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Appendix G

‘Site only’ TUFLOW model inputs and results – existing and proposed conditions

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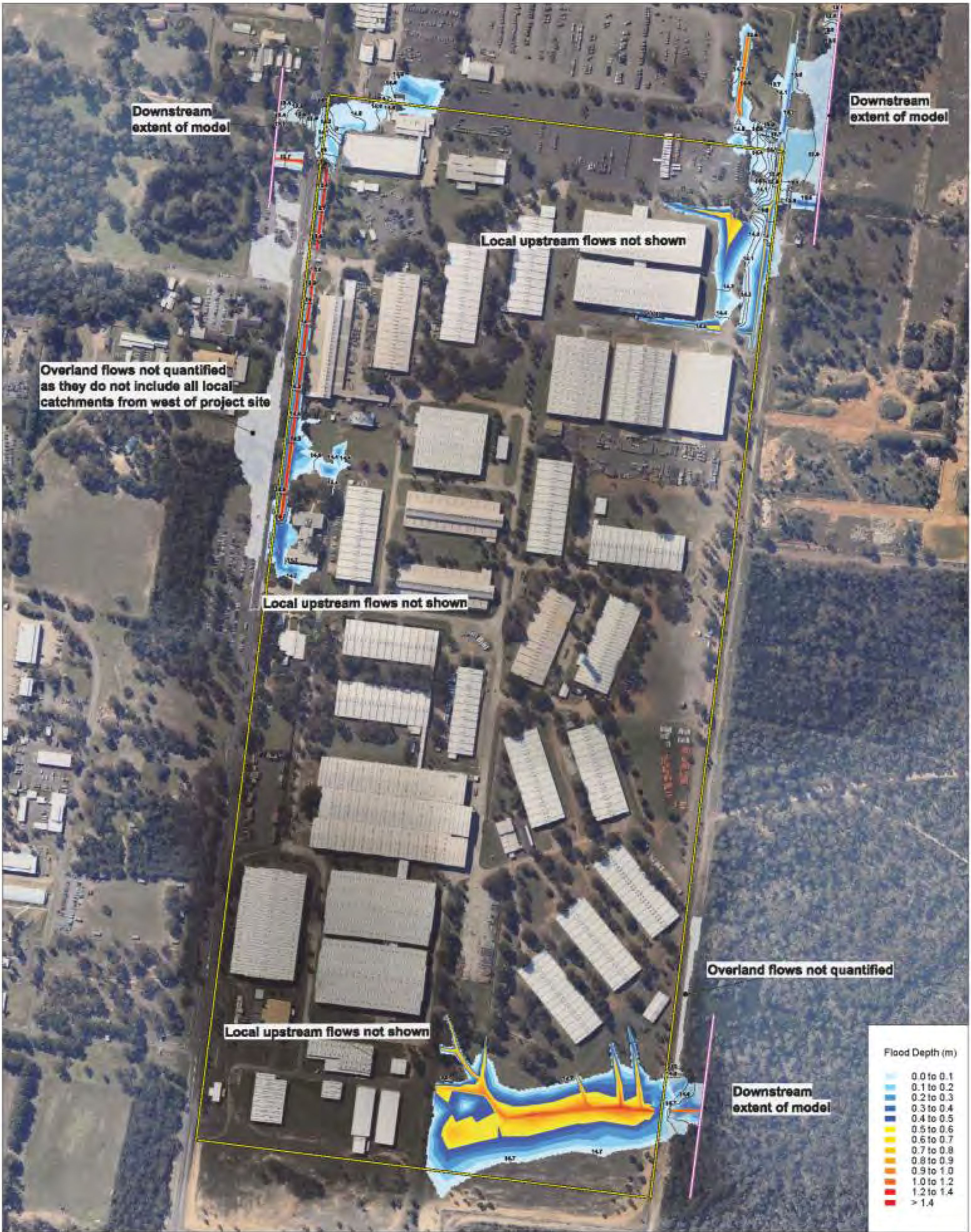

LEGEND

Project Site Boundary — Line

Flood Level Contour (m AHD) — Line

Notes:

The mapping on this drawing represents peak flood level and depth for the 100 year ARI 1, 2, 4, 6 and 9 hour duration storm events.

Flood regimes are based on aerial laser survey provided by AAM Hatch Pty Ltd (May 2008) and ground survey of the site by Hard and Forester (August 2010).

This figure may not represent all local flow regimes.

TUFLOW Run Files (TUFLOW Version 2010-10-AB-iSP-w32):
[illegible]
MB_Ex5_100y1h_01.tcf
MB_Ex5_100y2h_01.tcf
MB_Ex5_100y4h_01.tcf
MB_Ex5_100y6h_01.tcf
MB_Ex5_100y9h_01.tcf

Figure Workspace:
[illegible]
100yr_Ex5_Site_Model_Flood_Map.mxd
* Aerial imagery by Nearmap 2011 ©

Client: SYDNEY INTERMODAL TERMINAL ALLIANCE (SIMTA)

Project: MOOREBANK INTERMODAL TERMINAL FACILITY

Scale: 1:2500 @ A1

TUFLOW Grid Size: 2m

Datum: GDA94

Projection: MGA56

Title: SITE MODEL: 100 YEAR ARI FLOOD DEPTH AND FLOOD LEVEL CONTOURS FOR EXISTING CONDITION

HYDER CONSULTING PTY LTD
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Fax +61 (0)2 8907 9001
www.hyderconsulting.com
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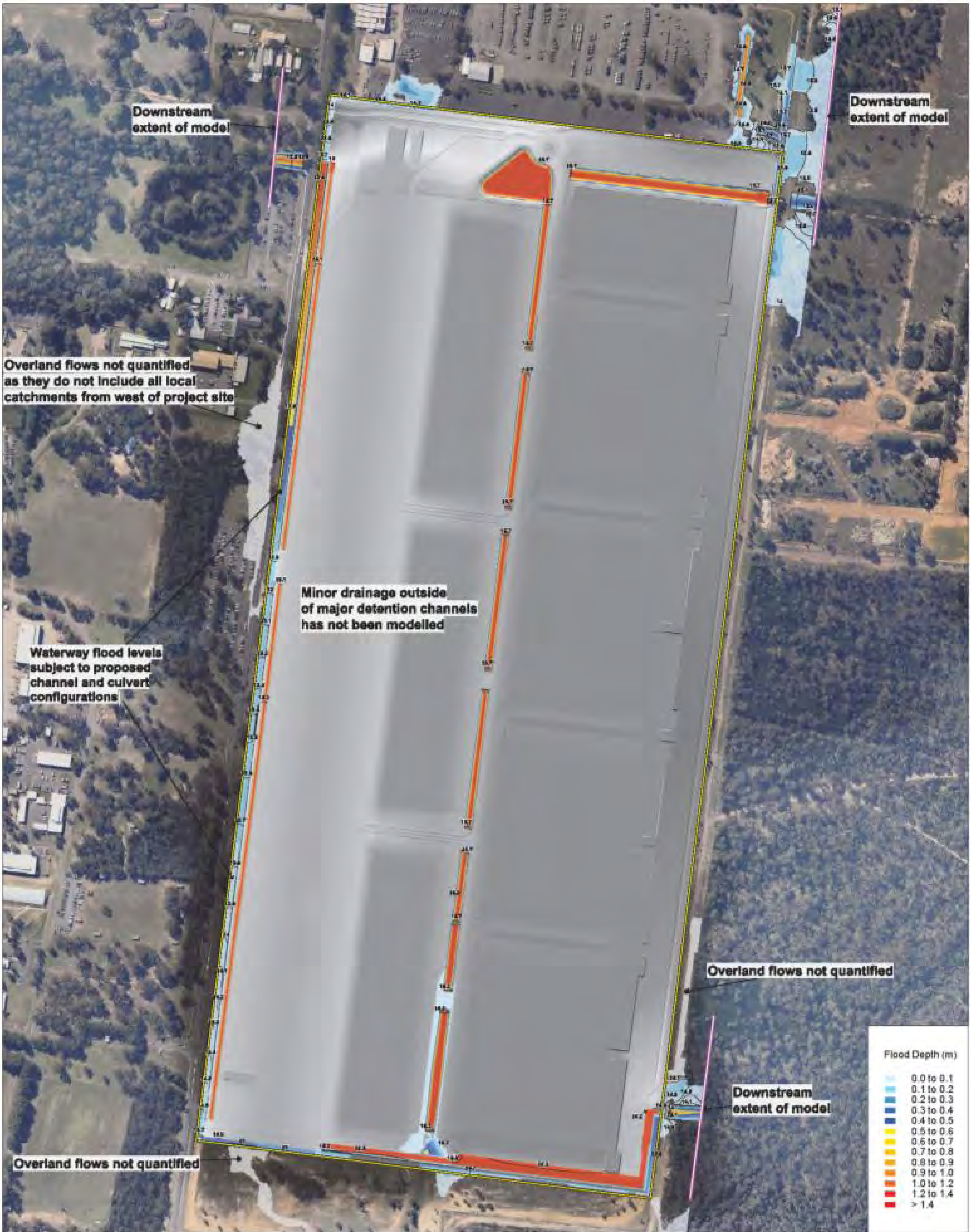
Figure No	Project No	Issue
01	AA003210	01



LEGEND

Project Site Boundary

Flood Level Contour (m AHD)

Notes

Client: SYDNEY INTERMODAL TERMINAL ALLIANCE (SIMTA)

Project: MOOREBANK INTERMODAL TERMINAL FACILITY

Scale: 1:2000 @ A1

TUFLOW Grid Size: 2m

Datum: GDA94

Projection: MGA56

Title: SITE MODEL 100 YEAR ARI FLOOD DEPTH AND FLOOD LEVEL CONTOURS FOR CONCEPT CIVIL DESIGN OPTIONS CONDITION

Hyder

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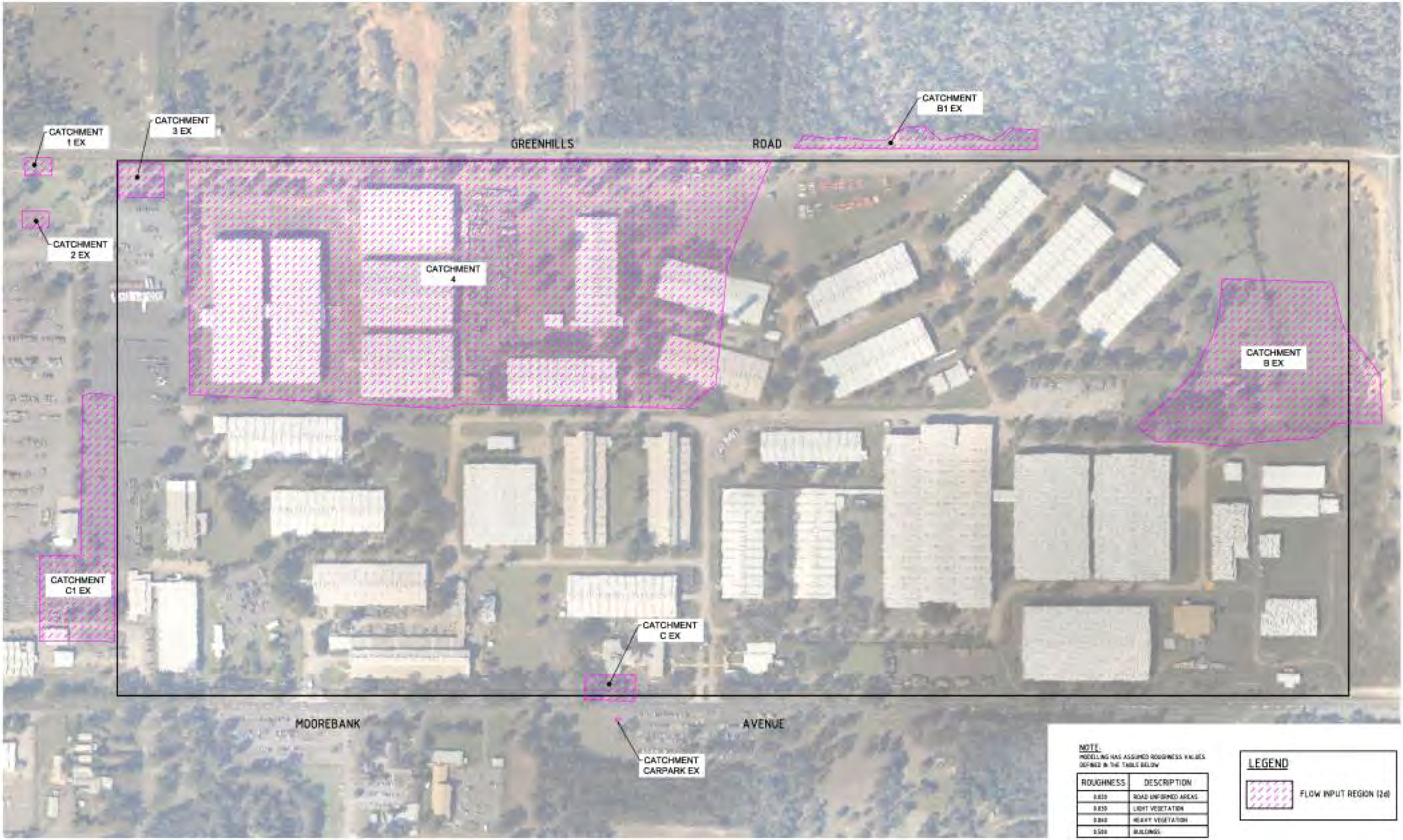
Figure No: 02

Issue: 01



NOTE:
MODELLING HAS ASSUMED ROUGHNESS VALUES DEFINED IN THE TABLE BELOW

ROUGHNESS	DESCRIPTION
0.020	ROAD UNFORMED AREAS
0.030	LIGHT VEGETATION
0.060	HEAVY VEGETATION
0.500	BUILDINGS

LEGEND
FLOW INPUT REGION (2d)

Issue	Description	Date
01	ISSUE FOR REVIEW	12/08/11

0 50 100 150 200m
1 : 2000

Client: SIMTA

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 2000	Current Issue Signatures	
		Drawn	S. MORRISON
Original Size	A1	Designed	C. McCLELLAND
Height Datum	AHD	Checked	S. IVES
Grid	MGA	Approved	N. McMELLAN

Filename

Project: SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

Title: EXISTING 'SITE ONLY' TUFLOW FLOW INPUT AND ROUGHNESS PLAN

HYDER CONSULTING PTY LTD
ABN 76 104 485 289
Level 5, 141 Walker St
North Sydney NSW 2060
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Tel: +61 (0)2 8907 9000
Fax: +61 (0)2 8907 9001
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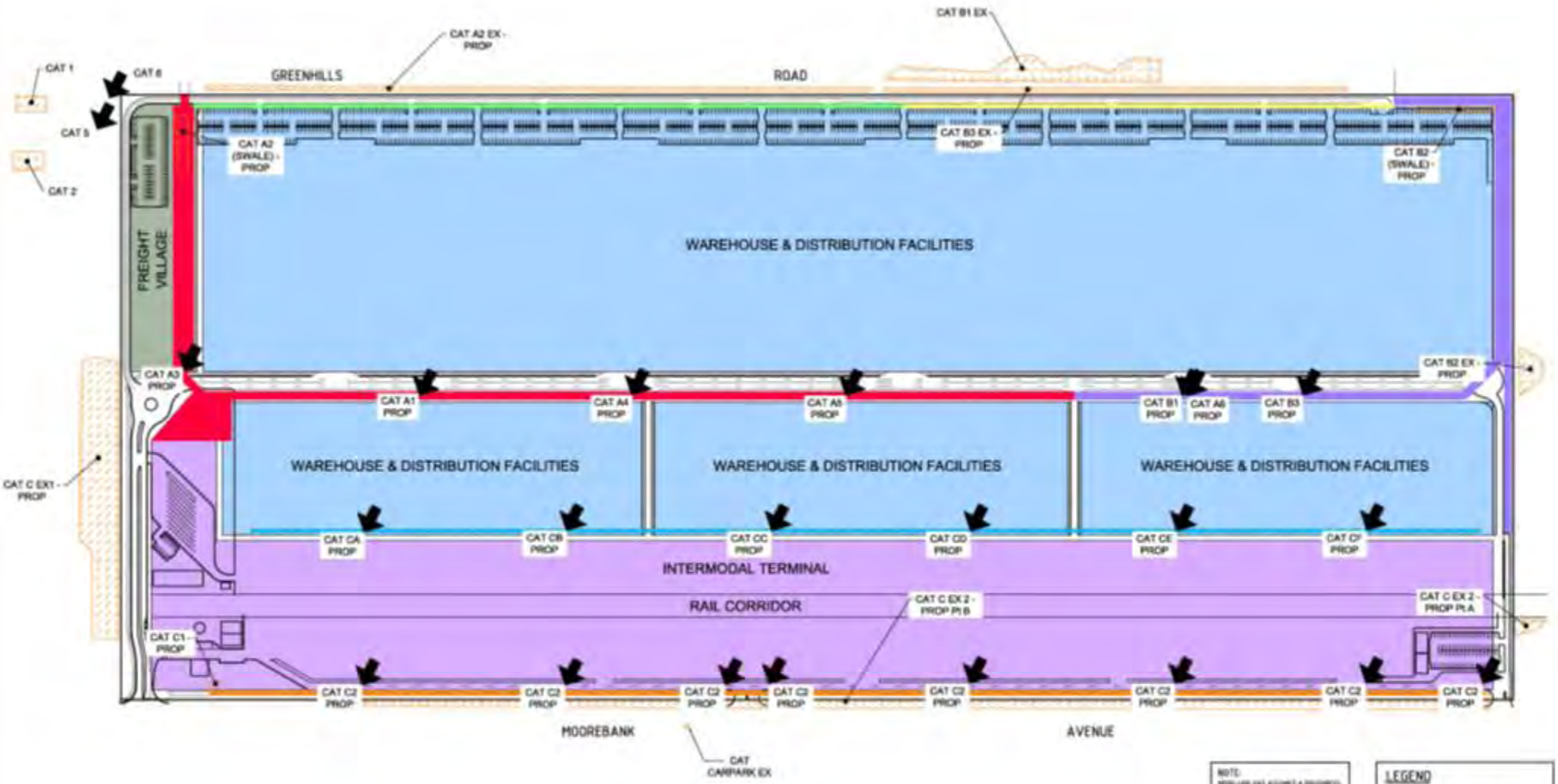
Drawing No	Project No	Issue
FIG-G3	AA003210	01

Date Plotted: 12 Aug 2011 - 09:58AM File Name: F:\AA003210\E-CADD\-Civil\8-Sketches\FIGURE-G3-Roughness_Plan-Existing.dwg



PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

SIMTA

SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

PROPOSED 'SITE ONLY' TUFLOW FLOW INPUT AND ROUGHNESS PLAN

Hyder

FIG-G4 — AA003210 — 01

Drawings

Current Civil Design
Dwg No. CP020 Existing Stormwater Catchment Plan
Dwg No. CP021 Stormwater Concept and Proposed Catchment Plan
Dwg No. CP022 Stormwater Quality Concept Plan
Dwg No. CP023 Stormwater Quantity Concept Plan
Dwg No. CP024 Stormwater Drainage Details Sheet 1 of 4
Dwg No. CP025 Stormwater Drainage Details Sheet 2 of 4
Dwg No. CP026 Stormwater Drainage Details Sheet 3 of 4
Dwg No. CP027 Stormwater Drainage Details Sheet 4 of 4

Civil Design Options
Dwg No. SKC230 Civil Design Options for Stormwater Plan Layout Sheet 1 of 4
Dwg No. SKC231 Civil Design Options for Stormwater Plan Layout Sheet 2 of 4
Dwg No. SKC232 Civil Design Options for Stormwater Plan Layout Sheet 3 of 4
Dwg No. SKC233 Civil Design Options for Stormwater Plan Layout Sheet 4 of 4
Dwg No. SKC220 Civil Design Options for Stormwater Sections Sheet 1 of 3
Dwg No. SKC221 Civil Design Options for Stormwater Sections Sheet 2 of 3
Dwg No. SKC222 Civil Design Options for Stormwater Sections Sheet 3 of 3

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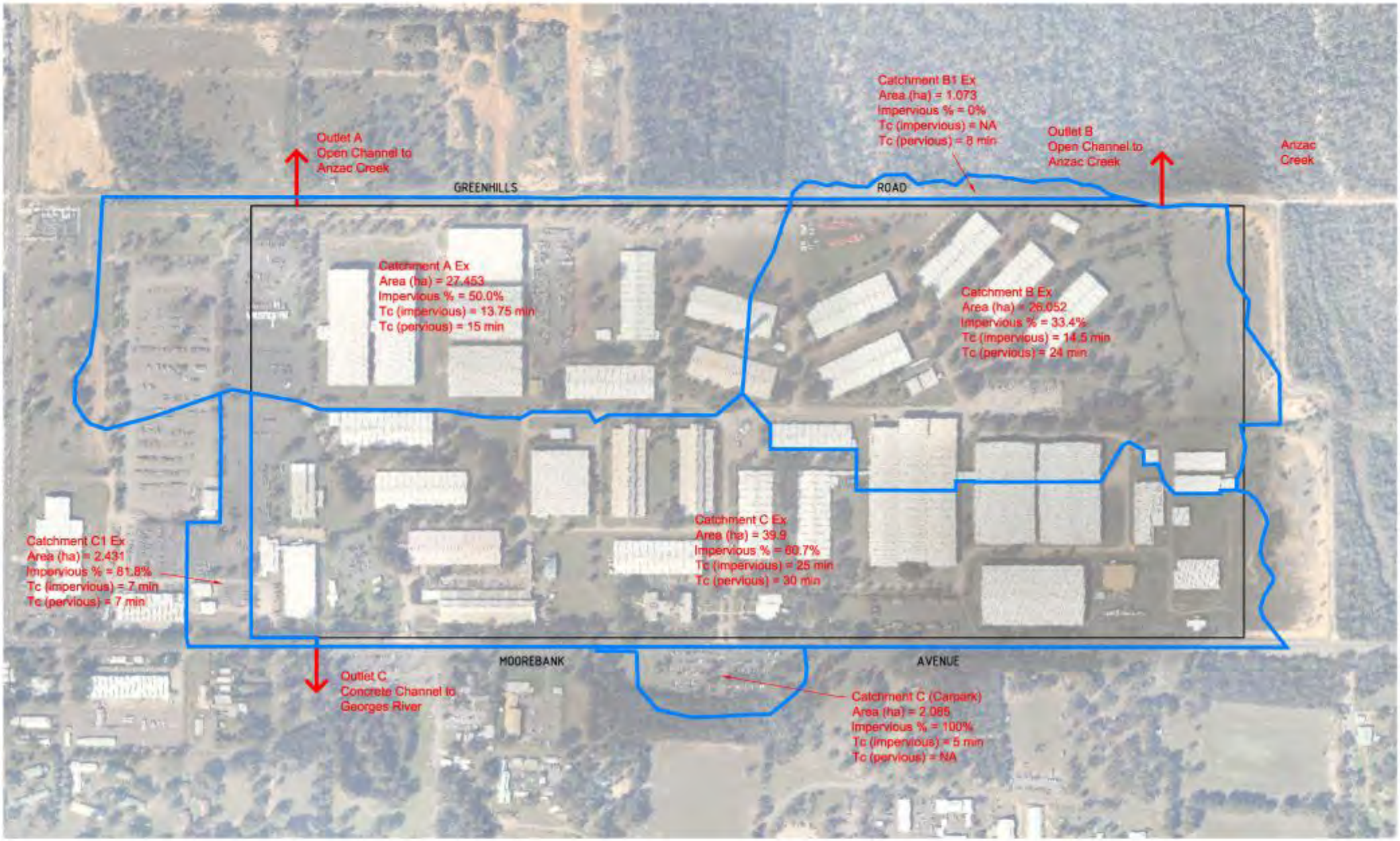

Issue	Description	Date
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01	ISSUE FOR REVIEW	03/08/11

1 : 2500

Client: SIMTA

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Size	A1	Designed	C. McCLELLAND
Height Datum	AHD	Checked	D. SMITH
Grid	MGA	Approved	J. HUDSWORTH
Filename:			

Project: SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

Title: EXISTING STORMWATER CATCHMENT PLAN

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Level 5, 141 Walker St
North Sydney NSW 2060
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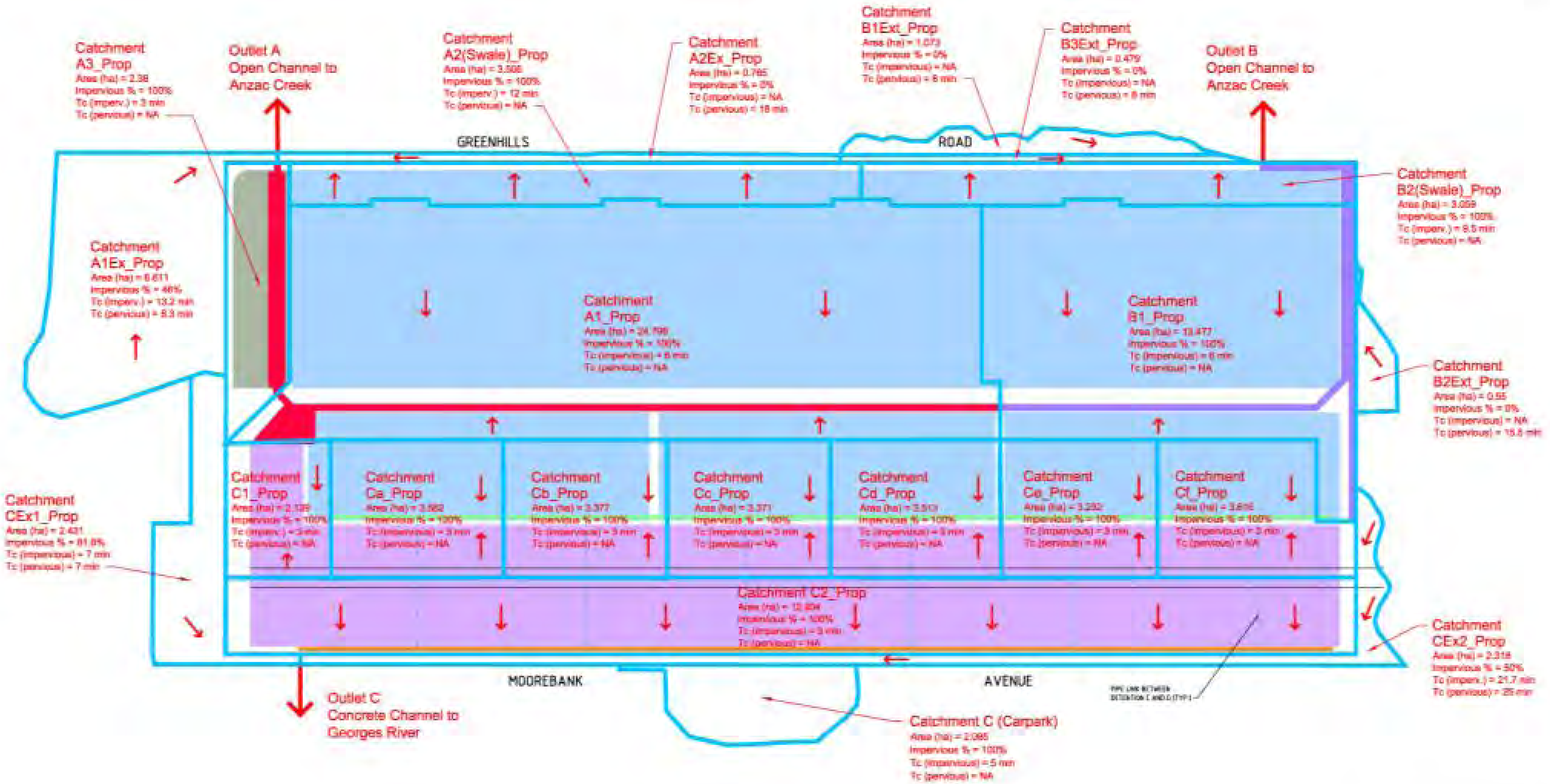
Fax: +61 (2)9927 0601
www.hyderconsulting.com

Drawing No. CP020 | Project No. AA003210 | Issue 02

Date Plotted: 11 Aug 2011 - 10:16AM File Name: P:\AA003210\02-CAD\12-Civil\12-Concept\CP020-AA003210-02-SK-CP-Existing_Catchment_Plan.dwg



NOTE:
LOCATION OF PROPOSED DETENTION DEVICES INDICATIVE ONLY

LEGEND
DIRECTION OF FALL (TYP.)
SITE BOUNDARY

Rev	Description	Date
02	ISSUE FOR REVIEW	
01	ISSUE FOR REVIEW	

1 : 2500

Client: SIMTA

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

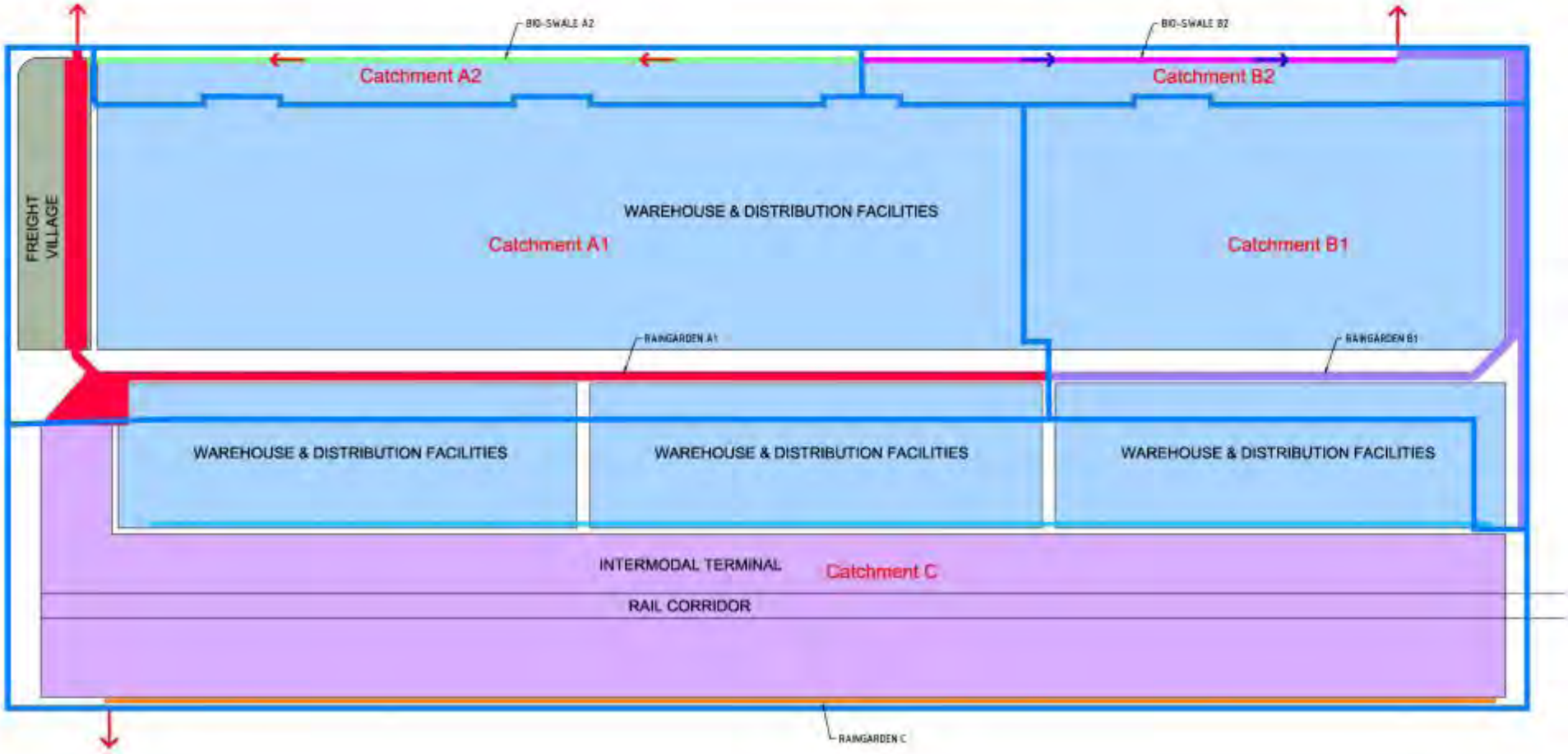
Scales	1 : 2500	Drawn	
Original Size	A1	Designed	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Project: SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

Title: PROPOSED STORMWATER CATCHMENT PLAN

Hyder
HYDER CONSULTING PTY LTD

Drawing No CP021 — Project No AA003210 — Issue 02



NOTE:
LOCATION OF PROPOSED STORMWATER QUALITY DEVICES INDICATIVE ONLY

Issue	Description	Date
02	ISSUE FOR REVIEW	12/08/11
01	ISSUE FOR REVIEW	04/08/11

1 : 2000

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 2000	Current Issue Signatures
Original Size	A1	Drawn: D. RAU
Height Datum	AHD	Designed: C. PULLELLAR
Grid	MGA	Checked: G. SMITH
Plotted:		Approved: J. HUGHMOTT

Project: SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

Title: STORMWATER QUALITY CONCEPT PLAN

HYDER CONSULTING PTY LTD
ABN 76 104 485 289
Level 5, 141 Walker St
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Fax: +61 (0)2 8907 9001
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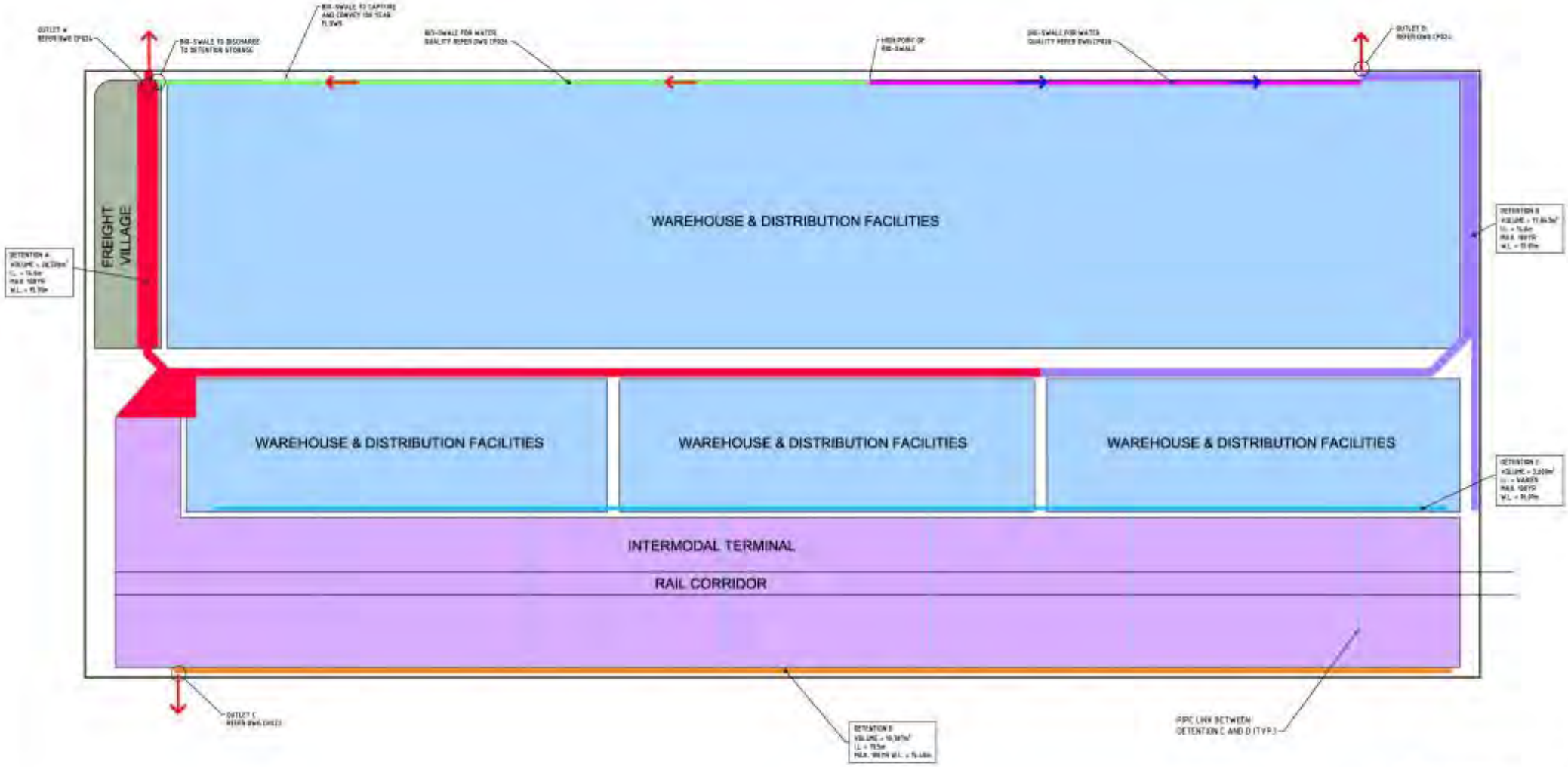
Drawing No.	Project No.	Issue
CP022	AA003210	02



Issue	Description	Date
02	ISSUE FOR REVIEW	31/08/11
01	ISSUE FOR REVIEW	03/08/11

1 : 2000

Client: SIMTA

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

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Original Size	A1	Designed	C. VALLELLANO
Height Datum	AHD	Checked	R. SMITH
Grid	MGA	Approved	J. McDERMOTT
Filename:			

Project: SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

Title: STORMWATER QUANTITY CONCEPT PLAN

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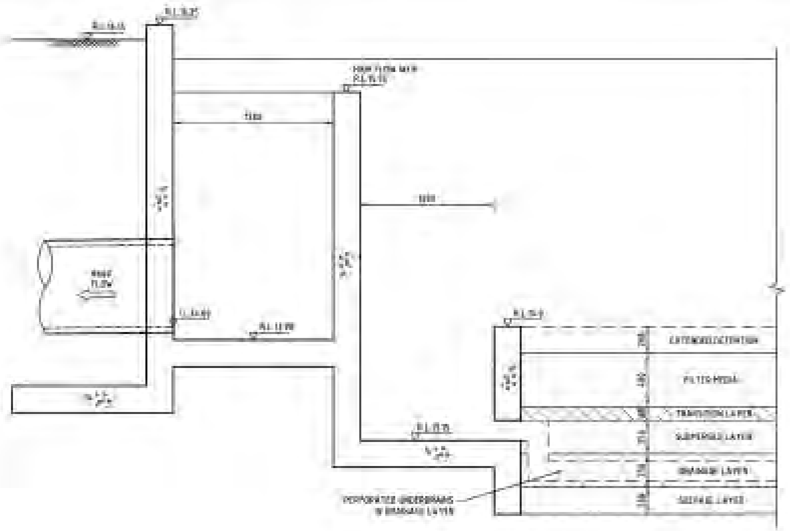
Drawing No.	Project No.	Issue
CP023	AA003210	02



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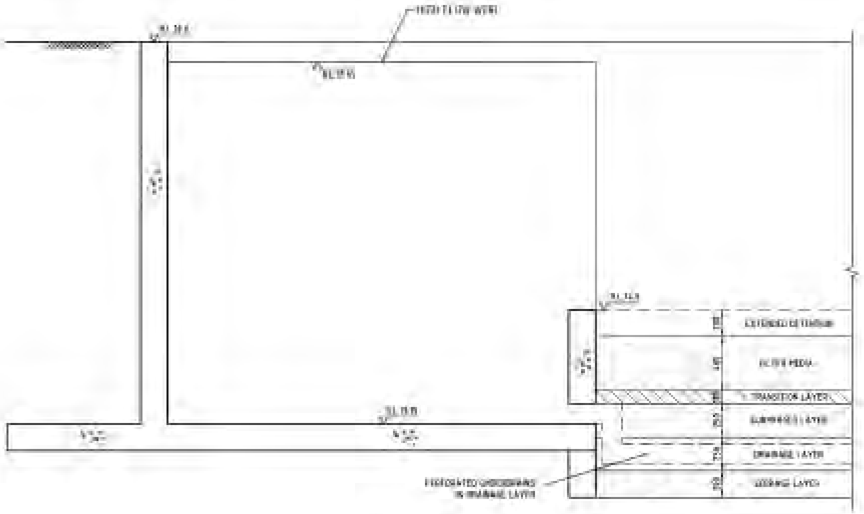

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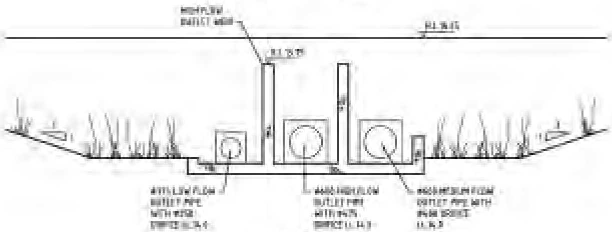

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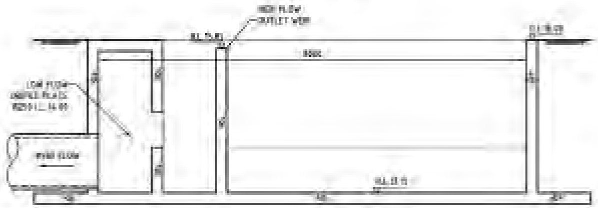

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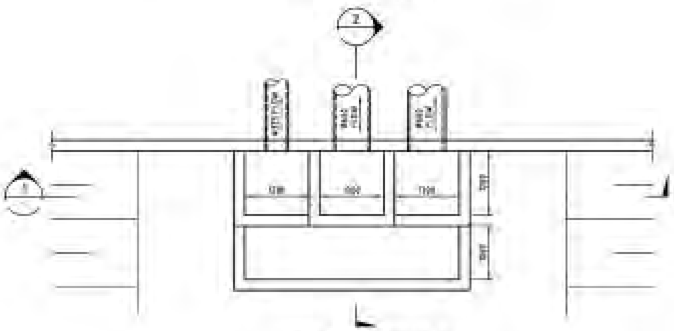

DRAINAGE OUTLET A
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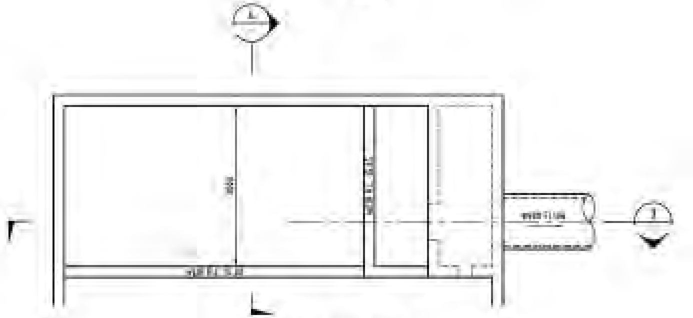

DRAINAGE OUTLET B
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Issue	Description	Date
02	ISSUE FOR REVIEW	[illegible]
01	ISSUE FOR REVIEW	[illegible]

1 : 20

1 : 50

Client: SIMTA

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION

Scale	AS SHOWN	Drawn	[illegible]
Original Size	A1	Designed	[illegible]
Height Datum	AHD	Checked	[illegible]
Grid	MGA	Approved	[illegible]

Project: SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

Title: STORMWATER DRAINAGE DETAILS SHEET 1 OF 4

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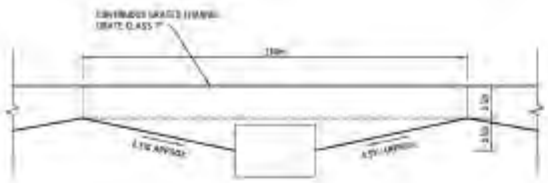
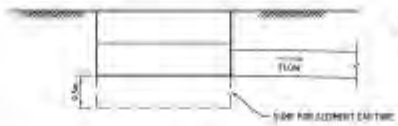
Drawing No: CP024 – Project No: AA003210 – Issue: 02



SECTION 2
NTS



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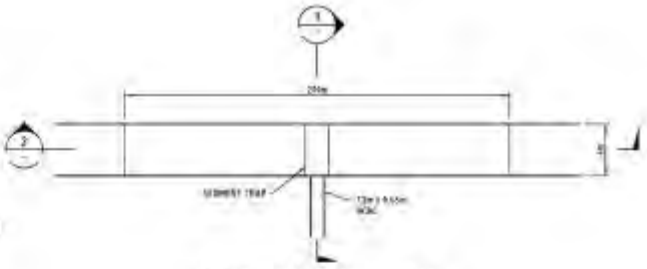
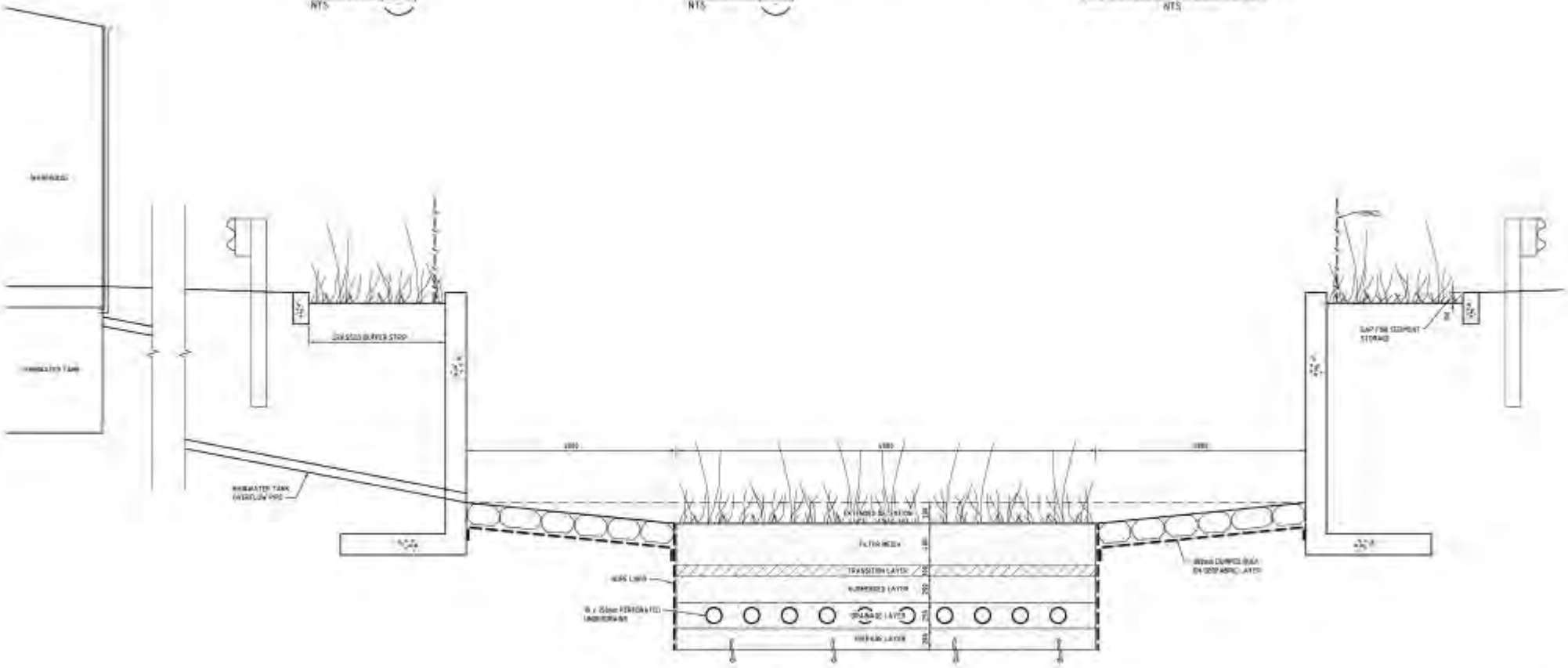
NTS



DETENTION 'C' CHANNEL PLAN
NTS



TYPICAL CROSS SECTION
CENTRAL CHANNEL BIO-RETENTION (DETENTION 'A' & 'B')
NTS

No.	Description	Date
02	ISSUE FOR REVIEW	13/08/15
01	ISSUE FOR REVIEW	31/07/15

Client: SIMTA

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures
Scale	AS SHOWN	Drawn: D. HALL
Original Size	A1	Designed: R. HENGELL
Height Datum	AHD	Checked: D. SMITH
Grid	MGA	Approved: J. ROSEWELL

Project: SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

Title: STORMWATER DRAINAGE DETAILS SHEET 2 OF 4

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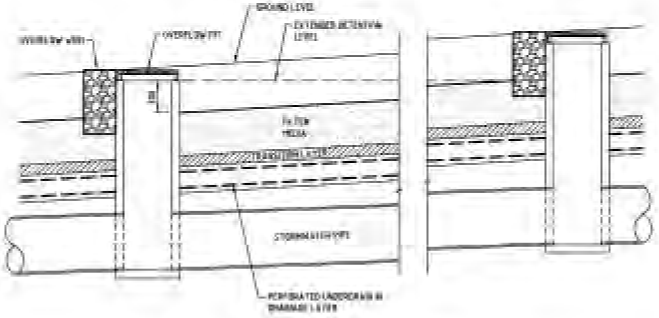
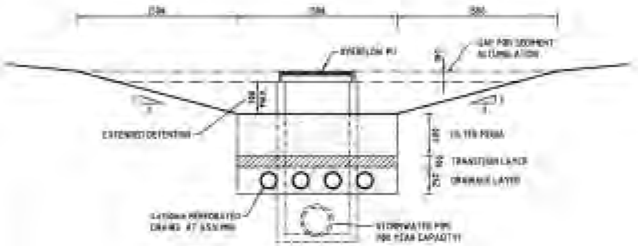
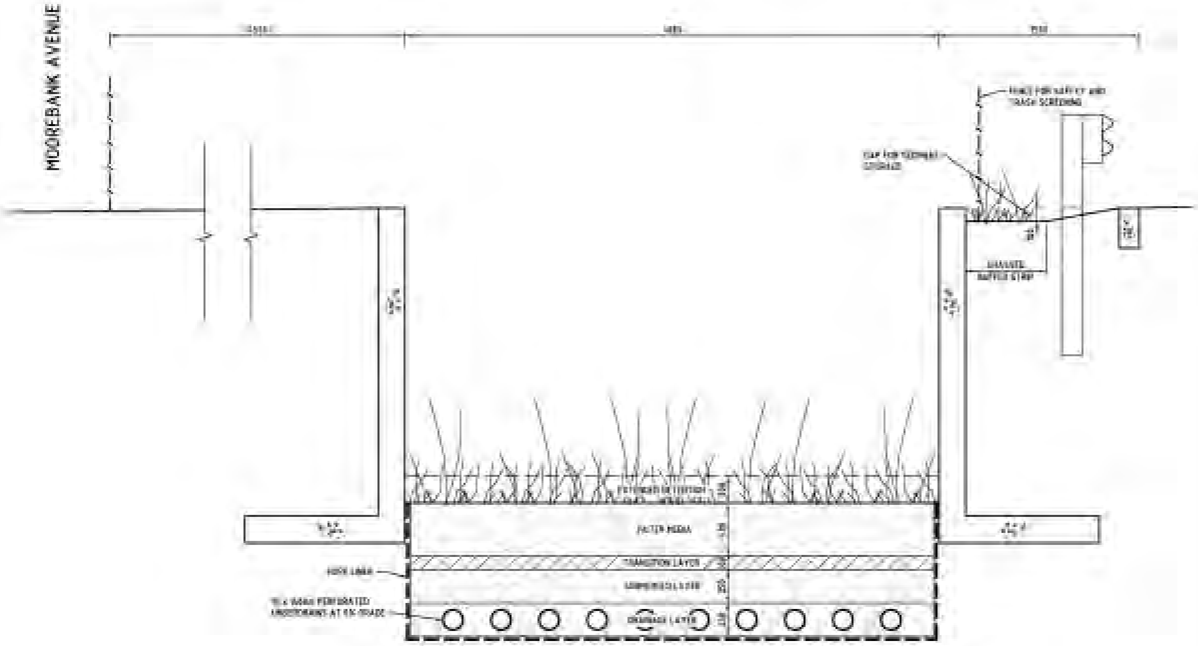
Drawing No.: CP025 — Project No.: AA003210 — Issue: 02



BIO SWALE
TYPICAL LONGITUDINAL SECTION
NTS



BIO SWALE
TYPICAL CROSS SECTION
NTS



TYPICAL CROSS SECTION
CHANNEL ALONG MOOREBANK AVENUE (DETENTION 'D')
NTS

Issue	Description	Date
02	ISSUE FOR REVIEW	
01	ISSUE FOR REVIEW	

Client: SIMTA

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION

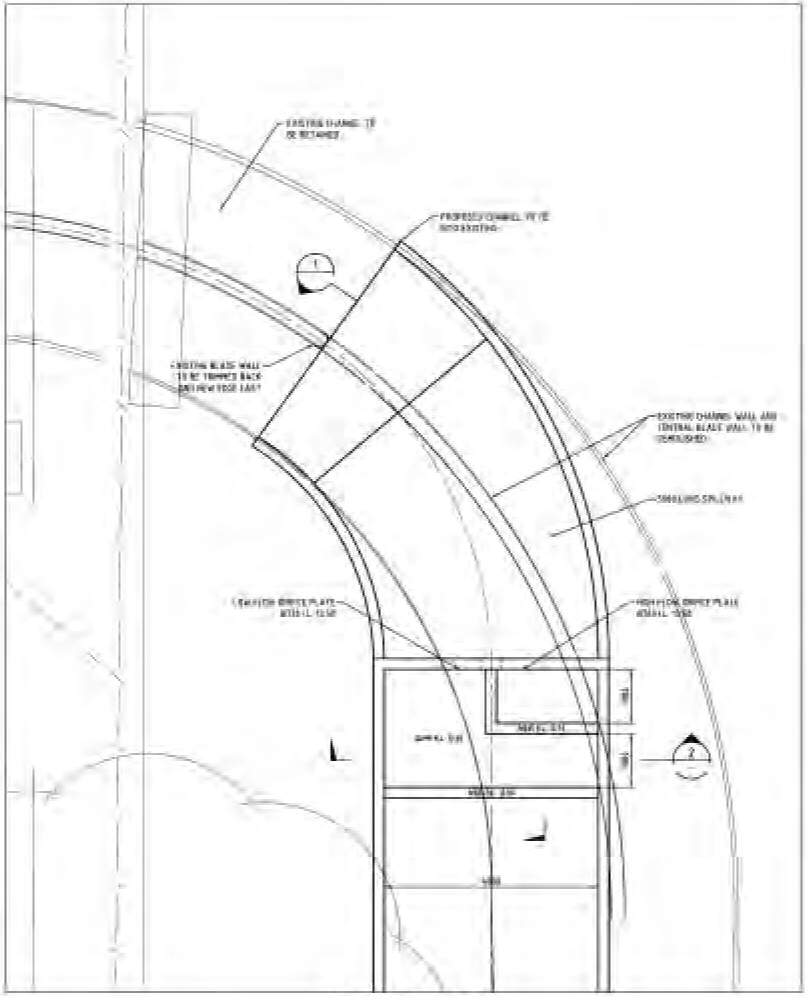
Scale	AS SHOWN
Original Size	A1
Height Datum	AHD
Grid	MGA

Project: SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

Title: STORMWATER DRAINAGE DETAILS SHEET 3 OF 4

HYDER CONSULTING PTY LTD
Level 5, 141 Walker St
North Sydney NSW 2060
Australia

Drawing No: CP026 — Project No: AA003210 — Issue: 02



DRAINAGE OUTLET C
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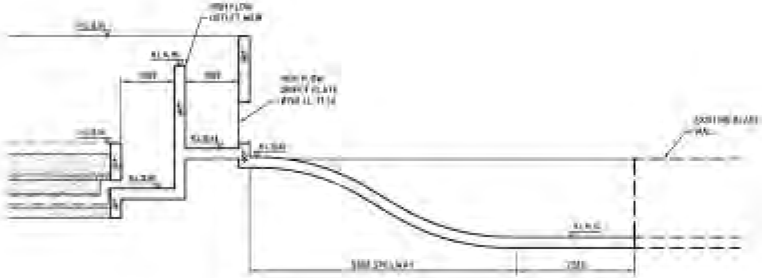

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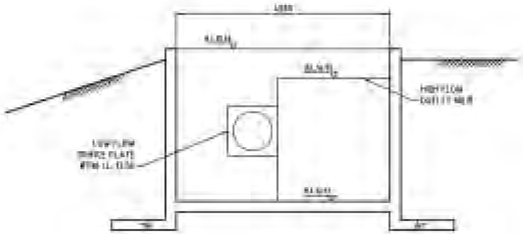

SECTION 2
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02	ISSUE FOR REVIEW	
01	ISSUE FOR REVIEW	
Issue	Description	Date

Client: SIMTA

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION

Scale	AS SHOWN	Drawn	
Original Size	A1	Designed	
Height Datum	AHD	Checked	
Grid	MGA	Approved	J McDERMOTT

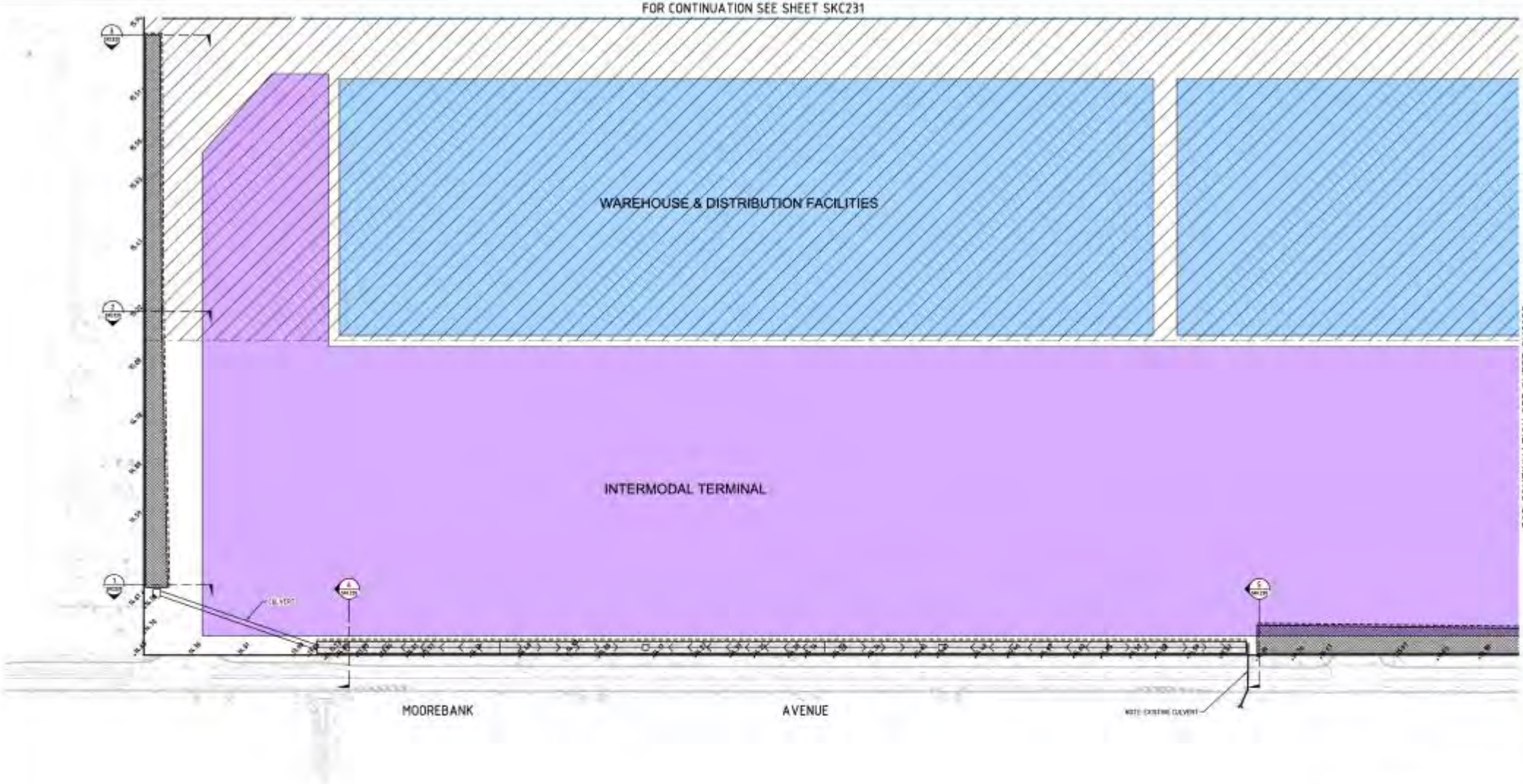
Project: SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

Title: STORMWATER DRAINAGE DETAILS SHEET 4 OF 4

HYDER CONSULTING PTY LTD

Drawing No: CP027 — Project No: AA003210 — Issue: 02

FOR CONTINUATION SEE SHEET SKC231



FOR CONTINUATION SEE SHEET SKC233

LEGEND

- INDICATES WATERWAY CORRIDOR
- INDICATES CULVERT AND SWALE CORRIDOR
- SITE LEVELS ARE 0.2m HIGHER THAN INDICATED IN CURRENT CIVIL DESIGN DRAWINGS

Issue	Description	Date
D1	FOR INFORMATION ONLY	7/08/09

1 : 1000

Client: SIMTA

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1 : 1000	Drawn	S. BALL
Original Size	A1	Designed	T. MCCLELLAND
Height Datum	AHD	Checked	G. WEIS
Grid	MGA	Approved	N. McMILLAN
Filename			

Project: SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

Title: CIVIL DESIGN OPTIONS FOR STORMWATER PLAN LAYOUT SHEET 1 OF 4

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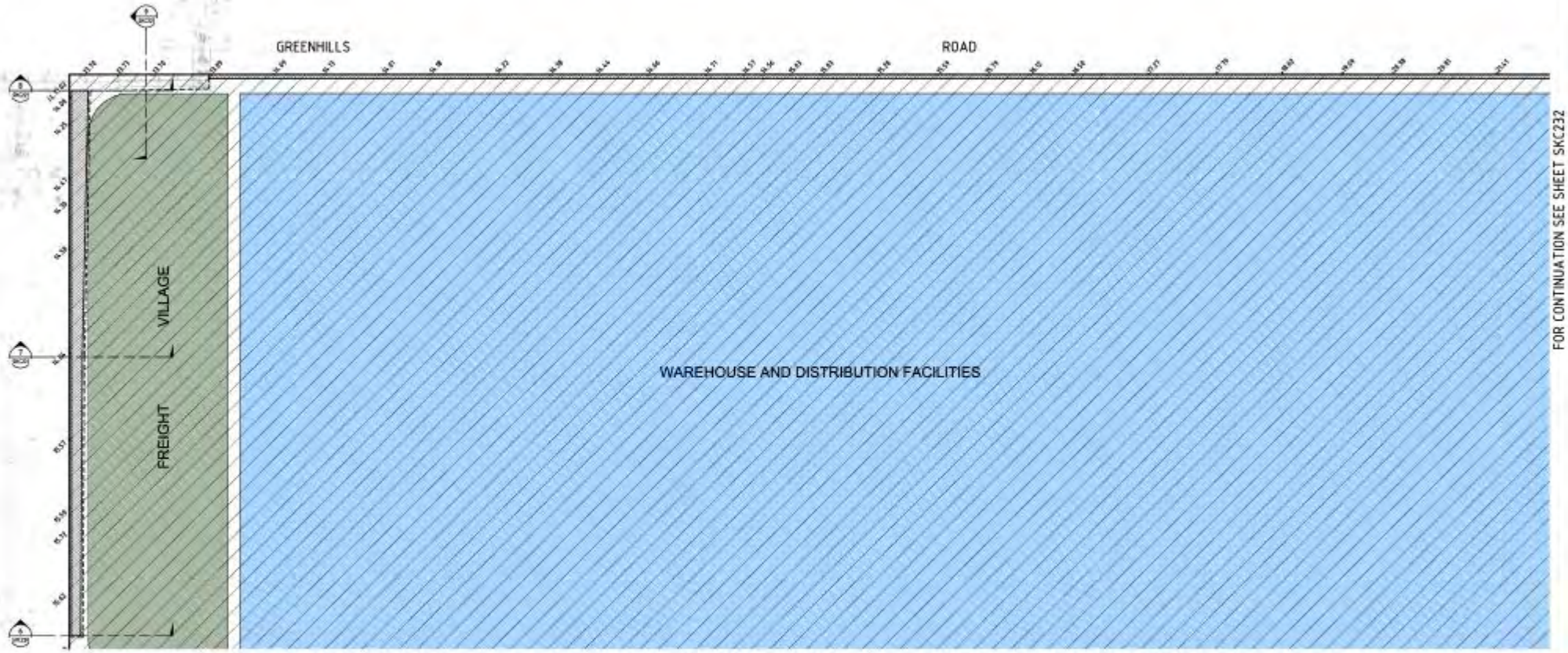
North Sydney NSW 2060
Australia
Tel: +61 (0)2 8907 9000
Fax: +61 (0)2 8907 9001
www.hyderconsulting.com

Drawing No.	Project No.	Issue
SKC230	AA003210	01



LEGEND

- INDICATES WATERWAY CORRIDOR
- INDICATES SWALE AND SWALE CORRIDOR
- SITE LEVELS ARE 0.2m HIGHER THAN INDICATED IN CURRENT CIVIL DESIGN DRAWINGS

Issue	Description	Date
01	FOR INFORMATION ONLY	12/08/11

1 : 1000

Client: SIMTA

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 1000	Current Issue Signatures: Drawn	D. BALL
Original Size	A1	Designed	C. MULLIGAN
Height Datum	AHD	Checked	G. IVES
Grid	MGA	Approved	N. HAMILAN
Filename			

Project: SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

Title: CIVIL DESIGN OPTIONS FOR STORMWATER PLAN LAYOUT SHEET 2 OF 4

HYDER CONSULTING PTY LTD
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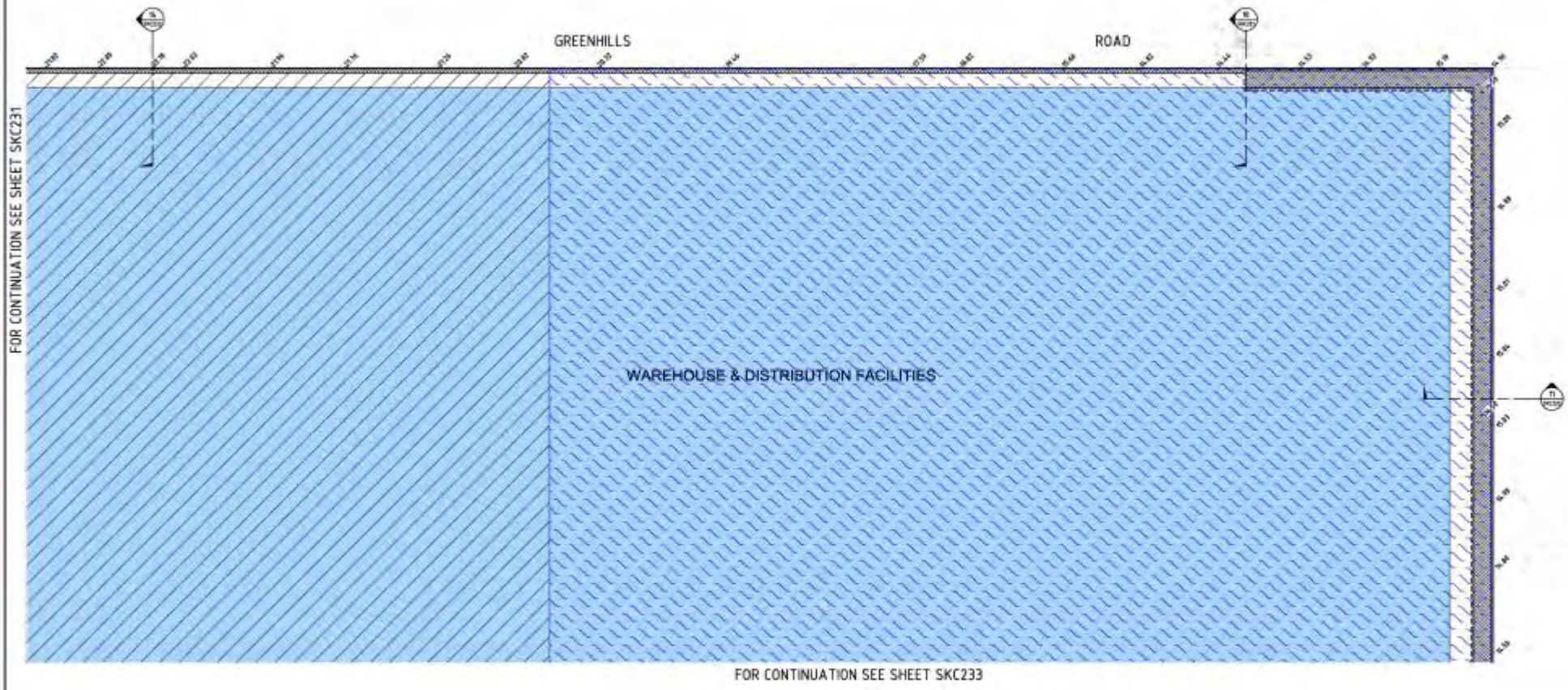
North Sydney NSW 2060
Australia
Tel: +61 (0)2 8907 9000
Fax: +61 (0)2 8907 9001
www.hyderconsulting.com

Drawing No.	Project No.	Issue
SKC231	AA003210	01



LEGEND

- INDICATES WATERWAY CORRIDOR
- INDICATES CULVERT AND SWALE CORRIDOR
- SITE LEVELS ARE 0.2m HIGHER THAN INDICATED IN CURRENT CIVIL DESIGN DRAWINGS
- SITE LEVELS ARE 0.4m HIGHER THAN INDICATED IN CURRENT CIVIL DESIGN DRAWINGS

Issue	Description	Date
B1	FOR INFORMATION ONLY	12/08/11

1 : 1000

Client: SIMTA

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	1 : 1000	Drawn	D. BALL
Original Size	A1	Designed	T. McCLELLAND
Height Datum	AHD	Checked	G. WEIS
Grid	MGA	Approved	N. McMILLAN
Filename			

Project: SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

Title: CIVIL DESIGN OPTIONS FOR STORMWATER PLAN LAYOUT SHEET 3 OF 4

HYDER CONSULTING PTY LTD
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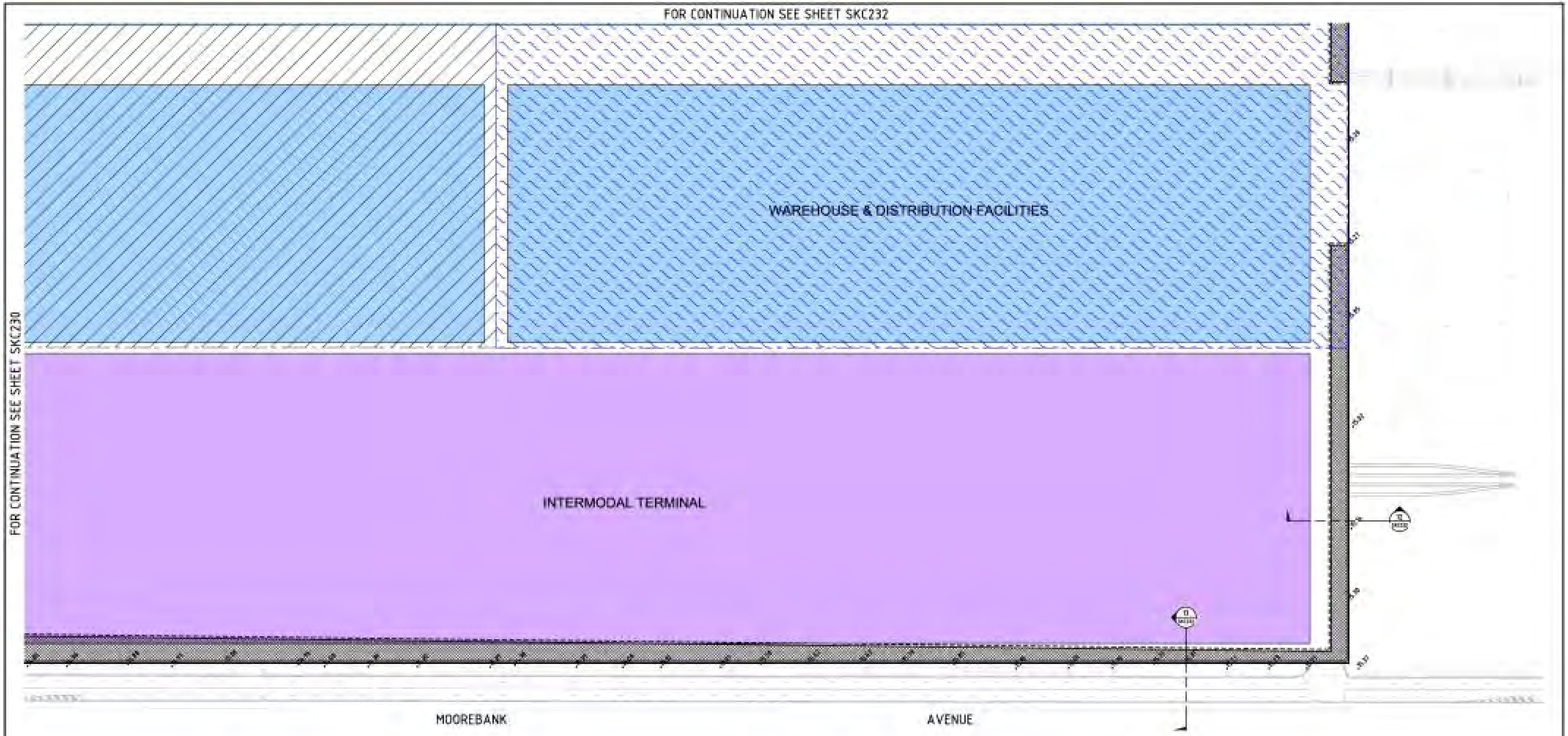
North Sydney NSW 2060
Australia
Tel: +61 (0)2 8907 9000
Fax: +61 (0)2 8907 9001
www.hyderconsulting.com

Drawing No.	Project No.	Issue
SKC232	AA003210	01



LEGEND

- INDICATES WATERWAY CORRIDOR
- INDICATES CULVERT AND SWALE CORRIDOR
- SITE LEVELS ARE 0.2m HIGHER THAN INDICATED IN CURRENT CIVIL DESIGN DRAWINGS
- SITE LEVELS ARE 0.4m HIGHER THAN INDICATED IN CURRENT CIVIL DESIGN DRAWINGS

Issue	Description	Date
01	FOR INFORMATION ONLY	12/08/11

1 : 1000

Client: SIMTA

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION

Scales	1 : 1000	Current Issue Signatures	
		Drawn	D. BALL
Original Size	A1	Designed	J. McCLELLAND
Height Datum	AHD	Checked	G. IVES
Grid	MGA	Approved	N. McMILLAN
Filename			

Project: SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

Title: CIVIL DESIGN OPTIONS FOR STORMWATER PLAN LAYOUT SHEET 4 OF 4

HYDER CONSULTING PTY LTD
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Level 5, 141 Walker St
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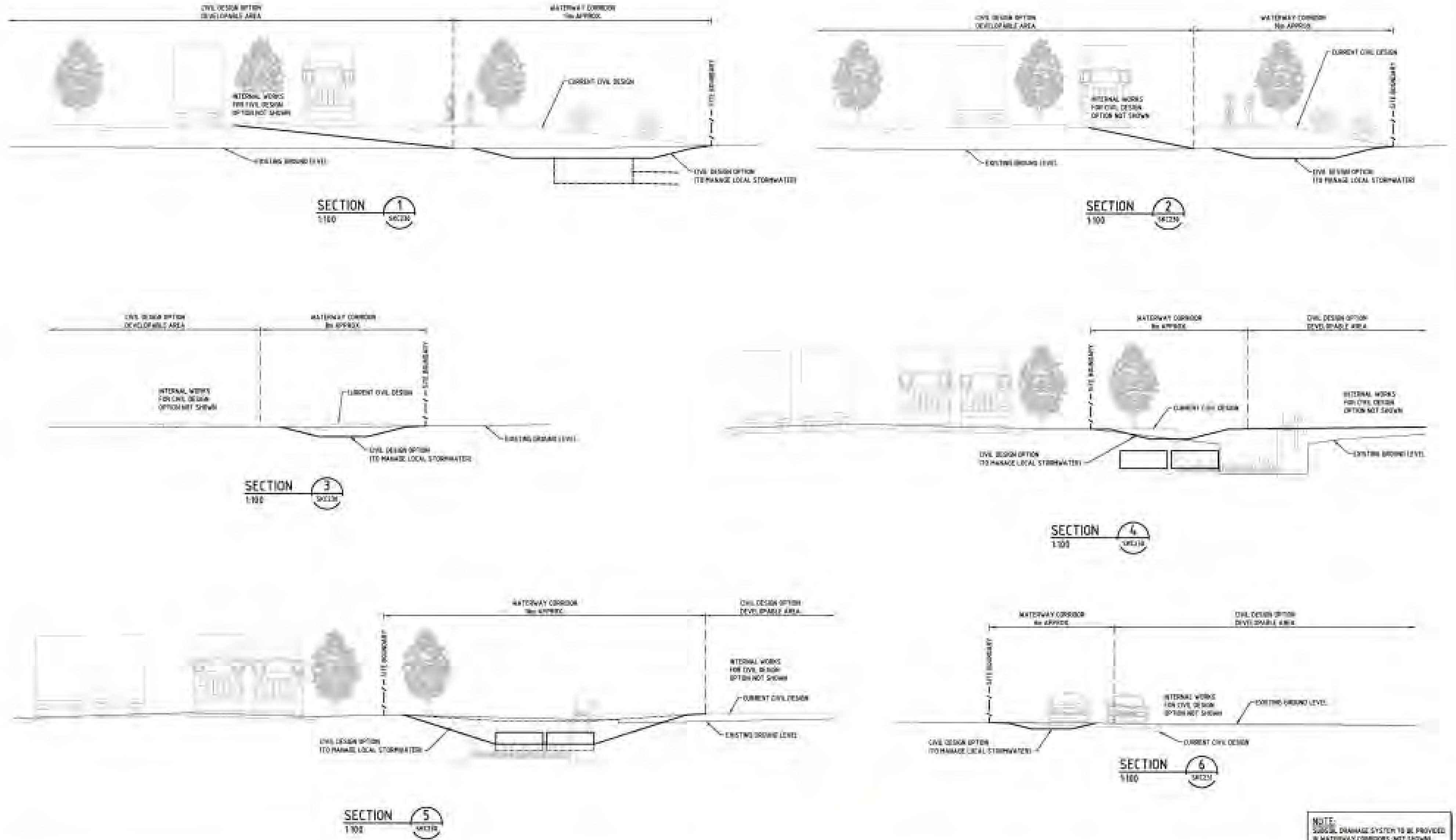
Drawing No	Project No	Issue
SKC233	AA003210	01



NOTE:
SUBSOIL DRAINAGE SYSTEM TO BE PROVIDED IN WATERWAY CORRIDORS (NOT SHOWN).

Issue	Description	Date
01	FOR INFORMATION ONLY	12/08/11

1:100

Client: SIMTA

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION

		Current Issue Signatures	
Scales	AS SHOWN	Drawn	E. BALL
Original Size	A1	Designed	J. MCCLELLAND
Height Datum	AHD	Checked	G. IVES
Grid	MGA	Approved	R. McMILLAN

Filename:

Project: SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

Title: CIVIL DESIGN OPTIONS FOR STORMWATER SECTIONS SHEET 1 OF 3

HYDER CONSULTING PTY LTD
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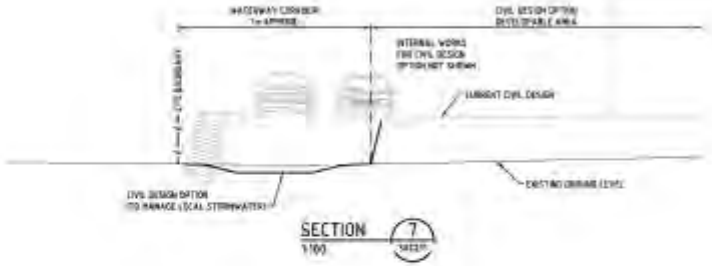
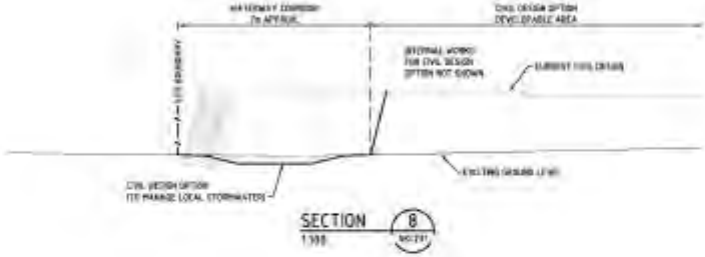
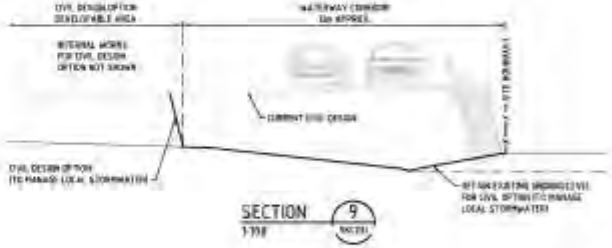
Drawing No.	Project No.	Issue
SKC220	AA003210	01



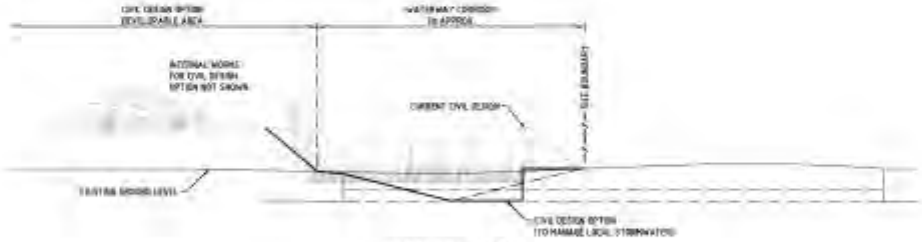
SECTION 7
1:100



SECTION 8
1:100



SECTION 9
1:100



SECTION 10
1:100

NOTE:
SUBSOIL DRAINAGE SYSTEM TO BE PROVIDED
IN WATERWAY CORRIDORS (NOT SHOWN)

01	FOR INFORMATION ONLY	12/04/11
Issue	Description	Date

0 1 2 3 4 5 10m
1:100

Client: SIMTA

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION

Scale	AS SHOWN	Original Issue Signatures	
		Drawn	D. BALL
Original Size	A1	Designed	C. MILLELLARO
Height Datum	AHD	Checked	D. LYES
Grid	MGA	Approved	M. PURELLA

Project: SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

Title: CIVIL DESIGN OPTIONS FOR STORMWATER SECTIONS SHEET 2 OF 3

HYDER CONSULTING PTY LTD
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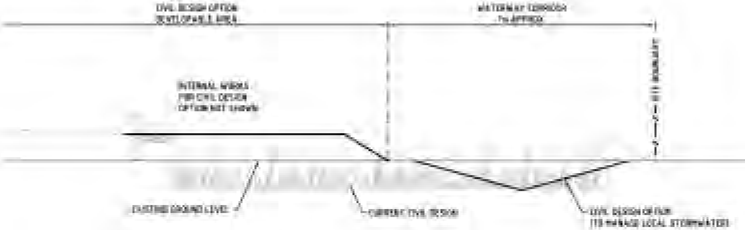
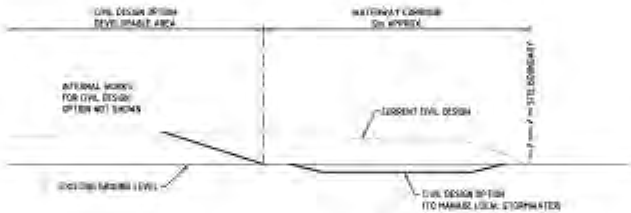
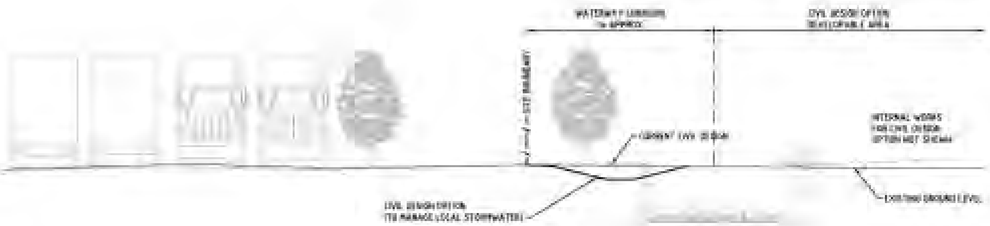
Drawing No.	Project No.	Issue
SKC221	AA003210	01



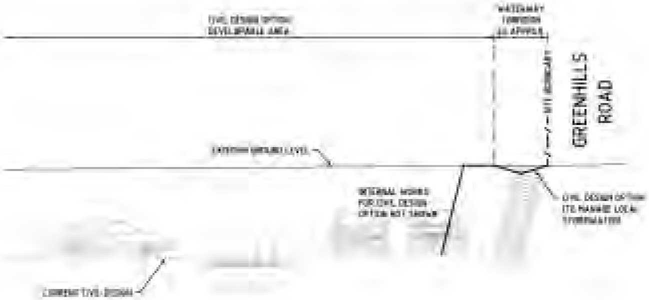
SECTION 11
1:100



SECTION 12
1:100



SECTION 13
1:100



SECTION 14
1:100

NOTE:
SUBSOIL DRAINAGE SYSTEM TO BE PROVIDED IN WATERWAY CORRIDORS (NOT SHOWN)

Issue	Description	Date
01	FOR INFORMATION ONLY	

1:100

Client: SIMTA

Status: **PRELIMINARY**
NOT TO BE USED FOR CONSTRUCTION

Scale	AS SHOWN	Drawn	D. BALL
Original Size	A1	Designed	
Height Datum	AHD	Checked	
Grid	MGA	Approved	

Project: SIMTA MOOREBANK INTERMODAL TERMINAL FACILITY

Title: CIVIL DESIGN OPTIONS FOR STORMWATER SECTIONS SHEET 3 OF 3

HYDER CONSULTING PTY LTD
Hyder

Drawing No: SKC222 — Project No: AA003210 — Issue: 01

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DRAINS Model Name and File Path:	F:\AA003210\D-Calculations\C-Civil\Stormwater\DRAINS\Moorebank.drn
DRAINS Version:	2010.09 - 5 August 2010
Modeller's Name:	Chris McClelland
Description:	Moorebank OSD

DRAINS results prepared 02 September, 2010 from Version 2010.09

RESULTS 20 YEAR ARI

PIT / NODE DETAILS

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Version 8 Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
HW2	12.76	10.166			1.44	0	None
N50	12.25		0				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
CatchB1Ex	0.381	0	0.381	3	8	0	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
CatchC1Ex	1.032	0.87	0.163	7	7	0	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
CatchBEx	5.832	2.538	3.35	14.5	24	0	AR&R 20 year, 2 hours storm, average 35.8 mm/h, Zone 1
CatchAEx	7.717	4.854	3.112	13.75	15	0	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
CatB1_Prop	6.108	6.108	0	6	3	0	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
CatB2(Swale)_Prop	1.26	1.26	0	9.5	8.5	0	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
CatB1Ext_Prop	0.381	0	0.381	5	8	0	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
CatB2Ext_Prop	0.132	0	0.132	8.5	15.5	0	AR&R 20 year, 2 hours storm, average 35.8 mm/h, Zone 1
CatA1_Prop	11.239	11.239	0	6	3	0	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
CatA2(Swale)_Prop	1.315	1.315	0	12	11	0	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
CatA1Ex_Prop	2.342	1.094	1.248	13.2	8.3	0	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
CatA2Ex_Prop	0.179	0	0.179	0	18	0	AR&R 20 year, 2 hours storm, average 35.8 mm/h, Zone 1
CatCa_Prop	1.732	1.732	0	3	0	0	AR&R 20 year, 5 minutes storm, average 175 mm/h, Zone 1
CatCb_Prop	1.642	1.642	0	3	0	0	AR&R 20 year, 5 minutes storm, average 175 mm/h, Zone 1
CatCc_Prop	1.639	1.639	0	3	0	0	AR&R 20 year, 5 minutes storm, average 175 mm/h, Zone 1
CatCd_Prop	1.708	1.708	0	3	0	0	AR&R 20 year, 5 minutes storm, average 175 mm/h, Zone 1
CatCe_Prop	1.571	1.571	0	3	0	0	AR&R 20 year, 5 minutes storm, average 175 mm/h, Zone 1
CatCf_Prop	1.758	1.758	0	3	0	0	AR&R 20 year, 5 minutes storm, average 175 mm/h, Zone 1
CatC2_Prop	6.273	6.273	0	3	0	0	AR&R 20 year, 5 minutes storm, average 175 mm/h, Zone 1
CatCEx1_Prop	1.032	0.87	0.163	7	7	0	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
CatCEx2_Prop	0.511	0.32	0.211	21.7	25	0	AR&R 20 year, 1.5 hours storm, average 42.7 mm/h, Zone 1
Cat_A3_Prop	1.157	1.157	0	3	0	0	AR&R 20 year, 5 minutes storm, average 175 mm/h, Zone 1
Cat Carpark_Ex	0.992	0.992	0	5	0	0	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
CatC1_Prop	1.04	1.04	0	3	0	0	AR&R 20 year, 5 minutes storm, average 175 mm/h, Zone 1
CatB3Ext_Prop	0.17	0	0.17	0	8	0	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
CatchCEx	8.567	6.236	2.563	25	30	0	AR&R 20 year, 1 hour storm, average 54.4 mm/h, Zone 1
Cat Carpark_Prop	0.992	0.992	0	5	0	0	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1

Outflow Volumes for Total Catchment (142 impervious + 56.3 pervious = 198 total ha)

Storm	Total Rainfall cu.m	Total Runoff cu.m (Runoff	Impervious Ru cu.m (Runoff	Pervious Runoff cu.m (Runoff %)
AR&R 20 year, 5 m	28912.92	21141.76 (73	19278.57 (93.	1863.19 (22.7%)
AR&R 20 year, 10	44278.07	35484.35 (80	30278.09 (95.	5206.26 (41.4%)
AR&R 20 year, 15	55512.8	45990.70 (82	38320.65 (96.	7670.05 (48.6%)
AR&R 20 year, 20	64897.1	54719.92 (84	45038.60 (96.	9681.32 (52.5%)
AR&R 20 year, 25	72530.12	61675.56 (85	50502.84 (97.	11172.72 (54.2%)
AR&R 20 year, 30	79204.87	67548.72 (85	55281.07 (97.	12267.66 (54.5%)
AR&R 20 year, 45	95313.5	81994.24 (86	66812.62 (97.	15181.62 (56.1%)
AR&R 20 year, 1 h	107853.43	93281.42 (86	75789.75 (98.	17491.67 (57.1%)
AR&R 20 year, 1.5	126985.53	110127.93 (8	89485.90 (98.	20642.03 (57.2%)
AR&R 20 year, 2 h	141954.16	123152.02 (8	100201.45 (98	22950.57 (56.9%)
AR&R 20 year, 3 h	165348.81	143816.59 (8	116949.47 (98	26667.13 (56.8%)
AR&R 20 year, 4.5	191816.53	165548.05 (8	135896.13 (99	29651.93 (54.4%)

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe13	1.549	1.4	15.728	15.649	AR&R 20 year, 15 minutes storm, average 112 mm/h, Zone 1
P18	1.489	1.4	15.716	15.649	AR&R 20 year, 15 minutes storm, average 112 mm/h, Zone 1
P20	1.487	1.4	15.716	15.649	AR&R 20 year, 15 minutes storm, average 112 mm/h, Zone 1
P22	1.533	1.4	15.724	15.649	AR&R 20 year, 15 minutes storm, average 112 mm/h, Zone 1
P24	1.449	1.3	15.707	15.649	AR&R 20 year, 15 minutes storm, average 112 mm/h, Zone 1
P26	1.567	1.5	15.731	15.649	AR&R 20 year, 15 minutes storm, average 112 mm/h, Zone 1
P10	10.166	3	12.303	12.253	AR&R 20 year, 1.5 hours storm, average 42.7 mm/h, Zone 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Chainage (m)	Max HGL (m)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF9	0.652	0.652	0.256	0.073	0.06	18.64	0.85	AR&R 20 year, 4.5 hours storm, average 21.5 mm/h, Zone 1
OF12	0.381	0.381	0.256	0.059	0.04	15.76	0.73	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
OF26	1.032	1.032	0.256	0.088	0.08	21.69	0.96	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
OF40	0	0	0.256	0	0	0	0	
OF1	0.632	0.632	0.256	0.072	0.06	18.46	0.84	AR&R 20 year, 4.5 hours storm, average 21.5 mm/h, Zone 1
OF19	6.244	6.244	0.256	0.185	0.28	40.91	1.53	AR&R 20 year, 2 hours storm, average 35.8 mm/h, Zone 1
OF17	6.244	6.244	0.256	0.185	0.28	40.91	1.53	AR&R 20 year, 2 hours storm, average 35.8 mm/h, Zone 1
StageDischarge_B	0.21	0.21	0.256	0.046	0.03	13.25	0.62	AR&R 20 year, 4.5 hours storm, average 21.5 mm/h, Zone 1
OF43	6.108	6.108	0.256	0.183	0.28	40.55	1.52	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
OF44	1.26	1.26	0.256	0.096	0.1	23.13	1.02	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
OF46	0.381	0.381	0.256	0.059	0.04	15.76	0.73	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
OF47	0.132	0.132	0.256	0.039	0.02	11.81	0.53	AR&R 20 year, 2 hours storm, average 35.8 mm/h, Zone 1
OF51	0.565	0.565	0.256	0.069	0.06	17.74	0.82	AR&R 20 year, 2 hours storm, average 35.8 mm/h, Zone 1
OF58	11.239	11.239	0.256	0.23	0.42	49.99	1.83	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
OF59	1.315	1.315	0.256	0.097	0.1	23.49	1.03	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1

OF60	2.342	2.342	0.256	0.123	0.15	28.7	1.2	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
OF61	0.179	0.179	0.256	0.044	0.03	12.71	0.59	AR&R 20 year, 2 hours storm, average 35.8 mm/h, Zone 1
OF64	2.935	2.935	0.256	0.135	0.17	31.03	1.27	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
StageDischarge_A	0.901	0.901	0.256	0.083	0.08	20.61	0.94	AR&R 20 year, 4.5 hours storm, average 21.5 mm/h, Zone 1
StageDischarge_D	7.154	7.154	0.256	0.194	0.31	42.89	1.59	AR&R 20 year, 1.5 hours storm, average 42.7 mm/h, Zone 1
OF102	8.354	8.354	0.256	0.207	0.34	45.4	1.65	AR&R 20 year, 1.5 hours storm, average 42.7 mm/h, Zone 1
OF101	6.273	6.273	0.256	0.185	0.28	40.91	1.54	AR&R 20 year, 5 minutes storm, average 175 mm/h, Zone 1
OF131	1.032	1.032	0.256	0.088	0.08	21.69	0.96	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
OF104	0.511	0.511	0.256	0.066	0.05	17.2	0.8	AR&R 20 year, 1.5 hours storm, average 42.7 mm/h, Zone 1
OF205	1.157	1.157	0.256	0.092	0.09	22.41	1	AR&R 20 year, 5 minutes storm, average 175 mm/h, Zone 1
OF485	0.992	0.992	0.256	0.087	0.08	21.33	0.96	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
OF305	1.04	1.04	0.256	0.088	0.09	21.69	0.97	AR&R 20 year, 5 minutes storm, average 175 mm/h, Zone 1
OF340	0.17	0.17	0.256	0.043	0.02	12.53	0.58	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1
OF28	0	0	0.256	0	0	0	0	
OF30	10.166	10.166	0.256	0.224	0.39	48.81	1.74	AR&R 20 year, 1.5 hours storm, average 42.7 mm/h, Zone 1
OF487	0.992	0.992	0.256	0.087	0.08	21.33	0.96	AR&R 20 year, 25 minutes storm, average 87.8 mm/h, Zone 1

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q	Max Q	Max Q
			Total	Low Level	High Level
DetBEx	14.69	11800.6	0.632	0	0.632
DetAEx	14.14	3976	6.244	0	6.244
DetB_Prop	15.52	13588.4	0.21	0	0.21
DetA_Prop	15.42	19125.6	0.901	0	0.901
DetC1	15.75	397.6	1.549	1.549	0
DetD_Prop	15.65	8894.7	7.154	0	7.154
DetC2	15.73	385.7	1.489	1.489	0
DetC3	15.73	385.3	1.487	1.487	0
DetC4	15.74	394.4	1.533	1.533	0
DetC5	15.72	376.9	1.449	1.449	0
DetC6	15.75	401.2	1.567	1.567	0

CONTINUITY CHECK for AR&R 20 year, 2 hours storm, average 35.8 mm/h, Zone 1

Node	Inflow	Outflow	Storage Chan	Difference
	(cu.m)	(cu.m)	(cu.m)	%
N4	4022.52	4022.52	0	0
N5	440.09	440.09	0	0
N8	1585.5	1585.5	0	0
DetBEx	13202.29	3588.01	9617.16	0
OutBEx	4016.95	4016.95	0	0
DetAEx	15299.77	15299.78	0	0
N40	15299.78	15299.78	0	0
OutAEx	15299.78	15299.78	0	0
OutCEx	26519.06	26519.06	0	0
N57	0	0	0	0
DetB_Prop	11870.87	1631.8	10240.45	0
N62	9514.76	9514.76	0	0
N63	2159.65	2159.65	0	0
N64	440.09	440.09	0	0
N65	224.69	224.69	0	0
N69	2293.86	2293.86	0	0
OutB_Prop	2291.16	2291.16	0	0
N75	17507.38	17507.38	0	0
N76	2475.24	2475.24	0	0
N77	3610.76	3610.76	0	0
N78	320.31	320.31	0	0
N79	11412.44	11412.44	0	0
OutA_Prop	11400.89	11400.89	0	0
DetA_Prop	21662.69	7492.92	14175.77	0
DetC1	2514.77	2514.02	0.75	0
DetD_Prop	26795.02	25435.83	1357.83	0
DetC2	2384.16	2383.42	0.75	0
DetC3	2379.93	2379.18	0.75	0
DetC4	2480.18	2479.43	0.75	0
DetC5	2281.79	2281.05	0.74	0
DetC6	2552.89	2552.15	0.75	0
N92	28192.02	28192.02	0	0
OutC_Prop	28186.63	28186.63	0	0
N95	9110.22	9110.22	0	0
N96	1585.5	1585.5	0	0
N97	1289.56	1289.56	0	0
N169	1680.28	1680.28	0	0
N177	1472.01	1472.01	0	0
N224	1510.13	1510.13	0	0
N232	196.46	196.46	0	0
HW2	26519.04	26519.06	0	0
N50	26519.06	26519.06	0	0
N294	1472.01	1472.01	0	0

Run Log for Moorebank.drn run at 17:00:05 on 2/9/2010

The maximum flow exceeded the safe value in the following overflow routes: OF487, OF485, OF305, OF205, OF131, OF104, OF102, OF101, StageDischarge_D, OF64, StageDischarge_A, OF60,

DRAINS results prepared 02 September, 2010 from Version 2010.09

PIT / NODE DETAILS — Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
HW2	12.4	6.295			1.8	0	None
N50	12		0				

SUB-CATCHMENT DETAILS

Name	Max Flow Q	Paved Max Q	Grassed Max Q	Paved Tc	Grassed Tc	Supp. Tc	Due to Storm

20 Year ARI Results

	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)						
CatchB1Ex	0.139	0	0.139	3	8	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatchC1Ex	0.355	0.298	0.057	7	7	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatchBEx	3.523	1.305	2.218	14.5	24	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatchAEx	3.825	2.059	1.766	13.75	15	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatB1_Prop	2.022	2.022	0	6	3	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatB2(Swale)_Prop	0.459	0.459	0	9.5	8.5	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatB1Ext_Prop	0.139	0	0.139	5	8	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatB2Ext_Prop	0.071	0	0.071	8.5	15.5	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatA1_Prop	3.72	3.72	0	6	3	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatA2(Swale)_Prop	0.526	0.526	0	12	11	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatA1Ex_Prop	0.917	0.456	0.461	13.2	8.3	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatA2Ex_Prop	0.101	0	0.101	0	18	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatCa_Prop	0.534	0.534	0	3	0	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatCb_Prop	0.507	0.507	0	3	0	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatCc_Prop	0.506	0.506	0	3	0	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatCd_Prop	0.527	0.527	0	3	0	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatCe_Prop	0.485	0.485	0	3	0	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatCf_Prop	0.542	0.542	0	3	0	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatC2_Prop	1.936	1.936	0	3	0	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatCEx1_Prop	0.355	0.298	0.057	7	7	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatCEx2_Prop	0.322	0.174	0.148	21.7	25	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
Cat_A3_Prop	0.357	0.357	0	3	0	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
Cat Carpark_Ex	0.313	0.313	0	5	0	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatC1_Prop	0.321	0.321	0	3	0	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatB3Ext_Prop	0.062	0	0.062	0	8	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
CatchCEx	5.627	3.633	1.994	25	30	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					
Cat Carpark_Prop	0.313	0.313	0	5	0	0	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1					

Outflow Volumes for Total Catchment (142 impervious + 56.3 pervious = 198 total ha)

Storm	Total Rainfall	Total Runoff	Impervious Ru	Pervious Runoff
	cu.m	cu.m (Runoff	cu.m (Runoff	cu.m (Runoff %)
AR&R 20 year, 6 h	214120.8	184181.44 (86	151861.70 (99	32319.73 (53.1%)
AR&R 20 year, 9 h	249807.59	211575.69 (84	177413.33 (99	34162.56 (48.1%)
AR&R 20 year, 12	278357.03	236380.27 (84	197848.50 (99	38531.77 (48.7%)
AR&R 20 year, 18	327961.66	273387.85 (83	233369.67 (99	40018.18 (42.9%)
AR&R 20 year, 24	368287.81	301332.22 (8	262250.53 (99	39081.69 (37.3%)

PIPE DETAILS

Name	Max Q	Max V	Max U/S	Max D/S	Due to Storm
	(cu.m/s)	(m/s)	HGL (m)	HGL (m)	
Pipe13	0.534	0.5	15.518	15.48	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
P18	0.506	0.5	15.514	15.48	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
P20	0.505	0.5	15.514	15.48	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
P22	0.526	0.5	15.517	15.48	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
P24	0.484	0.4	15.512	15.48	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
P26	0.542	0.5	15.519	15.48	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
P10	6.295	2.6	12.055	12.005	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1

CHANNEL DETAILS

Name	Max Q	Max V	Chainage	Max	Due to Storm
	(cu.m/s)	(m/s)	(m)	HGL (m)	

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF9	1.108	1.108	7.665	0.091	0.09	22.23	0.98	AR&R 20 year, 12 hours storm, average 11.7 mm/h, Zone 1
OF12	0.139	0.139	7.665	0.039	0.02	11.81	0.56	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF26	0.355	0.355	7.665	0.057	0.04	15.41	0.72	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF40	0	0	7.665	0	0	0	0	
OF1	1.075	1.075	7.665	0.089	0.09	21.87	0.98	AR&R 20 year, 12 hours storm, average 11.7 mm/h, Zone 1
OF19	3.46	3.46	7.665	0.145	0.19	33.01	1.32	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF17	3.46	3.46	7.665	0.145	0.19	33.01	1.32	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
StageDischarge_B	0.805	0.805	7.665	0.079	0.07	19.9	0.9	AR&R 20 year, 18 hours storm, average 9.19 mm/h, Zone 1
OF43	2.022	2.022	7.665	0.116	0.13	27.26	1.15	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF44	0.459	0.459	7.665	0.063	0.05	16.66	0.77	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF46	0.139	0.139	7.665	0.039	0.02	11.81	0.56	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF47	0.071	0.071	7.665	0.031	0.01	10.2	0.44	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF51	0.655	0.655	7.665	0.081	0.08	20.25	0.92	AR&R 20 year, 18 hours storm, average 9.19 mm/h, Zone 1
OF58	3.72	3.72	7.665	0.15	0.2	33.9	1.34	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF59	0.526	0.526	7.665	0.067	0.05	17.38	0.8	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF60	0.917	0.917	7.665	0.084	0.08	20.79	0.94	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF61	0.101	0.101	7.665	0.035	0.02	10.91	0.51	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF64	1.776	1.776	7.665	0.11	0.12	26	1.12	AR&R 20 year, 12 hours storm, average 11.7 mm/h, Zone 1
StageDischarge_A	0.973	0.973	7.665	0.086	0.08	21.15	0.95	AR&R 20 year, 12 hours storm, average 11.7 mm/h, Zone 1
StageDischarge_D	5.301	5.301	7.665	0.172	0.25	38.4	1.48	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF102	5.916	5.916	7.665	0.18	0.27	40.01	1.52	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF101	1.936	1.936	7.665	0.115	0.13	26.9	1.13	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF131	0.355	0.355	7.665	0.057	0.04	15.41	0.72	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF104	0.322	0.322	7.665	0.055	0.04	15.05	0.69	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF205	0.357	0.357	7.665	0.057	0.04	15.41	0.72	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF485	0.313	0.313	7.665	0.054	0.04	14.87	0.69	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF305	0.321	0.321	7.665	0.054	0.04	14.87	0.71	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF340	0.062	0.062	7.665	0.029	0.01	9.73	0.44	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF28	0	0	7.665	0	0	0	0	
OF30	6.295	6.295	7.665	0.185	0.28	40.91	1.54	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1
OF487	0.313	0.313	7.665	0.054	0.04	14.87	0.69	AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q	Max Q	Max Q
			Total	Low Level	High Level
DetBEx	14.72	12778.8	1.075	0	1.075
DetAEx	14.07	3022.5	3.46	0	3.46
DetB_Prop	15.87	16664	0.805	0	0.805

DetA_Prop	15.62	22285.6	0.973	0	0.973							
DetC1	15.53	220.8	0.534	0.534	0							
DetD_Prop	15.48	7982.5	5.301	0	5.301							
DetC2	15.52	217.3	0.506	0.506	0							
DetC3	15.52	217.2	0.505	0.505	0							
DetC4	15.52	219.9	0.526	0.526	0							
DetC5	15.52	214.7	0.484	0.484	0							
DetC6	15.53	221.9	0.542	0.542	0							
CONTINUITY CHECK for AR&R 20 year, 6 hours storm, average 18 mm/h, Zone 1												
Node	Inflow	Outflow	Storage Chan	Difference								
	(cu.m)	(cu.m)	(cu.m)	%								
N4	10685.39	10685.4	0	0								
N5	615.82	615.82	0	0								
N8	2381.69	2381.69	0	0								
DetBEx	19264.64	10075.01	9192.28	0								
OutBEx	10679.95	10679.95	0	0								
DetAEx	22564.03	22564	0	0								
N40	22564	22564	0	0								
OutAEx	22564	22564	0	0								
OutCEx	39522.07	39522.07	0	0								
N57	0	0	0	0								
DetB_Prop	17968.42	4176.21	13793.81	0								
N62	14420.32	14420.32	0	0								
N63	3273.11	3273.11	0	0								
N64	615.82	615.82	0	0								
N65	315.6	315.6	0	0								
N69	5104.5	5104.48	0	0								
OutB_Prop	5101.33	5101.33	0	0								
N75	26533.87	26533.87	0	0								
N76	3751.43	3751.43	0	0								
N77	5302.78	5302.78	0	0								
N78	450.42	450.42	0	0								
N79	23469.25	23469.22	0	0								
OutA_Prop	23457.26	23457.26	0	0								
DetA_Prop	32831.63	17727.97	15109.91	0								
DetC1	3811.34	3810.68	0.65	0								
DetD_Prop	40591.9	39837.63	752.57	0								
DetC2	3613.4	3612.74	0.65	0								
DetC3	3606.96	3606.32	0.65	0								
DetC4	3758.89	3758.25	0.65	0								
DetC5	3458.23	3457.6	0.65	0								
DetC6	3869.14	3868.47	0.66	0								
N92	43970.65	43970.64	0	0								
OutC_Prop	43967.65	43967.65	0	0								
N95	13807.34	13807.34	0	0								
N96	2381.69	2381.69	0	0								
N97	1905.04	1905.04	0	0								
N169	2546.6	2546.6	0	0								
N177	2230.95	2230.95	0	0								
N224	2288.74	2288.74	0	0								
N232	274.91	274.91	0	0								
HW2	39522.06	39522.07	0	0								
N50	39522.07	39522.07	0	0								
N294	2230.95	2230.95	0	0								
Run Log for Moorebank.drn run at 17:00:37 on 2/9/2010												
The following detention basins have little effect (less than 2%) in reducing peak discharge: DetC6, DetC5, DetC4, DetC3, DetC2, DetC1 You might consider upsizing these, or removing them												

DRAINS Model Name and File Path:	F:\AA003210\D-Calculations\C-Civil\Stormwater\DRAINS\Moorebank.drn
DRAINS Version:	2010.09 - 5 August 2010
Modeller's Name:	Chris McClelland
Description:	Moorebank OSD

DRAINS results prepared 02 September, 2010 from Version 2010.09

RESULTS
100 YEAR ARI

PIT / NODE DETAILS — Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
HW2	12.97	12.746			1.23	0	None
N50	12.41		0				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
CatchB1Ex	0.465	0	0.465	3	8	0	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
CatchC1Ex	1.231	1.034	0.197	7	7	0	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
CatchBEx	7.538	3.077	4.462	14.5	24	0	AR&R 100 year, 2 hours storm, average 46.1 mm/h, Zone 1
CatchAEx	9.881	5.94	4.252	13.75	15	0	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
CatB1_Prop	7.233	7.233	0	6	3	0	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
CatB2(Swale)_Prop	1.51	1.51	0	9.5	8.5	0	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
CatB1Ext_Prop	0.465	0	0.465	5	8	0	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
CatB2Ext_Prop	0.17	0	0.17	8.5	15.5	0	AR&R 100 year, 1 hour storm, average 69.7 mm/h, Zone 1
CatA1_Prop	13.308	13.308	0	6	3	0	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
CatA2(Swale)_Prop	1.595	1.595	0	12	11	0	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
CatA1Ex_Prop	2.808	1.335	1.531	13.2	8.3	0	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
CatA2Ex_Prop	0.231	0	0.231	0	18	0	AR&R 100 year, 1.5 hours storm, average 54.9 mm/h, Zone 1
CatCa_Prop	2.216	2.216	0	3	0	0	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
CatCb_Prop	2.101	2.101	0	3	0	0	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
CatCc_Prop	2.098	2.098	0	3	0	0	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
CatCd_Prop	2.186	2.186	0	3	0	0	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
CatCe_Prop	2.011	2.011	0	3	0	0	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
CatCf_Prop	2.25	2.25	0	3	0	0	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
CatC2_Prop	8.029	8.029	0	3	0	0	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
CatCEx1_Prop	1.231	1.034	0.197	7	7	0	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
CatCEx2_Prop	0.656	0.391	0.288	21.7	25	0	AR&R 100 year, 1.5 hours storm, average 54.9 mm/h, Zone 1
Cat_A3_Prop	1.481	1.481	0	3	0	0	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
Cat Carpark_Ex	1.228	1.228	0	5	0	0	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
CatC1_Prop	1.331	1.331	0	3	0	0	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
CatB3Ext_Prop	0.208	0	0.208	0	8	0	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
CatchCEx	10.983	7.698	3.592	25	30	0	AR&R 100 year, 1 hour storm, average 69.7 mm/h, Zone 1
Cat Carpark_Prop	1.228	1.228	0	5	0	0	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1

Outflow Volumes for Total Catchment (142 impervious + 56.3 pervious = 198 total ha)

Storm	Total Rainfall cu.m	Total Runoff cu.m (Runoff	Impervious Ru cu.m (Runoff	Pervious Runoff cu.m (Runoff %)
AR&R 100 year, 5 n	37008.53	29088.43 (78	25074.09 (94.	4014.34 (38.2%)
AR&R 100 year, 10	56834.53	47930.48 (84	39266.84 (96.	8663.64 (53.7%)
AR&R 100 year, 15	71373.59	61701.68 (86	49674.88 (97.	12026.80 (59.3%)
AR&R 100 year, 20	83269.2	72908.14 (87	58190.62 (97.	14717.52 (62.2%)
AR&R 100 year, 25	92521.33	81332.79 (87	64814.00 (97.	16518.80 (62.8%)
AR&R 100 year, 30	101112.6	89230.76 (88.	70964.27 (98.	18266.49 (63.6%)
AR&R 100 year, 45	122078.59	108532.58 (8	85973.19 (98.	22559.39 (65.0%)
AR&R 100 year, 1 h	138167.2	123320.74 (8	97504.91 (98.	25815.83 (65.8%)
AR&R 100 year, 1.5	163267.09	146174.80 (8	115458.91 (98	30715.90 (66.2%)
AR&R 100 year, 2 H	182795.72	163812.55 (8	129438.98 (98	34373.57 (66.2%)
AR&R 100 year, 3 H	213526.02	191312.87 (8	151437.14 (99	39875.73 (65.7%)
AR&R 100 year, 4.5	246023.27	221265.07 (8	176132.27 (99	45132.80 (64.0%)

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe13	1.77	1.6	15.986	15.896	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
P18	1.693	1.6	15.972	15.896	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
P20	1.69	1.6	15.972	15.896	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
P22	1.749	1.6	15.982	15.896	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
P24	1.634	1.5	15.963	15.896	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
P26	1.793	1.7	15.99	15.896	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
P10	12.746	3.2	12.48	12.41	AR&R 100 year, 1.5 hours storm, average 54.9 mm/h, Zone 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Chainage (m)	Max HGL (m)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF9	1.627	1.627	0.256	0.106	0.12	25.28	1.09	AR&R 100 year, 3 hours storm, average 35.9 mm/h, Zone 1
OF12	0.465	0.465	0.256	0.063	0.05	16.66	0.78	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
OF26	1.231	1.231	0.256	0.095	0.1	22.95	1.01	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
OF40	0	0	0.256	0	0	0	0	
OF1	1.572	1.572	0.256	0.105	0.11	24.92	1.08	AR&R 100 year, 3 hours storm, average 35.9 mm/h, Zone 1
OF19	8.334	8.334	0.256	0.207	0.34	45.4	1.65	AR&R 100 year, 2 hours storm, average 46.1 mm/h, Zone 1
OF17	8.334	8.334	0.256	0.207	0.34	45.4	1.65	AR&R 100 year, 2 hours storm, average 46.1 mm/h, Zone 1
StageDischarge_B	0.868	0.868	0.256	0.082	0.06	20.43	0.92	AR&R 100 year, 4.5 hours storm, average 27.8 mm/h, Zone 1
OF43	7.233	7.233	0.256	0.195	0.31	43.07	1.59	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
OF44	1.51	1.51	0.256	0.103	0.11	24.57	1.07	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
OF46	0.465	0.465	0.256	0.063	0.05	16.66	0.78	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
OF47	0.17	0.17	0.256	0.043	0.02	12.53	0.58	AR&R 100 year, 1 hour storm, average 69.7 mm/h, Zone 1
OF51	0.923	0.923	0.256	0.084	0.08	20.79	0.94	AR&R 100 year, 4.5 hours storm, average 27.8 mm/h, Zone 1
OF58	13.308	13.308	0.256	0.23	0.5	49.99	2.16	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
OF59	1.595	1.595	0.256	0.106	0.11	25.1	1.08	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1

OF60	2.808	2.808	0.256	0.133	0.17	30.67	1.25	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
OF61	0.231	0.231	0.256	0.048	0.03	13.61	0.64	AR&R 100 year, 1.5 hours storm, average 54.9 mm/h, Zone 1
OF64	3.542	3.542	0.256	0.146	0.19	33.19	1.34	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
StageDischarge_A	1.461	1.461	0.256	0.102	0.11	24.39	1.05	AR&R 100 year, 4.5 hours storm, average 27.8 mm/h, Zone 1
StageDischarge_D	7.816	7.816	0.256	0.202	0.33	44.32	1.62	AR&R 100 year, 2 hours storm, average 46.1 mm/h, Zone 1
OF102	9.195	9.195	0.256	0.215	0.36	47.02	1.69	AR&R 100 year, 1.5 hours storm, average 54.9 mm/h, Zone 1
OF101	8.029	8.029	0.256	0.203	0.33	44.68	1.64	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
OF131	1.231	1.231	0.256	0.095	0.1	22.95	1.01	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
OF104	0.656	0.656	0.256	0.073	0.06	18.64	0.85	AR&R 100 year, 1.5 hours storm, average 54.9 mm/h, Zone 1
OF205	1.481	1.481	0.256	0.103	0.11	24.57	1.05	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
OF485	1.228	1.228	0.256	0.095	0.1	22.95	1.01	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
OF305	1.331	1.331	0.256	0.098	0.1	23.67	1.02	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1
OF340	0.208	0.208	0.256	0.046	0.03	13.25	0.61	AR&R 100 year, 20 minutes storm, average 126 mm/h, Zone 1
OF28	0	0	0.256	0	0	0	0	
OF30	12.746	12.746	0.256	0.23	0.48	49.99	2.07	AR&R 100 year, 1.5 hours storm, average 54.9 mm/h, Zone 1
OF487	1.228	1.228	0.256	0.095	0.1	22.95	1.01	AR&R 100 year, 5 minutes storm, average 224 mm/h, Zone 1

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
DetBEx	14.74	13506.6	1.572	0	1.572
DetAEx	14.19	4567.1	8.334	0	8.334
DetB_Prop	15.87	16681.5	0.868	0	0.868
DetA_Prop	15.78	24891.2	1.461	0	1.461
DetC1	16.01	606.6	1.77	1.77	0
DetD_Prop	15.9	10227.8	7.816	0	7.816
DetC2	15.99	592.8	1.693	1.693	0
DetC3	15.99	592.4	1.69	1.69	0
DetC4	16	602.8	1.749	1.749	0
DetC5	15.98	582.8	1.634	1.634	0
DetC6	16.01	610.9	1.793	1.793	0

CONTINUITY CHECK for AR&R 100 year, 1 hour storm, average 69.7 mm/h, Zone 1

Node	Inflow (cu.m)	Outflow (cu.m)	Storage Chan (cu.m)	Difference %
N4	3835.12	3835.11	0	0
N5	497.8	497.8	0	0
N8	1571.57	1571.57	0	0
DetBEx	13909.94	3343.19	10569.78	0
OutBEx	3829.24	3829.24	0	0
DetAEx	15759.35	15759.39	0	0
N40	15759.39	15759.39	0	0
OutAEx	15759.39	15759.39	0	0
OutCEx	26769.13	26769.13	0	0
N57	0	0	0	0
DetB_Prop	11582.45	1128.4	10455.42	0
N62	9258.7	9258.7	0	0
N63	2101.53	2101.53	0	0
N64	497.8	497.8	0	0
N65	253.49	253.49	0	0
N69	1876.98	1876.98	0	0
OutB_Prop	1874.28	1874.28	0	0
N75	17036.23	17036.23	0	0
N76	2408.62	2408.62	0	0
N77	3744.73	3744.73	0	0
N78	360.94	360.94	0	0
N79	9405.76	9405.75	0	0
OutA_Prop	9393.51	9393.51	0	0
DetA_Prop	21079.91	5312.32	15773.72	0
DetC1	2447.09	2445.91	1.19	0
DetD_Prop	26100.04	24155.4	1946.41	0
DetC2	2320	2318.81	1.19	0
DetC3	2315.88	2314.69	1.19	0
DetC4	2413.43	2412.24	1.19	0
DetC5	2220.38	2219.2	1.19	0
DetC6	2484.19	2483	1.19	0
N92	26905.66	26905.66	0	0
OutC_Prop	26897.93	26897.93	0	0
N95	8865.05	8865.05	0	0
N96	1571.57	1571.57	0	0
N97	1325.57	1325.57	0	0
N169	1635.06	1635.06	0	0
N177	1432.39	1432.39	0	0
N224	1469.49	1469.49	0	0
N232	222.22	222.22	0	0
HW2	26769.13	26769.13	0	0
N50	26769.13	26769.13	0	0
N294	1432.39	1432.39	0	0

Run Log for Moorebank.dm run at 16:56:56 on 2/9/2010

The maximum flow exceeded the safe value in the following overflow routes: OF487, OF485, OF305, OF205, OF131, OF104, OF102, OF101, StageDischarge_D, OF64, StageDischarge_A, OF60,

DRAINS results prepared 02 September, 2010 from Version 2010.09

PIT / NODE DETAILS — Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
HW2	12.54	7.698			1.66	0	None
N50	12.1		0				

SUB-CATCHMENT DETAILS

Name	Max Flow Q	Paved Max Q	Grassed Max Q	Paved Tc	Grassed Tc	Supp. Tc	Due to Storm

	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)						
CatchB1Ex	0.173	0	0.173	3	8	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatchC1Ex	0.431	0.36	0.071	7	7	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatchBEx	4.356	1.575	2.782	14.5	24	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatchAEx	4.693	2.484	2.209	13.75	15	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatB1_Prop	2.439	2.439	0	6	3	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatB2(Swale)_Prop	0.554	0.554	0	9.5	8.5	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatB1Ext_Prop	0.173	0	0.173	5	8	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatB2Ext_Prop	0.088	0	0.088	8.5	15.5	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatA1_Prop	4.488	4.488	0	6	3	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatA2(Swale)_Prop	0.634	0.634	0	12	11	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatA1Ex_Prop	1.126	0.55	0.576	13.2	8.3	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatA2Ex_Prop	0.126	0	0.126	0	18	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatCa_Prop	0.645	0.645	0	3	0	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatCb_Prop	0.611	0.611	0	3	0	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatCc_Prop	0.61	0.61	0	3	0	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatCd_Prop	0.636	0.636	0	3	0	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatCe_Prop	0.585	0.585	0	3	0	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatCf_Prop	0.654	0.654	0	3	0	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatC2_Prop	2.335	2.335	0	3	0	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatCEx1_Prop	0.431	0.36	0.071	7	7	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatCEx2_Prop	0.395	0.21	0.186	21.7	25	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
Cat_A3_Prop	0.431	0.431	0	3	0	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
Cat Carpark_Ex	0.377	0.377	0	5	0	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatC1_Prop	0.387	0.387	0	3	0	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatB3Ext_Prop	0.077	0	0.077	0	8	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
CatchCEx	6.889	4.383	2.506	25	30	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					
Cat Carpark_Prop	0.377	0.377	0	5	0	0	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1					

Outflow Volumes for Total Catchment (142 impervious + 56.3 pervious = 198 total ha)

Storm	Total Rainfall	Total Runoff	Impervious Ru	Pervious Runoff
	cu.m	cu.m (Runoff	cu.m (Runoff %	cu.m (Runoff %)
AR&R 100 year, 6 h	277167.5	246007.27 (8	196995.98 (99	49011.29 (62.2%)
AR&R 100 year, 9 h	324749.88	284506.63 (8	231049.34 (99	53457.29 (57.9%)
AR&R 100 year, 12	364005.34	318045.67 (8	259161.44 (99	58884.23 (56.9%)
AR&R 100 year, 18	431810.28	371191.56 (8	307692.44 (99	63499.13 (51.8%)
AR&R 100 year, 24	490098.66	414839.37 (8	349419.16 (99	65420.21 (47.0%)

PIPE DETAILS

Name	Max Q	Max V	Max U/S	Max D/S	Due to Storm
	(cu.m/s)	(m/s)	HGL (m)	HGL (m)	
Pipe13	0.631	0.6	15.566	15.504	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
P18	0.598	0.6	15.56	15.504	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
P20	0.597	0.6	15.559	15.504	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
P22	0.623	0.6	15.564	15.504	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
P24	0.572	0.5	15.555	15.504	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
P26	0.641	0.6	15.568	15.504	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
P10	7.698	2.8	12.148	12.098	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1

CHANNEL DETAILS

Name	Max Q	Max V	Chainage	Max	Due to Storm
	(cu.m/s)	(m/s)	(m)	HGL (m)	

OVERFLOW ROUTE DETAILS

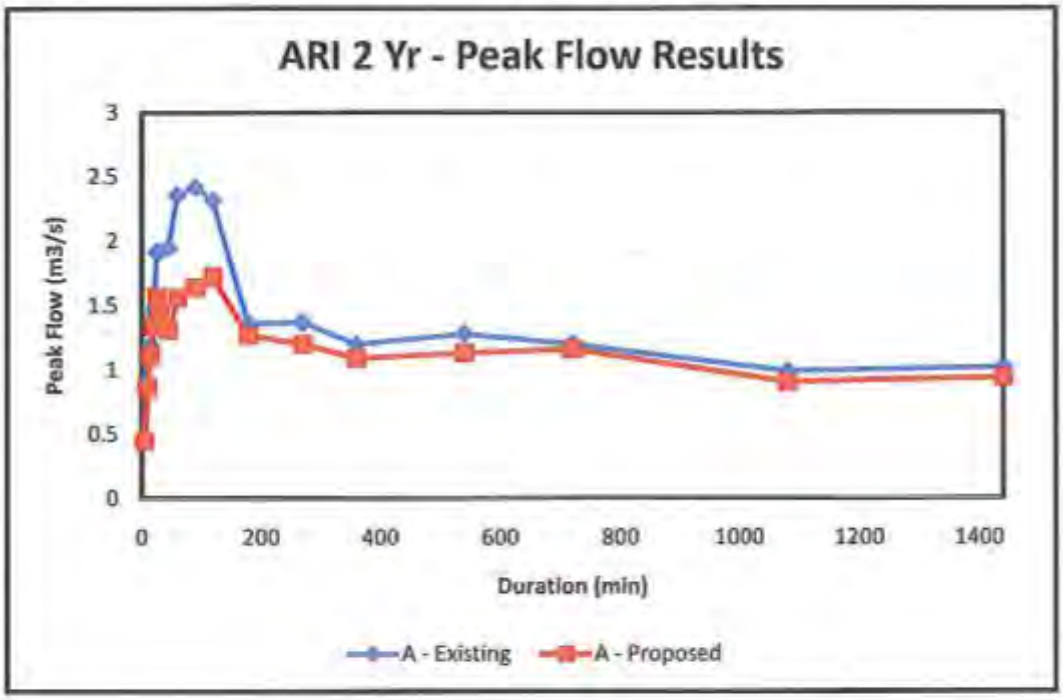
Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF9	2.626	2.626	7.665	0.13	0.16	29.95	1.23	AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1
OF12	0.173	0.173	7.665	0.043	0.03	12.53	0.59	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF26	0.431	0.431	7.665	0.062	0.05	16.3	0.76	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF40	0	0	7.665	0	0	0	0	
OF1	2.537	2.537	7.665	0.128	0.16	29.59	1.21	AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1
OF19	4.585	4.585	7.665	0.162	0.23	36.42	1.43	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF17	4.585	4.585	7.665	0.162	0.23	36.42	1.43	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
StageDischarge_B	1.847	1.847	7.665	0.112	0.13	26.36	1.13	AR&R 100 year, 12 hours storm, average 15.3 mm/h, Zone 1
OF43	2.439	2.439	7.665	0.125	0.15	29.06	1.21	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF44	0.554	0.554	7.665	0.069	0.06	17.74	0.81	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF46	0.173	0.173	7.665	0.043	0.03	12.53	0.59	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF47	0.088	0.088	7.665	0.034	0.02	10.74	0.47	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF51	2.01	2.01	7.665	0.116	0.13	27.26	1.14	AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1
OF58	4.488	4.488	7.665	0.161	0.23	36.24	1.41	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF59	0.634	0.634	7.665	0.072	0.06	18.46	0.84	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF60	1.126	1.126	7.665	0.091	0.09	22.23	0.99	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF61	0.126	0.126	7.665	0.038	0.02	11.63	0.53	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF64	2.734	2.734	7.665	0.132	0.16	30.31	1.24	AR&R 100 year, 9 hours storm, average 18.2 mm/h, Zone 1
StageDischarge_A	1.951	1.951	7.665	0.115	0.13	26.9	1.14	AR&R 100 year, 12 hours storm, average 15.3 mm/h, Zone 1
StageDischarge_D	6.735	6.735	7.665	0.19	0.3	41.99	1.56	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF102	7.507	7.507	7.665	0.198	0.32	43.6	1.61	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF101	2.335	2.335	7.665	0.123	0.15	28.7	1.19	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF131	0.431	0.431	7.665	0.062	0.05	16.3	0.76	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF104	0.395	0.395	7.665	0.06	0.04	15.94	0.74	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF205	0.431	0.431	7.665	0.062	0.05	16.3	0.76	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF485	0.377	0.377	7.665	0.059	0.04	15.76	0.72	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF305	0.387	0.387	7.665	0.059	0.04	15.76	0.74	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF340	0.077	0.077	7.665	0.032	0.01	10.38	0.46	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF28	0	0	7.665	0	0	0	0	
OF30	7.698	7.698	7.665	0.201	0.32	44.14	1.61	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1
OF487	0.377	0.377	7.665	0.059	0.04	15.76	0.72	AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1

DETENTION BASIN DETAILS

Name	Max Wl.	MaxVol	Max Q	Max Q	Max Q
			Total	Low Level	High Level
DetBEx	14.77	14733.9	2.537	0	2.537
DetAEx	14.1	3385.8	4.585	0	4.585
DetB_Prop	15.91	17055.5	1.847	0	1.847

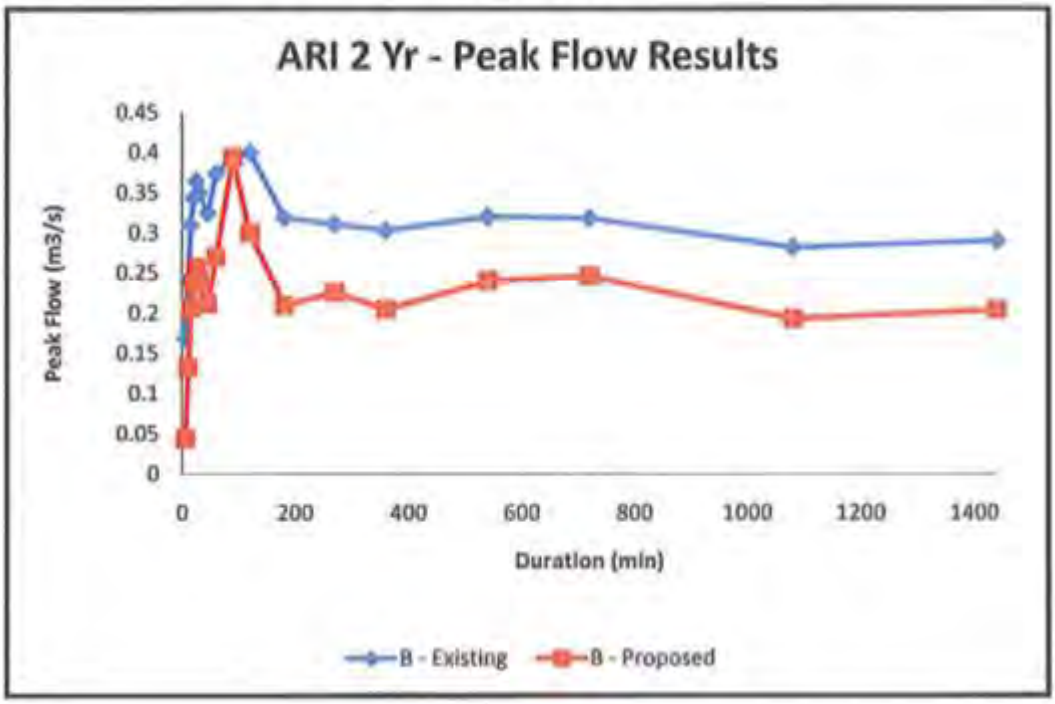
DetA_Prop	15.91	26975.3	1.951	0	1.951							
DetC1	15.58	264.1	0.631	0.631	0							
DetD_Prop	15.5	8112.2	6.735	0	6.735							
DetC2	15.57	258	0.598	0.598	0							
DetC3	15.57	257.8	0.597	0.597	0							
DetC4	15.58	262.5	0.623	0.623	0							
DetC5	15.57	253.4	0.572	0.572	0							
DetC6	15.58	266	0.641	0.641	0							
CONTINUITY CHECK for AR&R 100 year, 6 hours storm, average 23.3 mm/h, Zone 1												
Node	Inflow	Outflow	Storage Chan	Difference								
	(cu.m)	(cu.m)	(cu.m)	%								
N4	18363.92	18363.94	0	0								
N5	934.22	934.22	0	0								
N8	3145.34	3145.34	0	0								
DetBEx	27171.37	17435.32	9738.48	0								
OutBEx	18358.32	18358.32	0	0								
DetAEx	30999.16	30999.08	0	0								
N40	30999.08	30999.08	0	0								
OutAEx	30999.08	30999.08	0	0								
OutCEx	53292.52	53292.52	0	0								
N57	0	0	0	0								
DetB_Prop	23368.79	7704.15	15666.21	0								
N62	18706.2	18706.2	0	0								
N63	4245.87	4245.87	0	0								
N64	934.22	934.22	0	0								
N65	478.68	478.68	0	0								
N69	9113.47	9113.47	0	0								
OutB_Prop	9110.02	9110.02	0	0								
N75	34419.8	34419.8	0	0								
N76	4866.35	4866.35	0	0								
N77	7329.11	7329.11	0	0								
N78	683.11	683.11	0	0								
N79	30880.07	30880.13	0	0								
OutA_Prop	30866.4	30866.4	0	0								
DetA_Prop	42589.45	22881.83	19714.63	0								
DetC1	4944.05	4943.38	0.69	0								
DetD_Prop	52711.73	51826.04	885.07	0								
DetC2	4687.28	4686.58	0.69	0								
DetC3	4678.94	4678.26	0.69	0								
DetC4	4876.12	4875.35	0.69	0								
DetC5	4488.04	4485.33	0.69	0								
DetC6	5019.05	5018.32	0.7	0								
N92	57332.42	57332.39	0	0								
OutC_Prop	57328.88	57328.88	0	0								
N95	17910.6	17910.6	0	0								
N96	3145.34	3145.34	0	0								
N97	2616.88	2616.88	0	0								
N169	3303.44	3303.44	0	0								
N177	2893.97	2893.97	0	0								
N224	2968.94	2968.94	0	0								
N232	417.05	417.05	0	0								
HW2	53292.54	53292.52	0	0								
N50	53292.52	53292.52	0	0								
N294	2893.97	2893.97	0	0								
Run Log for Moorebank.dm run at 16:57:31 on 2/9/2010												
The maximum flow exceeded the safe value in the following overflow routes: OF30												
The following detention basins have little effect (less than 2%) in reducing peak discharge: DetD_Prop You might consider upsizing these, or removing them from the model.												

Outlet A



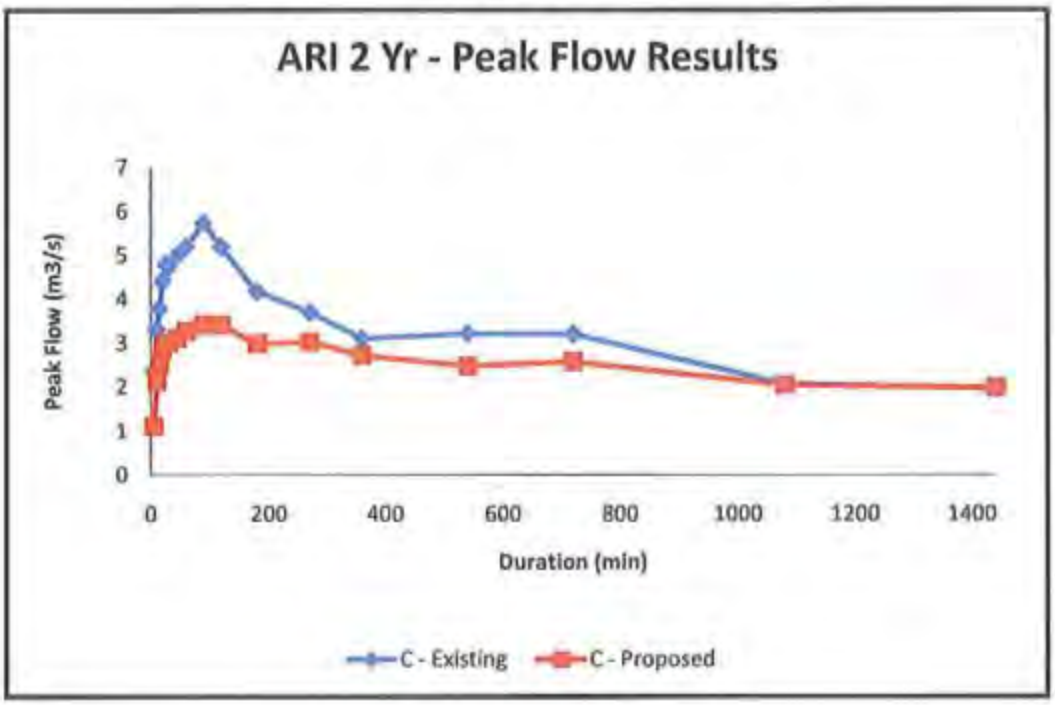
ARI 2 Yr - Peak Flow Results				
Duration (min)	A - Existing	A - Proposed	Basin A Outlet	A - WL(mAHD)
5	0.882	0.443	0.058	14.23
10	1.07	0.867	0.086	14.35
15	1.2	1.11	0.299	14.43
20	1.47	1.34	0.432	14.49
25	1.92	1.57	0.466	14.54
30	1.92	1.44	0.492	14.57
45	1.95	1.31	0.548	14.66
60	2.36	1.56	0.582	14.72
90	2.42	1.64	0.613	14.77
120	2.32	1.72	0.634	14.81
180	1.36	1.27	0.651	14.84
270	1.37	1.2	0.656	14.85
360	1.2	1.09	0.67	14.88
540	1.28	1.13	0.712	14.96
720	1.2	1.16	0.699	14.94
1080	0.99	0.905	0.677	14.89
1440	1.02	0.94	0.693	14.93
Peak	2.42	1.72	0.712	14.96

Outlet B



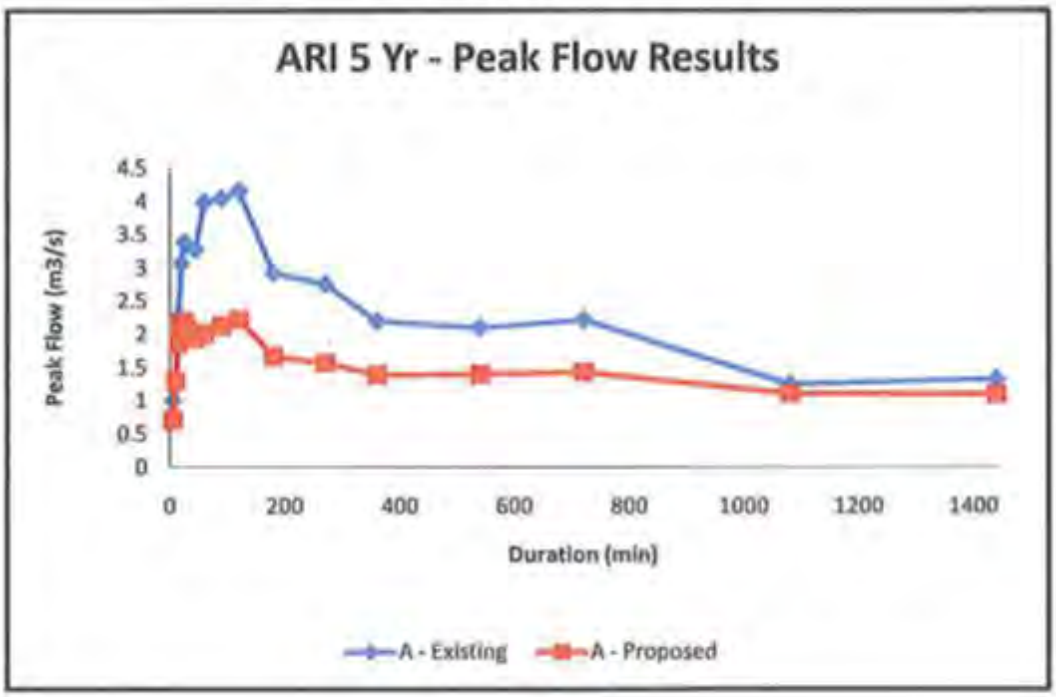
ARI 2 Yr - Peak Flow Results				
Duration (min)	B - Existing	B - Proposed	Basin B Outlet	B - WL(mAHD)
5	0.169	0.044	0.037	14.15
10	0.241	0.133	0.057	14.24
15	0.31	0.207	0.07	14.3
20	0.344	0.236	0.081	14.35
25	0.365	0.258	0.089	14.4
30	0.35	0.241	0.097	14.43
45	0.325	0.212	0.113	14.52
60	0.374	0.27	0.12	14.58
90	0.395	0.394	0.132	14.66
120	0.4	0.3	0.14	14.72
180	0.319	0.21	0.15	14.8
270	0.311	0.226	0.155	14.87
360	0.303	0.205	0.16	14.93
540	0.32	0.24	0.17	15.03
720	0.318	0.246	0.18	15.11
1080	0.282	0.193	0.18	15.11
1440	0.29	0.204	0.18	15.12
Peak	0.4	0.394	0.18	15.12

Outlet C



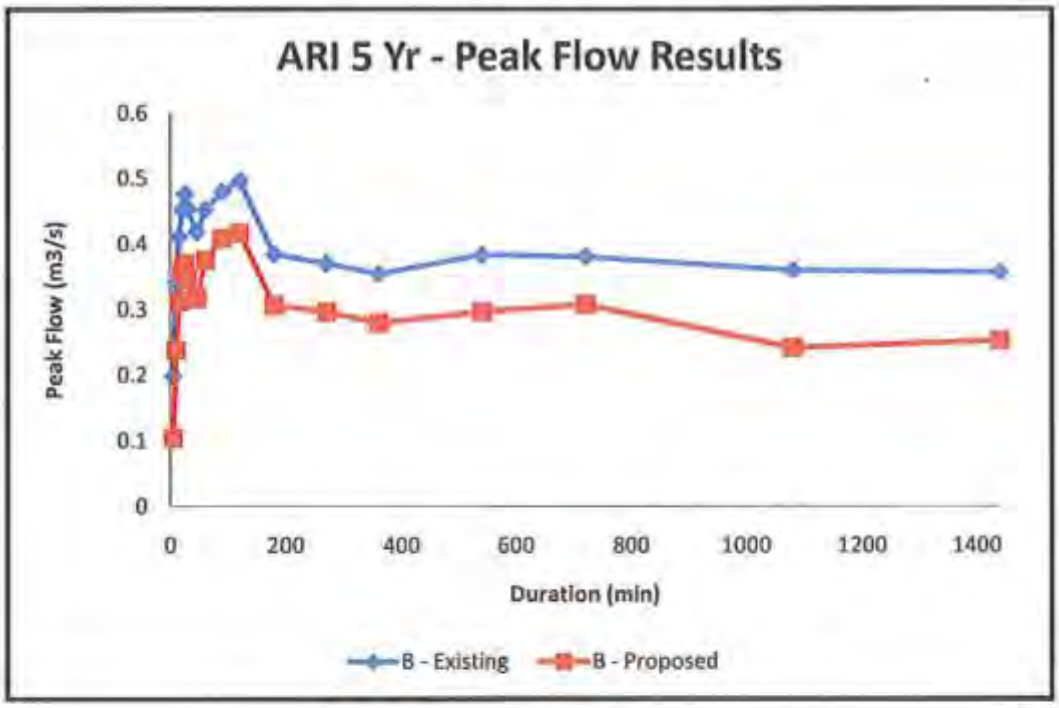
ARI 2 Yr - Peak Flow Results				
Duration (min)	C - Existing	C - Proposed	Basin D Outlet	D - WL(mAHD)
5	2.38	1.12	0.963	14.47
10	3.33	2.12	1.8	14.72
15	3.79	2.53	2.2	14.89
20	4.43	2.86	2.44	15.01
25	4.81	3.02	2.56	15.07
30	4.73	3	2.59	15.09
45	5.01	3.12	2.71	15.16
60	5.2	3.28	2.83	15.23
90	5.74	3.43	2.84	15.24
120	5.2	3.42	2.89	15.27
180	4.18	2.99	2.61	15.1
270	3.71	3.04	2.68	15.15
360	3.11	2.72	2.42	15
540	3.22	2.48	2.2	14.89
720	3.21	2.58	2.27	14.92
1080	2.07	2.04	1.83	14.73
1440	1.97	1.99	1.79	14.71
Peak	5.74	3.43	2.89	15.27

Outlet A



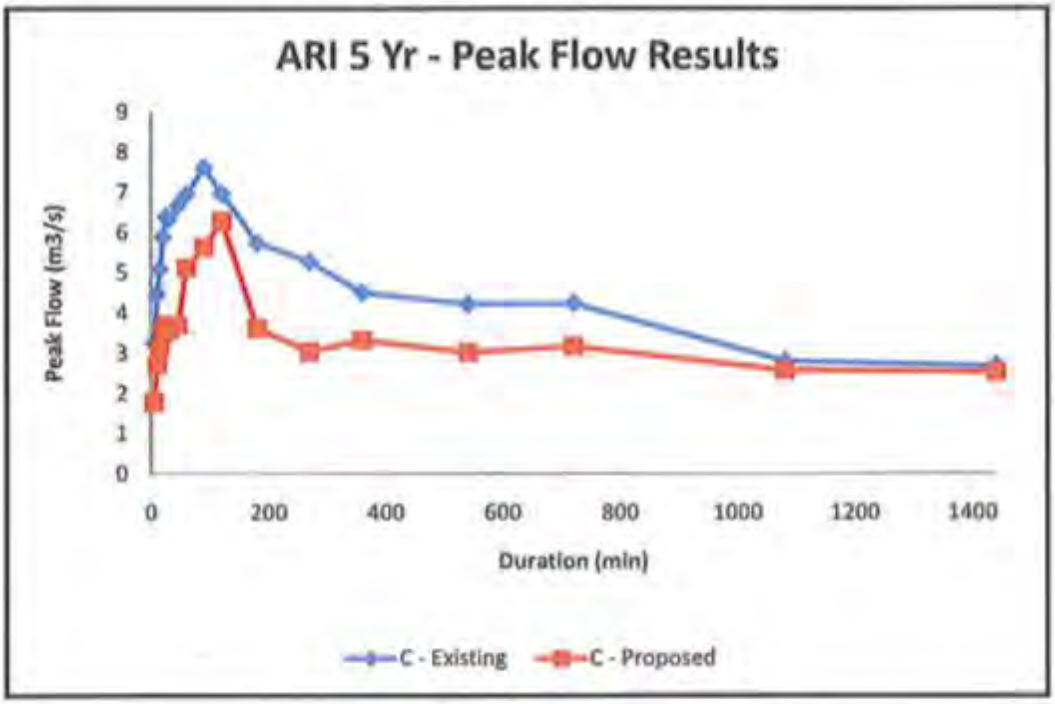
ARI 5 Yr - Peak Flow Results				
Duration (min)	A - Existing	A - Proposed	Basin A Outlet	A - WL(mAHD)
5	1.01	0.72	0.074	14.29
10	1.29	1.3	0.298	14.43
15	2.27	1.87	0.46	14.53
20	3.07	2.15	0.512	14.6
25	3.39	2.2	0.549	14.66
30	3.35	2.08	0.577	14.71
45	3.28	1.94	0.637	14.81
60	3.99	2.02	0.674	14.89
90	4.05	2.13	0.711	14.96
120	4.16	2.22	0.735	15.02
180	2.92	1.67	0.761	15.07
270	2.76	1.57	0.768	15.09
360	2.2	1.39	0.788	15.13
540	2.1	1.4	0.831	15.24
720	2.22	1.43	0.824	15.22
1080	1.25	1.11	0.808	15.18
1440	1.33	1.1	0.809	15.18
Peak	4.16	2.22	0.831	15.24

Outlet B



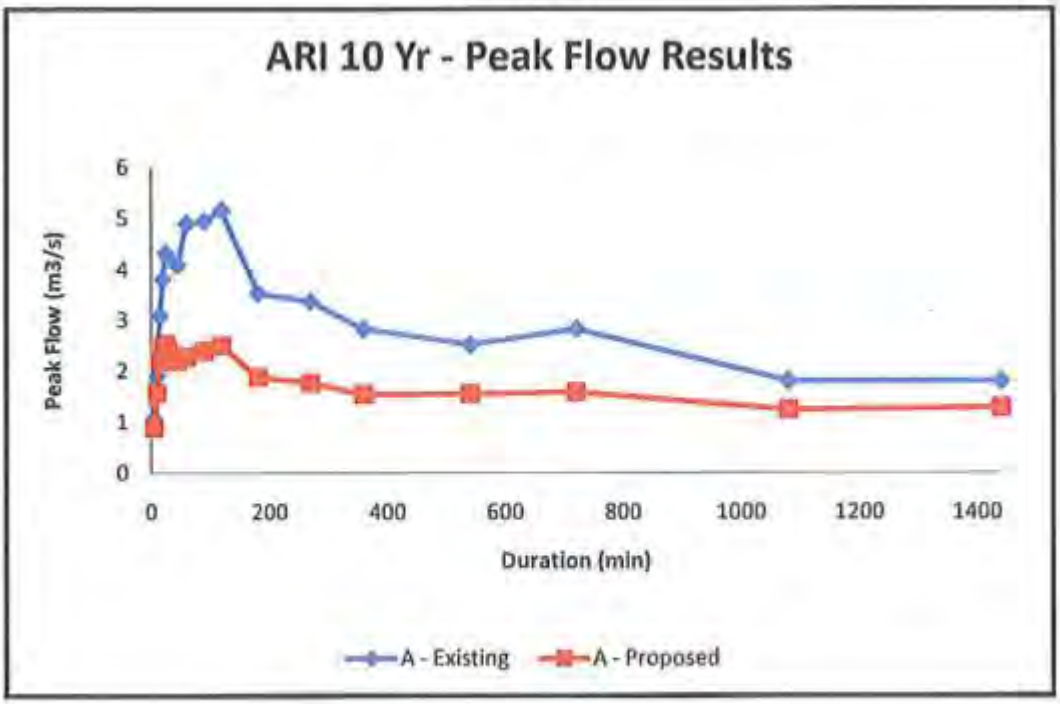
ARI 5 Yr - Peak Flow Results				
Duration (min)	B - Existing	B - Proposed	Basin B Outlet	B - WL(mAHD)
5	0.199	0.104	0.048	14.19
10	0.343	0.239	0.071	14.3
15	0.412	0.313	0.088	14.39
20	0.453	0.357	0.101	14.45
25	0.477	0.371	0.111	14.51
30	0.454	0.347	0.12	14.55
45	0.419	0.317	0.132	14.66
60	0.453	0.376	0.14	14.74
90	0.481	0.409	0.15	14.85
120	0.497	0.417	0.16	14.93
180	0.385	0.307	0.17	15.04
270	0.371	0.297	0.18	15.14
360	0.355	0.28	0.188	15.24
540	0.384	0.297	0.2	15.36
720	0.381	0.308	0.21	15.47
1080	0.36	0.242	0.21	15.51
1440	0.357	0.253	0.211	15.55
Peak	**0.497**	**0.417**	**0.211**	**15.55**

Outlet C



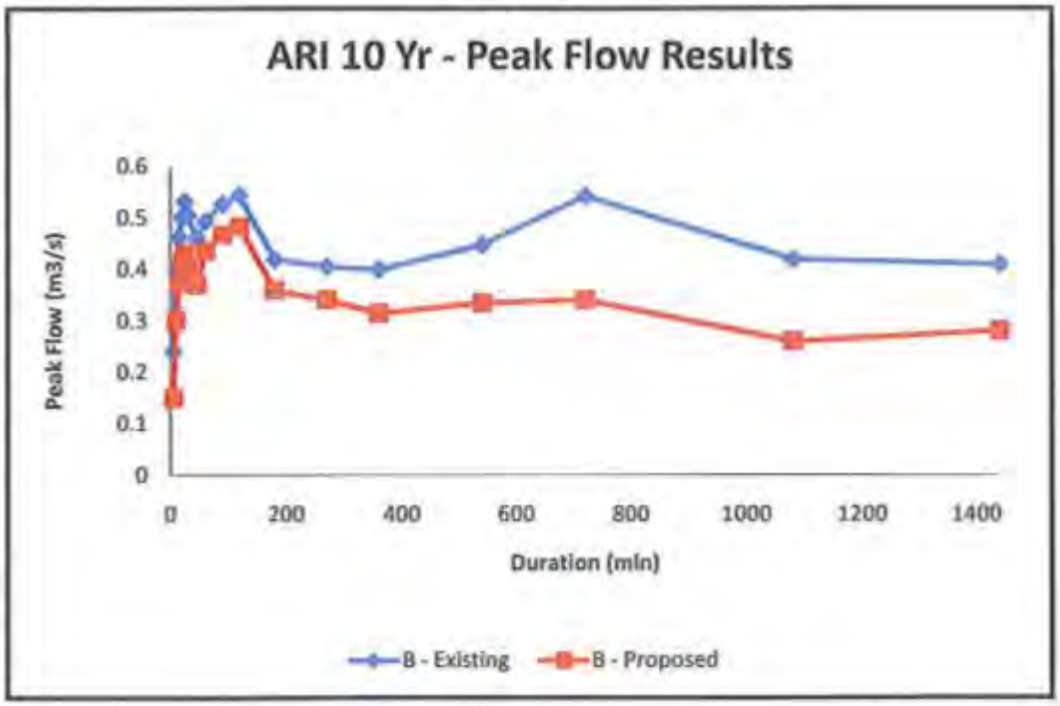
ARI 5 Yr - Peak Flow Results				
Duration (min)	C - Existing	C - Proposed	Basin D Outlet	D - WL(mAHD)
5	3.26	1.79	1.46	14.6
10	4.48	2.71	2.26	14.92
15	5.1	3.14	2.68	15.14
20	5.9	3.51	2.88	15.26
25	6.41	3.7	2.97	15.32
30	6.35	3.58	3	15.34
45	6.68	3.69	3.11	15.42
60	6.96	5.12	4.52	15.47
90	7.63	5.64	4.87	15.47
120	6.98	6.28	5.56	15.48
180	5.75	3.62	3.03	15.36
270	5.28	3.04	2.68	15.15
360	4.51	3.32	2.87	15.26
540	4.22	3.02	2.71	15.16
720	4.24	3.17	2.76	15.19
1080	2.8	2.57	2.29	14.93
1440	2.68	2.53	2.27	14.92
Peak	7.63	6.28	5.56	15.48

Outlet A



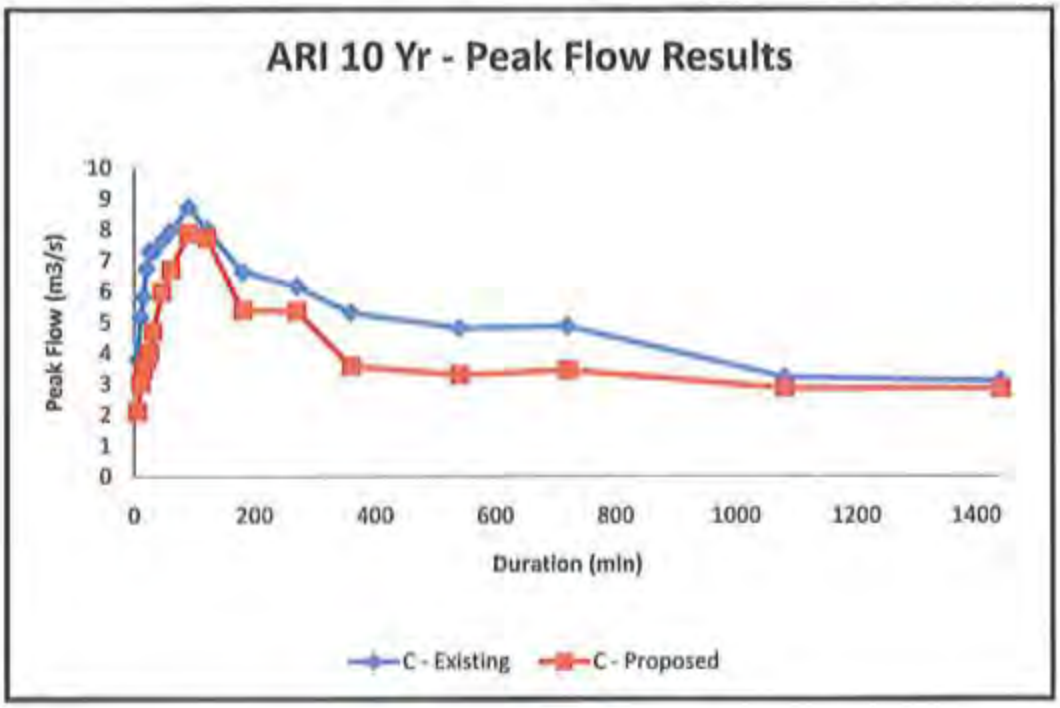
ARI 10 Yr - Peak Flow Results				
Duration (min)	A - Existing	A - Proposed	Basin A Outlet	A - WL(mAHD)
5	1.08	0.887	0.81	14.33
10	1.9	1.57	0.421	14.48
15	3.1	2.18	0.499	14.58
20	3.82	2.44	0.552	14.67
25	4.32	2.53	0.59	14.73
30	4.25	2.4	0.619	14.78
45	4.09	2.2	0.682	14.9
60	4.9	2.28	0.721	14.99
90	4.95	2.4	0.762	15.07
120	5.16	2.5	0.788	15.13
180	3.53	1.88	0.816	15.2
270	3.37	1.77	0.828	15.23
360	2.83	1.54	0.845	15.27
540	2.52	1.55	0.892	15.39
720	2.83	1.59	0.895	15.4
1080	1.81	1.24	0.879	15.36
1440	1.8	1.28	0.87	15.33
Peak	5.16	2.53	0.895	15.4

Outlet B



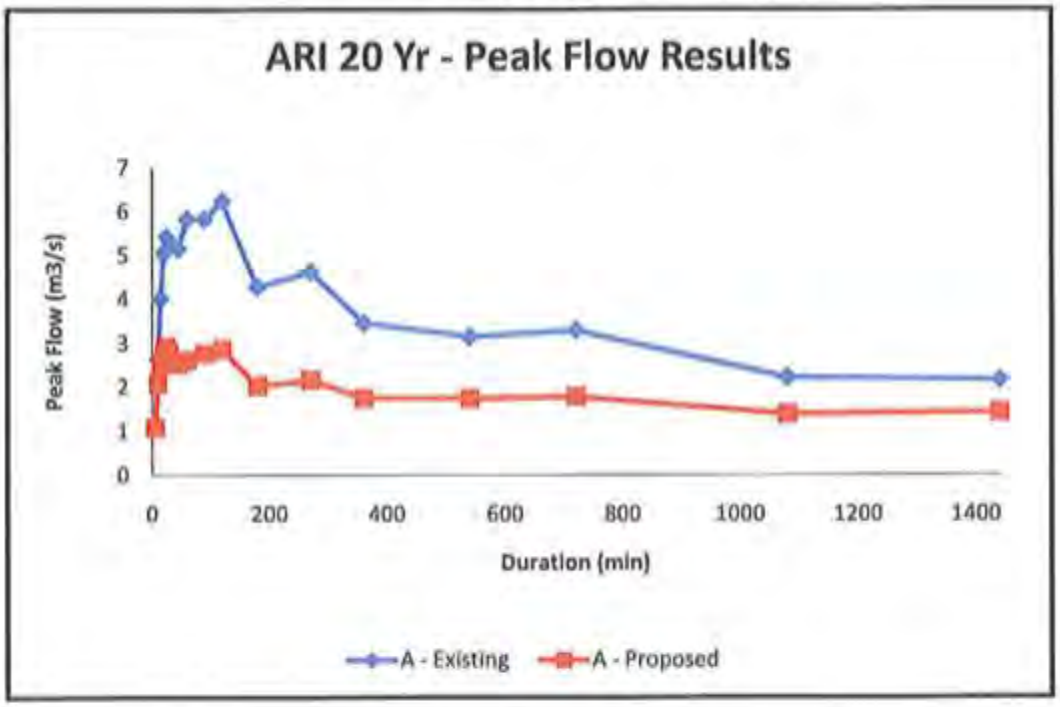
ARI 10 Yr - Peak Flow Results				
Duration (min)	B - Existing	B - Proposed	Basin B Outlet	B - WL(mAHD)
5	0.241	0.15	0.054	14.22
10	0.403	0.302	0.079	14.34
15	0.464	0.372	0.097	14.44
20	0.502	0.414	0.112	14.51
25	0.533	0.432	0.12	14.57
30	0.507	0.405	0.124	14.62
45	0.462	0.37	0.14	14.74
60	0.494	0.437	0.15	14.83
90	0.528	0.468	0.163	14.96
120	0.545	0.484	0.171	15.06
180	0.42	0.36	0.18	15.18
270	0.406	0.341	0.192	15.31
360	0.4	0.315	0.202	15.41
540	0.448	0.335	0.211	15.56
720	0.543	0.341	0.221	15.7
1080	0.42	0.26	0.23	15.75
1440	0.41	0.281	0.23	15.81
Peak	**0.545**	**0.484**	**0.23**	**15.81**

Outlet C



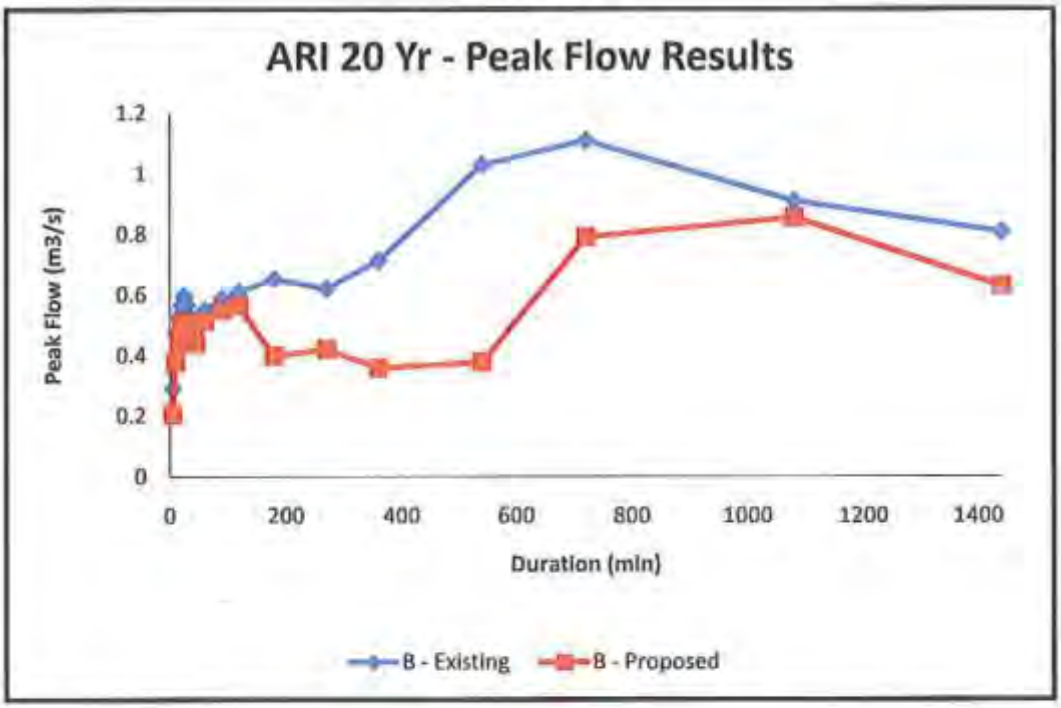
ARI 10 Yr - Peak Flow Results				
Duration (min)	C - Existing	C - Proposed	Basin D Outlet	D - WL(mAHD)
5	3.79	2.11	1.7	14.68
10	5.18	3.03	2.5	15.04
15	5.83	3.47	2.88	15.26
20	6.74	3.81	3.07	15.38
25	7.29	4.01	3.16	15.45
30	7.27	4.7	4.08	15.46
45	7.64	5.98	5.27	15.48
60	7.95	6.69	5.94	15.49
90	8.73	7.88	6.82	15.53
120	8.01	7.71	6.82	15.53
180	6.62	5.38	4.73	15.47
270	6.16	5.35	4.78	15.47
360	5.3	3.57	3.1	15.4
540	4.81	3.29	2.94	15.3
720	4.87	3.44	2.97	15.32
1080	3.22	2.86	2.54	15.06
1440	3.09	2.84	2.53	15.06
Peak	8.73	7.88	6.82	15.53

Outlet A



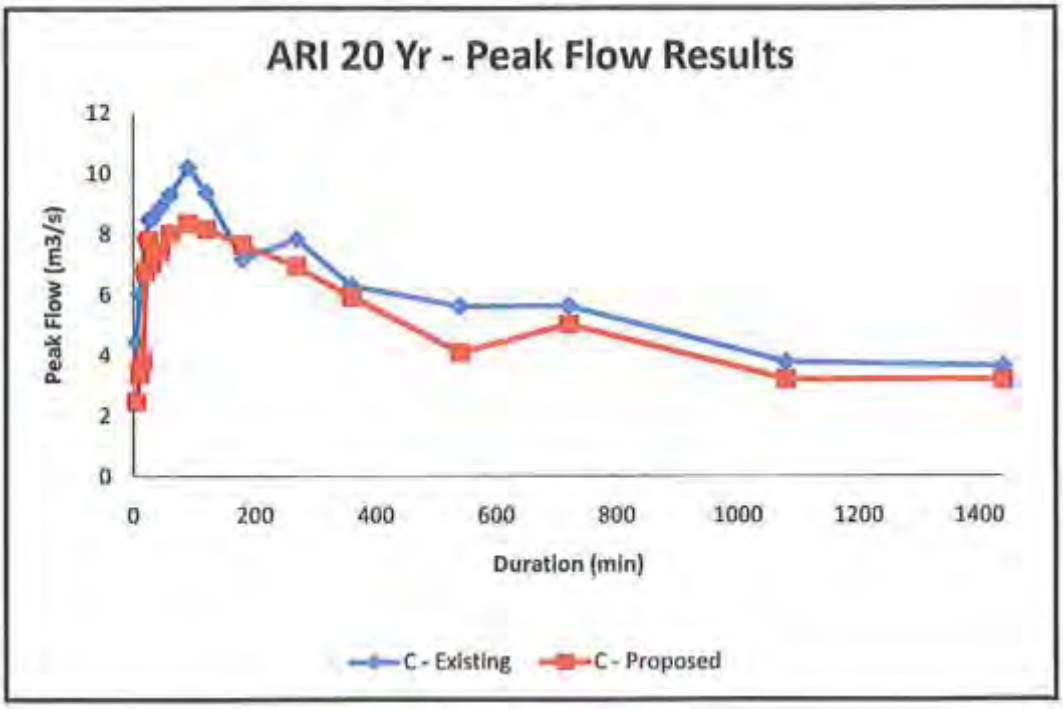
ARI 20 Yr - Peak Flow Results				
Duration (min)	A - Existing	A - Proposed	Basin A Outlet	A - WL(mAHD)
5	1.17	1.09	0.088	14.37
10	2.65	2.09	0.465	14.54
15	4.02	2.51	0.545	14.65
20	5.06	2.81	0.601	14.75
25	5.43	2.93	0.641	14.82
30	5.33	2.78	0.671	14.88
45	5.16	2.54	0.737	15.02
60	5.83	2.62	0.779	15.11
90	5.83	2.76	0.823	15.22
120	6.24	2.86	0.851	15.29
180	4.29	2.03	0.901	15.42
270	4.62	2.16	0.885	15.37
360	3.46	1.75	0.922	15.47
540	3.15	1.75	0.97	15.61
720	3.29	1.78	0.973	15.62
1080	2.22	1.39	0.964	1.39
1440	2.16	1.43	0.945	15.54
Peak	**6.24**	**2.93**	**0.973**	**15.62**

Outlet B



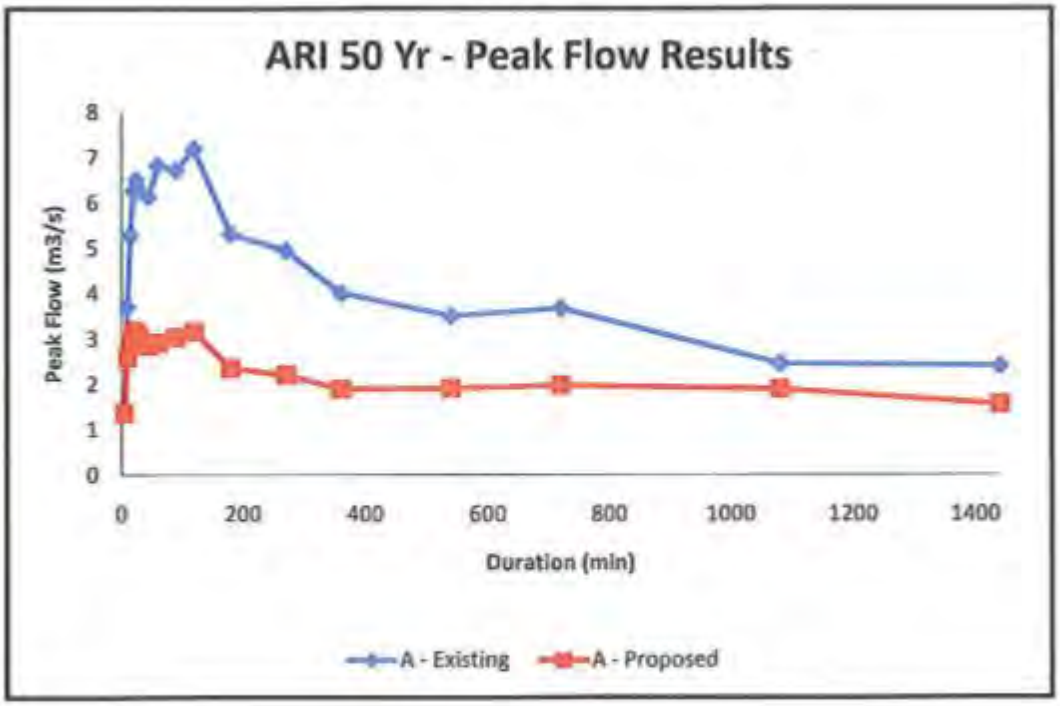
ARI 20 Yr - Peak Flow Results				
Duration (min)	B - Existing	B - Proposed	Basin B Outlet	B - WL(mAHD)
5	0.294	0.205	0.06	14.25
10	0.475	0.378	0.089	14.39
15	0.524	0.44	0.11	14.5
20	0.567	0.49	0.12	14.59
25	0.598	0.511	0.131	14.65
30	0.569	0.48	0.14	14.71
45	0.52	0.44	0.151	14.85
60	0.551	0.513	0.162	14.96
90	0.589	0.55	0.18	15.11
120	0.61	0.565	0.184	15.22
180	0.652	0.399	0.21	15.52
270	0.621	0.42	0.2	15.37
360	0.714	0.359	0.22	15.65
540	1.03	0.378	0.23	15.83
720	1.11	0.791	0.744	15.87
1080	0.91	0.855	0.805	15.87
1440	0.808	0.629	0.598	15.86
Peak	1.11	0.855	0.805	15.87

Outlet C



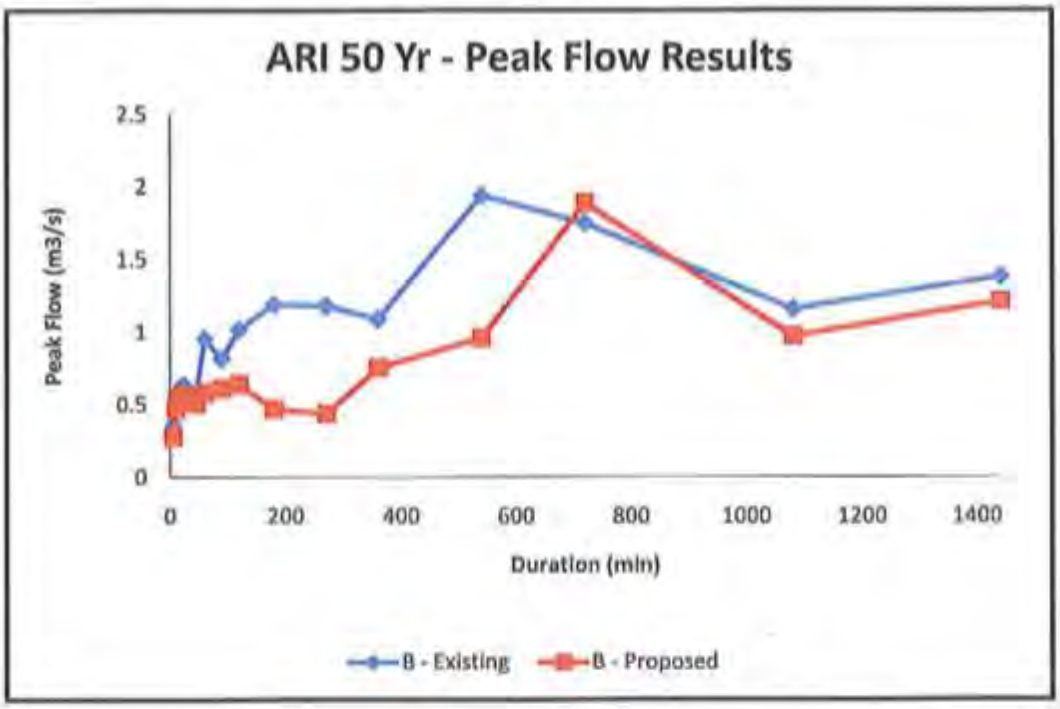
ARI 20 Yr - Peak Flow Results				
Duration (min)	C - Existing	C - Proposed	Basin D Outlet	D - WL(mAHD)
5	4.45	2.47	1.96	14.78
10	6.03	3.4	2.78	15.2
15	6.78	3.84	3.1	15.4
20	7.86	6.77	5.93	15.49
25	8.49	7.8	6.75	15.51
30	8.51	7.05	6.14	15.49
45	8.9	7.41	6.57	15.5
60	9.3	8	6.93	15.57
90	10.2	8.35	7.15	15.65
120	9.38	8.16	7.15	15.65
180	7.17	7.65	6.78	15.52
270	7.83	6.92	6.19	15.49
360	6.29	5.92	5.3	15.48
540	5.61	4.08	3.68	15.46
720	5.62	5.01	4.49	15.47
1080	3.77	3.19	2.81	15.22
1440	3.63	3.18	2.82	15.23
Peak	10.2	8.35	7.15	15.65

Outlet A



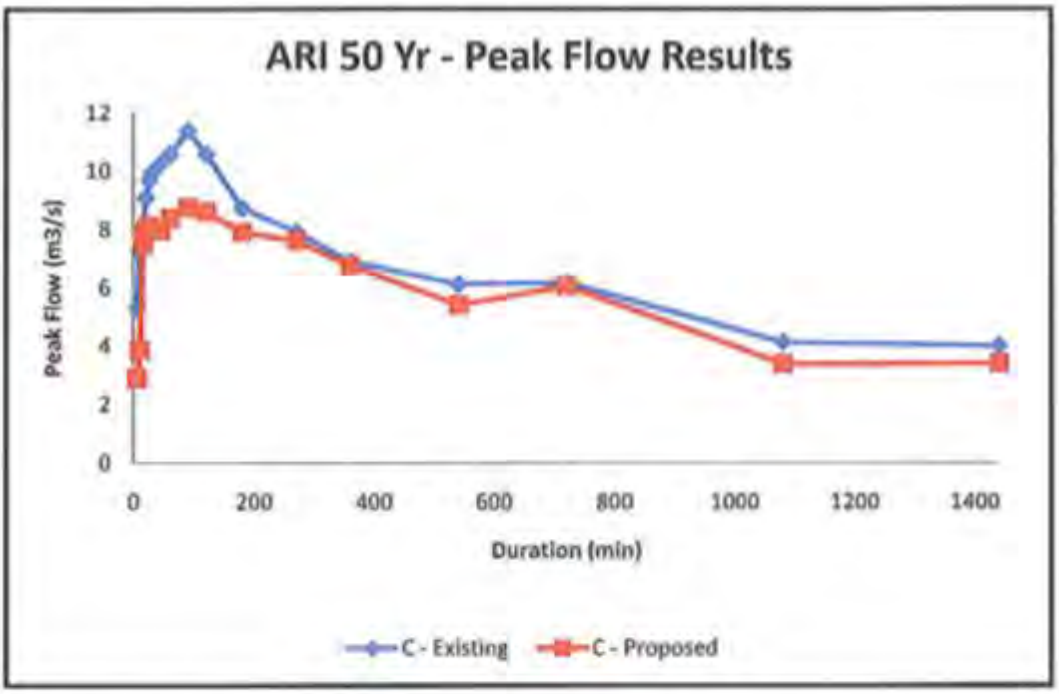
ARI 50 Yr - Peak Flow Results				
Duration (min)	A - Existing	A - Proposed	Basin A Outlet	A - WL(mAHD)
5	1.43	1.37	0.235	14.42
10	3.72	2.6	0.519	14.61
15	5.3	2.91	0.601	14.75
20	6.27	3.19	0.66	14.86
25	6.52	3.16	0.701	14.94
30	6.3	3.04	0.732	15.01
45	6.14	2.85	0.803	15.17
60	6.83	2.92	0.847	15.28
90	6.73	3.04	0.896	15.4
120	7.2	3.16	0.93	15.49
180	5.32	2.36	0.962	15.59
270	4.96	2.21	0.987	15.66
360	4.02	1.9	1.01	15.72
540	3.51	1.91	1.53	15.78
720	3.68	1.98	1.65	15.79
1080	2.46	1.9	1.58	15.78
1440	2.41	1.56	1.01	15.73
Peak	7.2	3.19	1.65	15.79

Outlet B



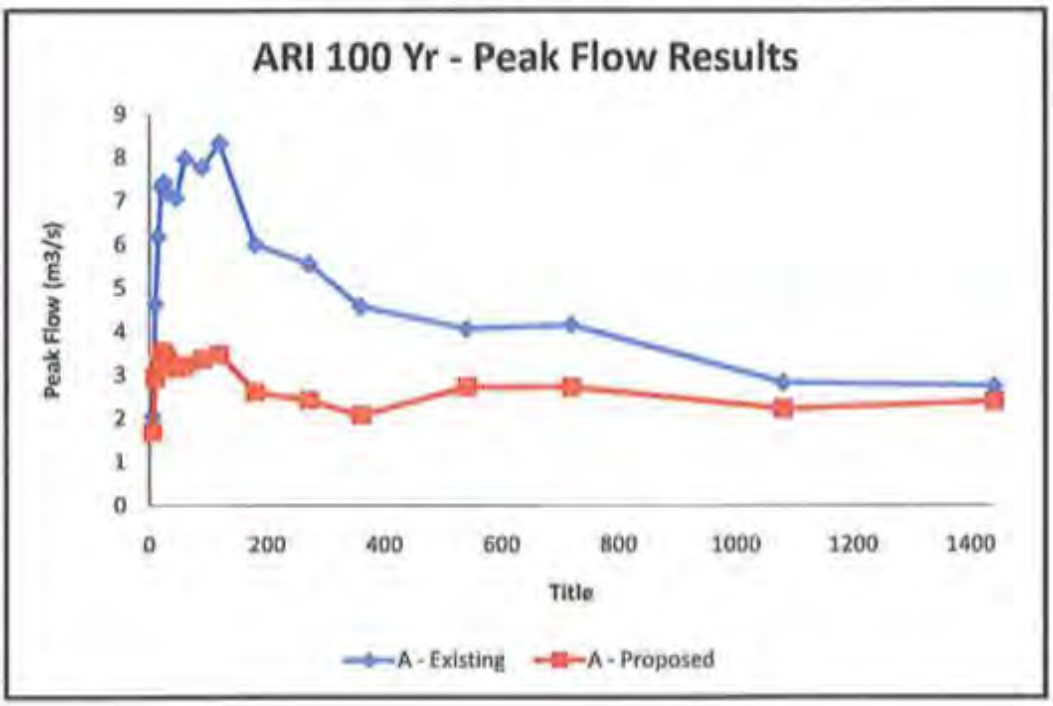
ARI 50 Yr - Peak Flow Results				
Duration (min)	B - Existing	B - Proposed	Basin B Outlet	B - WL(mAHD)
5	0.358	0.279	0.069	14.3
10	0.565	0.474	0.103	14.46
15	0.588	0.514	0.12	14.58
20	0.628	0.568	0.137	14.68
25	0.632	0.558	0.143	14.76
30	0.609	0.533	0.15	14.83
45	0.572	0.507	0.17	15
60	0.957	0.581	0.18	15.12
90	0.817	0.613	0.19	15.3
120	1.02	0.64	0.207	15.43
180	1.19	0.47	0.22	15.62
270	1.18	0.437	0.23	15.81
360	1.09	0.753	0.711	15.86
540	1.94	0.958	0.898	15.87
720	1.75	1.89	1.75	15.9
1080	1.16	0.971	0.911	15.87
1440	1.38	1.21	1.13	15.88
Peak	1.94	1.89	1.75	15.9

Outlet C



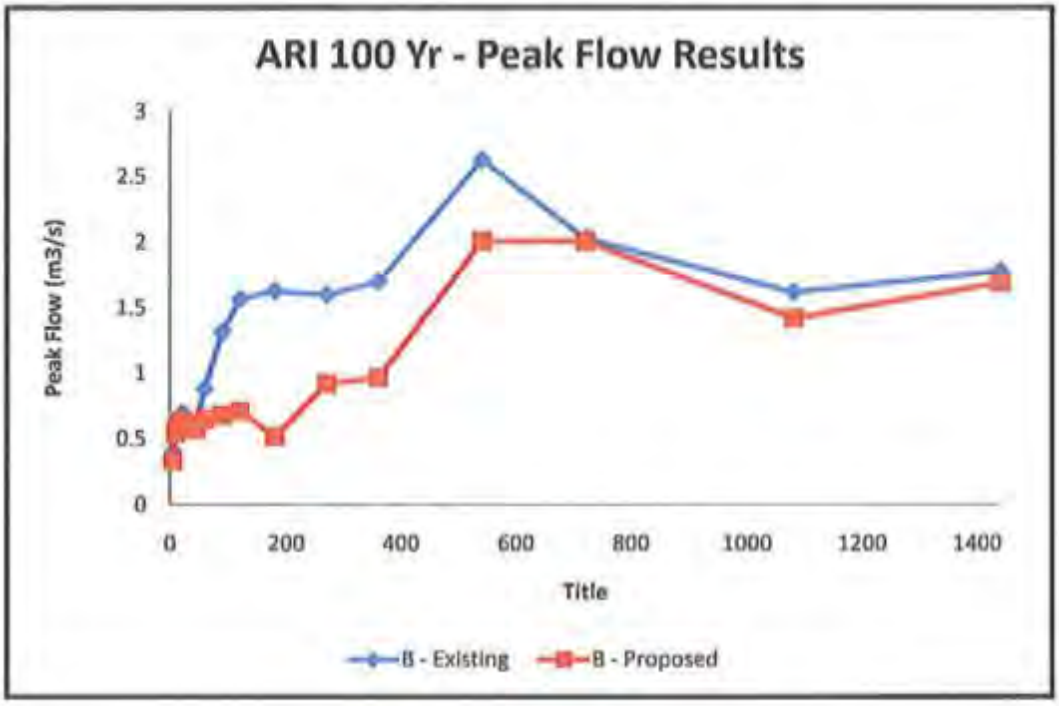
ARI 50 Yr - Peak Flow Results				
Duration (min)	C - Existing	C - Proposed	Basin D Outlet	D - WL(mAHD)
5	5.33	2.9	2.26	14.92
10	7.26	3.88	3.04	15.37
15	8.08	7.54	6.72	15.5
20	9.11	8.02	6.95	15.58
25	9.69	8.14	6.98	15.59
30	9.98	8	6.89	15.56
45	10.3	7.97	6.98	15.59
60	10.6	8.41	7.26	15.69
90	11.4	8.76	7.45	15.76
120	10.6	8.61	7.48	15.77
180	8.74	7.91	6.96	15.58
270	7.93	7.62	6.81	15.53
360	6.9	6.77	6.09	15.49
540	6.14	5.42	4.84	15.47
720	6.19	6.07	5.46	15.48
1080	4.14	3.39	2.98	15.33
1440	4.02	3.41	3.02	15.35
Peak	11.4	8.76	7.48	15.77

Outlet A



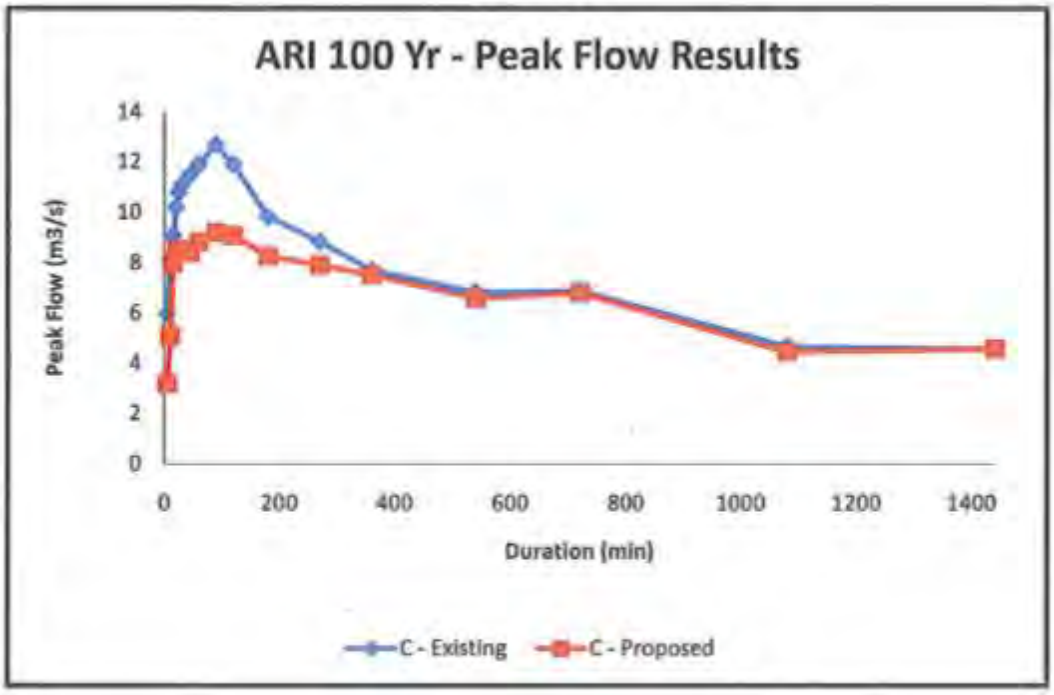
ARI 100 Yr - Peak Flow Results				
Duration (min)	A - Existing	A - Proposed	Basin A Outlet	A - WL(mAHD)
5	2.06	1.69	0.404	14.46
10	4.63	2.94	0.555	14.67
15	6.19	3.24	0.641	14.82
20	7.33	3.54	0.7	14.94
25	7.43	3.49	0.74	15.03
30	7.19	3.37	0.774	15.1
45	7.07	3.16	0.848	15.28
60	7.98	3.23	0.894	15.4
90	7.78	3.36	0.947	15.54
120	8.33	3.48	0.982	15.64
180	6	2.61	1.04	15.75
270	5.56	2.43	1.46	15.78
360	4.58	2.08	1.62	15.78
540	4.07	2.73	1.94	15.88
720	4.15	2.72	1.95	15.91
1080	2.83	2.22	1.85	15.8
1440	2.75	2.39	1.91	15.84
Peak	8.33	3.54	1.95	15.91

Outlet B



ARI 100 Yr - Peak Flow Results				
Duration (min)	B - Existing	B - Proposed	Basin B Outlet	B - WL(mAHD)
5	0.406	0.335	0.076	14.33
10	0.628	0.547	0.113	14.51
15	0.649	0.584	0.13	14.65
20	0.687	0.641	0.142	14.76
25	0.684	0.625	0.15	14.84
30	0.661	0.6	0.16	14.92
45	0.624	0.574	0.18	15.11
60	0.882	0.653	0.189	15.24
90	1.32	0.682	0.209	15.44
120	1.57	0.713	0.219	15.59
180	1.63	0.522	0.23	15.8
270	1.6	0.923	0.868	15.87
360	1.7	0.969	0.908	15.87
540	2.63	2.01	1.84	15.91
720	2.03	2.01	1.85	15.91
1080	1.62	1.42	1.32	15.88
1440	1.78	1.69	1.56	15.89
Peak	**2.63**	**2.01**	**1.85**	**15.91**

Outlet C



ARI 100 Yr - Peak Flow Results				
Duration (min)	C - Existing	C - Proposed	Basin D Outlet	D - WL(mAHD)
5	5.98	3.18	2.47	15.02
10	8.12	5.08	4.33	15.47
15	9.09	7.97	6.93	15.57
20	10.2	8.4	7.22	15.67
25	10.8	8.52	7.24	15.68
30	11.1	8.37	7.16	15.65
45	11.5	8.39	7.3	15.7
60	11.9	8.83	7.6	15.81
90	12.7	9.2	7.74	15.87
120	11.9	9.07	7.82	15.9
180	9.84	8.26	7.22	15.67
270	8.84	7.91	7.03	15.6
360	7.7	7.51	6.74	15.5
540	6.84	6.59	5.91	15.49
720	6.89	6.81	6.12	15.49
1080	4.68	4.47	4.2	15.46
1440	4.55	4.58	4.12	15.46
Peak	12.7	9.2	7.82	15.9

Appendix B

HEC-RAS model input and output data – existing and proposed conditions

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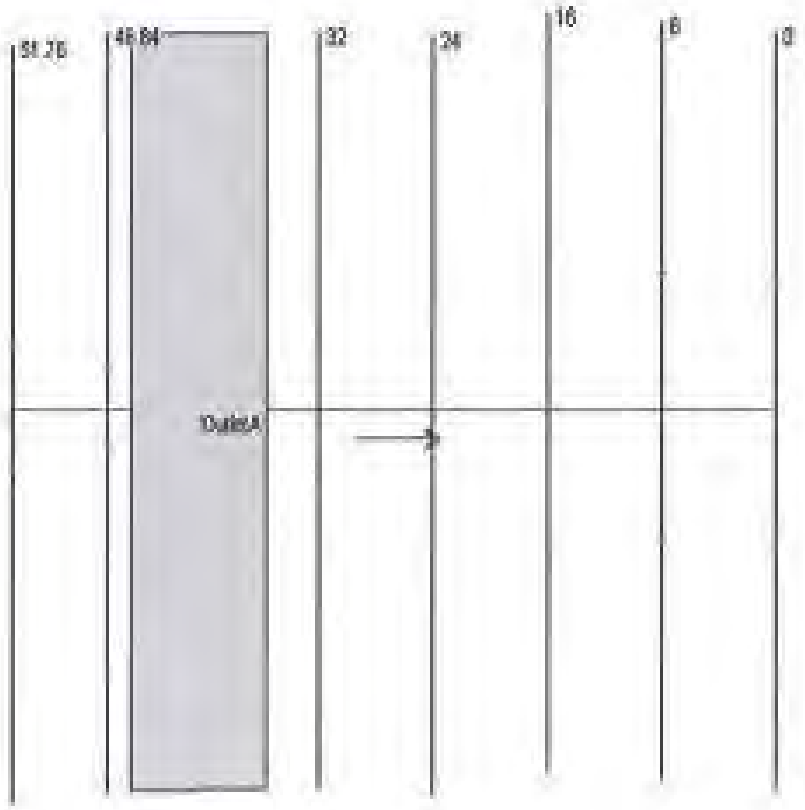
OUTLET A EXISTING CASE – HEC-RAS MODEL FILES



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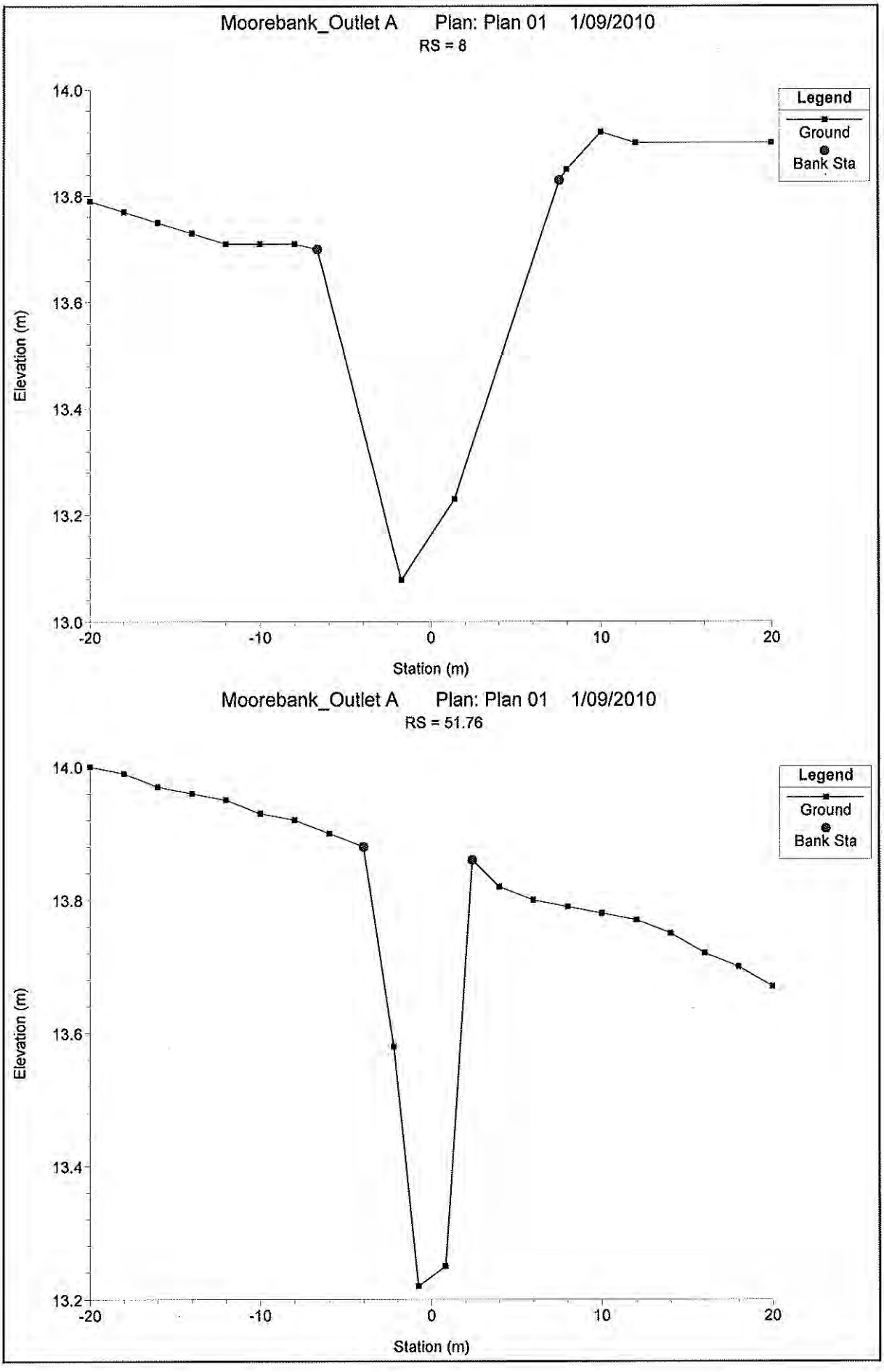
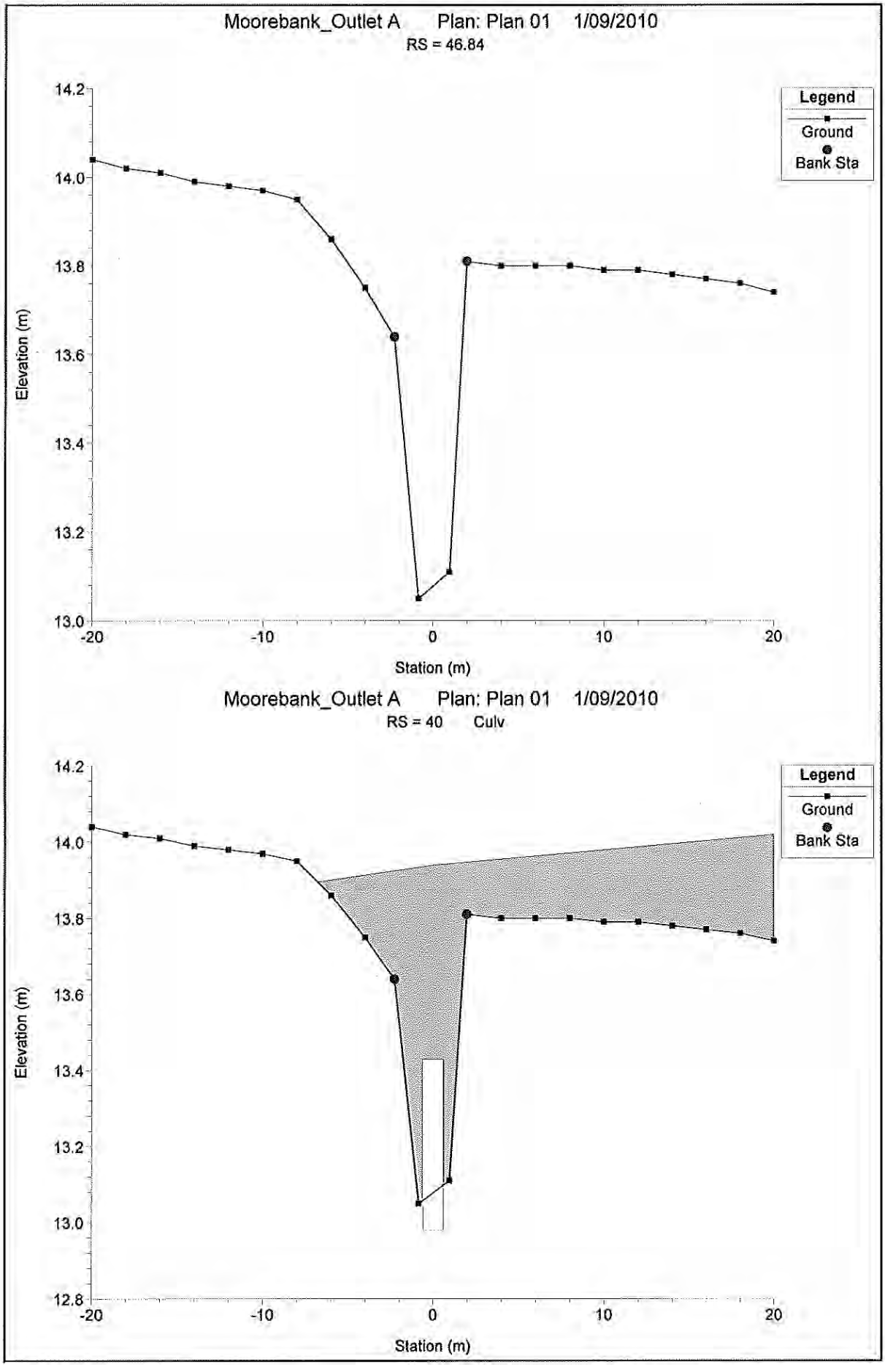
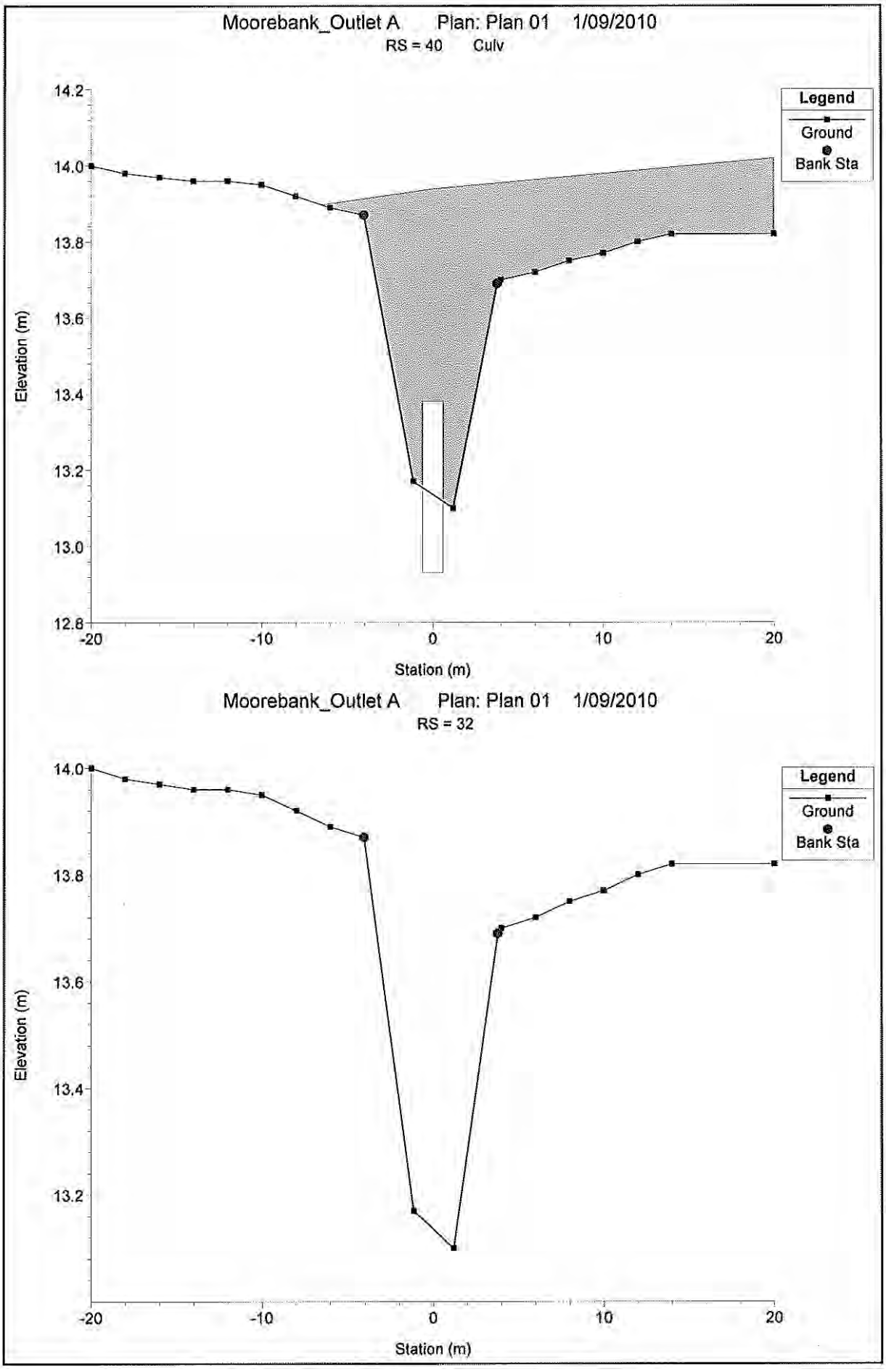
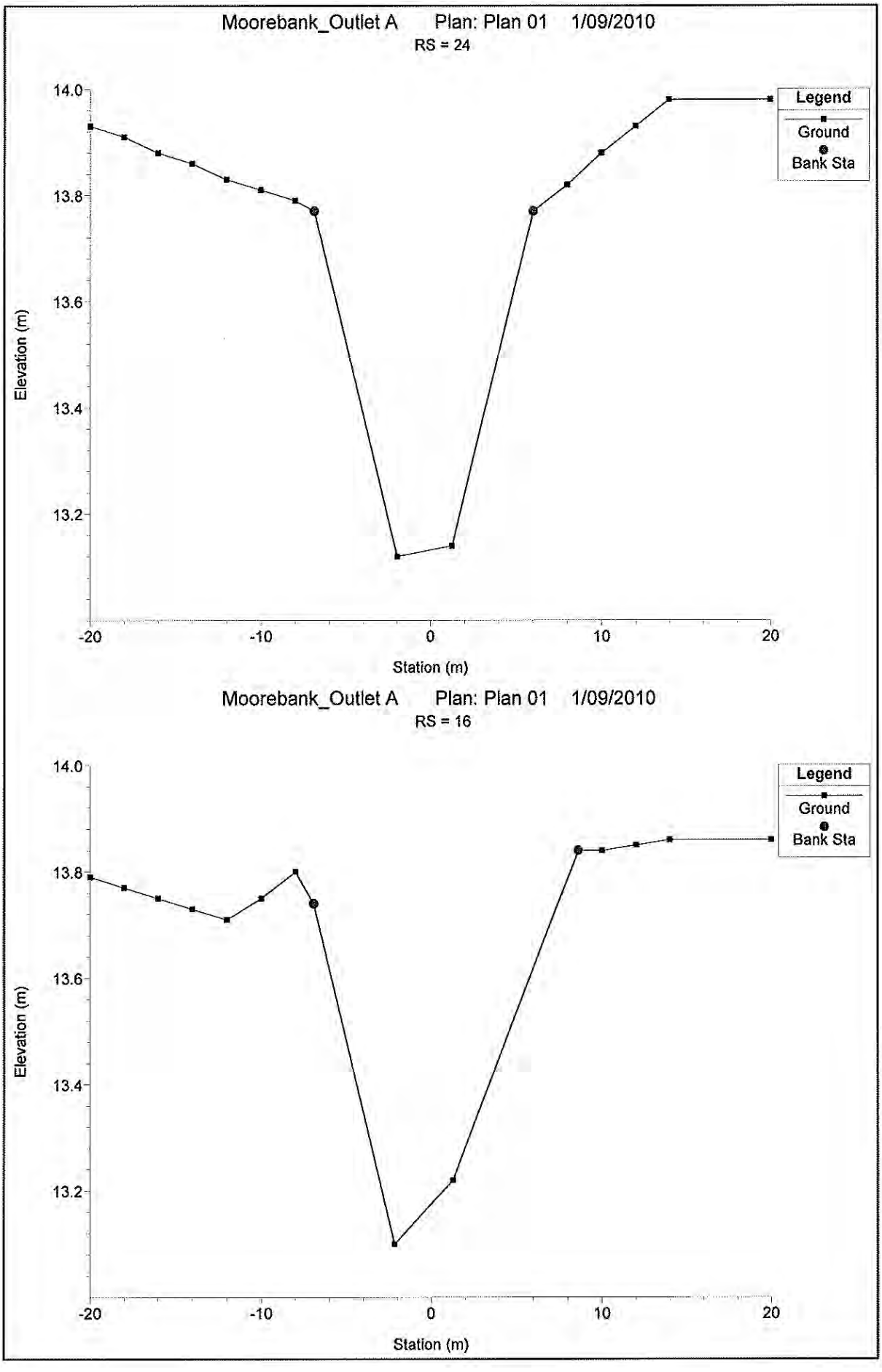
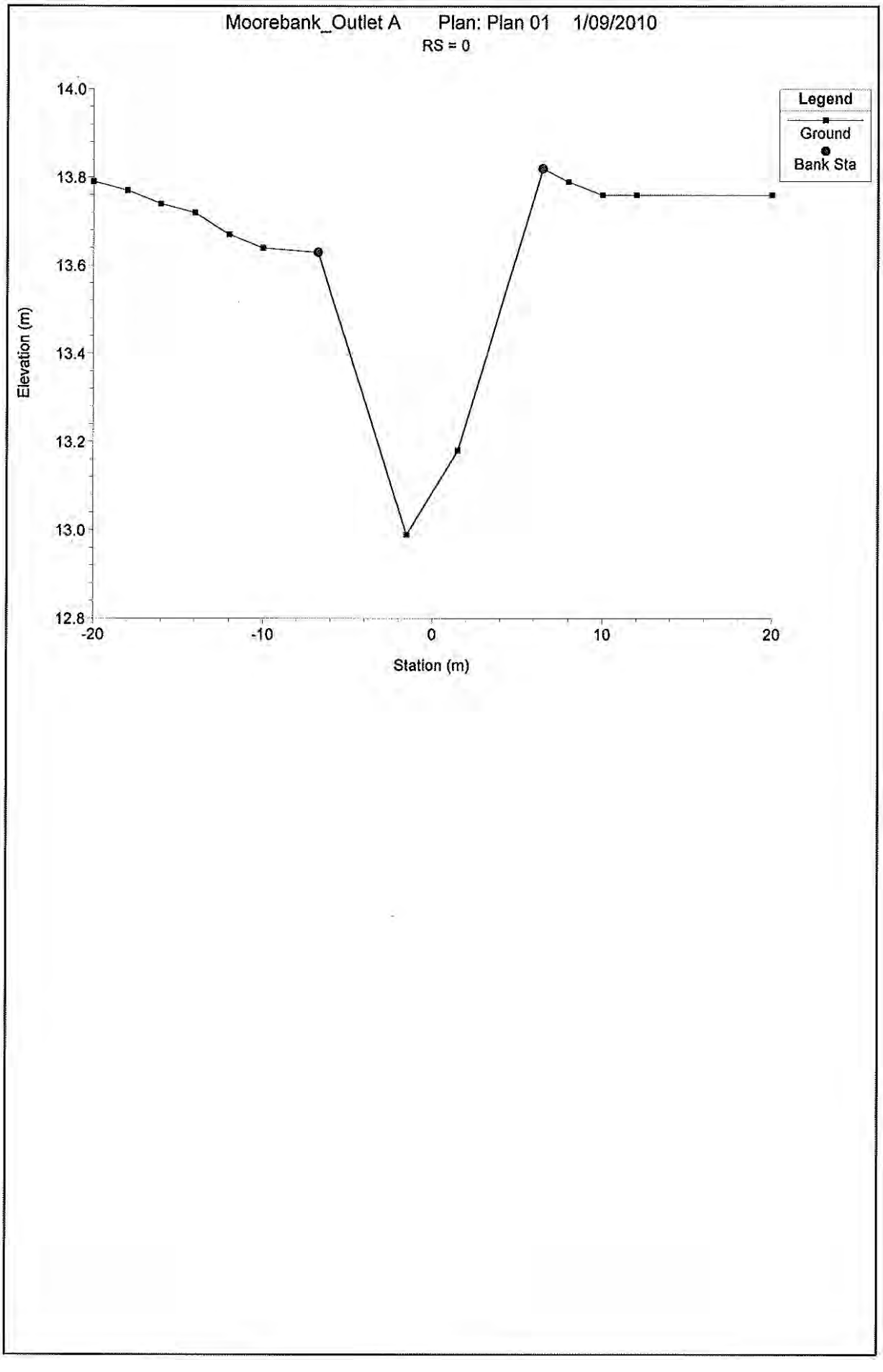

Moorebank_Outlet A Plan: Plan 01 1/09/2010
RS = 8
Legend
Ground
Bank Sta
14.0
13.8
13.6
13.4
13.2
13.0
Elevation (m)
-20
-10
0
10
20
Station (m)
Moorebank_Outlet A Plan: Plan 01 1/09/2010
RS = 51.76
Legend
Ground
Bank Sta
14.0
13.8
13.6
13.4
13.2
Elevation (m)
-20
-10
0
10
20
Station (m)


Moorebank_Outlet A Plan: Plan 01 1/09/2010
RS = 46.84
Legend
Ground
Bank Sta
Elevation (m)
Station (m)
Moorebank_Outlet A Plan: Plan 01 1/09/2010
RS = 40 Culv
Legend
Ground
Bank Sta
Elevation (m)
Station (m)


Moorebank_Outlet A Plan: Plan 01 1/09/2010
RS = 40 Culv
Legend
Ground
Bank Sta
Elevation (m)
14.2
14.0
13.8
13.6
13.4
13.2
13.0
12.8
-20
-10
0
10
20
Station (m)
Moorebank_Outlet A Plan: Plan 01 1/09/2010
RS = 32
Legend
Ground
Bank Sta
Elevation (m)
14.0
13.8
13.6
13.4
13.2
-20
-10
0
10
20
Station (m)


Moorebank_Outlet A Plan: Plan 01 1/09/2010
RS = 24
Legend
Ground
Bank Sta
14.0
13.8
13.6
13.4
13.2
Elevation (m)
-20
-10
0
10
20
Station (m)
Moorebank_Outlet A Plan: Plan 01 1/09/2010
RS = 16
Legend
Ground
Bank Sta
14.0
13.8
13.6
13.4
13.2
Elevation (m)
-20
-10
0
10
20
Station (m)


Moorebank_Outlet A Plan: Plan 01 1/09/2010
RS = 0
Legend
Ground
Bank Sta
14.0
13.8
13.6
13.4
13.2
13.0
12.8
Elevation (m)
-20
-10
0
10
20
Station (m)