

Preliminary development schemes indicate potential for mixed-use residential and commercial / retail land use for the project. The potential yield could incorporate up to approximately 1,200 new dwellings, 1,000 sq.m of retail and up to 7 hectares of employment land.

4.0 Services

The following services advice has been based on review of utility authority plans (via 'Dial-Before-You-Dig' services search), survey plans and preliminary discussions with authorities.

4.1 Potable Water

Existing

The site is currently serviced by a DN100 water main owned by Sydney Water Corporation (SWC). This main runs along the southern side of Manchester Road (along the eastern end). A DN150 main is also located directly opposite (on the northern side).

Proposed

The existing water main is not expected to be large enough to service the demand from the proposed development. It is likely a new water main (up to DN300) will need to be installed to supply the site from an existing DN375 water main located in Alice Street (approximately 1.2km in length). Refer to schematic plan HSK-02 in Appendix A.

The final extent of the augmentation, including confirming the acceptable point of connection, will be subject to a Section 73 Application to SWC as well as a Pressure and Flow statement for the existing water main(s).

Water requirements for fire-fighting purposes (including pumps and dedicated on-site water storage tanks) will be subject to confirmation through the design and detailed Authority consultation phase, including water meters to service various zones / buildings (as required).

4.2 Sewer

Existing

There is an existing DN300 Sydney Water sewer main that runs along the southern boundary of the site (along Manchester Road). The existing sewer line drains to a SWC sewage pump station (SPS), located on the south west corner of the site. There also exists two (2) pressure mains located along the western boundary of the proposed site which are directly connected to the SPS.

The SPS ultimately discharges to the North Head Sewer Treatment Plant.

Proposed

The existing DN300 sewer main should have sufficient capacity to service only a portion of the proposed development. It is anticipated approximately three (3) new connections and / or sewer extensions will be required from the existing main.

It is highly likely the development will necessitate augmentation of the existing SPS, in order to cater for the additional loads and further stages of the development. As a minimum, Northrop anticipates additional storage will need to be provided to the existing SPS as part of these upgrade works.

The final extent of works for sewerage servicing will be subject to Section 73 Application to SWC, and confirming the development loads (including initiatives that could reduce discharge to sewer).

Refer HSK-02 for anticipated location of proposed sewer infrastructure.

4.3 Gas

Existing

The site is surrounded by low pressure gas mains and a high pressure secondary network main, all provided by Jemena (refer to schematic plan HSK-03 in Appendix A.

Proposed

There is a DN350 secondary high pressure gas main located in Manchester Road. It is expected that there will be sufficient capacity in the high pressure secondary main to service the site.

A direct connection to the DN350 high pressure gas main will not be permissible. It is likely that a separate extension from the main will need to be provided to the site, with a pressure reduction substation. Preliminary calculations indicate that a 1050 kPa main would be sufficient to secure the supply of natural gas to the new development, subject to Jemena approval.

It is anticipated that the additional retail and commercial space may have slightly greater effects on the gas loads than the previous masterplan layout.

The final scope of works for natural gas supply will be subject to Jemena.

4.4 Power

Existing

The site currently accommodates a single sub-station (S.3759) owned by Ausgrid. The substation is serviced directly by high-voltage feeder lines from the Lidcombe Zone Substation (Lidcombe 43). The Lidcombe Zone Substation ZN1068 is located at the intersection of Queen and Helena Street approximately 2km from the subject development site.

Proposed

Preliminary load calculations indicate that the maximum demand for the proposed development would be in the order of 10,990 A or 7,850 kVA. A demand of such magnitude will require approximately eight (8) to nine (9), 1,000 kVA substations to service electricity for the site. A smaller number (around 5-6) of chamber substations could also be used should space to house a substation be an issue. The ultimate number of substations will depend on the size of the substations installed across the site.

It is expected new feeder lines will need to be extended from the Lidcombe Zone Substation ZN1068 to service the total demand for the proposed development. Currently there are no spare Ausgrid conduits available on Manchester Road. The west part of Manchester Road has been indicated as a private road with new trenching and HV cable works required as well as Ausgrid cable easement and right of way required along the cable route also.

A formal application will need to be submitted to Ausgrid to confirm sufficient capacity within the existing Lidcombe Zone Substation ZN1068; the final infrastructure provisions to be made to service the proposed development; and removal of the existing on-site sub-station (as required by the proposed site works).

The site is not affected by the 1% AEP (100-year ARI) flood flows from Duck Creek. Notwithstanding, it is recommended future substations be placed above the 1% AEP plus freeboard, to avoid any possibility for inundation from the adjoining floodwaters.

4.5 Stormwater

Existing

Aerial photographs from Google Maps and Nearmaps show there is a stormwater pit and pipe network that collects and discharges the majority of stormwater flows generated across the site. Interpretation of the survey information indicates stormwater flows generated from Lot 11 shed to the west (towards Duck River), while surface flows from Lot 12 tends to the south (towards Manchester Road).

Proposed

The proposed site stormwater drainage system should aim to maintain the natural catchment characteristics for determining site discharge points. Any provisions for managing stormwater runoff (including on-site stormwater detention, rainwater harvesting, stormwater pollution control and water sensitive urban design) will be subject to Auburn City Council requirements.

The 'Auburn Development Control Plan 2010, Stormwater Drainage' confirms on-site stormwater detention provisions are required for development within the Duck River catchment. Similarly, rainwater harvesting tanks are to be implemented for non-potable uses.

Erosion and Sediment Control measures will be required during the construction phase – in accordance with the Auburn DCP requirements.

It is recommended the status of all drainage lines traversing the site are investigated – with a view to determining the likely impact on the potential development, and whether they can be redirected / removed.

5.0 Flood Impacts and Management

The Flood Maps provided in Auburn City Council's LEP (2010) indicate the site is not categorised as 'Flood Prone Land'.

Northrop has also reviewed the following information to consider any potential effects of flooding on the proposed development, particularly from Duck River.

- survey information for the site, prepared by LTS Lockley, 2nd March 2015, and
- Flooding information obtained from the Duck River and Duck Creek Flood Study Review, prepared by WMA Water, November 2012 - for Auburn and Parramatta City Council.
- ‘Auburn Development Control Plan 2010, Stormwater Drainage’

The 'Duck River and Duck Creek Flood Study Review' Report was prepared by WMA Water in November 2012. This was prepared for Parramatta City Council, and investigated / calculated flooding for Duck River (to its confluence with the Parramatta River). The 'stations' within the Report, at which flood levels have been determined in vicinity of the subject site, are named as 'Duck River u/s Mona Street' and 'Duck River u/s Railway'. WMA Water calculated the following design flood levels for these locations:

Table 1 – Design Flood Levels

Station	Location	Peak Design Flood Level (m AHD)				
		20% AEP	5% AEP	2% AEP	1% AEP	PMF
Duck River	u/s Mona Street (approx. 300m south)	5.5	6.1	6.4	6.6	9.1
Duck River	u/s Railway (approx. 300m north)	4.4	5.0	5.4	5.6	8.4

These levels indicate:

- The subject site is likely to be free from flooding from Duck River in the 100-year ARI (1% AEP) design storm event.
- The subject development will not impede flows in Duck River (up to the 100-year ARI flood level).
- The subject site is likely to be affected by flooding in the Probable Maximum Flood (PMF) event. The Hydraulic Categorisation Diagram (Attachment B) substantiates this.

The 'Auburn Development Control Plan 2010, Stormwater Drainage' provides Flood Risk Management controls for development. The level of control is dependent on the Flood Risk assigned to flood-affected sites. Our preliminary determination is that a Low Flood Risk could be assigned to this site, because:

- A High Flood Risk is assigned to “land subject to a high hydraulic hazard in a 100 year flood or potentially subject to evacuation difficulties”.
- A Medium Flood Risk is assigned to “land below the 100 year flood level (plus freeboard)”.
- A Low Flood Risk is “defined as all other land within the floodplain.....”.

Residential Development within Low Flood Risk Precincts requires Flood Evacuation measures to:

- a) Achieve “reliable access for pedestrian or vehicles from the dwelling to an area of refuge above the PMF level”, and
- b) Demonstrate “the development is to be consistent with any relevant DISPLAN or flood evacuation strategy”.

6.0 Conclusion

This brief report has been prepared to support the Planning Proposal for the proposed mixed-use (residential, commercial and retail) development at Manchester Road, Auburn. The report has investigated the presence and capacity of existing services to establish the provisions that could be made for the development. In general the outcomes of this preliminary investigation suggest existing water, sewer, natural gas and electricity supply infrastructure can be augmented / extended to secure services to the new development

This report has also assessed the potential impact of flood inundation from Duck Creek and Duck River.

- Comparison of the flood levels presented in the Flood Study Review (by WMA Water (2012)), with the surveyed levels for the site, indicate it will not be inundated by floodwaters in the design 100-year ARI flood event.
- The site is susceptible to flooding in the Probable Maximum Flood (PMF) event. The Hydraulic Categorisation Diagram from the WMA Water report confirms this as a 'Low Flood Risk' area. The 'Auburn Development Control Plan 2010, Stormwater Drainage' indicates residential development within Low Flood Risk Precincts are required to implement Flood Evacuation measures to:
 - a) Achieve *“reliable access for pedestrian or vehicles from the dwelling.....to an area of refuge above the PMF level”*, and
 - b) Demonstrate *“the development is to be consistent with any relevant DISPLAN or flood evacuation strategy”*.

We trust the outcomes of this brief report are sufficient to support the Planning Proposal for the proposed development. Northrop remains available to provide further information – at your discretion.

If you have any questions, or wish to discuss any items in this letter further feel free to contact the undersigned on (02) 9241 4188.

Yours faithfully

Grinnell

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Encl.



APPENDIX A – SCHEMATIC HYDRAULIC INFRASTRUCTURE PLANS

FIGURE 22C
HYDRAULIC CATEGORIZATION
PMF EVENT

