MDA CONSULTING ENGINEERS PTY LTD
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ABN 16 997 612 233

Cobaki Residential Estate
Electrical and Telecommunication Infrastructure Report

For

Leda Holdings Pty Ltd

Prepared by
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Functionality Statement Details	
Title	Cobaki Residential Estate Availability of Electrical Supply
Client	Leda Holdings Pty Ltd
Client Contact	Mr Reg Van Rij
Description	Consult with Essential Energy and NBN to determine what existing capacity is within each party's network and to discuss what infrastructure upgrades would be required for the proposed Cobaki Residential Estate.

Revision History

Issue No.	Date	Description	Distributed To	No. Of Copies
A	05/11/15	Original Issue	Leda Holdings	1 (email)
B	02/12/15	Amended Report Title and added section in report on NBN	Lead Holdings	1 (email)

Contents

1.0 INTRODUCTION

MDA Consulting Engineers were engaged to complete a desk top review in consultation with Essential Energy to ascertain what spare capacity is within Essential Energy existing 11kV network for Cobaki Residential Estate.

Consultation was also conducted with the National Broadband Network (NBN) to the availability of the network to the estate and the infrastructure requirements to provide the NBN network.

This report will cover the outcome of the desk top review and consultation with both Essential Energy and NBN. The report will advise on the current capacities available and the major components required to be completed for infrastructure upgrades.

2.0 DESK TOP REVIEW OF ESSENTIAL ENERGY 11kV NETWORK

Based on the 5 year master plan in appendix A that was provided by Leda Holdings the following maximum demand calculation were estimated. The maximum demands where based on the following design parameters:

- Residential Lots – 4kVA ADMD (After Diversity Maximum Demand)
- Commercial/Tertiary Precinct – 80VA/m2

Year 1 - 2016

- 300 lots @ 4kVA per lot = 1200 kVA
- University Building @ 6000m2 @ 80VA/m2 = 480kVA
- University Facility Building @ 1000m2 @ 80VA/m2 = 80kVA
  Total = 1760kVA

Year 2 - 2017

- 350 lots @ 4kVA per lot = 1400kVA
  Total = 1400kVA

Year 3 - 2018

- 350 lots @ 4kVA per lot = 1400 kVA
- Commercial/Retail @ 3000m2 @ 80VA/m2 = 240kVA
- Additional University Facility Building @ 1000m2 @ 80VA/m2 = 80kVA
  Total = 1720kVA

Year 4 - 2019

- 275 lots @ 4kVA per lot = 1100kVA
- Commercial/Retail @ 3000m2 @ 80VA/m2 = 240kVA
- Club/Tavern @ 3000m2 @ 80VA/m2 = 240kVA
  Total = 1580kVA

Year 5 - 2020

- 275 lots @ 4kVA per lot = 1,100 kVA
- University Building @ 6000m2 @ 80VA/m2 = 480kVA
- University Facility Building @ 1000m2 @ 80VA/m2 = 80kVA
  Total = 1660kVA

The total estimated maximum demand for the 5 year master plan is **8120kVA or 8.12 MVA.**

3.0 CONSULTATION WITH ESSENTIAL ENERGY.

From the desk top review MDA Consulting Engineers contacted Essential Energy and provided them with the 5 year master in Appendix A and the above demand figures.

Essential Energy responded with a request for further information (RFI). The RFI required MDA to provide the total Masterplan yield for the estate and associated maximum demand estimates for the estate based on these yields.

Leda Holdings provided the estate's estimated master planned yields which are attached in appendix B. On this masterplan yield spreadsheet MDA included the estimated maximum demand for estate and forwarded this information onto Essential Energy.

In response Essential Energy provided the following items:

- The connection point will be the future Essential Energy Zone Substation in Piggabeen Road.
- A temporary overhead connection will be permitted off the existing network at pole NP365613 (peg 9A Project 108953).
- This overhead line will not be suitable for connection of future stages beyond stage 1 works.
- Additional Design Information Applications will be required for the specific works within each precinct.
- Essential Energy accepts the proposed ADMD of 4kVA per lot.
- The maximum load that can be supplied to Cobaki Residential development will be 1MVA without upstream upgrading.
- MDA Consulting Engineers have calculated the maximum demand of the University Campus in Stage 1 to be 560kVA. This will allow a further 100 homes to be connected before upgrading of the network outside of the development is required. The developer may nominate a different mix between commercial and residential, but the 1MVA maximum shall apply.
- Certification of Design for Stage 1 will not occur until the developer submits a Report detailing the overall development projected loadings including an updated Precinct map and expected loading requirements for each precinct.
- The temporary 11kV line will be constructed with 7/4.50AAAC conductor.
- It will the developers responsibility and at the developers cost to replace the temporary overhead network with underground cables as the road network progresses within the development as per Essential Energy's Capital Contributions policy. A bond in the form of a bank guarantee may be required to cover the cost of conversion from overhead conductor to underground cable. The value of the bond will be determined when distances are known and the extent of underground work has been completed for each stage.

Essential Energy Outcomes

From the response received from Essential Energy the following outcomes are available to Leda Holdings.

- Essential Energy will allow a temporary overhead connection for the first stage of works to the high voltage pole NP365613 which is located in the south east section of the estate and is part of the current overhead network relocation works which Leda Holding are currently undertaking.
- Essential Energy will allow a maximum of 1000kVA or 1 MVA to be connected to the network without upstream upgrading of the network. This means that based on the initial 5 year masterplan the works that are proposed for the year 2016 which has an estimated maximum demand of 1760 kVA or 1.76MVA cannot occur on the existing network. The level of works that could occur on the existing network base on the estimated demands would be the first stage of the University plus 100 residential lots.
  However if Leda Holding requires the 300 residential lots to be developed as part of the year 2016 works then this can occur but with upgrading Essential Energy network located upstream to the estate. Essential Energy have not given any formal detail to the extent of this upgrade of the upstream network, but have verbally stated that it would require up to 1km of conductor upgrade and an 11kV recloser replacement. This upgrade works would be at the cost of Leda Holdings.
- The permanent connection for the estate will be from the yet to be constructed Essential Energy Zone Substation that would be located across the creek on Piggabeen Road.
- Essential Energy will only allow stage 1 of works to be connected to the temporary 11kV line that will be installed. This means that if the future Zone substation construction has not yet been completed when further stages of the development are required to be constructed, additional

overhead networks would have to be designed to connect into the Essential Energy network. This is so to give the customers in the estate reliability of supply in case of a failure in the network. These works would be a Leda Holdings Cost.

- At Leda Holdings Costs and as the estate develops the existing overhead network that transverses the site will require to be undergrounded. Essential Energy have advise that a bond for these works will be required.
- Approval of the design for the first stage of works will not be given from Essential Energy until Leda Holdings Level 3 Electrical URD designer has completed and submitted a formal report to Essential Energy detailing the overall project loadings. Within this report an updated Precinct Masterplan must be provided.
- All infrastructure works within the estate from the point of connection from either the existing 11kV overhead network or the future zone substation will be reticulated underground.

4.0 NATIONAL BROADBAND NETWORK (NBN)

A master estate agreement has been signed and agreed with NBN for the reticulation of fibre optic telecommunication cabling through the entire estate.

NBN has advised that this network will be installed via the existing and where required new conduits from the Gold Coast Highway along Boyd Street, Tugun to the boundary of the Residential estate. At this point it will be the developer's responsibility to provide a NBN approved underground conduit and pit system throughout the estate. As part of the master agreement with NBN this conduit and pit system will be signed over to NBN as their asset. NBN will continue the installation of the fibre optic cabling system through the developer supplied conduit and pit system.

NBN system will have the capacity from time of the installation for stage 1 works for the telecommunication services for the complete masterplan yield.

5.0 SUMMARY

If Leda Holdings wish to proceed with works in the Cobaki Estate and **not** provide upgrade to the existing Essential Energy Network then the maximum capacity that Essential Energy will provide will be 1MVA. The 1MVA can be any mix between commercial and residential but the summative total of whatever mix is used can only be 1MVA.

If Leda Holdings wishes to exceed this 1MVA then there will be upstream Essential Energy Network upgrades required at Leda Holdings cost to achieve this additional load.

For future stages of works if the proposed future zone substation has not been completed then additional overhead network will be required as part of the future stages design as a temporary measure to ensure that Essential Energy can provide to residences and commercial customers a reliable supply.

To ensure that there are no delays in the design approval process within Essential Energy, the master plan for the estate needs to be updated/completed to reflect the precinct yield submitted to Essential Energy. When this master plan has been completed MDA consulting Engineers will be able to complete the formal report to Essential Energy.

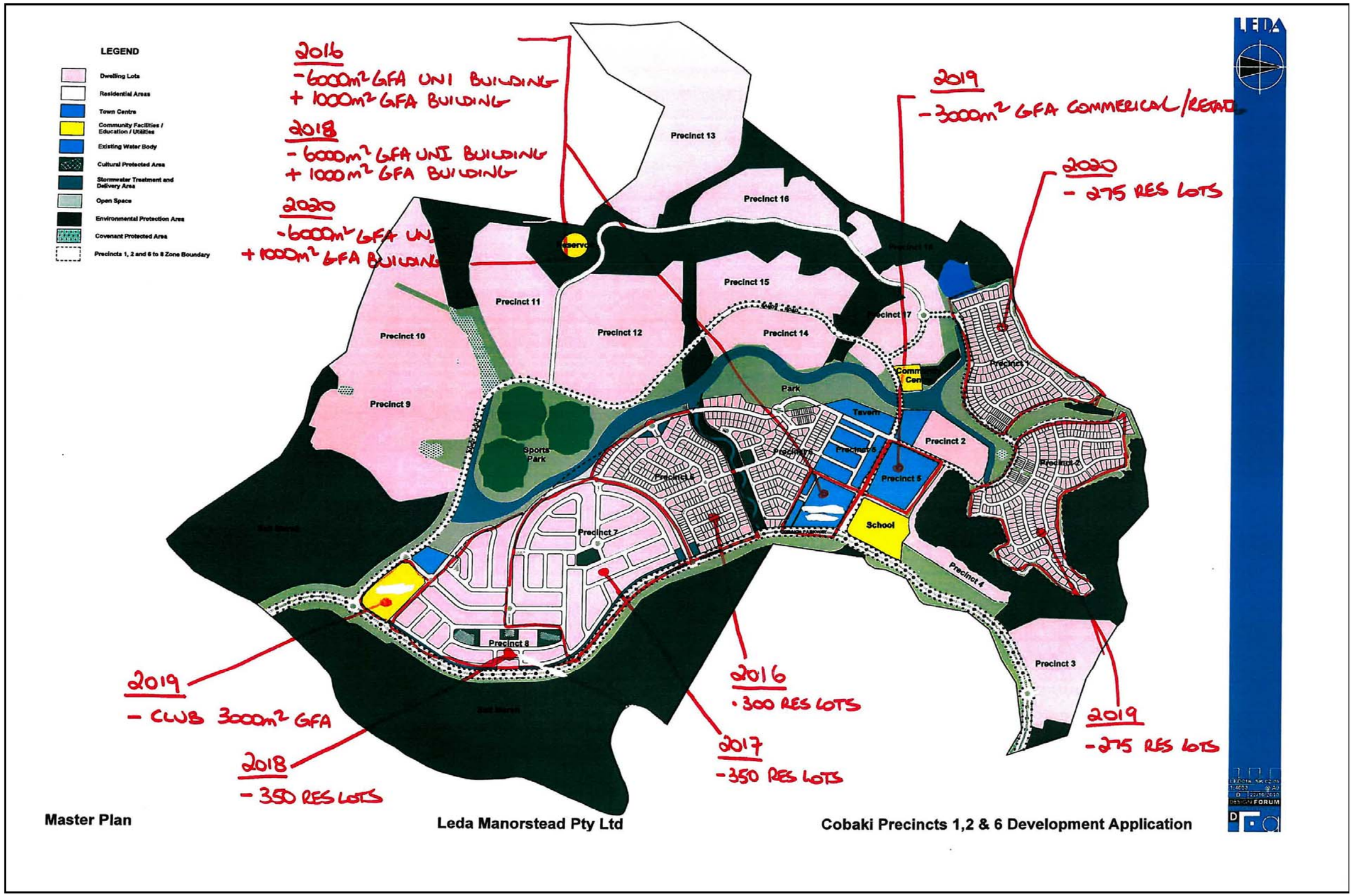
NBN has stated "as part of agreement AYCA-1BGY1X NBN will deliver fibre to the premise. NBN goal is to have 'live' services install to the premise prior to the arrival of the customer. The timings of the delivery are subject to the fulfilment of obligations for both the developer and NBNco." For the NBN infrastructure network to be installed and completed for the first stages of works Leda Holdings must ensure that the delivery of the pit and pipe system is completed in sufficient time for NBN to complete the installation of the fibre optic cabling infrastructure.

If there are any queries or issues arising from this desk top review please contact the undersigned.

Yours faithfully

Vaughan Oxenford
Associate
Senior Electrical Engineer

6.0 APPENDIX A – 5 YEAR MASTER PLAN



7.0 APPENDIX B – MASTER PLAN YIELD AND DEMAND ESITMATE

COBAKI YIELD SUMMARY | ESTIMATE **PRECINCT 6-8 MIX**

	LOT SIZE (M2)	PERCENTAGE
LOT TYPE 1	300	0.00%
LOT TYPE 2	375	26.00%
LOT TYPE 3	405	54.00%
LOT TYPE 4	450	15.00%
LOT TYPE 5	500	5.0%

	UNITS	
AVG SIZE	85	M2
LOT COVER	50.00%	
CORE	30.00%	
LEVELS	3	

NET CALC* 72.67%

	GROSS AREA	NET AREA	POS (M2)	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	UNITS	PERCENTAGE	UNIT AREA	BALANCE NET		TOTALS LOTS	Total (kVA)
P1	169276.00	123007.34	0	0	85	164	41	12	N	10.00%	0.00	123007.34	4kVA/Lot	303	1,212
P2	278989.00	202732.19	0	0	141	270	68	20	N	30.00%	0.00	202732.19	4kVA/Lot	499	1,996
P3	105652.00	76773.86	4000	0	50	97	24	7	N	0.00%	0.00	76773.86	4kVA/Lot	179	716
P4	27703.00	20130.86	0	0	14	27	7	2	N	0.00%	0.00	20130.86	4kVA/Lot	50	200
P5				0	0	0	0	0			31,500 m2 of GLFA		100VA/m2	0	3,150
P6,7,8	617310.00	448579.00	30000	0	290	558	140	42	N	10.00%	0.00	448579.00	4kVA/Lot	1030	4,120
P9	221199.00	160738.08	10000	0	105	201	50	15	N	10.00%	0.00	160738.08	4kVA/Lot	371	1,484
P10	218549.00	158812.41	10000	0	103	198	50	15	N	0.00%	0.00	158812.41	4kVA/Lot	366	1,464
P11	130800.00	95048.08	0	0	66	127	32	10	N	10.00%	0.00	95048.08	4kVA/Lot	234	936
P12	219389.00	159422.82	8000	0	105	202	50	15	N	10.00%	0.00	159422.82	4kVA/Lot	373	1,492
P13	289382.00	210284.44	10000	0	139	267	67	20	N	0.00%	0.00	210284.44	4kVA/Lot	493	1,972
P14	78757.00	57230.14	0	0	40	76	19	6	N	10.00%	0.00	57230.14	4kVA/Lot	141	564
P15	116945.00	84980.11	5000	0	55	107	27	8	N	0.00%	0.00	84980.11	4kVA/Lot	197	788
P16A	102585.00	74545.17	0	0	52	99	25	7	N	0.00%	0.00	74545.17	4kVA/Lot	183	732
P16B	15595.00	11332.38	0	0	8	15	4	1	N	0.00%	0.00	11332.38	4kVA/Lot	28	112
P16C	14977.00	10883.30	0	0	8	15	4	1	N	0.00%	0.00	10883.30	4kVA/Lot	27	108
P17A	73830.00	53649.85	4000	0	34	66	17	5	N	15.00%	0.00	53649.85	4kVA/Lot	122	488
P17B	8736.00	6348.17	0	0	4	8	2	1	N	15.00%	0.00	6348.17	4kVA/Lot	16	64
TOTALS	2689674.00	1954498.18	81000	0	1299	2498	624	187						4609	0 4609

*BASED ON PRECINCT 6-8 PLAN VER 11

POS % OF NET 4.14%
POS % GROSS 3.01%

Total - 21586 kVA