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WATER SENSITIVE URBAN DESIGN REPORT

Lot 8- First Estate Orchard Hills Warehouse Facilities

Lot 8 585-649 Mamre Road Orchard Hills,
NSW 2748

Date:	9 July 2018
Revision:	2
Issue:	1
Ref. No.:	18086

Prepared for: **ALTIS Property**
C/o Hansen Yuncken
Client Details: Email: CSims@hansenyuncken.com.au

S+P
FPA AUSTRALIA GOLD MEMBER Fire Protection Association Australia
AHSCA The Association of Hydraulic Services Consultants Australia (NSW) Inc.
DNV·GL

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Document Control

Revision	Date	Description	Prepared	Reviewed	Approved
1	21.06.18	SSD Application Issue	SK	MW	MW
2	09.07.18	SSD Application Issue	SK	MW	MW

Prepared by	Simon Kapsis	Revision	1
Approved by	Morgan Walter	Revision	1

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

Sparks & Partners have been engaged by Hansen Yuncken on behalf of Altis Property to provide civil engineering services to support the SSD application for two (2) new warehouse facilities at Lot 8, 585-649 Mamre Rd, Orchard Hills, NSW. The engineering services include the design and documentation of the concept stormwater drainage infrastructure, Water Sensitive Urban Design (WUSD) strategy and finished pavement levels for the proposed development.

Penrith City Council being the consent authority for the proposed development, require a WSUD strategy be prepared that takes into consideration the objectives and controls under Penrith Development Control Plan 2014 (PDCP) Part C3-Water Management, and the Mamre West Land Investigation Area DCP (MWDCP), Section 5-Stormwater and Flooding, prepared by Urbis. In response to these requirements Sparks and Partners have undertaken a review of the proposed estate infrastructure plans prepared by CostinRoe Consulting as part of the State Significant Development application (refer SSD 15_7173), completed modelling and prepared this report to demonstrate that the proposed development identifies and incorporates water conservation and stormwater management measures into its design and operation in accordance with the requirements of Part C3 of the PDCP

2. INTRODUCTION

2.1 Existing Site

The site is Lot 8 within the First Estate sub-division and is bounded by the future estate road on the western and southern boundaries, existing warehouse development on the northern boundary, and a future development on the eastern boundary. Lot 8 is approximately 32,780m² in area and benched to a bulk earthworks level of RL35.500 once the estate infrastructure works are complete. Reference is made to the SSD 15_7173 and engineering plans prepared by CostinRoe Consulting, ref: CO12042.00 for details of the site prior to this SSD Application.

2.2 Proposed Development

The proposed development consists of two (2) separate warehouse buildings (Lot 8A1 and 8A2), with associated hardstand areas, car park pavement areas and landscaping. Warehouse 8A1 is to run in an east-west orientation with the main entrances located on their southern elevation, and warehouse 8A2 is to run in a north-south orientation with the main entrances located on their western elevation. Warehouse 8A1 is to be a single tenancy and is approximately 11,720m² in area with the office located on the south eastern corner and car parking located along the eastern side of the warehouse. Warehouse 8A2 is to be a single tenancy and is approximately 5,500m² in area with the office and car parking located along the southern side of the warehouse. The main truck entrance to the site will be from the southern boundary for Warehouse 8A1 and on the western side for 8A2, with the exit driveways located on the southern boundary. Detailed architectural plans have been prepared by Nettleton Tribe architects for the DA submission and are to be read in conjunction with this report.

3. INTEGRATED WATER MANAGEMENT

3.1 General

The objective of WSUD is to provide a strategy that brings together the different aspects of the water cycle as a whole rather than an ad hoc approach to water management. This includes the management aspects of freshwater, wastewater and stormwater. The following WUSD strategies have been considered and addressed for the proposed development:

- Employ an integrated water collection and recycling system for capturing and recycling roofwater;
- Control the quality of stormwater that is disposed from the site;
- Control the quantity of stormwater that is discharged for the site.

The estate works as part of the SSD 15_7173 take the above objectives into consideration, and as such have included estate wide treatment measures to address water quality and quantity. These treatment measures consist of the following:

- Estate gross pollutant traps that provide primary treatment of collected stormwater runoff from roads and developed lots;
- An estate bio retention basin that provides secondary and tertiary treatment of collected stormwater runoff from roads and developed lots;
- An estate on-site detention (OSD) basin that provides discharge control of stormwater runoff from the estate.

By providing the above measures at an estate level on lot measures are not required to be implemented for quality and quantity objectives, with rainwater reuse being required to be implemented on lot. Reference is made to appendix A for the detailed estate plans prepared by CostinRoe Consulting which detail the estate wide measures that will be provided.

The following sections detail the on-lot measures that the development will implement to meet the requirements for rainwater collection and reuse. Concept Stormwater Management Plans for the subject development are provided in Appendix B for reference.

3.2 Water Conservation

Water usage reduction is to be achieved throughout the development through the use of a minimum of 4 Star WELS rated water fixtures and rainwater reuse in accordance with the performance criteria under section 3.1 Water Conservation of the Penrith City Council WSUD Policy, December 2013 and section 5.4 of the MWDCP.

3.3 Rainwater Reuse

Through the reuse of collected roofwater for non-potable reuse the proposed demand on potable water resources is reduced. The proposed development will capture roof water portions of roof area providing catchment areas of 1,880m² for Warehouse 8A1 and 1,970

m² for Warehouse 8A2. This collected roofwater will be conveyed to one (1) 50kL Rainwater Tanks for the office and Warehouse 8A1 and two (2) 30KL rainwater tanks for the office and Warehouse 8A2 and will be used for storage and reuse throughout the development. Re-use purposes will primarily include toilet flushing and irrigation. A water balance of the proposed reuse system has been completed to model its effectiveness and efficiency. The water balance model was constructed using the MUSIC software package with the following inputs:

- Penrith City Council MUSIClink files;
- Warehouse 8A1:
    - Total approximate non-potable reuse of 1.25KL per day based on:
        - Ten (10) toilets & urinals with each using 0.1KL/day for five (5) days of the week [0.72kL/day]
        - 500m² of irrigated area at 0.4KL/year/m². 0.55kL/day.
- Warehouse 8A2:
    - Total approximate non-potable reuse of 1.43KL per day based on:
        - Ten (10) toilets & urinals with each using 0.1KL/day for five (5) days of the week [0.72kL per day].
        - 650m² of irrigated area at 0.4KL/year/m². 0.71kL/day

Using the above determined non-potable demand the MUSIC model determines the rainwater tanks have an approximate efficiency of between 85%-86% resulting in an approximate reduction in the proposed demand on potable water supplies of 840,000L per year. The results of the MUSIC Model are presented in Table 1 for reference, with a MUSICLink report provided in Appendix C. This demonstrates that the reuse efficiency meets the minimum 80% requirement in accordance with the performance criteria under section 3.1 Water Conservation of the Penrith City Council WSUD Policy, December 2013 and section 5.4 of the MWDCP.

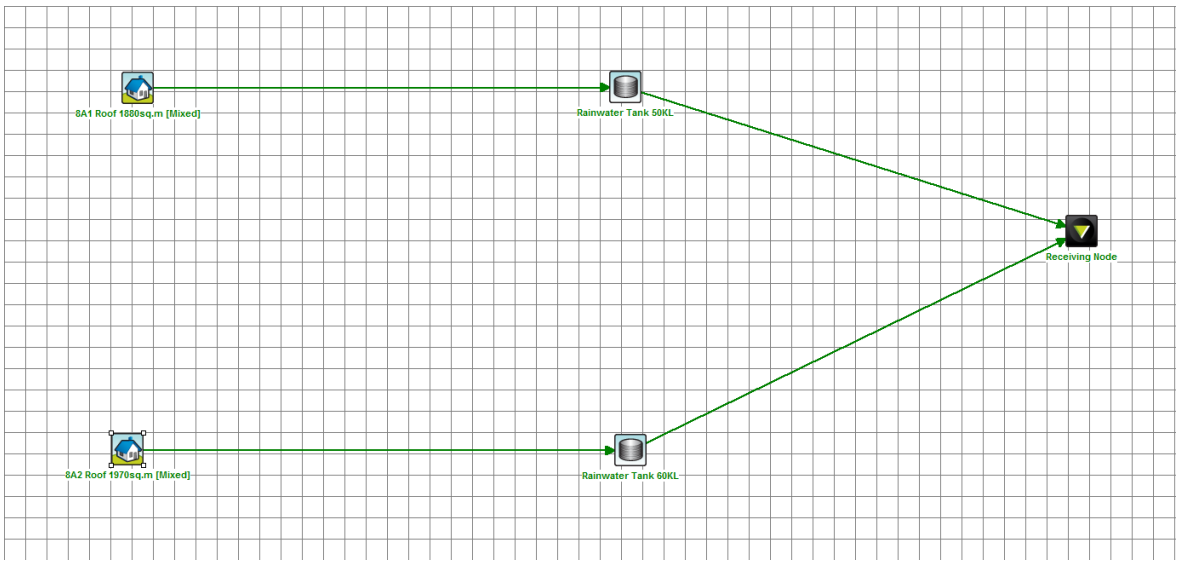


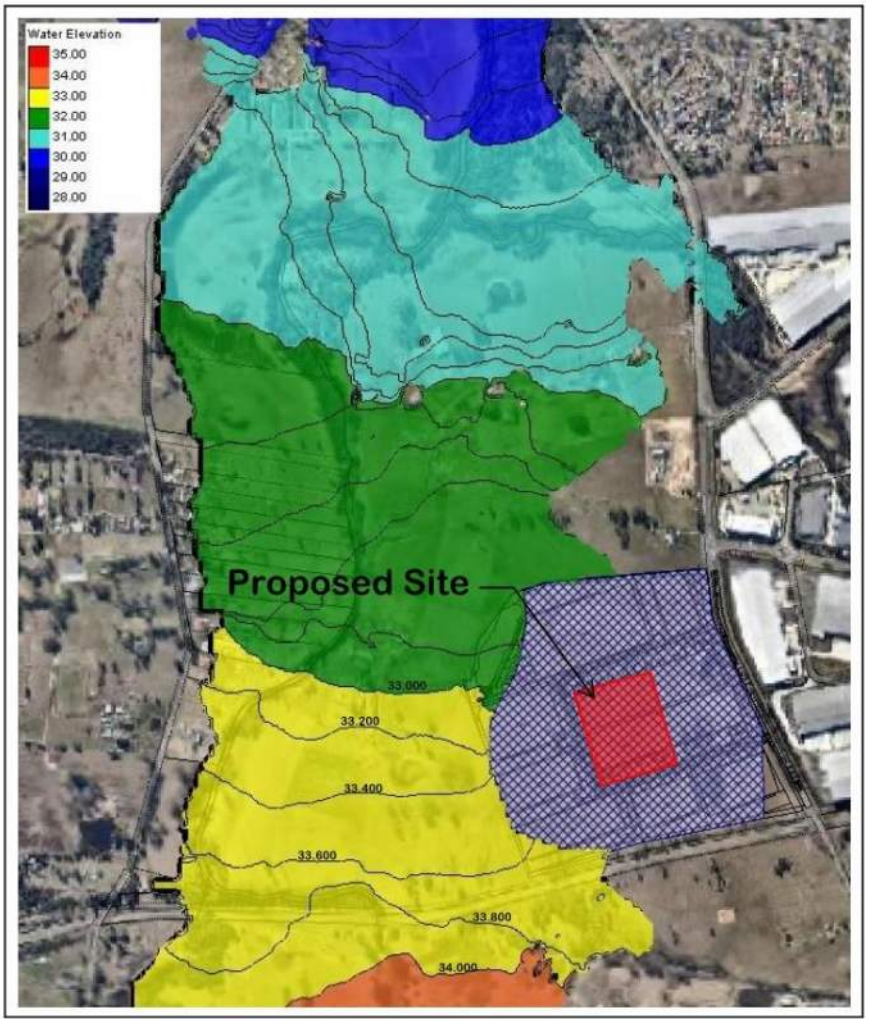
Figure 1 - MUSIC Model

	8A1	8A2
Rainwater Tank Size	50kL	60kL
Flow In (ML/yr)	1.11	1.16
Pipe Out (ML/yr)	0.72	0.72
Weir Out (ML/yr)	0.00	0.00
Reuse Supplied (ML/yr)	0.39	0.45
Reuse Requested (ML/yr)	0.46	0.52
% Reuse Demand Met	85.9	86.03
% Load Reduction	35.37	38.52

Table 1 - MUSIC Model Water Balance Results

3.4 Flooding

Detailed flood modelling was undertaken as part of the SSD application for the proposed estate subdivision. The figure below has been extracted from the ConstinRoe Consulting Flood Report and demonstrates that the subject site is located outside the flood zone. The flood level for the 1% AEP flood event adjacent to the site has been determined to be approximately 33.000-33.500 AHD. This flood level is below the proposed floor level of 35.500 AHD, with approximately 1.6m of freeboard being provided to the site.



CONCLUSION

Based on the preparation of the concept stormwater drainage plans and MUSIC modeling results it is demonstrated that the principles of WSUD have been incorporated into the design and operation of the proposed development at Lot 8 585-649 Mamre Rd, Orchard Hills NSW in accordance with PDCP 20014 Part C3 and Section 5 of the MWDCP. It is demonstrated that the proposed development achieves reductions in potable water import by capturing rainwater on site and reusing this for non-potable uses including irrigation and toilet flushing, achieving reuse reduction targets set by council. That the site is located outside the 1%AEP flood extents and not affected by flooding/overland flows.

APPENDIX A. ESTATE INFRSTRUCTURE PLANS

BREAKLINE - REFER TO DRAWING CO12042.00-C43 FOR CONTINUATION

STORMWATER DRAINAGE NOTES
REFER TO DRAWING C10 FOR STORMWATER DRAINAGE NOTES

FINISHED LEVELS NOTES
REFER TO DRAWING C10 FOR FINISHED LEVELS NOTES

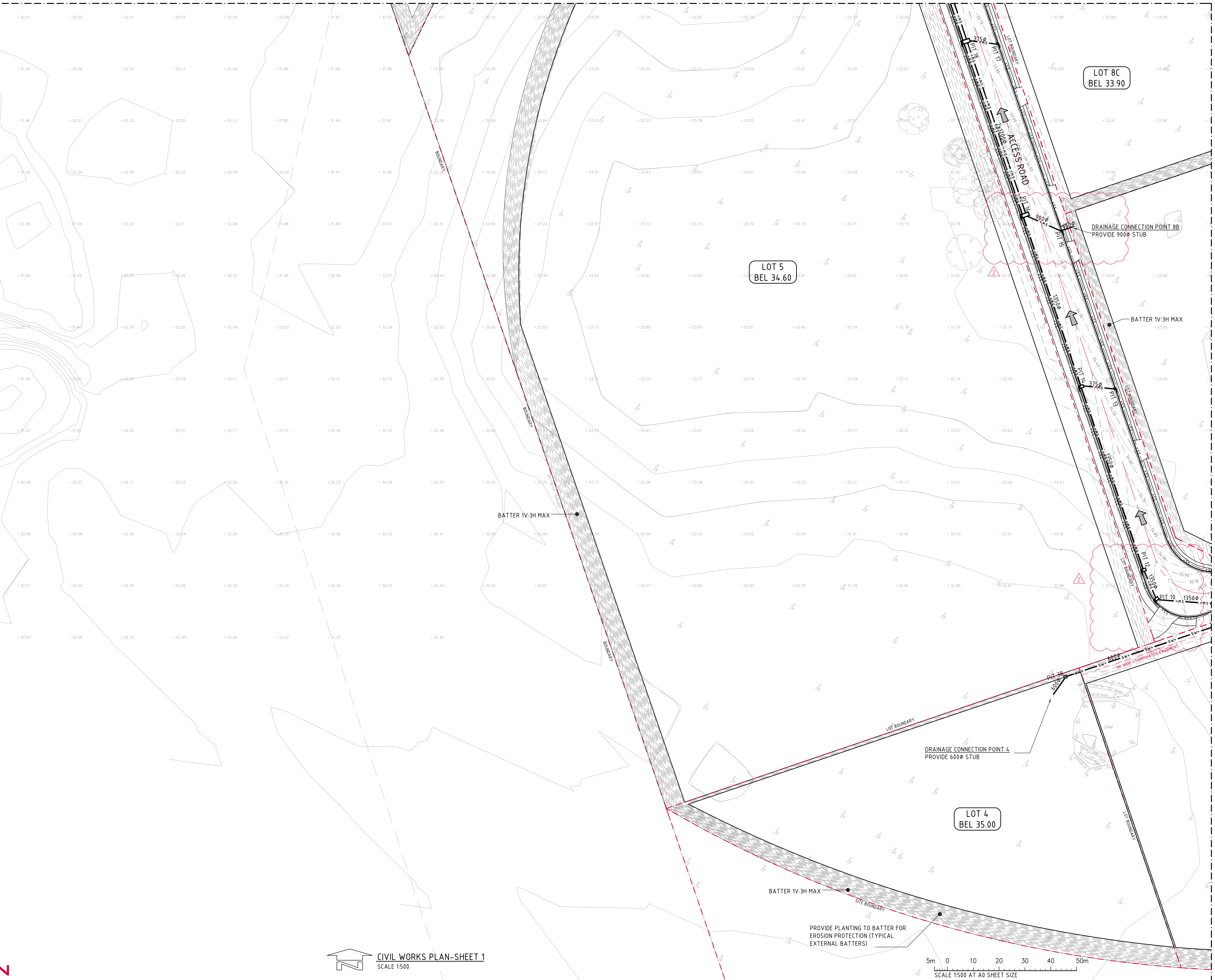
PIT SCHEDULE

PIT No.	TYPE	SIZE (LxB)	COMMENT
PIT 1	K.I.P	900x900	2400 LINTEL ON GRADE
PIT 2	K.I.P	900x900	2400 LINTEL ON GRADE
PIT 3	K.I.P	900x900	2400 LINTEL ON GRADE
PIT 4	K.I.P	900x900	2400 LINTEL ON GRADE
PIT 5	K.I.P	900x900	2400 LINTEL ON GRADE
PIT 6	K.I.P	1200x1500	2400 LINTEL ON GRADE
PIT 7	K.I.P	900x900	2400 LINTEL ON GRADE
PIT 8	K.I.P	900x1500	2400 LINTEL ON GRADE
PIT 9	K.I.P	1500x1800	2400 LINTEL ON GRADE
PIT 10	K.I.P	900x1800	2400 LINTEL ON GRADE
PIT 11	K.I.P	900x900	2400 LINTEL ON GRADE
PIT 12	K.I.P	900x1800	2400 LINTEL ON GRADE
PIT 13	K.I.P	900x900	2400 LINTEL ON GRADE
PIT 14	K.I.P	900x1800	2400 LINTEL ON GRADE
PIT 15	K.I.P	1200x900	2400 LINTEL ON GRADE
PIT 16	K.I.P	1200x3200	2400 LINTEL ON GRADE
PIT 17	K.I.P	900x900	2400 LINTEL ON GRADE
PIT 18	K.I.P	1200x3200	2400 LINTEL ON GRADE
PIT 19	K.I.P	1200x3200	2400 LINTEL ON GRADE
PIT 20	K.I.P	3800x3200	2400 LINTEL SAG
PIT 21	S.J.P	REFER DETAIL	
PIT 22	S.J.P	REFER DETAIL	
PIT 23	K.I.P	900x1200	2400 LINTEL SAG
PIT 24	K.I.P	1500x1500	2400 LINTEL ON GRADE
PIT 25	K.I.P	1500x1500	2400 LINTEL ON GRADE
PIT 26	K.I.P	1500x1500	2400 LINTEL ON GRADE
PIT 27	K.I.P	900x900	2400 LINTEL ON GRADE
PIT 28	K.I.P	900x1500	2400 LINTEL ON GRADE
PIT 29	K.I.P	900x1800	2400 LINTEL ON GRADE
PIT 30	S.J.P	1500x1500	
PIT 31	S.J.P	1500x1500	
PIT 32	S.J.P	1500x1500	
PIT 33	S.J.P	1500x1500	
PIT 34	S.J.P	1200x1200	
PIT 35	S.J.P	1500x1500	
PIT 36	B.I.P	4800x1200	
PIT 37	S.J.P	1200x1200	
PIT 38	S.J.P	900x900	
PIT 39	S.J.P	1200x1200	
PIT 40	K.I.P	1500x1500	2400 LINTEL ON GRADE
PIT 41	K.I.P	900x900	2400 LINTEL ON GRADE
PIT 42	K.I.P	900x900	2400 LINTEL ON GRADE
PIT 43	K.I.P	900x900	2400 LINTEL ON GRADE
PIT 44	K.I.P	900x900	2400 LINTEL ON GRADE
2 PIT 45	S.G.G.P	1500x1500	ON GRADE
2 PIT 46	K.I.P	1500x1500	2400 LINTEL ON GRADE
PIT 47	S.J.P	1500x1500	
PIT 48	S.J.P	1200x4000	
PIT 49	S.J.P	1500x1500	
2 PIT 50	K.I.P	1500x1500	2400 LINTEL ON GRADE

LEGEND:
LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY BOXALL SURVEYORS DATED 13.10.15.

- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- PROPOSED DRAINAGE LINE
- SUBSOIL LINE
- OVERLAND FLOW PATH
- SEWER LINE (BY OTHERS)
- FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- FINISHED PAVEMENT SPOT HEIGHT



CIVIL WORKS PLAN-SHEET 1
SCALE 1:500

5m 0 10 20 30 40 50m
SCALE 1:500 AT A0 SHEET SIZE

FOR CONSTRUCTION

AMENDMENTS	DATE	ISSUE
PIT 49 ADDED TO SCHEDULE	06.02.17	F
REVISED PIT SCHEDULE AS CLOUDED	20.12.16	E
ISSUED FOR CONSTRUCTION CERTIFICATE	17.11.16	D
ISSUED FOR TENDER	20.09.16	C
ISSUED FOR REVIEW	06.09.16	B
ISSUED FOR REVIEW	24.08.16	A

AMENDMENTS	DATE	ISSUE
PITS ADJUSTED	23.08.17	2
BOUNDARY ADJUSTMENT	05.04.17	1
ISSUED FOR CONSTRUCTION	22.02.17	0

ARCHITECT: nettleton

CLIENT: hansen yuncken
SYDNEY CORPORATE PARK
BUILDING 1, LEVEL 3
75-85 O'RIORDAN STREET
ALEXANDRIA NSW 2015
PO BOX 7062, ALEXANDRIA NSW 2015

PROJECT
FIRST ESTATE
ORCHARD HILLS
LOT 2171 MAMRE RD, ORCHARD HILLS

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
M.C	M.C	21.01.16	M.W	A0	AS SHOWN	Co12042.00- C41

Costin Roe Consulting Pty Ltd.
Consulting Engineers ACN 003 696 446
Level 1, 8 Windmill Street
Walsh Bay, Sydney NSW 2000
Tel: (02) 9251-7699 Fax: (02) 9241-3731
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Costin Roe Consulting
PRECISION | COMMUNICATION | ACCOUNTABILITY

DRAWING TITLE
CIVIL WORKS PLAN
SHEET 1

DRAWING No Co12042.00-C41
ISSUE 2

BREAKLINE - REFER TO DRAWING CO12042.00-C44 FOR CONTINUATION

BREAKLINE - REFER TO DRAWING CO12042.00-C41 FOR CONTINUATION

LOT 8C
BEL 33.90

BATTER 1V:3H MAX

BATTER 1V:3H MAX

LOT BOUNDARY

LOT 7
BEL 36.30

LOT 8A
BEL 35.50

LOT 8B
BEL 35.50

LOT BOUNDARY

EXTENT OF WORKS

PROPOSED 'SEAGULL' INTERSECTION.
REFER TO INTERSECTION DRAWING SET
FOR INFORMATION

MAMRE ROAD

ACCESS ROAD

PIT 1
PIT 2
PIT 3
PIT 4
PIT 5
PIT 6
PIT 7
PIT 8
PIT 9
PIT 11
PIT 39

375ø
1050ø
1200ø
825ø
450ø

LOT BOUNDARY

DRAINAGE CONNECTION POINT 2
PROVIDE 1050ø STUB

DRAINAGE CONNECTION POINT 3
PROVIDE 825ø STUB

BATTER 1V:3H MAX

LOT 2
BEL 37.30

29m FUTURE ROAD WIDENING

BOUNDARY

LOT 2
BEL 36.00

LOT BOUNDARY

BATTER 1V:3H MAX

1
DP 229770

LOT 3
BEL 35.20

BOUNDARY

BATTER 1V:3H MAX

BOUNDARY

1
DP 229770

LEGEND

REFER TO DRAWING C41 FOR LEGEND

STORMWATER DRAINAGE NOTES

REFER TO DRAWING C10 FOR STORMWATER DRAINAGE NOTES

FINISHED LEVELS NOTES

REFER TO DRAWING C10 FOR FINISHED LEVELS NOTES

PIT SCHEDULE

REFER TO DRAWING C41 FOR PIT SCHEDULE

5m 0 10 20 30 40 50m
SCALE 1:500 AT A0 SHEET SIZE

CIVIL WORKS PLAN-SHEET 2

SCALE 1:500

FOR CONSTRUCTION

AMENDMENTS	DATE	ISSUE
ISSUED FOR CONSRTUCTION	22.02.17	0
STUB UPDATED	06.02.17	E
ISSUED FOR CONSTRUCTION CERTIFICATE	17.11.16	D
ISSUED FOR TENDER	20.09.16	C
ISSUED FOR REVIEW	06.09.16	B
ISSUED FOR REVIEW	24.08.16	A

AMENDMENTS	DATE	ISSUE
PITS ADJUSTED	23.08.17	2
BOUNDARY ADJUSTMENT	05.04.17	1

AMENDMENTS	DATE	ISSUE

ARCHITECT

CLIENT
hansen yuncken
SYDNEY CORPORATE PARK
BUILDING 5 LEVEL 4
75-85 O'RIORDAN STREET
ALEXANDRIA NSW 2015
PO BOX 7832, ALEXANDRIA NSW 2015

PROJECT
FIRST ESTATE
ORCHARD HILLS
LOT 2171 MAMRE RD, ORCHARD HILLS

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
M C	M C	21.01.16	M W	A0	AS SHOWN	Co12042.00- C42

Costin Roe Consulting Pty Ltd.
Consulting Engineers
Level 1, 8 Windmill Street
Walsh Bay, Sydney NSW 2000
Tel: (02) 9251-7099 Fax: (02) 9241-3721
email: mail@costinroe.com.au ©

Costin Roe Consulting

PRECISION | COMMUNICATION | ACCOUNTABILITY

DRAWING TITLE
CIVIL WORKS PLAN
SHEET 2

DRAWING No Co12042.00- C42

ISSUE 2

BREAKLINE - REFER TO DRAWING C012042.00-C45 FOR CONTINUATION

BREAKLINE - REFER TO DRAWING C012042.00-C44 FOR CONTINUATION

BREAKLINE - REFER TO DRAWING C012042.00-C41 FOR CONTINUATION

CIVIL WORKS PLAN-SHEET 3
SCALE 1:500

SITE & UPSTREAM DEVELOPMENT TO BE CONVEYED FROM SITE DISCHARGE POINT TO SOUTH CREEK VIA EXISTING GULLY/ OVERLAND FLOW PATH AND EXISTING 14m WIDE DRAINAGE EASEMENT.

PROVIDE 8m LONG x 4m WIDE ROCK MATRESS COMPRISING OF 500mm RIP RAP OVER GEOFABRIC A44. ALIGN WITH BANKS AND CHANNEL INVERT LEVELS

PROVIDE NEW OVERLAND FLOW SWALE FROM EXISTING CULVERT. TO CONVEY Q100 A.R.I FLOW FROM UPSTREAM CATCHMENTS. - REFER NOTE ON DRAWING C44 FOR DIMENSIONS AND CAPACITY

PROVIDE HANDRAILS TO TOP OF HEADWALLS.

PROVIDE 3x1350Φ NEW CULVERTS UNDER EXISTING ACCESS ROAD. PROVIDE HEADWALL & CONCRETE APRON TO SUIT

CONCRETE COLLAR PER DETAILS ON DRAWING C46. COLLAR TO BE PLACED 3.5m AWAY FROM UPSTREAM PIT

BASIN OUTLET PIT
4800x1200 PIT WITH 590Φ STAINLESS STEEL ORIFICE AT OUTLET FIXED TO PIT WALL
TOP R.L = 30.60

PROVIDE CONCRETE OVERFLOW WEIR
WEIR WIDTH 20m
TOP WEIR R.L = 31.30

PROVIDE TEMPORARY BIO-RETENTION DURING CONSTRUCTION AS PER DETAIL ON DRAWING C46. TO REMAIN IN PLACE UNTIL 80% OF UPSTREAM DRAINAGE INFRASTRUCTURE HAS BEEN COMPLETED.

PROVIDE SLOTTED 225Φ PIPE AND CONNECT TO PIT 36 AS SHOWN

OSD BASIN TO BE BUNDED TO R.L 32.00 MINIMUM

'CE' DENOTES CLEANING EYE FLUSHING POINT

PROVIDE 600Sq x 600 DEEP SEALED PIT. CONNECT AG LINES FROM OSD BASIN

LOT 1
OSD BASIN
BBL 29.55
FSL 30.30

STORMWATER OUTLET TO OVERFLOW CHANNEL. EXTEND RIP RAP TO HEADWALL OF 3x1350Φ CULVERTS AS SHOWN. REFER TO ENERGY DISSIPATER DETAIL.

DRAINAGE CONNECTION POINT 6
PROVIDE 825Φ STUB

G.P.T
ROCLA CDS 1518 UNIT OR APPROVED EQUIVALENT INSTALLED OFFLINE FROM SYSTEM VIA LOW FLOW/HIGH FLOW BYPASS

STORMWATER OUTLET 2
REFER TO DETAIL ON DRAWING C47

BIO-RETENTION
FILTER AREA = 4 000m²
SAT. HYDRAULIC CONDUCTIVITY = 100mm/hr
FILTER DEPTH = 500mm
EXTENDED DETENTION DEPTH = 300mm

PROVIDE FENCE TO EXTENTS OF BASIN. FENCE TO BE 1800mm HIGH CYCLONE FENCE WITH 50mm POST DRIVEN INTO GROUND. PROVIDE LOCKABLE GATE FOR MAINTENANCE ACCESS ADJACENT TO DRIVEWAY

FLOOD WARNING SIGN IN ACCORDANCE WITH PENRITH CITY COUNCIL STANDARDS

STORMWATER OUTLET 1
REFER TO DETAIL ON DRAWING C46

G.P.T
ROCLA CDS 3018 UNIT OR APPROVED EQUIVALENT INSTALLED OFFLINE FROM SYSTEM VIA LOW FLOW/HIGH FLOW BYPASS

PROVIDE 1000 HIGH INTERNAL WEIR FOR HIGH FLOW BYPASS

LOT 6
BEL 33.40

OSD BASIN
STORAGE CAPACITY = 21 000m³
SURFACE AREA = 15 300m²
MAX DEPTH 1.20m
REFER TO REPORT 12042.00-07a BY COSTIN ROE CONSULTING FOR OSD BASIN HYDRAULICS

PROVIDE 2xSUBSOIL LINES UNDER BASIN LOWPOINT 600mm BELOW SURFACE

FLOOD WARNING SIGN IN ACCORDANCE WITH PENRITH CITY COUNCIL STANDARDS

5m WIDE ACCESS TRAIL. 200 DGS40 & 2 COAT SPRAY SEAL. PROVIDE KERB ONLY EACH SIDE OF TRACK. CARE TO BE TAKEN DURING COMPACTION OVER PIPE WITH LOW COVER

DRAINAGE CONNECTION POINT 5
PROVIDE 1050Φ STUB

PROVIDE LAYBACK AND DRIVE CROSSING UP TO BOUNDARY

FOOTWAY CROSSFALL TO BE REVERSED ACROSS ACCESS TRAIL & PIT 20 AS SHOWN

DRAINAGE CONNECTION POINT 8C
PROVIDE 900Φ STUB

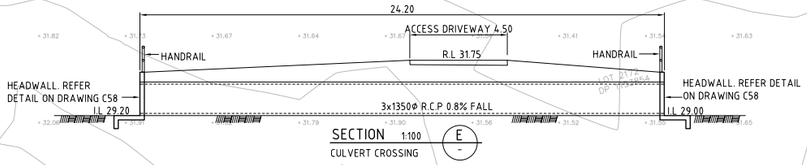
BATTER 1V:3H MAX

LEVELS TO REMAIN AS PER EXISTING

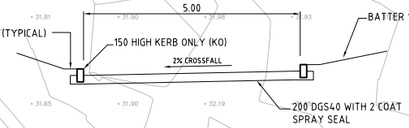
LOT 5
BEL 34.60

LOT 8C
BEL 33.90

SECTION 1:100 (E)
CULVERT CROSSING



SECTION 1:50 (E)
BASIN ACCESS TRACK



LEGEND:
LEVELS DATUM IS AHD.
EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY BOXALL SURVEYORS DATED 13.10.15.

- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- PROPOSED DRAINAGE LINE
- SUBSOIL LINE
- OVERLAND FLOW PATH
- SEWER LINE (BY OTHERS)
- FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- FINISHED PAVEMENT SPOT HEIGHT

STORMWATER DRAINAGE NOTES
REFER TO DRAWING C10 FOR STORMWATER DRAINAGE NOTES

FINISHED LEVELS NOTES
REFER TO DRAWING C10 FOR FINISHED LEVELS NOTES

PIT SCHEDULE
REFER TO DRAWING C41 FOR PIT SCHEDULE

1m 0 1 2 3 4 5 6 7 8 9 10m
SCALE 1:100 AT A0 SHEET SIZE
500mm 0 1 2 3 4 5m
SCALE 1:50 AT A0 SHEET SIZE
5m 0 10 20 30 40 50m
SCALE 1:500 AT A0 SHEET SIZE

AMENDMENTS	DATE	ISSUE
BASIN UPDATED & SECTION ADDED	06.02.17	F
REVISED FOR BRS COMMENTS AS CLOUDED	20.12.16	E
ISSUED FOR CONSTRUCTION CERTIFICATE	17.11.16	D
ISSUED FOR TENDER	20.09.16	C
ISSUED FOR REVIEW	06.09.16	B
ISSUED FOR REVIEW	24.08.16	A
PITS ADJUSTED	23.08.17	2
REVISED AS CLOUDED	01.05.17	1
ISSUED FOR CONSTRUCTION	22.02.17	0

ARCHITECT

CLIENT
hansen yuncken
SYDNEY CORPORATE PARK
BUILDING 5 LEVEL 3
75-85 O'RIORDAN STREET
ALEXANDRIA NSW 2015
PO BOX 7692, ALEXANDRIA NSW 2015

PROJECT
FIRST ESTATE
ORCHARD HILLS
LOT 2171 MAMRE RD, ORCHARD HILLS

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
M.C	M.C	21.01.16	M.W	A0	AS SHOWN	C012042.00- C43

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FOR CONSTRUCTION

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DRAWING TITLE
CIVIL WORKS PLAN
SHEET 3

DRAWING No C012042.00- C43 | ISSUE 2

BREAKLINE - REFER TO DRAWING C012042.00-C43 FOR CONTINUATION

BOUNDARY

LOT BOUNDARY

PIT 47

PIT 30

1050ø

900ø

DRAINAGE CONNECTION POINT 9
PROVIDE 900ø STUB

PROVIDE ARMCO W-BEAM BARRIER TO END OF ROAD

PIT 45

PIT 25

375ø

TEMPORARY TURNING CIRCLE

LOT 2171 DP 1153854

PIT 44

PIT 43

PIT 42

PIT 41

LOT 6
BEL 33.40

LOT 9
BEL 34.90

BATTER 1V:3H MAX

PIT 24

PIT 40

PIT 39

PIT 26

PIT 23

1200ø

ACCESS ROAD

DRAINAGE CONNECTION POINT 7
PROVIDE 1050ø STUB

LOT 8C
BEL 33.90

LOT 7
BEL 36.30

FOR FUTURE ROAD WIDENING

PROVIDE NEW OVERLAND FLOW SWALE FROM EXISTING CULVERT TO CONVEY Q100 A.R.I FLOW FROM UPSTREAM CATCHMENTS. - REFER NOTE

D
C47

PROVIDE 3m LONG x 1.5m WIDE ROCK MATRESS COMPRISING OF 150mm RIP RAP OVER GEOFABRIC A44. ALIGN WITH BANKS AND CHANNEL INVERT LEVELS

EXISTING 450ø CULVERT.
CULVERT CAPACITY = 0.184m³/s AT 1.3% SLOPE & 50% BLOCKED
UPSTREAM CATCHMENT = 0.5Ha
Q100 PEAK FLOW ESTIMATE = 0.131m³/S

PROVIDE NEW OVERLAND FLOW SWALE FROM EXISTING CULVERT TO CONVEY Q100 A.R.I FLOW FROM UPSTREAM CATCHMENTS.
BASE WIDTH = 0.5m
SIDE WIDTH = 0.65m AT 1V:3H MAX SLOPE
CHANNEL WIDTH = 1.75m MIN
CHANNEL SLOPE = 5% MIN
MANNINGS n = 0.04
CHANNEL CAPACITY = 0.193m³/s WITH 50mm FREEBOARD.

MAMRE ROAD

EXISTING BOX CULVERT 3x1.2m WIDEx0.6m DEEP (T.B.C)
CULVERT CAPACITY = 3.375m³/s AT 0.7% SLOPE & 50% BLOCKED
UPSTREAM CATCHMENT = 9.0Ha
Q100 PEAK FLOW ESTIMATE = 2.69m³/s
MAX VELOCITY = 1.5m/s

PROVIDE 3m LONG x 7m WIDE ROCK MATRESS COMPRISING OF 150mm RIVER ROCK OVER GEOFABRIC A44, AS DETAILED ON DRAWING C012042.00-R46 (ROADWORKS DRAWINGS). ALIGN WITH BANKS AND CHANNEL INVERT LEVELS

PROVIDE NEW OVERLAND FLOW SWALE FROM EXISTING CULVERT TO CONVEY Q100 A.R.I FLOW FROM UPSTREAM CATCHMENTS.
BASE WIDTH = 1.0m
SIDE WIDTH = 3m AT 1V:3H MAX SLOPE
CHANNEL WIDTH = 7m MIN
CHANNEL SLOPE = 0.5% MIN
MANNING n = 0.04
CHANNEL CAPACITY = 2.82m³/s WITH 200mm FREEBOARD.

FOR FUTURE ROAD WIDENING

BREAKLINE - REFER TO DRAWING C012042.00-C42 FOR CONTINUATION

CIVIL WORKS PLAN-SHEET 4
SCALE 1:500

5m 0 10 20 30 40 50m
SCALE 1:500 AT A0 SHEET SIZE

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY BOXALL SURVEYORS DATED 13.10.15.

- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- SW> - PROPOSED DRAINAGE LINE
- ss> - SUBSOIL LINE
- OVERLAND FLOW PATH
- SEWER LINE (BY OTHERS)
- 35.00 - FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- 35.10 - FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- +35.10 - FINISHED PAVEMENT SPOT HEIGHT

STORMWATER DRAINAGE NOTES

REFER TO DRAWING C10 FOR STORMWATER DRAINAGE NOTES

FINISHED LEVELS NOTES

REFER TO DRAWING C10 FOR FINISHED LEVELS NOTES

PIT SCHEDULE

REFER TO DRAWING C41 FOR PIT SCHEDULE

AMENDMENTS	DATE	ISSUE
ISSUED FOR CONSTRUCTION	22.02.17	0
FLOW VELOCITY NOMINATED	06.02.17	E
ISSUED FOR CONSTRUCTION CERTIFICATE	17.11.16	D
ISSUED FOR TENDER	20.09.16	C
ISSUED FOR REVIEW	06.09.16	B
ISSUED FOR REVIEW	24.08.16	A

AMENDMENTS	DATE	ISSUE
ISSUED FOR APPROVAL	13.10.17	3
CUL-DE-SAC ADJUSTED	28.09.17	2
CUL-DE-SAC ADJUSTED	23.08.17	1

AMENDMENTS	DATE	ISSUE

ARCHITECT

CLIENT
hansen yuncken
SYDNEY CORPORATE PARK
BUILDING 1, LEVEL 3
75-85 O'RIORDAN STREET
ALEXANDRIA NSW 2015
PO BOX 7002, ALEXANDRIA NSW 2015

PROJECT
FIRST ESTATE
ORCHARD HILLS
LOT 2171 MAMRE RD, ORCHARD HILLS

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
M.C	M.C	21.01.16	M.W	A0	AS SHOWN	Co12042.00- C44

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FOR APPROVAL

Costin Roe Consulting

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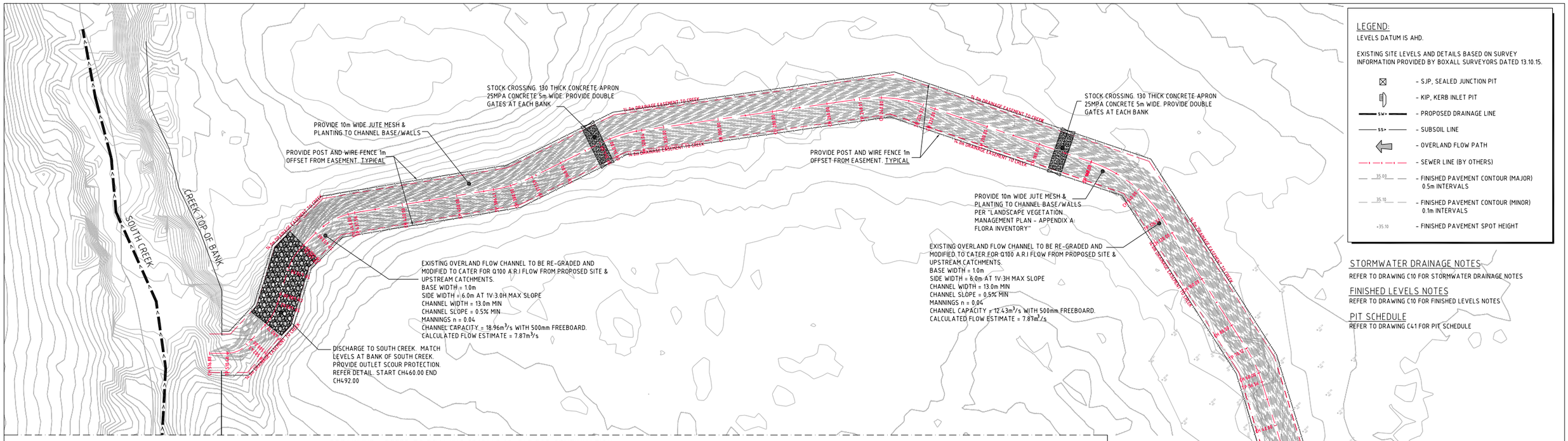
DRAWING TITLE
CIVIL WORKS PLAN
SHEET 4

DRAWING No Co12042.00- C44

ISSUE 3



CIVIL WORKS PLAN–SHEET 5
SCALE 1:500

LEGEND:
LEVELS DATUM IS AHD.

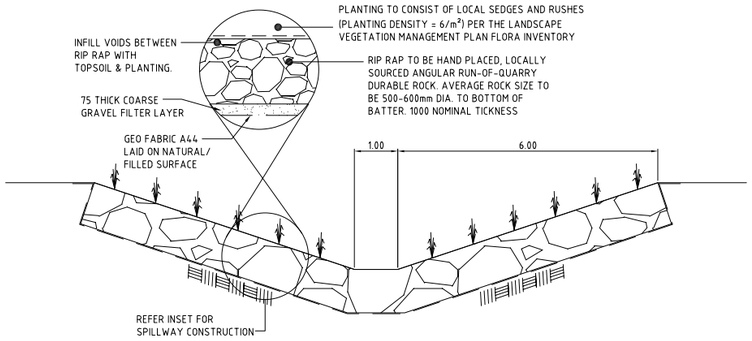
EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY BOXALL SURVEYORS DATED 13.10.15.

- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- PROPOSED DRAINAGE LINE
- SUBSOIL LINE
- OVERLAND FLOW PATH
- SEWER LINE (BY OTHERS)
- FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- FINISHED PAVEMENT SPOT HEIGHT

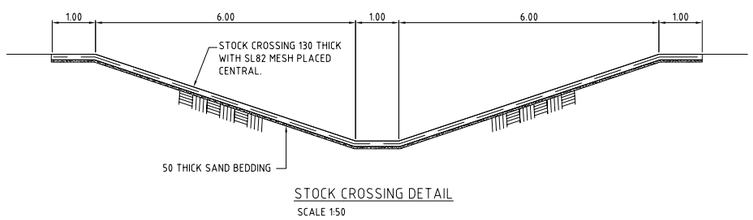
STORMWATER DRAINAGE NOTES
REFER TO DRAWING C10 FOR STORMWATER DRAINAGE NOTES

FINISHED LEVELS NOTES
REFER TO DRAWING C10 FOR FINISHED LEVELS NOTES

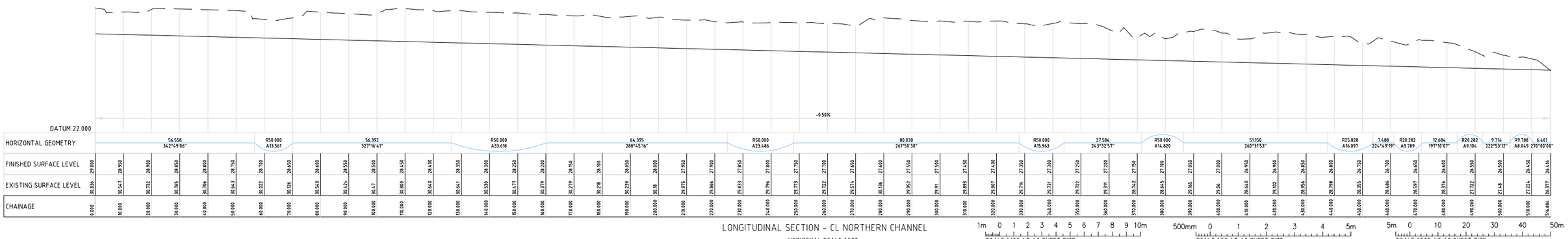
PIT SCHEDULE
REFER TO DRAWING C41 FOR PIT SCHEDULE



CHANNEL OUTLET PROTECTION DETAIL
SCALE 1:50



STOCK CROSSING DETAIL
SCALE 1:50



LONGITUDINAL SECTION – CL NORTHERN CHANNEL
HORIZONAL SCALE 1:500
VERTICAL SCALE 1:100

SCALE 1:100 AT A0 SHEET SIZE
SCALE 1:50 AT A0 SHEET SIZE
SCALE 1:500 AT A0 SHEET SIZE

FOR CONSTRUCTION

AMENDMENTS	DATE	ISSUE
CHANNEL RE-GRADED TO 0.3%	25.01.17	F
REVISED FOR CERTIFIER COMMENTS AS CLOUDED	20.12.16	E
ISSUED FOR CONSTRUCTION CERTIFICATE	17.11.16	D
ISSUED FOR TENDER	20.09.16	C
ISSUED FOR REVIEW	06.19.16	B
ISSUED FOR REVIEW	24.08.16	A

AMENDMENTS	DATE	ISSUE
ISSUED FOR CONSTRUCTION	22.02.17	0
CHANNEL REVERTED TO 0.5%	06.02.17	G

AMENDMENTS	DATE	ISSUE

ARCHITECT

CLIENT
hansen yuncken
SYDNEY CORPORATE PARK
BUILDING 1, LEVEL 3
70-76 O'RIORDAN STREET
ALEXANDRIA NSW 2015
PO BOX 7692, ALEXANDRIA NSW 2015

PROJECT
FIRST ESTATE
ORCHARD HILLS
LOT 2171 MAMRE RD, ORCHARD HILLS

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
M.C	M.C	21.01.16	M.W	A0	AS SHOWN	C012042.00- C45

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DRAWING TITLE
CIVIL WORKS PLAN
SHEET 5

DRAWING No: C012042.00- C45
ISSUE: 0

APPENDIX B. CONCEPT STORMWATER MANAGEMENT PLANS

LOT 8 FIRST ESTATE MAMRE RD ORCHARD HILLS
CONCEPT STORMWATER MANAGEMENT

SITE WORKS - GENERAL

1. ALL WORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH LOCAL COUNCIL, AUSTRALIAN AND AUTHORITY STANDARDS.
2. ALL TRENCHING WORKS ARE TO BE RESTORED TO ORIGINAL CONDITION.
3. THE INTEGRITY OF ALL EXISTING AND NEW SERVICES IS TO BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
4. ALL PLANS ARE TO BE READ IN CONJUNCTION WITH APPROVED ARCHITECTS, STRUCTURAL ENGINEERS AND OTHER CONSULTANT'S PLANS. ANY DISCREPANCIES ARE TO BE NOTIFIED TO THE ENGINEER FOR CLARIFICATION.

SEDIMENT AND EROSION CONTROL

1. THE CONTRACTOR SHALL INSTIGATE ALL SEDIMENT AND EROSION CONTROL MEASURES IN ACCORDANCE WITH PENRITH CITY COUNCIL REQUIREMENTS AND THE "BLUE BOOK" (MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION, PRODUCED BY THE DEPARTMENT OF HOUSING). THESE MEASURES ARE TO BE REGULARLY INSPECTED AND MAINTAINED.
2. THE SEDIMENT & EROSION CONTROL PLAN PRESENTS CONCEPTS ONLY, THE CONTRACTOR SHALL AT ALL TIMES BE RESPONSIBLE FOR THE ESTABLISHMENT & MANAGEMENT OF A DETAILED SCHEME MEETING COUNCIL'S DESIGN, AND ALL OTHER REGULATORY AUTHORITY REQUIREMENTS.
3. WHERE PRACTICAL, THE SOIL EROSION HAZARD ON THE SITE SHALL BE KEPT AS LOW AS POSSIBLE. TO THIS END, WORKS SHOULD BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:
   a. INSTALL ALL TEMPORARY SEDIMENT FENCES AND BARRIER FENCES. WHERE FENCES ARE ADJACENT TO EACH OTHER THE SEDIMENT FENCE CAN BE INCORPORATED INTO THE BARRIER FENCE.
   b. CONSTRUCT TEMPORARY STABILISED SITE ACCESS. INCLUDING SHAKE DOWN AND WASH PAD.
   c. INSTALL SEDIMENT CONTROL MEASURES AS OUTLINED ON THESE SEDIMENT AND CONTROL PLANS (ONCE APPROVED)
4. THE CONTRACTOR SHALL UNDERTAKE SITE DEVELOPMENT WORKS SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF MINIMUM WORKABLE SIZE.
5. AT ALL TIMES AND IN PARTICULAR DURING WINDY AND DRY WEATHER, LARGE, UNPROTECTED AREAS WILL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL. TACIFIERS MAY BE USED TO CONTROL DUST DURING EXTENDED PERIODS OF DRY WEATHER.
6. ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) SHALL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.
7. WATER SHALL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS THE CATCHMENT AREA HAS BEEN STABILISED AND/OR ANY LIKELY SEDIMENT HAS BEEN FILTERED OUT.
8. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES SHALL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE STABILISED / REHABILITATED.
9. THE CONTRACTOR SHALL ALLOW FOR THE ESTABLISHMENT OF ANY OTHER EROSION PROTECTION MEASURES. (IF APPLICABLE).
10. THE CONTRACTOR SHALL REGULARLY INSPECT (MINIMUM TWICE PER WEEK) ALL EROSION AND SEDIMENT CONTROL MEASURES TO ENSURE THEY ARE OPERATING EFFECTIVELY. REPAIRS AND/OR MAINTENANCE SHALL BE UNDERTAKEN REGULARLY AND AS REQUIRED, PARTICULARLY FOLLOWING STORM EVENTS.
11. ACCEPTABLE RECEPTORS SHALL BE USED FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER. WASTE FROM THESE RECEPTORS SHALL BE DISPOSED OF IN ACCORDANCE WITH REGULATORY AUTHORITY REQUIREMENTS. PAY ALL FEES AND PROVIDE EVIDENCE OF SAFE DISPOSAL.

SITE WORKS - ACCESS AND SAFETY

1. ALL WORKS ARE TO BE UNDERTAKEN IN A SAFE MANNER IN ACCORDANCE WITH ALL STATUTORY AND INDUSTRIAL RELATION REQUIREMENTS.
2. ACCESS TO ADJACENT BUILDINGS AND PROPERTIES SHALL BE MAINTAINED AT ALL TIMES.
3. WHERE NECESSARY SAFE PASSAGE SHALL BE PROVIDED FOR VEHICLES AND PEDESTRIANS THROUGH OR ADJACENT TO THE SITE.

STORMWATER

1. ALL WORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH THE FOLLOWING AUSTRALIAN STANDARDS AS2032, AS3500 AND AS3725 AS A MINIMUM.
2. ALL PIPES LESS THAN OR EQUAL TO Ø300mm IN SIZE ARE TO BE SOLVENT WELD-JOINTED UPVC CLASS SN6 U.N.O.
3. ALL PIPES Ø375mm OR GREATER IN SIZE ARE TO BE MIN. CLASS 2 REINFORCED CONCRETE PIPE (RCP) WITH SPIGGOT AND SOCKETED JOINT OR VANTAGE PIPE PLUS (VPIPE+) FIBRE REINFORCED CONCRETE (FRC) WITH VANTAGE PIPE PLUS JOINT U.N.O.
4. ALL PIPES ARE TO BE LAID AT MIN. 1.0% GRADE U.N.O.
5. PIPE BEDDING IS TO BE HS2 UNDER ROADS AND TRAFFICKED AREAS AND SHALL BE H2 IN LANDSCAPED AND PEDESTRIAN TRAFFICKED AREAS U.N.O.
6. ALL PIPE BENDS AND JUNCTIONS ARE TO BE MADE WITH EITHER PURPOSE MADE FITTINGS OR STORMWATER DRAINAGE PITS.
7. MINIMUM COVER FROM THE OBVERT OF THE STORMWATER PIPE OF 300mm IS TO BE PROVIDED IN LANDSCAPED AREAS AND 600mm IN VEHICULAR TRAFFICKED AREAS U.N.O.
8. WHERE MINIMUM COVER CANNOT BE ACHIEVED CONCRETE ENCASEMENT OF THE AFFECTED PIPE IS MAY BE UNDERTAKEN WITH 20MPa CONCRETE WITH A MIN. COVER OF 150mm TO ALL SIDES OF THE PIPE. THE CONTRACTOR SHALL CONFIRM THIS REQUIREMENT WITH THE ENGINEER OR SUPERINTENDENT.
9. LAID PIPELINES ARE TO HAVE THE FOLLOWING CONSTRUCTED TOLERANCES:
   a. HORIZONTAL-1:300 ANGULAR DEVIATION FROM REQUIRED ALIGNMENT;
   b. VERTICAL-1:300 ANGULAR DEVIATION FROM REQUIRED ALIGNMENT.
10. ALL DRAINAGE PITS ARE TO BE CAST IN-SITU, PRECAST DRAINAGE PITS MAY BE USED WITH APPROVAL FROM THE ENGINEER. THE CONTRACTOR SHALL SUBMIT A PRECAST PIT INSTALLATION WORK METHOD STATEMENT FOR ASSESSMENT BY THE ENGINEER FOR APPROVAL.
11. DRAINAGE PIT COVERS ARE TO BE EITHER GALVANISED STEEL OR CAST IRON CLASS 'B' IN LANDSCAPED AND PEDESTRIAN TRAFFICKED AREAS AND CLASS 'D' IN ALL VEHICULAR TRAFFICKED AREAS U.N.O.
12. DRAINAGE PIT COVERS ARE TO BE 'HEELSAFE' TYPE IN ALL PEDESTRIAN TRAFFICKED AREAS U.N.O.
13. EXISTING STORMWATER PIT LOCATIONS AND INVERT LEVELS TO BE CONFIRMED PRIOR TO COMMENCING WORKS ON SITE.
14. PROVIDE CLEANING EYES (RODDING POINTS) TO PIPES AT ALL CORNERS AND T-JUNCTIONS WHERE NO PITS ARE PRESENT.
15. DOWN PIPES CONNECTED DIRECT TO PIPES TO BE CONNECTED AT 45° TO THE FLOW DIRECTION WITH A CLEANING EYE PROVIDED AT GROUND LEVEL.

FINISHED LEVELS

1. LEVELS BASED ON ESTATE INFRASTRUCTURE PLANS PREPARED BY COSTINROE CONSULTING, Ref: 12042.00 & SURVEY PREPARED BY BOXALL SURVEYORS Ref: 10116. THE CONTRACTOR SHALL VERIFY LEVELS PRIOR TO CONSTRUCTION COMMENCEMENT, ANY DISCREPANCIES SHALL BE NOTIFIED TO THE ENGINEER OR SUPERINTENDENT FOR CLARIFICATION.
2. FINISHED LEVELS SHOWN ARE CONCEPTUAL ONLY AND SUBJECT TO DETAILED DESIGN PRIOR TO CONSTRUCTION CERTIFICATE APPLICATION. FINAL FINISHED LEVELS TO BE +/- 0.5m FROM LEVELS SHOWN.
3. CARPARK & SERVICE AREA LAYOUT AND GRADES TO COMPLY WITH AS2890.
4. DRIVEWAY LAYOUT AND DESIGN TO COMPLY WITH PENRITH CITY COUNCIL ACCESS DRIVEWAY DESIGN AND CONSTRUCTION SPECIFICATION.
5. ALL CONTOUR LINES & SPOT LEVELS INDICATE FINISHED PAVEMENT LEVELS U.N.O. ON PLAN.
6. PERMANENT BATTER SLOPES ARE TO HAVE A MAXIMUM GRADE OF 1V:3H.
7. ALL FOOTPATHS ARE TO FALL AWAY FROM THE BUILDING AT 2.5% NOMINAL. GRADE.
8. ALL PAVEMENTS ARE TO BE SET AT 50mm BELOW THE FINISHED FLOOR LEVEL OF THE WAREHOUSE AND OFFICE AREAS.

LOCALITY PLAN
NOT TO SCALE - COURTESY OF SIX MAPS

DRAWING SCHEDULE

ISSUED FOR SSD APPLICATION

1. DO NOT SCALE OFF THIS DRAWING. USE DIMENSIONS & ARCHITECTURAL DRAWINGS ONLY
2. DRAWINGS TO BE READ IN CONJUNCTION WITH SPECIFICATION.
3. LEVELS ARE INDICATIVE ONLY AND ARE TO BE CHECKED PRIOR TO COMMENCEMENT OF ANY WORKS
4. AUTHORITIES MAINS AND/OR EXISTING SERVICES ARE TO BE LOCATED AND CHECKED PRIOR TO COMMENCEMENT OF ANY WORKS
5. COMPLETION OF THE QUALITY RECORD IS EVIDENCE THAT THE DESIGN AND DRAWING HAVE BEEN VERIFIED.

VERIFICATION
COMPLETION OF THE DRAWING STATUS IS EVIDENCE THAT THE DESIGN HAS BEEN VERIFIED AS CONFORMING TO THE REQUIREMENTS OF THE PROJECT QUALITY PLAN

DRAWING STATUS	INITIAL	DATE
PRELIMINARY		
FOR INFORMATION ONLY		
FOR CLIENT APPROVAL		
FOR TENDER		
FOR CONSTRUCTION		

CHECKED | DATE
APPROVED | DATE
PAGE A1 | PLOT DATE June 21, 2018

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NORTH POINT

SCALE: NOT TO SCALE

DATE	No	AMENDMENT	INT	REV
21.06.18		ISSUED FOR SSD APPLICATION	SK	1

hansen yuncken BUILDING VALUE

CLIENT: ALTIS Property Partners

ARCHITECT: SBA ARCHITECTS

PROJECT: Lot 8 First Estate Mamre Rd Orchard Hills

DRAWING TITLE: DA Issue COVER SHEET, LOCALITY PLAN AND DRAWING SCHEDULE

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P 02 9891 5033 | F 02 9891 3898 | E admin@sparksandpartners.com.au

AHSCA CORPORATE MEMBER

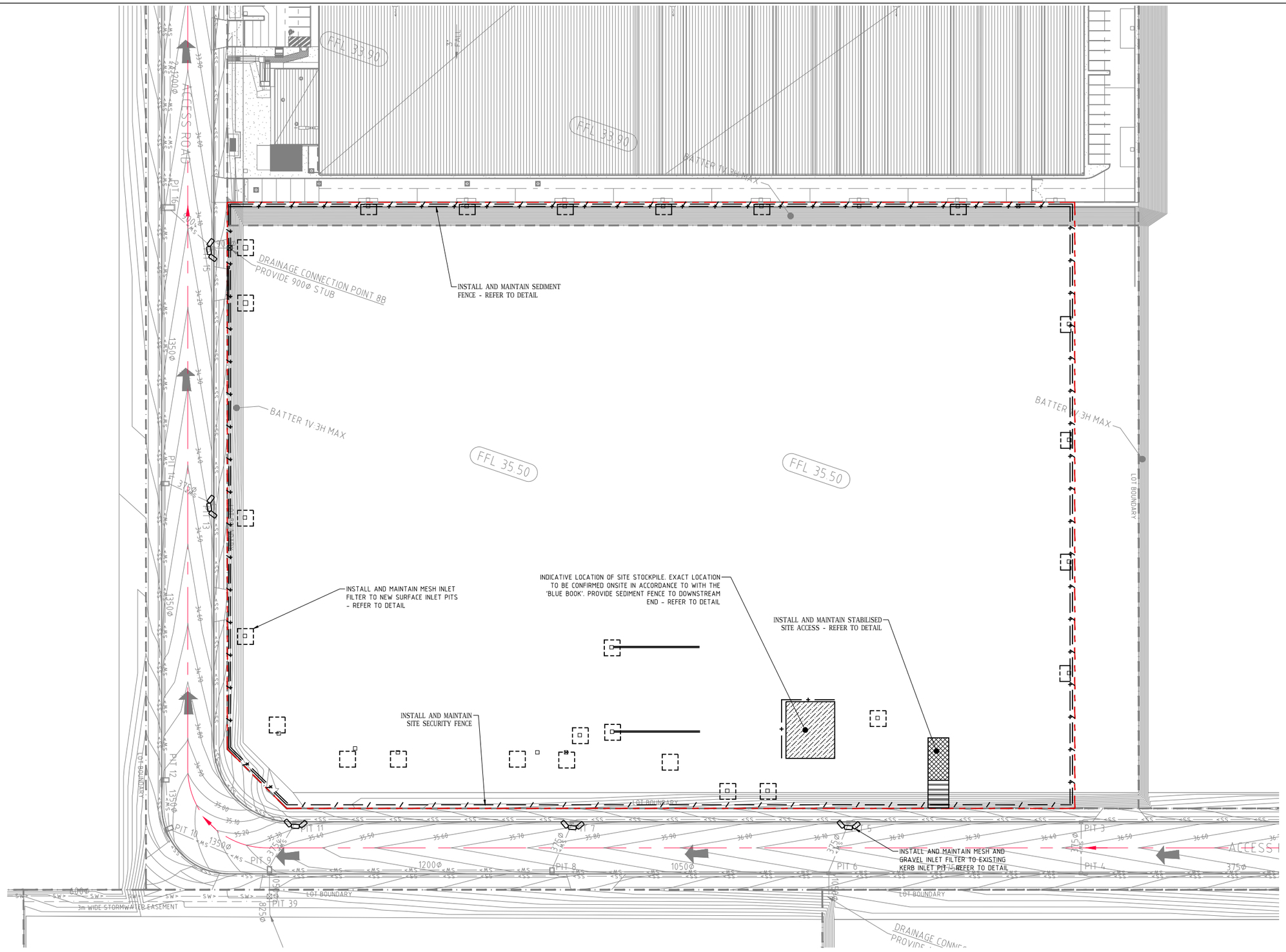
DATE	DESIGNED	SCALE	DRAWN	JOB No	DWG No	No IN SET	REV
----	SK	NTS	SK	18086	DA1.01		1

LEGEND

- SITE SECURITY FENCE
- SEDIMENT FENCE
- STABILISED SITE ACCESS
- SITE STOCKPILE
- MESH AND GRAVEL INLET FILTER
- EARTH BANK DIVERSION MOUND
- GEOTEXTILE INLET FILTER

NOTES

1. REFER TO DA1.01 FOR GENERAL NOTES AND SPECIFICATIONS



ISSUED FOR SSD APPLICATION

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DRAWING STATUS	INITIAL	DATE
PRELIMINARY		
FOR INFORMATION ONLY		
FOR CLIENT APPROVAL		
FOR TENDER		
FOR CONSTRUCTION		

CHECKED | DATE
APPROVED | DATE
PAGE A1 | PLOT DATE June 21, 2018

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NORTH POINT

SCALE 0 2 4 6 8 10 12 14 16 METERS

DATE	No	AMENDMENT	INIT	REV
21.06.18		ISSUED FOR SSD APPLICATION	SK	1

CLIENT

ARCHITECT

PROJECT
Lot 8 First Estate Mamre Rd Orchard Hills

DRAWING TITLE
DA Issue
CONCEPT SEDIMENT AND EROSION CONTROL PLAN

SPARKS + PARTNERS
CONSULTING ENGINEERS
HYDRAULIC | CIVIL | FIRE
Level 1, 91 George Street | Parramatta | NSW 2150
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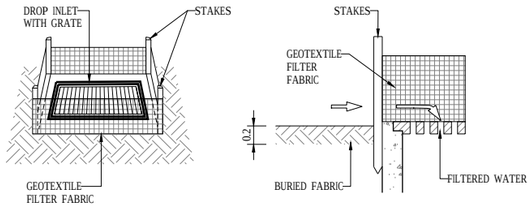
AHSCA CORPORATE MEMBER

DATE	DESIGNED
----	SK
SCALE	DRAWN
1:500	SK

JOB No	DWG No	No IN SET	REV
18086	DA2.01	--- OF	1

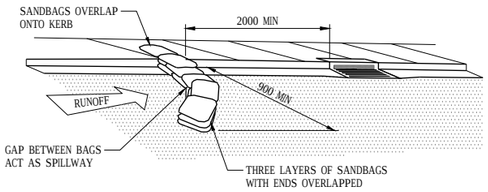


GEOTEXTILE INLET FILTER DROP INLET SEDIMENT TRAP

NOT TO SCALE

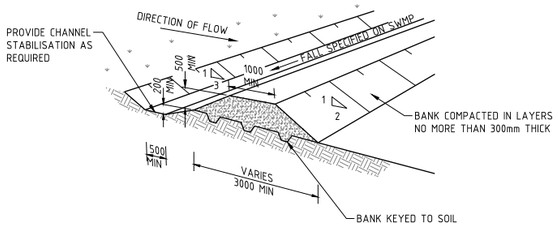
NOTES:

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
2. CUT A 200mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.0m LONG STAR PICKETS INTO GROUND AT THE FOUR CORNERS OF PIT WALLS. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.



SEDIMENT TRAP FOR KERB INLET (ON GRADE - SANDBAG)

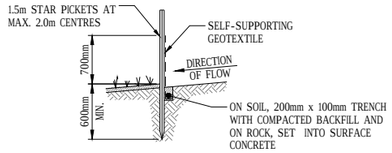
NOT TO SCALE



DIVERSION BANK AND CHANNEL

NOT TO SCALE

(FOR CATCHMENT GREATER THAN 2ha)



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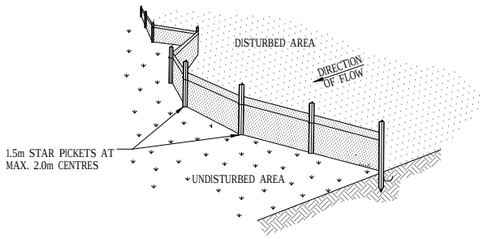
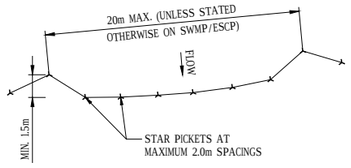




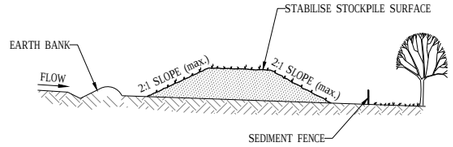
PLAN

SEDIMENT FENCE

NOT TO SCALE

NOTES:

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50L/s IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 200mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5m LONG STAR PICKETS INTO GROUND AT 2.0m INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

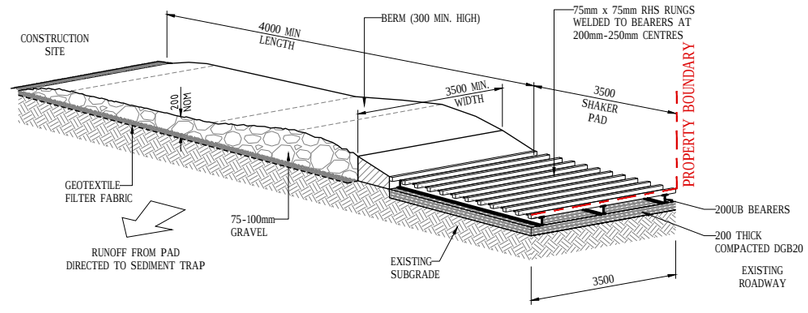


STOCKPILE

NOT TO SCALE

NOTES:

1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES 1 TO 2 METRES DOWNSLOPE.



STABILISED SITE ACCESS

NOT TO SCALE

MAINTENANCE

- THE TEMPORARY ACCESS SHALL BE MAINTAINED IN A CONDITION THAT PREVENTS TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY.
- THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL GRAVEL AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT,
- ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY.
- INSTALL BARRIER ON EITHER SIDE OF SHAKER PAD TO ENSURE VEHICLES ARE GUIDED ON TO THE PAD.
- INVERT OF SHAKER PAD TO BE DRAINED VIA AGRICULTURAL PIPE WRAPPED IN GEOTEXTILE FABRIC.

ISSUED FOR SSD APPLICATION

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VERIFICATION
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HANSEN YUNCKEN
Building 1, L3
75-85 O'Riordan St, Alexandria

CLIENT
ALTIS
Property Partners
60 Castlereagh St, Sydney

ARCHITECT
nettletontribe

PROJECT
Lot 8 First Estate Mamre Rd Orchard Hills

DRAWING TITLE
DA Issue
SEDIMENT AND EROSION CONTROL DETAILS

SPARKS + PARTNERS
CONSULTING ENGINEERS
HYDRAULIC | CIVIL | FIRE
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AS SHOWN	SK
JOB No	DWG No	No IN SET	REV
18086	DA2.02	--- OF	1

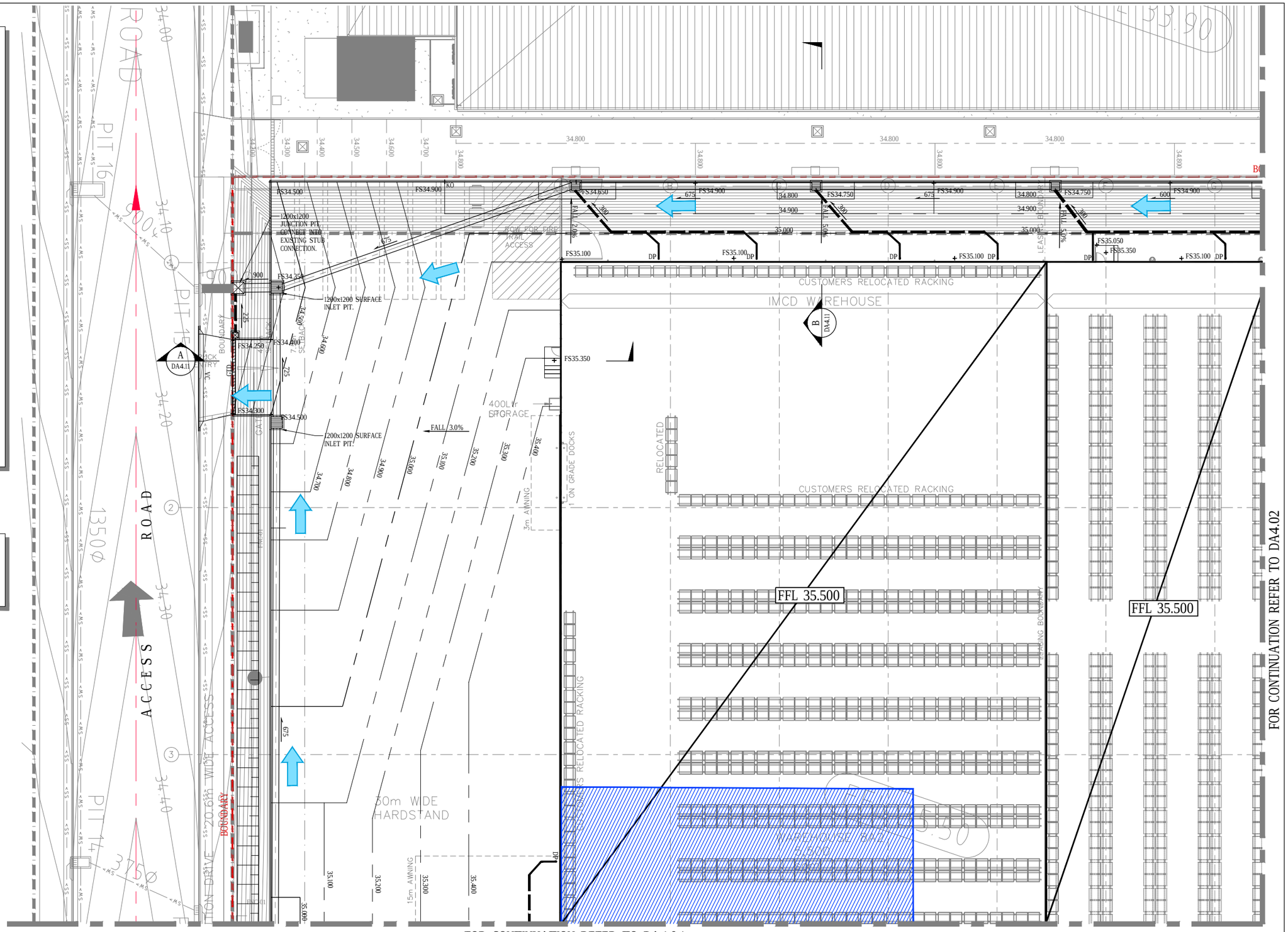
AHSCA

LEGEND

- PROPOSED STORMWATER PIPE (< 300)
- PROPOSED STORMWATER PIPE (> 300)
- EXISTING STORMWATER PIPE
- 225 — PIPE FLOW DIRECTION AND SIZE
- PROPOSED STORMWATER SURFACE INLET PIT (SIZE 900x900 U.N.O.)
- PROPOSED STORMWATER SEALED JUNCTION PIT (SIZE 900x900 U.N.O.)
- GTD — PROPOSED GRATED TRENCH DRAIN
- PROPOSED SUBSOIL DRAINAGE LINE
- • DP — PROPOSED DOWNPIPE
- RAINWATER TANK
- ROOF CATCHMENT AREA DRAINING TO RAINWATER TANK
- OVERLAND FLOW PATH
- 21.00 — FINISHED SURFACE MAJOR CONTOUR LINE
- 21.10 — FINISHED SURFACE MINOR CONTOUR LINE
- FFL 555.555 — FINISHED FLOOR LEVEL OF PROPOSED BUILDING
- + FS55.555 — FINISHED SURFACE LEVEL
- FALL 1.28% — DIRECTION OF SURFACE FALL
- PROPERTY BOUNDARY LINE
- ADJACENT BOUNDARY LINE
- KO — PROPOSED KERB ONLY - REFER DETAIL
- VC — PROPOSED VEHICULAR CROSSING - REFER DETAIL
- EXTENT OF BATTER
- RW — RETAINING WALL

NOTES

1. REFER TO DRAWING DA1.01 FOR GENERAL NOTES AND SPECIFICATIONS.
2. ROOF DRAINAGE TO BE CONFIRMED WITH HYDRAULIC DESIGNER PRIOR TO CC.
3. REFER TO DA4.11-12 FOR TYPICAL SECTIONS.



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21.06.18		ISSUED FOR SSD APPLICATION	SK	2
09.07.18		ISSUED FOR SSD APPLICATION	MW	3

CLIENT

PROJECT: Lot 8 First Estate Mamre Rd Orchard Hills

ARCHITECT

DRAWING TITLE: DA Issue
CONCEPT GRADING AND DRAINAGE PLAN SHEET 1

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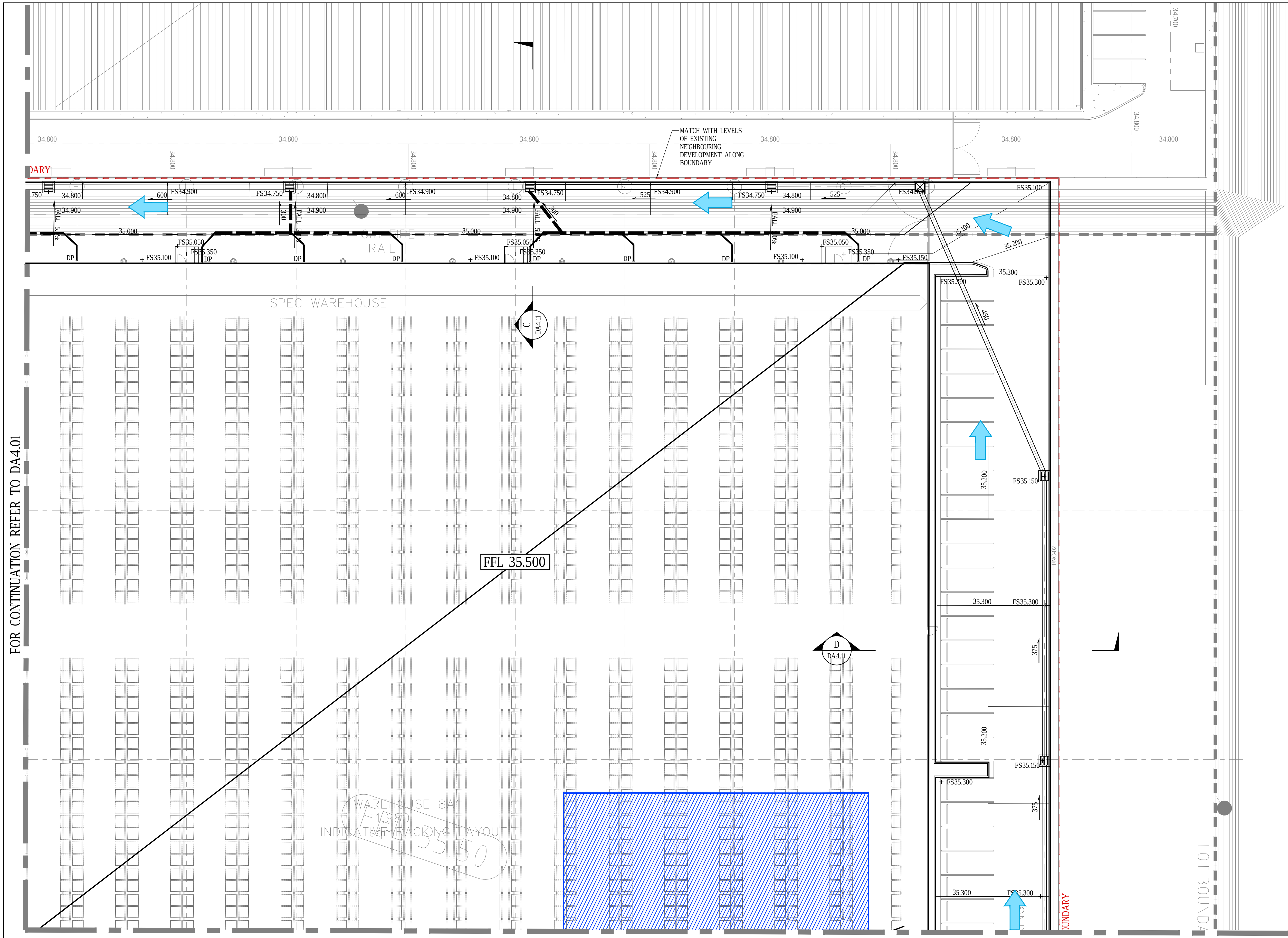
AHSCA CORPORATE MEMBER

DATE	DESIGNED	DRAWN	SCALE	JOB No	DWG No	No IN SET	REV
----	SK	SK	1:200 @ A1	18086	DA4.01	OF	3



NOTES

1. REFER TO DRAWING DA4.01 FOR LEGEND

FOR CONTINUATION REFER TO DA4.03

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ARCHITECT

PROJECT
Lot 8 First Estate Mamre Rd Orchard Hills

DRAWING TITLE
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CONCEPT GRADING AND DRAINAGE PLAN SHEET 2

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----	SK	SK	1:200 @ A1	18086	DA4.02	OF	3

FOR CONTINUATION REFER TO DA4.02

FOR CONTINUATION REFER TO DA4.04

FFL 35.500

1,880m² ROOF CATCHMENT TO RAINWATER TANK

4 ON GRADE DOCKS

RECESSED DOCK

50kL RAINWATER TANKS. DOWNPIPE AND OVERFLOW CONNECTIONS TBC IN CC STAGE

15m AWNING

38m WIDE HARDSTAND

FFL 35.500

LEVELS ALONG BOUNDARY TO BE COORDINATED WITH FUTURE DEVELOPMENT.

POTENTIAL AREA FOR DISABLED PARKING SPOT RELOCATION

DISABLED PARKING SPOT TO BE RELOCATED.

SWITCH BACK RAMP

7.5m SETBACK

4.0m SETBACK

SUBSTATION

GATE

BOUNDARY

DISTRIBUTION DRIVE

20.6m WIDE ACCESS ROAD

TRUCK ENTRY

CAR ENTRY/EXIT

ACCESS ROAD

PIT 3

PIT 4

PIT 5

PIT 6

1050ø

375ø

LOT BOUNDARY

NOTES

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PROJECT
Lot 8 First Estate Mamre Rd Orchard Hills

DRAWING TITLE
DA Issue
CONCEPT GRADING AND DRAINAGE PLAN SHEET 3

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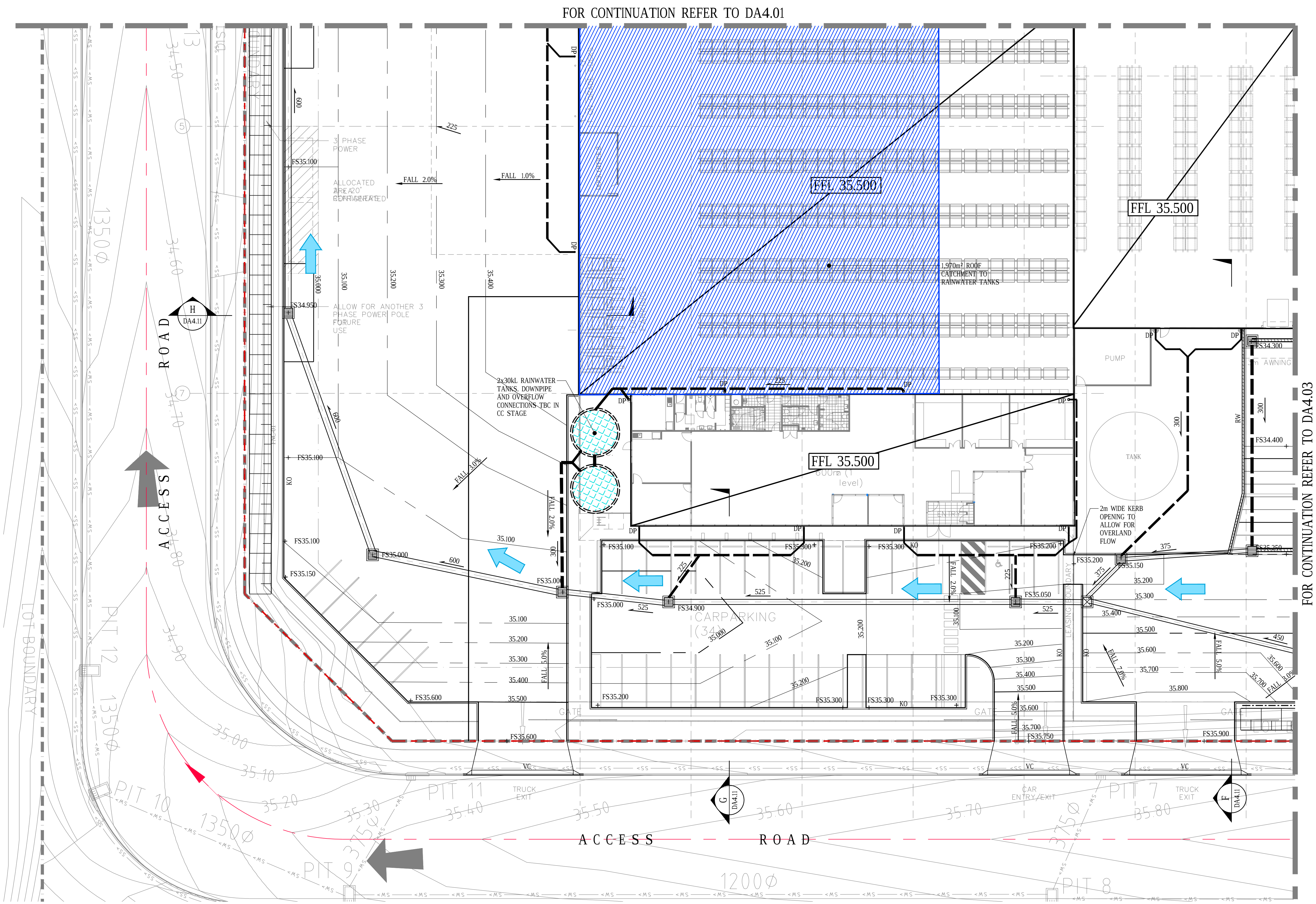

NOTES

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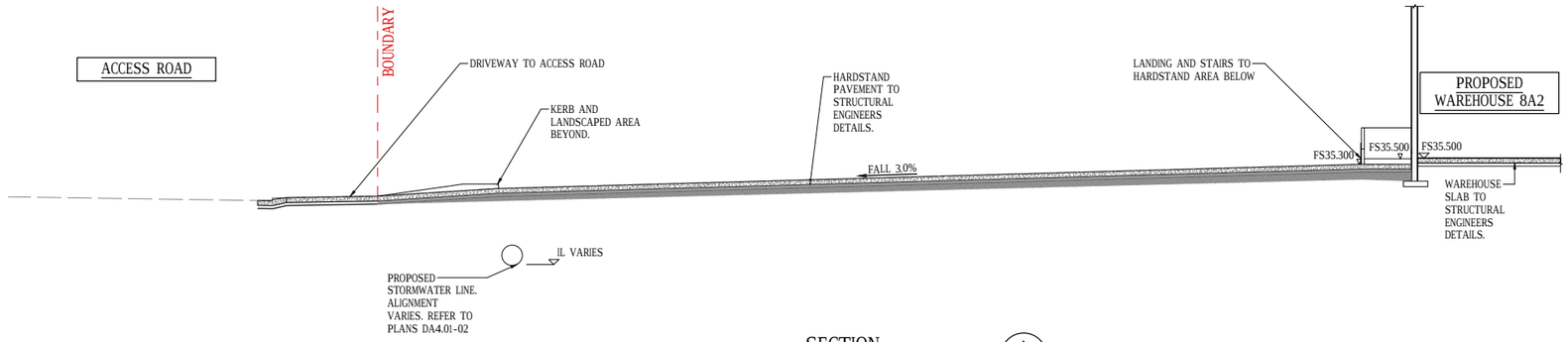

SECTION A
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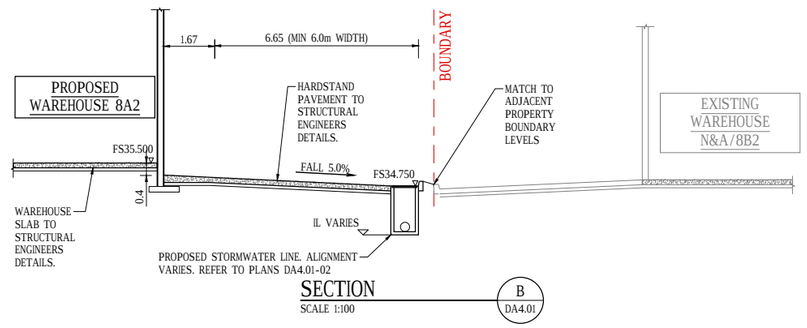
DA4.01



SECTION B
SCALE 1:100
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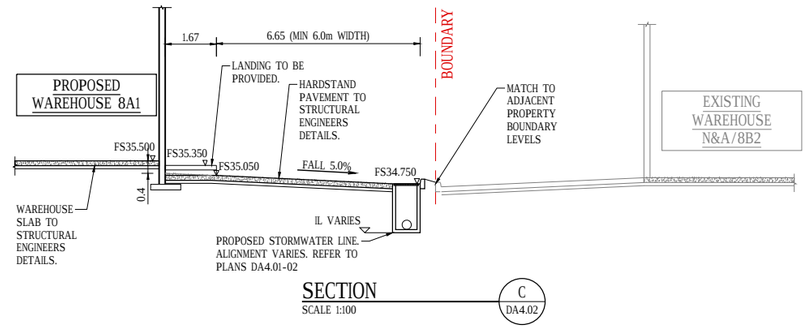

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SCALE 1:100
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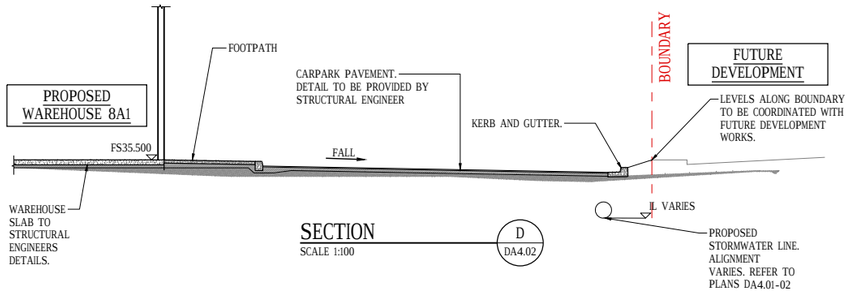

SECTION D
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DA4.02

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09.07.18		ISSUED FOR SSD APPLICATION	MW	2

DATE	No	AMENDMENT	INIT	REV

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PROJECT
Lot 8 First Estate Mamre Rd Orchard Hills

DRAWING TITLE
DA Issue
CONCEPT TYPICAL SECTIONS
SHEET 1

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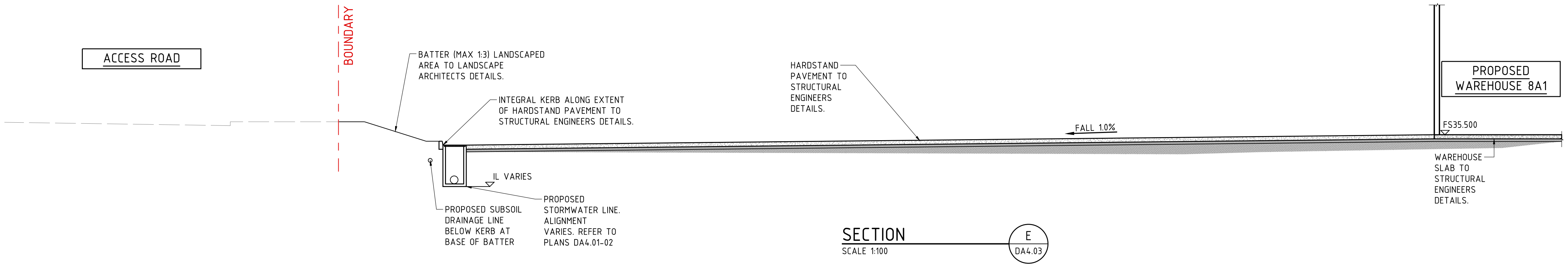

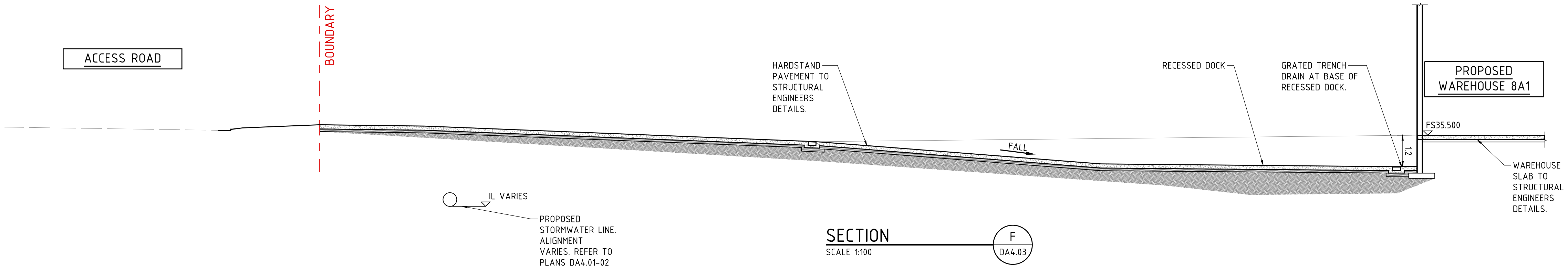

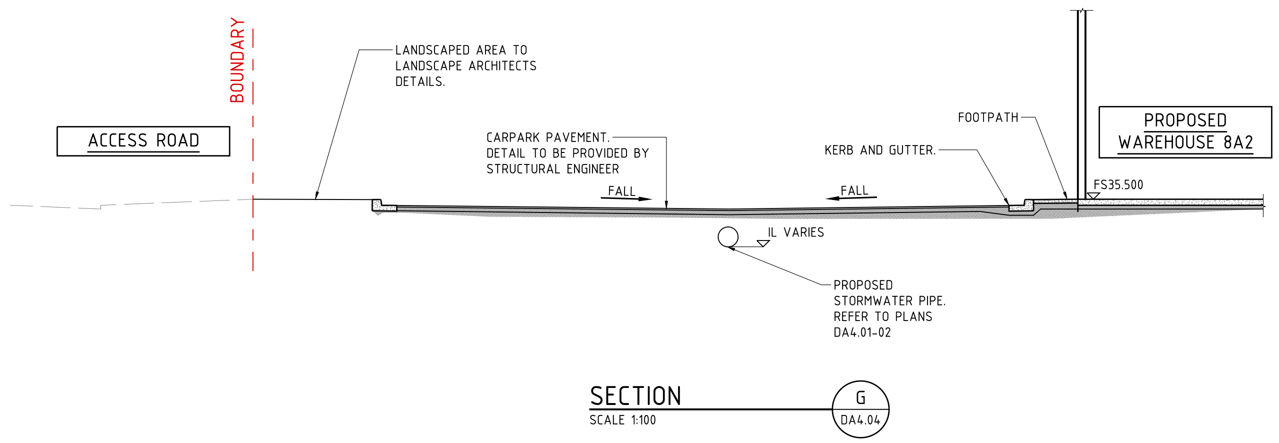

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DATE	No	AMENDMENT	INIT	REV

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ARCHITECT

PROJECT
Lot 8 First Estate Mamre Rd Orchard Hills

DRAWING TITLE
DA Issue
CONCEPT TYPICAL SECTIONS
SHEET 2

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APPENDIX C. MUSICLINK REPORT

PENRITH CITY COUNCIL

music@link

MUSIC-*link* Report

Project Details		Company Details	
Project:	18081	**Company:**	Sparks and Partners Consulting Engineers
Report Export Date:	21/06/2018	**Contact:**	Simon Kapsis
Catchment Name:	18086_MUSIC Model-RWT Sizing	**Address:**	91 George St Parramatta
Catchment Area:	0.385ha	**Phone:**	9891 5033
Impervious Area*:	100%	**Email:**	simon@sparksandpartners.com.au
Rainfall Station:	67113 PENRITH		
Modelling Time-step:	6 Minutes		
Modelling Period:	1/01/1999 - 31/12/2008 11:54:00 PM		
Mean Annual Rainfall:	691mm		
Evapotranspiration:	1158mm		
MUSIC Version:	6.3.0		
MUSIC-link data Version:	6.31		
Study Area:	Penrith		
Scenario:	Penrith Development		

* takes into account area from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness		Treatment Nodes		Source Nodes	
Node: Receiving Node	**Reduction**	**Node Type**	**Number**	**Node Type**	**Number**
Flow	37%	Rain Water Tank Node	2	Urban Source Node	2
TSS	56.7%				
TP	42%				
TN	43%				
GP	100%				

Comments

Water quality has not ben modelled for the development as estate treatment measures are in place. Reference is made to SD 15_7173, and report prepared by CostinRoe Consulting, ref: CO12042.0. The modeling provided is for determining the efficiency of the proposed rainwater tanks only in accordance with Penrith Development Control Plan 2014 (PDCP) Part C3-Water Management.

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Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Rain	Rainwater Tank 50KL	% Reuse Demand Met	80	None	85.90
Rain	Rainwater Tank 60KL	% Reuse Demand Met	80	None	86.02
Receiving	Receiving Node	% Load Reduction	None	None	37
Receiving	Receiving Node	GP % Load Reduction	90	None	100
Urban	8A1 Roof 1880sq.m	Area Impervious (ha)	None	None	0.188
Urban	8A1 Roof 1880sq.m	Area Pervious (ha)	None	None	0
Urban	8A1 Roof 1880sq.m	Total Area (ha)	None	None	0.188
Urban	8A2 Roof 1970sq.m	Area Impervious (ha)	None	None	0.197
Urban	8A2 Roof 1970sq.m	Area Pervious (ha)	None	None	0
Urban	8A2 Roof 1970sq.m	Total Area (ha)	None	None	0.197

Only certain parameters are reported when they pass validation

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Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Receiving	Receiving Node	TN % Load Reduction	45	None	43
Receiving	Receiving Node	TP % Load Reduction	60	None	42
Receiving	Receiving Node	TSS % Load Reduction	85	None	56.7

Only certain parameters are reported when they pass validation