located, has identified a potential opportunity to connect the site to an existing Sewage Pumping Station (SPS) 999. This SPS is located south east of the development site along Morgan Road near Kellys Way.
- SPS 999 receives flows from SPS 941 which were both designed to transfer flows. The sewage pumping stations have limited capacity to receive additional flows and any option to connect to either SPS will require detail waste water planning investigation to determine the SPS and associated rising main upsizing and additional emergency storage requirements.
- Due to the complexity of the potential servicing options, it is recommended that the developer liaises with Sydney Water prior to initiating any concept servicing investigation.
- Sydney Water is keen to understand the potential development program for consideration within the ongoing Ingleside Precinct options investigation.
- **You must construct a waste water main extension to serve the proposed lots.** The terms of the Deed define this extension as 'Major Works'.
- You must use Sydney Water's new **Technical Specifications for Leak Tight Sewer Systems** to plan, design and construct the sewer. This specification must be used in conjunction with (and have precedence over) the Sewerage Code of Australia, WSA02- 2002 (Sydney Water Edition).

Funding of works

Under Sydney Water's 'Funding of infrastructure to service growth' policy we may agree to contribute towards a portion of the cost of the works you are required to build. This is done either by Sydney Waters Schedule of Rates or via the Procurement process. Your Water Service Coordinator can advise you in relation to this policy, the likelihood of Sydney Water

sharing a portion of the cost and the process you need to satisfy Sydney Water's probity requirements.

If you do choose to request a quote through the Schedule of Rates for Sydney Water's contribution you will avoid going through the full procurement process. Your WSC can advise you of this option.

The funding assessment will be made at the detailed design stage, prior to any construction works commencing. A firm commitment would not be made by Sydney Water until we:

- Have reviewed the detailed design and;
- Have reviewed the detailed construction quotations needed to meet our probity requirements and;
- Come to an agreement on the amount.

5. Ancillary Matters

5.1 Asset adjustments

After Sydney Water issues this Notice (and more detailed designs are available), Sydney Water may require that the water main/sewer main/stormwater located in the footway/your property needs to be adjusted/deviated. If this happens, you will need to do this work as well as the extension we have detailed above at your cost. The work must meet the conditions of this Notice and you will need to complete it **before we can issue the Certificate**. Sydney Water will need to see the completed designs for the work and we will require you to lodge a security. The security will be refunded once the work is completed.

5.2 Entry onto neighbouring property

If you need to enter a neighbouring property, you must have the written permission of the relevant property owners and tenants. You must use Sydney Water's **Permission to Enter** form(s) for this. You can get copies of these forms from your Coordinator or the Sydney Water website. Your Coordinator can also negotiate on your behalf. Please make sure that you address all the items on the form(s) including payment of compensation and whether there are other ways of designing and constructing that could avoid or reduce their impacts. You will be responsible for all costs of mediation involved in resolving any disputes. Please allow enough time for entry issues to be resolved.

5.3 Costs

Construction of these **future** works will require you to pay project management, survey,

design and construction costs **directly to your suppliers**. Additional costs payable to Sydney Water may include:

- water main shutdown and disinfection;
- connection of new water mains to Sydney Water system(s);
- design and construction audit fees;
- contract administration, Operations Area Charge & Customer Redress prior to project

finalisation;

- creation or alteration of easements etc; and
- water usage charges where water has been supplied for building activity purposes prior to disinfection of a newly constructed water main.

Note: Payment for any Goods and Services (including Customer Redress) provided by Sydney Water will be required prior to the issue of the Section 73 Certificate or release of the Bank Guarantee or Cash Bond.

Your Coordinator can tell you about these costs.

OTHER THINGS YOU MAY NEED TO DO

Shown below are other things you need to do that are NOT a requirement for the Certificate. They may well be a requirement of Sydney Water in the future because of the impact of your development on our assets. You must read them before you go any further.

Approval of your building plans

Please note that the building plans must be approved when each lot is developed. This can be done at Sydney Water Tap in™. Visit www.sydneywater.com.au > Plumbing, building & developing > Building > Sydney Water Tap in™.

This is not a requirement for the Certificate but the approval is needed because the construction/building works may affect Sydney Water's assets (e.g. water, sewer and stormwater mains).

Where a Sydney Water stormwater channel, pipe or culvert is located within ten (10) metres of your development site it must be referred to Sydney Water for further assessment.

Your Coordinator can tell you about the approval process including:

- Possible requirements;
- Costs; and
- Timeframes.

Note: You must obtain our written approval before you do any work on Sydney Water's systems. Sydney Water will take action to have work stopped on the site if you do not have that approval. We will apply Section 44 of the *Sydney Water Act 1994*.

Backflow Prevention Water supply connections

A backflow prevention containment device appropriate to the property's hazard rating must be installed at the property boundary. The device is to be installed on all water supplies entering the property, regardless of the supply type or metering arrangements. It is needed to reduce the risk of contamination by backflow from these supplies.

A licensed plumber with backflow accreditation can advise you of the correct requirements for your property. To view a copy of Sydney Water's Backflow Prevention Policy and a list of backflow accredited plumbers visit www.sydneywater.com.au > Plumbing, building & developing
> Plumbing > Backflow prevention.

Fire Fighting

Definition of fire fighting systems is the responsibility of the developer and is not part of the Section 73 process. It is recommended that a consultant should advise the developer regarding the fire fighting flow of the subdivision and the ability of Sydney Water's system to provide that flow in an emergency. Sydney Water's Operating Licence directs that Sydney Water's mains are only required to provide domestic supply at a minimum pressure of 15 m head.

Disused Water Service Sealing

You must pay to disconnect all disused private water services and seal them at the point of connection to a Sydney Water water main. This work must meet Sydney Water's standards in the Plumbing Code of Australia (the Code) and be done by a licensed plumber. The licensed plumber must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this.

Disused Sewerage Service Sealing

Please do not forget that you must pay to disconnect all disused private sewerage services and seal them at the point of connection to a Sydney Water sewer main. This work must meet Sydney Water's standards in the Plumbing Code of Australia (the Code) and be done by a licensed drainer. The licensed drainer must arrange for an inspection of the work by a NSW Fair Trading Plumbing Inspection Assurance Services (PIAS) officer. After that officer has looked at the work, the drainer can issue the Certificate of Compliance. The Code requires this.

Soffit Requirements

Please be aware that floor levels must be able to meet Sydney Water's soffit requirements for property connection and drainage.

Other fees and requirements

The requirements in this Notice relate to your Certificate application only. Sydney Water may be involved with other aspects of your development and there may be other fees or requirements. These include:

- plumbing and drainage inspection costs;
- the installation of backflow prevention devices; and
- council fire fighting requirements. (It will help you to know what the fire fighting requirements are for your subdivision as soon as possible. Your hydraulic consultant can help you here.)

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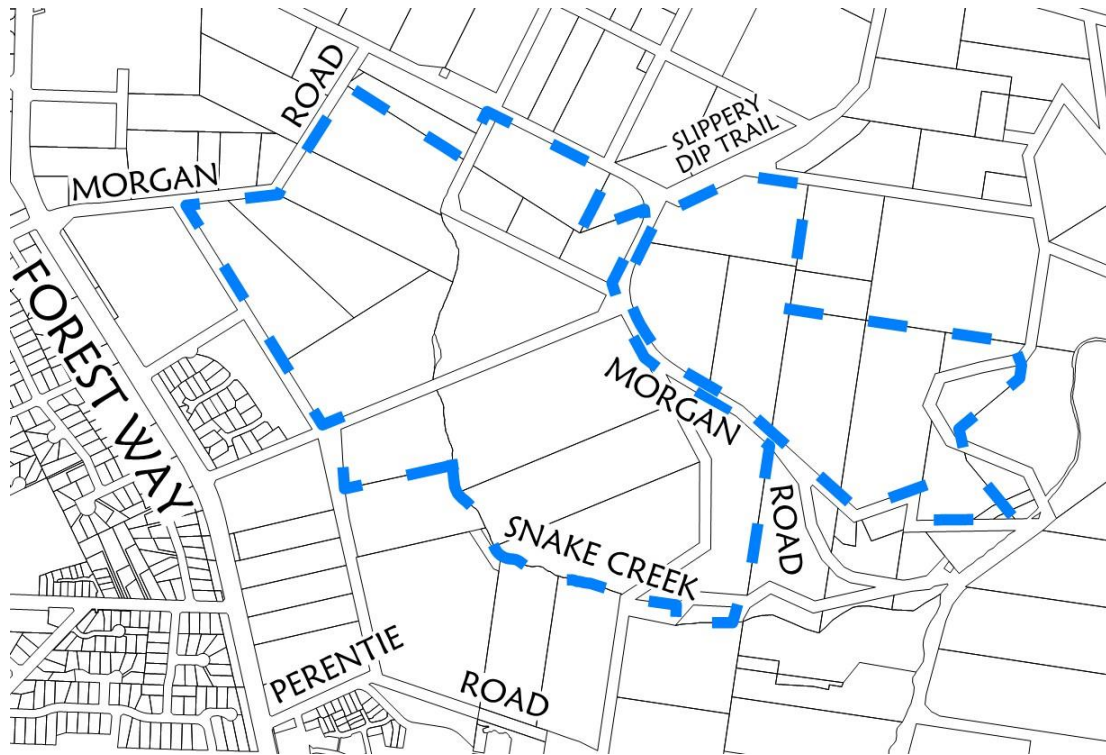
END



Annexure E – Ausgrid Correspondence

Electrical HV Infrastructure Review and Masterplan

Morgan Road Belrose



August 2020

Suite C106 The Landmark
215 Pacific Hwy CHARLESTOWN NSW
PO BOX 278 CHARLESTOWN NSW 2290
1300 732 293
projects@powersol.com.au

DOCUMENT CONTROL

Version	Date	Author	Reviewer	Revision Details
A	12/08/2020	Jamie Antonuccio	Scott Clothier	Initial Issue

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1. SCOPE

This report has been prepared by Power Solutions as part of an electrical servicing strategy for the proposed site. The review was commissioned by Andrew Halmarick from Craig & Rhodes. The intention of this report is to;

- Review Ausgrid's WebGIS systems and Google Streetview records to identify existing electrical infrastructure within vicinity of development
- Complete preliminary electrical maximum demand calculations for the proposed development
- Provide summary report outlining findings inclusive of; Ausgrid's expected servicing requirements, high-level masterplan drawings, transmission relocation scope & possible lead in requirements.

2. BACKGROUND

The concept development layout consists of a proposed Residential Torrens subdivision on the existing lots 93, 944 – 948 DP752038 on Morgan Road Belrose. The intended development proposes the registration of approximately 500 lots.

Refer to Appendix A for the proposed site plan.

3. EXISTING ELECTRICAL NETWORK

See Appendix B for a sketch of the existing electrical infrastructure in and around the site.

230V/415V - Low Voltage Network

The existing low voltage network does not have the capacity to supply the development. An 11kV upgrade will be required in the form of new kiosk substations in order to supply the development.

There is existing overhead low voltage conductors running along the Southern side of Morgan Road. The proposed development substations will require an interconnection to the existing low voltage network to allow for a combined HV/LV earthing design, the safest possible earthing configuration. This low voltage line provides a simple point of interconnection for the development (i.e. no lead in works required to interconnect the low voltage network).

If preferred, this section of the overhead network can be relocated underground along the development boundary. This would likely involve a construction cost of between \$150,000 and \$180,000 to underground between 2 & 20 Morgan Road (approximately 360m). See Appendix B for further information

11kV – High Voltage Network

There is one 11kV feeder in the direct vicinity of the development, known as Panel 10. Panel 10 is supplied by zone substation ZN15005 – Belrose which is located 1.5km South of the development (113 Prince Charles Rd Belrose). The Panel appears to have a medium-heavy loading, with a peak demand of 70%-75% of its total capacity. The proposed development would utilise 15%-20% of the panel's capacity. Therefore, it is recommended to engage with Ausgrid early in the development process to determine if any upstream augmentation is required. See Section 5 for more information.

The panel extends underground to the adjacent Belrose Uniting Church lot (directly to the east), providing the ideal point of connection for the development. The panel also travels overhead along the North-Eastern Perimeter of the development (along Morgan Road).

33kV – Sub-Transmission Network

There are two 33kV feeders that run adjacent/within the development footprint. Feeder S22 runs along Morgan Road and Hilversum Crescent. It is recommended that the development layout be coordinated to leave this overhead powerline in it's existing location due to the significant expense involved in relocation.

The second 33kV feeder runs within the development and will require relocation in order to allow for the proposed subdivision. See Section 5 & Appendix C for an outline of this scope of works.

4. DEVELOPMENT DEMAND REQUIREMENTS

Maximum demand based on ADMD per lot

Please see below for a maximum demand spreadsheet produced by Power Solutions based upon the preliminary information provided. The demand calculations were completed in accordance with Ausgrid's network standards as per NS110 Section 9.3 & Appendix B.

This calculation yields an additional load of **1893A** at Low Voltage. This equates to **72A** at High Voltage.

<u>Voltage Drop Calculations</u>		
<u>Job No.:</u>	3661	
<u>Location:</u>	Morgan Road Belrose	
<u>ADMD:</u>	3.5kVA/Lot	
No of Customers	Maximum Demand (kVA)	Phase current
500	1362.35	1892.15

5. DEVELOPMENT SERVICING STRATEGY

Proposed 11kV Network

It is expected that for a development of 500 lots, 6-8 Kiosk substations will be required. Ausgrid require that each kiosk substation be located in private land within a registered easement (nominally 2.05m x 5.3m). Each kiosk substation will also require two 11kV cable connections. The likely point of connection will be to the West of the development at existing kiosk substation S65242 Morgan Forest Way. This connection point is detailed in Appendix B.

Proposed 33kV Relocation

Feeder S21 is currently located within the development footprint and will require relocation to allow for the proposed subdivision. The relocation scope of works will involve installation of underground cables in thermally stable bedding along the proposed roadway. Depending upon the preference of the developer, the cables can be installed within the roadway (pending Ausgrid approval). The size of the proposed cables will be confirmed in detailed design once Ausgrid's Design Information Package (DIP) is issued and the required feeder rating is known.

The relocation will likely require the installation of a concrete pole on Morgan road on the Eastern side of the development to connect the existing overhead line with the proposed underground cables. Once the new line is energised, the existing overhead powerline can be removed, and the existing easements extinguished.

Upstream Augmentation Works/Alternate Connection

When a Preliminary Enquiry is made, Ausgrid will review the existing high voltage network to determine if the feeder has capacity for the additional development load. Depending upon their assessment, Ausgrid may require upgrade works further upstream.

If upstream augmentation is required, it would likely involve upgrading a section of Panel 10 that has the lowest current carrying capacity. This would involve upgrading the existing underground cable from the Ralston Ave/Forest Way Intersection to the development site (approx. 1km). The majority of this section is direct buried i.e. is not installed in a conduit. This means that replacing this section of cable would require open excavation for 1km in existing footways. If this requirement is put forward by Ausgrid it is recommended that an alternate connection point is explored.

Alternate Connection Option - Panel 12L is located 400m to the West of the development at Charleroi Road. Although this connection point requires 400m of lead in works to supply the development, this would be preferred over 1km of cable upgrades. This panel has a light-medium loaded, having a peak demand of 50% of its total capacity. Depending upon Ausgrid's preliminary enquiry response, this may be the best available connection option for the development.

Please see Appendix D for a sketch outlining the abovementioned scope of works.

6. CONCLUSION

- A. Expected development load of 1893 Amps at LV (72A at 11kV)
- B. Between 6 and 8 substations will be required to supply the 500-lot development
- C. 450m 33kV line relocation required. Likely outcome involving installation of underground cables in development roadway in thermally stable bedding.
- D. Ideal connection point at Panel 10 directly adjacent development site. If Panel 10 has insufficient capacity, secondary connection point at panel 12L 400m to the West

APPENDIX A – DEVELOPMENT SITE PLAN

A1 DRAFT

DISCLAIMER

BOUNDING CADASTRAL BOUNDARIES FROM LPI GIS ARE NOT SURVEY ACCURATE. LPI ACCURACY AND CURRENCY UNKNOWN. ALONGING BOUNDARIES SHOWN ARE INDICATIVE ONLY. CONTOURS HAVE BEEN DERIVED FROM CLIPPED HARVESBURY SOUTH DIGITAL ELEVATION MODEL (DEM) 5 METRE GRID OF AUSTRALIA DERIVED FROM LIDAR (UPDATED 2015). DEM PROVIDED BY: 5 COMBINATION/1/4 OF AUSTRALIA GEOSCIENCE AUSTRALIA 2015.

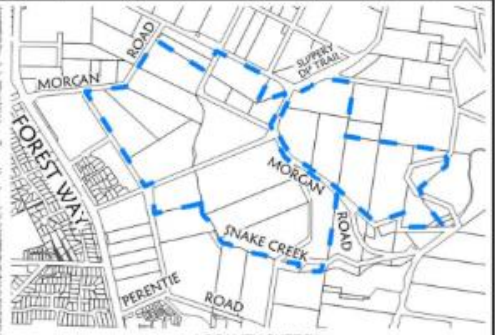
LINEAGE STATEMENT - EXTRACT FROM DEM METADATA:

THE LIDAR DERIVED 5 METRE DIGITAL ELEVATION MODEL VERSION 1.0 REPRESENTS A NATIONAL 5 METRE (BARE EARTH) DEM WHICH HAS BEEN DERIVED FROM SOME 230 INDIVIDUAL LIDAR SURVEYS BETWEEN 2001 AND 2015 COVERING ALL AVAILABLE 1 METRE RESOLUTION LIDAR DERIVED DEMS HAVE BEEN COMPILED AND RESAMPLED TO A METRE RESOLUTION DATASETS FOR EACH SURVEY AREA, AND THEN MERGED INTO A SINGLE DATASET FOR EACH STATE. THESE STATE DATASETS HAVE ALSO BEEN MERGED INTO A 1 SECOND RESOLUTION NATIONAL DATASET.

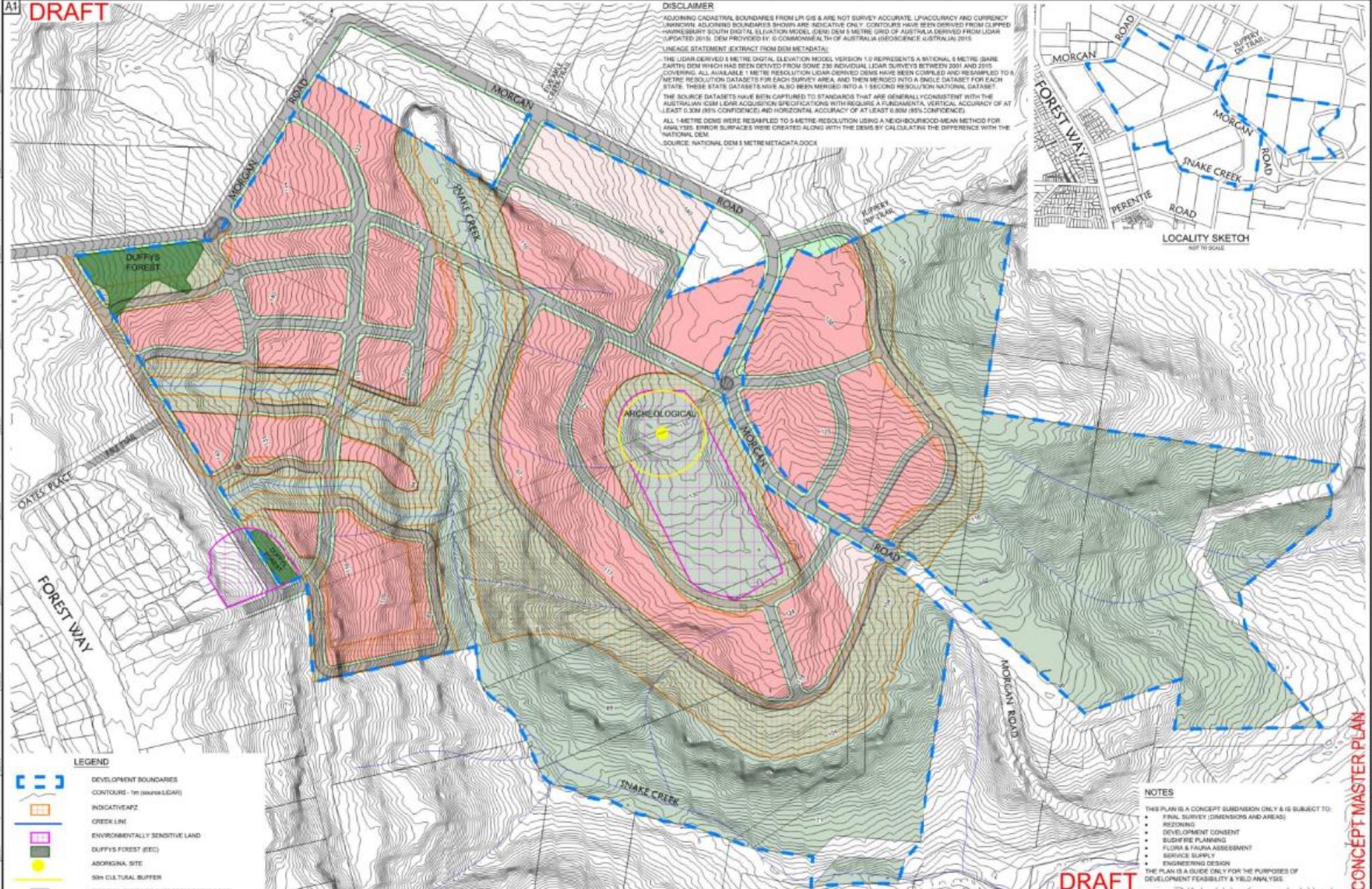
THE SOURCE DATASETS HAVE BEEN CAPTURED TO STANDARDS THAT ARE GENERALLY CONSISTENT WITH THE AUSTRALIAN ICBM LIDAR ACQUISITION SPECIFICATIONS WHICH REQUIRE A FUNDAMENTAL VERTICAL ACCURACY OF AT LEAST 0.30M (85% CONFIDENCE) AND HORIZONTAL ACCURACY OF AT LEAST 0.80M (85% CONFIDENCE).

ALL 1 METRE DEMS WERE RESAMPLED TO 5-METRE RESOLUTION USING A NEIGHBOURHOOD-MEAN METHOD FOR ANALYSIS. ERROR SURFACES WERE CREATED ALONG WITH THE DEMS BY CALCULATING THE DIFFERENCE WITH THE NATIONAL DEM.

SOURCE: NATIONAL DEM 5 METRE METADATA.DOCX



LOCALITY SKETCH
NOT TO SCALE



LEGEND

- DEVELOPMENT BOUNDARIES
- CONTOURS - 1m (BASED ON LIDAR)
- INDICATIVE APZ
- CREEK LINE
- ENVIRONMENTALLY SENSITIVE LAND
- DUFFY'S FOREST (EEC)
- ABORIGINA SITE
- 50m CULTURAL BUFFER
- RIPARIAN CORRIDOR & ENVIRONMENTAL LAND
- PROPOSED ROAD
- RESIDENTIAL LAND

NOTES

- THIS PLAN IS A CONCEPT SUBDIVISION ONLY & IS SUBJECT TO:
 - FINAL SURVEY (DIMENSIONS AND AREAS)
 - ZONING
 - DEVELOPMENT CONSENT
 - SUBDIVISION PLANNING
 - FLORA & FAUNA ASSESSMENT
 - SERVICE SUPPLY
 - ENGINEERING DESIGN
- THE PLAN IS A GUIDE ONLY FOR THE PURPOSES OF DEVELOPMENT FEASIBILITY & YIELD ANALYSIS.

CONCEPT MASTER PLAN

NO.	REV.	DATE	DESCRIPTION
1	01	2019-08-21	ISSUE FOR TENDERS
2	02	2019-08-21	ISSUE FOR TENDERS
3	03	2019-08-21	ISSUE FOR TENDERS
4	04	2019-08-21	ISSUE FOR TENDERS
5	05	2019-08-21	ISSUE FOR TENDERS
6	06	2019-08-21	ISSUE FOR TENDERS
7	07	2019-08-21	ISSUE FOR TENDERS
8	08	2019-08-21	ISSUE FOR TENDERS
9	09	2019-08-21	ISSUE FOR TENDERS
10	10	2019-08-21	ISSUE FOR TENDERS



CONCEPT MASTER PLAN
MORGAN ROAD BELROSE
MALCOLM LANDS

BELROSE LAND PTY LTD			
Scale:	1:2000	Date:	21 AUG 2019
Drawn:	A.H.	Checked:	G.W.E.
Project:	MORGAN ROAD BELROSE	Client:	BELROSE LAND PTY LTD



Project No:	095-16P L05 (04)
Client:	BELROSE LAND PTY LTD
Scale:	1:2000
Date:	21 AUG 2019
Drawn:	A.H.
Checked:	G.W.E.
Project:	MORGAN ROAD BELROSE
Client:	BELROSE LAND PTY LTD

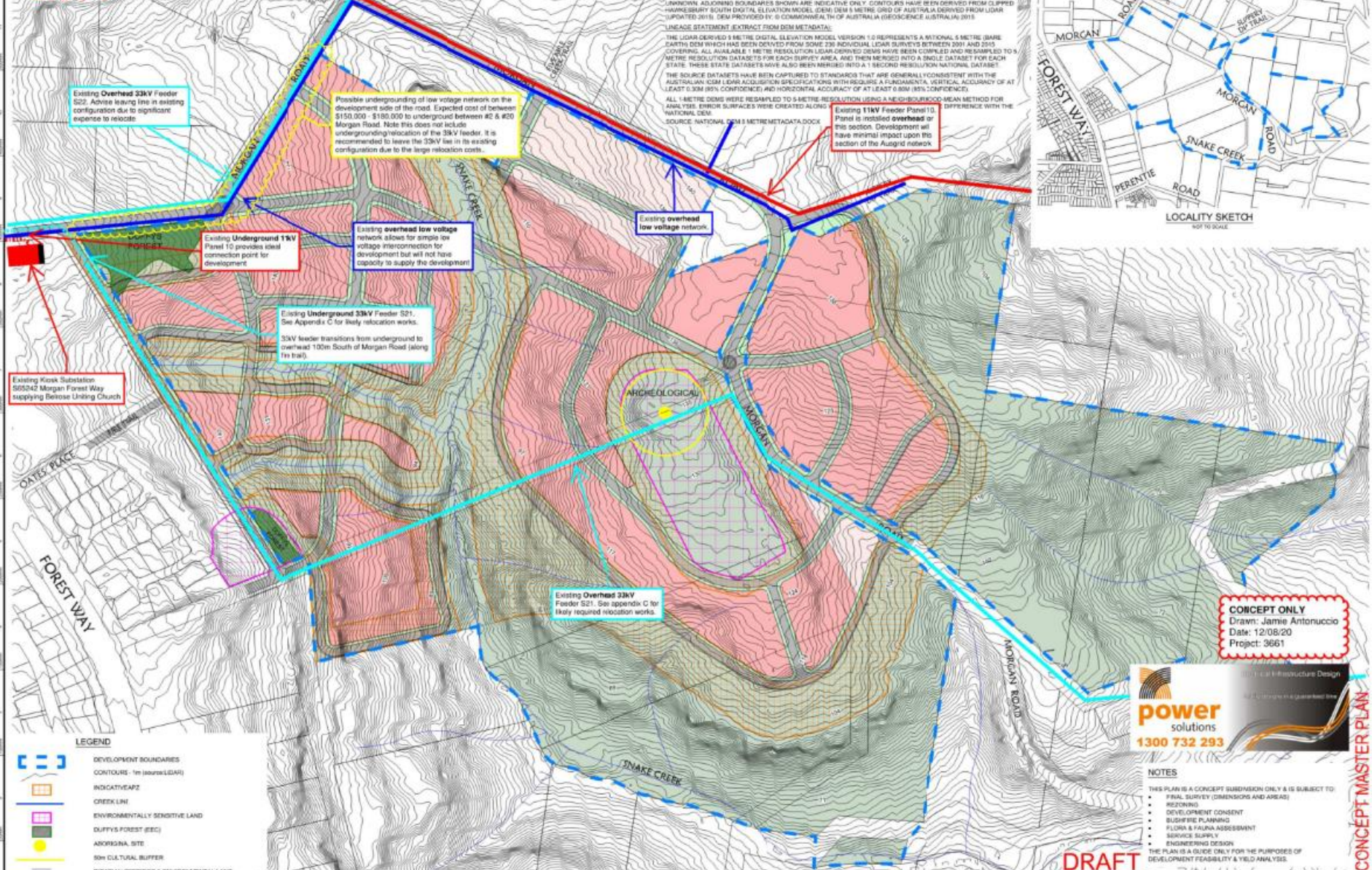
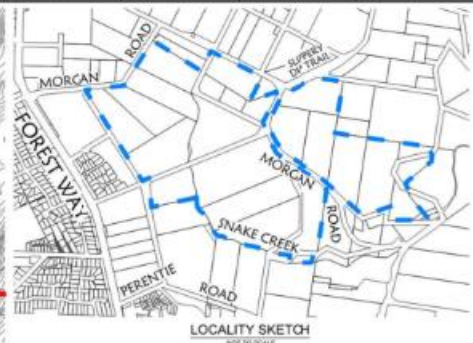
APPENDIX B – EXISTING ELECTRICAL INFRASTRUCTURE

A1 DRAFT

DISCLAIMER

BOUNDARIES AND CONTOUR LINES FROM LIDAR DATA ARE NOT SURVEY ACCURATE. LINEACCUACY AND CURRENCY UNKNOWN. ADJOINING BOUNDARIES SHOWN ARE INDICATIVE ONLY. CONTOURS HAVE BEEN DERIVED FROM CLIPPED HAMPSHIRE SOUTH DIGITAL ELEVATION MODEL (DEM) DEM 5 METRE GRID OF AUSTRALIA DERIVED FROM LIDAR (UPDATED 2015). DEM PROVIDED BY: G. COMMONWEALTH OF AUSTRALIA (GEOSCIENCE AUSTRALIA) 2015.

LINEAGE STATEMENT EXTRACT FROM DEM METADATA:
 THE LIDAR DERIVED 5 METRE DIGITAL ELEVATION MODEL VERSION 1.0 REPRESENTS A NATIONAL 5 METRE (BARE EARTH) DEM WHICH HAS BEEN DERIVED FROM SOME 230 INDIVIDUAL LIDAR SURVEYS BETWEEN 2001 AND 2015 COVERING ALL AVAILABLE 1 METRE RESOLUTION LIDAR DERIVED DEMS HAVE BEEN COMPILED AND RESAMPLED TO A 5 METRE RESOLUTION DATASET FOR EACH SURVEY AREA, AND THEN MERGED INTO A SINGLE DATASET FOR EACH STATE. THESE STATE DATASETS WERE ALSO REPROJECTED INTO A 1 SECOND RESOLUTION NATIONAL DATASET. THE SOURCE DATASETS HAVE BEEN CAPTURED TO STANDARDS THAT ARE GENERALLY CONSISTENT WITH THE AUSTRALIAN ICSM LIDAR ACQUISITION SPECIFICATIONS WITH REQUIRE A FUNDAMENTAL VERTICAL ACCURACY OF AT LEAST 0.3M (95% CONFIDENCE) AND HORIZONTAL ACCURACY OF AT LEAST 0.8M (95% CONFIDENCE). ALL 1 METRE DEMS WERE RESAMPLED TO 5 METRE RESOLUTION USING A NEIGHBOURHOOD-MEAN METHOD FOR ANALYSIS. ERROR SURFACES WERE CREATED ALONG WITH THE NATIONAL DEM.
 SOURCE: NATIONAL DEM 5 METRE METADATA DOCK



Existing Overhead 33kV Feeder S21. Advise leaving line in existing configuration due to significant expense to relocate.

Possible undergrounding of low voltage network on the development side of the road. Expected cost of between \$150,000 - \$180,000 to underground between #2 & #20 Morgan Road. Note this does not include undergrounding/relocation of the 33kV feeder. It is recommended to leave the 33kV line in its existing configuration due to the large relocation costs.

Existing 11kV Feeder Panel 10. Panel is installed overhead of this section. Development will have minimal impact upon this section of the Ausgrid network.

Existing Underground 11kV Panel 10 provides ideal connection point for development.

Existing overhead low voltage network allows for simple low voltage interconnection for development but will not have capacity to supply the development.

Existing Underground 33kV Feeder S21. See Appendix C for likely relocation works.

Existing Overhead 33kV Feeder S21. See appendix C for likely required relocation works.

Existing Kerak Substation 505242 Morgan Forest Way supplying Belrose Uniting Church

CONCEPT ONLY
 Drawn: Jamie Antonuccio
 Date: 12/05/20
 Project: 9661

NOTES

- THIS PLAN IS A CONCEPT SUBMISSION ONLY & IS SUBJECT TO:
 - FINAL SURVEY (DIMENSIONS AND AREAS)
 - REZONING
 - DEVELOPMENT CONSENT
 - BUSHFIRE PLANNING
 - FLOOD & PALMIA ASSESSMENT
 - SERVICE SUPPLY
 - ENGINEERING DESIGN
- THIS PLAN IS A GUIDE ONLY FOR THE PURPOSES OF DEVELOPMENT FEASIBILITY & YIELD ANALYSIS.

LEGEND

- DEVELOPMENT BOUNDARIES (dashed blue line)
- CONTOURS - 1m (brown line)
- INDICATIVE APZ (orange outline)
- CREEK LINE (blue line)
- ENVIRONMENTALLY SENSITIVE LAND (pink fill)
- DUFFY'S FOREST (EEC) (green fill)
- ABORIGINAL SITE (yellow circle)
- 50m CULTURAL BUFFER (yellow outline)
- RIPARIAN CORRIDOR & ENVIRONMENTAL LAND (grey fill)
- PROPOSED ROAD (dashed grey line)
- RESIDENTIAL LAND (grey fill)



CONCEPT MASTER PLAN
 MORGAN ROAD BELROSE
 MURC/LANDS

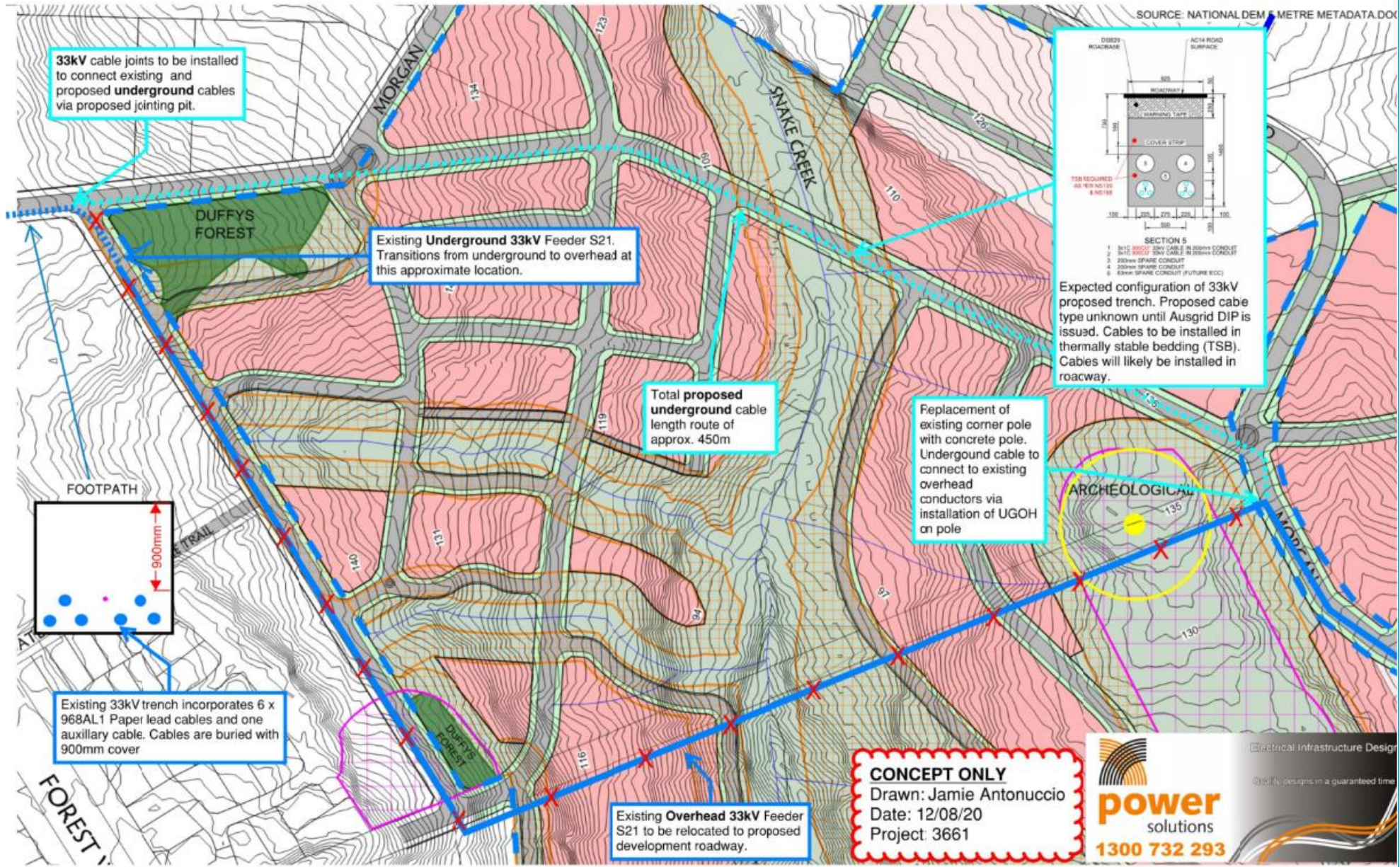
BELROSE LAND PTY LTD	
Date: 12/05/20	Scale: 1:2000
Drawn: JAMIE ANTONUCCIO	Check: JAMIE ANTONUCCIO
Drawn: JAMIE ANTONUCCIO	Check: JAMIE ANTONUCCIO
Drawn: JAMIE ANTONUCCIO	Check: JAMIE ANTONUCCIO

CRAIG & RHODES
 TAKE THE LEAD

Plan No: 096-16	Scale: 1:2000	Date: 12/05/20
Project: 096-16P L05 [04]	Client: BELROSE LAND PTY LTD	Drawn: JAMIE ANTONUCCIO
Checked: JAMIE ANTONUCCIO	Approved: JAMIE ANTONUCCIO	Project Manager: JAMIE ANTONUCCIO

CONCEPT MASTER PLAN

APPENDIX C – CONCEPT 33KV RELOCATION

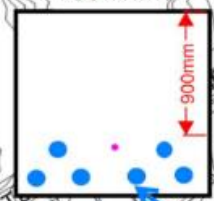
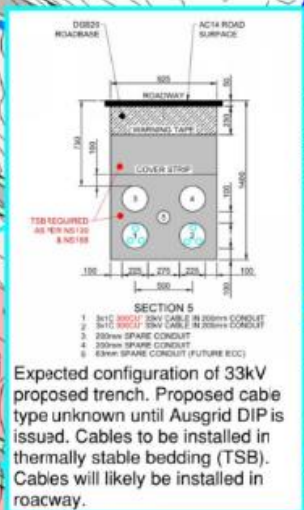


33kV cable joints to be installed to connect existing and proposed **underground** cables via proposed jointing pit.

Existing **Underground 33kV Feeder S21**. Transitions from underground to overhead at this approximate location.

Total proposed **underground** cable length route of approx. 450m

Replacement of existing corner pole with concrete pole. Underground cable to connect to existing overhead conductors via installation of UGOH on pole



Existing 33kV trench incorporates 6 x 968AL1 Paper lead cables and one auxiliary cable. Cables are buried with 900mm cover

Existing **Overhead 33kV Feeder S21** to be relocated to proposed development roadway.

CONCEPT ONLY
 Drawn: Jamie Antonucci
 Date: 12/08/20
 Project: 3661

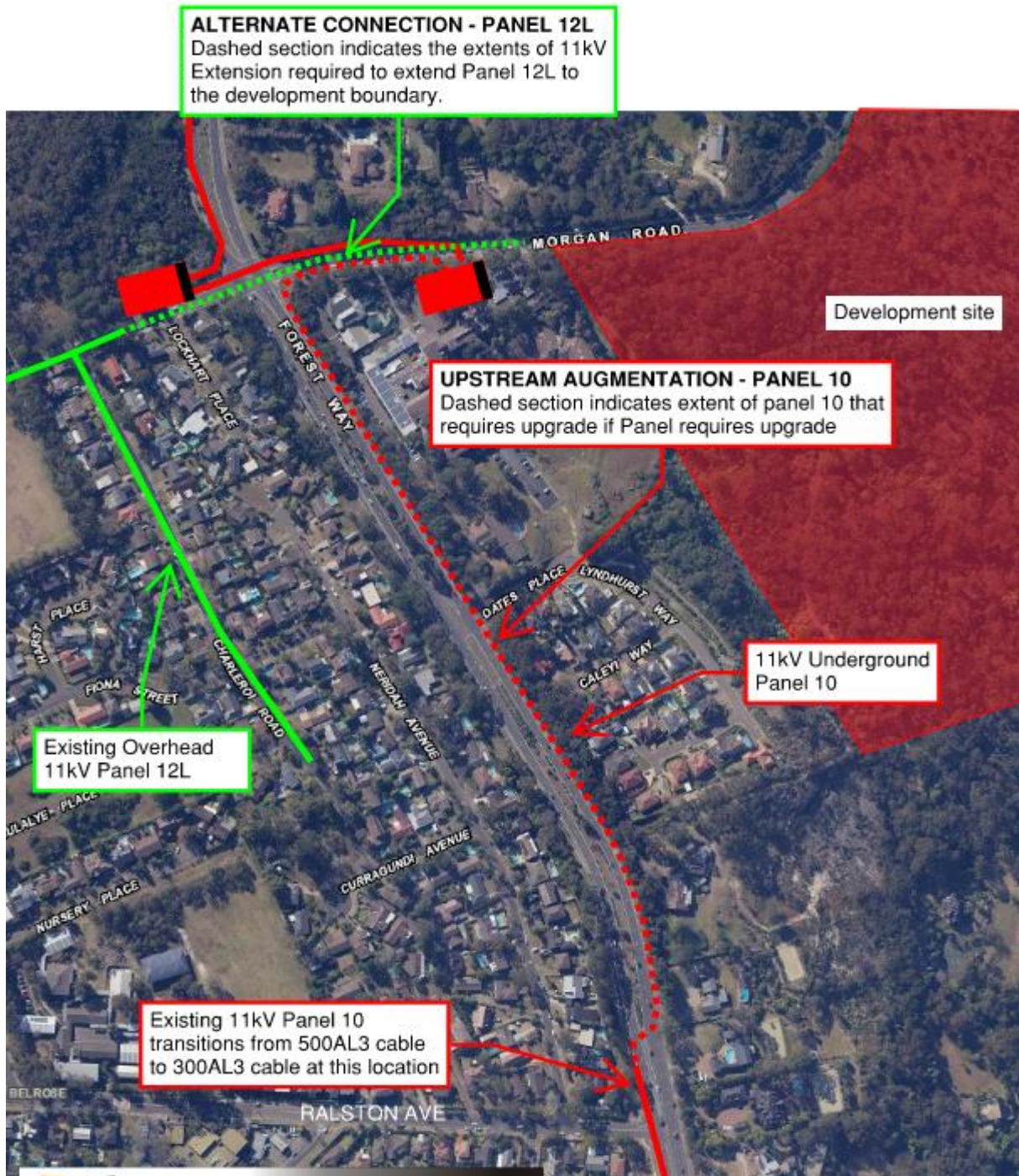
Electrical Infrastructure Design

power solutions

1300 732 293

© 2010 designs in a guaranteed time

APPENDIX D – UPSTREAM AUGMENTATION WORKS & ALTERNATE CONNECTION



Annexure F – NBN Correspondence

From: Kareena Prado <kareenaprado@nbnc.com.au>
Sent: 25 August 2020 14:25
To: Andrew Halmarick; Brodie Young
Cc: Kristine Lam; Shannon Dudley
Subject: RE: nbn service availability Belrose - DEV-00116553 reply

Hello Andrew,

The assessment has come back and all is approved with no backhaul costs for provide FTTP to the development.

We can issue the proposal for acceptance once we have the entity name and abn .

Please do not hesitate to contact me

**Kind
regards,
Kareena
Prado**

Senior Business Development Manager, NSW/ACT | New Developments, Business Enterprise & Government

| M +61 4 2853 7208 | E kareenaprado@nbnc.com.au

Visit our New Developments site: www.nbn.com.au/newdevelopments

Remember to submit all Pre-Construct and As-Built designs for review via the [new upload tools](#).

For all existing application updates please use the [tracker](#)

business nbn™



From: Andrew Halmarick <ahalmarick@crhodes.com.au>

Sent: Tuesday, 25 August 2020 2:17 PM

To: Kareena Prado <kareenaprado@nbnc.com.au>; Brodie Young <brodieyoung@nbnc.com.au>

Cc: Kristine Lam <KristineLam@nbnc.com.au>; Shannon Dudley <shannondudley@nbnc.com.au>

Subject: [External] RE: nbn service availability Belrose - DEV-00116553 reply

This message is from an **external sender - be cautious**, particularly with links and attachments. Hi Kareena,

Would you be able to give me an update on the status of our application as I have a client meeting this Thursday and I would like to present an update.

Regards,

Andrew Halmarick - Managing Director

Registered Land Surveyor - B.App.Sc(Surv.) M.I.S.(NSW), Grad.Dip.U.E.M, M.S.S.S.I (Aust), A.A.P.I.(CDP)

CRAIG & RHODES

Mobile: 0408 466 751 | Direct: 02 8752 9204 | Office Phone: 02 9869 1855

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PO Box 3220, Rhodes NSW 2138

ABN 77 050 209 991

www.craigandrhodes.com.au

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In the current COVID 19 situation it is still business as usual for Craig & Rhodes in accordance with Federal and State Government directions.

We have implemented our Work from Home policy and a majority of our team are now working safely from home.

In the event the situation changes we will advise. Thanks for your patience and we look forward to working with you.

From: Kareena Prado <kareenaprado@nbnc.com.au>

Sent: Tuesday, 28 July 2020 1:35 PM

To: Brodie Young <brodieyoung@nbnc.com.au>; Andrew Halmarick <ahalmarick@crhodes.com.au>

Cc: Kristine Lam <KristineLam@nbnc.com.au>; Shannon Dudley <shannondudley@nbnc.com.au>

Subject: RE: nbn service availability Belrose - DEV-00116553

Hello Andrew,

Thank you for speaking with me today regarding this high profile development.

I have lodged the application on your behalf for a feasibility assessment.

The application number is DEV-00116553

I have also included Shannon Dudley into this email so we can give you access to our logo and discuss marketing options with you.

Please do not hesitate to contact me

Kind

regards,

Kareena

Prado

Senior Business Development Manager, NSW/ACT | New Developments, Business Enterprise & Government

| M +61 4 2853 7208 | E kareenaprado@nbnc.com.au

Visit our New Developments site: www.nbn.com.au/newdevelopments

Remember to submit all Pre-Construct and As-Built designs for review via the [new upload tools](#).

For all existing application updates please use the [tracker](#)

business nbn™



From: Brodie Young <brodieyoung@nbnco.com.au>
Sent: Tuesday, 28 July 2020 1:12 PM
To: Kareena Prado <kareenaprado@nbnco.com.au>
Cc: ahalmarick@crhodes.com.au
Subject: FW: nbn service availability Belrose

NBN Classification - Commercial

Hi Kareena

Are you able to assist Andrew with the below potential new MDA?

Brodie Young

Relationship Manager | nbn New Developments

M +61 427 378 167 |

**From:** Andrew Halmarick <ahalmarick@crhodes.com.au>**Sent:** Tuesday, 28 July 2020 12:59 PM**To:** Brodie Young <brodieyoung@nbnco.com.au>**Subject:** [External] nbn service availability Belrose

This message is from an **external sender - be cautious**, particularly with links and attachments. Hi Brodie,

Craig & Rhodes have been appointed to undertake a Services Report for a rezoning application for land at Belrose for residential purposes.

The land is located off Morgan Rd Belrose near the intersection with Forest Way.

I have attached a concept plan that shows a yield of 500 land lots across the project.

For the purposes of my report I require written advice from nbn regarding the availability of service and the ability to supply 500 lots.

Please advise if you require lodgement via the portal or if this enquiry is sufficient to provide a response.

Regards,

Andrew Halmarick - Managing Director

Registered Land Surveyor - B.App.Sc(Surv.) M.I.S.(NSW), Grad.Dip.U.E.M, M.S.S.S.I (Aust), A.A.P.I.(CDP)

Mobile: 0408 466 751 | Direct: 02 8752 9204 | Office Phone: 02 9869 1855

Suite 7.01 Level 7, 3 Rider Blvd, Rhodes NSW 2138

PO Box 3220, Rhodes NSW 2138**ABN** 77 050 209 991www.craigandrhodes.com.au**TAKE THE LEAD**

In the current COVID 19 situation it is still business as usual for Craig & Rhodes in accordance with Federal and State Government directions.

We have implemented our Work from Home policy and a majority of our team are now working safely from home.

In the event the situation changes we will advise. Thanks for your patience and we look forward to working with you.

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Annexure G – Jemena Correspondence

From: Neale Hilton <Neale.Hilton@jemena.com.au>
Sent: 27 August 2020 17:12
To: Andrew Halmarick
Subject: RE: Morgan Rd Belrose

Andrew

Jemena has conducted an simulated load profile for these proposed Lots and can advise that an extension of the 160mm existing gas main in Forest Way, corner Morgan Rd, through to the site will be required. No formal cost have been investigated at this point in time and please note that Jemena does not reserve capacity for any individual project. Regards

Neale Hilton

Network Development Specialist –
Residential Medium Density/High

Rise **Jemena**

Level 14, 99 Walker Street, North Sydney, NSW 2060
M 0402 060 151

neale.hilton@jemena.com.au | www.jemena.com.au



From: Andrew Halmarick <ahalmarick@crhodes.com.au>
Sent: Thursday, 27 August 2020 11:04 AM
To: Neale Hilton <Neale.Hilton@jemena.com.au>
Subject: FW: Morgan Rd Belrose

CAUTION: This email originated from outside of the organisation. Do not click links or open attachments unless you recognise the sender and are expecting the content or attachment from the sender.

Hi Neale,

Can you give me an update on the availability of gas in this location to service 500 lots.

Regards,

Andrew Halmarick - Managing Director

Registered Land Surveyor - B.App.Sc(Surv.) M.I.S.(NSW), Grad.Dip.U.E.M, M.S.S.S.I (Aust), A.A.P.I.(CDP)

CRAIG & RHODES

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From: Andrew Halmarick

Sent: Monday, 27 July 2020

9:38 AM**To:**

neale.hilton@jemen.com.au

Subject: Morgan Rd Belrose

Neale,

Thanks for talking with me.

As discussed we are preparing a Services Report for the rezoning of land at Belrose.

Please find attached an indicative subdivision plan with a potential yield of 500 residential land lots.

Could you please advise the availability of gas to service the project for residential purposes.

Please call if you have any questions.

Regards,

Andrew Halmarick - Managing Director

Registered Land Surveyor - B.App.Sc(Surv.) M.I.S.(NSW), Grad.Dip.U.E.M, M.S.S.S.I (Aust), A.A.P.I.(CDP)

Mobile: 0408 466 751 | Direct: 02 8752 9204 | Office Phone: 02 9869 1855

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In the event the situation changes we will advise. Thanks for your patience and we look forward to working with you.

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