Overland Flow Study Report

265-267 King Georges Road, Roselands

Prepared for Evolve Pacific Developments / 26 July 2016

161087 PA

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Structural
Civil
Traffic
Facade
Consulting
Engineers

Contents

1.0 Introduction

Taylor Thomson Whitting Pty. Ltd. (TTW) has been engaged by Evolve Pacific Developments to undertake a flood study for the proposed development at 265-267 King Georges Road, Roselands NSW. The purpose of the study is to quantify the upstream overland flow for the 100 year Annual Recurrence Interval (ARI) storm event and the Probable Maximum Precipitation (PMP) storm event, and determine the extent of the flow conveyance through the development site.

1.1 The Site

The proposed development will be situated on the proposed amalgamation of 265 and 267 King Georges Road, Roselands. The two existing dwellings are proposed to be demolished with new affordable living units to be constructed. The amalgamated site is bounded by an existing multi-residential dwelling to the north, King Georges Road to the east, and existing dwellings on its southern and western boundaries.

The existing site has general topographic fall to the north. There is minimal in ground stormwater infrastructure evident, thus majority of site stormwater discharge is currently along its northern boundary into the adjacent property.

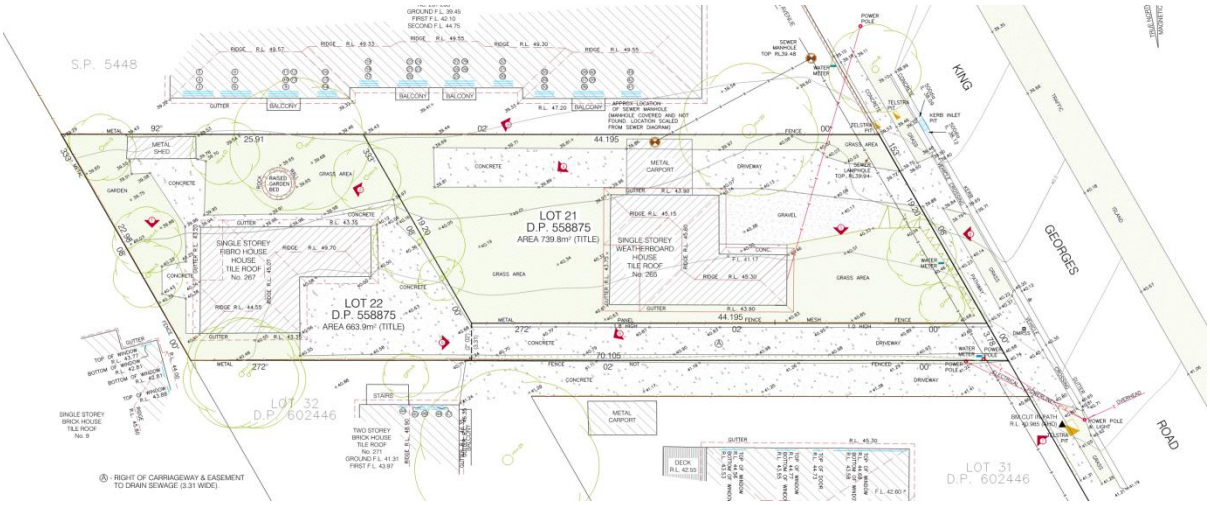


Figure 1 - Existing Site Survey

The proposed development consists of two new multi residential dwellings with a centralised access pathway. A new car park is proposed to be provided at the building frontage to King Georges Road to service 6 cars, inclusive of 3 disabled spots. A communal landscaping area is proposed at the rear of the property.

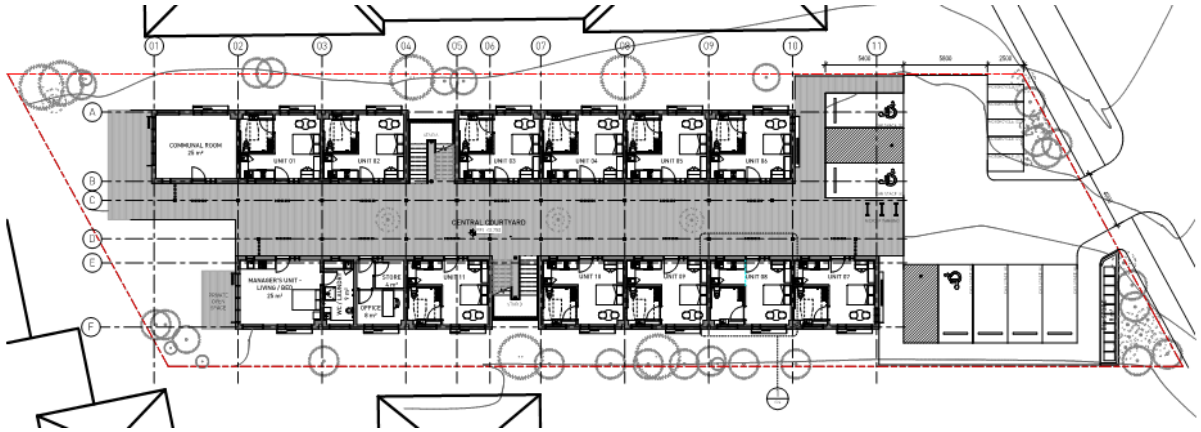


Figure 2 - Proposed Architectural Ground Floor Plan

1.2 Referenced Documents

This report, and the findings within, has been prepared upon reviewing the following documents:

- City of Canterbury-Bankstown Development Control Plan 2012 (CCB DCP) – Part 6.4 Developments Engineering, Flooding and Stormwater
- Australian Rainfall and Runoff 1987 (AR&R)
- Commonwealth Bureau of Meteorology (BoM)
- Map images courtesy of Nearmaps
- NSW LiDAR Survey Data 2013
- NSW Flood Development Manual
- Existing land survey plan prepared by Lawrence Group
- Architectural plans prepared by Sissons Architects

2.0 Upstream Catchment

The upstream overland flow catchment has been sized using both visual inspection and using the NSW Lidar survey. The upstream catchment further divides into sub-catchments, whereby only a portion affects the development site. Refer Figure 3 for catchment plan.

Figure 3 - Upstream Catchment Plan
Legend
Catchment A = Blue
Catchment B = Yellow
Catchment C = Green

As suggested above, Catchment C is the portion of the upstream catchment falling towards the site, with Catchment A and B falling and draining away from the site.

- Catchment A has a main overland flow route down the southern side of Penshurst Street. The crown of Penshurst Street cuts off and redirects the overland flow traversing down through the properties and Beggs Street towards King Georges Road.
- Catchment B utilises the northern side of Penshurst Street and Georges Crescent and the main overland flow route. Flow then traverses through the downstream properties at the end of Georges Crescent adjacent to the development site.
- Overland flow from Catchment C sheets between the properties upstream of the development site and continues similarly through and downstream.

Utilising an Intensity Frequency Distribution (IFD) table generated and provided by BoM, the information was relayed into DRAINS to quantify the overland flows generated by the upstream catchments. The following figures demonstrate the model setup in DRAINS and the results for the 100 year ARI and PMP storm events.

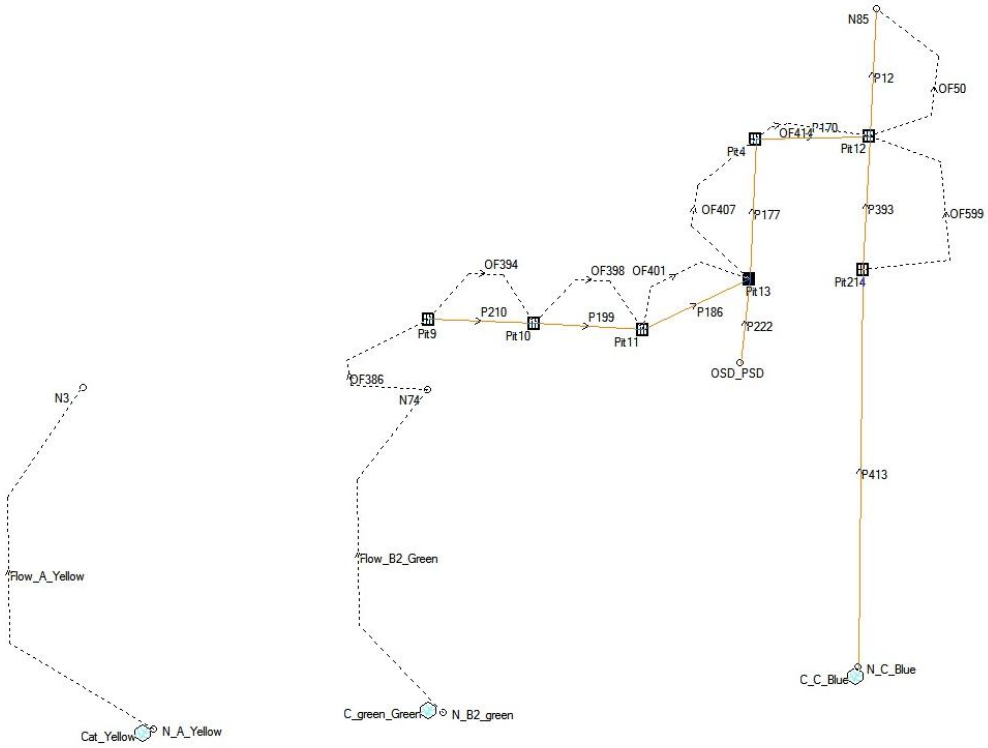


Figure 4 - DRAINS Model Setup

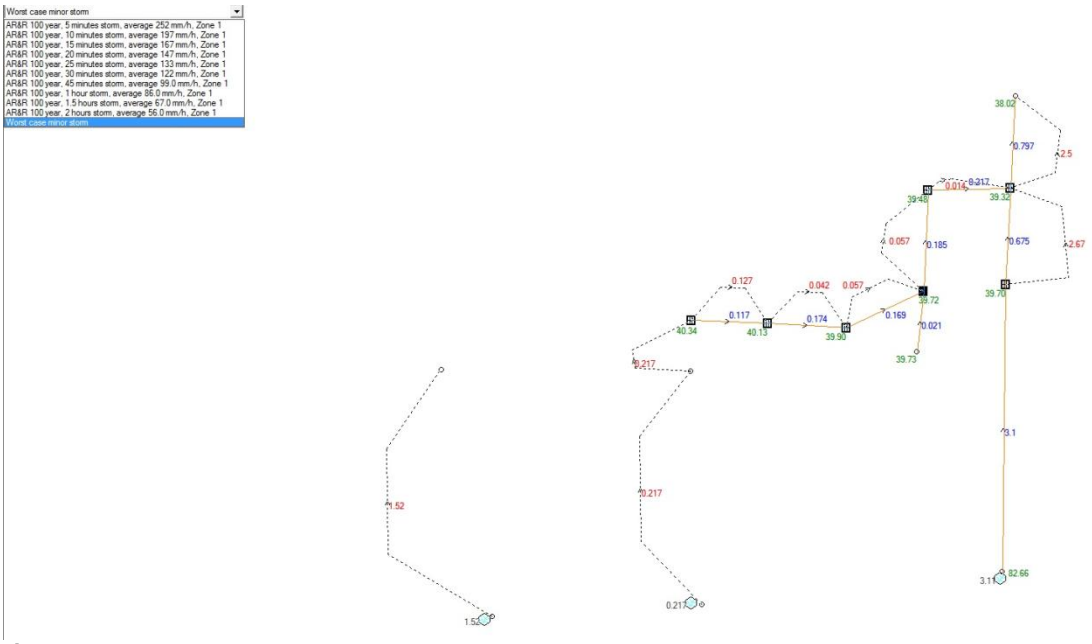


Figure 5 – 100 year ARI storm event

The critical storm for the 100 year ARI event was 20 minutes.

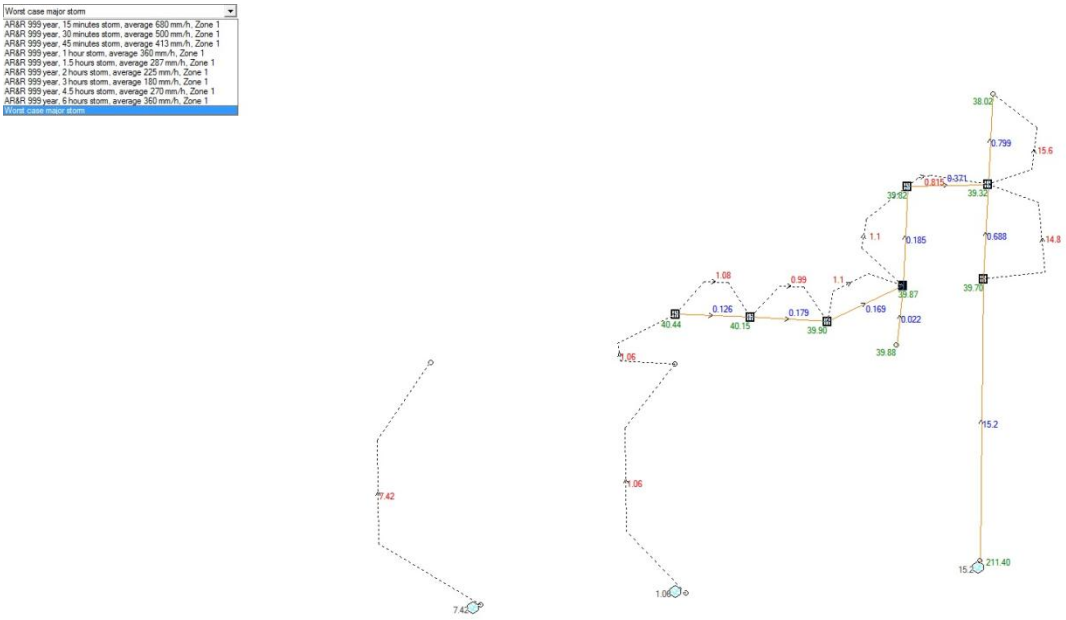


Figure 6 - PMP storm event

3.0 Overland Flow Modelling

The flows obtained in the DRAINS were further modelled in HEC-RAS to determine the channelized water levels. Two HEC-RAS models were created to analyse the upstream overland flows:

- Catchment B model – demonstrates the likely water levels from the flow generated by Catchment B. The 100 year ARI and PMP storm events were analysed with results demonstrating that the development site is not subjected to overland flows from Catchment B. Existing buildings, fencing and retaining walls in the adjacent

properties to the development site have been incorporated into the model to demonstrate they prevent the site being subjected to the overland flow.

- Catchment C model - demonstrates the proposed landscape channel within the development site along its southern boundary to intercept the overland flow from the upstream properties for conveyance towards King Georges Road. This alters from the existing scenario and relieves the downstream properties of overland flow inundation. The channel is sized to cater for the PMP storm event.

No existing in ground stormwater infrastructure was included in the above model for a conservative approach. Refer Appendix A for HEC-RAS model and extent of overland model plan.

As Catchment A is directed towards King Georges Road further upstream, the overland flow route was analysed as a typical road section in DRAINS to obtain flow depth to determine if flow inundates the development site on its eastern boundary. The 100 year ARI and PMP storm events were analysed with the 100 year ARI event demonstrated to be safely contained within the road reserve. The PMP storm event flow inundates the site only at the driveway and exits as per the proposed overland flow path within the site. Refer to the following figures for King Georges Road section analysis.

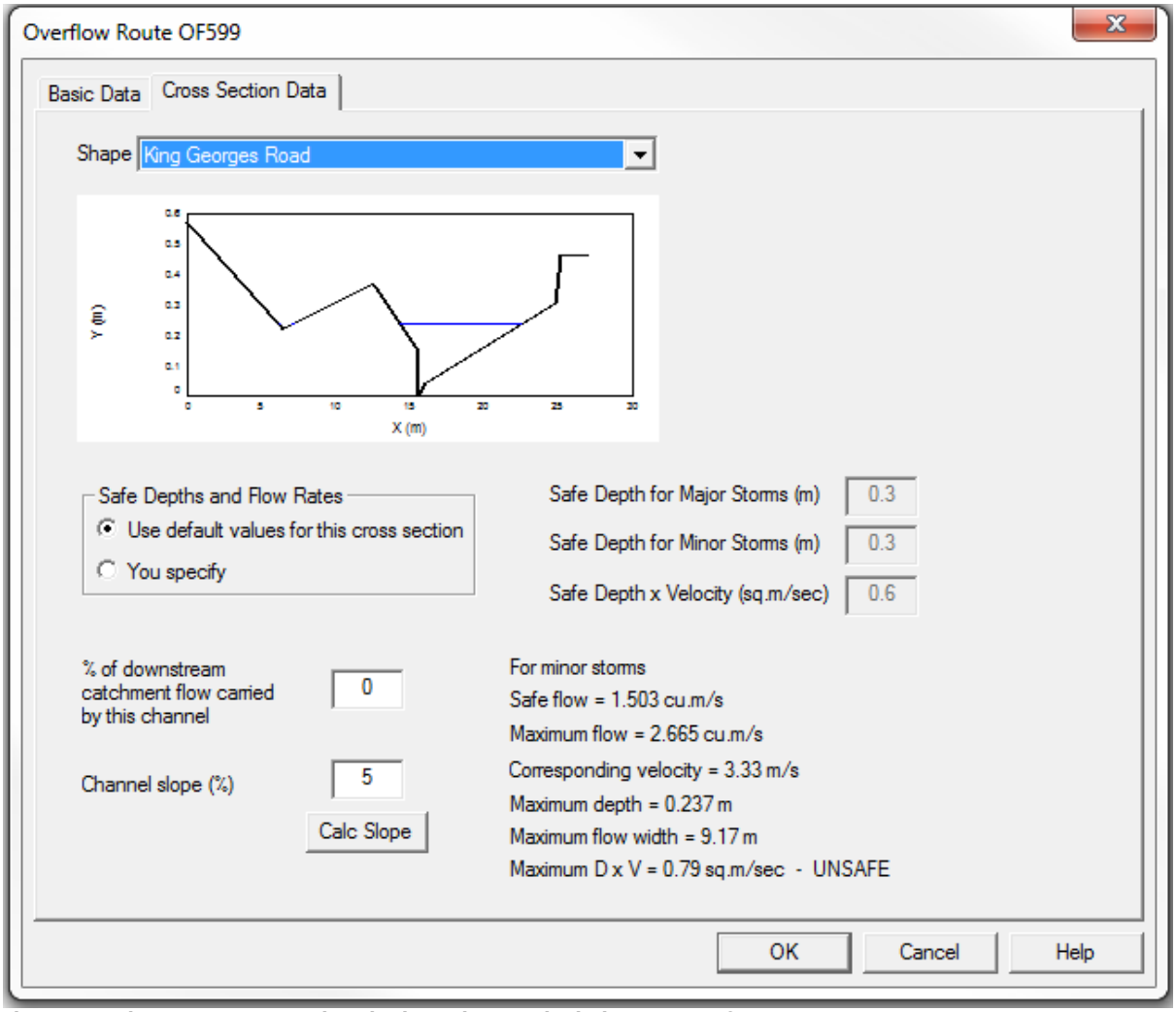


Figure 7 - King Georges Road typical section analysis in DRAINS for 100 year ARI storm event

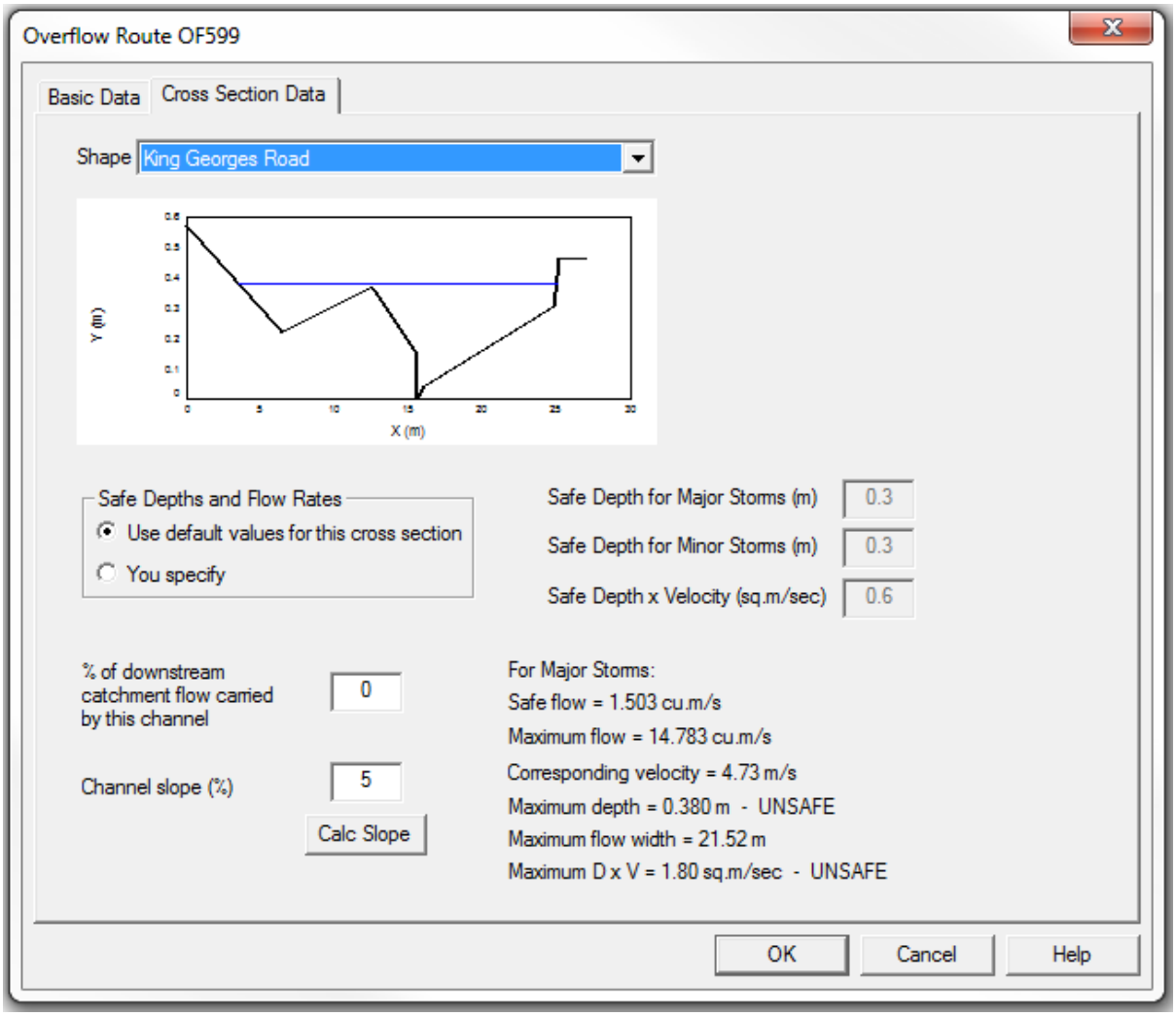


Figure 8 - King Georges Road typical section analysis in DRAINS for PMP storm event

4.0 Flood Evacuation Strategy

In accordance with NSW's Flood Development Manual, along with industry practice, an evacuation strategy is to be set in place to cater for all storms up to and including the PMP event. TTW's analysis demonstrates the overland flow paths pertaining to the site from the upstream catchments do not impose an immediate threat to the residents. The proposed finished floor levels are set above the PMP storm event overland flow levels, thus residents will not be required to be evacuated as part of the strategy and can stay put.

5.0 Summary

From the results, we summarise and recommend the following:

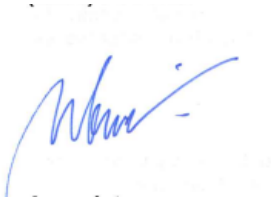
- The Finished Floor Levels (FFL) of the units to be at RL 40.20 Australian Height Datum (AHD);
- A bund or wall to be provided at the upstream end of the proposed landscape channel to ensure the upstream overland flow is capture and conveyed through the channel;
- A piped system to be provided within the proposed landscaped channel to capture the smaller, more frequent storm events;
- All openings including windows, vents, etc. adjacent to the channel to be set at a minimum level of RL 41.00 AHD;
- Southern building adjacent to proposed channel to be constructed with water resistant materials to a minimum level of RL41.00 AHD;
- No concentrate number of small shrubs to be provided to the landscaped channel, only long stemmed (trunk) planting;
- A reduced overland flow quantity inundating downstream proposed as overland flow is now directed towards King Georges Road.

The above recommendations are outlined on the plan affixed in Appendix B

Prepared by
TAYLOR THOMSON WHITTING (NSW) PTY LTD

Chris Veleski
Engineer

Authorised By
TAYLOR THOMSON WHITTING (NSW) PTY LTD



Nemesio Biason
Associate

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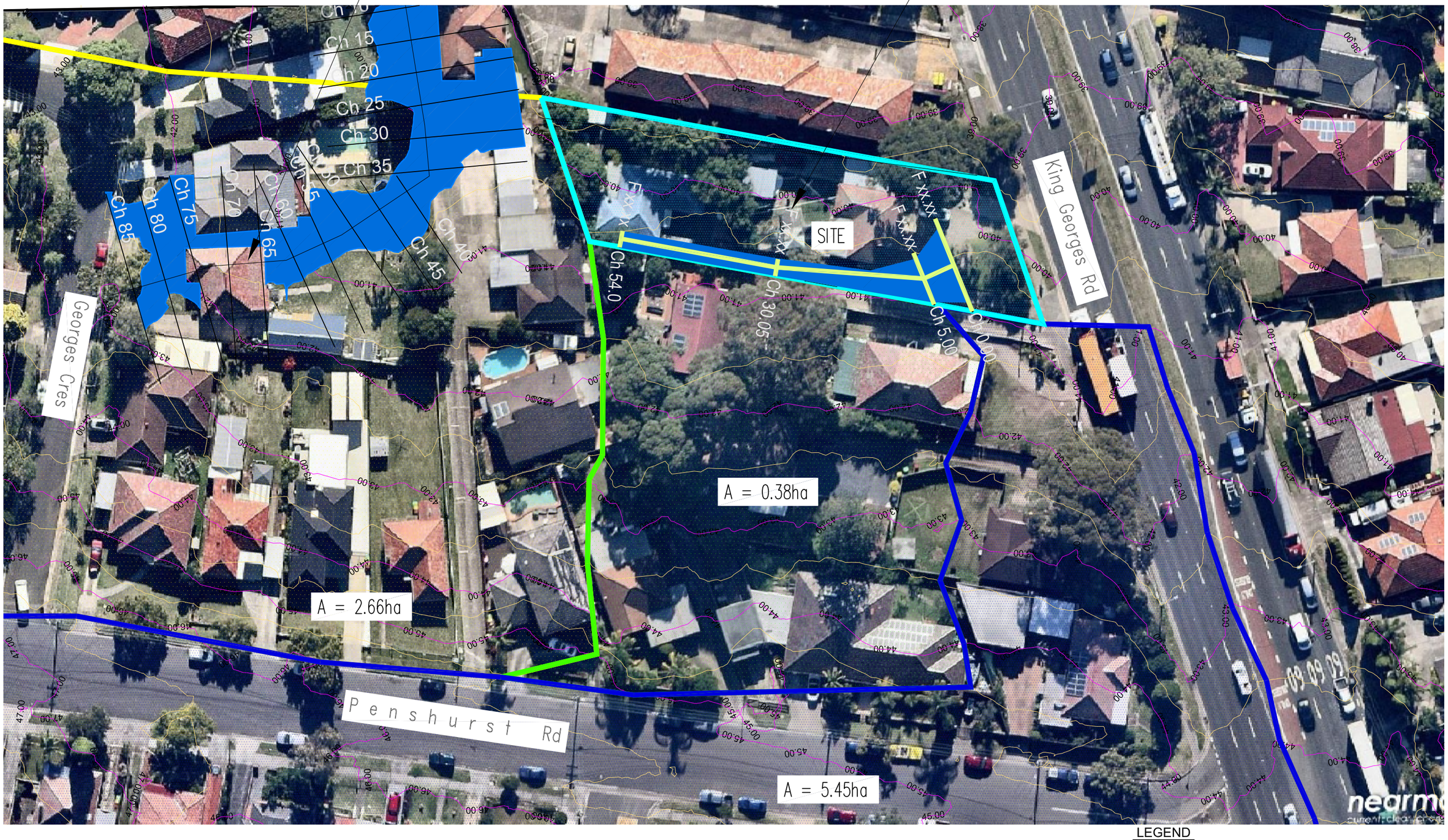
Appendix A

Overland Flow Results

1. **HEC-RAS Model and Extent of Overland Flow Plan**

2. **Longitudinal Section of Catchment B Model**
3. **Cross Sections of Catchment B Model**
4. **Velocities of Catchment B Model**

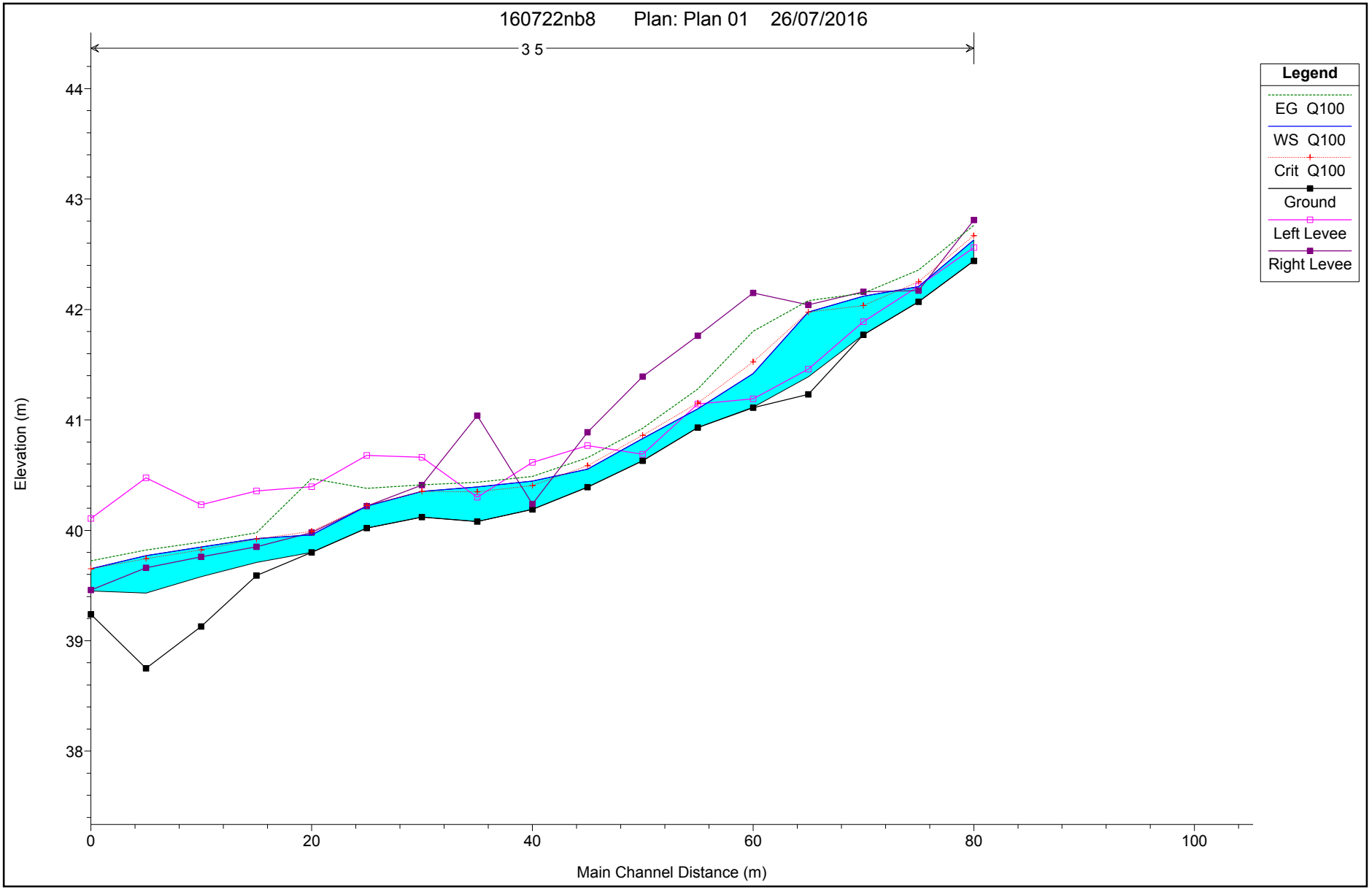
5. **Longitudinal Section of Catchment C Model (Proposed Channel)**
6. **Cross Sections of Catchment C Model (Proposed Channel)**
7. **Velocities of Catchment C Model (Proposed Channel)**



HEC - RAS MODEL PLAN

LEGEND

CH 30	GEORGES CRES CHANNEL – HECRAS MODEL HECRAS CHAINAGE CROSS SECTION.
CH 5.00	PROPOSED SITE'S OPEN CHANNEL – HECRAS MODEL HECRAS CHAINAGE CROSS SECTION.
	APPROXIMATE 100ARI OVERLAND FLOW EXTENTS



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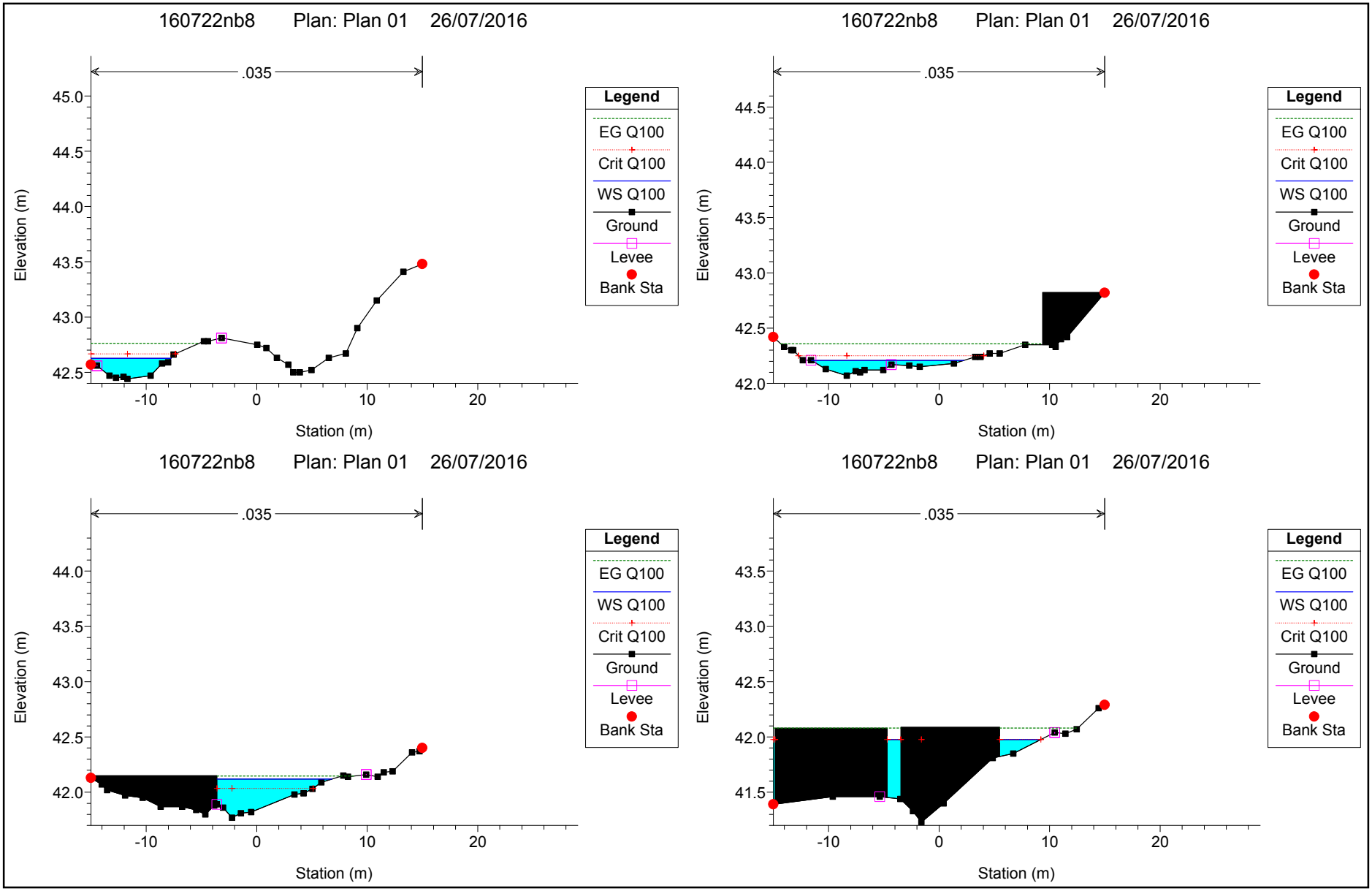


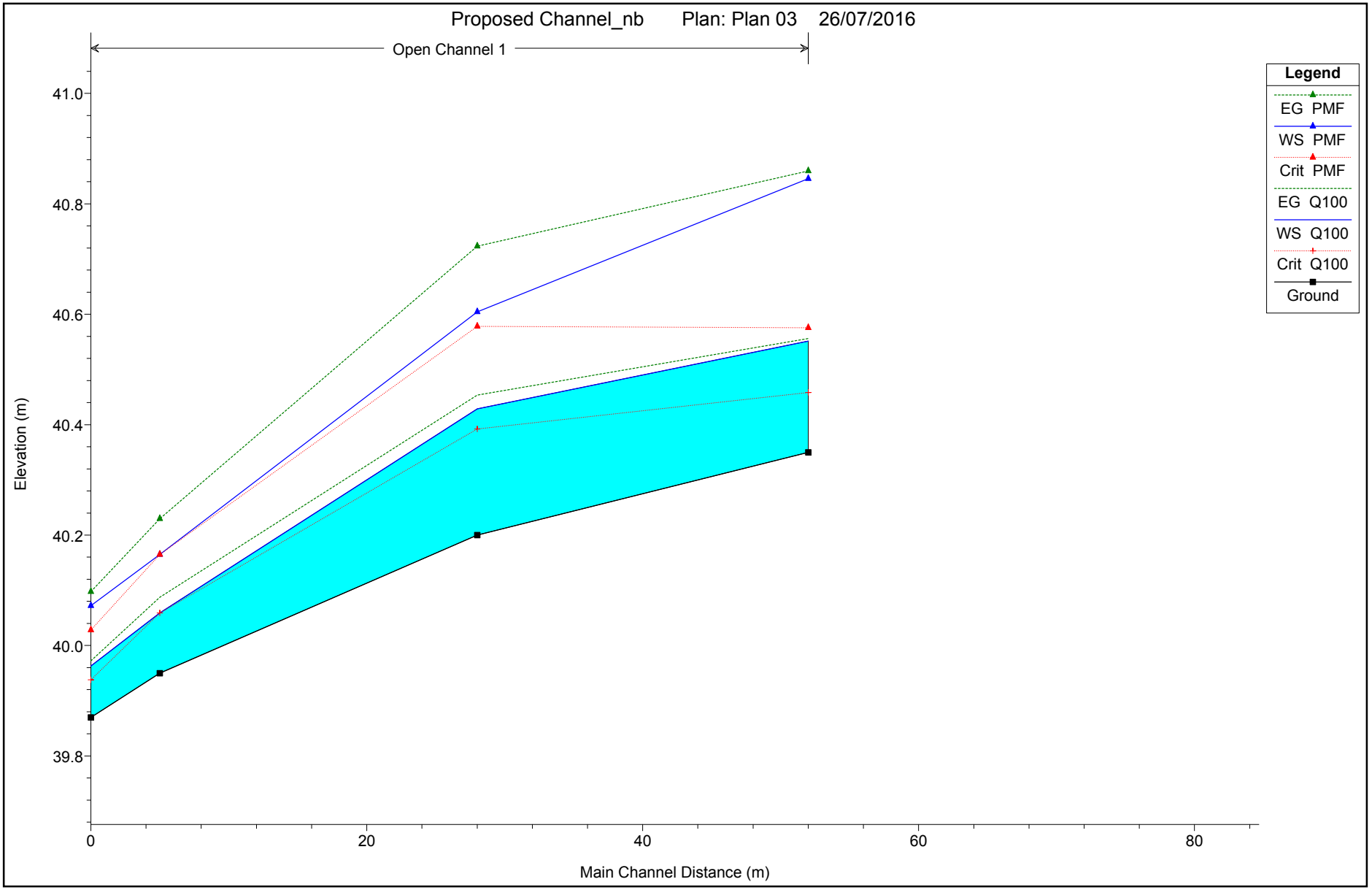
1 cm Horiz. = 5 m 1 cm Vert. = 0.5 m

Catchment B

HEC-RAS Plan: Plan 01 River: 3 Reach: 5

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
5	85	Q100	1.52	42.44	42.63	42.67	42.76	0.050093	1.62	0.94	7.24	1.44
5	85	QPMP	7.42	42.44	42.84	42.84	42.95	0.020558	1.45	5.11	23.85	1
5	80	Q100	1.52	42.07	42.21	42.25	42.36	0.140866	1.72	0.88	13.77	2.17
5	80	QPMP	7.42	42.07	42.31	42.42	42.7	0.141223	2.78	2.67	20.27	2.44
5	75	Q100	1.52	41.77	42.12	42.03	42.15	0.00607	0.74	2.05	10.41	0.53
5	75	QPMP	7.42	41.77	42.32	42.26	42.38	0.008518	1.04	7.17	28.69	0.66
5	70	Q100	1.52	41.39	41.98	41.98	42.08	0.033498	1.43	1.07	5.1	1
5	70	QPMP	7.42	41.39	42.22	42.22	42.31	0.023154	1.34	5.52	28.99	0.98
5	65	Q100	1.52	41.11	41.42	41.53	41.8	0.088333	2.74	0.55	1.85	1.6
5	65	QPMP	7.42	41.11	41.77	41.87	42.09	0.075592	2.52	2.95	13.83	1.74
5	60	Q100	1.52	40.93	41.1	41.15	41.28	0.096779	1.88	0.81	8.25	1.91
5	60	QPMP	7.42	40.93	41.27	41.44	41.7	0.081767	2.9	2.56	11.87	1.99
5	55	Q100	1.52	40.63	40.83	40.86	40.92	0.049102	1.36	1.12	11.28	1.37
5	55	QPMP	7.42	40.63	40.96	41.05	41.26	0.076519	2.42	3.06	18.04	1.88
5	50	Q100	1.52	40.39	40.55	40.58	40.66	0.056766	1.43	1.06	10.94	1.47
5	50	QPMP	7.42	40.39	40.73	40.82	40.97	0.043	2.17	3.42	15.43	1.47
5	45	Q100	1.52	40.19	40.44	40.4	40.49	0.011038	0.92	1.65	9.66	0.71
5	45	QPMP	7.42	40.19	40.79	40.67	40.87	0.006129	1.23	6.06	14.7	0.61
5	40	Q100	1.52	40.08	40.39	40.35	40.44	0.009739	0.93	1.64	8.53	0.68
5	40	QPMP	7.42	40.08	40.63	40.63	40.81	0.017324	1.88	3.94	10.89	0.99

5	35	Q100	1.52	40.12	40.35	40.35	40.41	0.003112	1.08	1.41	11.21	0.97
5	35	QPMP	7.42	40.12	40.56	40.56	40.69	0.002529	1.6	4.65	17.34	0.98
5	30	Q100	1.52	40.02	40.22	40.23	40.38	0.009381	1.77	0.86	7.38	1.66
5	30	QPMP	7.42	40.02	40.29	40.39	40.64	0.014025	2.65	2.8	17.65	2.13
5	25	Q100	1.52	39.8	39.96	39.99	40.47	0.496882	3.16	0.48	7.72	4.05
5	25	QPMP	7.42	39.8	40.04	40.16	40.47	0.124497	2.66	2.62	17.65	2.31
5	20	Q100	1.52	39.71	39.93	39.92	39.98	0.020129	1.01	1.51	12.05	0.91
5	20	QPMP	7.42	39.71	40.04	40.14	40.35	0.056307	2.46	3.02	13.53	1.66
5	15	Q100	1.52	39.58	39.85	39.82	39.89	0.013611	0.93	1.64	10.88	0.76
5	15	QPMP	7.42	39.58	40.03	40.06	40.17	0.030239	1.63	4.55	23.73	1.19
5	10	Q100	1.52	39.43	39.77	39.74	39.82	0.014578	0.99	1.53	9.62	0.79
5	10	QPMP	7.42	39.43	40.01	39.95	40.08	0.009391	1.14	6.51	24.01	0.7
5	5	Q100	1.52	39.45	39.65	39.65	39.72	0.026383	1.18	1.29	9.83	1.04
5	5	QPMP	7.42	39.45	39.88	39.88	40.01	0.020488	1.57	4.73	19.45	1.02



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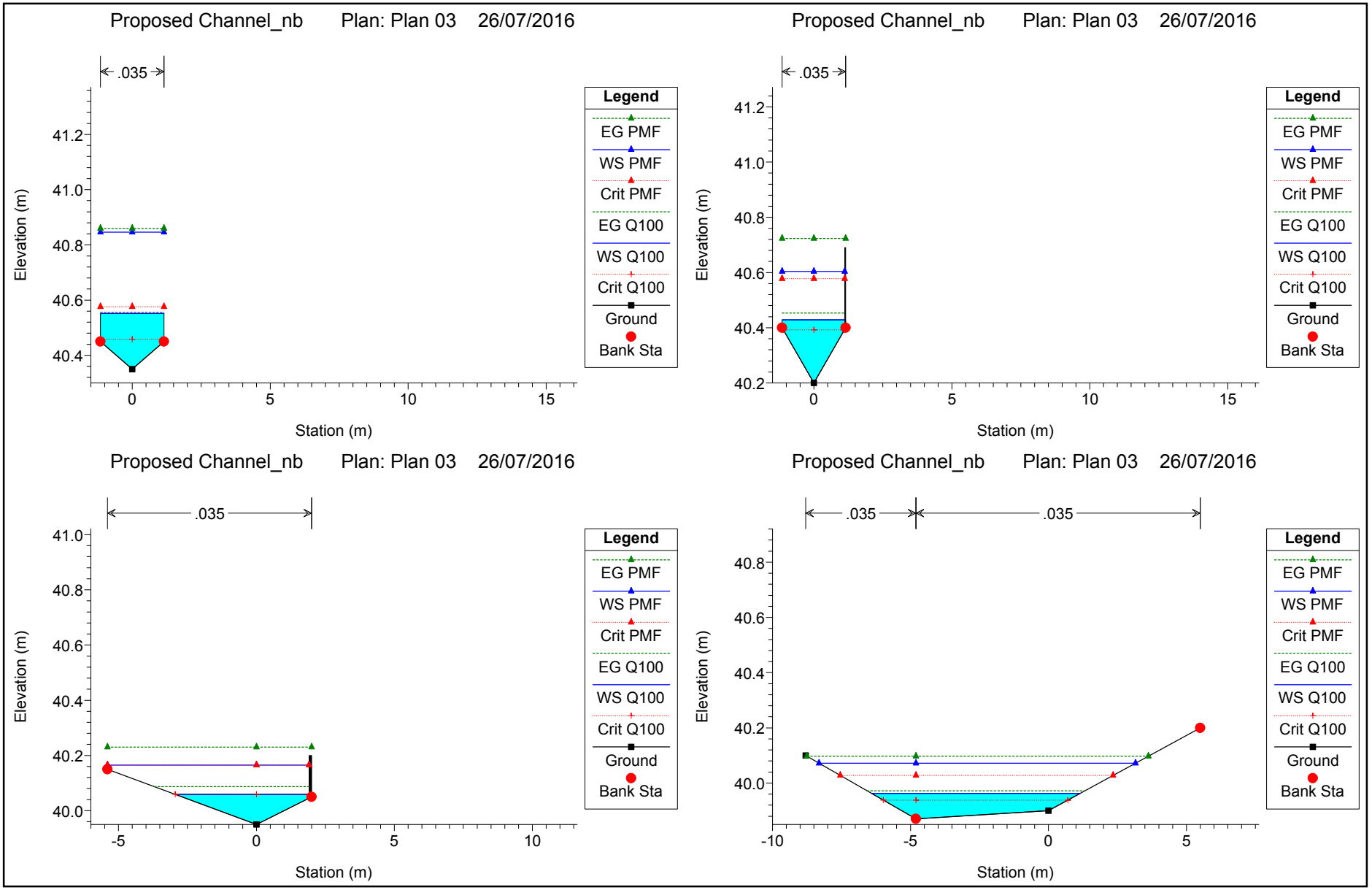

1 cm Horiz. = 2 m 1 cm Vert. = 0.2 m

Catchment C

HEC-RAS Plan: Plan 03 River: Open Channel Reach: 1

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
1	52	Q100	0.1	40.35	40.55	40.46	40.56	0.001387	0.29	0.36	2.3	0.23
1	52	QPMP	0.53	40.35	40.85	40.58	40.86	0.001411	0.51	1.03	2.3	0.25
1	28	Q100	0.21	40.2	40.42	40.4	40.45	0.011569	0.74	0.28	2.27	0.68
1	28	QPMP	1.06	40.2	40.6	40.58	40.72	0.017707	1.53	0.69	2.27	0.88
1	5	Q100	0.21	39.95	40.06	40.06	40.09	0.023396	0.67	0.31	5.01	0.87
1	5	QPMP	1.06	39.95	40.16	40.16	40.23	0.024724	1.13	0.94	7.31	1.01
1	0	Q100	0.21	39.87	39.96	39.94	39.97	0.008503	0.44	0.48	7.56	0.54
1	0	QPMP	1.06	39.87	40.07	40.02	40.1	0.008515	0.73	1.52	11.46	0.61

Appendix B

Flood Mitigation and Protection Plan

FLOOD MITIGATION AND PROTECTION PLAN

- NO LANDSCAPING MOUND
- NO WALLS
- NO STRUCTURES BLOCKING THE OVERLAND FLOWPATH

100mm heelsafe grated drain shown as ▪▪▪▪ (typ)

OVERLAND FLOWPATH

LANDSCAPING MOUND TO 41.0 RL

LIGHT LANDSCAPING ONLY

LANDSCAPING TO BE LIMITED TO LONG STEM PLANTING

FLOODPROOF TO 41.0RL.

TOP OF WALL VARIES TO MATCH EXISTING SOUTHERN NEIGHBOUR'S LEVELS

SECTION ② – NOT TO SCALE

FLOODPROOF TO 41.0RL

SECTION ③ – NOT TO SCALE

1:200@A3

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Appendix C

Revised Concept Stormwater Management Drawings

265-267 KING GEORGES RD, ROSELANDS

GENERAL NOTES

1. Contractor must verify all dimensions and existing levels on site prior to commencement of works. Any discrepancies to be reported to the Engineer
2. Strip all topsoil from the construction area. All stripped topsoil shall be disposed of off-site unless directed otherwise.
3. Make smooth connection with all existing works.
4. Compact subgrade under buildings and pavements to minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1. Compaction under buildings to extend 2m minimum beyond building footprint.
5. All work on public property, property which is to become public property, or any work which is to come under the control of the Statutory Authority is to be carried out in accordance with the requirements of the relevant Authority. The Contractor shall obtain these requirements from the Authority. Where the requirements of the Authority are different to the drawings and specifications, the requirements of the Authority shall be applicable.
6. For all temporary batters refer to geotechnical recommendations.

REFERENCE DRAWINGS

1. These drawings have been based from, and to be read in conjunction with the following Consultants drawings. Any conflict to the drawings must be notified immediately to the Engineer.

Consultant	Dwg Title	Dwg No	Rev	Date
LAWRENCE GROUP	DETAIL AND LEVEL SURVEY	DETL-001	E	22.03.16
SISSONS ARCH.	LOO GA PLAN	ADA 100	3	28.04.16

SURVEY AND SERVICES INFORMATION

SURVEY

Origin of levels : RL40.985
Datum of levels : A.H.D. AUSTRALIAN HEIGHT DATUM
Coordinate system : LOCAL
Survey prepared by : LAWRENCE GROUP PTY. LTD.
Setout Points : CONTACT THE SURVEYOR

Taylor Thomson Whitting does not guarantee that the survey information shown on these drawings is accurate and will accept no liability for any inaccuracies in the survey information provided to us from any cause whatsoever.

UNDERGROUND SERVICES - WARNING

The locations of underground services shown on Taylor Thomson Whittings drawings have been plotted from diagrams provided by service authorities. This information has been prepared solely for the authorities own use and may not necessarily be updated or accurate.

The position of services as recorded by the authority at the time of installation may not reflect changes in the physical environment subsequent to installation.

Taylor Thomson Whitting does not guarantee that the services information shown on these drawings shows more than the presence or absence of services, and will accept no liability for inaccuracies in the services information shown from any cause whatsoever.

The Contractor must confirm the exact location and extent of services prior to construction and notify any conflict with the drawings immediately to the Engineer/Superintendent.

The contractor is to get approval from the relevant state survey department, to remove/adjust any survey mark. This includes but is not limited to; State Survey Marks (SSM), Permanent Marks (PM), cadastral reference marks or any other survey mark which is to be removed or adjusted in any way.
Taylor Thomson Whitting plans do not indicate the presence of any survey mark. The contractor is to undertake their own search.

BOUNDARY AND EASEMENT NOTE

The property boundary and easement locations shown on Taylor Thomson Whitting drawing's have been based from information received from : 22.03.2016,
Lawrence Group Pty. Ltd
Taylor Thomson Whitting makes no guarantees that the boundary or easement information shown is correct.
Taylor Thomson Whitting will accept no liabilities for boundary inaccuracies. The contractor/builder is advised to check/confirm all boundaries in relation to all proposed work prior to the commencement of construction. Boundary inaccuracies found are to be reported to the superintendent prior to construction starting.

STORMWATER DRAINAGE NOTES

1 Stormwater Design Criteria :
(A) Average recurrence interval –
1:100 years for roof drainage to first external pit
1:100 years for paved and landscaped areas
(B) Rainfall intensities –
Time of concentration: 6 minutes
1:100 years = 252 mm/hr
1:100 years = 194 mm/hr
(C) Runoff coefficients –
Roof areas: C_{100} = 1.0
Roads and paved areas: C_{100} = 1.0
Landscaped areas: C_{100} = 0.6

2. Pipes 300 dia and larger to be reinforced concrete Class " 2 " approved spigot and socket with rubber ring joints U.N.O.
3. Pipes up to 300 dia shall be sewer grade uPVC with solvent welded joints.
4. Equivalent strength VCP or FRP pipes may be used subject to approval.
5. Precast pits may be used external to the building subject to approval by Engineer
6. Enlargers, connections and junctions to be manufactured fittings where pipes are less than 300 dia.
7. Where subsoil drains pass under floor slabs and vehicular pavements, unslotted uPVC sewer grade pipe is to be used.
8. Grates and covers shall conform with AS 3996–2006, and AS 1428.1 for access requirements.
9. Pipes are to be installed in accordance with AS 3725. All bedding to be type H2 U.N.O.
10. Care is to be taken with levels of stormwater lines. Grades shown are not to be reduced without approval.
11. All stormwater pipes to be 150 dia at 1.0% min fall U.N.O.
12. Subsoil drains to be slotted flexible uPVC U.N.O.
13. Adopt invert levels for pipe installation (grades shown are only nominal).

PIT SCHEDULE

Note: Grate size does not necessarily reflect pit size, refer pit type details, shown on detail sheets – **C03**
Final internal pit dimensions are to comply with AS3500

Type	Description	Cover (Clear Opening)	Number
A	Surface inlet pit	600 x 600 Class C galvanised mild steel grate hinged to frame	1,3,5,6,7,8 9,10,11
B		600 x 900 Class C galvanised mild steel grate hinged to frame	4
C	Junction pit	600 x 600 Class B cast iron cover with concrete infill	2
		900 x 900 Class B cast iron cover with concrete infill	13,14
D	OSD Access pit	900 x 900 Class C concrete infill to frame	15,17,18,19
		900 x 900 Class C grate and frame	16
E		Existing pit to remain	12

STORMWATER LEGEND

KO – Kerb only
FK – Flush kerb
F22.20 – Finished surface level
eRL22.20 – Existing surface level
TOW22.20 – Top of wall level
TOB22.20 – Top of bund level
CREST – Crest in pavement
Blockwork retaining wall
Stormwater pit, flow direction
Subsoil drainage
IO – Inspection Outlet
GD – Grated drain
Overland flow route
(11) – Pit number
Landscape berm

CATCHMENT LEGEND

Catchment to Onsite Detention
Catchment bypassing Onsite Detention

LOCALITY PLAN

Not to Scale – Map courtesy of Spaxial Information Exchange NSW

DRAWING SCHEDULE

FileName: C01.dwg – USER: jheath – Plot File Created: Jul 27, 2016 - 2:42pm

A1 0 1 2 3 4 5 6 7 8 9 10

PRELIMINARY

Rev	Description	Eng	Draft	Date
P2	REISSUED FOR DEVELOPMENT APPLICATION	CV	JH	27.07.16
P1	ISSUED FOR DEVELOPMENT APPLICATION	CV	CV	29.04.16

Architect
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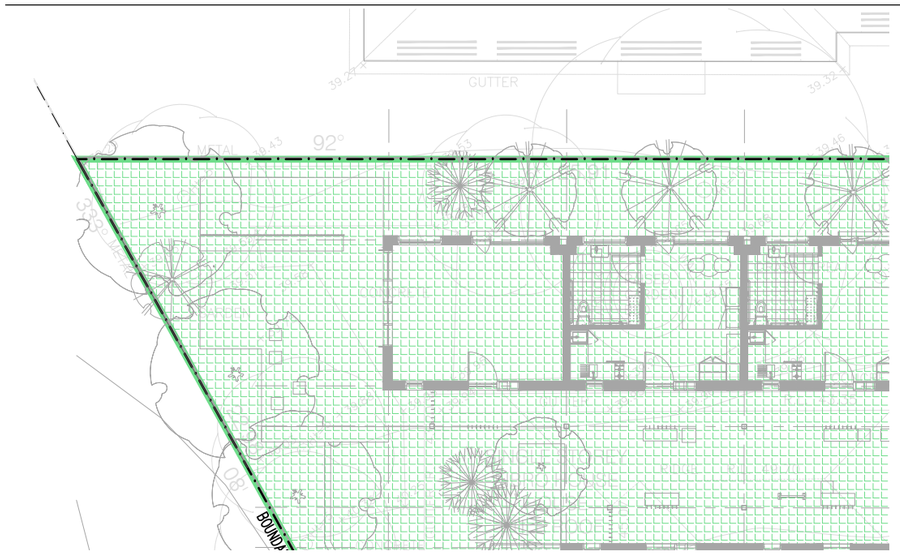
Project
265 / 267
KING GEORGES ROAD,
ROSELANDS

Sheet Subject
COVERSHEET, LOCALITY PLAN, LEGENDS & DRAWING SCHEDULE

Scale : A1 N.T.S | Drawn CV | Authorised
Job No 161087 | Drawing No C01 | Revision P2
Plot File Created: Jul 27, 2016 - 2:42pm

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING C01



FOR CONTINUATION REFER BELOW

Catchment Notes

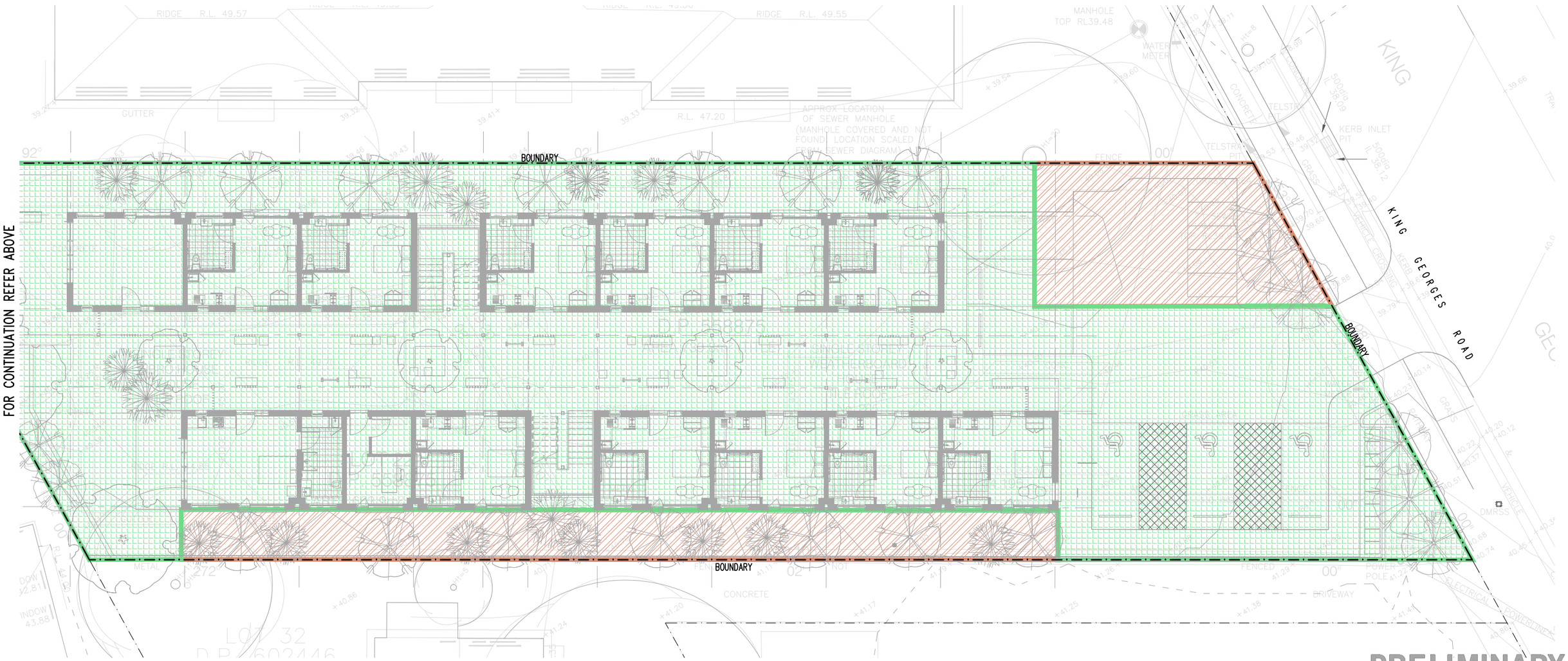
Total Site Area = 1410.2m²

Catchment draining to Onsite Detention = 1203.4m² (85.3%)
Catchment bypassing Onsite Detention = 206.8m² (14.7%)

Permissible Site Discharge Rate: 150L/s/ha

Permissible Site Discharge = 0.14102x150 = 21.153 L/s

DRAINS was utilised to size Site Storage Requirement to meet permissible site discharge. Refer C04 for OSD detail.



FOR CONTINUATION REFER ABOVE

PRELIMINARY

File Name: C02.dwg - USER: jheath - Plot File Created: Jul 27, 2016 - 10:24am

A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
P2	REISSUED FOR DEVELOPMENT APPROVAL	CV	JH	27.07.16
P1	ISSUED FOR DEVELOPMENT APPROVAL	CV	CV	29.04.16

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265 / 267
KING GEORGES ROAD,
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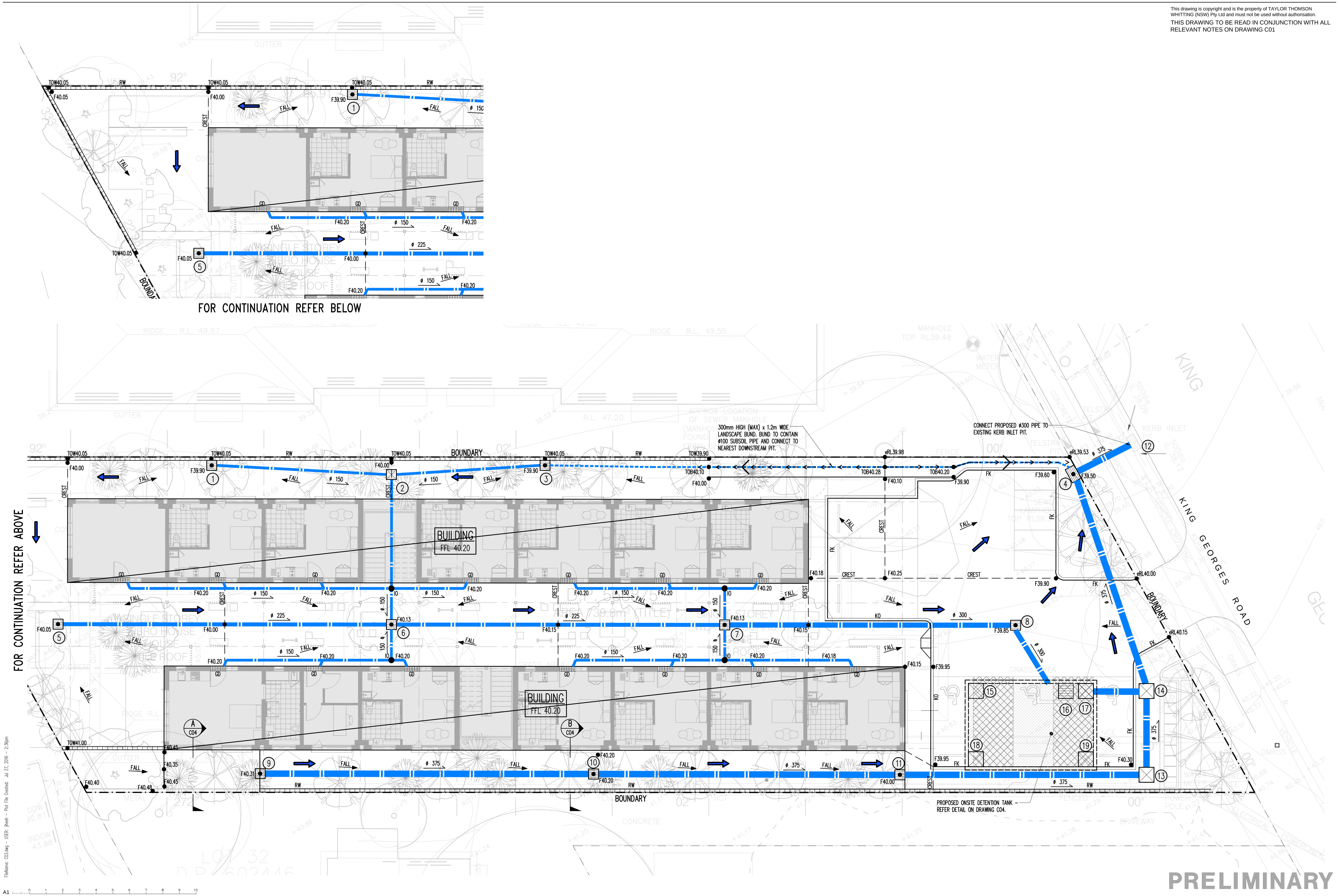
Sheet Subject
CATCHMENT PLAN

Scale : A1 1:100
Drawn CV
Authorised

Job No 161087
Drawing No C02
Revision P2

Plot File Created: Jul 27, 2016 - 10:24am

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING C01



PRELIMINARY

Rev	Description	Eng	Draft	Date
P2	REISSUED FOR DEVELOPMENT APPROVAL	CV	JH	27.07.16
P1	ISSUED FOR DEVELOPMENT APPROVAL	CV	CV	29.04.16

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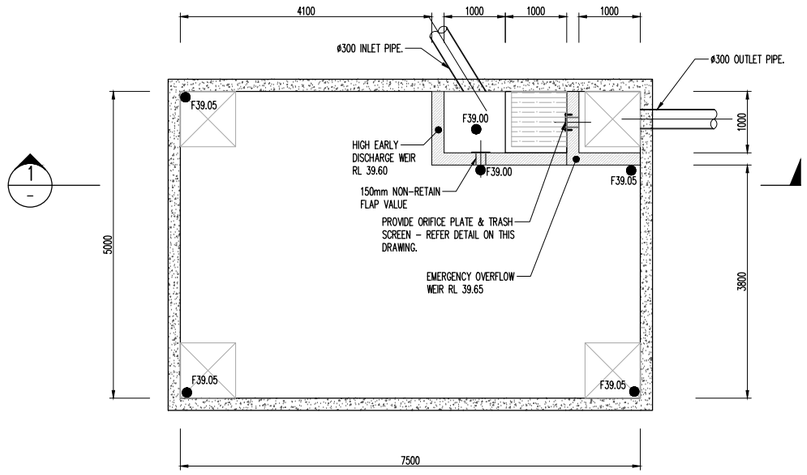
Sheet Subject
SITEWORKS & STORMWATER PLAN

Scale : A1	Drawn	Authorised
1:100	CV	

Job No	Drawing No	Revision
161087	C03	P2

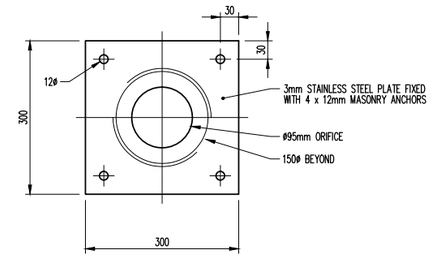
Plot File Created: Jul 27, 2016 - 2:36pm

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING C01



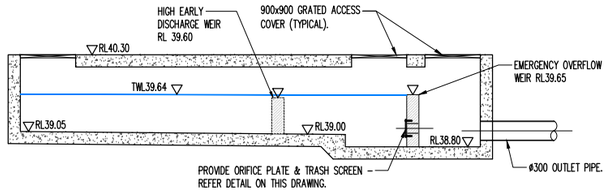
OSD TANK PLAN

SCALE 1:50



ORIFICE PLATE DETAIL

NTS

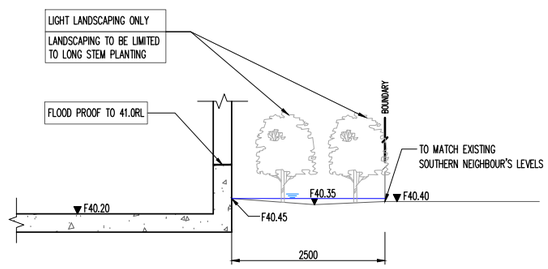


SECTION 1

SCALE 1:50

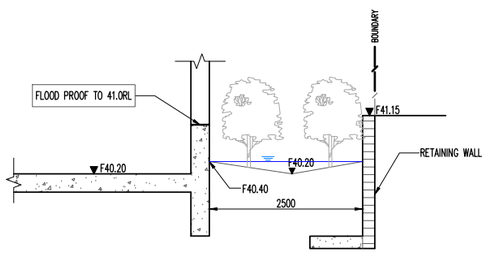
TRASH SCREEN

SCALE 1:10



SECTION A C01

SCALE 1:50



SECTION B C01

SCALE 1:50

PRELIMINARY

FileName: C04.dwg - USER: jheath - Plot File Created: Jul 27, 2016 - 2:39pm

A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
P2	REISSUED FOR DEVELOPMENT APPROVAL	CV	JH	27.07.16
P1	ISSUED FOR DEVELOPMENT APPROVAL	CV	CV	29.04.16

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Project

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ROSELANDS

Sheet Subject

SITEWORKS & STORMWATER PLAN

Scale : A1	Drawn	Authorised
1:100	CV	

Job No	Drawing No	Revision
161087	C04	P2

Plot File Created: Jul 27, 2016 - 2:39pm