St Francis College, Crestmead
Proposed BGA 2013
STORMWATER MANAGEMENT PLAN

Opus International Consultants (Australia) Pty Ltd

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1. INTRODUCTION

Opus International Consultants (Australia) Pty Ltd. has been commissioned by St Francis College to identify the stormwater quantity and quality management measures required for the construction and operational phases of the proposed new buildings and proposed modification to the existing car park area at St Francis College, Crestmead.

The report has been developed in accordance with the current State Planning Policy 4/10 – Healthy Waterways, Queensland Urban Drainage Manual Second Edition 2007 (QUDM) and 'best management practices'.

2. SITE CHARACTERISTICS

2.1 LOCATION

The St Francis College is located at 64 Julie St, Crestmead. The property description of the site is Lot 1 on RP191064 with a total area of approximately 9.8 hectares. Refer to 'Locality Plan' and 'Aerial Photo' in Appendix A for the site location.

The subject site has frontage to Julie Street to the east. The site is accessed from Julie Street.

The proposed development on the site consists of 1 new prep building, 1 new multipurpose room and 3 new GLA buildings with a total new roof area of 365 m^2. The car park has been proposed to be modified with additional car park areas and set down area. The total increase of impervious area due to the proposed development will be approximately 800 m2. Refer to the 'Proposed Site Plan' in Appendix A for the proposed location of the new buildings.

2.2 EXISTING TOPOGRAPHY & DRAINAGE

According to the part site survey and contour information available, it is understood that the site generally falls towards south and south-east towards Julie Street. The average slope of the site is approximately 3%. Refer to 'Site Survey' in Appendix A.

The stormwater runoff from the site currently discharges into the existing internal stormwater drainage network and ultimately discharges into the existing stormwater pipe in Julie Street to the east.

2.3 FLOODING

The site, according to the Logan City Council's electronic map information, has not been identified as within flood prone areas. Refer to the LCC Flood Regulated Area Map – 11 attached in Appendix D.

3. METHODOLOGY

The proposed development will comprise of the construction of a new prep building, a multipurpose room and 3 GLA buildings located in the north-eastern part of the St Francis College. The existing car park to the east with frontage to Julie Street will be modified with additional car park spaces and set down area.

Refer to Appendix B for the Architectural Site Plan.

The overall increase of the impervious area due to the new buildings and modification of the existing car park will be approximately 800 m^2. The increase in runoff due to the proposed new building has been calculated and compared against the pre-development runoff.

The existing lawful point of discharge to Council's stormwater drainage system in Julie Street is to be maintained as part of these works, in accordance with the Section 3.4 of QUDM.

4. STORMWATER QUANTITY

4.1 RATIONAL METHOD

Rational Method calculations were undertaken to estimate the peak discharge during various storm events for the pre and post-developed scenarios.

The time of concentration has been calculated to be 8.5 minutes along the road along the northern boundary, consisting of 5 minutes of Standard Inlet Time and 3.5 minutes kerb and channel flow for 430 m at 3% slope. The existing college site has an impervious area of approximately 25%. The proposed new buildings will increase the impervious area by approximately 800 m2, which will make the post-developed percent impervious to 26 %.

An IFD chart for Marsden was created, a copy of which is attached in Appendix F. For further details of the adopted parameters in these calculations, refer to the Rational Method calculations spreadsheets in Appendix E. The results from the rational method analysis for the existing site are summarised in Table 4.1 below.

Table 4.1: Peak flows for Pre- and Post- Development

Catchment	Area (ha)	ARI (years)	% impervious		Peak Flow (m^3/s)	
			Pre-Development	Post-Development	Pre-Development	Post-Development
Site	9.8	1	25	26	1.56	1.57
		2			2.11	2.12
		5			2.94	2.95
		10			3.45	3.47
		20			4.14	4.15
		50			5.27	5.29
		100			6.09	6.11

4.2 NON-WORSENING REQUIREMENTS.

As illustrated in Table 4.1, due to the increase in impervious areas a minor increase in the total peak stormwater discharge off site has been observed.

However the increase in peak flow due to the proposed new development has been considered insignificant to require any on site stormwater detention.

The existing lawful point of discharge to Council's stormwater drainage system in Julie Street is to be maintained as part of these works, in accordance with the Section 3.4 of QUDM.

Refer to the drawing SW01 in Appendix C for the proposed stormwater drainage layout.

5. STORMWATER QUALITY

The proposed development will increase the overall impervious area of the site by approximately 800 m^2 . This increase will not warrant the water quality objectives as per the 'State Planning Policy 4/10 – Healthy Waters'. The current State Planning Policy 4/10 – Healthy Waters notes that any building area with a less than 2500 m^2 is not required to meet the water quality management design objectives under the policy.

6. CONCLUSION

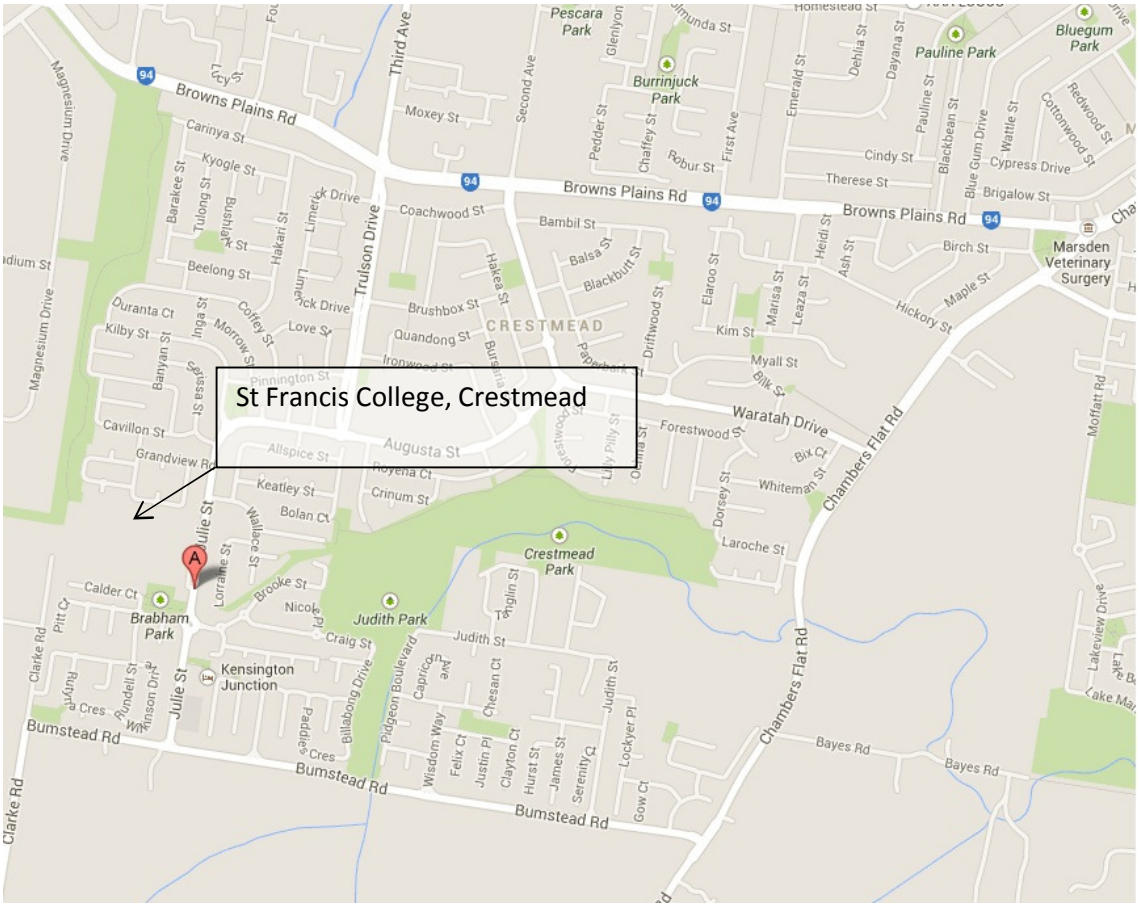
This report has investigated the stormwater runoff quantity and quality issues for the proposed development at St Francis College, Creastmead. The report has demonstrated that the development has been designed in accordance with Council Guidelines, QUDM and best management practices.

7. REFERENCES

Department of Natural Resources and Water, 2007. "Queensland Urban Drainage Manual – Volume 1, Second Edition 2007." Natural Resources and Water, Local Government Engineers Association & Brisbane City Council

Department of Environment and Resource Management, 2010. ''State Planning Policy 4/10 Healthy Waters"

APPENDIX A – Locality Plan and Site Survey

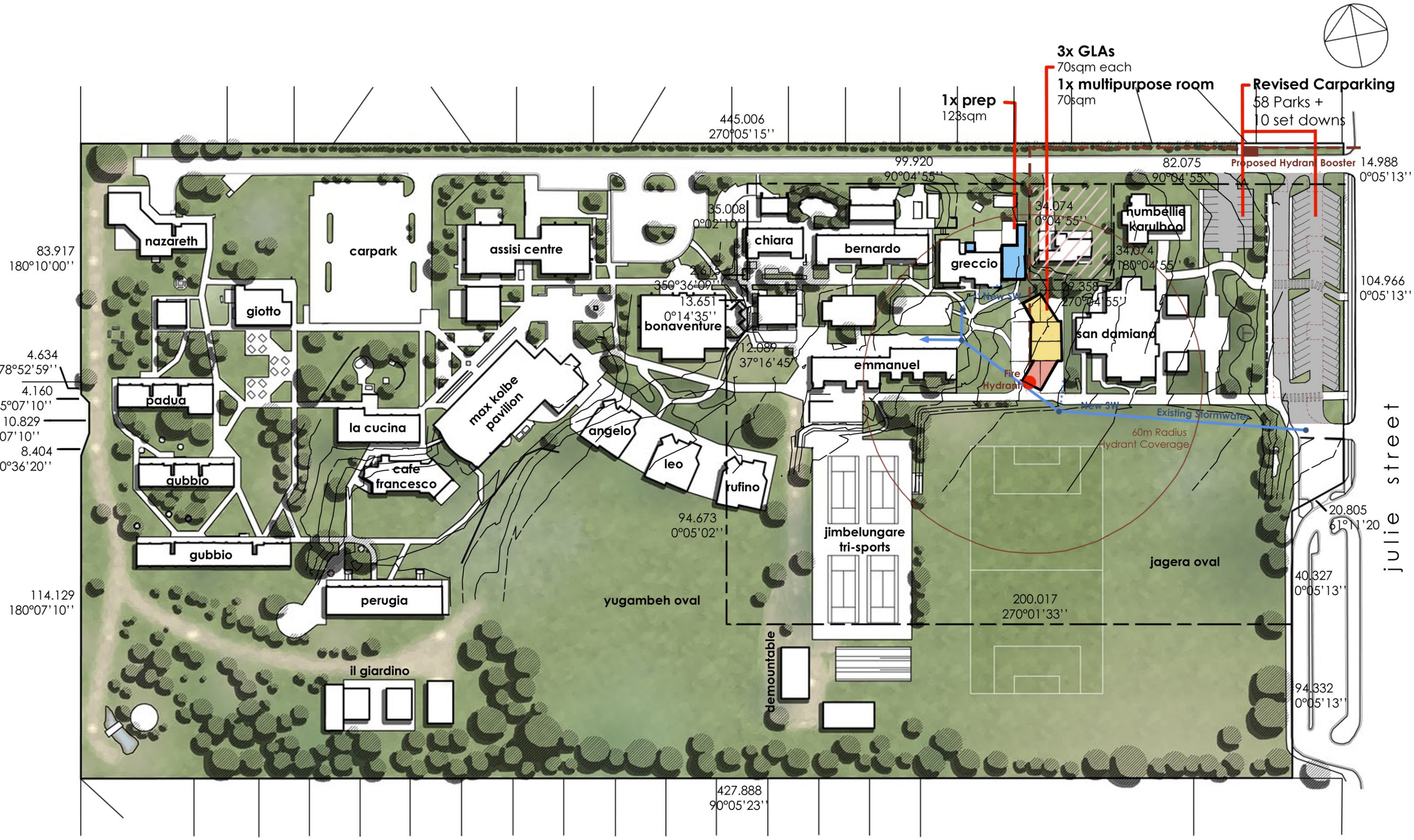


Site Locality Plan (From Google Map)



Site Aerial Photo (From Google Earth)

APPENDIX B – Architectural Site Plan



64 Julie Street, Crestmead
QLD 4132

Lot 1 on RP191064
PARISH of MACKENZIE
COUNTY of STANLEY

LOCALITY: CRESTMEAD

Proposed BGA 2013

St Francis College, Crestmead, Qld

Proposed Site Plan

Job: Q-B3176.01 Scale: 1:1250 at A3 Date: 11/10/2013 Drawing: AS01 RB

OPUS architecture
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existing trees

car park extension 419sqm
16 place carpark

line of existing carpark

10 setdown carpark

one way

1.2m wide median strip

1.2m wide median strip

entry

exit

(52 total)
42 place carpark
car park extension 342sqm

one way

entry

line of existing carpark

line of existing carpark

retaining wall

Height: 0.6m
Area: **38sqm**

retaining wall

julie street

Proposed BGA 2013

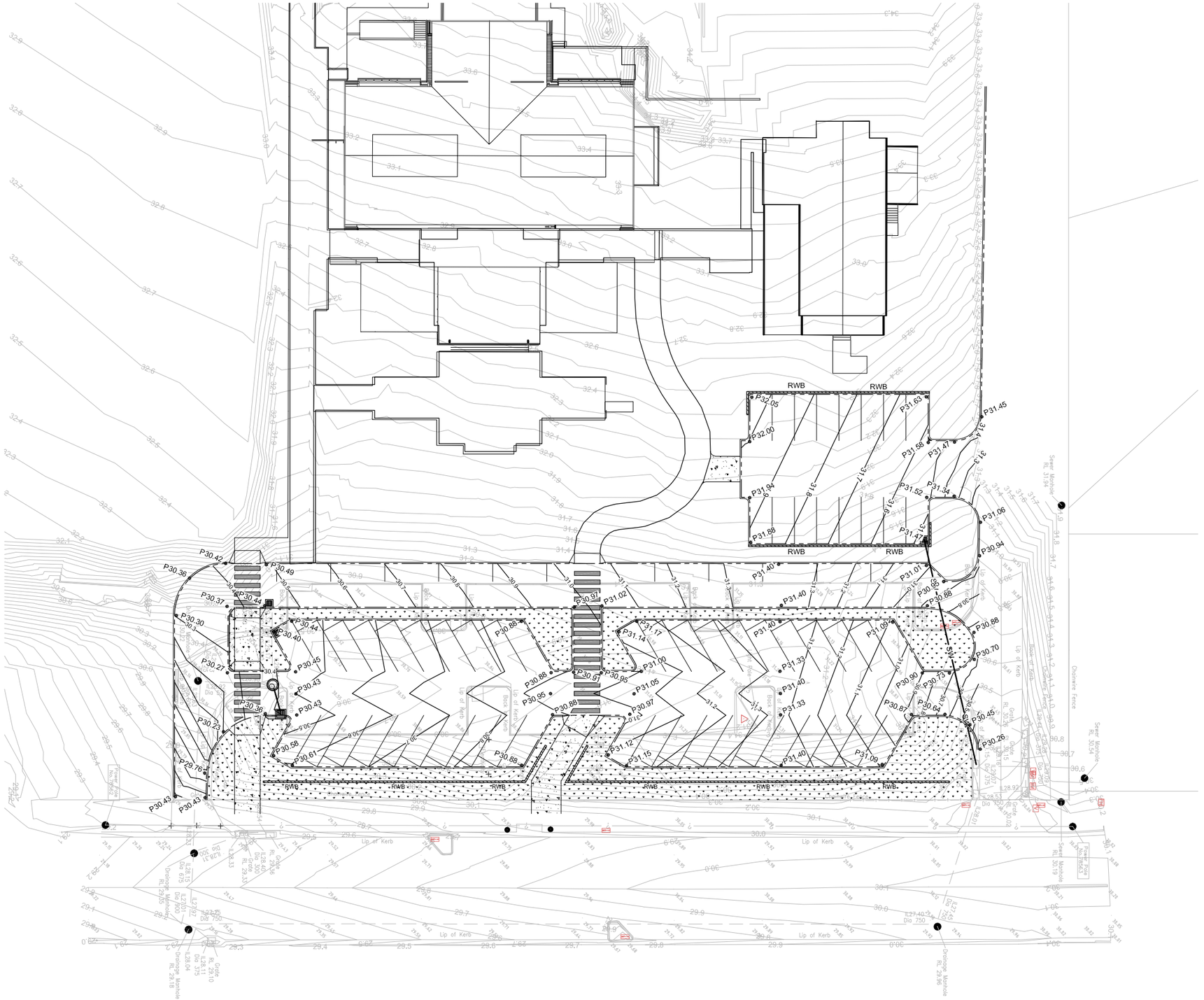
St Francis College, Crestmead, Qld

Proposed Front Carpark Plan

Job: Q-B3176.01 Scale: 1:250 at A3 Date: 26/09/2013 Drawing: AS06

OPUS architecture
PO Box 99, Spring Hill QLD 4004 - ph 3838 2400

APPENDIX C – Civil Engineering Plans



LEGEND

- PROPOSED LANDSCAPING, REFER TO LANDSCAPE ARCHITECTS DRAWINGS FOR SURFACE TREATMENT.
- PROPOSED BIORETENTION SYSTEM. REFER DWG C0701 FOR BIORETENTION DETAILS.
- PROPOSED EXTENT OF REINFORCED CONCRETE PAVEMENT. REMAINDER OF CARPARK ASPHALTIC CONCRETE.REFER PAVEMENT PLAN C0401 FOR DETAILS.
- • P12.50 — PROPOSED PAVEMENT LEVEL
- • S12.50 — PROPOSED SURFACE LEVEL
- • TW12.50 — PROPOSED TOP OF WALL LEVEL
- • BW12.50 — PROPOSED BOTTOM OF WALL LEVEL
- RWB — PROPOSED BLOCK RETAINING WALL. REFER STRUCTURAL DRGS
- WS — PROPOSED WHEELSTOP. REFER DETAIL SHEET
- 12.5 — PROPOSED CONTOUR
- • EX12.50 — EXISTING LEVEL
- SW — PROPOSED STORMWATER DRAINAGE PIPE
- PROPOSED SWALE DRAIN IN LANDSCAPING. REFER TO DETAIL ON C0701.
- S — PROPOSED SEWER PIPE AND EASEMENT
- 12.5 — EXISTING CONTOUR
- SW — EXISTING STORMWATER
- S — EXISTING SEWER
- E — EXISTING ELECTRICAL
- T — EXISTING TELECOMMUNICATIONS
- W — EXISTING WATER
- G — EXISTING GAS
- (N1) — REFER NOTE 1 FOR DETAILS

NOTES

1. AREAS TO BE LANDSCAPED IN ACCORDANCE WITH THE LANDSCAPE ARCHITECTS PLANS.
2. GRADE LANDSCAPE AREA AT MAX 1V:3H (UNO).
3. GRADE LANDSCAPED AREAS TO DRAIN TO SURFACE INLET PITS.
4. GENERAL CARPARK AND INTERNAL LINEMARKING TO ARCHITECTS DETAILS.
5. REFER ELECTRICAL, HYDRAULIC & LANDSCAPE DRAWINGS FOR CONDUIT LOCATIONS. PIPEWORK TO BE INSTALLED PRIOR TO PAVEMENT CONSTRUCTION.
6. TRAFFIC MANAGEMENT PLAN TO BE SUBMITTED AND APPROVED BY THE SUPERINTENDENT, OPUS AND LOGAN CITY COUNCIL PRIOR TO COMMENCING WORK.
7. EXISTING SEWER TO BE RELOCATED. REFER TO DWG C0901 FOR DETAILS.
8. REFER EXTERNAL WORKS DRAWINGS FOR ALL WORKS OUTSIDE THE BOUNDARY.
9. PROVIDE NEW DRIVEWAY CROSSOVER TO FIFTH AVENUE IN ACCORDANCE WITH LOGAN CITY COUNCIL STANDARDS.

300 mm
200
100
50
10 mm
0

1:250 @ A1
1:500 @ A3
0 4 8 12 16 20 24 m

PRELIMINARY - NOT FOR CONSTRUCTION

Revision	Amendment	Approved	Revision Date
R0	FOR APPROVAL	JDC	23.10.13

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PO Box 99
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Australia

Drawn	Designed	Approved	Revision Date
TAH	TAH	JDC	OCT 2013

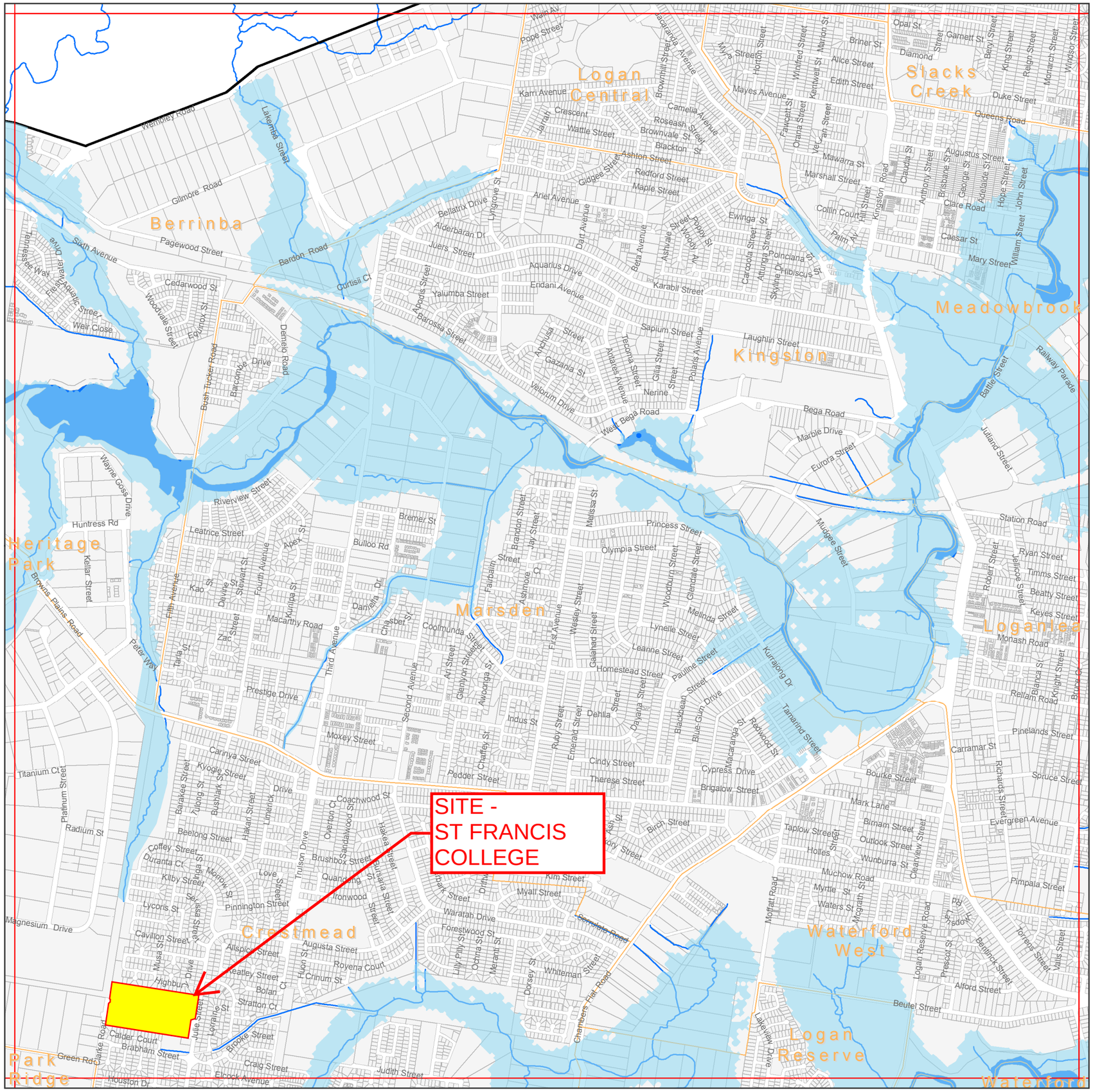
Project
PROPOSED FRONT CARPARK
St FRANCIS COLLEGE , CRESTMEADE, QLD

Sheet
SITEWORKS PLAN

Project No.	Scale	Drawing No.	Sheet. No.	Revision
Q-B3176.01	1:200 @A1	Q-B30176.01	SW01	R0

Original Sheet Size A1 [841x594] Plot Date 15 Oct 2013 @ 1:26 PM Path G:\Projects 2013\Q-B3176 - St Francis College\Q-B3176,01 - St Frands College BGA 2013 (dd)\Deliver CM\Q-B3176,01_SW01.dwg Layout1

APPENDIX D – Flood information



Flood Regulated Area Map

LOGAN CITY COUNCIL

- Predicted 1% AEP Flood Extent
- Waterways
- Property boundary
- Suburb boundary
- Logan City Council boundary

SITE REFERENCE NOTES AND SHADING BY OPUS

DISCLAIMER:-
While all reasonable care has been taken in producing this information, Council does not warrant the accuracy, completeness or currency of this information and accepts no responsibilty for, or in connection with, any loss or damage suffered as a result of any inaccuracies, errors or omissions or your reliance on this information.
Planning and Development information can be confirmed by obtaining a Flood Search from Council.

The flood regulated area maps provided were determined using the information available to Council at the date of issue. The flood regulated area maps have been developed to provide the public with information on flooding in Logan and show areas where flooding may occur. The flood regulated area maps are a reference guide only and do not indicate whether a property has or has not been affected by floods. Council may have since revised flood data in areas where more detailed information has become available.

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Map Projection : Universal Transverse Mercator
Horizontal Datum : Geocentric Datum of Australia 1994
Grid : Map Grid of Australia, Zone 56

Map 11 of 48



Date of issue: 20 August 2013

500 250 0 500 1,000
Metres
1:20,000 at A3

APPENDIX E – Stormwater Calculations

Insert data in [ ] **boxes ;** **insert rainfall data in ' intensity ' sheet from OPUS QMCW ARR civil worksheet**

PROJECT: St Francis College
JOB NO.: Q-B3176.01

CATCHMENT NAME: Site CASE: Pre development

CATCHMENT AREA: 9.8 ha

tc: 9 min

ARI	I mm/hr	C	Q cu.m/sec
1	99.04	0.58	1.56
2	126.34	0.61	2.11
5	157.42	0.69	2.94
10	175.47	0.72	3.45
20	200.23	0.76	4.14
50	232.80	0.83	5.27
100	257.76	0.87	6.09

C10: 0.7225

CATCHMENT NAME: Site CASE: Post development

CATCHMENT AREA: 9.8 ha

tc: 9 min

ARI	I mm/hr	C	Q cu.m/sec
1	99.04	0.58	1.57
2	126.34	0.62	2.12
5	157.42	0.69	2.95
10	175.47	0.73	3.47
20	200.23	0.76	4.15
50	232.80	0.83	5.29
100	257.76	0.87	6.11

C10: 0.725