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PUBLIC UTILITY INFRASTRUCTURE SERVICING REPORT

MAMRE WEST PRECINCT

PREPARED FOR: ALTIS PROPERTY PARTNERS

PREPARED BY: LANDPARTNERS LIMITED

27 OCTOBER, 2015

OUR REF: 73535 Ver. 3

Planning Titling Surveying Mapping & GIS Landscape Architecture Environmental Urban Design

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EXECUTIVE SUMMARY:

POTABLE WATER:

- Potable water can be supplied to the subject development from Erskine Park Elevated reservoir.
- Existing reticulation systems adjacent to the site within Mamre Road will provide supply to the site and allow the development of internal reticulation mains to service the development.

WASTE WATER:

- Waste water reticulation lead in mains can be constructed along Mamre Road from the existing 750mm trunk sewer main (Mamre Road carrier) to the site.
- Initial calculations indicate there are no amplification requirements of downstream waste water systems.

ELECTRICAL SUPPLY:

- Endeavour Energy have issued a design brief for the initial stage 1 proposed rezoning area (the subject site) of the Mamre West precinct confirming the electrical feeder adjacent to the precinct, and within Mamre Road corridor, can supply electrical services to the development.

TELECOMMUNICATIONS:

- Substantial telecommunications asset exist in the immediate area supplying the surrounding industrial developments. Extensions of these systems to service the Mamre West precinct will occur.
- Existing fibre-optic and copper cables are adjacent to the site within the Mamre Road corridor.

GAS:

- Existing Jemena network main (110mm, 210 kPa) system is adjacent to the site within Mamre Road. This main will provide reticulation services to the Mamre West Precinct.

REVISION HISTORY

REVISION	DETAILS	NAME	DATE
1	Issue for Comment	Greg Oxley	October, 2015
2	Revisions – Ver 2	Greg Oxley	22 October, 2015
3	Revisions -- Ver 3	Greg Oxley	27 October, 2015

1. INTRODUCTION

1.1 Background

The Mamre West precinct has been lodged as a proponent-led proposal area within the Western Sydney Priority Growth Area (formerly the Broader Western Sydney Employment Lands).

The precinct provides the opportunity to increase employment opportunities for the growing workforce of Western Sydney by utilising the proximity of the precinct to surrounding existing infrastructure.

This Public Utility Infrastructure Servicing Report provides an overview and assessment of the requirements of infrastructure services to support development of the Mamre West Precinct. The site subject of rezoning (Lot 2171 DP 1153854) comprises an area of 48.35ha with a net developable area of approximately 41.6ha (excluding flood impacted lands and areas reserved for public roads and infrastructure). An allowance of an additional 40.52ha has been provided for the remaining land within the Precinct – which allows for development within the flood prone lands. When the additional lands within the Precinct are subject to rezoning – the report (subject to confirmation of the exact developable area) will need to be revisited and confirmed.

1.2 The Precinct

The Mamre West Precinct is located west of the existing Erskine Park Employment Lands with an early release of part of the precinct known as Lot 2171 DP1153854 – the "subject site"

The subject site, subject to the initial proposed rezoning, is located on the western side of Mamre Road, north of the Sydney Catchment water supply pipeline and bounded by existing rural landscape lands to the west and north (RU2 zoning). The subject site is comprised of 41.6ha of net developable area with an allowance for future developable area within the Mamre West Precinct of 43.62ha (approximate area)

2. PLANNING PROPOSAL

- The site investigations have identified that a significant part of the Mamre West Precinct is affected by flooding, predominantly along the western and northern parts of the precinct adjacent to South Creek and the tributary along the northern boundary. Further, parts of the developable land (i.e. outside of the floodway) have already been developed, including the recently opened child care centre on Mamre Road and the large rural-residential dwellings on Mandalong Close.

  Accordingly, it was resolved that the initial industrial land release and rezoning would be limited to the developable land within the southern part of the site, which is owned by the proponent (Lot 2171 in DP 1153854). This first stage would allow the timely release of land suitable for industrial uses, such as warehouse and distribution centres, and provide employment opportunities in accordance with the objectives for the Western Sydney Priority Growth Area.

  The balance of the developable land, generally comprising the land to the north of Lot 2171, would then be addressed by way of a separate precinct planning process. This would allow the affected landowners to review the technical reports that have already been prepared for the broader Precinct and resolve an appropriate approach to the potential future land release and rezoning of their land.

  The proponent of the precinct release has developed a concept masterplan for the site which can be used to allow an estimation of utility demands and as a basis for indicating the extent of service infrastructure to be provided for the development.

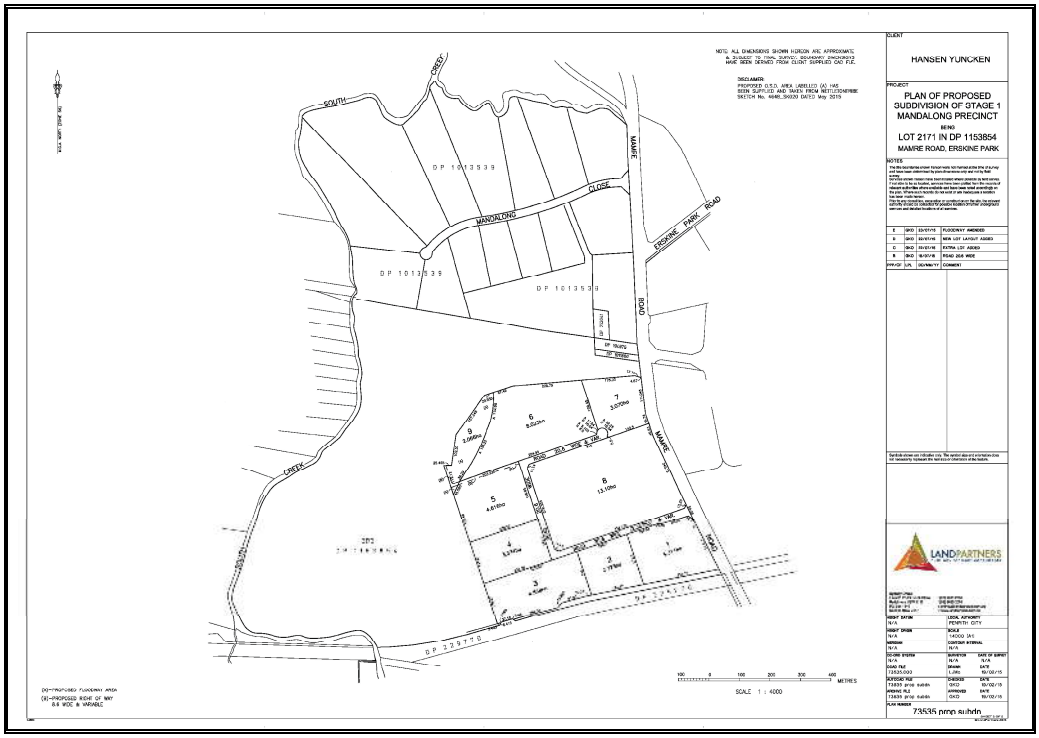


Fig. 1: Mamre West Precinct and concept Masterplan subdivision of "subject site".

3. SERVICE PROVISION

Mamre West precinct is adjacent to the existing Erskine Park Employment Lands precinct. Substantial infrastructure has been established to service the Erskine Park Employment Lands.

The capacity of the infrastructure provided to the Erskine Park Employment Lands for waste water and potable water usage has been assessed using traditional service demand planning parameters that were adopted during the 1990's and early 2000's. These parameters provide an overestimation of the demand requirements of an area due to the changing nature of industrial lands. The current use of industrial lands is predominantly logistics or warehouse based development as opposed to the "traditional" use of industrial lands based on manufacturing uses.

Within the Erskine Park Employments Lands only one user – Bluescope Steel – would be considered a "traditional" industrial development. The Erskine Park Employment lands are substantially utilised for warehousing/logistics purposes.

The result of the changing nature of the type of development in industrial or employment-zoned land is that demands on public utility infrastructure are much lower than traditional development types leading to excess capacity in the utility systems that have been installed to service developments.

This scenario is applicable to Mamre West precinct which will be utilising infrastructure which has been built to supply Erskine Park Employment lands

Electrical supply to the Erskine Park Employment lands has similar comments as outlined for the supply of waste water and potable water due to the changing nature of industrial development. Electrical supply is provided from the Mamre Zone Substation off John Morphett Place in Erskine Park, some 900m to the north of the "subject site". This Zone Substation has been upgraded to 90MVa capacity and provides substantial capacity to serve Erskine Park Employments lands and surrounding areas, including the "subject site" and future developable land within Mamre West precinct.

4. REQUIRED INFRASTRUCTURE

4.1 Sydney Water Assets

Inception meetings have been undertaken with Sydney Water to discuss requirements for supply to Mamre West. Following those meetings, the proponent of the precinct release has engaged Calibre Consulting to prepare a "Basis of Planning Report" and to develop a servicing strategy and servicing concepts.

Part of this process involves assessment of existing Sydney Water models for potable water and waste water systems and analysis of the impact on these systems by demand generated by the Mamre West precinct. These assessments are currently being undertaken by Calibre Consulting in close consultation with Sydney Water and will be followed by the detailed design of the infrastructure

4.1.1 Potable Water

Initial discussions with Calibre Consulting and overview of the existing system servicing Erskine Park indicate that capacity exists to supply Mamre West precinct based on demand calculations listed in Sec. 5.1 below.

Supply will be obtained from the 250mm water main in Mamre Road south of the James Erskine Drive/Mamre Road intersection. The main will be extended along Mamre Road and an internal reticulation system for the subject site will supply development.

4.1.2 Waste Water

Further discussions with Calibre Consulting and overview of the Mamre Road sewer carrier that services Erskine Park Employment lands indicate that capacity would be available to service the subject site based on demand calculations listed in Sec 5.2 below.

Reticulation for Mamre West precinct will be obtained by construction of a lead in gravity sewer main from the Mamre Road carrier approximately 900m to the north of the site (refer Appendix 'A'). The lead in reticulation main would be constructed within the Mamre Road corridor to the north-east corner of the development site. Bulk earthworks plans provided by the proponent of the precinct release indicate that sufficient fall would exist to construct the internal waste water reticulation to serve developments within the precinct release area.

4.2 Endeavour Energy (EE)

The subject site is the initial release area of the Mamre West precinct. The proponent of this initial release area is aware of the nature of development that will occur within the subject site and therefore can quantify the demand requirements to support development on the subject site. The proponent has been able to submit applications to Endeavour Energy to commence the approval process to allow supply to be provided to the subject site on the basis of these load estimates.

Future development of other areas within the Mamre West precinct will require confirmation of demand requirements, load estimates, the nature of development likely to occur in these other areas and site layouts to enable Endeavour Energy to assess future supply requirements.

Connect Infrastructure, on behalf of the proponent, lodged a Connection of Load Application with Endeavour Energy for Lot 2171 – the subject site - and a supply offer was received on 2/2/2015.

Connect Infrastructure have lodged a Method of Supply with Endeavour Energy and received a Design Brief from Endeavour Energy confirming the supply of required loads and connection details for the subject site. Connect are currently preparing a detailed design in consultation with EE which will lead to an application for the issue of a certified design.

Electrical supply will be obtained from the existing underground feeder located in Mamre Road and extended to the site. Reticulation systems would then be provided to the development. Padmount substations would be required within the precinct release area, however, sizing of those padmount substations would be dependent on the requirements of future users of the sites within the precinct.

The future developable area of 43.62ha adjacent to the subject site can either be obtained from either the existing underground feeder located in Mamre Road, a further feeder from the Mamre Zone Substation or augmentation works within the Erskine Park Employment lands to reduce load in the existing underground feeder in Mamre Road and therefore provide capacity within that feeder for the 43.62ha future developable land.

4.3 Telecommunications

Substantial telecommunications infrastructure exists within the Erskine Park employment lands. Immediately adjacent to the Mamre Road West precinct within Mamre Road corridor are existing fibre-optic and copper cables.

Extension from the existing network to the development site is readily achievable.

4.4 Gas

Jemena provide gas reticulation to service development in this area. Currently, a 110mm (210 kPa) gas main is constructed in the Mamre Road corridor adjacent to the site. This main can be utilised for reticulation extension into the development area.

5. DEMAND ESTIMATES

5.1 Potable Water

Demand can be assessed in two different ways – using traditional planning parameters which are outlined in the Water Supply Code of Australia (Sydney Water Supplement) or by "Average Daily Water Use By Property Type", a Sydney Water publication.

Demand calculations, using traditional planning parameters, outline water usage for industrial zoned land at 40 kilolitres/day/pure net hectare. Pure net hectare excludes roads, reserves, other non-potable water serviceable areas within an estate and, generally equates to approximately 80-90% of an industrial site.

The traditional planning parameters are considered an over-estimation because of stormwater harvesting and water re-use that is implemented in new industrial and commercial developments.

Studies undertaken by this firm indicate that areas such as Glendenning, Arndell Park, Huntingwood and Eastern Creek (all substantially developed as warehousing/logistics centres) utilise approximately 15 - 17 kilolitres/day/pure net hectare.

Calculation, based on the Sydney Water publication "Average Daily Water Use By Property Type" provides guidance on potable water demand based on floor areas that are generated from a development. Sydney Water have undertaken studies of areas to determine a realistic assessment of average daily water use based on floor area.

5.1.1 The Subject Site demand

Therefore, calculations utilising the two different methods are listed as follows:-

POTABLE WATER DEMAND – "TRADITIONAL" PARAMETERS BASED ON WSA CODE

POTABLE WATER DEMAND – "TRADITIONAL" PARAMETERS BASED ON WSA CODE					
PROPERTY TYPE	**TOTAL AREA**	**PURE NET HECTARE (pnha)**	**"TRADITIONAL DEMAND"**	**MAX. DAY DEMAND**	**PEAK DAY DEMAND**
INDUSTRIAL	48.3 ha	41.6 ha	40 kl/d/pnha	1664 kl/day	2662 kl/day
***NOTE**: Peak day demand is demand which could possibly occur in any one day of the year and incorporates the worst case maximum demand required of the system.*					

AVERAGE DAILY WATER USE BY PROPERTY TYPE

AVERAGE DAILY WATER USE BY PROPERTY TYPE			
PROPERTY TYPE	**GROSS FLOOR AREA m^2**	**AVERAGE DAY DEMAND LITRE/m^2/DAY**	**DEMAND (kl/day)**
INDUSTRIAL WAREHOUSE	247,000	2.82	696 kl/day
OFFICE	13,000	2.27	29 kl/day say: 725 kl/day
***NOTE**: Areas are based on estimated floorspace yield provided by proponent.*			

As stated above, based on our studies of other warehousing/logistics area, the rate we have determined of 15 - 17 kilolitres/day/pure net hectare would equate to water usage of 625 - 710 kilolitres/day which provides reasonably close correlation of the "Average Daily Water Usage By Property Type" publication issued by Sydney Water.

Therefore, an average daily water use of 725 kl is utilised.

5.1.2 Future Developable land

Based on the Average Daily Use by Property Type calculations, an average daily water usage can be determined for water usage.

An estimate of floor space for industrial properties can be utilised for the 43.62ha of future developable land. An allowance of 3.1ha has been made for roads and service infrastructure for this area leaving a net developable area of 40.52ha. The proponent has estimated a Gross Floor Area (GFA) yield of 245,000m2 with a 95% yield of warehouse/industrial floor area and 5% ancillary office floor area –in this case, an allowance of 12,250m^2 of office floor area and 232,750m^2 of warehouse floor area has been adopted.

AVERAGE DAILY WATER USE BY PROPERTY TYPE			
PROPERTY TYPE	**GROSS FLOOR AREA m^2**	**AVERAGE DAY DEMAND LITRE/m^2/DAY**	**DEMAND (kl/day)**
INDUSTRIAL WAREHOUSE	232,750	2.82	656 kl/day
OFFICE	12,250	2.27	28 kl/day say: 684 kl/day

In terms of the existing supply capacity in Erskine Park Employment land and surrounding infrastructure, the estimate of 684 kl/day average day demand is a small load on the supply system and existing infrastructure will meet this demand requirement.

5.2 Waste Water

Waste water demand can be estimated from planning guidelines provided in the "Sewerage Code of Australia" (Sydney Water Edition). Sydney Water currently allows a population yield of 75EP/ha – which is an over-estimation should the site be developed for warehousing or logistics purposes.

However, Sydney Water take a conservative view and cater for land use changes over a planning horizon of 80—100 years. Therefore, to provide adequate capacity for current and possible future uses, a rate of 75EP/hectare is used.

Each EP is assessed to discharge 180 litres/day as outlined in the Sewerage Code of Australia publication.

5.2.1 The Subject Site Demand

The summary table of waste water demand is as follows:-

WASTE WATER DEMAND

WASTE WATER DEMAND				
PROPERTY TYPE	**TOTAL AREA (GROSS AREA)**	**EP/ha**	**DISCHARGE/EP**	**DISCHARGE**
Industrial	48.3	75	180kl/day	652 kl/day
NOTE: *Again, this calculation provides an over-estimation of demand requirements as Sydney Water, in certain cases, are allowing EP yields of approximately 40EP/hectare as a more realistic assessment in industrial areas.*				

Waste water discharge normally equates to approximately 90% of the average daily water use (estimated at 725 kl/day), so it would be expected that the waste water discharge, in this particular instance, would be approximately 650 kilolitres/day.

Therefore, a waste water discharge of 650 kl/day or average 7.5 l/s is assumed.

5.2.2 Future Developable Land

Based on similar demand estimates, the following can be assessed:

WASTE WATER DEMAND

WASTE WATER DEMAND				
PROPERTY TYPE	**TOTAL AREA (GROSS AREA)**	**EP/ha**	**DISCHARGE/EP**	**DISCHARGE**
Industrial	43.6	75	180kl/day	588 kl/day

A waste water discharge can be assessed as 588kl/day or average 6.8 l/s.

5.3 Electrical

The development site comprises an area of 48.35 ha. The net development area within the subject site is approximately 41.6 ha.

Traditional planning parameters provide a demand guide of 0.4 MVa per hectare of industrial land. In this instance, that would equate to 16.6 MVa demand for the release area.

However, further demand studies have been able to refine current demand requirements based on usage per square metre of floor area. Current rates to assess demand on this basis would be:

- Office areas .. .. .. 100 VA per m^2
- Warehouse areas .. .. .. 25 VA per m^2

Given a developable area of 41.6 ha and assuming a 60% site take-up with physical structures (i.e., warehouse/logistics buildings) and also 5% of that area allocated for office space, the following demand can be determined:

247,000 m^2 warehouse floor area X 25 Va	=	6.2 MVa
13,000 m^2 office X 100 Va	=	1.3 MVa
Total:	=	7.5 MVa

A realistic assessment of demand for a warehouse/logistics development within the subject site would be approximately 7.5 - 8 MVa.

The future 43.62ha of developable land adjacent to the subject site can be assessed in a similar manner based on estimates of possible office and warehouse floor space areas – in this case an allowance of 12,250m2 of office floor area and 232,750m2 of warehouse floor area

12,250m^2 office X 100 Va	=	1.2 MVa
232,750m^2 warehouse floor area X 25 Va	=	5.8 MVa
Total:	=	7 MVa

5.4 Telecommunications

No demand figures exist for development such as this precinct release. However, band widths provided by the fibre-optic system in the area will cater for substantial usage.

5.5 Gas

Without details of the specific developments that are proposed for the development, it is not possible to estimate gas demand for the release precinct.

6. DELIVERY INFRASTRUCTURE

6.1 Sydney Water

Substantial, existing Sydney Water utility assets exist adjacent or near to the precinct. Extension of water and waste water mains is readily achievable. Utilisation of these existing assets provides a point of difference for this precinct release from other precinct where Sydney Water assets, such as reservoirs, trunk mains, pumping stations, gravity sewer trunk mains, need to be provided to support development. The location of the surrounding infrastructure provides community economic benefits by using ultimate capacity within the adjacent service assets.

Waste water infrastructure to service the subject site will be provided by a lead in 225mm – 300mm waste water main that will be constructed along the Mamre Road road corridor from a receiving manhole constructed on the Mamre Rd sewer carrier approximately 900m north of the subject site. This lead in waste water main will also have the capacity to service the future 43.62ha development area as well as future development within the Mamre West precinct. Refer to Appendix 'A' showing the location of the lead in main along Mamre Road and the connection point along the Mamre Road carrier (denoted 1200mm GRP).

Potable water will be provided by a short reticulation extension across Mamre Road from the existing 250mm water main adjacent to the subject site. Capacity within this reticulation extension will also exist to service the future 43.62ha developable area adjacent to the subject site.

Following precinct release, development applications will be lodged with consent authorities for approval. As part of those consents, Section 73 Applications will need to be lodged with Sydney Water that will outline the assets that will need to be delivered to service the development area.

The process of design, construction and hand-over of water and waste water mains is outlined in Sydney Water's Section 73 process.

6.2 Endeavour Energy

Endeavour Energy has assessed the Connect Infrastructure Method of Supply (MoS) and based on that MoS a design brief has issued by Endeavour Energy for the supply of electrical services to the subject site.

The design brief notes that an extension of electrical reticulation infrastructure to the subject site will be made by a cut in to the existing underground feeder MM1192 located on the eastern side of Mamre Road near the proposed intersection with a further connection to be made to the overhead feeder MM1112 located on the eastern side of Mamre Road at pole 760769. A loop internal electrical reticulation within the subject site will supply electrical services to developments within the subject site.

The potential to also service the future 43.62ha of developable land adjacent to the subject site was discussed in Sec 4.2 of this report – in summary, either from the existing MM1192 underground feeder, a further feeder from Mamre Zone Substation or augmentation works within the Erskine Park Employments lands to free up load in the MM1192 feeder.

Endeavour Energy have a delivery system for extension of the electrical assets that are required to service the development – either initiated by an application for a "Notification of Arrangement" Notice if subdivision is proposed, or a "Connection of Load" Application if building development is proposed.

Both of these processes clearly outline the design, certification, construction and hand-over process to be followed for the delivery of Endeavour Energy assets.

6.3 Telecommunications

Delivery of telecommunications infrastructure can be facilitated by applications to Telstra or NBN Co. where adjacent to or within existing NBN Co. footprint area.

NBN Co. rollout has not commenced in the area adjacent to the Mamre West precinct and, therefore, Telstra will be the default service provider for the installation of telecommunications cable system.

The Mamre West Precinct is currently serviced with Telstra Copper Cable Network. The Developer will have to supply design and fibre ready pit and pipe for this development to Telstra G:645 guidelines. Application to “Telstra Smart Community” will be required. A telecommunications consultant will be engaged once final loads and concept layouts are finalised. Upon application to Telstra’s Smart Community – consultation and design certification will need to be undertaken. As this project is currently within a Telstra serviced area, Telstra will charge for the installation of cable for this development

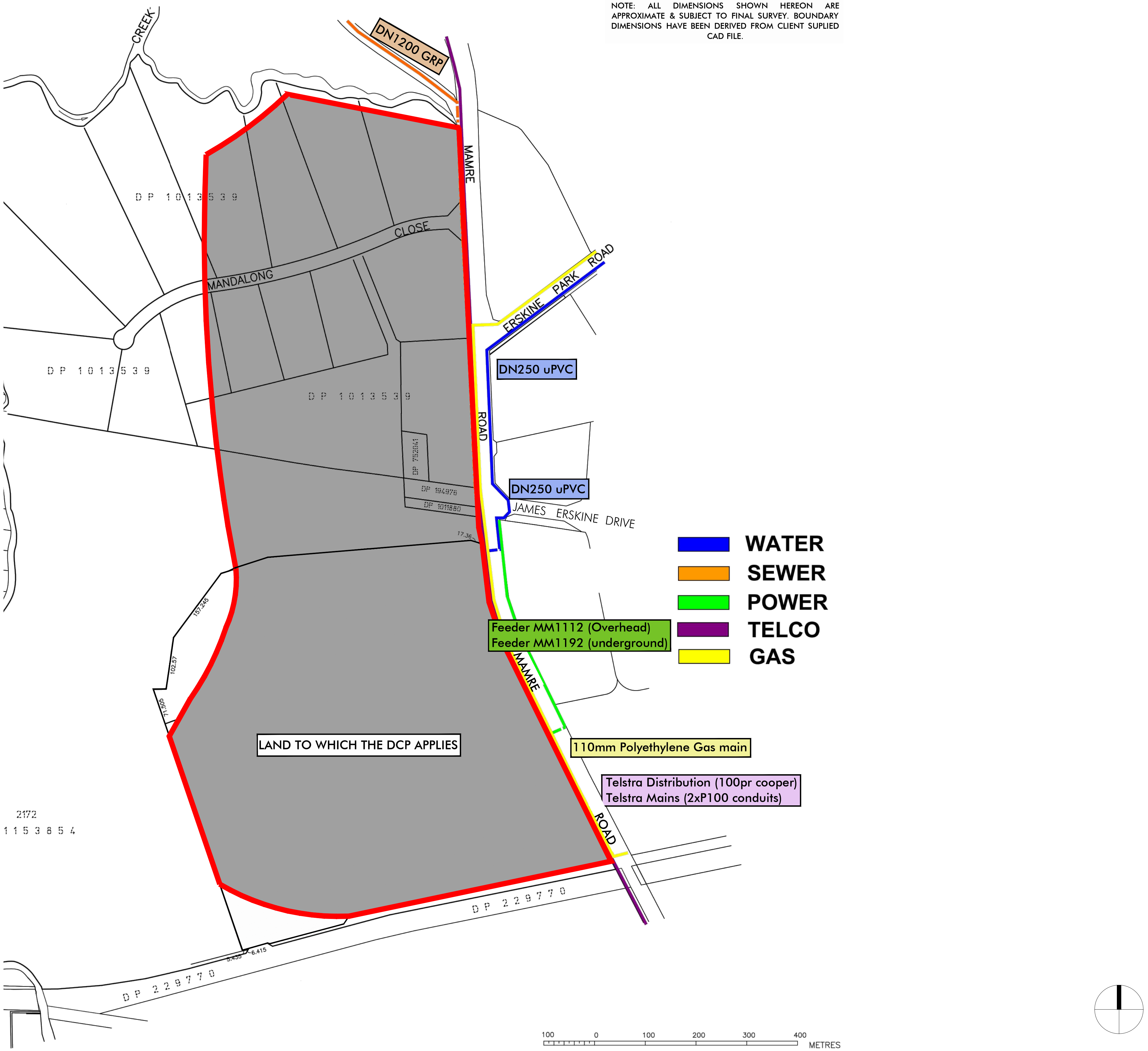
6.4 Gas

The Mamre West Precinct is currently serviced with a 110mm polyethylene gas main (210 kPa) is located adjacent the site within Mamre Road. Under standard provisioning for gas in subdivisions, a shared trench arrangement will be adopted should gas be required for the development and will be done by direct agreement with Jemena based on the specific demand for the gas. Therefore, no consultation is required with Jemena until specific load requirements (if any) are known.

7. CONCLUSION

The Mamre West precinct including the subject site and future 43.62ha development area is well-serviced by adjacent utility infrastructure assets that have the capacity to accommodate the proposed development within the precinct.

APPENDIX 'A'



Client

ALTIS Property Partners

Project

Mamre West Precinct, Erskine Park

PUBLIC UTILITY INFRASTRUCTURE SERVICING

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