

Att: STAT ADMIN APP GP

STAT ADMIN
NERANG



The attached document requires a development number generated in AMS.

Please return to Records Services - CLASSIFICATION TEAM upon completion for registration.

The document has been temporarily classified to PD97/-/- file until the new development file is created in TRACKS.

Any queries please call extension 8194.

Regards

RECORDS SERVICES
Classification Team

*Please move file to
Ranji De Silva.*

DA: _____



OPW/MCU/ROL: _____

2011 01727

PN 307555/03/PA4

Administration Centre, Gold Coast, Queensland
 Surfers Paradise Telephone: 07 5582 8211 Fax: 07 5581 6346
 Nerang Telephone: 07 5582 8211 Fax: 07 5596 3653

PO Box 5042 Gold Coast MC Qld 9729 Australia
 goldcoastcity.com.au

GOLD COAST CITY COUNCIL
 PAGE 1

13 CONSULTING PTY LTD
 X/ ICUBED CONSULTING PTY LTD
 PO BOX 909
 KENMORE QLD 4069

TAX INVOICE

RECEIPT

TAX INV.DATE
 30/11/11

ABN: 84 858 548 450
 DATE 30/11/11
 REGISTER 1016
 TAX INV.NO. 16132412
 TIME 13:43:32

OPW-2011/01504
 84-160 CHRISTENSEN RD, STAPYLT

Allocations

REVENUE SUREV SUNDRY REVENUE REF: 360700 ACCOUNT 98214
 AMENDED LANDSCAPING APPLICATION FEE OPERATIONAL WORKS
 APPLICATION 201101504

Value	GST	Price
137.20	0.00	137.20

Total Amounts:	137.20	0.00	137.20
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Which consists of:

MAIL-CHQ PROCESSING 001040

Total Tendered:

137.20
137.20

THIS PAYMENT MAY NOT REPRESENT FULL AND FINAL SETTLEMENT OF THE DEBT ON
 COUNCIL'S RECORDS.

Our Ref: 20111129 - 11-129- LE Cover

29th November, 2011

Mr Dale Dickson
Chief Executive Officer
Gold Coast City Council
PO Box 5042
Gold Coast MC 9729



icubed consulting
innovation ingenuity inspiration
75 156

Attention: Planning and Development Section

Dear Sir/Madam,

RE REQUEST TO CHANGE A DEVELOPMENT APPROVAL OPW201101504
81 CHRISTENSEN ROAD SOUTH, STAPYLTON

Enclosed is our application for a Request to Change an Existing Development Approval (OPW201101504). The following are enclosed for your assessment:

1. Five sets of development drawings prepared by *i3 consulting pty ltd* (5 x A3);
2. Completed GCCC application form;
3. Cheque for \$137.20 in favour of Gold Coast City Council in payment of GCCC application fees, calculated as 20% of \$686.

Should you require any further information, please do not hesitate to contact us.

Yours faithfully,

Kathy Miller
Urban Planner

GOLD COAST CITY COUNCIL	
CUSTOMER SERVICE - NERANG	
RECEIVED TIME:	1:45 PM
DATE:	30-11-11
RECEIPT No:	
SIGNED BY:	JO

**Planning Assessment Section, Implementation
& Assessment**
Planning Environment & Transport Directorate

Phone: 5582 8708 Facsimile: 5582 8248
PO Box 5042 GOLD COAST MC QLD 9729



Gold Coast City Council is collecting your personal information in accordance with the *Sustainable Planning Act 2009* in order to help assess your application. The information will only be used by authorised Council officers for the purpose of assessment, statistical reporting and ensuring our records are accurate. Your information will not be given to any other person or agency unless you have given us permission or we are required by law

Contact details

Name

BRIDGET PARGE, icubed consulting pty ltd

Postal address

PO BOX 909,
KENMORE, QLD 4069

Email address

bridget.parge@icubed.com.au

Phone number

38789100

Fax number

38789144

Mobile number

Property details

Lot number

334

Registered plan number

SP193431

Existing approval number (if applicable)

CPW2011 01504

Property address

84-160 CHRISTENSEN RD SOUTH, STAPYLTON

Is this the right form/process for you?

Use this form process:

- If the original application was decided by Council (and not via an appeal process or by the relevant Minister);
And
- If you are seeking to amend a condition or the relevant period imposed by Council (and not by a Court or concurrence agency).

Nature of the request

- ☐ An extension to the relevant period before an approval lapses (s383 SPA)
☒ A permissible change to the development approval (s369 SPA)

Details of existing approval

Type of approval

- ☒ Development Permit
☐ Preliminary Approval
☐ Environmentally Relevant Activity
☐ Material Change of Use
☐ Reconfiguration of Lot
☐ Operational Works

Council approval number

CPW2011 01504

Date issued

11/11/2011

Office use only

Date received

30.11.11

Fee paid

\$137.20

Receipt number

16132412

Received by

JO

Sundry debtor name

Sundry debtor number

Application No

2011/01504

Application Type

File No

Fees

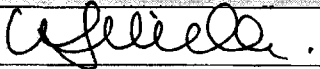
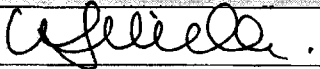
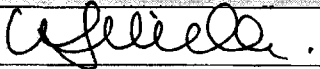
Fees must accompany form – Credit Card payment by fax or phone is not available.

Council's fee for a request to change and/or extend an existing approval is in accordance with Council's Regulatory Fees and Non-regulatory Charges. A copy of Council's Regulatory Fees and Non-regulatory Charges can be found on Council's website via the following link:

http://www.goldcoast.qld.gov.au/t_standard.aspx?PID=4071

no new applications if in AMS no provision for (ABW Pmc)

Details of the request	Condition #	Description of requested change to condition	Justification for change
	N/A.	Stormwater Invert levels changed to enable connection.	As-constructed Stormwater Invert levels for B50 of SW in Christensen Rd was ~ 1m lower than actual level.
Please provide any relevant history of the application and the request for permissible change or extension to the relevant period			
Resource owners agreement	If an application for the existing approval were being now, would evidence be required to support the application because it involved taking or interfering with a State-owned resource? ☒ No ☐ Yes – the written agreement of the chief executive from whom evidence would need to be obtained under the <i>Sustainable Planning Act 2009</i> , s254(1) must be attached		
Details are pre-request response notice	Has a pre-request response notice been issued from a referral agency in relation to this approval in accordance with s368 of the <i>Sustainable Planning Act 2009</i> ? ☒ No ☐ Yes – Please attach a copy and provide details below		
	Details of pre-request response notice		Date of Notice
Concurrence Agencies	Were there one or more concurrence agencies involved in the original approval? ☒ No ☐ Yes – Provide details below		
	Concurrence Agencies (Use a separate row for each agency)		
	Has the applicant sent a copy of the request to the concurrence agency? ☐ No you will be issued with an Incorrectly Lodged Notice (s372) ☐ Yes – please attach evidence of referral		
Attachments and information	What attachments and supporting information accompanies this application? Description of the attachment or information (e.g. Notice to concurrence agencies, declaration re owners consent, reports) Title and date (if applicable) (e.g. James Street Traffic Report) DEVELOPMENT DRAWINGS 11-129-C06, C07, C08, C09, C10, C12 and C13.		
	Is the information for a request for permissible change or extension to the relevant period being provided in accordance with the <i>Sustainable Planning Act 2009</i> (SPA)		

Attachments and information (con'd)	<u>Permissible Change</u> Section 370 of SPA requires the person requesting a permissible change to fill out the relevant Council forms (this form) accompanied by: ☒ the fee for the request PLEASE PROVIDE FEE QUOTE N/A a copy of any pre-request response notice (from a concurrence agency) relevant to the request (refer to question 9); and N/A evidence to show the person making the request has referred the application to all concurrence agencies, if applicable (refer to question 10).										
Note: Council cannot commence with the request until section 370 of SPA has been complied with;											
	<u>Extension of the Relevant Period</u> Section 383(3) of SPA required the person requesting an extension of the relevant period to fill out the relevant Council forms (this form) which is to be accompanied by: ☐ the fee for the request; and ☐ evidence to show the person making the request has referred the application to all concurrence agencies, if applicable (refer to question 10).										
Note: Council cannot commence with the request until section 383 of SPA has been complied with;											
Owners Consent	I/ We, the owner/s of the land, consent to the making of this request <table border="1"> <tr> <td data-bbox="422 786 788 819">Name of all owner/s of the land</td> <td data-bbox="820 786 1453 819">Signature of all owner/s of the land</td> </tr> <tr> <td data-bbox="422 819 788 898"></td> <td data-bbox="820 819 1453 898"></td> </tr> <tr> <td data-bbox="422 898 788 987"></td> <td data-bbox="820 898 1453 987"></td> </tr> <tr> <td data-bbox="422 987 788 1021">Date</td> <td data-bbox="820 987 1453 1021"></td> </tr> <tr> <td data-bbox="422 1021 788 1077"></td> <td data-bbox="820 1021 1453 1077"></td> </tr> </table> Or ☐ I confirm the owner/s consent is not required in accordance with s371 of the <i>Sustainable Planning Act 2009 (SPA)</i> If ticked, please confirm why owners consent is not required: ☐ The person making the request is the owner of the land; or ☐ Acquisition land acquired by entity, e.g. Council or State land; or ☐ Approval is for building work or operational work for supply of community infrastructure on land designated for the community infrastructure; or ☒ Request relates to operational works approval only; or ☐ Consent being unreasonably withheld and change does not materially affect the owner's land; or ☐ Not practicable to obtain all owners' consent and does not materially affect the owners' land.	Name of all owner/s of the land	Signature of all owner/s of the land					Date			
Name of all owner/s of the land	Signature of all owner/s of the land										
Date											
Applicants declaration	By making this request, I declare that all information in this request is true and correct. Please Note: A request for permissible change may lead to a change in the relevant infrastructure charges <table border="1"> <tr> <td data-bbox="422 1570 810 1603">Signature</td> <td data-bbox="810 1570 1453 1603">  </td> </tr> </table>	Signature									
Signature											

***Section 367 of the Sustainable Planning Act (2009) defines a permissible change for a development approval as:**

- (1) A **permissible change**, for a development approval, is a change to the approval that would not -
- (a) result in a substantially different development; or
 - (b) if the application for the approval were remade including the change -
 - (i) require referral to additional concurrence agencies; or
 - (ii) for an approval for assessable development that previously did not require impact assessment—require impact assessment; or
 - (c) for an approval for assessable development that previously required impact assessment—be likely, in the responsible entity's opinion, to cause a person to make a properly made submission objecting to the proposed change, if the circumstances allowed; or
 - (d) cause development to which the approval relates to include any prohibited development.

Project Number: 11-129

Project Name: Building 8 Lot 334 Christensen Road South, Yatala

Client: Multispan Australia

Issued by: Bridget Parge



icubed consulting
innovation ingenuity inspiration
ABN 89 106 675 156

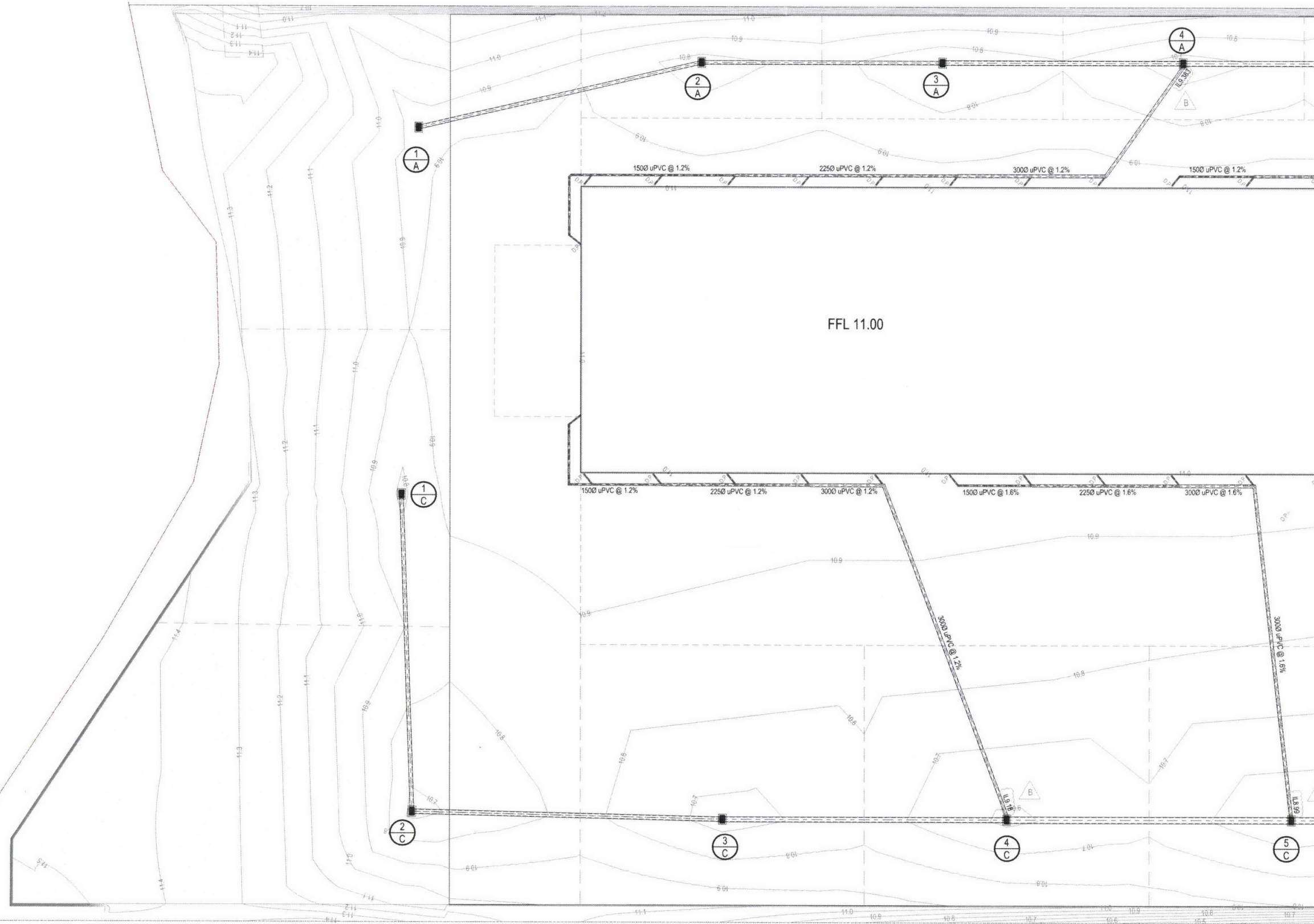
**Sulte 3, 636 Moggill Road
Chapel Hill, Qld 4069**

mail@icubed.com.au
www.icubed.com.au

P +61 7 3878 9100
F +61 7 3878 9144

[illegible]

PLEASE MARK PREVIOUS DRAWINGS 'SUPERCEDED' AND WITHDRAW / DESTROY ALL COPIES.



STORMWATER PLAN - 1

1:250

PROJECT TEAM

Consulting Engineer:

i³ consulting pty ltd
engineering consultants
innovation, ingenuity, inspiration
3/636 Moggill Road PO Box 909
Chapel Hill, Qld 4069 Kenmore, Qld 4069
www.icubed.com.au mail@icubed.com.au
ABN 89 106 675 156 ACN 106 675 156
p 07 3878 9100 f 07 3878 9144

Engineers Certification:

Nicola Canto MIE Aust. CPEng.
NPER Civil & Structural
CAES 3355 RPEQ 6750

Signature:

Date: 28 / 11 / 2011

LEGEND

- EXISTING STORMWATER
- PROPOSED STORMWATER
- FINISHED SURFACE CONTOUR
- BIORETENTION
- SEDIMENT FOREBAY / SCOUR PROTECTION
- STORMWATER STRUCTURE NUMBER

- NOTES:
- ALL STORMWATER DRAINAGE SHALL BE IN ACCORDANCE WITH AS/NZS 3500.3
 - ALL NON-PRESSURE PIPE SHALL BE HD PVC PIPE UNLESS NOTED OTHERWISE.

B	INVERT LEVELS CHANGED	28/11/2011	BP
A	FOR APPROVAL	11/10/2011	BP
REV	DESCRIPTION	DATE	BY

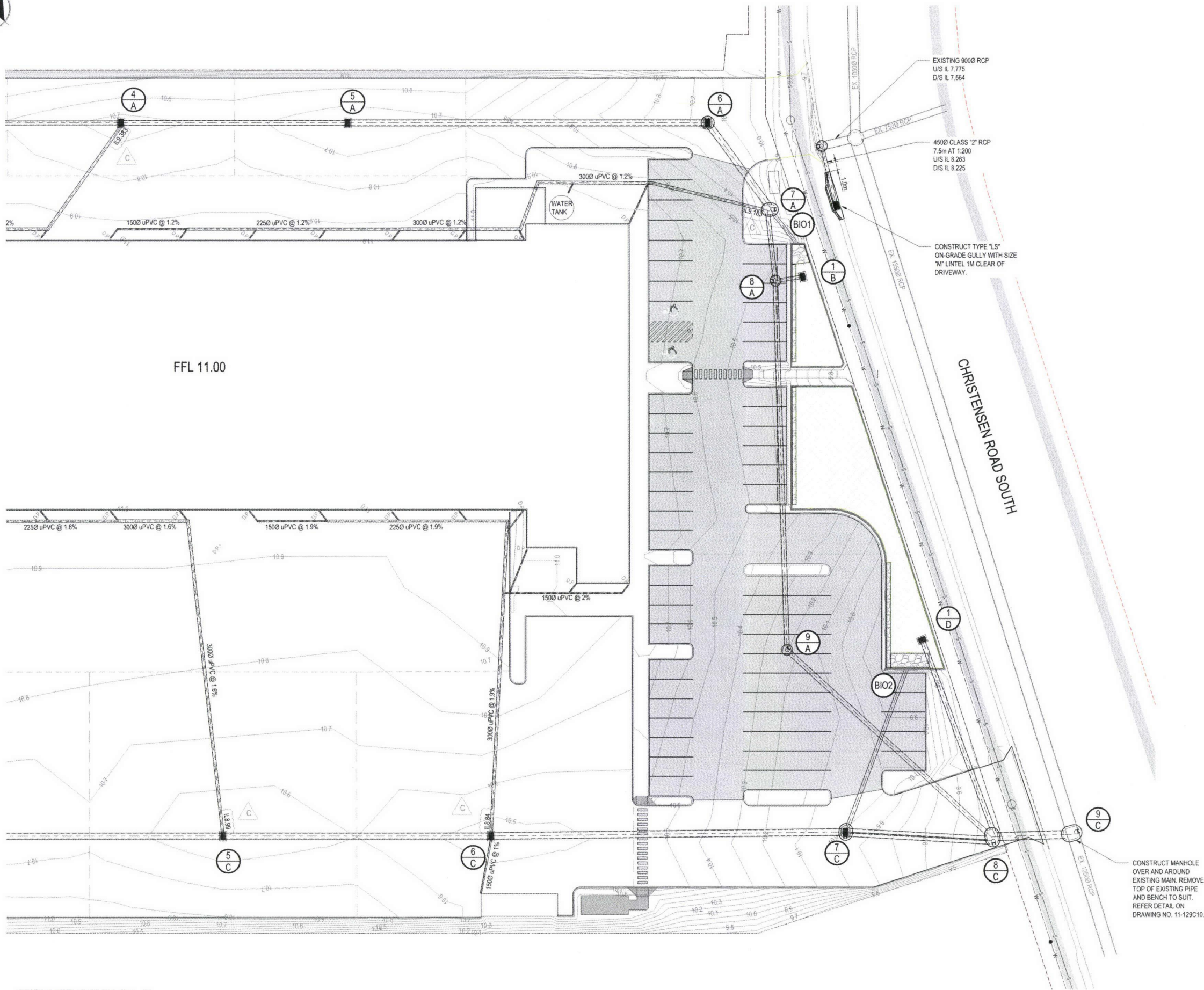
FOR APPROVAL

Project
**BUILDING 8 ON LOT 334/SP193431
CHRISTENSEN ROAD SOUTH
YATALA**
for
MULTISPAN AUSTRALIA

STORMWATER PLAN - 1

Drawn	Date	Chkd	Date
B. PARGE	9/9/11	T. SMITH	10/10/11
Design	Date	Apprd	Date
B. PARGE	7/9/11	N. CANTO	11/10/11
Scale	A1	Certif	Date
AS SHOWN		N. CANTO	11/10/11
Project No.	Dwg. No.	Rev	
11-129	C06	B	

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STORMWATER PLAN - 2

1:250

PROJECT TEAM

Consulting Engineer:

i³ consulting pty ltd
engineering consultants
innovation, ingenuity, inspiration

3/636 Moggi Road
Chapel Hill, Qld 4069
www.icubed.com.au
ABN 89 106 675 156
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PO Box 909
Kenmore, Qld 4069
mail@icubed.com.au
ACN 106 675 156
f 07 3878 9144

Engineers Certification:

Nicola Canto MIE Aust. CPEng.
NPER Civil & Structural
CAES 3355 RPEQ 6750

Signature:

Date: 28/11/2011

LEGEND

- EXISTING STORMWATER
- PROPOSED STORMWATER
- FINISHED SURFACE CONTOUR
- BIORETENTION
- SEDIMENT FOREBAY / SCOUR PROTECTION
- STORMWATER STRUCTURE NUMBER

- NOTES:
- ALL STORMWATER DRAINAGE SHALL BE IN ACCORDANCE WITH AS/NZS 3500.3
 - ALL NON-PRESSURE PIPE SHALL BE HD PVC PIPE UNLESS NOTED OTHERWISE.

C	INVERT LEVELS AMENDED	28/11/2011	BP
B	EX. GULLY REMOVED NEW ADDED	11/11/2011	BP
A	FOR APPROVAL	11/10/2011	BP
REV	DESCRIPTION	DATE	BY

FOR APPROVAL

Project
**BUILDING 8 ON LOT 334/SP193431
CHRISTENSEN ROAD SOUTH
YATALA**
for
MULTISPAN AUSTRALIA

STORMWATER PLAN - 2

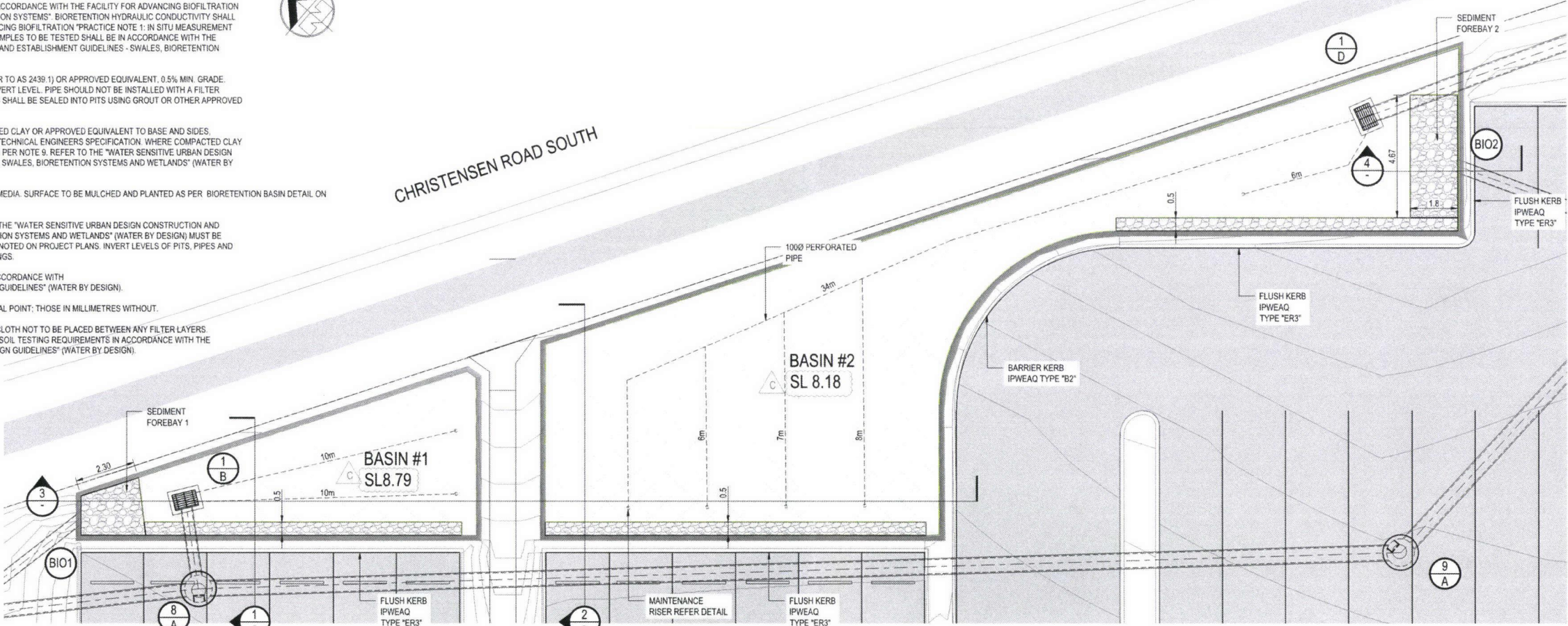
Drawn	Date	Chkd	Date
B.PARGE	9/9/11	T.SMITH	10/10/11
Design	Date	Apprd	Date
B.PARGE	7/9/11	N.CANTO	11/10/11
Scale	A1	Certif	Date
AS SHOWN		N.CANTO	11/10/11
Project No.	Dwg. No.	Rev	
11-129	C07	C	

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BIORETENTION NOTES

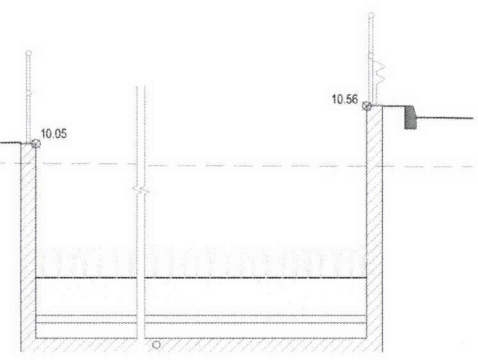
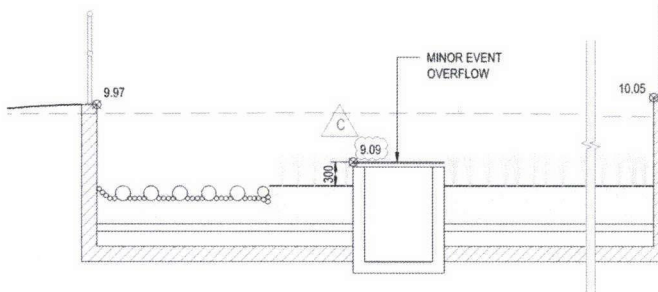
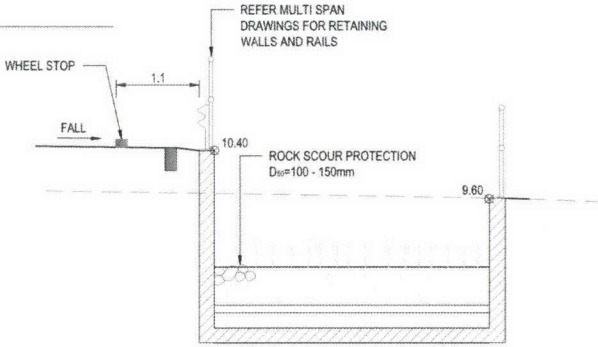
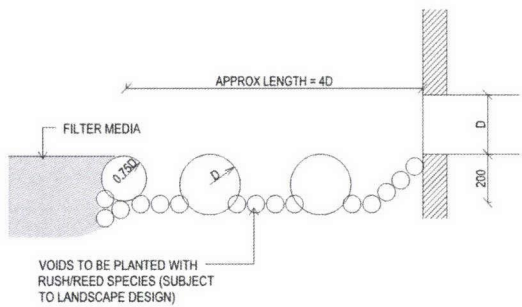
- BIORETENTION MEDIA SPECIFICATION SHALL BE IN ACCORDANCE WITH THE FACILITY FOR ADVANCING BIOFILTRATION "GUIDELINE FOR SOIL FILTER MEDIUM IN BIOTRETENTION SYSTEMS". BIOTRETENTION HYDRAULIC CONDUCTIVITY SHALL BE IN ACCORDANCE WITH THE FACILITY FOR ADVANCING BIOFILTRATION "PRACTICE NOTE 1: IN SITU MEASUREMENT OF HYDRAULIC CONDUCTIVITY". THE NUMBER OF SAMPLES TO BE TESTED SHALL BE IN ACCORDANCE WITH THE "WATER SENSITIVE URBAN DESIGN CONSTRUCTION AND ESTABLISHMENT GUIDELINES - SWALES, BIOTRETENTION SYSTEMS AND WETLANDS (WATER BY DESIGN)".
- UNDER-DRAIN: SLOTTED RIGID PIPE (PVC OR SIMILAR TO AS 2439.1) OR APPROVED EQUIVALENT. 0.5% MIN. GRADE. REFER PROJECT DRAWINGS FOR DIAMETER AND INVERT LEVEL. PIPE SHOULD NOT BE INSTALLED WITH A FILTER SOCK SURROUNDING PIPE. UNDER-DRAINAGE PIPES SHALL BE SEALED INTO PITS USING GROUT OR OTHER APPROVED WATERTIGHT SEAL.
- IMPERMEABLE LINER - HDPE, BENTONITE, COMPACTED CLAY OR APPROVED EQUIVALENT TO BASE AND SIDES. INSTALLED AS PER MANUFACTURERS AND/OR GEOTECHNICAL ENGINEERS SPECIFICATION. WHERE COMPACTED CLAY LINER IS ADOPTED, FILTER CLOTH IS TO BE USED AS PER NOTE 9. REFER TO THE "WATER SENSITIVE URBAN DESIGN CONSTRUCTION AND ESTABLISHMENT GUIDELINES - SWALES, BIOTRETENTION SYSTEMS AND WETLANDS (WATER BY DESIGN)" FOR DETAILS.
- BASIN FINISHED SURFACE LEVEL IS TOP OF FILTER MEDIA. SURFACE TO BE MULCHED AND PLANTED AS PER BIOTRETENTION BASIN DETAIL ON DRAWING NO. 11-129C14.
- CONSTRUCTION TOLERANCES AS DOCUMENTED IN THE "WATER SENSITIVE URBAN DESIGN CONSTRUCTION AND ESTABLISHMENT GUIDELINES - SWALES, BIOTRETENTION SYSTEMS AND WETLANDS (WATER BY DESIGN)" MUST BE ACHIEVED. CONSTRUCTION TOLERANCES MUST BE NOTED ON PROJECT PLANS. INVERT LEVELS OF PITS, PIPES AND BASE LEVELS MUST BE NOTED ON PROJECT DRAWINGS.
- PLANT SPECIFICATION AND DENSITY SHALL BE IN ACCORDANCE WITH THE "WATER SENSITIVE URBAN DESIGN TECHNICAL GUIDELINES" (WATER BY DESIGN).
- DIMENSIONS IN METRES ARE SHOWN WITH A DECIMAL POINT; THOSE IN MILLIMETRES WITHOUT.
- FILTER CLOTH - NON-WOVEN GEOTEXTILE. FILTER CLOTH NOT TO BE PLACED BETWEEN ANY FILTER LAYERS. IMPERVIOUS LINER MAY BE REQUIRED SUBJECT TO SOIL TESTING REQUIREMENTS IN ACCORDANCE WITH THE "WATER SENSITIVE URBAN DESIGN TECHNICAL DESIGN GUIDELINES" (WATER BY DESIGN).

CHRISTENSEN ROAD SOUTH



BIOTRETENTION BASIN DETAIL

1:100

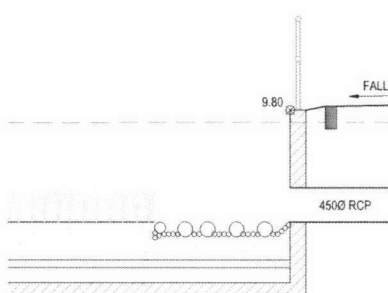
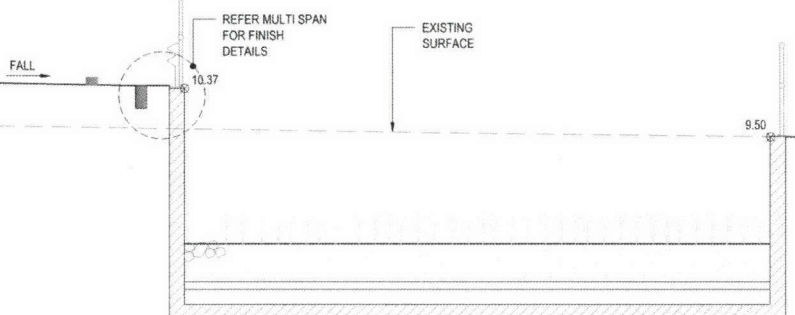


BIOTRETENTION BASIN #1 SECTION

1:50

BIOTRETENTION BASIN #1 AND #2 SECTION

1:50



BIOTRETENTION BASIN #2 SECTION

1:50

BIOTRETENTION BASIN #2 SECTION

1:50

BIOTRETENTION BASIN #1 = 47m²
BIOTRETENTION BASIN #2 = 206m²

SEDIMENT FOREBAY DETAIL

NTS

PROJECT TEAM

Consulting Engineer:

i³ consulting pty ltd
engineering consultants
innovation, ingenuity, inspiration
3/636 Moggi Road
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www.icubed.com.au
ABN 89 106 675 156
p 07 3878 9100
f 07 3878 9144
PO Box 909
Kenmore, Qld 4069
mail@icubed.com.au
ACN 106 675 156

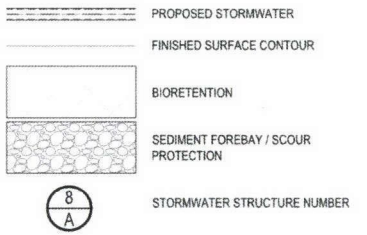
Engineers Certification:

Nicola Canto MIE Aust. CPEng.
NPER Civil & Structural
CAES 3355 RPEQ 6750

Signature:

Date: 28/11/2011

LEGEND



HEALTHY WATERWAY FORMS

HEALTHY WATERWAYS BIOTRETENTION BASIN CONSTRUCTION AND ESTABLISHMENT SIGN OFF FORMS SHALL BE COMPLETED DURING CONSTRUCTION AND OPERATIONAL MAINTENANCE.

B	BASIN RL'S AMENDED	28/11/2011	BP
A	FOR APPROVAL	11/10/2011	BP
REV	DESCRIPTION	DATE	BY

FOR APPROVAL

Project
BUILDING 8 ON LOT 334/SP193431
CHRISTENSEN ROAD SOUTH
YATALA
for
MULTISPAN AUSTRALIA

Title

BIO-RETENTION DETAILS

Drawn	Date	Chkd	Date
B. PARGE	9/9/11	T. SMITH	10/10/11
Design	Date	Apprd	Date
B. PARGE	7/9/11	N. CANTO	11/10/11
Scale	A1	Certif	Date
AS SHOWN		N. CANTO	11/10/11
Project No.	Dwg. No.	Rev	
11-129	C08	B	

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PROJECT TEAM

Consulting Engineer:

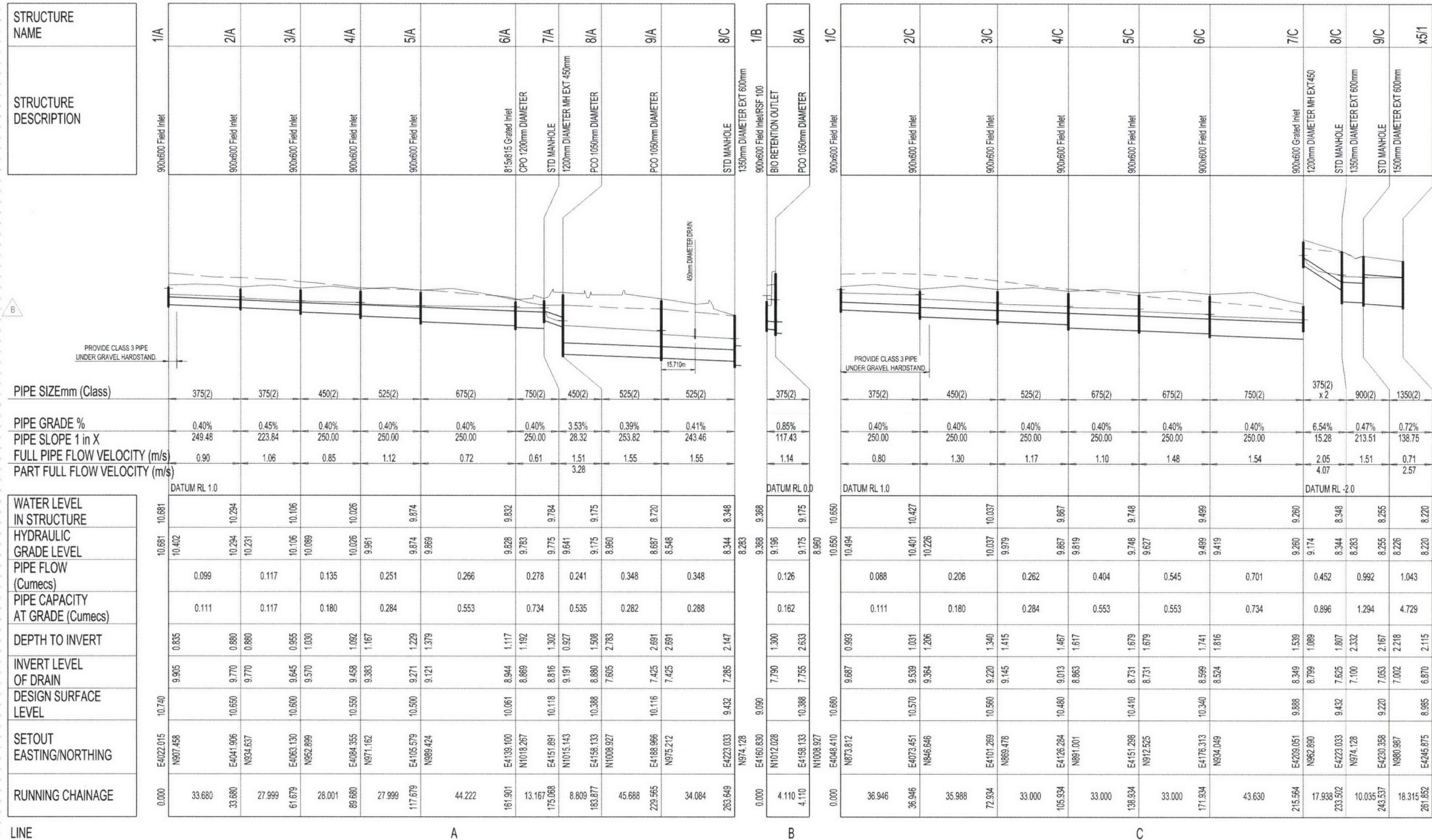


Engineers Certification:

Nicola Canto MIE Aust. CPEng.
NPER Civil & Structural
CAES 3355 RPEQ 6750

Signature:

Date: 28/11/2011



B	INVERT LEVELS AMENDED	28/10/2011	BP
A	FOR APPROVAL	11/10/2011	BP
REV	DESCRIPTION	DATE	BY

Status

FOR APPROVAL

Project
**BUILDING 8 ON LOT 334/SP193431
CHRISTENSEN ROAD SOUTH
YATALA**
for
MULTISPAN AUSTRALIA

Title
**STORMWATER
LONGITUDINAL SECTIONS
SHEET 1**

Drawn	Date	Chkd	Date
B.PARGE	9/9/11	T.SMITH	10/10/11
Design	Date	Apprd	Date
B.PARGE	7/9/11	N.CANTO	11/10/11
Scale	A1	Certif	Date
AS SHOWN		N.CANTO	11/10/11
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11-129	C09	B	

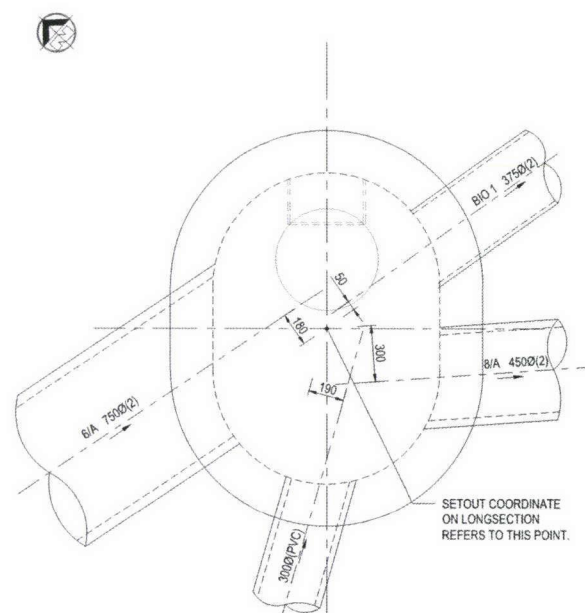
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WATER LEVEL IN STRUCTURE
HYDRAULIC GRADE LEVEL
PIPE FLOW (Cumecs)
PIPE CAPACITY AT GRADE (Cumecs)
DEPTH TO INVERT
INVERT LEVEL OF DRAIN
DESIGN SURFACE LEVEL
SETOUT EASTING/NORTHING
RUNNING CHAINAGE

D		BIO 1		BIO 2	
0.000	E4200.709	8.480	8.711	8.711	8.711
25.771	N987.003	7.190	1.290	0.259	0.266
25.771	E4223.033	9.432	7.100	2.332	
	N974.128		8.283		
0.000	E4152.904	10.178	9.268	9.274	
5.266	N1017.043		8.816	1.362	0.126
5.266	E4157.266	9.600	8.790	0.810	0.123
	N1014.093		9.165	9.165	
0.000	E4206.749	9.655	8.854	8.854	
20.566	N963.216		8.349	1.306	0.259
20.566	E4201.556	9.400	8.180	1.220	0.258
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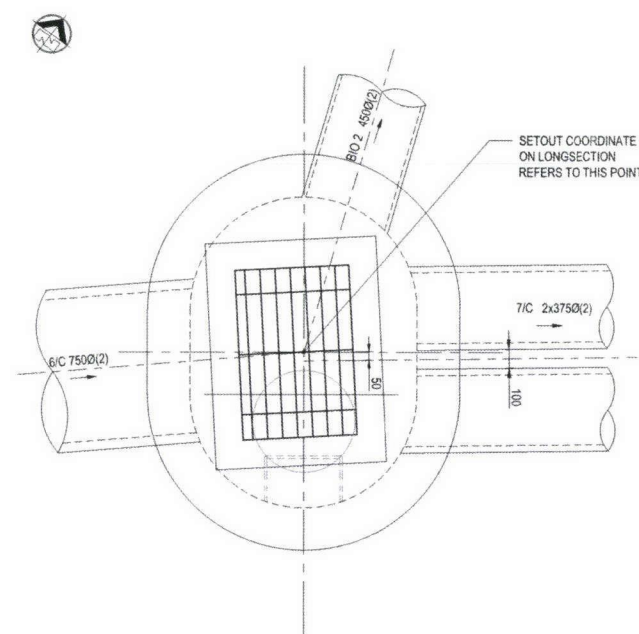
STORMWATER LONGITUDINAL SECTIONS - 2

HORIZONTAL 1:1000
VERTICAL 1:100



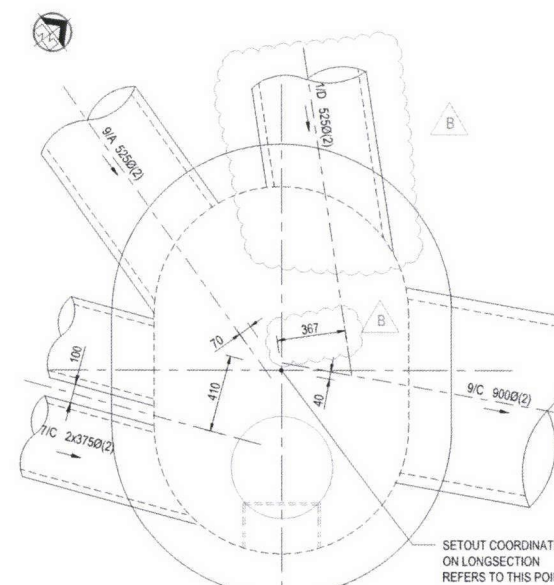
7/A CHAMBER 1200Ø EXTEND 450MM

1:20



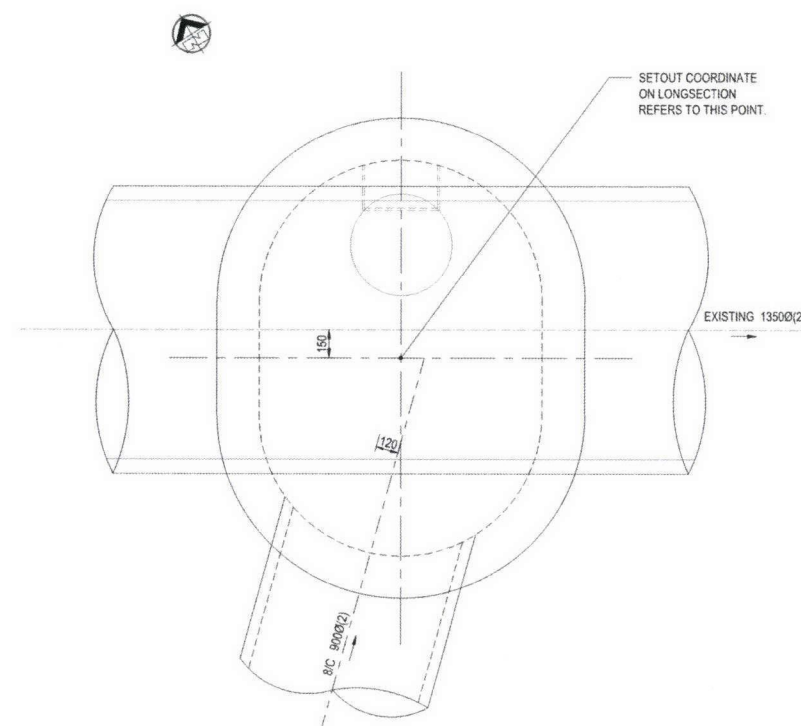
7/C CHAMBER 1200Ø EXTEND 450MM

1:20



8/C CHAMBER 1350Ø EXTEND 600MM

1.20



9/C CHAMBER 1500Ø EXTEND 600MM

1:20

PROJECT TEAM

Consulting Engineer:



Engineers Certification:

Nicola Canto MIE Aust. CPEng.
NPER Civil & Structural
CAES 3355 RPEQ 6750

Signature: [Signature]

Date: 28 / 1 / 2011

B	INVERT LEVELS AMENDED	28/10/2011	BF
A	FOR APPROVAL	11/10/2011	BF
REV	DESCRIPTION	DATE	B

Status
FOR APPROVAL

Project

**BUILDING 8 ON LOT 334/SP193431
CHRISTENSEN ROAD SOUTH
YATALA**

for
MULTISPAN AUSTRALIA

Title
STORMWATER
LONGITUDINAL SECTIONS
SHEET 2 & STRUCTURE DETAILS

Drawn	Date	Chkd	Date
B. PARGE	9/9/11	T. SMITH	10/10/11
Design	Date	Apprd	Date
B. PARGE	7/9/11	N. CANTO	11/10/11
Scale	A1	Certif	Date
AS SHOWN		N. CANTO	11/10/11
Project No.	Dwg. No.	Rev	
11-129	C10	B	

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LOCATION				TIME		SUB-CATCHMENT RUNOFF					INLET DESIGN					DRAIN DESIGN										HEADLOSSES										PART FULL				DESIGN LEVELS															
				tc	I	C10	C	A	C'A	+CA	Q				Qg	Qb		tc	I	+CA	Qt	Qm	Qs	Qp	L	S		V	T			V2/g	Ku	hu	Kl	hl	Kw	hw	Sf	hf		Vp													
DESIGN ARI	STRUCTURE No.	DRAIN SECTION	SUB-CATCHMENTS CONTRIBUTING	LAND USE	SLOPE OF CATCHMENT	SUB-CATCHMENT TIME OF CONC.	RAINFALL INTENSITY	10yr RUNOFF CO-EFFICIENT	CO-EFFICIENT OF RUNOFF	SUB-CATCHMENT AREA	EQUIVALENT AREA	SUM OF (C * A)	SUB-CATCHMENT DISCHARGE	FLOW IN K&C (INC. BYPASS)	ROAD GRADE AT INLET	MINOR FLOW ROAD CAPACITY	INLET TYPE	FLOW INTO INLET	BYPASS FLOW	BYPASS STRUCTURE No.	CRITICAL TIME OF CONC.	RAINFALL INTENSITY	TOTAL (C * A)	MAJOR TOTAL FLOW	MAJOR SURFACE FLOW CAPACITY	MAJOR SURFACE FLOW	PIPE FLOW	REACH LENGTH	PIPE GRADE	PIPE / BOX DIMENSIONS (CLASS)	FLOW VELOCITY FULL (PIPE GRADE VELOCITY)	TIME OF FLOW IN REACH	STRUCTURE CHART No.	STRUCTURE RATIOS FOR K VALUE CALCULATIONS	VELOCITY HEAD	US HEADLOSS COEFFICIENT	US PIPE STRUCT. HEADLOSS	LAT. HEADLOSS CO-EFFICIENT	LAT. PIPE STRUCT. HEADLOSS	W/S.E. CO-EFFICIENT	CHANGE IN W/S.E	PIPE FRICTION SLOPE	PIPE FRICTION HEADLOSS (L * Sf)	DEPTH	VELOCITY	OBVERT LEVELS	DRAIN SECTION H.G.L	UPSTREAM H.G.L	LAT. H.G.L	W/S.E.	SURFACE OR K&C INVERT LEVEL	STRUCTURE No.			
YRS				%	min	mm/h				ha	ha	ha	l/s	l/s	%	l/s	l/s	l/s	l/s	l/s	min	mm/h	ha	l/s	l/s	l/s	l/s	m	%	mm	m/s	min			m		m		m	%	m	m	m	m/s	m	m	m	m	m	m	m	m	m	m	
10	7/A	7/A to B/C1															24					7.85	248	0.000	0		126	5.266	0.49	375(2)	1.14	0.08			0.066	1.15	0.076			1.23	0.062	0.52	0.027			9.191	9.165	9.192	9.165	9.268		9.274	10.178	7/A/B	
10	7/C	7/C to B/C2																				7.89	248	0.000	0		259	20.566	0.82	450(2)	1.63	0.21			0.135	0.40	0.054			0.40	0.054	0.83	0.170			8.799	8.630	8.800	8.630	8.854		8.854	9.655	7/C	
10	1/A	1/A to 2/A	1/A		5.00	248	0.89	0.89	0.161	0.143	0.143	99	99	0.00	159	#D.16L3F.5	99	0	2/A		5.00	248	0.143	167		99	33.680	0.40	375(2)	0.90	0.56			0.041	6.77	0.279			6.77	0.279	0.32	0.108			10.280	10.145	10.402	10.294	10.661		10.661	10.740	1/A		
10	2/A	2/A to 3/A	1/A,2/A		5.00	248	0.89	0.89	1.000	0.036	0.032	0.032	22	22	0.00	67	#D.08L3F.5	22	0	3/A		5.56	240	0.175	197		117	27.999	0.45	375(2)	1.06	0.44			0.057	1.09	0.063			1.09	0.063	0.45	0.125			10.145	10.020	10.231	10.106	10.294		10.294	10.650	2/A	
10	3/A	3/A to 4/A	1/A,2/A,3/A		5.00	248	0.89	0.89	1.000	0.036	0.032	0.032	22	22	0.00	67	#D.08L3F.5	22	0	4/A		6.00	234	0.207	227		135	28.001	0.40	450(2)	0.85	0.47			0.037	0.46	0.017			0.46	0.017	0.22	0.063			10.020	9.908	10.089	10.026	10.106		10.106	10.600	3/A	
10	4/A	4/A to 5/A	1/A,2/A,3/A,4/A		5.00	248	0.89	0.89	1.000	0.036	0.032	0.032	22	22	0.00	67	#D.08L3F.5	22	0	5/A		6.47	229	0.239	363		251	27.999	0.40	525(2)	1.12	0.42			0.064	1.01	0.065			1.01	0.065	0.31	0.087			9.917	9.805	9.961	9.874	10.026		10.026	10.550	4/A	
10	5/A	5/A to 6/A	1/A,2/A,3/A,4/A,5/A		5.00	248	0.89	0.89	1.000	0.037	0.033	0.033	23	23	0.00	67	#D.08L3F.5	23	0	6/A		6.89	224	0.272	389		123	266	44.222	0.40	675(2)	0.72	0.74			0.026	0.20	0.005			0.20	0.005	0.09	0.041			9.806	9.629	9.869	9.828	9.874		9.874	10.500	5/A
10	6/A	6/A to 7/A	1/A,2/A,3/A,4/A,5/A,6/A		5.00	248	0.89	0.89	1.000	0.040	0.036	0.036	25	25	3.10	54	#D.09L2.4F.5	25	0			7.63	216	0.308	411		278	13.167	0.40	750(2)	0.61	0.22			0.019	2.40	0.045			2.40	0.045	0.06	0.008			9.631	9.578	9.783	9.775	9.828		9.832	10.061	6/A	
10	7/A	7/A to 8/A	1/A,2/A,3/A,4/A,5/A,6/A		5.00	248	0.89	0.89	1.000	0.040	0.036	0.036	25	25	3.10	54	#D.09L2.4F.5	25	0			7.63	216	0.308	411		278	13.167	0.40	750(2)	0.61	0.22			0.019	2.40	0.045			2.40	0.045	0.06	0.008			9.631	9.578	9.783	9.775	9.828		9.832	10.061	6/A	
10	1/C	1/C to 2/C	1/C		5.00	248	0.89	0.89	0.144	0.128	0.128	88	88	0.00	159	#D.16L3F.5	88	0	2/C		5.00	248	0.128	149		88	36.946	0.40	375(2)	0.80	0.62			0.033	4.79	0.156			4.79	0.156	0.25	0.093			10.062	9.914	10.494	10.401	10.650		10.650	10.680	1/C		
10	2/C	2/C to 3/C	1/C,2/C		5.00	248	0.89	0.89	0.206	0.183	0.183	126	126	0.00	159	#D.16L3F.5	126	0	3/C		5.62	239	0.311	349		206	35.968	0.40	450(2)	1.30	0.46			0.088	2.04	0.175			2.04	0.175	0.52	0.189			9.814	9.670	10.226	10.037	10.401		10.427	10.570	2/C		
10	3/C	3/C to 4/C	1/C,2/C,3/C		5.00	248	0.89	0.89	0.106	0.094	0.094	65	65	0.00	91	#D.11L3F.5	65	0	4/C		6.06	233	0.405	443		262	33.000	0.40	525(2)	1.17	0.47			0.070	0.83	0.058			0.83	0.058	0.34	0.112			9.679	9.547	9.979	9.867	10.037		10.037	10.560	3/C		
10	4/C	4/C to 5/C	1/C,2/C,3/C,4/C		5.00	248	0.89	0.89	0.106	0.094	0.094	65	65	0.00	91	#D.11L3F.5	65	0	5/C		6.55	228	0.499	628		404	33.000	0.40	675(2)	1.10	0.50			0.062	0.79	0.048			0.79	0.048	0.21	0.071			9.548	9.416	9.819	9.748	9.867		9.867	10.480	4/C		
10	5/C	5/C to 6/C	1/C,2/C,3/C,4/C,5/C		5.00	248	0.89	0.89	0.106	0.094	0.094	65	65	0.00	91	#D.11L3F.5	65	0	6/C		7.05	222	0.593	816		545	33.000	0.40	675(2)	1.48	0.37			0.112	1.08	0.121			1.08	0.121	0.39	0.128			9.416	9.284	9.627	9.499	9.748		9.748	10.410	5/C		
10	6/C	6/C to 7/C	1/C,2/C,3/C,4/C,5/C,6/C		5.00	248	0.89	0.89	0.126	0.112	0.112	77	77	0.00	91	#D.11L3F.5	77	0	7/C		7.42	218	0.705	1026		701	43.630	0.40	750(2)	1.54	0.47			0.121	0.66	0.080			0.66	0.080	0.36	0.159			9.286	9.111	9.419	9.260	9.499		9.499	10.340	6/C		

LOCATION				TIME		SUB-CATCHMENT RUNOFF				INLET DESIGN				DRAIN DESIGN										HEADLOSSES										PART FULL										DESIGN LEVELS								
DESIGN ARI	STRUCTURE No.	DRAIN SECTION	SUB-CATCHMENTS CONTRIBUTING	LAND USE	SLOPE OF CATCHMENT	SUB-CATCHMENT TIME OF CONC.	RAINFALL INTENSITY	10yr RUNOFF CO-EFFICIENT	CO-EFFICIENT OF RUNOFF	SUB-CATCHMENT AREA	EQUIVALENT AREA	SUM OF (C * A)	SUB-CATCHMENT DISCHARGE	FLOW IN K&C (INC. BYPASS)	ROAD GRADE AT INLET	MINOR FLOW ROAD CAPACITY	INLET TYPE	FLOW INTO INLET	BYPASS FLOW	BYPASS STRUCTURE No.	CRITICAL TIME OF CONC.	RAINFALL INTENSITY	TOTAL (C * A)	MAJOR TOTAL FLOW	MAJOR SURFACE FLOW CAPACITY	MAJOR SURFACE FLOW	PIPE FLOW	REACH LENGTH	PIPE GRADE	PIPE / BOX DIMENSIONS (CLASS)	FLOW VELOCITY FULL (PIPE GRADE VELOCITY)	TIME OF FLOW IN REACH	STRUCTURE CHART No.	STRUCTURE RATIOS FOR K' VALUE CALCULATIONS	VELOCITY HEAD	US HEADLOSS COEFFICIENT	US PIPE STRUCT. HEADLOSS	LAT. HEADLOSS CO-EFFICIENT	LAT. PIPE STRUCT. HEADLOSS	W.S.E. CO-EFFICIENT	CHANGE IN W.S.E	PIPE FRICTION SLOPE	PIPE FRICTION HEADLOSS (L * Sf)	DEPTH	VELOCITY	OBVERT LEVELS	DRAIN SECTION H.G.L	UPSTREAM H.G.L	LAT. H.G.L	W.S.E	SURFACE OR K&C INVERT LEVEL	STRUCTURE No.
Yrs					%	min	mm/h			ha	ha	ha	l/s	l/s	%	l/s		l/s	l/s		min	mm/h	ha	l/s	l/s	l/s	m	%	mm	m/s	min			m		m	%	m	m	m/s	m	m	m	m	m	m	m	m	m			
10 100	7/C	7/C to 8/C	rw5 to rw3, 1C, 2C, 3C, 4C, 5C, 6C, 7C		5.00 5.00	248 373	0.89 1.00	0.89 1.00	0.051 0.051	0.045 0.051	0.045 0.051	31 53	31 53	2.60 3.10	67 81	RD 2L 9F 5	31	0				7.89 7.89	213 320	0.750 1.181	1060		452 17.938	6.54 x 2	375(2)	2.05 (4.06)	0.15	Qo 0.027 Qo 0.7111 Do 694.000 CHART 33 Angle 2 SDo 2.5 DuDo 1.08 QoDo 0.04 K 0.34 SDo 1.16 cor 0.06 Ku 0.40 Kw 0.40	0.214	0.40	0.086			0.40	0.086	1.67	0.299	0.189	4.07	9.174 8.000	9.174 8.344	9.260		9.260	9.888	7/C		
10 100	1/B	1/B to 8/A															24				5.00 5.00	248 373	0.000 0.122	126		126 4.110	0.85 x 2	375(2)	1.14 (1.46)	0.06	Qo 0.126 Do 375 CHRT 32 Vu2QoDo 0.18 HDo Kg side flow 2.59 end flow 2.35	0.066	2.59	0.172			2.59	0.172	0.52	0.021			8.165 8.130	9.196 9.175	9.368		9.368	9.090	1/B			
10 100	8/A	8/A to 9/A	rw2 to 1A, 2A, 3A, 4A, 5A, 6A														24				7.95 7.95	213 319	0.308 0.698	616		348 45.688	0.39 x 2	525(2)	1.55 (1.26)	0.49	Qo 0.348 Do 525 Flow 7/A made eqv grate flow Angle 83 Chart 47 SDo 2.5 chart DuDo 0.71 K0 2.37 K0.5 2.33 QuDo 0.31 Cg 1.20 K 2.32 SDo 3.0 K0 2.27 K0.5 1.98 K 1.92 SDo 2.5 K0 2.37 K0.5 2.33 K 2.32 Interp val for SDo 2.98 Kw 1.94 CHART 46 SDo 3.0 K0 1.60 K0.5 1.88 K 1.93 SDo 2.5 K0 1.49 K0.5 1.97 K 2.07 Interp val for SDo 2.98 Kw 1.94 K vals above for stepped pipes as grate flow grate flow decreased by 0.240 from 7/A	0.122	1.75	0.215	Routine 2/2 Combined pipes in line case Join Pipes 1/B and 7/A Vel1 1.509 Vel2 0.989 Eq Dia 574 Angle 203 Flow 0.348 CHART 50 DuDo1.09 alpha 0 Kw 0.05 Yu 1.34 WSE 0.08 Ku 0.62 Kw 0.66 Interpolated Kw= 0.76 Kw= 0.76 K vals step pipes as pipe flow Ku 0.76 Kw 0.76 Averaged Ku 1.75 Kw 1.75			1.75	0.215	0.60	0.273			8.139 7.959	8.960 8.687	9.175		9.175	10.368	8/A		
10 100	9/A	9/A to 8/C	rw2 to 1A, 2A, 3A, 4A, 5A, 6A														24				8.44 8.44	208 312	0.308 0.698	605		348 34.084	0.41 x 2	525(2)	1.55 (1.29)	0.37	Qo 0.348 Do 525 CHART 50 DuDo1.00 alpha 46 Kw 0.25 Yu 1.81 WSE 0.17 Ku 1.14 Kw 1.41	0.122	1.14	0.139			1.41	0.172	0.60	0.204			7.959 7.819	8.548 8.344	8.687		8.720	10.116	9/A			
10 100	1/D	1/D to 8/C															24				5.00 5.00	248 373	0.000 0.250	259		259 25.771	0.35 x 2	525(2)	1.16 (1.19)	0.37	Qo 0.259 Do 525 CHRT 32 Vu2QoDo 0.13 HDo Kg side flow 4.10 end flow 3.40	0.069	4.10	0.282			4.10	0.282	0.33	0.085			7.724 7.634	8.429 8.344	8.711		8.711	8.480	1/D			
10 100	8/C	8/C to 9/C	rw5 to 7C, rw2 to 1A, 2A, 3A, 4A, 5A, 6A														24				8.81 8.81	205 307	1.058 2.129	1815		992 10.035	0.47 x 2	900(2)	1.51 (1.97)	0.11	Qo 0.992 Do 900 Routine 3.2 Join Pipes 1/D and 9/A Vel1 0.989 Vel2 1.583 Eq Dia 723 Angle 235 Flow 0.557 CHART 50 DuDo0.98 alpha 0 Kw 0.05 Yu 1.63 WSE 0.03 Ku 0.21 Kw 0.27 Interpolated Kw= 0.53 Kw= 0.56	0.116	0.53	0.061	Eqv 1/D & 9/A and 7/C Vel1 1.378 Vel2 1.358 Eq Dia 881 Angle 212 Flow 0.992 CHART 50 DuDo0.98 alpha 0 Kw 0.05 Yu 1.63 WSE 0.03 Ku 0.21 Kw 0.27 Interpolated Kw= 0.53 Kw= 0.56			0.56	0.065	0.28	0.028			8.015 7.968	8.283 8.255	8.344		8.348	9.432	8/C		
10 100	x3/1	x3/1 to x4/1															24				0.00 0.00	248 373	0.000 0.000	0		0 102.296	0.74 x 2	1050(2)	0.00 (2.75)	1.70			0.000	0.20	0.000			0.20	0.000	0.00	0.000			9.416 8.654	8.350 8.256	8.350		8.350	10.207	x3/1		
10 100	x4/1	x4/1 to 9/C	x2/4a														24				5.07 5.07	247 371	0.108 0.121	125		67 90.005	0.62 x 2	1350(2)	0.05 (2.96)	1.50	Qo 0.087 Do 1350 Flow x3/1 made eqv grate flow CHART 50 DuDo0.67 alpha 89 Kw 0.30 Yu 0.11 WSE 0.00 Ku 1.36 Kw 2.69 K vals above for stepped pipes as grate flow	0.000	1.00	0.001	Part full downstream pipe Upstream HGL 8.256 below outlet pipe chv 8.936 Set Kp to 1			1.00	0.001	0.00	0.000	0.116	1.08	8.936 8.374	8.256 8.255	8.256		8.256	9.705	x4/1		
10 100	9/C	9/C to x5/1	rw5 to 6A, x2/4a														24				8.92 8.92	204 305	1.168 2.250	1906		1043 18.315	0.72 x 2	1350(2)	0.71 (3.20)	0.31	Qo 1.043 Do 1350 Routine 2.15 Join Pipes 8/C and x4/1 Vel1 1.552 Vel2 0.039 Eq Dia 949 Angle 192 Flow 1.043 CHART 50 DuDo0.70 alpha 12	0.026	1.00	0.029	Kw 0.19 Yu 1.47 WSE -0.01 Ku -1.35 Kw -0.54 Part full downstream pipe Upstream HGL 8.255 below outlet pipe chv 8.374 Set Kp to 1			1.00	0.029	0.04	0.006	0.438	2.57	8.374 8.242	8.226 8.220	8.255		8.255	9.220	9/C		

CALCULATIONS TABLE

C

PROJECT TEAM

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NPER Civil & Structural
CAES 3355 RPEQ 6750

Signature:

Date: 28 / 11 / 2011

C	INVERT LEVELS AMENDED	28/10/2011	BP
B	GULLY DETAIL REMOVED	11/11/2011	BP
A	FOR APPROVAL	11/10/2011	BP
REV	DESCRIPTION	DATE	BY

Status

FOR APPROVAL

Project

BUILDING 8 ON LOT 334/SP193431
CHRISTENSEN ROAD SOUTH
YATALA

for

MULTISPAN AUSTRALIA

Title

STORMWATER
CALCULATION TABLE
SHEET 2

Drawn	Date	Chkd	Date
B.PARGE	9/9/11	T.SMITH	10/10/11
Design	Date	Apprd	Date
B.PARGE	7/9/11	N.CANTO	11/10/11
Scale	A1	Certif	Date
AS SHOWN		N.CANTO	11/10/11
Project No	Dwg. No.	Rev	
11-129	C13	C	

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