

BLIGH TANNER

LOGAN CITY COUNCIL

APPROVED DOCUMENT

This is an approved document for Development Application

MCUI/13/2018

10 LAUREL STREET, WOODRIDGE TRINDER PARK

SITE BASED STORMWATER MANAGEMENT PLAN

Company. Lutheran Services
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Position. Project Manager, RPSPM
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RFQ # 2017.0289

DOCUMENT CONTROL SHEET

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10 Laurel Street, Woodridge
Trinder Park

JOB NUMBER

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PROJECT ENGINEER

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CLIENT

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1 INTRODUCTION

1.1 Background

Bligh Tanner Pty Ltd was commissioned by RPS Project Management, c/- Lutheran Community Care, to prepare this Site Based Stormwater Management Plan (referred to as SBSMP herewith), for the proposed development at 10 Laurel Street, Woodridge. This SBSMP has been completed in support of the DA application to investigate the conceptual stormwater management strategy to be adopted for the proposed works. Detailed hydraulic modelling and detailed design is required to further progress the stormwater management strategy for the development and will form part of the submission of future operational works applications.

1.2 Description of the Proposed Development

RPS, BVN and the design team have developed a masterplan for development of aged care facilities on the Trinder Park site. The proposed development is to consist of a new RACF building, new ILUs, botanic gardens, community plaza, retail and a new entry and exit from Acacia Road.

The project includes the following key components (refer to BVN documents for further information):

- Residential aged care (RAC) facility with 3 above ground levels and single storey basement
- Repurposed nursing home
- Existing chapel at the centre of the development
- Independent Living Units (ILUs)
- Enhancement of the existing Lake
- New access road provision
- Infrastructure replacement and upgrades

A layout plan of the proposed development is provided in Appendix A, an insert of which can be seen overleaf, (with centrally placed existing chapel [03] and RAC building around [01]).

1.3 Report Objectives

The purpose if this site based stormwater management plan is to support a development application. It describes the stormwater strategy for the site and considers erosion and sediment control and stormwater management (water quality and hydrology).

This stormwater management plan has been prepared in accordance with the requirements for Site Based Stormwater Management Plans as outlined in the *State Planning Policy* and Council's planning scheme.



Figure 1 BVN Masterplan dated 9 August 2017

2 SITE CHARACTERISTICS

2.1 Location

The site is located within the Logan City Council jurisdiction, approximately 24 km south west of Brisbane's CBD in the suburb of Woodridge. Woodridge is predominantly Low Density Residential with small areas of Low-Medium Density Residential. There are also some neighbourhood centre zones throughout the suburb. The site is bound to the north, west and south by Karawatha Forest Park which is located within the Brisbane City Council Local Government Area. The north-eastern boundary of the site aligns with Acacia Road and is lined by residential allotments.

At the south end of the site there is a large easement associated with the Trinder Park Pump Station, (referred to as TPPS) and water main, located within this easement are two water storage tanks. The easement intersects the site and runs in a predominantly east/west direction along the ridgeline in the southern part of the site.

The site has two points of entry, the main entry point is from Laurel Street to the South and a secondary access point off Patricia Avenue towards the north of the site.

2.2 Topography

The site has a steep slope and falls from the highest point being at the pump station and water tanks, towards Acacia Road and the existing dam on site to the north east and Karawatha Forest to the north. Ultimately, site runoff is conveyed overland towards Slacks Creek downstream. The site falls over 25

metres from above RL 70m AHD at the TPPS to RL 45m AHD at the existing dam to the north, fronting Acacia Road.

The existing facilities on site are represented predominantly by single storey brick buildings. These are made up of RAC, nursing home, administration and reception building. There is also a Community Hall and Chapel located in the middle of the site. The remaining development on the site is made up of single storey independent living units (ILU).

2.3 Vegetation

Vegetation comprises of manicured lawns and gardens across the existing developed site, with much of the remaining site consisting of bushland, with small to large trees and shrubs. Drainage is good, in consideration of the falls across the site, with the eastern portion of the site and the majority of the developed site, discharging to the man-made dam to the north-east corner of the site.

3 RISKS AND OPPORTUNITIES

3.1 Site and Development Risks

- Variability of ground conditions and rock level
- Presence of uncontrolled fill (0.4m – 1.6m at RACF building location)
- Stability of man-made dam wall at detention lake.
- Cut and fill – potential for surplus spoil which will need to be managed on site to minimise costs
- Fire Ant area – restrictions on soil movement off site / costs associated with same
- Slope stability (temporary and long-term) – refer Geotechnical Report by Soil Surveys dated July 2017
- Reactive soils and removal of existing trees – potentially leading to excessive ground movements
- Logan Water (water and sewer) upgrade requirements (refer to Logan Water Technical Memorandum -Pre-Lodgement Application at Trinder Park Aged Care Rest Home dated 25 August 2017). There are significant budget allowances required for these works. Refer summary below:

3.2 Key challenges and considerations

- Developing and planning each of the construction phases particularly in relation to basement excavation and retention requirements. The phases should also consider support of adjacent buildings, contractor working areas and safe exclusion zones – and seek to minimise disruption to residents
- Ageing infrastructure and in-ground services (and need to plan and phase its upgrade), and poor site records of same
- Need to maintain servicing to Operational facilities during construction of services upgrades
- Planning for significant infrastructure upgrades, building construction, new roads and car parking alongside new and refurbished buildings.
- Sitewide earthworks modelling (cut, fill) to optimise cut / fill.
- Studying opportunities for open cut excavations to minimise cost of retention systems
- Designing with the overall masterplan and phasing in mind.

- Consideration of early tree removal in proposed building areas to minimise ground movements

3.3 Opportunities

- Maximise use of swales and natural landscaping within the stormwater treatment strategy.
- Similarly, the use of the enhanced lake as part of the site wide detention strategy.
- Early consideration of earthworks modelling to optimise cut and fill as far as possible
- Early consideration of the orientation of the ILUs and their associated earthworks.
- Site wide infrastructure upgrades undertaken during stage 1 to facilitate the new building and the growth upon the site and to get maximum cost efficiency.

4 BULK EARTHWORKS

4.1 Geotechnical Investigation

A preliminary geotechnical investigation has been undertaken by Soil Surveys and is appended for reference, (Project 117-19539, dated July 2017). The scope of geotechnical services provided by Soil Surveys Engineering Pty Limited was directed towards a preliminary evaluation (Phase 1 Study).

It should be noted that the findings in Soil Surveys' report are preliminary in nature and suitable for planning purposes only. A detailed geotechnical investigation should be carried out, following finalisation of development planning, for the purposes of detailed design.

4.2 Subsurface Profile

A total of seven boreholes were taken across the site including two deep bores where the proposed RAC building is to be located. Subsurface conditions were found to consist of fill material (considered uncontrolled fill material varying from 400mm to 1.6m), overlying natural silty sand, natural sandy clayey gravel and weathered siltstone and sandstone at depth.

4.3 Proposed Earthworks

The proposed development includes a basement carpark and significant earthworks will be required for this excavation, including the possible use of a rock breaker for the weathered rock. Limited filling is likely to occur as part of the development and therefore the majority of the excavated material will need to be disposed of off-site subject to restrictions on soil movement within fire ant zones, or kept on-site.

Significant retention systems are likely due to the 20 metre fall across the site. Construction sequencing, staging and various retention systems all need to be considered as part of the detailed design phase.

4.4 Erosion and Sediment Control

The investigation has confirmed an Emerson Class of 3 to 4 across the samples taken, indicating a medium to high potential for erosion and dispersity. An erosion and sediment control plan will be required as part of the approval process and is discussed further within the Site Based Stormwater Management Plan prepared by Bligh Tanner.

4.5 Man-made Lake

The construction of the existing lake was considered to have not been carried out under controlled conditions. The existing dam wall is considered steep in terms of long term stability and with material of variable quality.

It is proposed for the existing lake to be expanded and utilised for on-site attenuation, treatment of runoff and provide a sustainable, environmental solution that can be utilised as a feature for residents. Dewatering of the existing lake may be required as well as improving the long-term stability of the lake. Capacity of the lake is considerable, with the top 500mm providing an estimated 700m^3 storage.

4.6 Other considerations

- Variability of ground conditions and rock level.
- Presence of uncontrolled fill (0.4m – 1.6m at RACF building location)
- Stability of man-made dam wall at detention lake.
- Cut and fill – potential for surplus spoil which will need to be managed on site to minimise costs.
- Fire Ant area – restrictions on soil movement off site / costs associated with same.
- Slope stability (temporary and long-term) – refer Geotechnical Report by Soil Surveys dated July 2017.
- Reactive soils and removal of existing trees – potentially leading to excessive ground movements.

5 STORMWATER MANAGEMENT STRATEGY

5.1 Existing Drainage and Lawful Point of Discharge

The existing site falls over 20 metres in a northerly direction, with stormwater runoff ultimately discharging to Slacks Creek further downstream. The site discharges in two main directions, with the majority of the developed portion of the site discharging overland directly north towards the Acacia Road carriageway and the remaining bushland discharging north west through Karawatha Forest Discovery Centre.

There is an existing man-made lake to the north-east corner of the site that accepts runoff from the majority of the existing development. This lake has evidence of scouring and steep batters. As part of the development it is intended to expand this lake to provide additional detention storage, harvesting of runoff and provide enhance the landscape.

5.2 Stormwater Quantity Strategy

It is estimated that the fraction impervious of the site increases marginally from 14.5% to 23% once the proposed development is complete. This increase would generate increased peak stormwater runoff off site, although this increase would likely be negligible by comparison to the total peak flow from the entire catchment. Refer to the catchment plans in Appendix A for reference.

To mitigate the possible adverse impacts created by this runoff increase, the existing lake will be expanded to provide additional storage to capture and attenuate runoff from the development before overtopping and discharging towards Acacia Road in accordance with existing site conditions.

The development should ensure that there is no change to these peak flows resulting from increased impervious surfaces and more efficient drainage systems. It has been estimated that the increase in peak flows of-site can be attenuated with an additional detention storage of approximately 500-900m^3. Detailed hydraulic modelling will confirm this as the design progresses through detailed design, however, this temporary storage will account for approximately an additional 300mm to 500mm ponding in the lake during heavy rain periods.

As the architectural and landscape design is still in development at the time of preparing this report, the detailed design of the stormwater system will need to occur at a later date. In principle, existing overland

flow paths are to be maintained wherever possible and will be formalised to become part of the landscape concept. Refer to the landscape concept plan for reference, in Appendix A.

5.3 Stormwater Quality Strategy

The development will trigger the current State Planning Policy and Council's stipulated water quality objectives. The designated overland flow paths will be formalised open channels. It is recommended that these open channels have sections with bioretention swales incorporated into their design at strategic locations that prevent scouring, whilst providing adequate treatment of overland flow.

Irrigation of trees incorporated into the landscaping as well as bioretention basins within the streetscape will also further assist to increase the treatment of runoff. Consideration can also be given to providing rainwater tanks to the RACF and other main building for the capture and harvesting of roofwater for non-potable uses such as irrigation and toilet flushing.

The existing lake will provide an element of treatment of runoff, however should the lake be utilised as harvesting of runoff for non-potable uses such as topping up the water feature for the proposed RACF, additional treatment of runoff, together with significant pumping and drainage infrastructure will be required.

6 EROSION AND SEDIMENT CONTROL

It is assumed that erosion and sediment control will be designed by the Contractor to suit their proposed construction methodology. With that in mind, the following is intended to clarify a minimum standard of practice for erosion and sediment control during the construction period.

6.1 General

All erosion and sediment control measures should be in accordance wit the International Erosion Control Association (IECA) Best Management Practices (2008), the latest version of the IECA guidelines, Council requirements and the SPP. All erosion and sediment control devices implemented onsite should represent current best management practices and all practical measures applicable to the site. This applies to all stages of the project including installation, operation and management of the control measures as well as maintenance and monitoring of devices.

6.2 Responsibility

The contractor is responsible for the establishment, management and maintenance of erosion and sediment control measures to ensure minimal environmental harm and compliance with State and Federal legislation.

6.3 Basic Concepts

- Erosion control measures favoured over sediment control devise, that is any exposed surfaces shall be stabilised as soon as practicable and sediment control devices used as a last defence;
- Limit disturbance by only clearing and disturbing areas necessary for works. Disturbance should only extend 2 to 5 metres from necessary works areas;
- Minimise the extent and duration of disturbance by staging the works.
- Divert all clean upstream stormwater runoff around the site and disturbed areas. Collect all dirty runoff from work areas for treatment.

7 CONCLUSION

- The site at 10 Laurel Street, Woodridge is to be redeveloped as a Retirement Facility building.
- The development site is not affected by flooding from any source.
- The development would need to implement a flow control / detention strategy to mitigate the possible runoff increase generated by the works.
- Any increase in peak runoff from the proposed development would have minimal impact to surrounding properties. Additional temporary storage will be provided within the existing lake to attenuate peak runoff from the proposed development.
- Stormwater quality management measures will be provided throughout the site and will include: bioretention swales within designated open channels for conveyance and mitigation of overland flow; bioretention basins; rainwater tanks; irrigation of trees; the existing lake.
- The site has been classified as medium to high risk in terms of soil loss during construction activities and so a detailed Erosion and Sediment Control Plan would be required to be implemented for construction.

APPENDIX A
SITE PLANS



KEY

1. MAX 1:20 PEDSTRIAN FOOTPATH
2. ROAD BASE WALKING TRAIL
3. WATER FEATURE
4. OPEN GRASS AREA
5. CENTRAL PIAZZA – Events, celebrations & market space
6. RAISED PEDESTRIAN ZONE
7. LARGE SHADE TREES
8. TALL FOLIAGE & NATIVE PALM PLANTING
9. EXISTING WOODLAND AREAS
10. REVEGETATION WITH NATIVE TREE SPECIES
11. BOULDER LINED CHANNEL
12. EXTENDED LAGOON
13. MID POND
14. UPPER POND
15. ROCK POOLS REST
16. 'THE CLEARING' -Meditation & passive recreation space
17. 'THE CLIFFS'- with fire pit & yarning circle
18. TIMBER BRIDGE
19. SERVICE VEHCILES
20. STAFF CARPARK
21. ACCESS ROAD

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AMENDMENTS

ISSUE	DATE		
A	-	NOT YET ISSUED	GC

LANDSCAPE LAYOUT PLAN - MASTERPLAN

TRINDER PARK AGED CARE FACILITY

10 Laurel St, Woodridge

SHEET No. x OF x
DRAWING No. SK-XX
SCALE 1:750 at A1, 1:1500 at A3
PROJECT NO. XXX
DRAWN CE
CHECKED GC

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NOTE

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ISSUE	DATE	FOR
A	08.08.17	DRAFT MASTERPLAN
B	22.09.17	FOR INFORMATION

CONSULTANT

CONSULTANT

CONSULTANT

CONSULTANT

PROJECT MANAGER
RPS

CLIENT

LUTHERANS (LCC)
CLIENT NUMBER

PF58
PROJECT

TRINDER PARK - RACF
LAUREL ST, WOODRIDGE
BVN PROJECT NUMBER

b1608013
DRAWING KEY

TRUE NORTH PROJECT NORTH

GRAPHIC SCALE
0 2000 5000
SCALE

1 : 1000@A1
STATUS

PRE-DESIGN
DRAWING

SITE PLAN

AR-A-MP-01

ISSUE
B

APPENDIX B
CIVIL CATCHMENT PLAN



LEGEND

- SITE BOUNDARY
- EXISTING CONTOURS MAJOR (1.0m INTERVALS)
- EXISTING CONTOURS MINOR (0.25m INTERVALS)
- PROPOSED OPEN CHANNEL (REFER TO TYPICAL CROSS SECTION)
- DIRECTION OF OVERLAND FLOW

NOTES

1. PROPOSED WATER FEATURE - ALLOW FOR RAINWATER TANKS FROM RACF AND ALL REQUIRED INTERNAL DRAINAGE, RISING MAIN AND PUMPS.
2. EXISTING MAN MADE LAKE: ALLOW TO STABILIZE EXISTING BATTERS TO IMPROVE LONG-TERM STABILITY AND INCREASE TEMPORARY STORAGE FOR DETENTION.
3. CONSTRUCTED WEIR
4. TREATMENT OF STORMWATER RUNOFF TO BE PROVIDED BY BIORETENTION BASINS WITHIN GARDEN AREAS, SWALES AND BIORETENTION WITHIN THE OPEN CHANNELS AND TREE IRRIGATION

NOT FOR CONSTRUCTION

SCALE 1:1000 0 10 20 30 40m

BLIGH TANNER

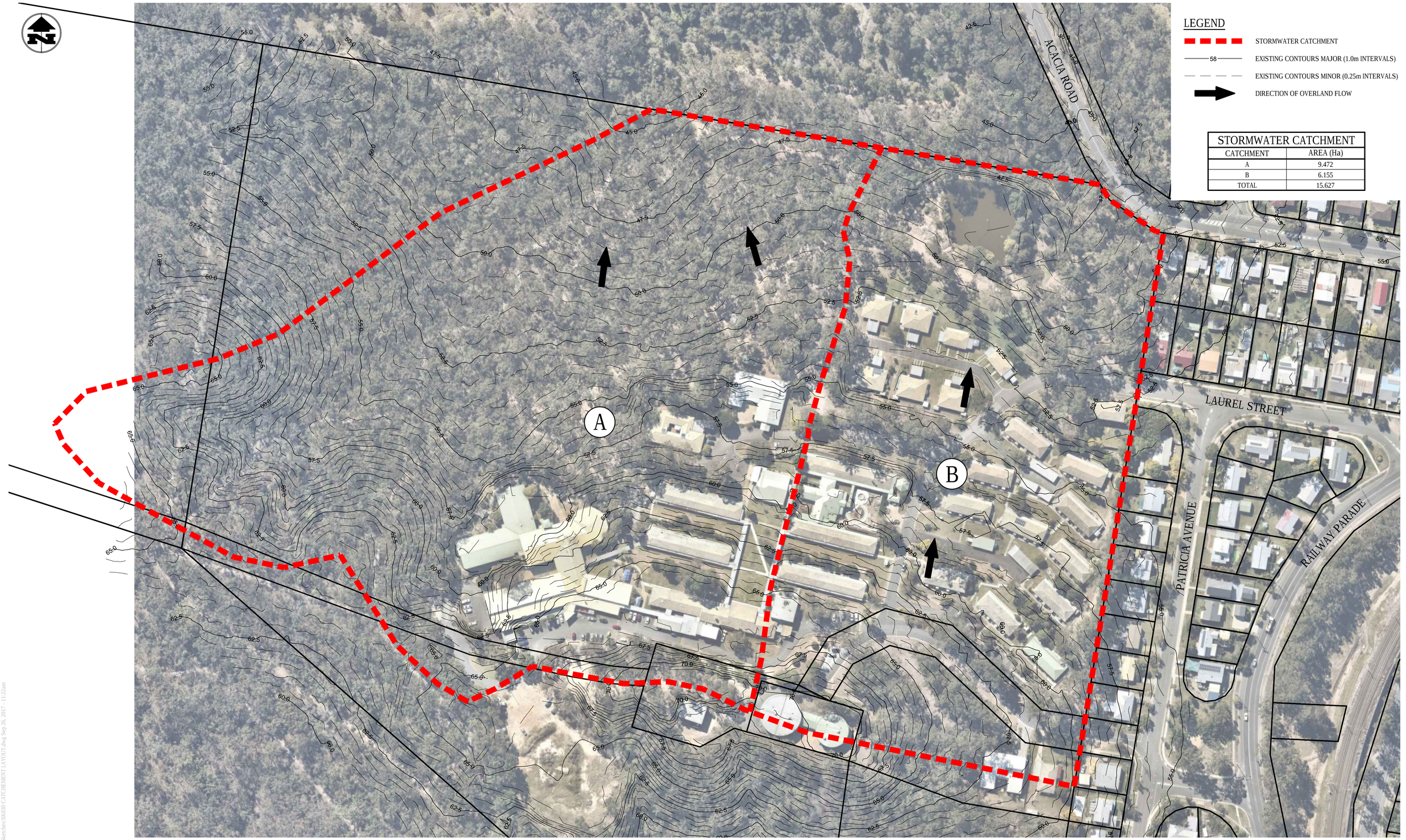
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REV	DATE	DESCRIPTION	DESIGN	DRAWN	CHECKED	APPROVED	RPEQ
A	DD-MM-2017	PRELIMINARY ISSUE					

PROJECT	LCC TRINDER PARK	DRAWING TITLE	PROPOSED STORMWATER CONCEPT PLAN
LOCATION	10 LAUREL ST, WOODRIDGE QLD 4114	ARCHITECT	
CLIENT	LUTHERAN COMMUNITY CARE	ASSOCIATE CONSULTANT	
SCALES	1:1000 @ A1	JOB NO	2017.0289
DRAWING NO	SK040	REVISION	----

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STORMWATER CATCHMENT	
CATCHMENT	AREA (Ha)
A	9.472
B	6.155
TOTAL	15.627

NOT FOR CONSTRUCTION

SCALE 1:1000 0 10 20 30 40m

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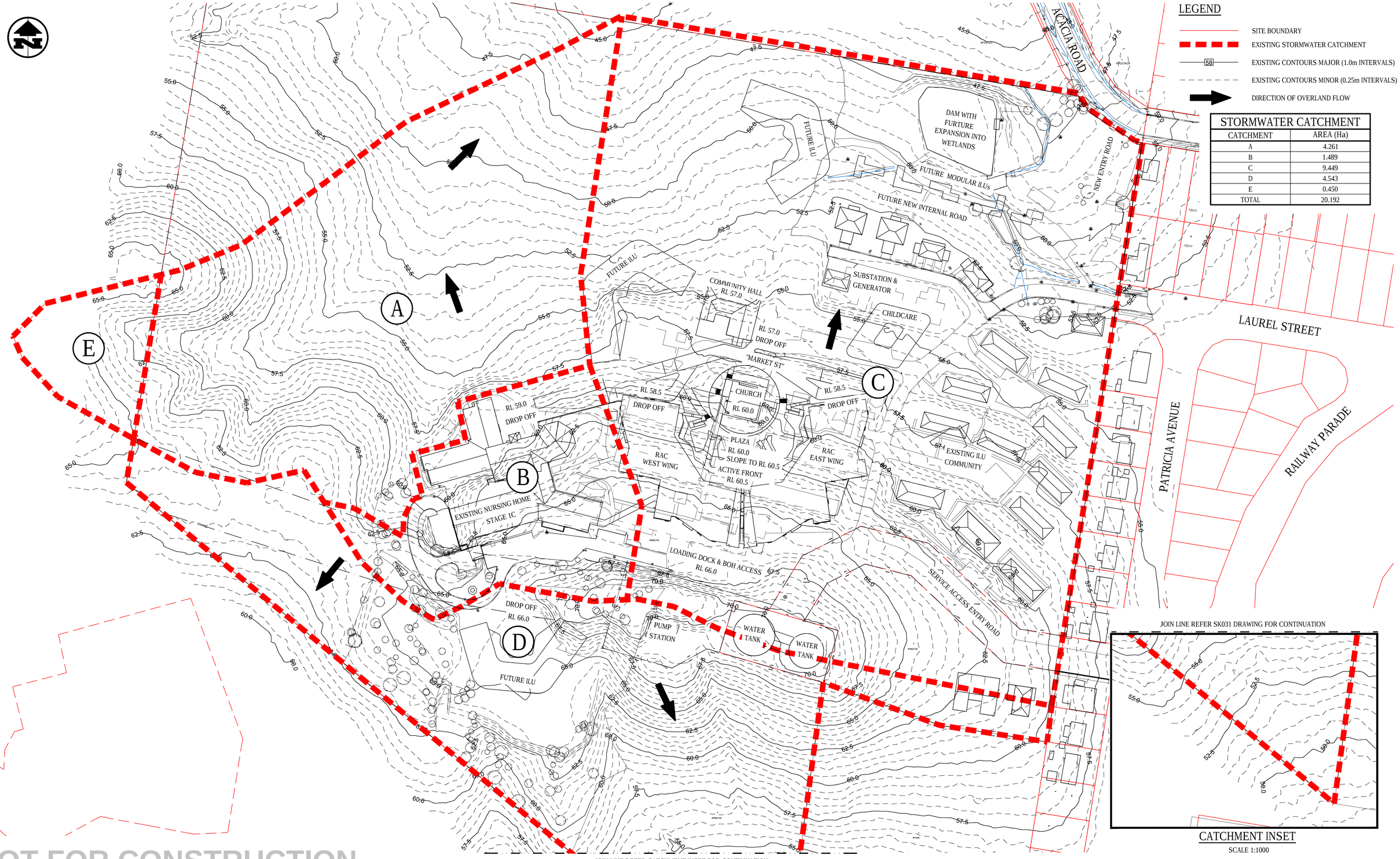
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REV	DATE	DESCRIPTION	DESIGN	DRAWN	CHECKED	APPROVED	RPEQ
A	26-09-2017	PRELIMINARY ISSUE					

PROJECT	LCC TRINDER PARK	DRAWING TITLE	CATCHMENT LAYOUT
LOCATION	10 LAUREL ST, WOODRIDGE QLD 4114	ARCHITECT	
CLIENT	LUTHERAN COMMUNITY CARE	ASSOCIATE CONSULTANT	
SCALES	1:1000 @ A1		
JOB NO	2017.0289		
DRAWING NO	SK030	REVISION	A

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STORMWATER CATCHMENT

CATCHMENT	AREA (Ha)
A	4.261
B	1.489
C	9.449
D	4.543
E	0.450
TOTAL	20.192

CATCHMENT INSET

SCALE 1:1000

SCALE 1:1000 0 10 20 30 40m

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REV	DATE	DESCRIPTION	DESIGN	DRAWN	CHECKED	APPROVED	RPEQ
A	DD-MM-2017	PRELIMINARY ISSUE					

PROJECT: LCC TRINDER PARK	DRAWING TITLE: PROPOSED CATCHMENT PLAN	SCALES: 1:1000 @ A1	
LOCATION: 10 LAUREL ST, WOODRIDGE QLD 4114	ARCHITECT	JOB NO: 2017.0289	
CLIENT: LUTHERAN COMMUNITY CARE	ASSOCIATE CONSULTANT	DRAWING NO: SK031	REVISION: ----

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