Infrastructure Report

Lots 1-9,1400-1480 Elizabeth Drive, Cecil Park

PREPARED FOR WESTERN SYDNEY TOWN CENTRE PTY LTD

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D	20.3.2019	Development Concept Plan updated	CV		

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1 Introduction

This Infrastructure Report has been prepared to inform the Planning Proposal for the proposed rezoning of the site located at Lots 1-9, 1400-1480 Elizabeth Drive, Cecil Park from RU4 Primary Production to IN2 Light Industrial zoning. The site is proposed to ultimately comprise of a mix of warehouse and distribution facilities, light industries and highway retail (takeaway food premises / service stations). The site currently sits fully within the South West Growth Area, and partially within the Western Sydney Aerotropolis Growth Area. It is bounded by Elizabeth Drive to the north and Range Road to the east. The intersection of Mamre Rd and Elizabeth Drive is located at the northern boundary of the site.

2 Site Description

2.1 Existing Site

The site is described as Lots 1 to 9 DP 1054778. The corresponding street addresses are 1400 to 1480 Elizabeth Drive, Cecil Park. The sizes of individual parcels, and of the overall site, are given in Table 2-1 below. The site has one owner.

Table 2.1: Existing Property Details

RP Description	Street Address	Area (ha.)
Lot 1 DP 1054778	1400 Elizabeth Drive	2.427
Lot 2 DP 1054778	1410 Elizabeth Drive	2.148
Lot 3 DP 1054778	1420 Elizabeth Drive	2.097
Lot 4 DP 1054778	1430 Elizabeth Drive	2.109
Lot 5 DP 1054778	1440 Elizabeth Drive	2.000
Lot 6 DP 1054778	1450 Elizabeth Drive	2.000
Lot 7 DP 1054778	1460 Elizabeth Drive	2.037
Lot 8 DP 1054778	1470 Elizabeth Drive	2.035
Lot 9 DP 1054778	1480 Elizabeth Drive	2.028
	TOTAL	**18.881 ha**

A copy of the Title Plan for the site is included in Appendix A to this report. The total area of the site is approximately **188,881** square metres (18.9 hectares).

The site has direct frontage to Elizabeth Drive to the north, Range Road to the south and east, and a bowling club to the west.

An easement crosses the site from north to south, straddling the boundary between Lots 2 and 3. The easement has an overall width of 30.48 metres and contains high voltage overhead power lines owned by Endeavour Energy.

The site falls from a high point of approximately RL 80 m in the north-east corner to a low point of approximately RL 55 m in the south-west corner. Surface slopes vary between approximately 9.1 % (1 in 11) at the north-east corner to approximately 1.8 % (1 in 55) in the south-west. The site is well grassed and sparsely forested.

All levels quoted in this report are to Australian Height Datum (AHD).

2.2 Proposed M12 Acquisition

Roads and Maritime Services has issued a plan of proposed acquisition of land through the site for the construction of the proposed M12 motorway. A copy of this plan is included in Appendix B to this report.

The area of proposed resumption is approximately 82,730 square metres (8.27 hectares) and runs roughly east to west. It will divide the balance of the site into two parcels. The larger (northern) remnant parcel would have an area of approximately 90,461 square metres (9.05 hectares). The smaller (south-western) remnant parcel would have an area of approximately 15,690 square metres (1.57 hectares).

3 Development Concept

An indicative development concept has been prepared by Nettleton Tribe Architects and is included in Appendix C to this report. It is anticipated that the site will be developed with a mix of office, retail and light industrial uses with an overall Floor Space Ratio (FSR) of up to 1:1. The northern remnant parcel has been named Site 1, and the south-western parcel has been named Site 2.

It is proposed that the site will initially be developed as these two parcels of land, but with a view to ultimate subdivision to produce Torrens Title allotments and dedicated public roads. Accordingly, the internal road and drainage layout will be designed and constructed in accordance with Liverpool City Council standards. Water mains and underground gas, electrical and telecommunications services would be located within the road reserves in easements which would be relinquished when the roads are dedicated as public roads. Internal sewerage reticulation would also be designed, documented and built in accordance with Sydney Water standards, so that they may be handed over to Sydney Water Corporation when the site is subdivided in the future.

The concept plan divides the site into eight parcels, of which three are super-lots, further divided into smaller lots within each super-lot. Typical uses for these lots are indicated, as examples only.

The proposed layout assumes two access points from Elizabeth Drive. It is understood that the existing roundabout at the junction of Mamre Road with Elizabeth Drive is to be replaced by a signalised intersection. This provides an opportunity for the main access point to the site to be controlled by the traffic signals by the addition of a fourth leg to the intersection to service the site. A branch from the internal roadway from the intersection would pass beneath the M12 Carriageway to access the southern parcel.

The proposed access point (subject to RMS approval) would allow left-in, left-out turns only.

Two minor access points are also indicated from Range Road to the east, for access to site car parking only.

The site infrastructure plan (drawing 19-000186-C8-00 in Appendix E) shows the existing electrical easement crossing one of the super-lots. It is expected that the existing power lines passing over the M12 corridor would need to be relocated underground. There is an opportunity for this undergrounding to be extended across or around Site 1 and across Elizabeth Drive. The current development concept a building extending into the existing easement. This conflict will be resolved with detailed design, either by relocating cables or buildings, as no buildings may be erected within the existing easement.

It should be stressed that these development concepts are provided as initial concepts only and all development is subject to approval by Liverpool City Council.

4 Flooding and Stormwater

4.1 Flood Risk Terminology

In this section, several terms are used to describe flood risks.

Rainfall intensities have been measured and collated by the Bureau of Meteorology over many years in order to determine the statistical relationship between rainfall of a particular intensity and the frequency of its occurrence. The probability that a particular intensity might be exceeded in a storm in any one year is denoted as its *Annual Exceedance Probability (AEP)*. Thus an intensity which has an AEP of 1% has a probability of 0.01 of being exceeded in any one year. This may also be considered as the intensity that might be exceeded on average once every 100 years (the inverse of 0.01). This intensity can thus be termed as the 100-year *Average Recurrence Interval (ARI)* intensity, and the greatest rate of runoff generated from this rainfall would be termed the Q100 peak runoff.

The absolute worst case flood risk does not rely on extrapolation of rainfall records, but on the physical capacity to generate rainfall based on climatic considerations. The *Probable Maximum Precipitation (PMP)* is defined by the Bureau of Meteorology as the greatest depth of rainfall that is physically possible according to meteorological constraints for a given duration for a given size storm area at a particular location at a particular time of year, with no allowance for long-term climatic trends. The most extreme flood generated by any storm duration at a particular site is called the *Probable Maximum Flood (PMF)*. The PMF is commonly considered to be approximately 10,000 years ARI.

4.2 Flooding

Several flood studies have been carried out in the area, mostly focusing on South Creek which extends all the way to the Hawkesbury River. A flood study was carried out for the new Western Sydney Airport, but it focused on the Badgerys Creek catchment to the west of South Creek. Flood extents have been indicated on maps presented by the Department of Planning for the Western Sydney Airport and its surrounding areas. A typical example is provided in Figure 4-3 on Page 6, showing the site to be outside the flood extents but providing no information on flood levels.

Kemps Creek has been modelled in the upstream reaches only as part of a flood study for Camden City Council. Liverpool City Council commissioned Perrens Consultants to prepare the Austral Floodplain Risk Management Study and Plan and a final report was issued in September 2003. Liverpool Council has confirmed that this study has the most up-to-date information on flooding in the area. The report included modelling of the flood behaviour of South Creek but also Kemps Creek from its headwaters down to Elizabeth Drive. A map of the flood extents in the 1 in 100 year Average Recurrence Interval (ARI) peak flood event was included in Appendix B to that report as Figure B1.1. This map, marked up to show the position of the site at 1400-1480 Elizabeth Drive, is reproduced as Figure 4-2 on the following page.

The branch of Kemps Creek closest to the site is identified as Branch KC-27 on Tributary 3. Calculated flood levels at selected points along this branch have been summarised in Table B3.42 and reproduced in Table 4-1 below. The corresponding 100-year ARI flood level is RL 46.5m AHD at Elizabeth Drive.

Table 4.1: Branch KC27 off Tributary 3 – Peak Water Surface Elevations (Table B3.42 Austral FRMP - Perrens [2003])

STATION	CROSS SECTION NUMBER	CHAINAGE ON BRANCH KC27 (m)	CHANNEL INVERT	PEAK WATER LEVEL (m AHD)				
				1 YR ARI	5 YR ARI	20 YR ARI	100 YR ARI	PMF
A		0	49.59	50.9	50.9	50.9	51.0	51.4
B	2705	715	56.55	56.8	57.0	57.2	57.2	57.9
C	2704	900	58.76	59.5	59.6	59.6	59.6	59.9
D	2701	1800	78.62	78.8	78.7	78.8	78.8	79.0

The locations of these cross-sections relative to the site have been shown on Figure 4-2.

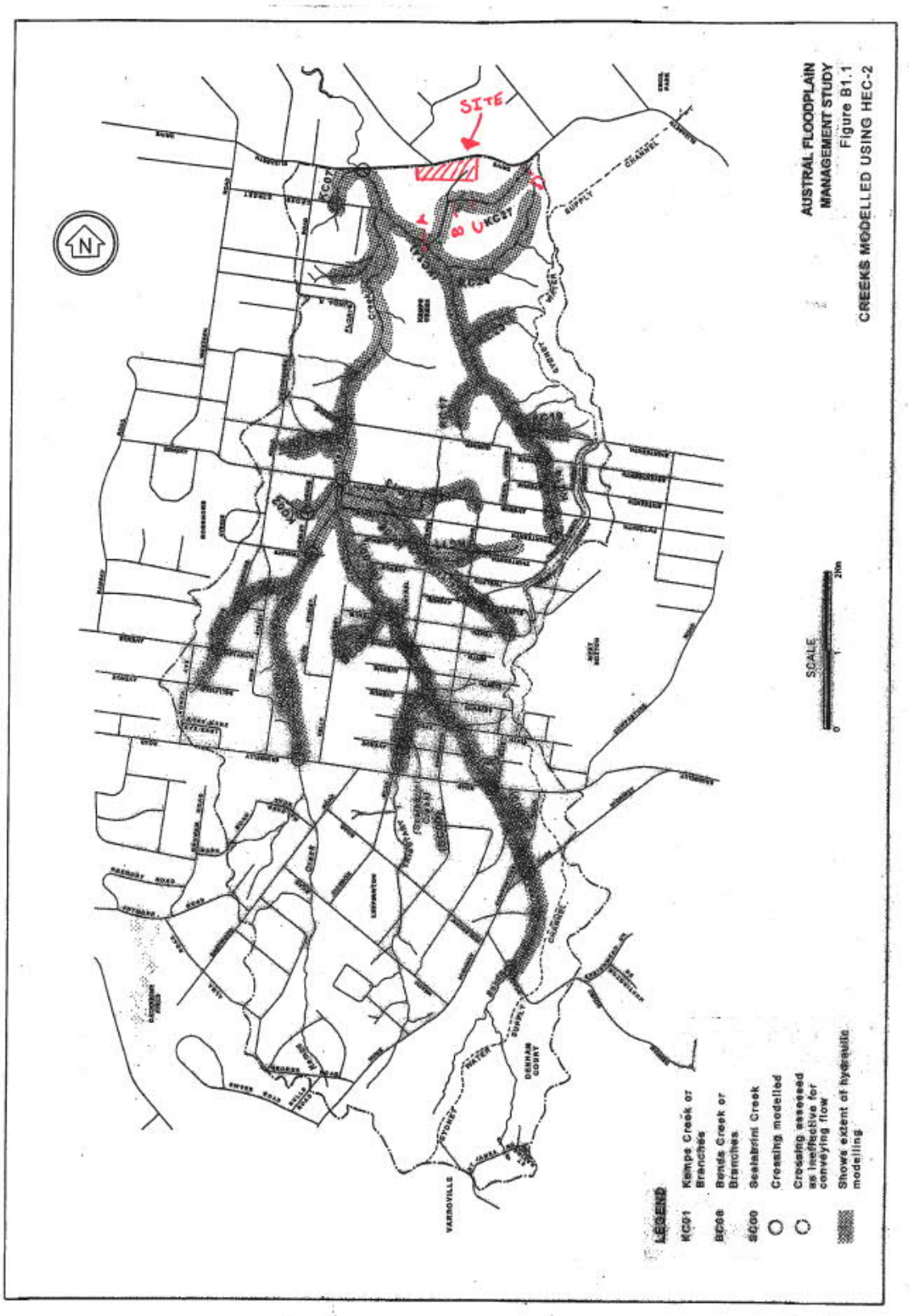


Figure 4.1 Flood Extents for 100 year ARI (Fig B1.1 Austral FRMP - Perrens [2003])

The closest cross-sections to the site are shown on Figure 4-2. A comparison with the corresponding surface level along the southern boundary of the site is given in Table 4-2 below.

Table 4.2: Comparison of Flood Levels to Site Levels

Location	Chainage	100 year ARI Flood Level (m AHD)	Surface Level at site (m AHD)
B	715	57.2	60 (approx.)
C	900	59.6	66 (approx.)

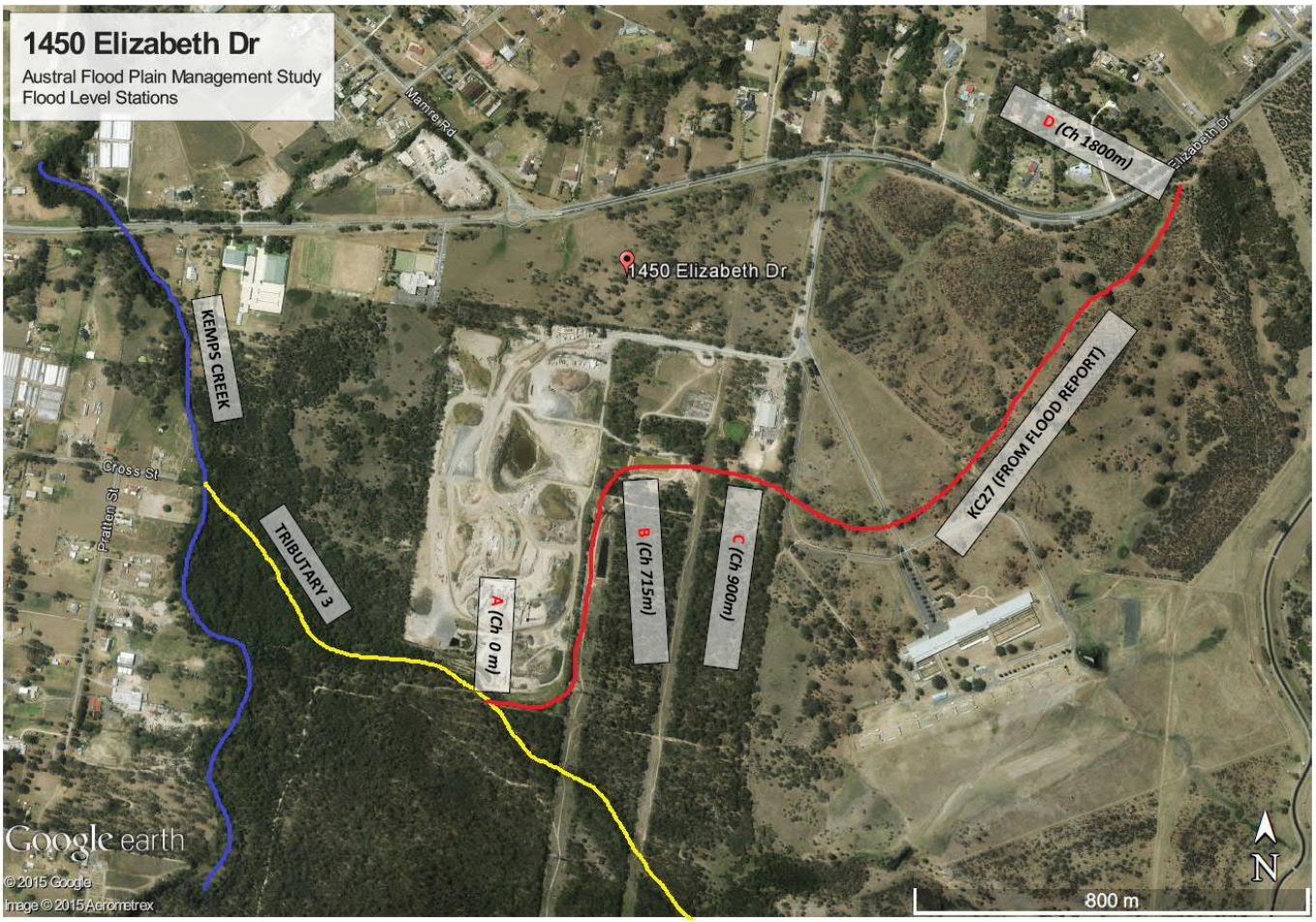


Figure 4.2 Location of Cross-sections (from Austral FRMP - Perrens [2003])

Accordingly, it is concluded that the site is not affected by flooding of Kemps Creek in flood events up to the 100-year ARI.

Flooding can occur from localised events, separate from Kemps Creek and in much shorter storm durations. Overland flow paths must be provided to prevent ponding and to convey the runoff that exceeds the capacity of the in-ground drainage system. Along the frontage of the site to Elizabeth Drive, overland flows would be conveyed along the roadway until reaching either the entrance road to the site or to a suitable overland flow path further to the east. Within the site, overland flows would be conveyed along the internal road system. The combined capacity of in-ground piped drainage and overland flows will be greater than the localised 100-year peak runoff, without overflow through the developed parcels of land.

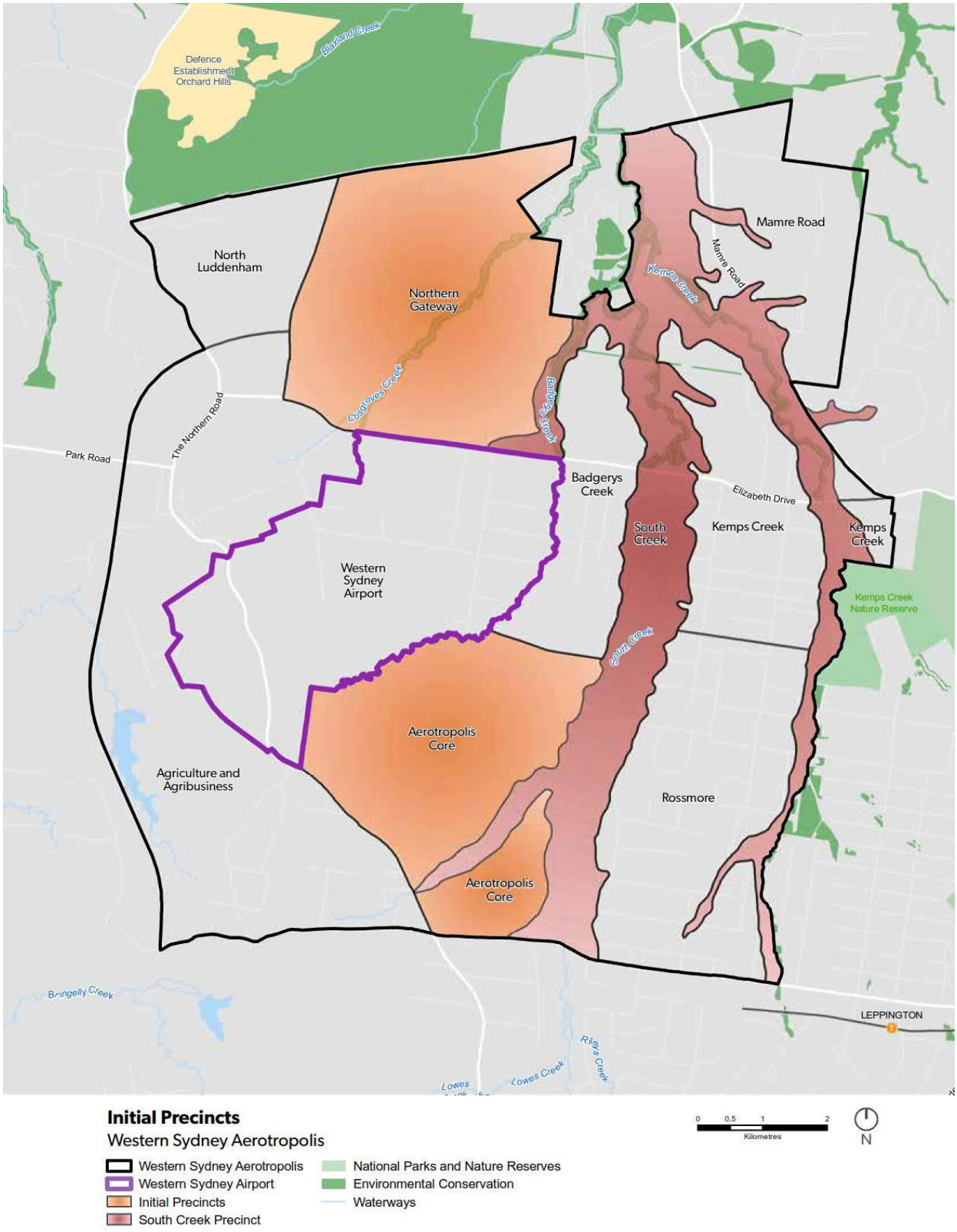


Figure 4.3 Aerotropolis Precinct Plan showing flood extents Badgerys Creek, South Creek and Kemps Creek

4.3 Stormwater Drainage

In accordance with Liverpool Council design standards for commercial subdivisions, the internal stormwater drainage would be designed to the major / minor principle. So-called "minor" flows, up to the peak runoff from the 10-year ARI design storm, would be conveyed by an in-ground pipe network. Storm runoff in excess of the capacity of these pipes, up to the peak 100-year ARI design storm, would be conveyed by overland flow along the internal road network.

The existing site drains towards the south-west corner. The proposed east-west M12 road corridor would run across the natural flow paths. This is shown on drawing 19-000186-C4-00 in Appendix D to this report. There are two valleys draining in a south-westerly direction, and these flow paths would be blocked by any road embankment.

It is expected that the designers of the motorway would maintain the status quo on the site, in that the flows from Site 1 should be permitted to flow through pipes crossing beneath the motorway embankment to discharge towards the south-west. A concept plan has been prepared to show how stormwater drainage may be collected and conveyed through the site. This plan, drawing 19-000186-C4-01, is also included in Appendix D.

All development sites will be provided with direct piped connections from the site to the road drainage network. This minimises the surface flow that would need to be collected by the gully pits in the roadways.

It is important to note that the actual flows from the developed site in the 10-year ARI storm event would be less than the flows for which the drainage network would be designed. This is because the drainage network assumes a fully developed site, with approximately 80% impervious surfaces. As discussed in the following section, the actual flows from each site would be reduced to match the existing (i.e. pervious) ground surface.

4.4 On-Site Detention

Liverpool City Council requires that the peak stormwater runoff from the site must not exceed the peak runoff that would have occurred prior to development in the 20 year and 100-year flood events. There are two possible methods for dealing with this requirement.

Scenario 1 is to provide on-site detention in each individual lot, such that the combined discharge from all the lots and the road system will not exceed the pre-developed peak runoff. This will require the detention system in each lot to be sized for the combined runoff from the site itself and the street frontage to that lot.

This scenario shares the cost between each development fairly. To maximise the use of land within each developed site, it is normal to provide this detention storage in permanent concrete tanks with discharge control devices at the outlet from each tank. Caveats would be placed on the title to ensure that the OSD system including its inlet pits and outlet discharge controls, will be regularly maintained by the developer / building tenant to ensure correct operation.

The approximate volume of stormwater runoff that would need to be retained within each site has been estimated at 20 cu. metres per 1,000 sq. metres of developed site including the external road frontage, and assumes an overall 80% impervious area in the developed site.

Scenario 2 is to provide a single basin to provide on-site detention for the entire precinct. This allows the size of the OSD basin and its discharge controls to be designed and built at the time of development of the overall site. Future development of each site would not need to include the provision of OSD on those sites. While this requires the setting aside of part of the site for the basin, the cost is considerably less than the combined cost of multiple OSD systems.

The proposed land acquisition by RMS makes it difficult to provide a single basin for the entire developed site (excluding the acquired land area. An indicative size of the basin and the space required has been calculated using the DRAINS software package assuming it is located at the lowest point of the site, at the south-west corner in Site 2. Liverpool City Council requires that computations must be performed for the existing site conditions and for the developed site, for a low recurrence interval (5 Year), a medium recurrence interval (in this case, 10 Year) and an upper recurrence interval (100 Year). The total rate of runoff in the developed case must not exceed that in the pre-developed case.

The estimated volume is approximately 4,500 cu.m. with an overall site area (including batters) of 3,600 sq. metres. The maximum depth would be 1.2 metres in the 20-year ARI storm event, and batters would provide 300mm freeboard above the top water level in the 100-year ARI flood event.

An alternative scheme has been suggested, which may be called Scenario 3. In this scenario, some on-site detention could be provided on the individual building sites. This would be supplemented by detention provided in a triangular basin as shown on the Development Concept and longitudinally between the east-west access roadway and the M12 road embankment. Both detention areas would drain to the cross-motorway drainage culverts.

The actual size and shape of the basins and the amount of site-provided detention would be subject to detailed design. Maintenance of the basins would be in accordance with an Operation and Maintenance Manual prepared as part of the design. Maintenance would be the responsibility of the developer until such time as the roadworks and drainage infrastructure is handed over to Council at the time of subdivision.

4.5 Water Quality

Liverpool City Council has established standards for the treatment of stormwater runoff from developed land. Their DCP 6.4 Stormwater Runoff Quality requires that post-development water quality shall be reduced to the following targets when compared to the pre-development water quality:

- 45% reduction in the mean annual load of total nitrogen
- 45% reduction in the mean annual load of total phosphorus
- 80% reduction in the mean annual load of total suspended solids

This level of treatment can be provided for Scenario 2 by a Gross Pollutant Trap located in the trunk drainage system just before discharge into the On-Site Detention basin, and by providing a bio-retention filter in the floor of the basin. Preliminary calculations indicate that the minimum area of bio-retention filter would be approximately 1,680 sq. metres. This is considerably smaller than the actual OSD basin floor area (estimated as 2,080 sq. metres).

Each development site would be required to install primary treatment devices to capture sediment and oil spills from car parking areas before discharge to the street drainage system.

As for the On-Site Detention systems, maintenance of gross pollutant traps and bio-retention filter systems would be in accordance with an Operation and Maintenance Manual prepared as part of the design. Maintenance of water quality devices in road reserves would be the responsibility of the developer until such time as the roadworks and drainage infrastructure is handed over to Council at the time of subdivision.

For Scenario 1, where individual on-site detention would be provided, there would still be a need for a Gross Pollutant Trap to be located near the outlet from the drainage system to collect litter and oil spills from roads. In addition, each individual site would be required to provide primary treatment devices (to capture sediment and oil spills) and tertiary treatment by bio-retention (if there is sufficient space on site) or by cartridge filtration systems if space is at a premium.

For the “hybrid” scheme proposed as Scenario 3, bio-retention could be provided in the detention basins, so that they provide a dual purpose. This is common practice and an effective and economical use of the landscaped buffer shown on the Development Concept.

5 Infrastructure Servicing

5.1 Drinking Water Supply

5.1.1 Design Criteria

Water design criteria adopted for this study are provided in Tables 5.1 and 5.2 and are based on the following documents:

- Water Supply Code of Australia (WSA-03 2011 – Sydney Water edition, Version 3.1)
- Water System Planning Guideline, Sydney Water (2014)

The criteria assume rainwater tanks are provided for non-potable water uses, with top-up to the rainwater tanks provided from the drinking water supply.

For the purposes of calculating potential drinking water demands for the site, it is assumed that no reticulated recycled water will be provided to the site.

Table 5.1 Design Demands for Drinking Water Systems

Item	Design Criteria	Units	Value
Light Industrial	Maximum Day Demand	kL/Ha/day	40
	Maximum Hr Demand	kL/Ha/day	64
Commercial (Suburban)	Maximum Day Demand	kL/Ha/day	41
	Maximum Hr Demand	kL/Ha/day	82

Table 5.2 Water Supply Design Criteria

Item	Unit	Planning Criteria
Minimum Pressure	m	>20 (desirable) >15 (minimum) ~ 20-25 (desirable minimum range for boosted areas if required) >12 (during abnormal operation for boosted areas) >3 for trunk mains not supplying customers
Maximum Pressure	m	< 50 (desirable) < 60 (maximum, subject to economic evaluation)
Reticulation Mains and Lead-in mains		Sized for max hour demand
Target Head Losses (as a guide)	m/km	5 (mains <= DN150) 3 (mains >= DN200)
Maximum Velocity	m/s	2 (during max hour demand in reticulation mains)
Minimum Pipe Size	mm	150 (industrial and commercial)

5.1.2 Water Supply Demands

Estimated water demands for the proposed development site are shown in the table below and are based on the design demands shown in Table 5.3 and a developable area of 10.6 Ha proposed for industrial development. These demands are preliminary only and will be refined during the detailed planning phase of the project.

Table 5.3 Water supply demands

Item	Design Criteria (KL/net ha/day)	Design Criteria (KL/ha/day)	Area (Hectares)	Estimated Additional Demand
Light Industrial/ Commercial	Average Day Demand	25	10.6	0.27 MLD
	Maximum Day Demand	40	10.6	0.42 MLD
	Maximum Hour Demand	64 (light Industrial) 82 (Commercial)	10.6	0.72 MLD[1]

Note: 1. Assumes approximately 2.2 Ha of total developable site is dedicated to light commercial/retail.

5.1.3 Existing Water Supply Infrastructure

The proposed Industrial development is located approximately 3 km from the Cecil Park Reservoirs and fronts a DN 300mm and 450mm water main (see Figure 5.1).

Sydney Water has advised that they are planning major upgrades to the existing system to service the planned development in the surrounding area. The new trunk infrastructure is planned to be delivered by 2022 and will provide additional bulk capacity to service future growth areas including the subject site.

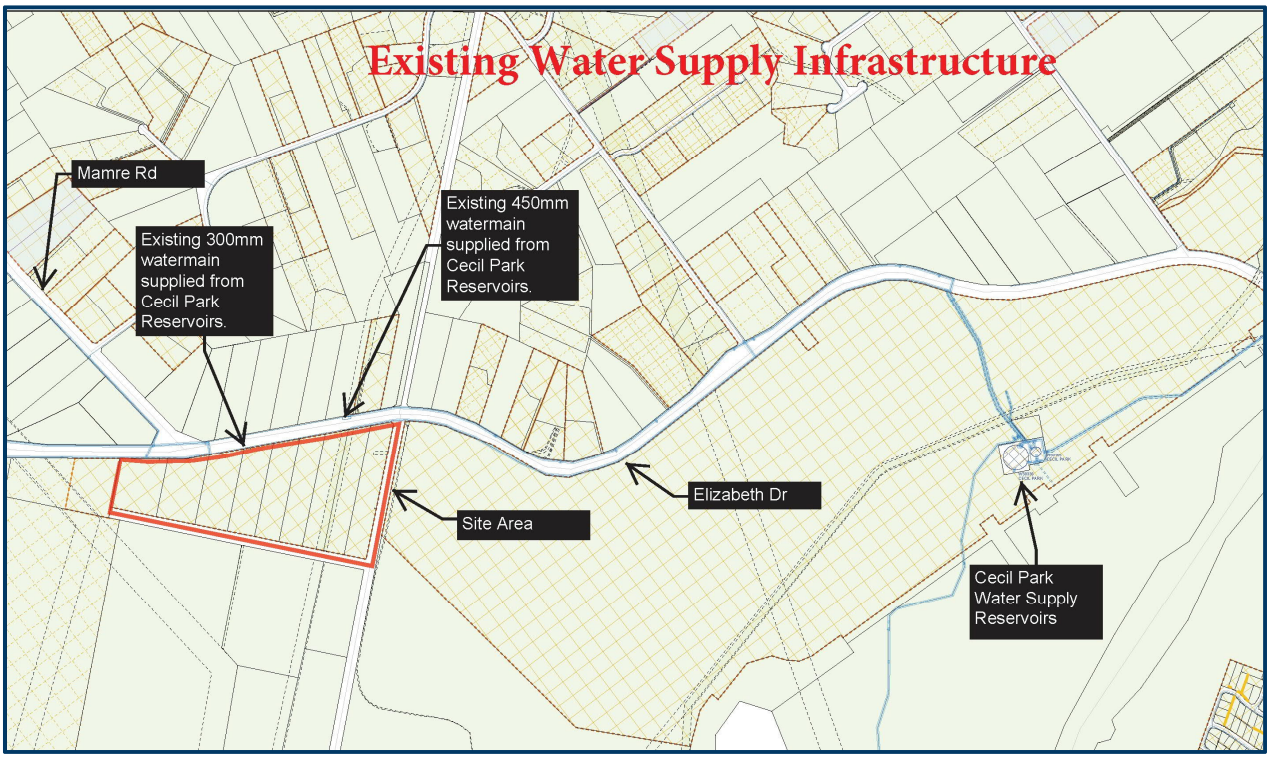


Figure 5.1 Existing Water Supply (Source: Sydney Water)

5.1.4 Proposed Water Supply Strategy

Following preliminary discussions with Sydney Water the following potential servicing strategy is proposed for the subject site:

- Development to be supplied via the existing Cecil Park Water Supply System. At this stage Sydney Water has not formally confirmed the uncommitted capacity of the existing water supply.
- The internal watermains within the site would be minimum DN 150 with a DN 200 offtake from the DN 300 main in Elizabeth Drive.
- Sydney Water is proposing to deliver major upgrades to the existing network by 2022 (including a reservoir, pumping station and trunk mains) to service future growth areas including the subject site. The full details of these upgrades are yet to be finalised and are the subject of a current Sydney Water investigation, due to be completed this year.
- There may be some limited spare capacity within the existing system to allow connection to the existing 300mm watermain along Elizabeth Drive prior to 2022.
- If there is insufficient capacity within the existing network and the proposed Sydney Water's delivery timeframe (2022) does not meet the development's timeframe, then some of the proposed infrastructure may need to be brought forward by the developer (subject to Sydney Water's approval).
- A preliminary connection and reticulation scheme plan to service the site is provided in Figure 5.2. The sizes, alignments and connection points shown are indicative only and will be refined via hydraulic modelling during the detailed planning phase of project.
- The estimated capital cost for water supply servicing (internal reticulation only) is approximately $500,000.
- A Feasibility Application has been submitted to Sydney Water to confirm servicing advice for the site.

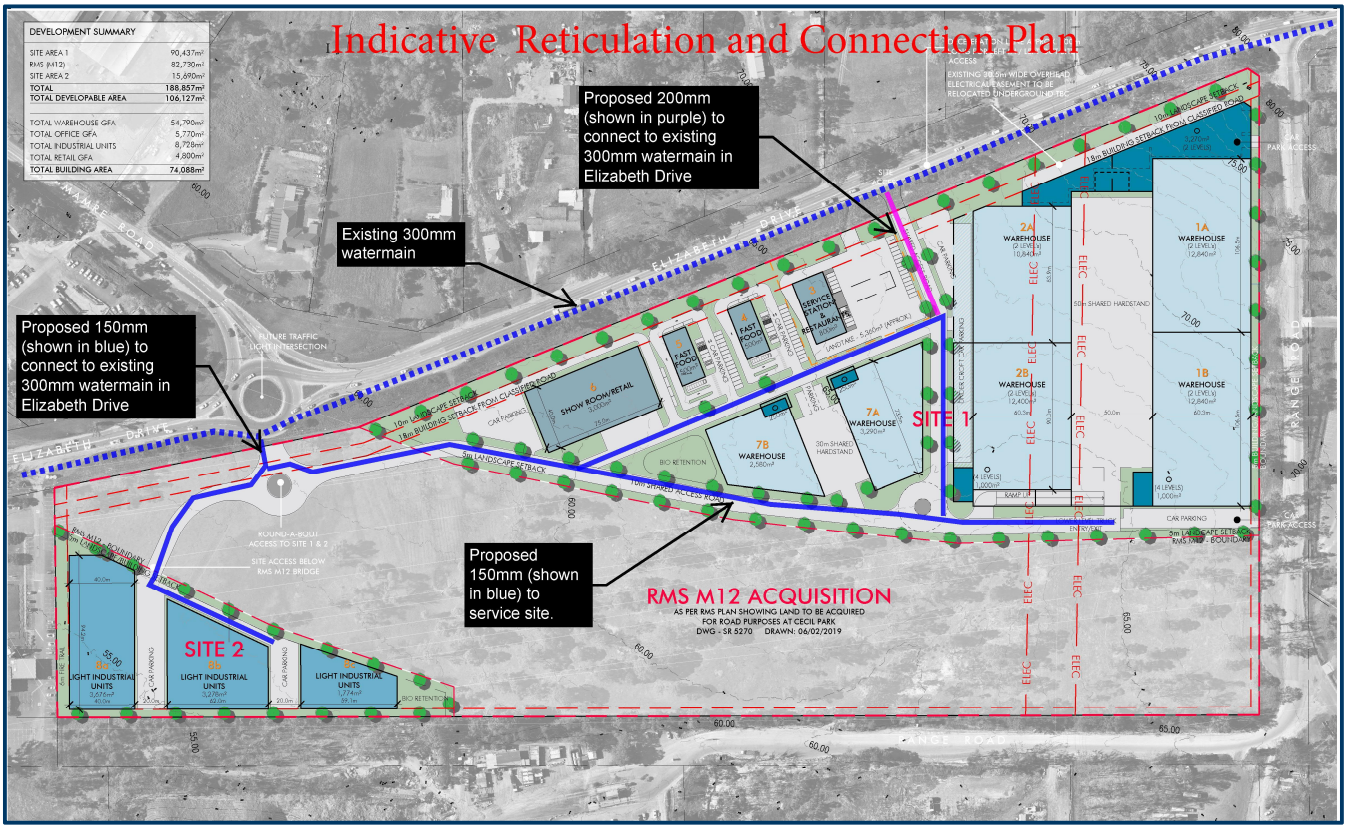


Figure 5.2 Indicative Water Reticulation Scheme

5.2 Wastewater

5.2.1 Design Criteria

The design criteria used to forecast future sewer loadings are generally taken from the Sydney Water Area Planning Design Criteria Guide and are expressed as an Equivalent Population for a particular land use. The key planning criteria applicable for the proposed development site are summarised in Table 5.4.

Table 5.4 Wastewater Design Criteria

Item	Description	Units	Criteria
Commercial/Light Industrial	EP	EP/Ha	75
Future Design Flow (Greenfield Growth Areas)	Average Dry Weather Flow (ADWF)	l/s	ADWF = 0.001736 x EP Based on 150L/EP/day for new system for greenfield areas
	Wet Weather	l/s	2% I/I over 20 years (3xPDWF) for low infiltration sewer
Pipeline Design			
Gravity main	Minimum diameter	mm	150
Rising main	Minimum velocity	m/s	0.75
Rising main	Target velocity	m/s	1.2 – 1.8
Rising main	Maximum velocity	m/s	2.5

Table 5.5 Water supply demands

Item	Design Criteria (KL/net ha/day)	Design Criteria (KL/ha/day)	Area (Hectares)	Estimated Additional Demand
Light Industrial/ Commercial	Average Day Demand	25	10.6	0.27 MLD
	Maximum Day Demand	40	10.6	0.42 MLD
	Maximum Hour Demand	64 (light Industrial) 82 (Commercial)	10.6	0.72 MLD[1]

Note: 1. Assumes approximately 2.2 Ha of total developable site is dedicated to light commercial/retail.

5.2.2 Wastewater Flows

Based on the design rate of 75 EP/Ha for Light Industrial/Commercial Development and a total EP of 795 for the proposed site, the estimated wastewater flows are shown in Table 5.5. These demands are preliminary only and will be refined during the detailed planning phase of the project.

Table 5.6 Wastewater Flows

Flow	MLD	L/s
Average Dry Weather Flow (ADWF)	0.12	1.4
Peak Dry Weather Flow (PDWF)	0.42	4.9
Design Wet Weather Flow (DWWF)	1.26	14.6

Note: A Dilution Factor “d’ of 3.6 was assumed.

5.2.3 Existing Wastewater Infrastructure

There is currently no wastewater infrastructure in the area. The nearest sewer is the Liverpool Sewerage System located approximately 4.8 km to the east of the site. The St Marys Sewerage System is located approximately 8 km to the north but is thought to be too far from this site to be considered a reasonable servicing option.

Preliminary discussions with Sydney Water indicate that they are about to commence several detailed options studies for the provision of wastewater and effluent management infrastructure to service the future growth areas within the South Creek and Kemps Creek catchments. The subject site is within these catchments. It is expected that there will be a new wastewater treatment facility at South Creek with the preferred site location currently being assessed. Sydney Water plans to deliver the first stage of the ultimate infrastructure by 2026. Outcomes of the Sydney Water options studies are not expected until late 2019.

5.2.4 Proposed Wastewater Servicing Strategy

It is proposed that the subject development site will be serviced via an interim servicing arrangement prior to the delivery of the ultimate infrastructure by Sydney Water. The interim infrastructure will be funded and constructed by the developer. The preferred interim wastewater servicing strategy will be subject of a detailed assessment (including cost, risk, environment and stakeholder acceptability) of all options identified during the detailed planning phase of the project. Once the ultimate infrastructure has been delivered, the interim infrastructure will be decommissioned, and properties will reconnect to the permanent infrastructure as per Sydney Water's preferred ultimate servicing strategy.

A Feasibility Application has been submitted to Sydney Water to confirm the servicing advice for the site

Ultimate Wastewater Servicing

It is anticipated that the subject site will ultimately drain to a new wastewater treatment facility to be located at South Creek. Confirmation of this strategy is subject to the outcomes of several studies by Sydney Water that are due to be finalised this year. The subject site is included within the servicing area being assessed by Sydney Water. Until this strategy is confirmed and more details are known regarding the location of the future treatment facility no further assessment can be made. The delivery of Stage 1 of the ultimate infrastructure is anticipated early 2026.

Preliminary assessment indicates that the development site would be serviced largely by 225mm diameter reticulation gravity sewer pipes. Estimated capital cost for wastewater servicing (internal reticulation only) is approximately $1.0 million. This does not include any lead-in infrastructure or other transfer infrastructure (local pumping station) that may be required to connect to the ultimate infrastructure.

Interim Wastewater Servicing

Prior to Sydney Water's ultimate wastewater infrastructure being delivered in 2026, the subject site could be serviced via an interim servicing arrangement. Four potential interim options have been identified and are discussed below.

Option A – Pumpout via Tanker

This option proposes an interim wastewater servicing solution to service the proposed development site by draining the proposed industrial lots to a temporary storage tank from where the wastewater will be pumped into a tanker and transported to a licensed trade waste facility. The pumpout system will need to be designed and constructed to Sydney Water's Interim Operating Plan (IOP) draft guidelines.

A proposed location of the temporary storage tank facility is shown in Figure 5.3 and is assumed to be located within the subject site. Preliminary assessment shows that an onsite storage tank (including emergency storage) would have a capacity of approximately 162 kl under full development (approximately 800 EP) and would require approximately 8 tanker movements per day (assuming 20 kl tanker volumes).

The capital cost of the proposed onsite storage tank is estimated at $0.7m with operating costs of $270,000 per month based on an ultimate average daily flow of 120 kl/day from the development site.

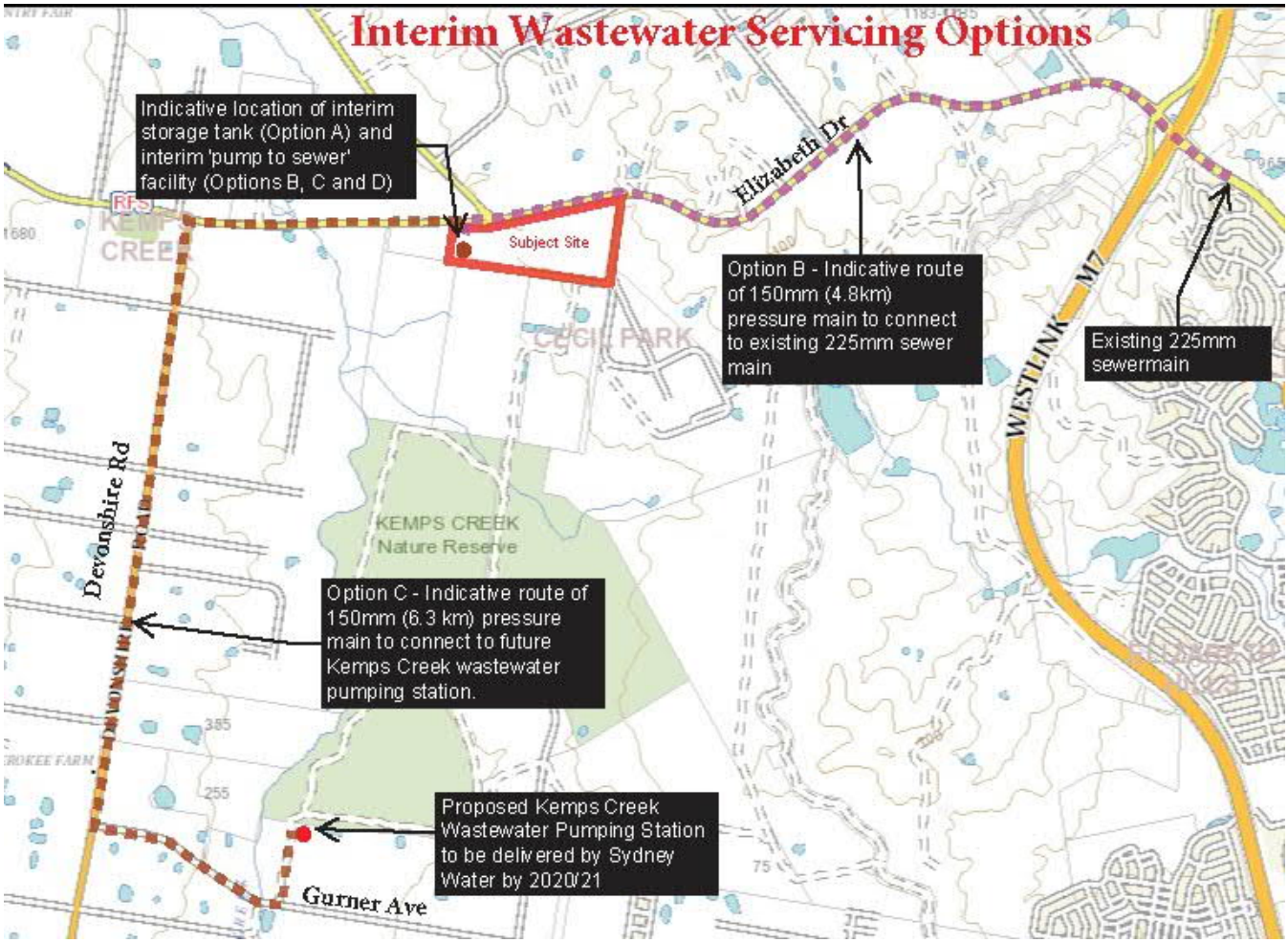


Figure 5.3 Interim Wastewater Servicing Options

Option B – Transfer to Liverpool System (via the Inverness Creek Carrier)

The Liverpool Wastewater System is located approximately 4.8 km to the east. The most likely connection point would be to an existing 225 mm sewer shown in Figure 5.3. This sewer is located in a park and drains to the Inverness Creek Carrier. Hydraulic modelling in the detailed planning phase will be required to ascertain the suitability of this connection point.

The scheme would involve the construction of an interim 'pump to sewer' facility situated on the southeast corner of the site, with an estimated pumping capacity of 12.5 L/s (based on 2.5 x PDWF). Flows will be pumped via a new 150 mm pressure main along Elizabeth Drive to the existing 225mm sewer (see Figure 5.3). It is likely, because of the long length of the pressure main, that Sydney Water would require the developer to provide odour control and dosing to prevent odours at the discharge point caused by septicity due to long detention times.

The receiving 225 mm sewer should have capacity for the pumped flows. If this is not the case, direct discharge to the 375 mm Inverness Creek Carrier would be an alternate interim connection point. The larger sewer is likely to have capacity to accept the proposed flows.

The capital cost to provide this interim infrastructure is estimated at $5.1m.

Option C – Transfer to Liverpool System (via future pump station at Kemps Creek)

Sydney Water has started to prepare a concept design and environmental assessment for wastewater infrastructure to service growth in the Austral and Leppington growth areas. This includes a new wastewater pumping station at Kemps Creek to be located on the northern side of Gurner Avenue as shown in Figure 5.3. This pumping station will transfer flows to the existing pumping station (SP1190) which is within the Liverpool wastewater system. Sydney Water have indicated that they plan to commence construction in 2020 and the new infrastructure will be commissioned in 2021. The new pumping station has not been designed to cater for flows from the subject site. However, Sydney Water may consider an interim connection to this new pump station depending on the projected rate of development within the Austral/Leppington areas.

Similarly to Option 2, this option proposes a new interim 'pump to sewer' facility (pump capacity of 12.5 l/s) to be located within the development site as shown in Figure 5.3. Flows will be pumped via a new 150 mm pressure main to the new Sydney Water pump station at Kemps Creek. There are a number of potential alignments for the proposed pressure main including following existing roads as shown in Figure 3.1 (approximately 6.3km in length) or through Kemps Creek Nature Reserve (approximately 3.2km in length). It is also anticipated that Sydney Water would require the developer to provide odour control and dosing to prevent odours caused by septicity due to long detention times in the pressure main.

The capital cost to provide this interim infrastructure is estimated at $6.0m. However significant savings are possible if the pressure main is laid through Kemps Creek Reserve (potentially reducing cost to approximately $4.0m).

Option D – Transfer to a temporary decentralised treatment facility

This option assumes that Sydney Water will deliver a temporary decentralised treatment scheme/s (at a precinct level) to service the early development of the Western Sydney Aerotropolis and adjacent growth areas prior to 2026. The subject site could potentially become part of any such temporary scheme. It is unknown at this stage if Sydney Water is committed to delivery of such a scheme and what servicing area it may include. Further consultation with Sydney Water after the completion of the planning studies currently being undertaken may provide more direction regarding the likelihood and timing of any such proposed temporary servicing arrangement.

No costs are provided for this option due to the lack of detailed information available.

5.3 Electricity

Based on Table C3 in AS/NZS 3000:2018 Electrical Installations ("Wiring Rules"), anticipated maximum demands for the Development Concept are given in Table 5-7 below.

Table 5.7 Projected Maximum Energy Demand

Land Use	GLA (sq.m.)	Average Energy demand (VA/sq.m.)	Total Energy Demand (kVA)
Office	4,000	75	300
Showroom Retail	7,560	100	756
Fast Food Retail	1,800	350	630
Open Space	29,275	5	146
Warehouse	54,800	15	822
Light Industrial	8,728	35	218
TOTAL	106,163		2872 (2.9 MVA)
Contingency (25%)			718
TOTAL WITH CONTINGENCY			**3.6 MVA**

An electricity easement, 30.48 metres wide, traverses the site generally from north to south, straddling the boundaries of No 1410 and No 1420 Elizabeth Drive. This easement contains 132 kV overhead power lines, which are the main transmission lines between the Kemps Creek and Luddenham Zone Substations, forming part of the West Liverpool Transmission network owned and operated by Endeavour Energy. Land uses such as car parking but not building construction are allowable activities within the easement.

Additional overhead power lines run along both sides of Elizabeth Drive and to properties to the south. These consist of 11 kV and lower voltage power lines.

The site would be serviced from the Kemps Creek Zone substation located at the corner of Devonshire Road and Cross Street. This zone substation provides both 33kV and 11kV power, and has two 25 MVA transformers for a total installed capacity of 50 MVA. Endeavour Energy's Distribution Annual Planning Report (2018) notes that current maximum demands are approximately 12.7 MVA in summer and 9.3 MVA in winter, and forecasts a reduction to 10.1 MVA in summer and an increase to 11.5 MVA in winter up to 2021, so there is considerable reserve capacity.

There are plans to upgrade the Kemps Creek Zone substation to include a 132kV switching station by 2024 to service the Western Sydney Priority Growth Area, the Western Sydney Airport and surrounding developments. Joint planning is also being undertaken with Transgrid to consider an alternative bulk supply point closer to the Airport. In either case, there would be increased availability of power to the site.

Endeavour Energy has confirmed that the site could be serviced from the substation based on current loads. Two new underground 11kV feeders (typically 300 mm2 copper XLPE cable) would need to be extended to probably two (one larger and one smaller) padmount transformers within the site. The approximate distance from the zone substation to the site is 2 km but the actual length of cable would depend on the siting of the internal transformers. Low voltage (three-phase and single-phase 240V) reticulation would then be provided from the internal transformers to individual development sites and to street lighting. All internal reticulation would be underground.

5.4 Gas

Jemena advise that a 150mm diameter high-pressure (1050 kPa) secondary gas main is located on the northern side of Elizabeth Drive. This would need to be stepped down in pressure to provide network mains to service the site.

Jemena has confirmed that Natural Gas can be supplied to this site, subject to an economic assessment being carried out based on final layout and load configurations.

Accordingly, gas supply is not considered a development constraint.

5.5 Telecommunications

Telstra Corporation advise that Telstra cables are located on both sides of Elizabeth Drive, as well as in Range Road to the east of the site.

The National Broadband Network Corporation has advised that Cecil Park was scheduled for high-speed FTTN broadband (Fibre to the Node) between April and June 2018. This has been confirmed on the current NBN Rollout Map for NSW.

Accordingly, full telecommunications services will be available to the site.

6 Conclusion

6.1 Water and Wastewater Servicing

This report concludes that;

- The site can be provided with drinking water and wastewater services.
- Further refinement of the servicing strategies will need to be undertaken in consultation with Sydney Water, RMS and other relevant authorities in the strategic and detailed planning phases of this project to determine the preferred option for servicing that will be independent of the servicing of the Badgerys Creek Aerotropolis and the construction of new road infrastructure.
- Private servicing by the developer can be undertaken independently of Sydney Water, but subject to their approval as to the point of discharge. These services will need to be fully funded by the proponent as required.

6.2 Other Infrastructure

This report demonstrates that existing electrical, gas and telecommunications infrastructure is available to service the site, and additional capacity can readily be provided.

The site is flood free and well drained, and stormwater discharge from the site can be managed within the site to ensure that the runoff does not exceed existing conditions in quantity or quality.

The proposed acquisition of land by Roads and Maritime Services for the M12 corridor through the site does not prevent normal development of the site.

LOTS 1-9,1400-1480 ELIZABETH DRIVE, CECIL PARK

Appendix A **Title Plan**

WESTERN SYDNEY TOWN CENTRE PTY LTD

PLAN FORM 2

Plan Drawing only to appear in this space

SIGNATURES AND SEALS ONLY

DP1054778

Registered 28-10-2004

C.A. : SEE CERTIFICATE

Title System : TORRENS

Purpose : SUBDIVISION

Ref Map : U8245-4, U7345-6

Last Plan : DP229646

PLAN OF SUBDIVISION OF LOT 3 ON DP.229646

Lengths are in metres. Reduction Ratio: 1:3000

L.G.A: LIVERPOOL

Locality: ~~BADGERYS CREEK~~ CECIL PARK

Parish: MELVILLE

County: CUMBERLAND

This is sheet 1 of my plan in 2 sheets (Delete if inapplicable)

Survey Certificate *Surveyors (Practice) Regulation 1996*

I JOHN HOWIE (C.J.BRITTEN AND ASSOCIATES)

of P.O. BOX 171A FAIRFIELD MTS NSW 2165

a surveyor registered under the Surveyors Act, 1929, as amended, hereby certify that the survey represented in this plan is accurate and has been made in accordance with the Surveyors (Practice) Regulation, 1998

and was completed on 21ST AUGUST 2000

This survey relates to LOTS 1-9 INCLUSIVE

(here specify the land actually surveyed, or specify any land shown in the plan that is not the subject of the survey)

Datum Line: A ~ B

Zoning: Suburban/~~Country~~ (Signature)

Surveyor registered under the Surveyors Act 1929

Plans used in preparation of survey/compilation.

DP.229646
DP.217806
DP.621659

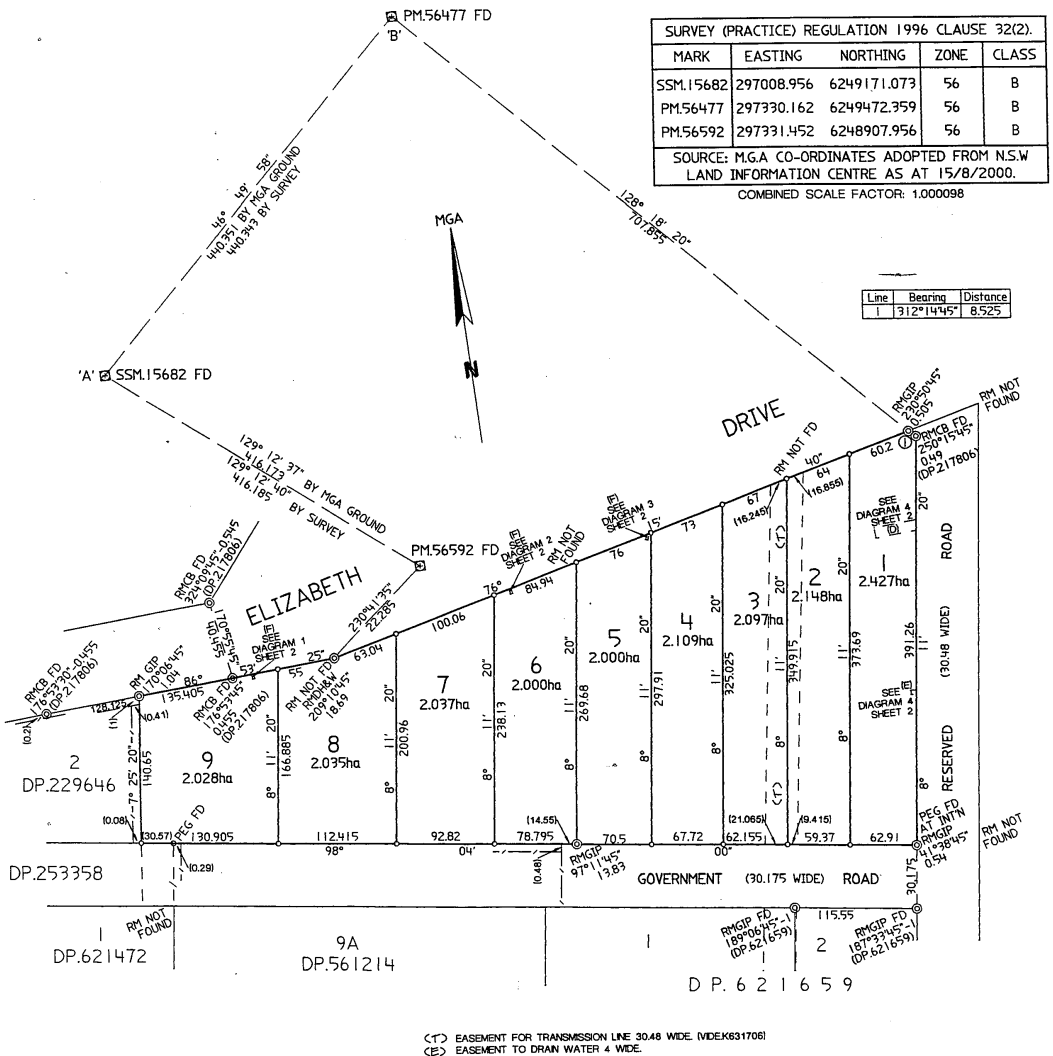
PANEL FOR USE ONLY for statements of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT AS AMENDED 1919. IT IS INTENDED TO CREATE:

1. EASEMENT TO DRAIN WATER 4 WIDE.
2. EASEMENT TO DRAIN WATER 10 WIDE.
3. EASEMENT TO DRAIN WATER 2 WIDE.
4. RESTRICTION ON USE OF LAND.
5. RESTRICTION ON USE OF LAND.

SURVEY (PRACTICE) REGULATION 1996 CLAUSE 32(2).				
MARK	EASTING	NORTHING	ZONE	CLASS
SSM.15682	297008.956	6249171.073	56	B
PM.56477	297330.162	6249472.359	56	B
PM.56592	297331.452	6248907.956	56	B
SOURCE: M.G.A CO-ORDINATES ADOPTED FROM N.S.W LAND INFORMATION CENTRE AS AT 15/8/2000.				
COMBINED SCALE FACTOR: 1.000098				

Line	Bearing	Distance
1	312°14'45"	8.525



(T) EASEMENT FOR TRANSMISSION LINE 30.48 WIDE. (VIDE K631706)
(E) EASEMENT TO DRAIN WATER 4 WIDE.
(D) EASEMENT TO DRAIN WATER 10 WIDE.
(F) EASEMENT TO DRAIN WATER 2 WIDE.

Crown Lands Office Approval

PLAN APPROVED ..... Authorised Officer

Land District .....

Paper No. .....

Field Book ..... pages .....

Subdivision Certificate

I certify that the provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to the proposed SUBDIVISION set out herein

* (insert subdivision or new road)

D.K. KOSSIV

* Authorised Person/~~General Manager/Accredited Certifier~~

Consent Authority: LIVERPOOL CITY COUNCIL

Date of Endorsement: 26-10-2000

Accreditation no: .....

Subdivision Certificate no: 290

File no: 1295-880

Note:
When the plan is to be lodged electronically in the Land Titles Office, it should include a signature in an electronic or digital format approved by the Registrar - General.

* Delete whichever is inapplicable

SURVEYOR'S REFERENCE: 3712 "CHECK LIST" ORIGINAL PLAN SIGNED IN BLUE INK

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

LOTS 1-9,1400-1480 ELIZABETH DRIVE, CECIL PARK

Appendix B Proposed M12 Acquisition

WESTERN SYDNEY TOWN CENTRE PTY LTD

TfNSW M12 Map – M12 Land Acquisition

PLAN
SHOWING LAND TO BE ACQUIRED
FOR ROAD PURPOSES AT CECIL PARK

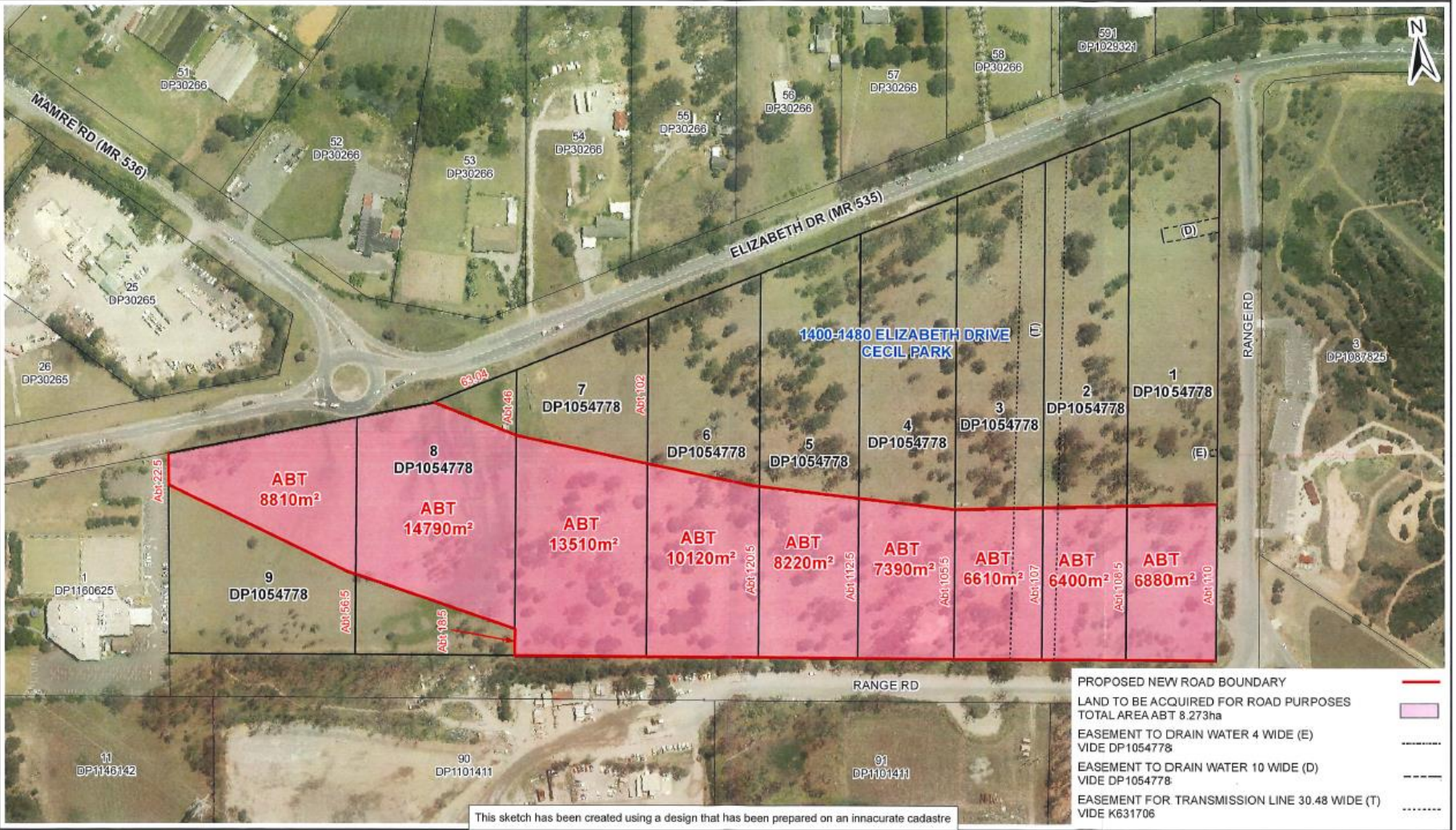
Reduction Ratio 1:2500

Lengths are in metres

ROADS & MARITIME SERVICES
BUSINESS SERVICES

LGA: LIVERPOOL Locality: CECIL PARK
Parish: MELVILLE County: CUMBERLAND

SKETCH
SR 5270
DRAWN 06/02/2019



This sketch has been created using a design that has been prepared on an innacurate cadastre

Dimensions and positions of improvements in relation to the boundaries are subject to final survey
Offsets are 90° to property boundaries

0 25 50 100 Metres

Transport Roads & Maritime Services
NSW GOVERNMENT

LOTS 1-9,1400-1480 ELIZABETH DRIVE, CECIL PARK

Appendix C Development Concept

WESTERN SYDNEY TOWN CENTRE PTY LTD

DEVELOPMENT SUMMARY	
SITE AREA 1	90,461m²
RMS (M12)	82,730m²
SITE AREA 2	15,690m²
TOTAL	**188,881m²**
TOTAL DEVELOPABLE AREA	**106,151m²**
TOTAL WAREHOUSE GFA	54,790m²
TOTAL OFFICE GFA	5,770m²
TOTAL INDUSTRIAL UNITS	8,728m²
TOTAL RETAIL GFA	4,800m²
TOTAL BUILDING AREA	**74,088m²**

CAR PARKING MATRIX	REQUIRED	PROVIDED
DRIVE-THROUGH FAST FOOD	194	194
INDUSTRIAL UNITS	117	117
SERVICE STATION	31	31
WAREHOUSE	162	162
WAREHOUSE OFFICE	120	120
TOTAL	**624**	**624**

REFER TO TRAFFIC ENGINEER'S REPORT FOR FINAL CAR PARKING REQUIREMENTS

DECELERATION LANE APPROX. 135m LONG FOR LEFT IN / LEFT OUT SITE ACCESS

EXISTING 30.5m WIDE OVERHEAD ELECTRICAL EASEMENT TO BE RELOCATED. FINAL LOCATION TO BE CONFIRMED AND FUTURE DETAIL

SITE ACCESS

CAR PARK ACCESS PARKING 125No.

FUTURE TRAFFIC LIGHT INTERSECTION

ROUND-A-BOUT ACCESS TO SITE 1 & 2

SITE ACCESS BELOW RMS M12 BRIDGE

SITE 1

SITE 2

2A WAREHOUSE (2 LEVEL's) 10,840m²

1A WAREHOUSE (2 LEVEL's) 12,840m²

2B WAREHOUSE (2 LEVEL's) 12,400m²

1B WAREHOUSE (2 LEVEL's) 12,840m²

3 SERVICE STATION & RESTAURANT 800m²

4 FAST FOOD 500m²

5 FAST FOOD 500m²

6 SHOW ROOM/RETAIL 3,000m²

7A WAREHOUSE 3,290m²

7B WAREHOUSE 2,580m²

8a LIGHT INDUSTRIAL UNITS 3,676m²

8b LIGHT INDUSTRIAL UNITS 3,278m²

8c LIGHT INDUSTRIAL UNITS 1,774m²

50m SHARED HARDSTAND

30m SHARED HARDSTAND

LANDTAKE - 5,360m² (APPROX.)

SHARED ACCESS ROAD

10m SHARED ACCESS ROAD

10m LANDSCAPE SETBACK FROM CLASSIFIED ROAD

18m BUILDING SETBACK FROM CLASSIFIED ROAD

5m LANDSCAPE SETBACK

5m LANDSCAPE/BUILDING SETBACK

RMS M12 - BOUNDARY

2m BUILDING/LANDSCAPE SETBACK BOUNDARY

6m FIRE TRAIL

BIO RETENTION

RAMP UP

LOWER LEVEL TRUCK ENTRY/EXIT

CAR PARKING - 20No.

CAR PARKING - 30No.

CAR PARKING 65No.

CAR PARKING 30No.

CAR PARKING 11No.

CAR PARKING 45No.

CAR PARKING 53No.

CAR PARKING 68No.

CAR PARKING 34No.

CAR PARKING 17No.

UNDER CROFT CAR PARKING

ELIZABETH DRIVE

RANGE ROAD

MAMRE ROAD

RMS M12 ACQUISITION

AS PER RMS PLAN SHOWING LAND TO BE ACQUIRED FOR ROAD PURPOSES AT CECIL PARK
DWG - SR 5270 DRAWN: 06/02/2019

Cecil Park

1400-1480 elizabeth drive, cecil park, nsw, australia

march, 2019

site plan
1:2000 (A3)
11071_SK012

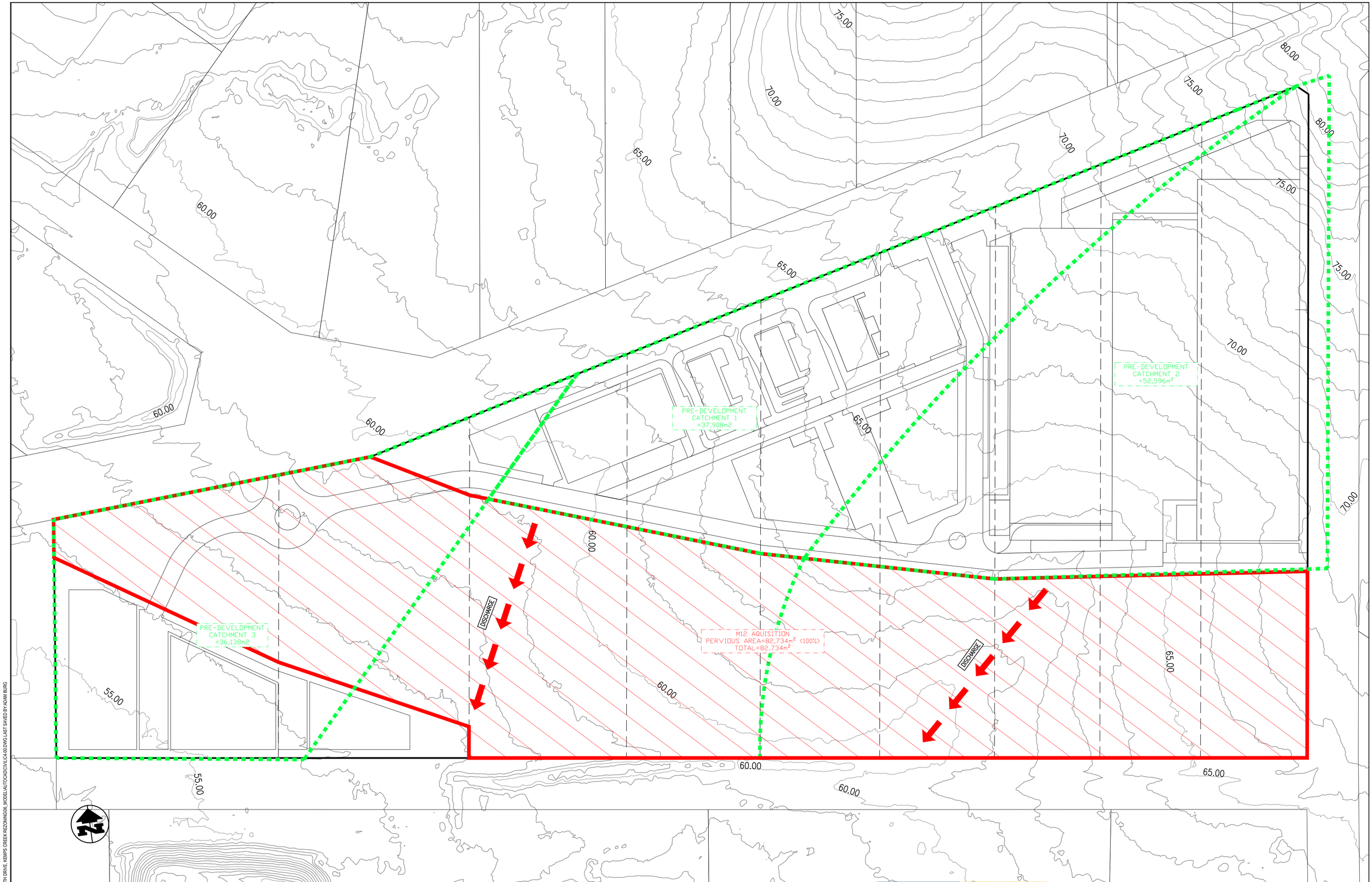
nettletontribe

Mar 20, 2019 - 1:28pm N:\11071-Kemps Creek\6 Sketches\11071_SK012.dwg

LOTS 1-9,1400-1480 ELIZABETH DRIVE, CECIL PARK

Appendix D Stormwater Drainage Concept

WESTERN SYDNEY TOWN CENTRE PTY LTD



FIRST ISSUE	DESIGN	DRAWN	CHECK	APPD.	DATE	AMENDMENT DETAILS
	AB	AB	CV	CV	13/03/19	
A		AB	CV		11/03/19	ISSUED FOR CONCEPT DESIGN
B		AB	CV		19/03/19	ISSUED FOR CONCEPT DESIGN

AMENDMENTS

STATUS

CONCEPT DESIGN

SCALE

0 10 20 30 40 50 60 70 80

SCALE 1:1000 (A1) SCALE 1:2000 (A3)

CLIENT

WESTERN SYDNEY TOWN CENTRE

calibre

 calibregroup.com

PROJECT

1400-1480 ELIZABETH DRIVE
KEMPS CREEK REZONING

DISCLAIMER

ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY, DO NOT SCALE. NOT FOR CONSTRUCTION UNLESS STAMPED BY CERTIFYING AUTHORITY

DRAWING TITLE

PRE-DEVELOPMENT STORMWATER CATCHMENT PLAN

PROJECT No.	DRAWING No.	STAGE	REVISION
19-000186	C4-00		B

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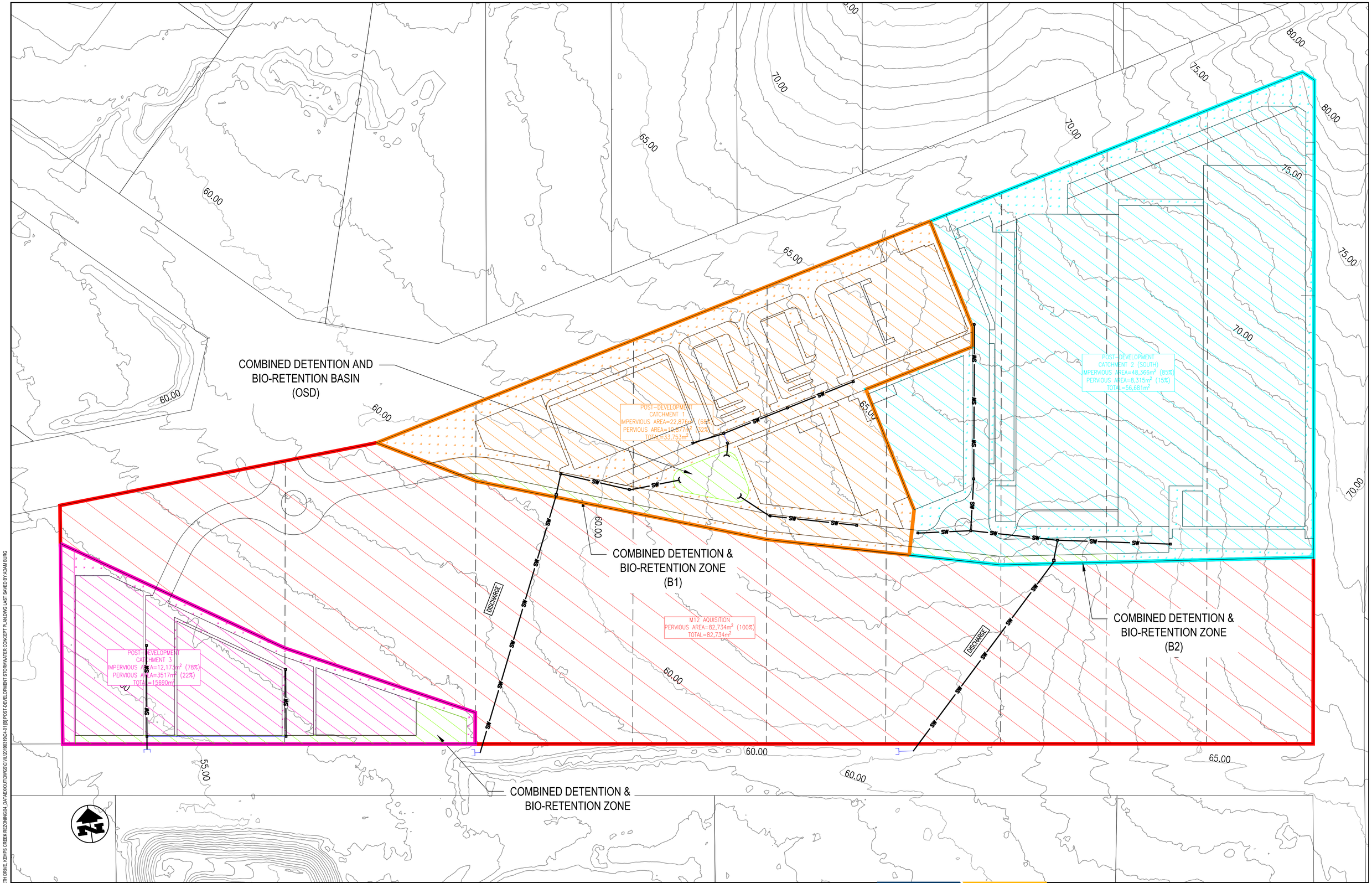

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STATUS: CONCEPT DESIGN

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CLIENT: WESTERN SYDNEY TOWN CENTRE

 calibre calibregroup.com

PROJECT: 1400-1480 ELIZABETH DRIVE
KEMPS CREEK REZONING

DISCLAIMER
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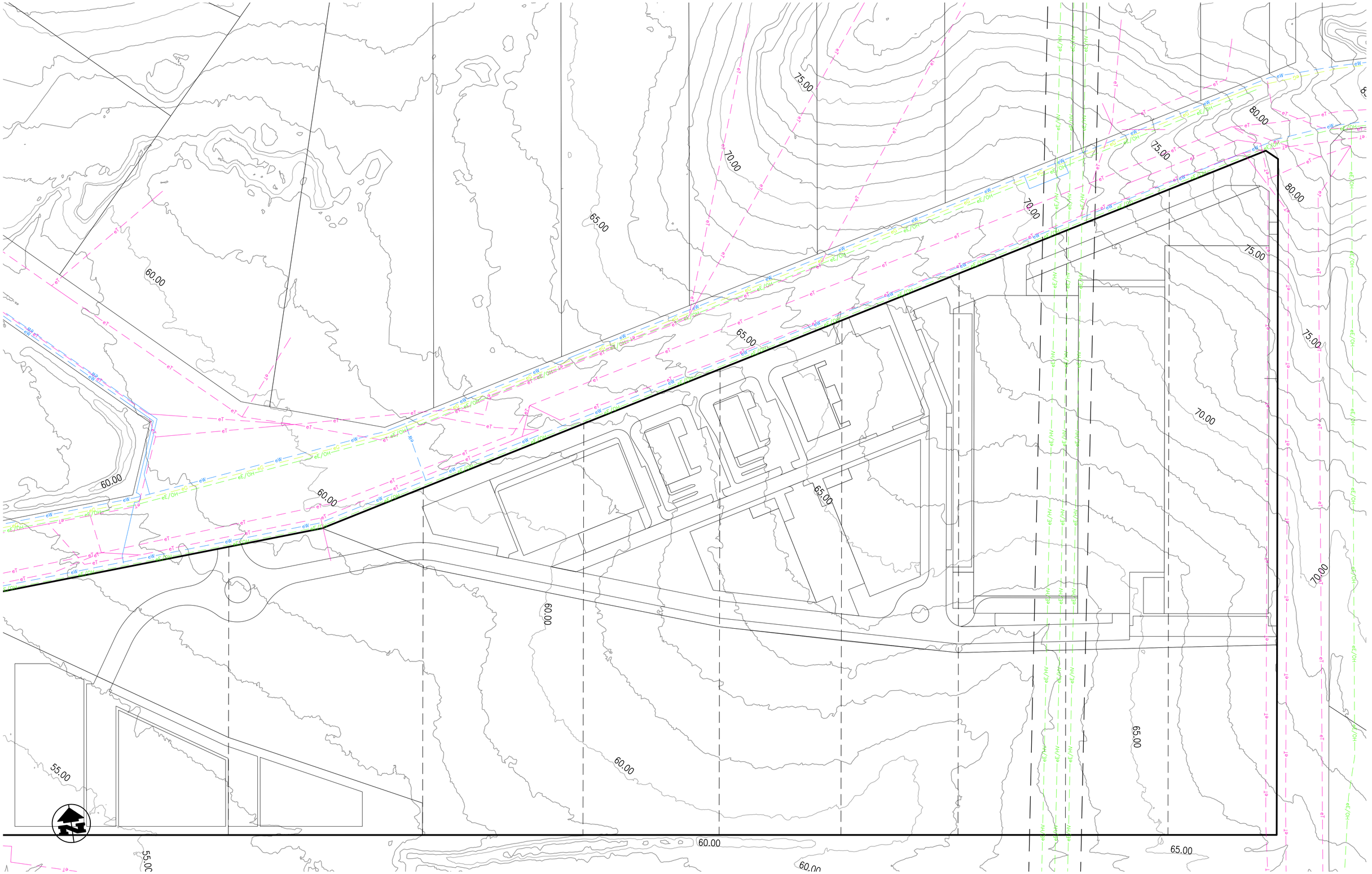
DRAWING TITLE: POST-DEVELOPMENT STORMWATER CONCEPT PLAN

PROJECT No.	DRAWING No.	STAGE	REVISION
19-000186	C4-01		B

LOTS 1-9,1400-1480 ELIZABETH DRIVE, CECIL PARK

Appendix E Existing Infrastructure

WESTERN SYDNEY TOWN CENTRE PTY LTD



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B		AB	CV		19/03/19	ISSUED FOR CONCEPT DESIGN

AMENDMENTS

STATUS

CONCEPT DESIGN

SCALE

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SCALE 1:1000 (A1) SCALE 1:2000 (A3)

CLIENT

WESTERN SYDNEY TOWN CENTRE

calibre

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PROJECT

1400-1480 ELIZABETH DRIVE
KEMPS CREEK REZONING

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DRAWING TITLE

INFRASTRUCTURE PLAN

PROJECT No.	DRAWING No.	STAGE	REVISION
19-000186	C8-00		B

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