DCE dalton consulting engineers

LINDUM VALE RESIDENTIAL DEVELOPMENT SERVICING STRATEGY

JUNE 2013

REF: 11604

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Revision No.
2
Date:
June 2013
Description:
Lindum Vale residential servicing strategy
Prepared:
F Goff AN: 281036
Reviewed:
J Baumann AN: 401020
Approved:
J McGrath AN: 371074

EXECUTIVE SUMMARY

The following is a summary of the key infrastructure items required to service the Lindum Vale residential development. This summary has been provided following discussions with the relevant service authorities.

Roads – The subject site is bound by Mickleham Road to the west and Mount Ridley Road to the south. A 20 m easement along the southern boundary of the site will be required to allow for the future widening of Mount Ridley Road. Two signalised intersections will be required; one on Mickleham Road and one on Mt Ridley Road. The future construction of the Outer Metropolitan Ring Road (OMRR) will enhance access further and require a small PAO in the north east corner of the site.

Sewer – The site will be served by internal gravity sewers that will discharge to a pump station constructed at the low point on the eastern boundary of the site. A rising main will be required to pump the sewerage north an outlet to a proposed gravity sewer within the Merrifield development.

Potable Water – Potable water will be supplied via a booster pump station and connection to the 375 mm main in donnybrook Road. A secondary connection will be required to connect via another booster pump station to the water main located in Mount Ridley Road.

Recycled Water – Class A recycled water will be distributed to the development via a third pipe reticulation network. The external augmentation will be similar to the potable water upgrades.

Stormwater – The majority of the site grades to a low point on the eastern boundary of Lindum Vale. A constructed waterway will convey flows both from the development and from external catchments to the outlet. There will be a constructed wetland required to treat the runoff and double up as a retarding basin located partially on site and partially in the neighbouring drainage reserve. Outfall augmentation works may extend up to 1 km to the east.

The southern catchment will require a sedimentation basin before discharging into proposed drains along Mt Ridley Road which shall form part of the Aitken Creek Drainage Scheme. Both hydraulic and water quality offsets will be payable for this catchment.

Electricity – An existing 22 kV electricity supply is present along Mickleham Road and Mount Ridley Road. This will require augmentation to meet the demands of the Lindum Vale development.

Telecommunications – 'Pit and Pipe' infrastructure will be constructed within the Lindum Vale development to National Broadband Network (NBN Co) standards. External trunk infrastructure and the installation of fibre infrastructure will be the responsibility of NBN Co.

Natural Gas – Gas mains within the Mt Ridley road reserve will provide sufficient capacity to service the Lindum Vale development, but will need extending approximately 4km.

CONTENTS

1 INTRODUCTION

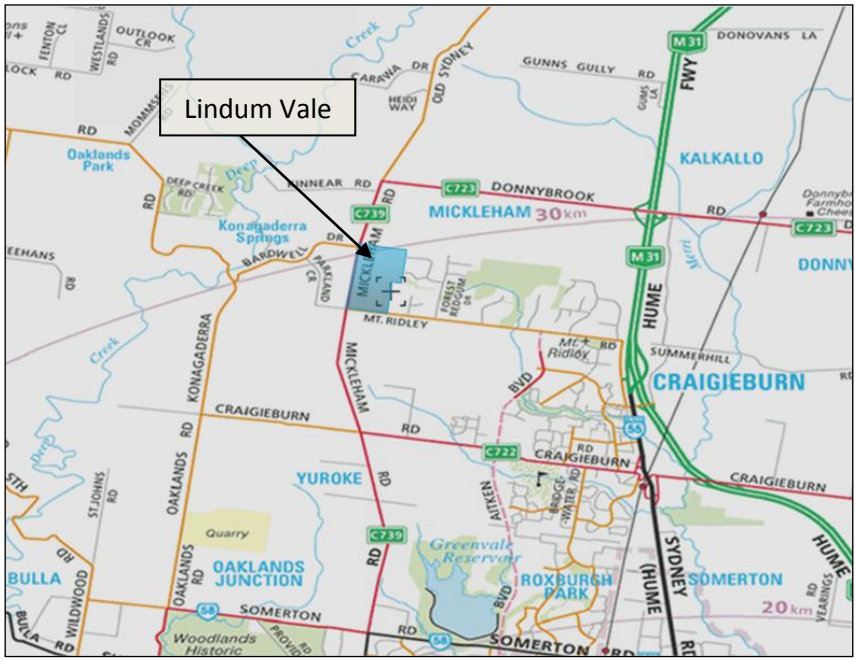
This report outlines the requirements for servicing the Lindum Vale development. The information contained in this report has been compiled as a result of discussions with officers from the relevant authorities and on-site inspections. Table 1 provides a summary of the relevant service authorities for the site.

Table 1—Summary of services and relevant authorities

Service	Responsible authority
Roads	VicRoads/Hume City Council
Sewer reticulation	Yarra Valley Water
Water reticulation	Yarra Valley Water
Recycled water reticulation	Yarra Valley Water
Stormwater drainage	Melbourne Water/Hume City Council
Electricity supply	Jemena
Telecommunication	National Broadband Network Corporation (NBN Co)
Gas reticulation	SP AusNet

Lindum Vale is located approximately 28 km north of the Melbourne CBD. The Melway reference is 366 D2. As shown in Figure 1, the site is bound by Mickleham Road to the west and Mount Ridley Road to the south. The site is surrounded by existing and proposed developments: the existing Mount Ridley rural subdivision to the east and proposed conventional density residential development to the south and north (Merrifield).

Figure 1—Location of the proposed Lindum Vale development (image credit: www.melway.com/au/online-maps)

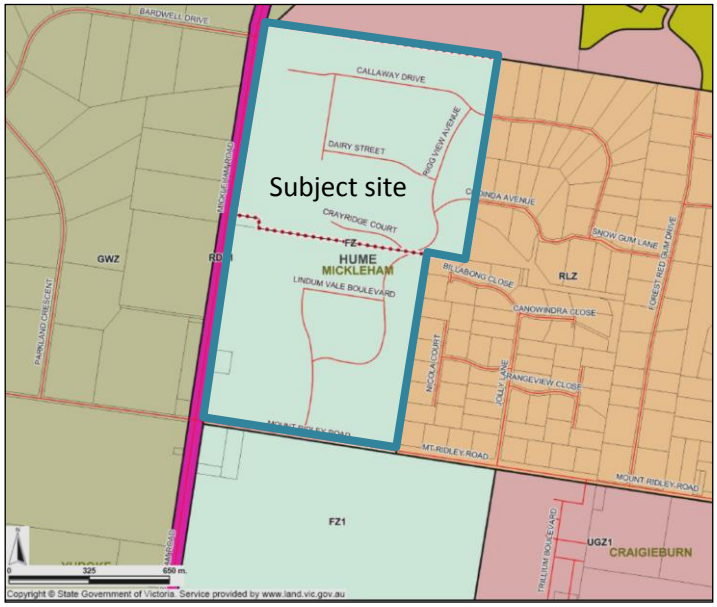


Joint venture partners:
MAB GPC

The proposed Lindum Vale development will include potential for approximately 1,400-1,600 residential lots, municipal area, parks and open space and a neighbourhood activity centre.

Lindum Vale has recently been included in the Urban Growth Boundary (UGB). On 13 September 2012, planning scheme update C166 amended the UGB to include Lindum Vale. In addition, the planning zone designation of Lindum Vale was changed from 'Green wedge' to 'Farming'. Figure 2 shows the existing zoning for the Lindum Vale development and surrounding areas.

Figure 2—Existing zoning of Lindum Vale and the surrounding area



2 ROADS

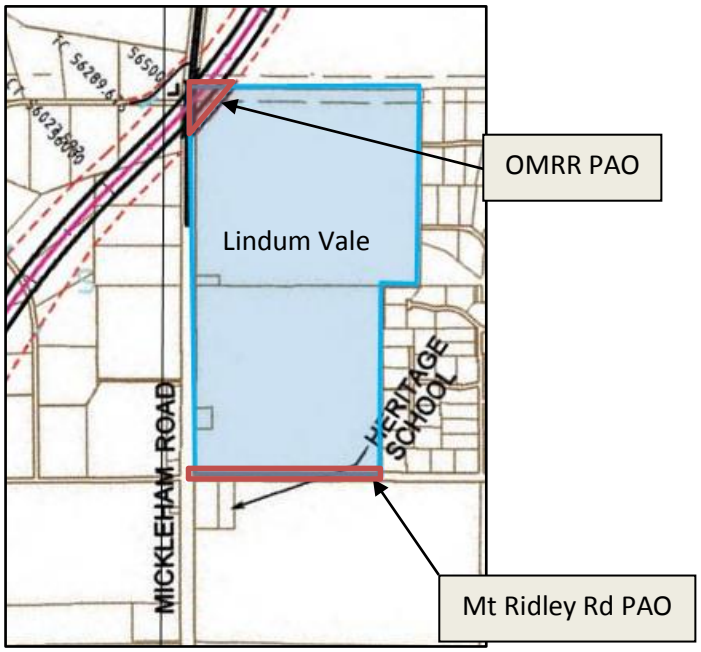
VicRoads and Hume City Council are the responsible authorities for road improvement works for the subject site. Upgrades to Mount Ridley Road and Mickleham Road shall be undertaken to VicRoads standards; all other road works shall be to Council standards.

The Lindum Vale development is well connected to major arterial roads. Mickleham Road provides links to the north and south to the intersection with Donnybrook road and beyond along Old Sydney Road. Mt Ridley Road provides excellent east-west access to the E14-Aitken Boulevard and developing communities in the R2 Precinct Structure Plan area. An internal connector street through Lindum is planned to provide access to the approved Merrifield Precinct Structure Plan.

Mount Ridley Road is assigned for future upgrade. The provision for a Mount Ridley Road reserve widening of 20 m is included as part of the proposed Lindum Vale Development layout.

Two relevant public acquisition overlays (PAOs) exist on the Lindum Vale site. Figure 3 shows both PAOs. The OMRR PAO is located at the northwest of the site. The OMRR will be grade-separated at Mickleham Road with the OMRR expected to cross beneath Mickleham Road. The Mount Ridley Road PAO is located along the southern boundary of Lindum Vale.

Figure 3—PAOs at Lindum Vale



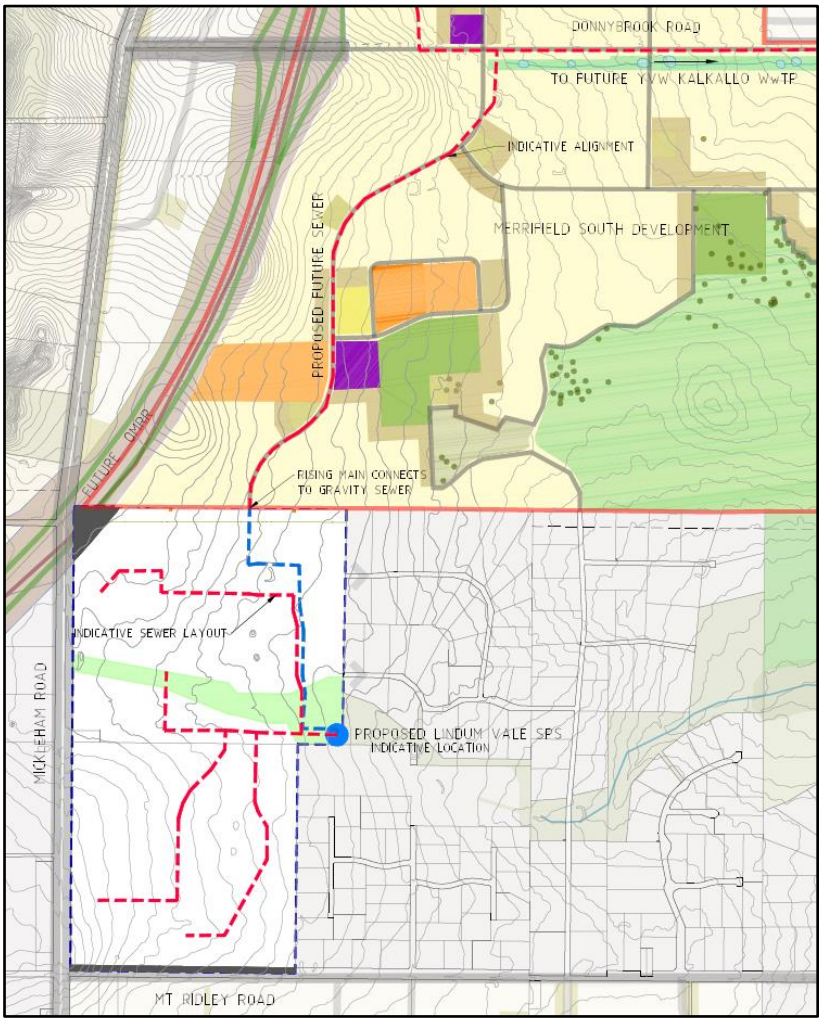
3 SEWER RETICULATION

Yarra Valley Water is the responsible authority for sewer reticulation for the Lindum Vale development.

The Lindum Vale development naturally grades to two sewer catchments. The majority of the site grades to a low point on the eastern boundary. There is a small sub-catchment along the southern boundary which grades towards Mount Ridley Road. In the developed state, it will be possible to control both catchments via the proposed sewer pump station. As shown in Figure 4, the sewers will gravitate to this low point where the Lindum Vale sewer pump station will be constructed. The pump station will pump sewerage north to a gravity sewer within the proposed Merrifield development which will ultimately connect to the Donnybrook Branch Sewer. The sewerage will be treated at the future Kalkallo sewerage treatment plant. Appendix B details the infrastructure that will serve the Lindum Vale development.

Provision of the ultimate sewer services to the site will be dependent upon the delivery of a sewer connection from the Merrifield West PSP area to the north.

Figure 4—Lindum Vale sewage overview



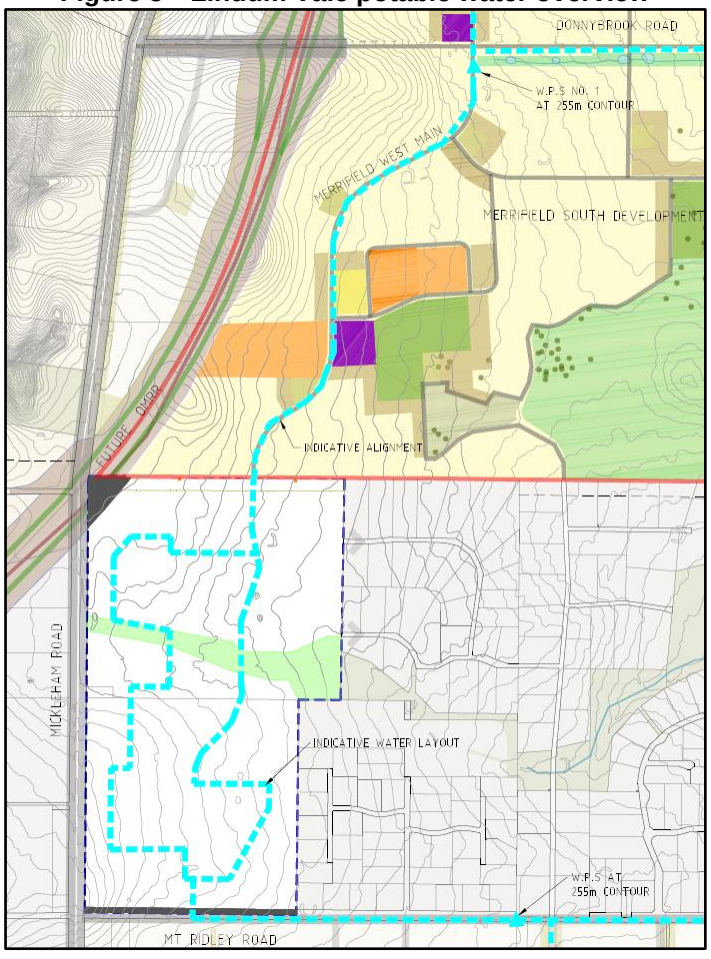
4 POTABLE WATER RETICULATION

Yarra Valley Water is the responsible authority for potable water reticulation for the Lindum Vale development.

Due to the high elevation of the site (it ranges from 261 m to 271 m), the reticulation mains will require a booster pump station. It is likely that a booster pump station will be constructed at Donnybrook Road 495 (immediately north of the subject site) to boost the pressure of the 375 mm diameter main above the 255 m contour. The transfer main will be constructed along Donnybrook Road as part of the Merrifield development. The transfer main will need to be extended south either through Merrifield or along Mickleham Road. The alignment of the main will depend on the rate of development and the ownership of land. An overview of potable water supply is shown in Figure 5. Full details are shown in Appendix C. Provision of the ultimate potable water services to the site will be dependent upon the delivery of a water connection from the Merrifield West PSP area to the north.

Yarra Valley Water has a development limit of 500 lots before a secondary connection is required. The secondary connection to Lindum Vale will be provided by a connection to the transfer main along Mt Ridley Road. Again, a booster pump station will be required at approximately the 255 m elevation to supply Lindum Vale. The secondary connection will link Lindum Vale to the potable water tanks at Mount Ridley.

Figure 5—Lindum Vale potable water overview



5 RECYCLED WATER RETICULATION

Yarra Valley Water is the responsible authority for recycled water reticulation for the Lindum Vale development.

Due to the high elevation of the site (it ranges from 261 m to 271 m), the reticulation mains will require a booster pump station. It is likely that a booster pump station will be constructed at Donnybrook Road 495 (immediately north of the subject site) to boost the pressure above the 255 m contour. The recycled water transfer main will be constructed along Donnybrook Road as part of the Merrifield development. The transfer main will need to be extended south either through Lindum Vale or along Mickleham Road. The alignment of the main will depend on the rate of development and the ownership of land. Full details of recycled water supply for Lindum Vale are shown in Appendix D.

Provision of the ultimate recycled water services to the site will be dependent upon the delivery of a water connection from the Merrifield West PSP area to the north.

Yarra Valley Water has a development limit of 500 lots before a secondary connection is required. The secondary connection to Lindum Vale will be provided by a connection to the transfer main along Mt Ridley Road. Again, a booster pump station will be required at approximately the 255 m elevation to supply Lindum Vale. The secondary connection will link Lindum Vale to the recycled water tanks at Mount Ridley.

6 STORMWATER

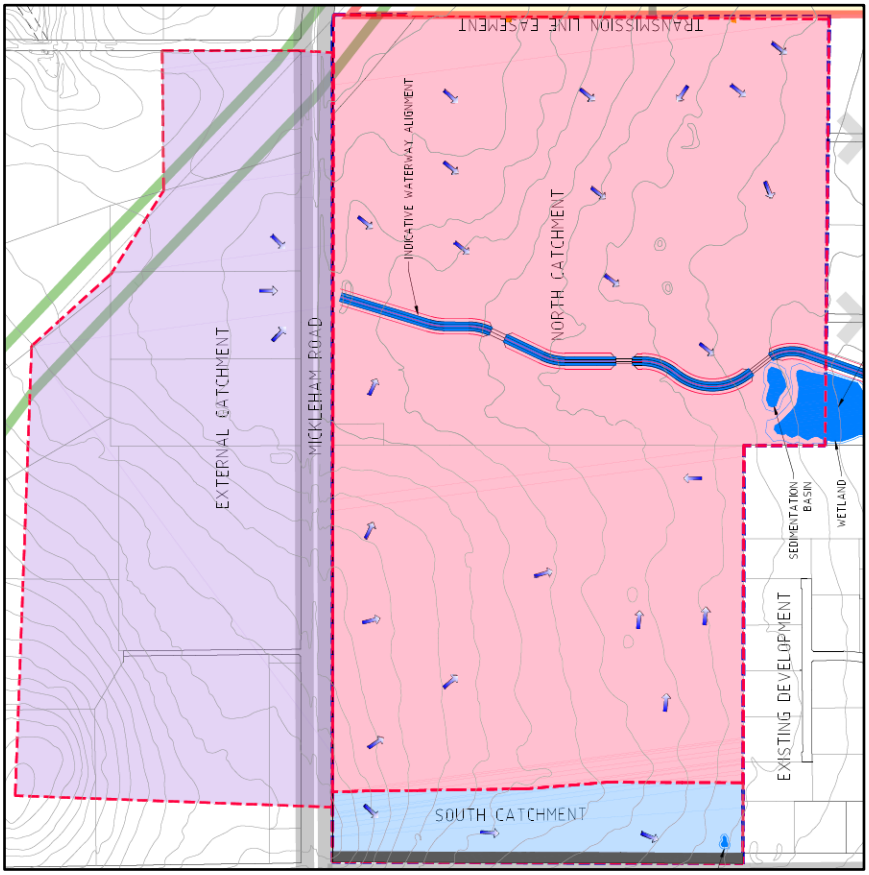
6.1 Stormwater drainage

Melbourne Water Corporation and Hume City Council are the responsible authorities for stormwater drainage.

The majority of the Lindum Vale site grades toward a low point on the eastern boundary of the site. At present, stormwater generated by external catchments to the west of Lindum Vale is conveyed to a low point on Mickleham Road. The external flow is partially controlled by a small culvert under Mickleham Road which discharges to an on-site dam. In large events, runoff sheet flows over Mickleham Road. At present, surface runoff overflows from the dam and is conveyed east along a shallow depression, picking up flows from several other dams on the Lindum Vale site, before being captured by the dam at the low point on the eastern boundary. From there, the water discharges into a drainage reserve through the neighbouring subdivision. This is essentially the upstream reach of the Malcolm Creek. Figure 6 shows existing condition stormwater flows across the Lindum Vale site.

A high point traverses the site approximately 150 m north of the southern property boundary and separates the northern catchment from a small southern catchment that drains to the south-eastern boundary of the Lindum Vale site.

Figure 6—Existing condition stormwater flows



In the developed condition, an urban waterway will be created to convey stormwater from west to east. Underground drainage sized for the 5-year Average Reoccurrence Interval (ARI) event will discharge to the waterway. The proposed constructed waterway will be designed to convey the minor and major stormwater runoff flows from both internal and external catchments. The waterway will provide a minimum 600 mm freeboard to lot boundaries during the 100-year ARI event and will be well-vegetated, giving the appearance of a natural creek environment. An overview of the proposed urban waterway is shown in Appendix E.

The total area of the northern catchment is 204.0 ha. This includes the 74.0 ha external catchment as well as 130.0 ha that is part of Lindum Vale. Currently, the northern catchment's outlet is not part of any Melbourne Water drainage scheme; however, the section of Malcolm Creek south of Mount Ridley Road is within the Melbourne Water scheme as shown in Figure 7. As of 12 June 2013, contributions for a standard residential development which outflows to Malcolm Creek are:

- Hydraulic Contributions: $0/ha*
- Water Quality Contributions: $0/ha*
- TOTAL = $0/ha*

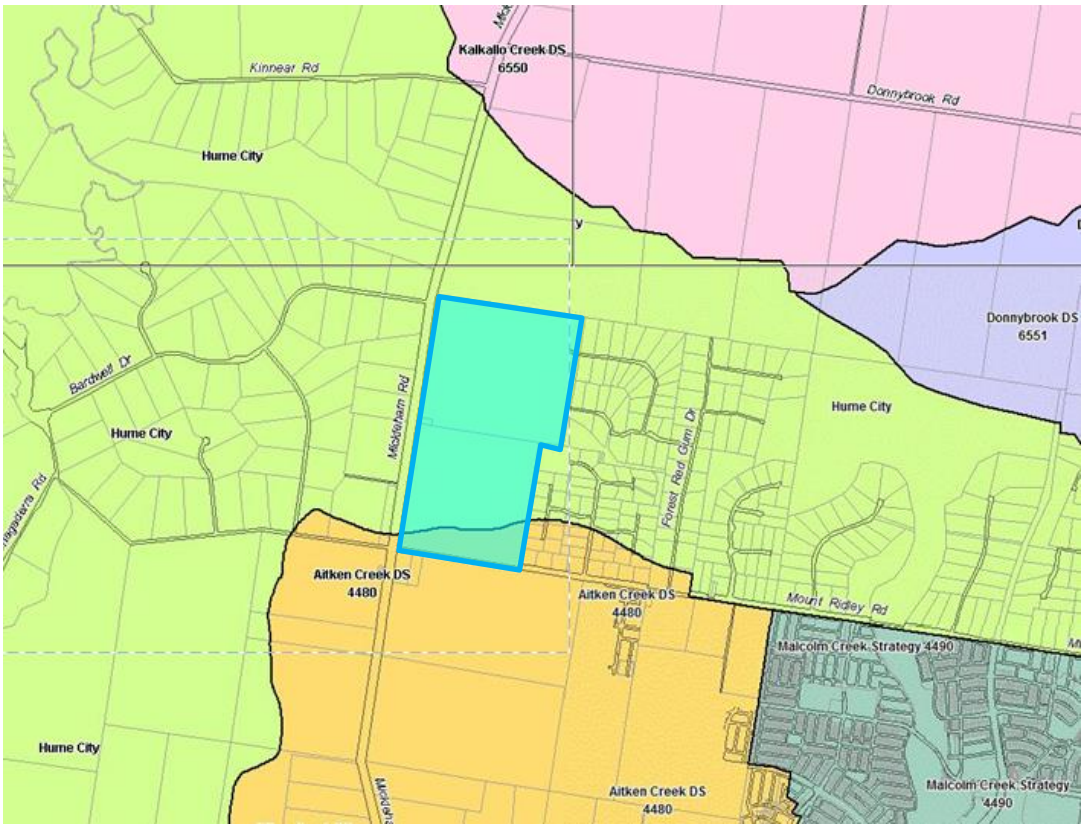
* Melbourne Water currently lists contributions for Malcolm Creek as $0/ha, however there is potential to develop a new servicing scheme. Based on neighbouring scheme rates, we believe indicative rates may be approximately:

- Hydraulic Contributions: $25,000/ha*
- Water Quality Contributions: $25,000/ha*
- TOTAL = $50,000/ha*

In the developed condition, stormwater from the small southern catchment (11.6 ha) will discharge into drains on Mount Ridley Road as part of the Aitken Creek Drainage Scheme. As this catchment falls within a Melbourne Water Drainage Scheme, it will be subject to contributions. As of 12 June 2013, these are as follows for a standard residential development:

- Hydraulic Contributions: $23,435/ha
- Water Quality Contributions: $19,089/ha
- TOTAL = $42,524/ha

Figure 7—Lindum Vale site and Melbourne water drainage schemes



Constructed waterways will be designed to Council and Melbourne Water standards. The minor drainage network (piped) will be designed to convey the 5-year ARI event as prescribed in the Growth Area Authority's *Engineering Design and Construction Manual* (2011). Major events up to the 100-year ARI event will be conveyed overland.

As a result of undergrounding the drainage pipes, a new outfall channel of approximately 2 km in length will have to be graded to daylight back to the existing surface elevations at Lindum Vale. The new channel will provide sufficient capacity for stormwater to exit Lindum Vale. Any required retention storage will be provided

above the stormwater treatment and will be located both at the boundary of the Lindum Vale site and in the Melbourne Water drainage reserve. Appendix E details stormwater drainage at Lindum Vale.

6.2 Stormwater quality

Melbourne Water and Council require the treatment of stormwater to meet Best Practice Management Objectives in accordance with Clause 56 of the Victorian Planning Provisions. To meet these objectives, a stormwater treatment train comprising sediment control (sedimentation basins), constructed waterways and treatment wetlands will be required. Additionally, all inlets to the constructed waterways, including those for the piped external flows, will be constructed with sediment control (sedimentation basins).

Northern Catchment

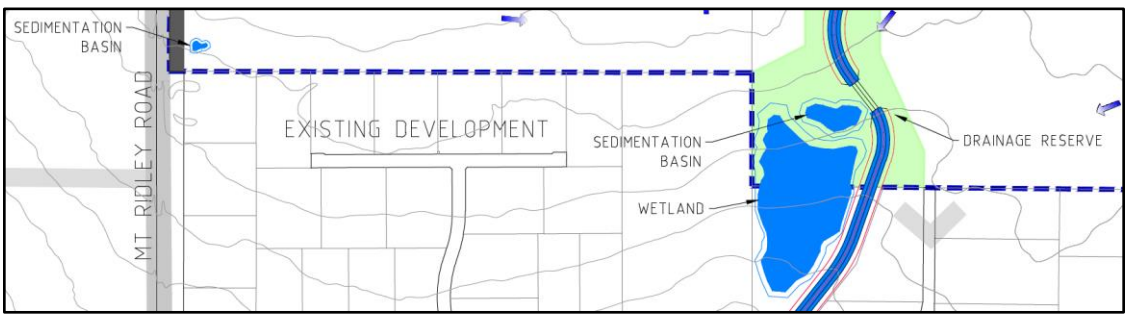
It is proposed that a wetland be constructed in order to treat and detain flows to within the capacity of the existing downstream floodway. The wetland would be constructed both within Lindum Vale and the Melbourne Water drainage reserve, as shown in Figure 8. This wetland will discharge to Malcolm Creek. The retarding basin at this location will maintain flows that are within the capacity of the downstream channel, up to and including the 100-year ARI event.

Preliminary calculations show that a macrophyte area of 19,000 m^2 is required to provide the necessary stormwater quality treatment. Additionally, a sedimentation basin of 1,900 m^2 is also required. The stormwater treatment will be located in a reserve of approximately 5 ha.

Southern Catchment

The southern catchment forms part of the Melbourne Water Aitken Creek Drainage Scheme. Water quality treatment is included in this scheme. Therefore, it is likely that the water quality offsets will be payable and sediment control (a sedimentation basin) will be required. Flow from this catchment will discharge directly to the proposed stormwater drain along Mount Ridley Road. Additional information regarding stormwater treatment is included in Appendix E.

Figure 8—Proposed stormwater treatment



7 ELECTRICITY SUPPLY

Jemena is the responsible authority for electrical supply.

The site is bound by an electrical easement to the north, but his cannot be used for supply as it is too high voltage. Currently, 22 kV electricity services exist along Mickleham Road and Mount Ridley Road which will be suitable to supply the development. The existing services will require augmentation to meet the total demand of the development.

The extension and installation of this infrastructure will be subject to normal Jemena supply extension policies, as applicable at the time. Appendix F details the electricity supply strategy for the Lindum Vale development.

8 GAS SUPPLY

SP AusNet is the responsible authority for the provision of gas reticulation.

Gas will be provided to the Lindum Vale development from a 180 mm high-pressure (450 kPa main) in Mount Ridley Road or Mickleham Road. Currently, a 180 mm high pressure gas main runs parallel to Mount Ridley Road as far as Aitken Boulevard (E-14), approximately 4 km east of the subject site. SP AusNet has advised that in the future this gas main will be extended along Mount Ridley Road and will have sufficient capacity to supply the proposed Lindum Vale Development. The distance to extend the main from Aitken Boulevard and the number of lots in the first few stages of Lindum Vale will determine whether the expected revenue is enough to fund the infrastructure or whether some contributions will be required.

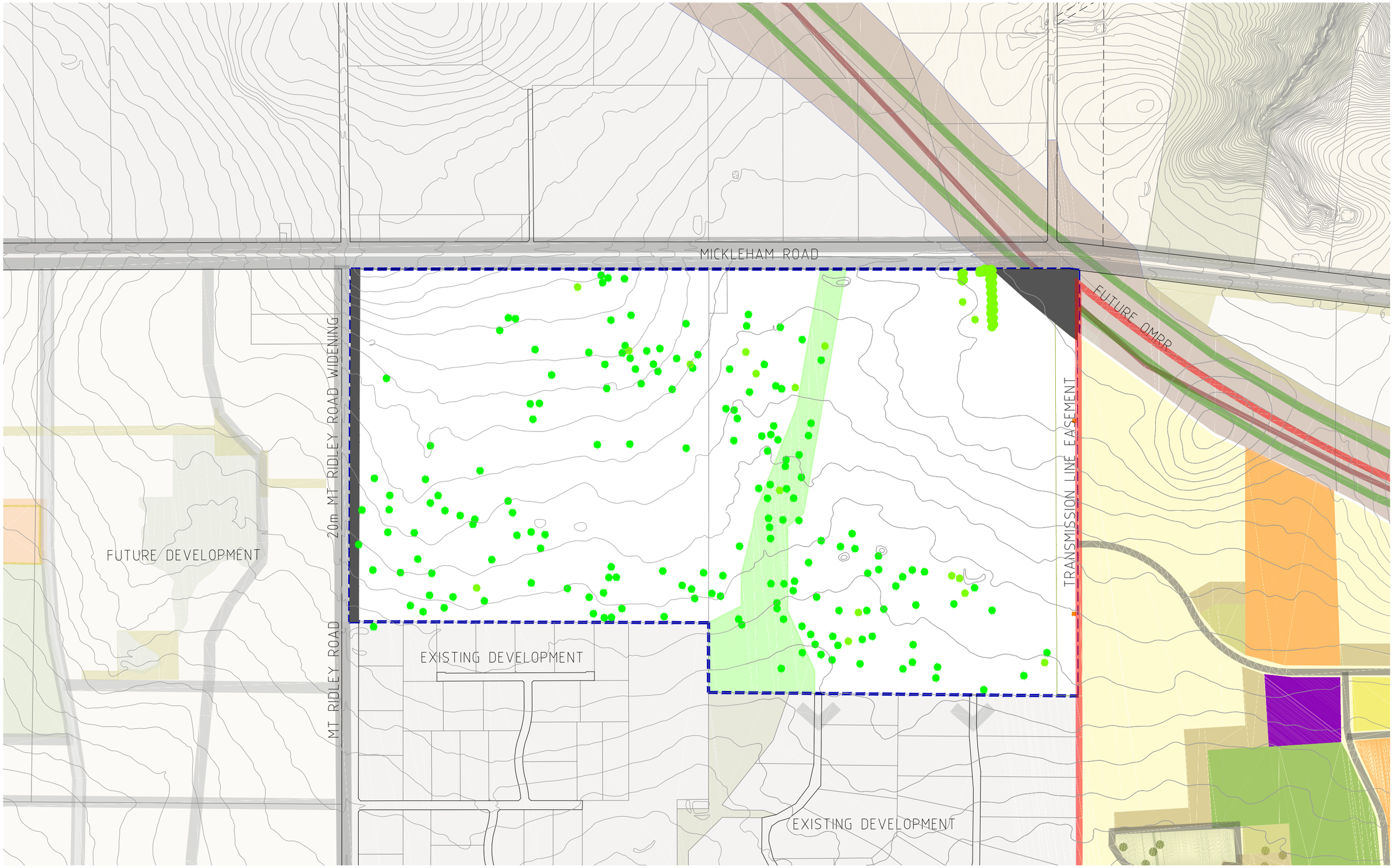
Reticulation will be by standard 63 mm diameter mains. Appendix G details the gas supply strategy for the Lindum Vale development.

9 TELECOMMUNICATIONS

The responsible authority for the provision of optic fibre infrastructure to developments over 100 lots is the National Broadband Network Company (NBN Co).

'Pit and pipe' infrastructure within the development will be constructed in accordance with NBN Co standards. NBN Co will install the fibre infrastructure. The nearest active fibre node is a Transit Fibre Access Node (T-FAN) in Peppertree Boulevard in the Highlands estate, however, full service to that T-FAN is not expected until March 2013. Depending on the total number of lots at Lindum Vale, additional T-FAN may be needed. NBN Co will provide more specific detail once an application is made. Appendix H details the telecommunications strategy for the Lindum Vale development.

Appendix A: EXISTING TREES



NOT TO BE USED FOR CONSTRUCTION

REV	AMENDMENTS	DATE	APP'D.
B	REVISED FOR SERVICING STRATEGY V2	12/06/13	TL
A	ISSUED FOR SERVICE STRATEGY REPORT	05/11/12	TL

Drawn PM Date 05/11/12
Designed - Date - AN
Verified - Date - AN
Audited - Date - AN
Approved - Date - AN
Written dimensions to take precedence over scale.
Contractor shall check and verify all dimensions on site.
Discrepancies to be brought to the attention of the Superintendent.

LEGEND

EXISTING TREE

ENCUMBERED OPEN SPACE

PASSIVE OPEN SPACE

Joint venture partners: MAB GPC

Coords: MGA
Levels: AHD

Hor 1:4000 0m 40m 80m 160m 240m

Scale @ A1/A3

LINDUM VALE DEVELOPMENT
LOT 7 & 8 MICKLEHAM ROAD
MICKLEHAM
SERVICING STRATEGY
EXISTING TREES
Drawing No. 11604SS09 Rev B
Sheet No. 09 PRELIMINARY

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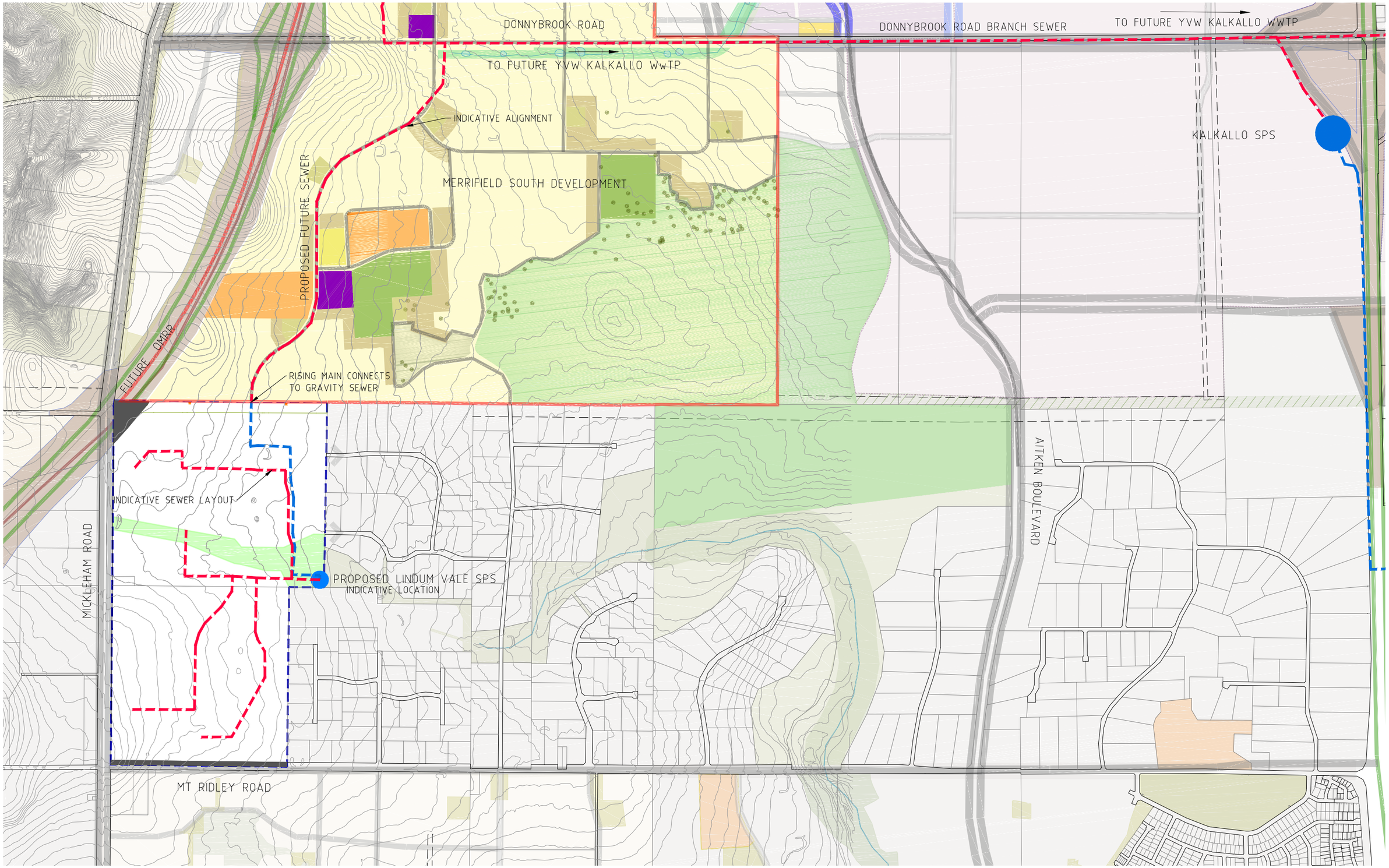
Appendix B: SEWER RETICULATION



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LEGEND
- EXISTING BRANCH SEWER
- PROPOSED RISING MAIN
- PROPOSED GRAVITY SEWER
- SEWER PUMP STATION

Joint venture partners: MAB GPC

Coords: MGA
Levels: AHD

Hor 1:8000 0m 80m 160m 320m 480m

Scale @ A1/A3

LINDUM VALE DEVELOPMENT

LOT 7 & 8 MICKLEHAM ROAD
MICKLEHAM
SERVICING STRATEGY
SEWER RETICULATION
Drawing No. 11604SS02 Rev B
Sheet No. 02 PRELIMINARY

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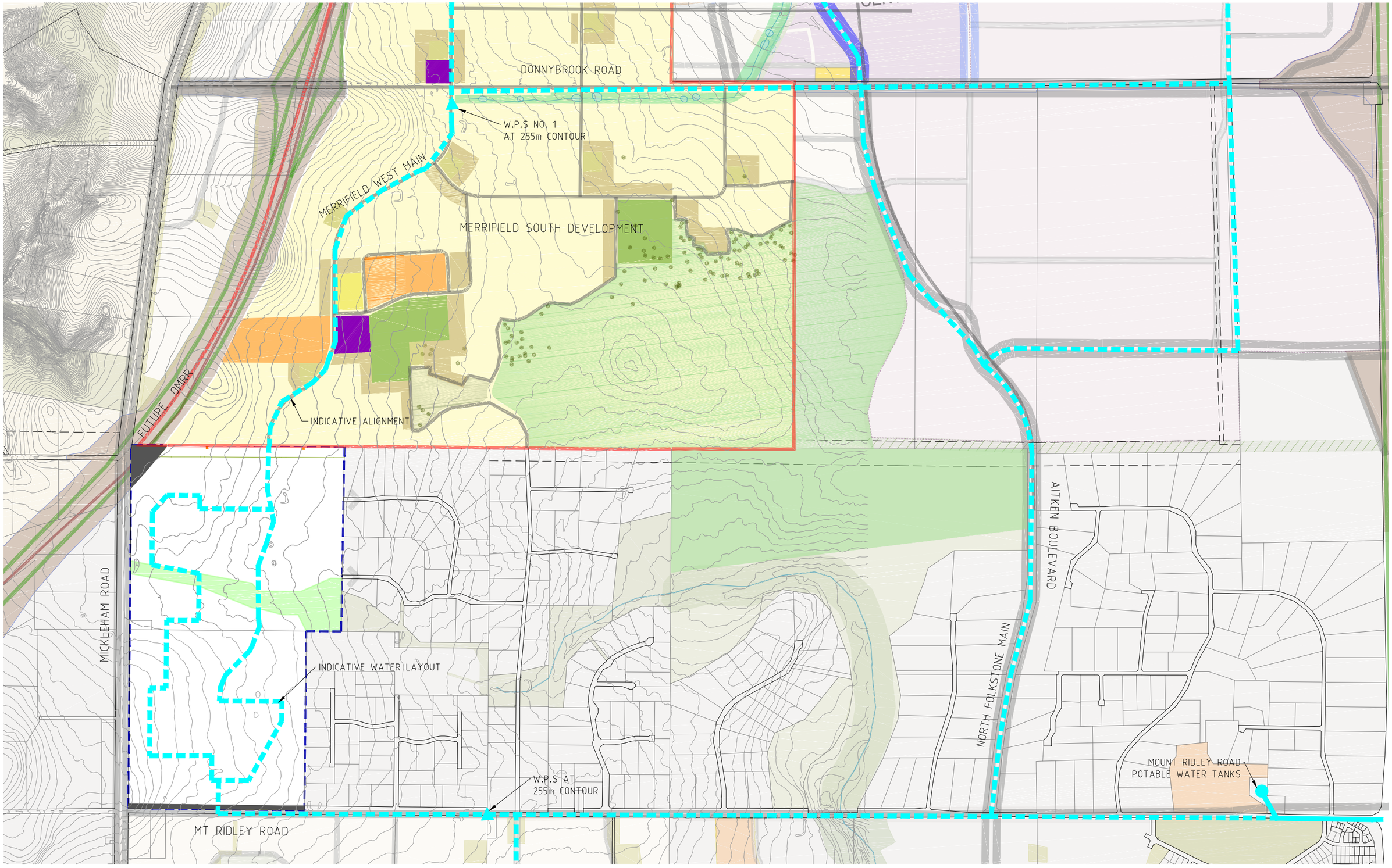
Appendix C: POTABLE WATER RETICULATION



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A	ISSUED FOR SERVICE STRATEGY REPORT	05/11/12	TL

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Verified - Date - AN
Audited - Date - AN
Approved - Date - AN
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LEGEND
- EXISTING POTABLE WATER MAIN
- PROPOSED POTABLE WATER MAIN
- WATER PUMP STATION
- POTABLE WATER TANK

Hor 1:8000 0m 80m 160m 320m 480m
Scale @ A1/A3

Joint venture partners: MAB GPC
Coords: MGA
Levels: AHD

LINDUM VALE DEVELOPMENT
LOT 7 & 8 MICKLEHAM ROAD
MICKLEHAM
SERVICING STRATEGY
POTABLE WATER RETICULATION
Drawing No. 11604SS03 Rev B
Sheet No. 03 PRELIMINARY

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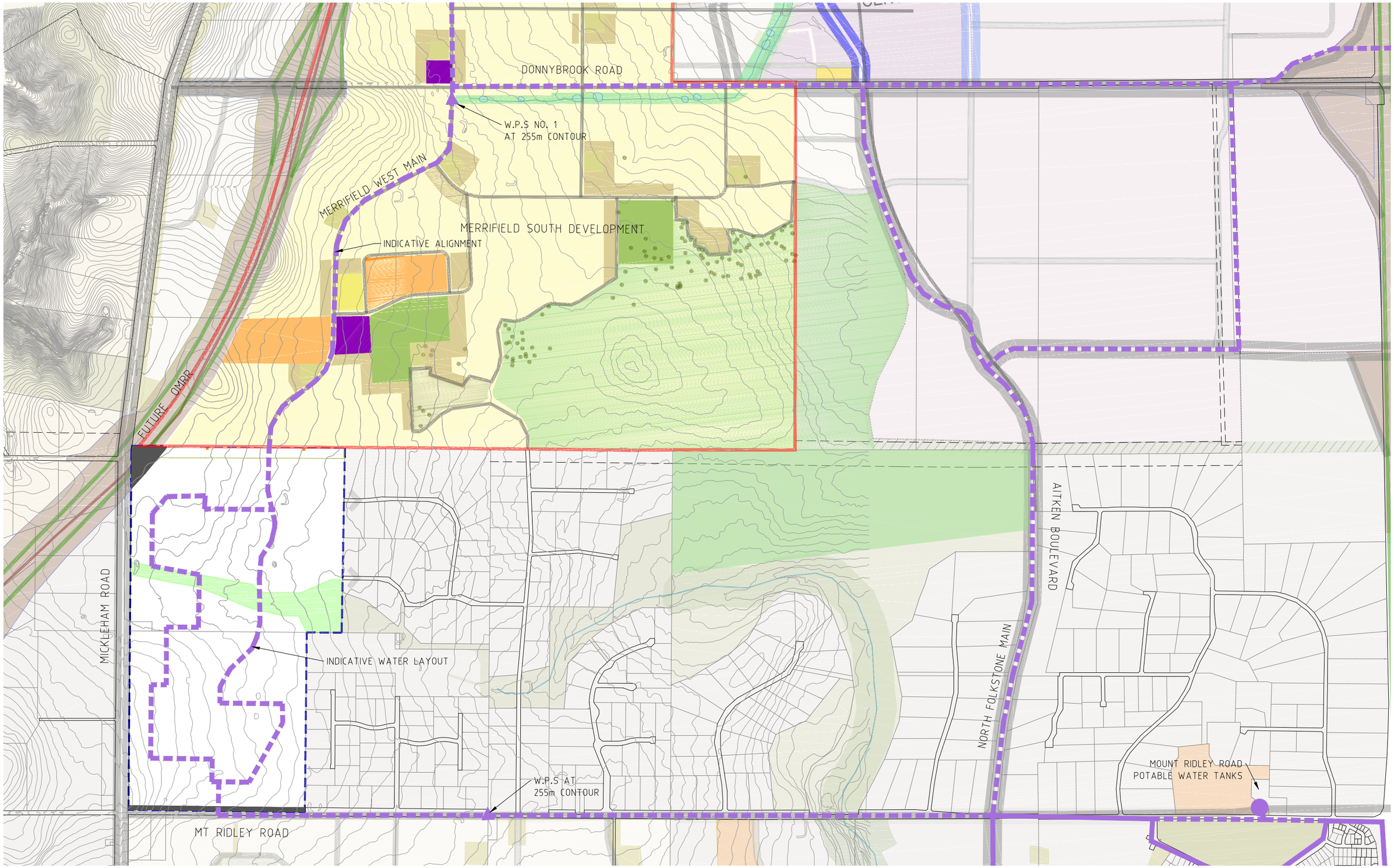
Appendix D: RECYCLED WATER RETICULATION



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LEGEND
- EXISTING RECYCLED WATER MAIN
- PROPOSED RECYCLED WATER MAIN
- RECYCLED WATER TANK
- WATER PUMP STATION

Joint venture partners: MAB GPC

Coords: MGA
Levels: AHD

Hor 1:8000 0m 80m 160m 320m 480m

Scale @ A1/A3

LINDUM VALE DEVELOPMENT

LOT 7 & 8 MICKLEHAM ROAD
MICKLEHAM
SERVICING STRATEGY
RECYCLED WATER RETICULATION
Drawing No. 11604SS04 Rev B
Sheet No. 04 PRELIMINARY

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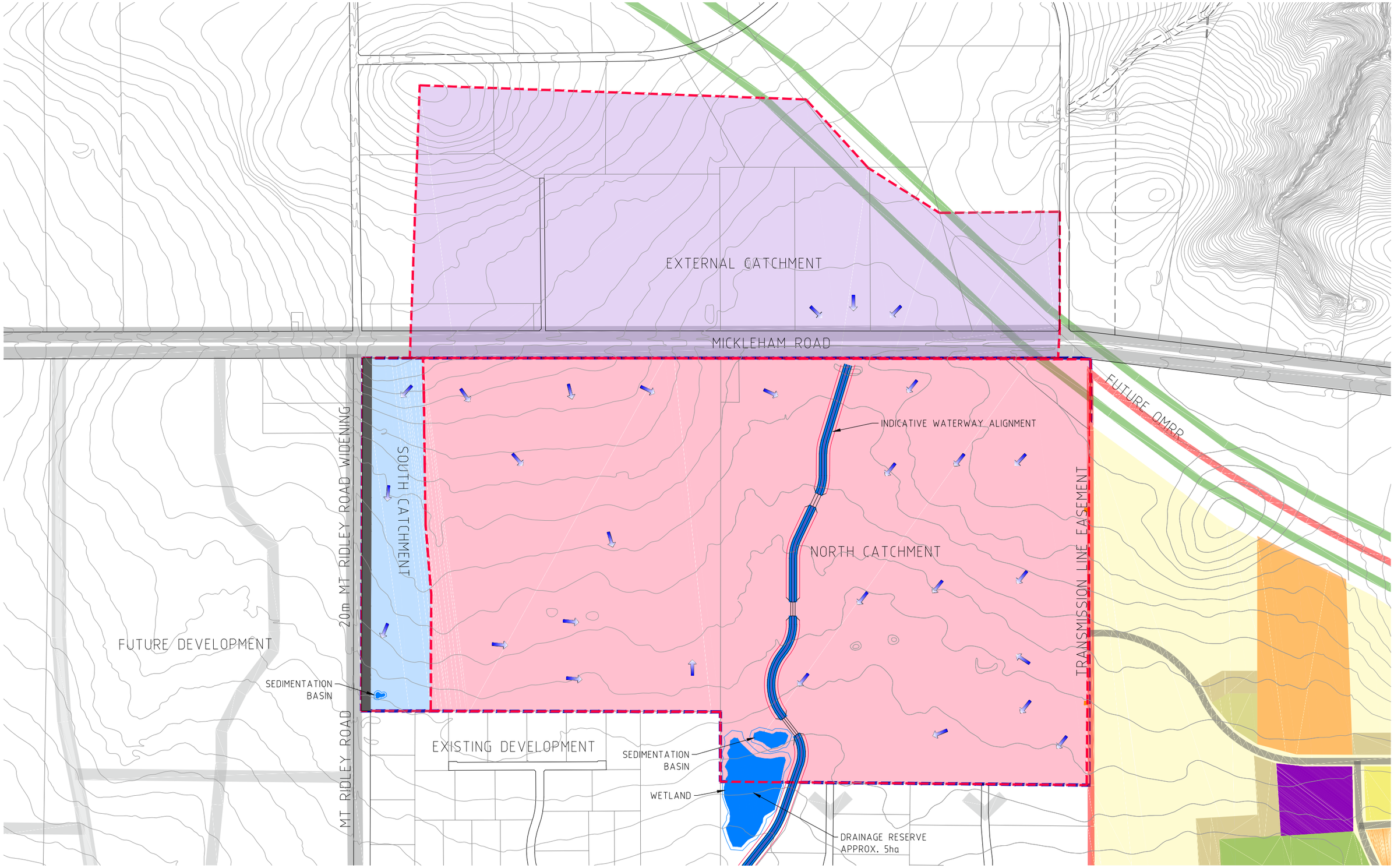
Appendix E: STORMWATER



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LEGEND
- PROPOSED MAIN DRAIN
- SOUTH CATCHMENT
- NORTH CATCHMENT
- EXTERNAL CATCHMENT
- PROPOSED CONSTRUCTED WATERWAY AND WETLAND
- FLOW DIRECTION

Joint venture partners: MAB GPC

Coords: MGA
Levels: AHD

Hor 1:4000 0m 40m 80m 160m 240m

Scale @ A1/A3

LINDUM VALE DEVELOPMENT
LOT 7 & 8 MICKLEHAM ROAD
MICKLEHAM
SERVICING STRATEGY
STORMWATER DRAINAGE
Drawing No. 11604SS05 Rev B
Sheet No. 05 PRELIMINARY

ABN 78 429 221 049

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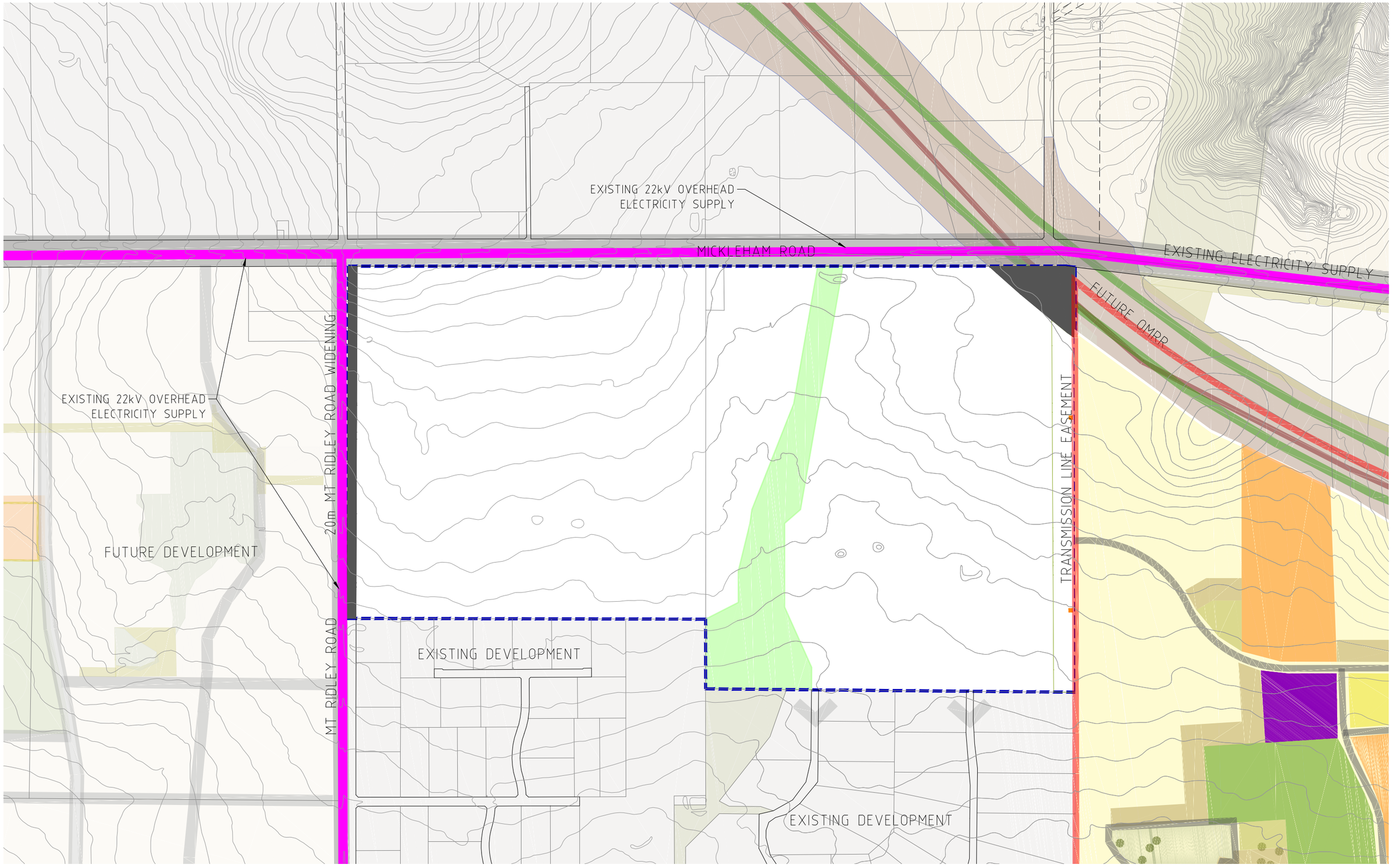
Appendix F: ELECTRICITY



Drawing File: c:\Designdata\11600\11604-Lindum Vale Servicing Strategy\Vicad\Concept\Servicing Strategy\
11604_Servicing Strategy.dwg - 11604SS06
Date/Time: Wed Jun 12, 2013 - 10:06am --fraserg--

REV	AMENDMENTS	DATE	APP'D.
B	REVISED FOR SERVICING STRATEGY V2	12/06/13	TL
A	ISSUED FOR SERVICE STRATEGY REPORT	05/11/12	TL

NOT TO BE USED FOR CONSTRUCTION

Drawn PM Date 05/11/12
Designed -
Date -
AN
Verified -
Date -
AN
Audited -
Date -
AN
Approved -
Date -
AN
Written dimensions to take precedence over scale.
Contractor shall check and verify all dimensions on site.
Discrepancies to be brought to the attention of the Superintendent.

LEGEND

EXISTING ELECTRICAL MAIN

Joint venture partners:
MAB GPC

Coords: MGA
Levels: AHD

Hor 1:4000 0m 40m 80m 160m 240m

Scale @ A1/A3 1:2500/1:5000

LINDUM VALE DEVELOPMENT
LOT 7 & 8 MICKLEHAM ROAD
MICKLEHAM
SERVICING STRATEGY
ELECTRICAL RETICULATION
Drawing No. 11604SS06 Rev B
Sheet No. 06 PRELIMINARY

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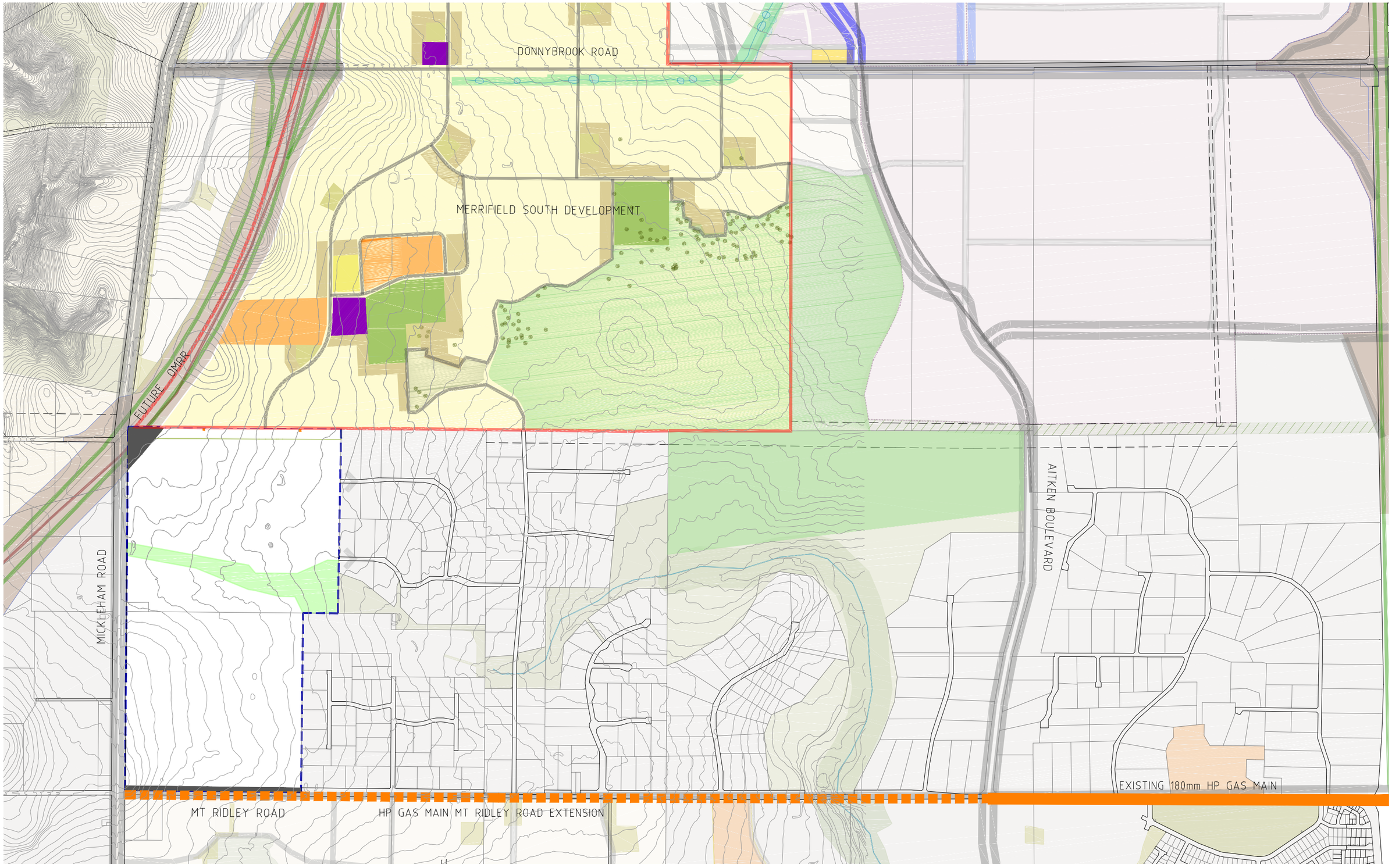
Appendix G: GAS



Drawing File: c:\Designdata\11600\11604-Lindum Vale Servicing Strategy\Mcad\Concept\Servicing Strategy\
11604_Servicing Strategy.dwg - 11604SS07
Date/Time: Wed Jun 12, 2013 - 10:07am --frozen--

REV	AMENDMENTS	DATE	APP'D.
B	REVISED FOR SERVICING STRATEGY V2	12/06/13	TL
A	ISSUED FOR SERVICE STRATEGY REPORT	05/11/12	TL

NOT TO BE USED FOR CONSTRUCTION

Drawn PM Date 05/11/12
Designed -
Date -
AN
Verified -
Date -
AN
Audited -
Date -
AN
Approved -
Date -
AN
Written dimensions to take precedence over scale.
Contractor shall check and verify all dimensions on site.
Discrepancies to be brought to the attention of the Superintendent.

LEGEND
EXISTING GAS MAIN
PROPOSED GAS MAIN EXTENSION

Joint venture partners:
MAB GPC

Coords: MGA
Levels: AHD

Hor 1:8000 0m 80m 160m 320m 480m

Scale @ A1/A3

LINDUM VALE DEVELOPMENT
LOT 7 & 8 MICKLEHAM ROAD
MICKLEHAM
SERVICING STRATEGY
GAS RETICULATION
Drawing No. 11604SS07 Rev B
Sheet No. 07 PRELIMINARY

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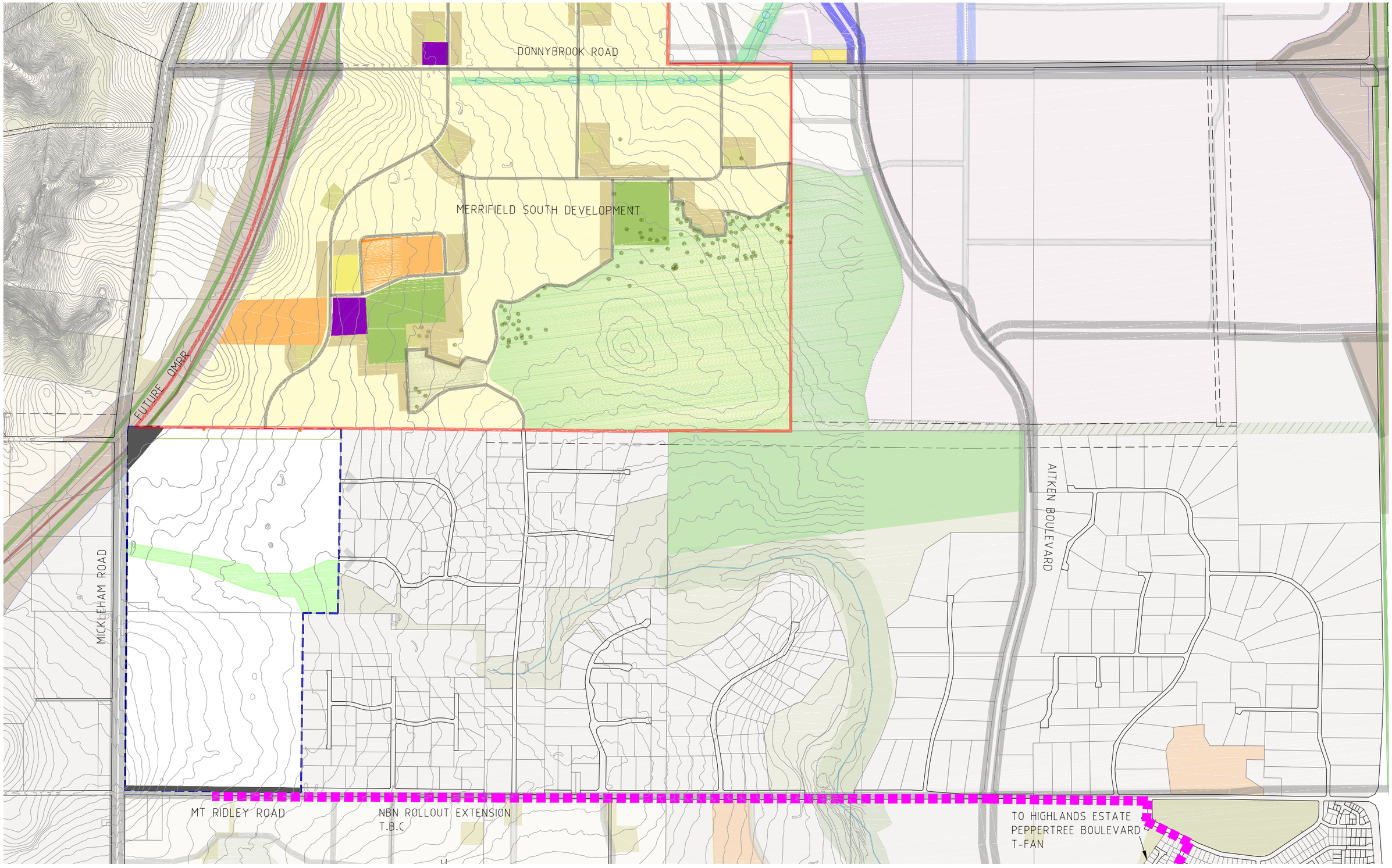
Appendix H: TELECOMMUNICATIONS



Drawing File: c:\Designdata\11600\11604-Lindum Vale Servicing Strategy\Mcad\Concept\Servicing Strategy\
11604_Servicing Strategy.dwg - 11604SS08
Date/Time: Wed Jun 12, 2013 - 10:07am --fraserg--

REV	AMENDMENTS	DATE	APP'D.
B	REVISED FOR SERVICING STRATEGY V2	12/06/13	TL
A	ISSUED FOR SERVICE STRATEGY REPORT	05/11/12	TL

NOT TO BE USED FOR CONSTRUCTION

Drawn PM Date 05/11/12
Designed -
Date -
AN
Verified -
Date -
AN
Audited -
Date -
AN
Approved -
Date -
AN
Written dimensions to take precedence over scale.
Contractor shall check and verify all dimensions on site.
Discrepancies to be brought to the attention of the Superintendent.

LEGEND
EXISTING TELECOMMUNICATIONS
PROPOSED NBN EXTENSION

Hor 1:8000 0m 80m 160m 320m 480m
Scale @ A1/A3

Joint venture partners:
MAB GPC

Coords: MGA
Levels: AHD

LINDUM VALE DEVELOPMENT
LOT 7 & 8 MICKLEHAM ROAD
MICKLEHAM
SERVICING STRATEGY
TELECOMMUNICATIONS
Drawing No. 11604SS08 Rev B
Sheet No. 08 PRELIMINARY

ABN 78 429 221 049

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