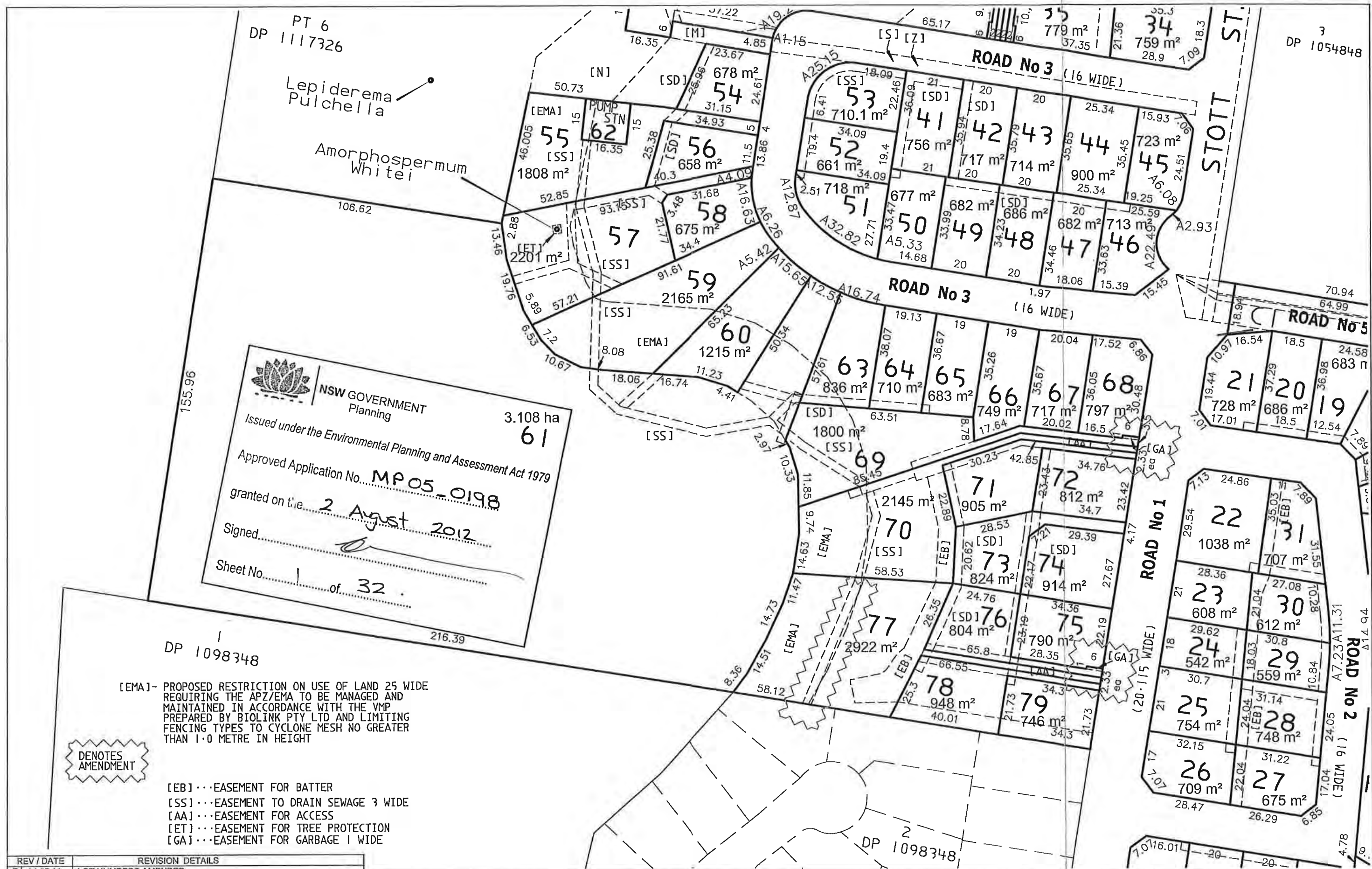




REV / DATE	REVISION DETAILS
F 04.05.11	LOT NUMBERS AMENDED
	LOT REDESIGN LOTS 35-40, ROAD 4 REMOVED
	REVISED APZ-EMA AREA LOTS 38-40
	GARBAGE AREAS ADDED TO TOP OF RIGHT OF CARRIAGEWAYS
	NEIGHBOURHOOD PROPERTY INCREASED IN SIZE
	BATTER EASEMENTS ADDED
	SEWER CONNECTION AND EASEMENT ADDED TO LOT 2 DP 1098348
	SEWER PUMP STATION SITE MOVED

LANDSURV PTY LTD
 REGISTERED SURVEYORS & DEVELOPMENT CONSULTANTS
 14 ENID STREET TWEED HEADS NSW 2485
 Ph. (07) 55366467 Fax (07) 55367489 email: macsurv@landsurv.com.au

PLAN OF PROPOSED SUBDIVISION OF
 LOT 1 DP 167380, LOT 1 DP 134787, LOT 2 DP 961928 AND
 LOT 5 DP 1117326, WALMSLEYS ROAD AND
 STOTT STREET, BILAMBIL HEIGHTS
 CLIENT: WALMSLEY AND DICKINSON

LEVEL DATUM	SCALE 1: 1250
DATE OF SURVEY	REVISION F
DATE 04.05.11	SHEET 2 OF 3
DRAWN GMB	JOB No
CHECKED BG	35054
CAD FILE No. 35054-PROP	

**DENOTES
AMENDMENT**

SEE

4m

SHEET 2

[EMA]- PROPOSED RESTRICTION ON USE OF LAND 25 WIDE
REQUIRING THE APZ/EMA TO BE MANAGED AND
MAINTAINED IN ACCORDANCE WITH THE VMP
PREPARED BY BIOLINK PTY LTD AND LIMITING
FENCING TYPES TO CYCLONE MESH NO GREATER
THAN 1.0 METRE IN HEIGHT

REV / DATE	REVISION DETAILS
F 04.05.11	LOT NUMBERS AMENDED
	LOT REDESIGN LOTS 35-40, ROAD 4 REMOVED
	REVISED APZ-EMA AREA LOTS 38-40
	GARBAGE AREAS ADDED TO TOP OF RIGHT OF CARRIAGEWAYS
	NEIGHBOURHOOD PROPERTY INCREASED IN SIZE
	BATTER EASEMENTS ADDED
	SEWER CONNECTION AND EASEMENT ADDED TO LOT2 DP 109834
	SEWER PUMP STATION SITE MOVED

[illegible]NSW GOVERNMENT
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DP PT 6
1117326

3 WID
[X]

LANDSURV PTY LTD

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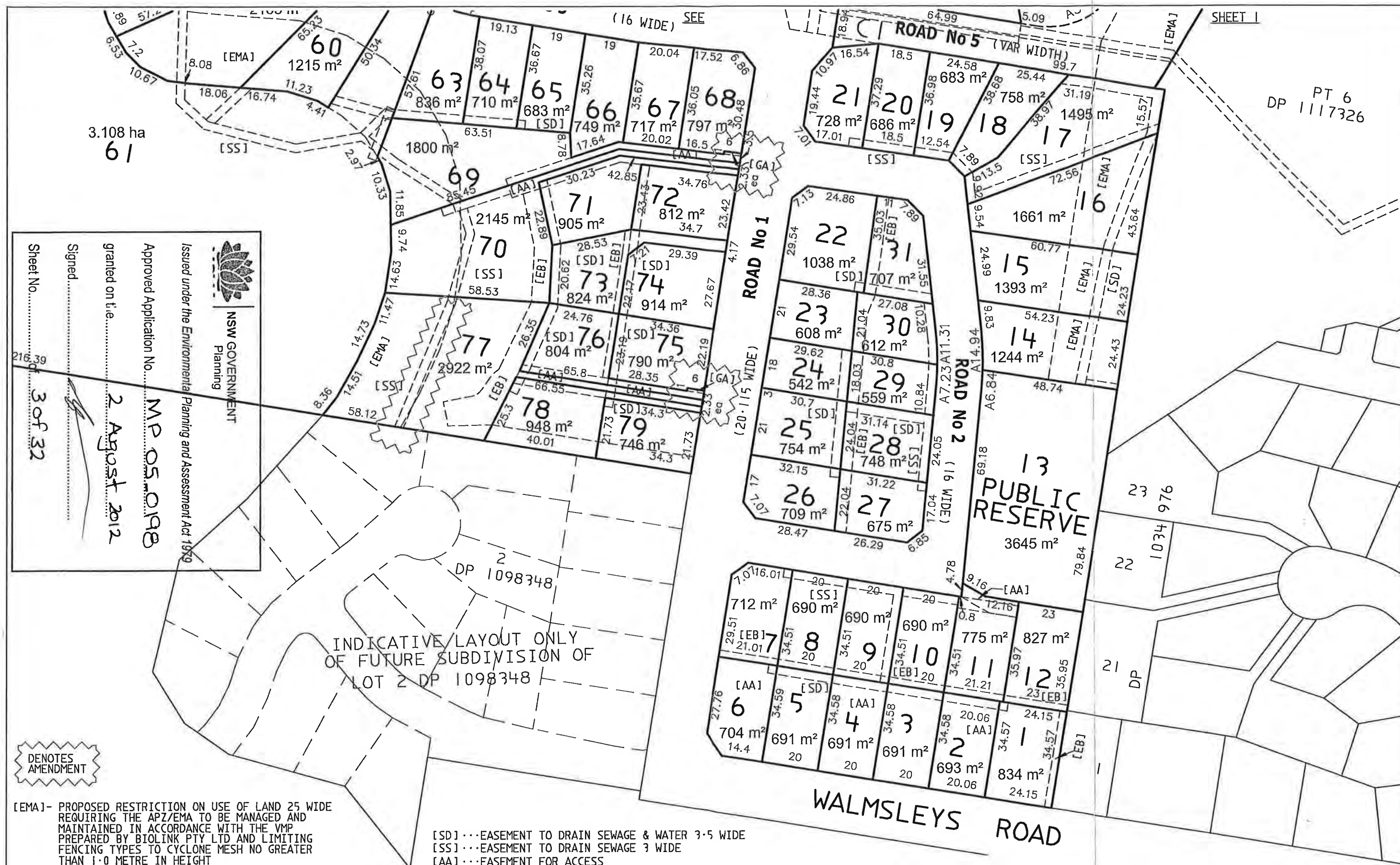
14 ENID STREET TWEED HEADS NSW 2485

Ph. (07) 55366467 Fax (07)55367489 email: macsurv@landsurv.com.au

PLAN OF PROPOSED SUBDIVISION OF
LOT 1 DP 167380, LOT 1 DP 134787, LOT 2 DP 961928 AND
LOT 5 DP 1117326, WALMSLEYS ROAD AND
STOTT STREET, BILAMBIL HEIGHTS

CLIENT: WALMSLEY AND DICKINSON

LEVEL DATUM	SCALE 1: 1250 REVISION F SHEET 1 OF 3 JOB No 35054
DATE OF SURVEY	
DATE 04.05.11	
DRAWN GMB	
CHECKED BG	
CAD FILE No. 35054-PROP	



REV / DATE	REVISION DETAILS
F 04.05.11	LOT NUMBERS AMENDED
	LOT REDESIGN LOTS 35-40, ROAD 4 REMOVED
	REVISED APZ-EMA AREA LOTS 38-40
	GARBAGE AREAS ADDED TO TOP OF RIGHT OF CARRIAGEWAYS
	NEIGHBOURHOOD PROPERTY INCREASED IN SIZE
	BATTER EASEMENTS ADDED
	SEWER CONNECTION AND EASEMENT ADDED TO LOT 2 DP 1098348
	SEWER PUMP STATION SITE MOVED

LANDSURV PTY LTD
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LOT 1 DP 167380, LOT 1 DP 134787, LOT 2 DP 961928 AND
LOT 5 DP 1117326, WALMSLEYS ROAD AND
STOTT STREET, BILAMBIL HEIGHTS
CLIENT: WALMSLEY AND DICKINSON

LEVEL DATUM	SCALE 1: 1250
DATE OF SURVEY	REVISION F
DATE 04.05.11	SHEET 3 OF 3
DRAWN GMB	JOB No
CHECKED BG	35054
CAD FILE No. 35054-PROP	





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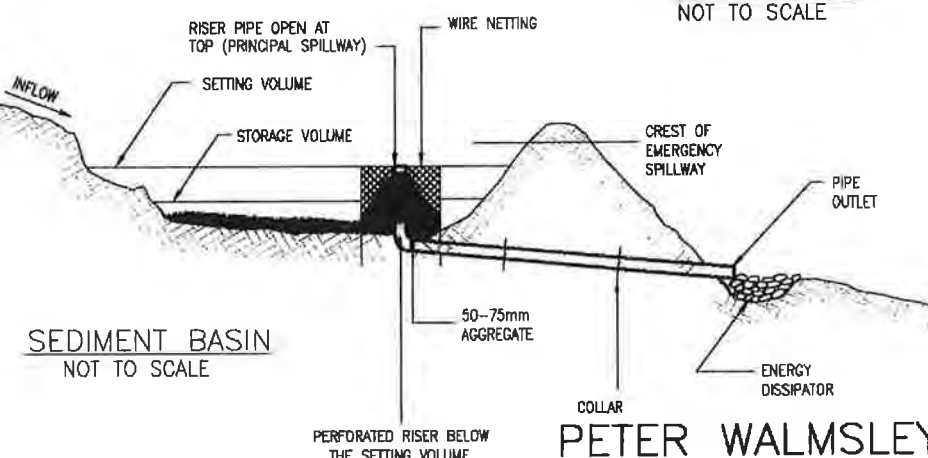
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Sheet 5 of 32



CHECK DAM
NOT TO SCALE



SEDIMENT BASIN
NOT TO SCALE

LEGEND

S.F.

PROPOSED SILT FENCE

D.C.

DIVERSION CHANNEL

C.D.

CATCH DRAIN

SB-1

SEDIMENT BASIN

CATCHMENT BOUNDARY

|||||

SHAKEDOWN DEVICE
IN ACCORDANCE WITH TSC D7

I

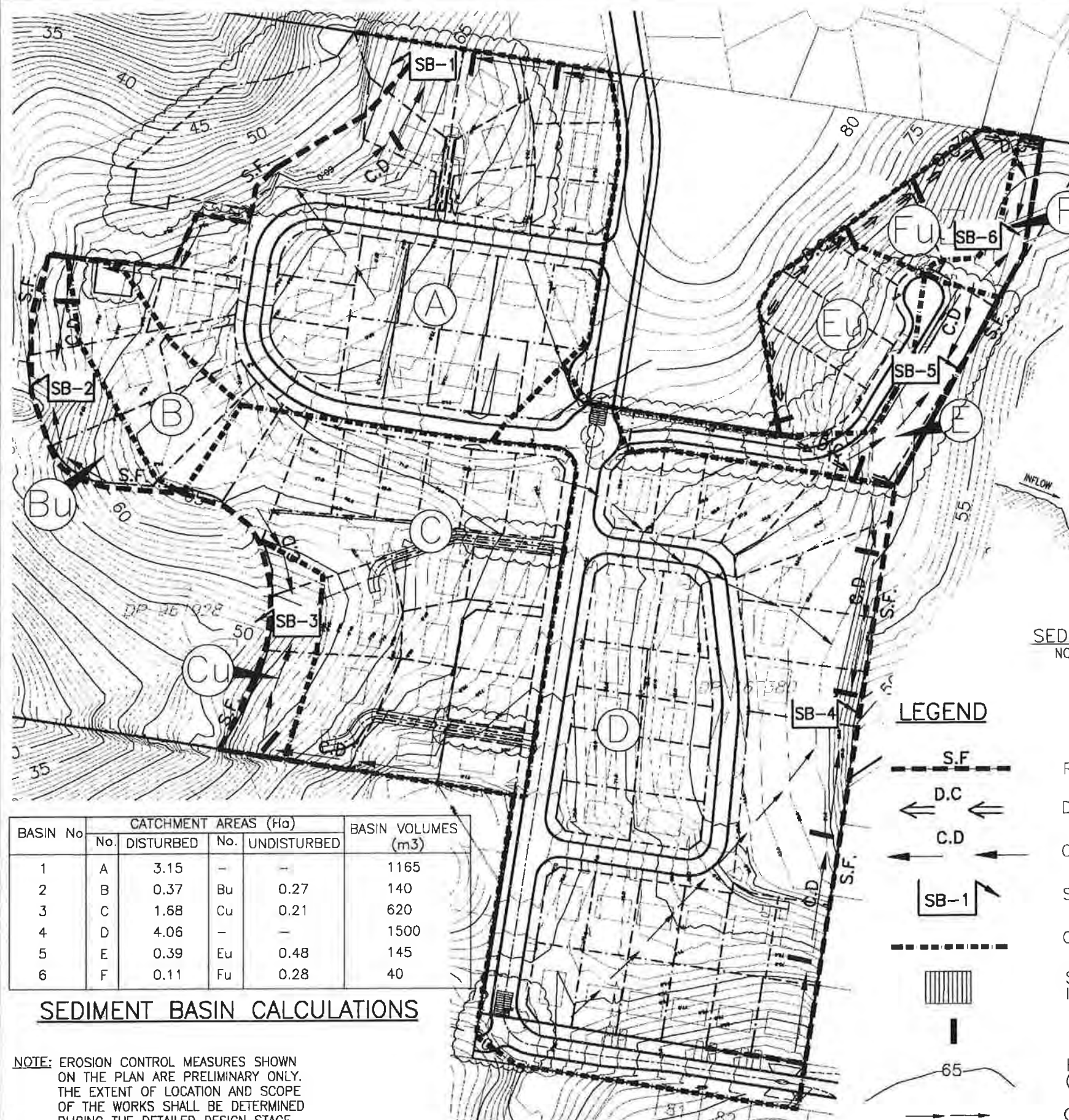
ROCK CHECK DAM

65

FINISHED SURFACE CONTOURS
(1.0m INTERVAL)

→

CONCENTRATED FLOW PATH



BASIN No	CATCHMENT AREAS (Ha)				BASIN VOLUMES (m ³)
	No.	DISTURBED	No.	UNDISTURBED	
1	A	3.15	-	-	1165
2	B	0.37	Bu	0.27	140
3	C	1.68	Cu	0.21	620
4	D	4.06	-	-	1500
5	E	0.39	Eu	0.48	145
6	F	0.11	Fu	0.28	40

SEDIMENT BASIN CALCULATIONS

NOTE: EROSION CONTROL MEASURES SHOWN ON THE PLAN ARE PRELIMINARY ONLY. THE EXTENT OF LOCATION AND SCOPE OF THE WORKS SHALL BE DETERMINED DURING THE DETAILED DESIGN STAGE.

OCTOBER, 2007
OCTOBER, 2006
AUGUST, 2005
FEBRUARY, 2005

APRIL, 2009
MARCH, 2009
JANUARY, 2009
OCTOBER, 2008

OCTOBER, 2011
APRIL, 2010

0 20 40 60 80m
1:2,000 UNREDUCED

NOTE: SURVEY INFORMATION FROM MCLAUCHLAN
SURVEYING DRAWING NUMBER 37401

PETER WALMSLEY,
LES & JIM DICKINSON

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WALMSLEYS ROAD
BILAMBIL HEIGHTS

FIGURE 6.0

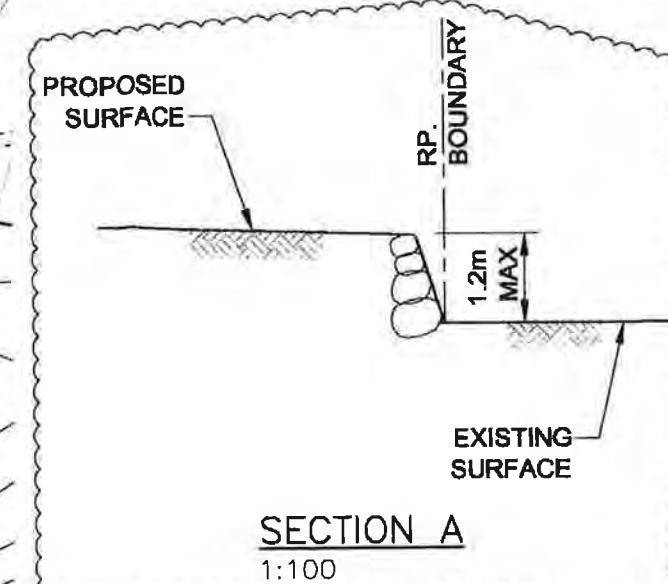
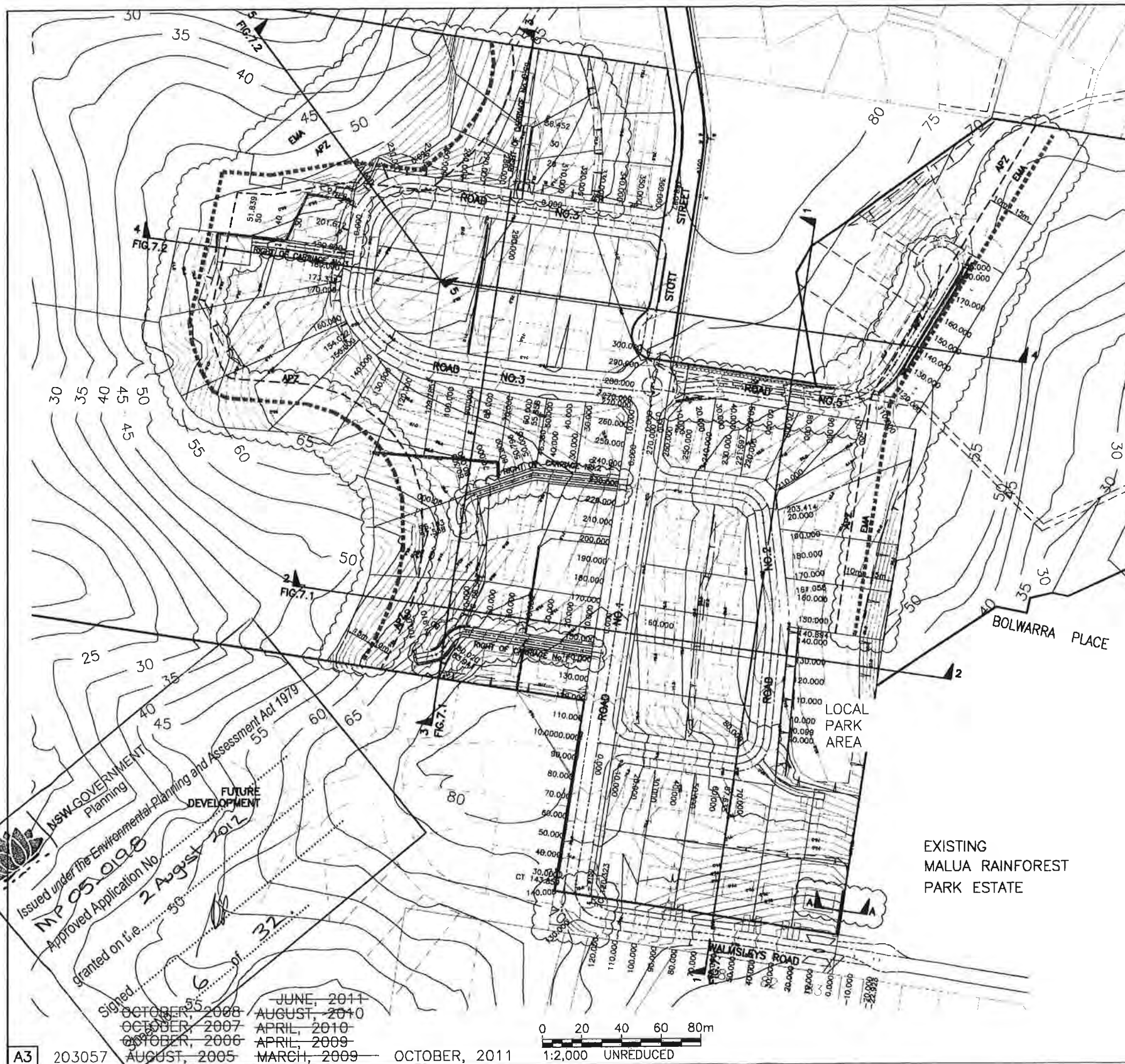
EROSION & SEDIMENT
CONTROL PLAN

OPUS QANTEC McWILLIAM



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1/10 Rivendell
PO Box 6389
Tweed Heads South NSW 2486
Telephone: (07) 5523 1755
Facsimile: (07) 5523 9664
E-Mail: tweedheads@opusqmcw.com.au



LEGEND

- 45 — FINISHED SURFACE CONTOURS (1.0m INTERVALS)
- PROPOSED RETAINING WALL
- - - APZ - - - ASSET PROTECTION ZONE
- - - PROPOSED BATTER
- EMA ENVIRONMENTAL MANAGEMENT AREA

NOTE: REFER FIGURES 7.1 & 7.2 FOR SECTIONS.

**PETER WALMSLEY,
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WALMSLEYS ROAD & STOTT STREET
BILAMBIL HEIGHTS N.S.W.

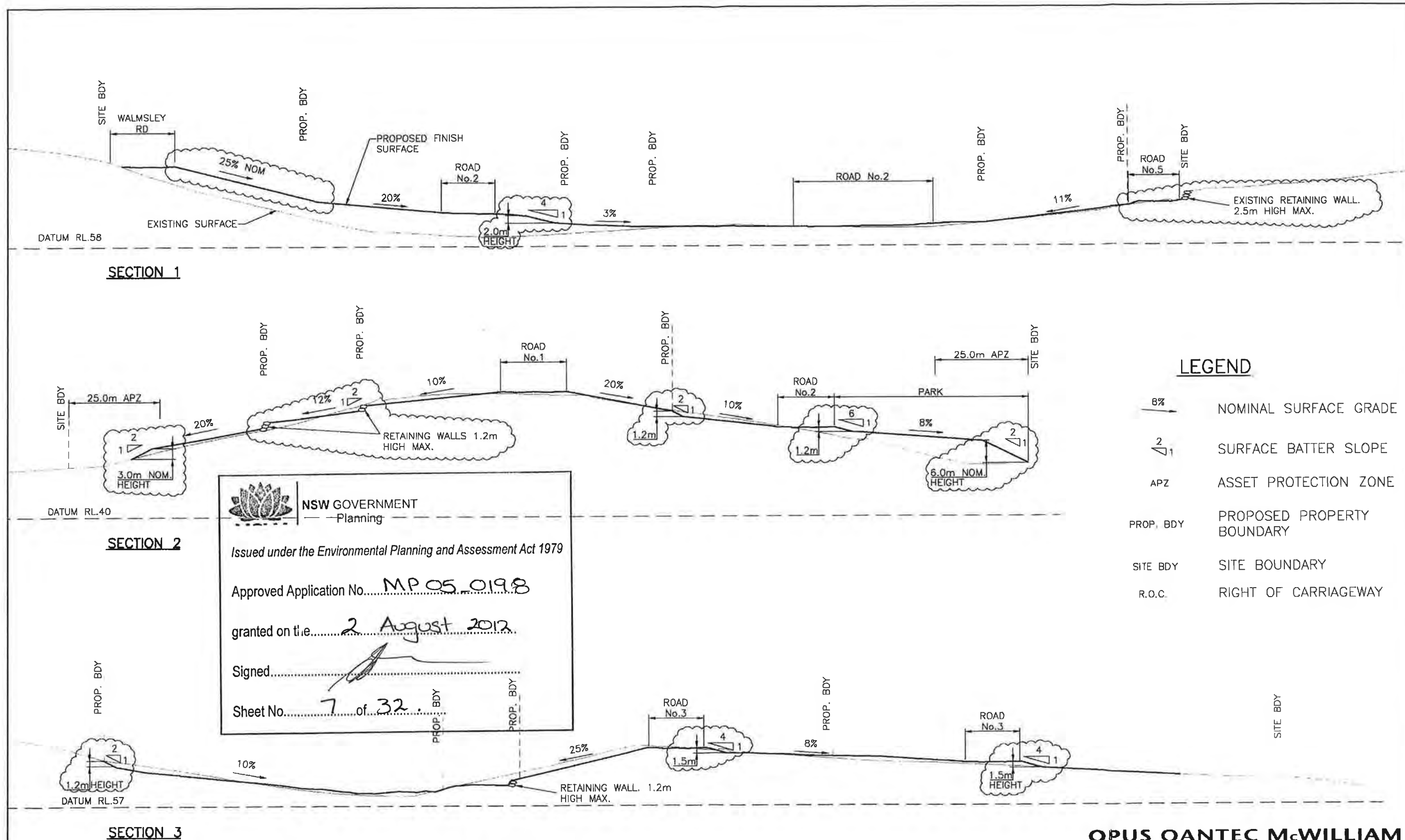
FIGURE 7.0
ROAD LAYOUT PLAN

OPUS QANTEC McWILLIAM



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JUNE, 2011
AUGUST, 2010
APRIL, 2010
APRIL, 2009
MARCH, 2009
OCTOBER, 2011
OCTOBER, 2008
OCTOBER, 2007
OCTOBER, 2006
AUGUST, 2005



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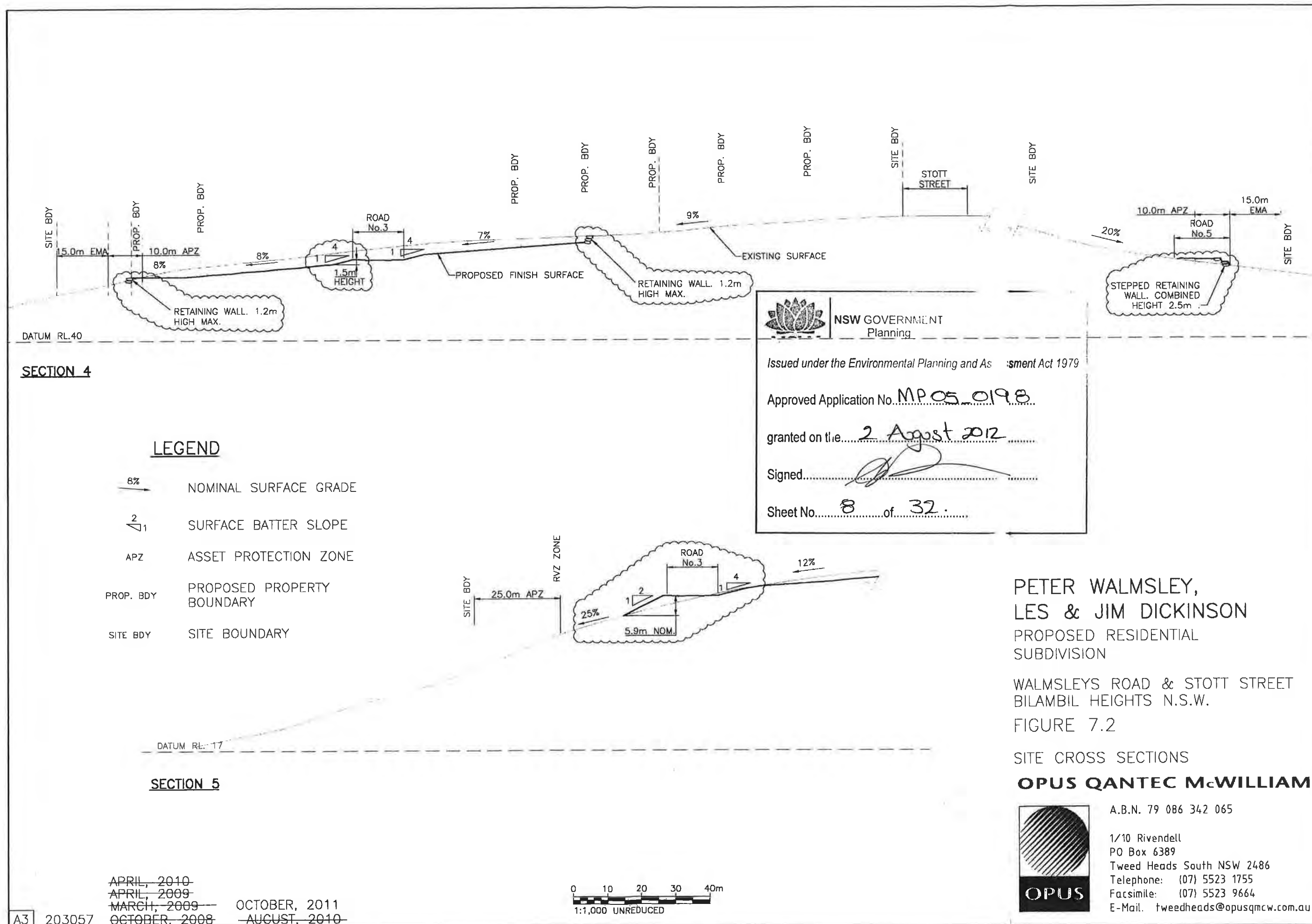
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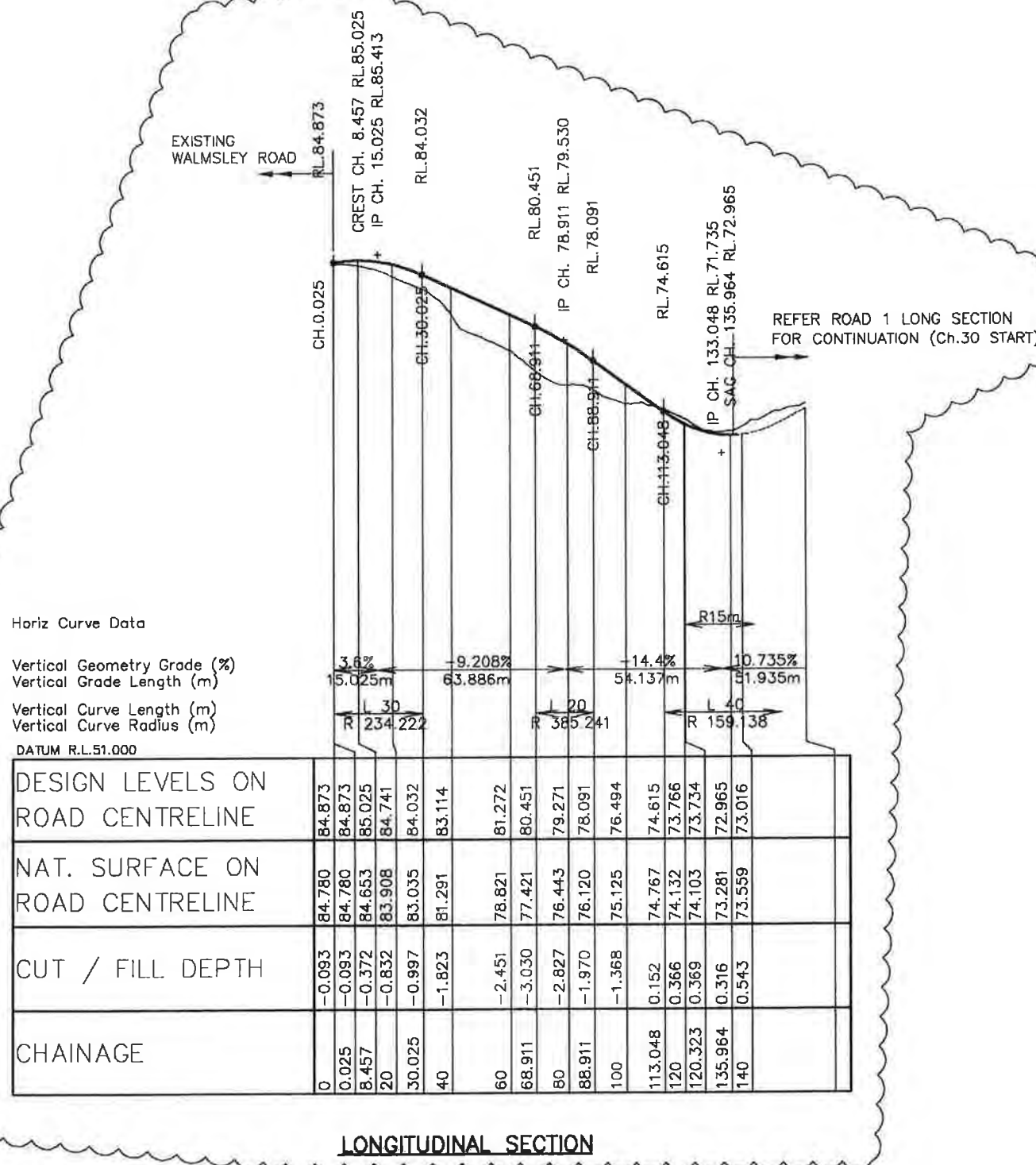
WALMSLEYS ROAD & STOTT STREET
BILAMBIL HEIGHTS N.S.W.
FIGURE 7.1
SITE CROSS SECTIONS

0 10 20 30 40m
1:1,000 UNREDUCED

~~APRIL, 2010~~
~~APRIL, 2009~~
~~MARCH, 2009~~
~~OCTOBER, 2008~~

OCTOBER, 2011
SEPTEMBER, 2010





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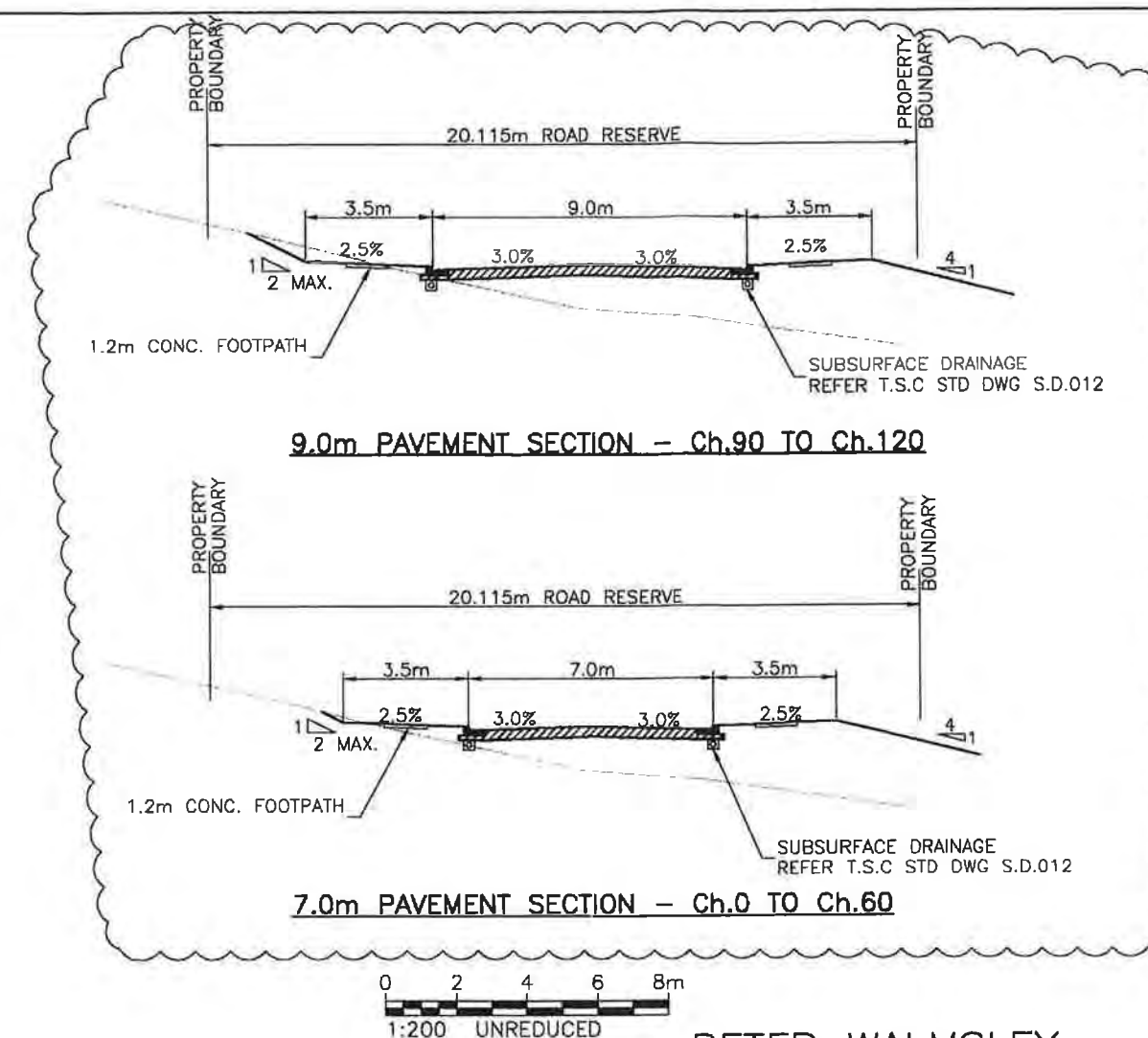
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WALMSLEYS ROAD & STOTT STREET
BILAMBIL HEIGHTS N.S.W.

FIGURE 8.0

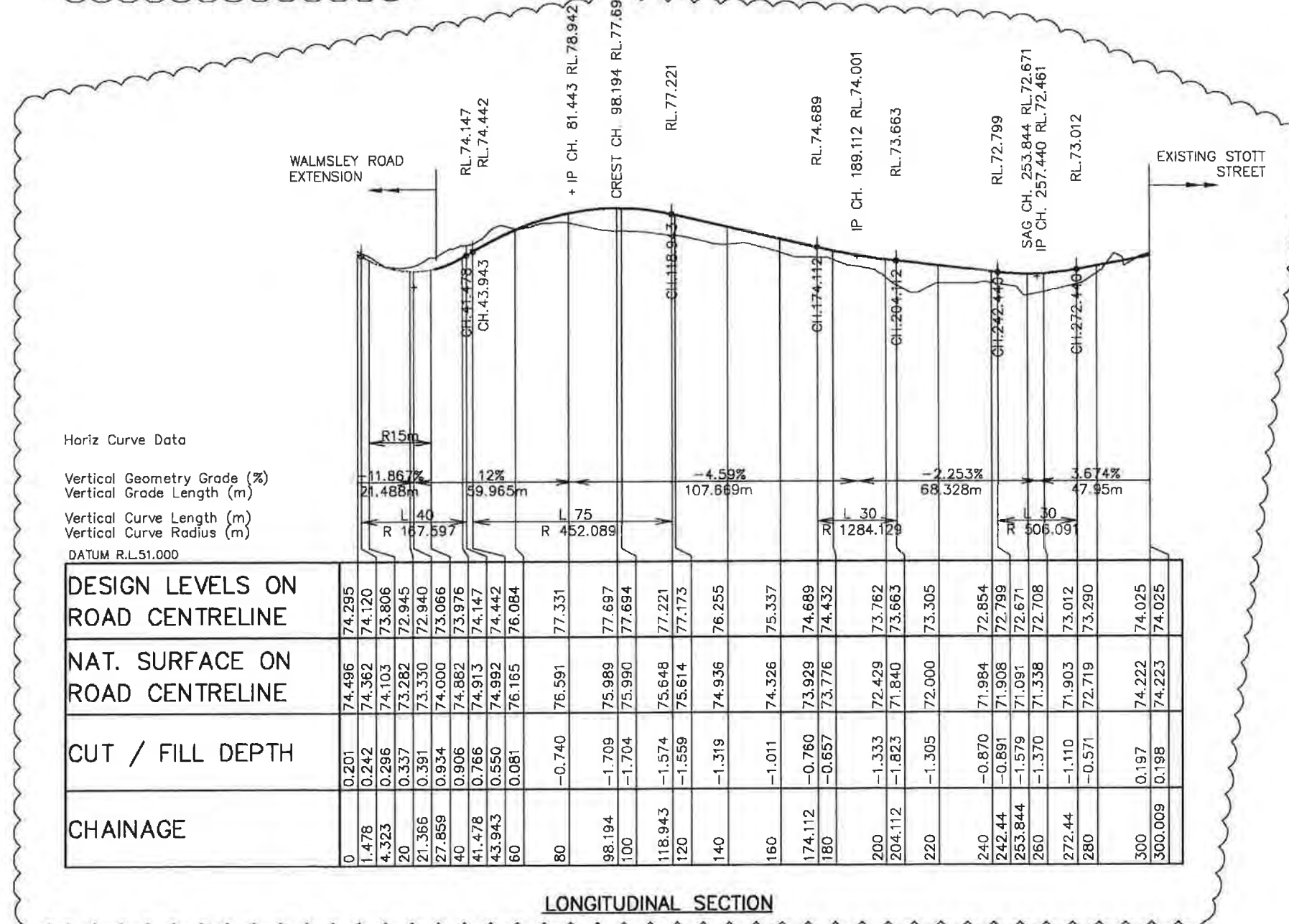
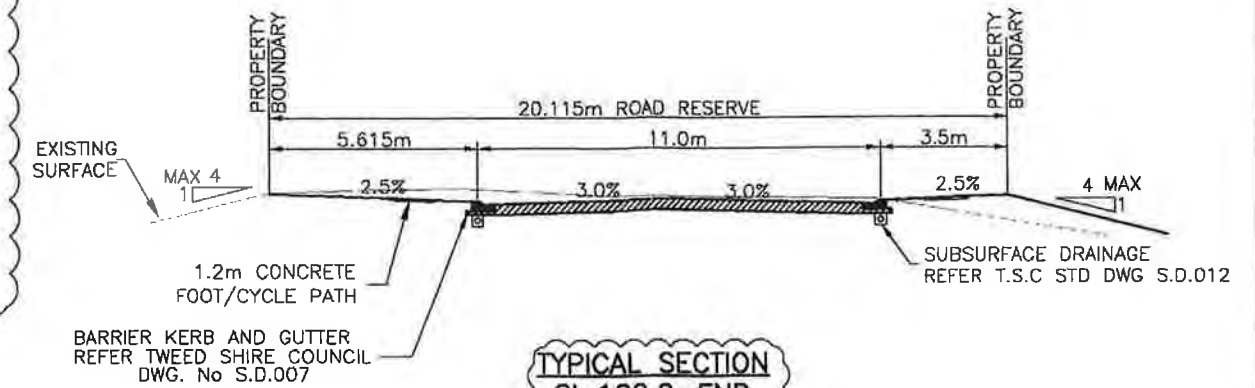
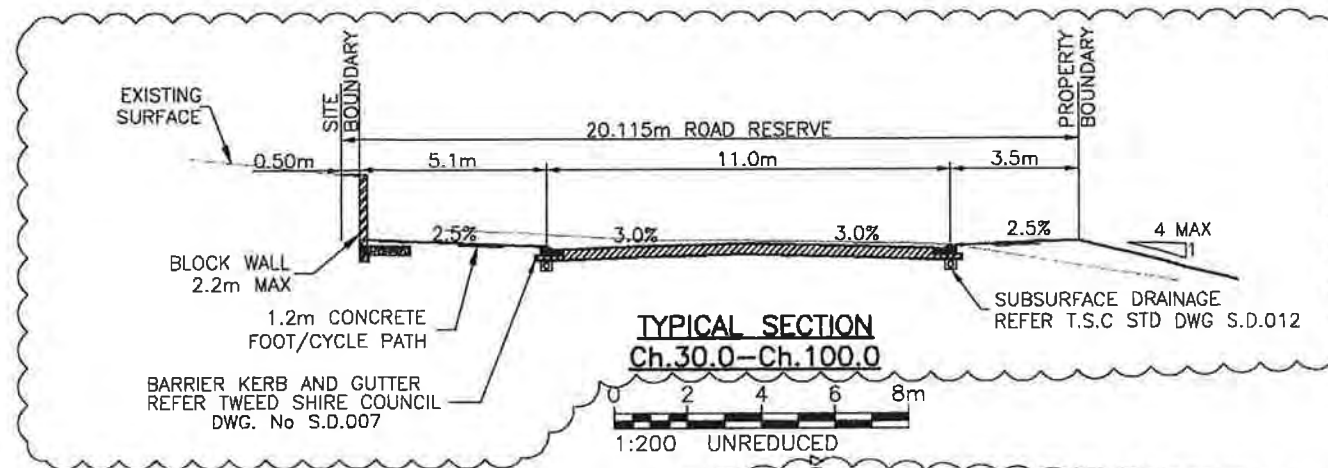
WALMSLEYS ROAD LONGITUDINAL
SECTION AND TYPICAL CROSS
SECTION

OPUS QANTEC McWILLIAM



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WALMSLEYS ROAD & STOTT STREET
BILAMBIL HEIGHTS N.S.W.

FIGURE 9.0

**ROAD 1 LONGITUDINAL SECTION
AND TYPICAL CROSS SECTION**

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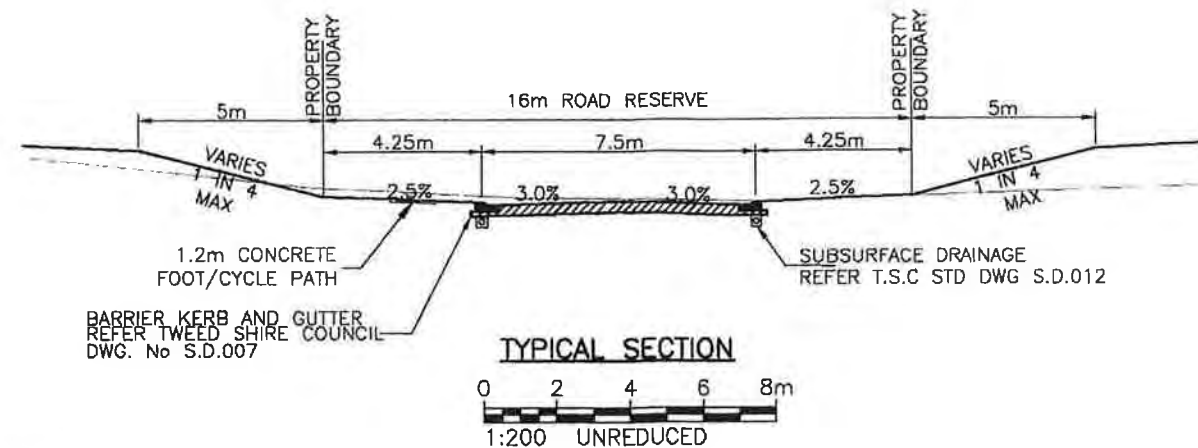
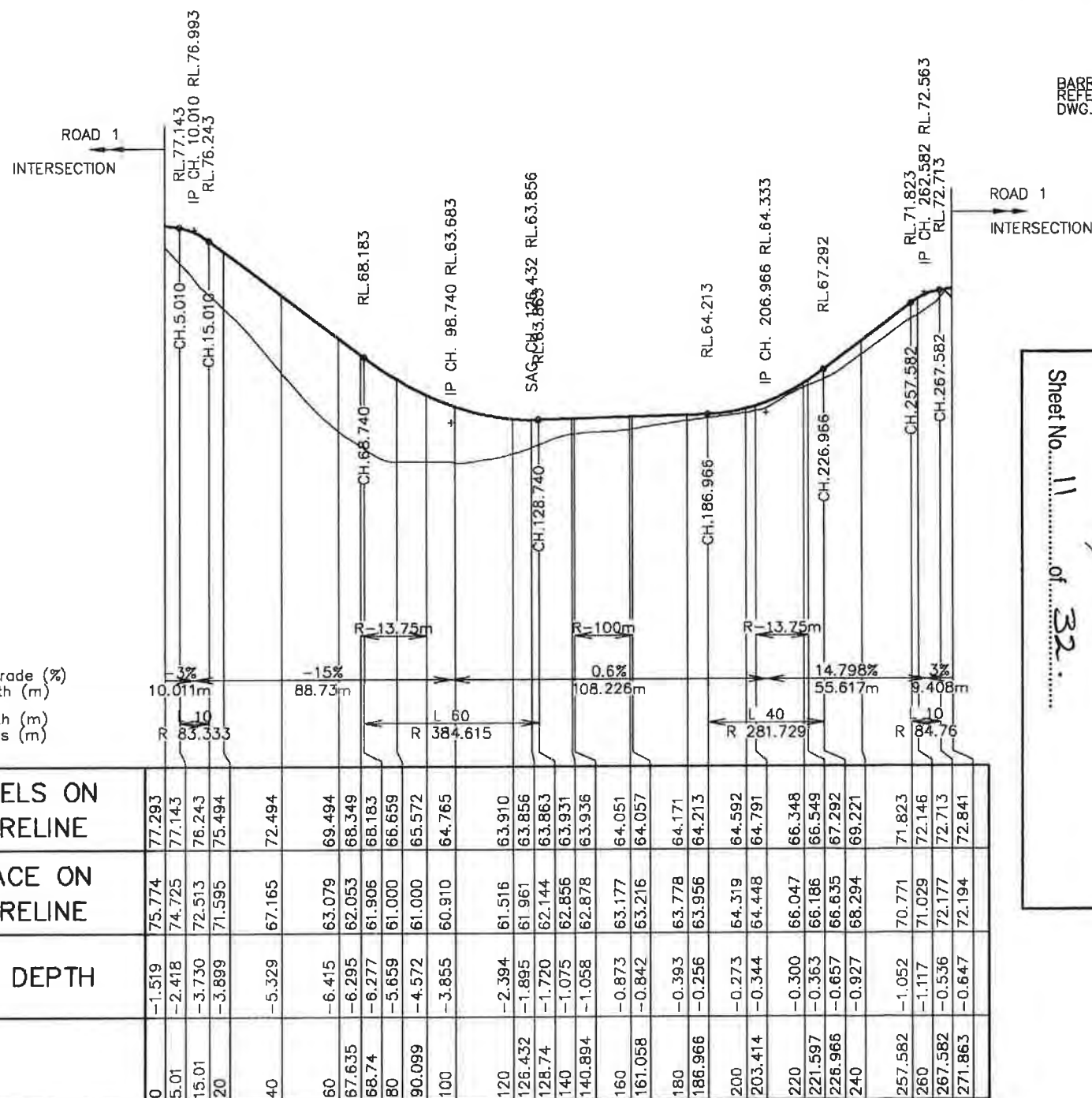


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JUNE, 2005

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AUGUST, 2010



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WALMSLEYS ROAD & STOTT STREET
BILAMBIL HEIGHTS N.S.W.

FIGURE 10.0

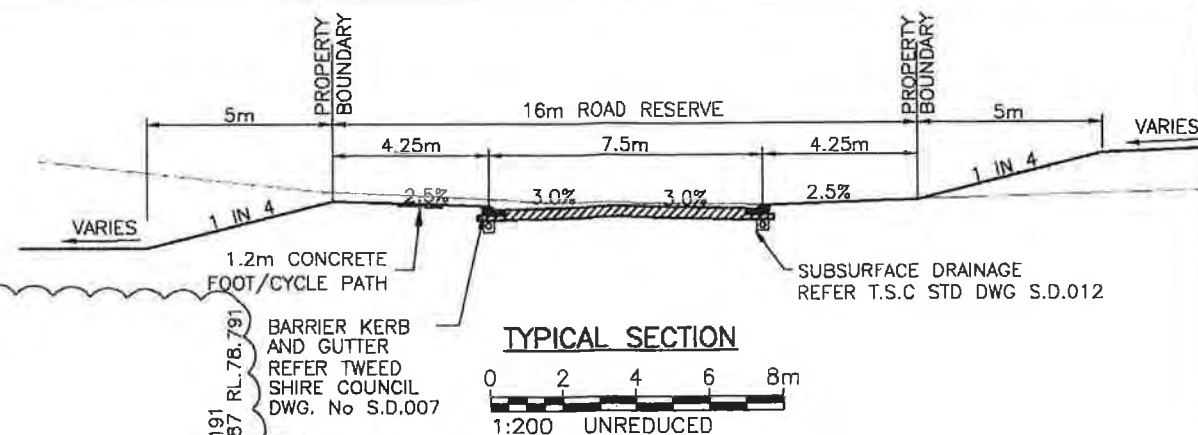
ROAD 2 LONGITUDINAL SECTION
AND TYPICAL CROSS SECTION

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WALMSLEYS ROAD & STOTT STREET
BILAMBIL HEIGHTS N.S.W.

FIGURE 11.0

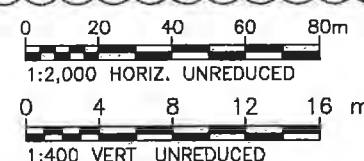
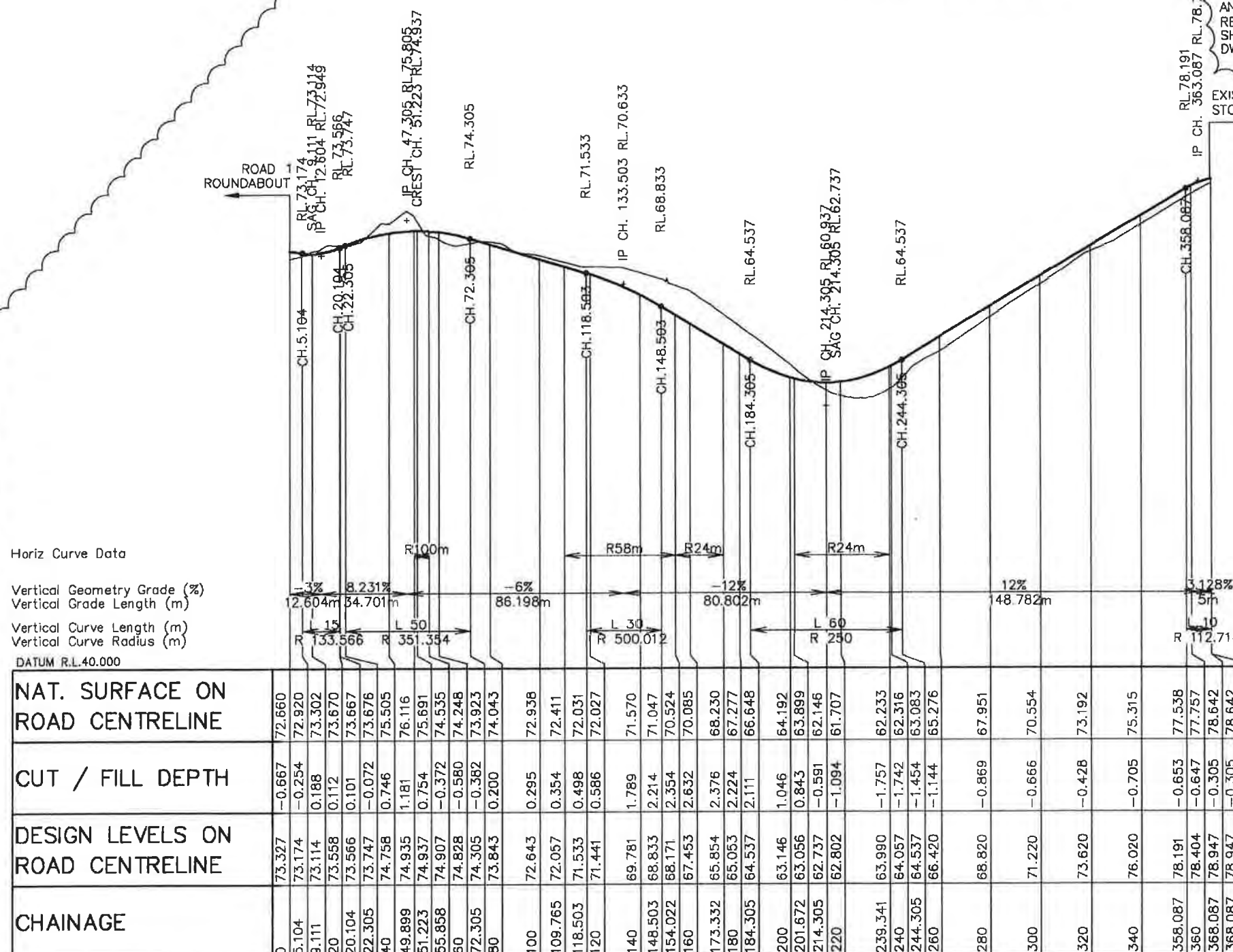
ROAD 3 LONGITUDINAL SECTION
AND TYPICAL CROSS SECTION

OPUS QANTEC McWILLIAM



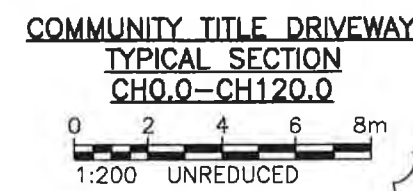
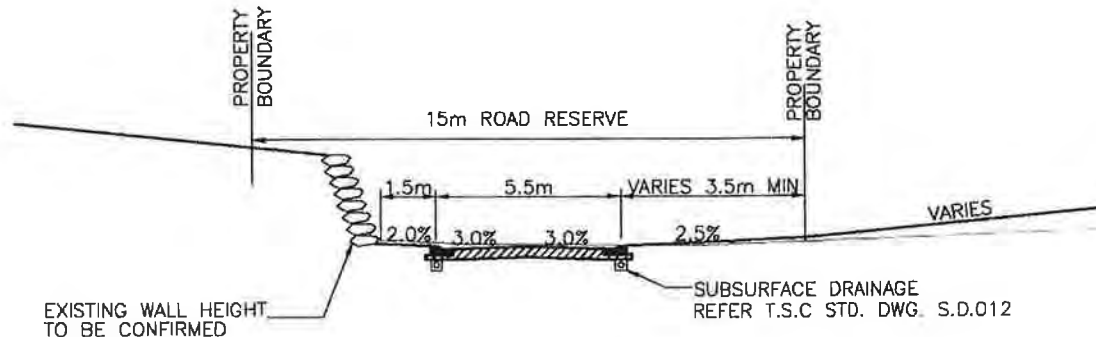
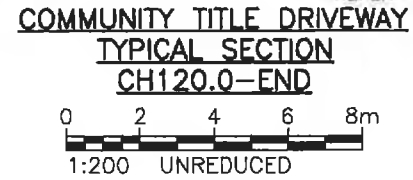
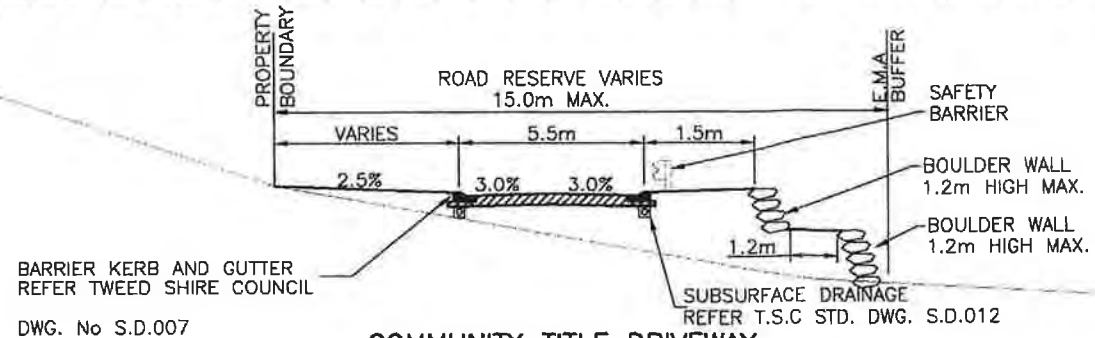
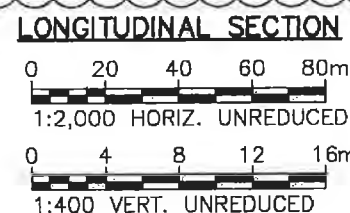
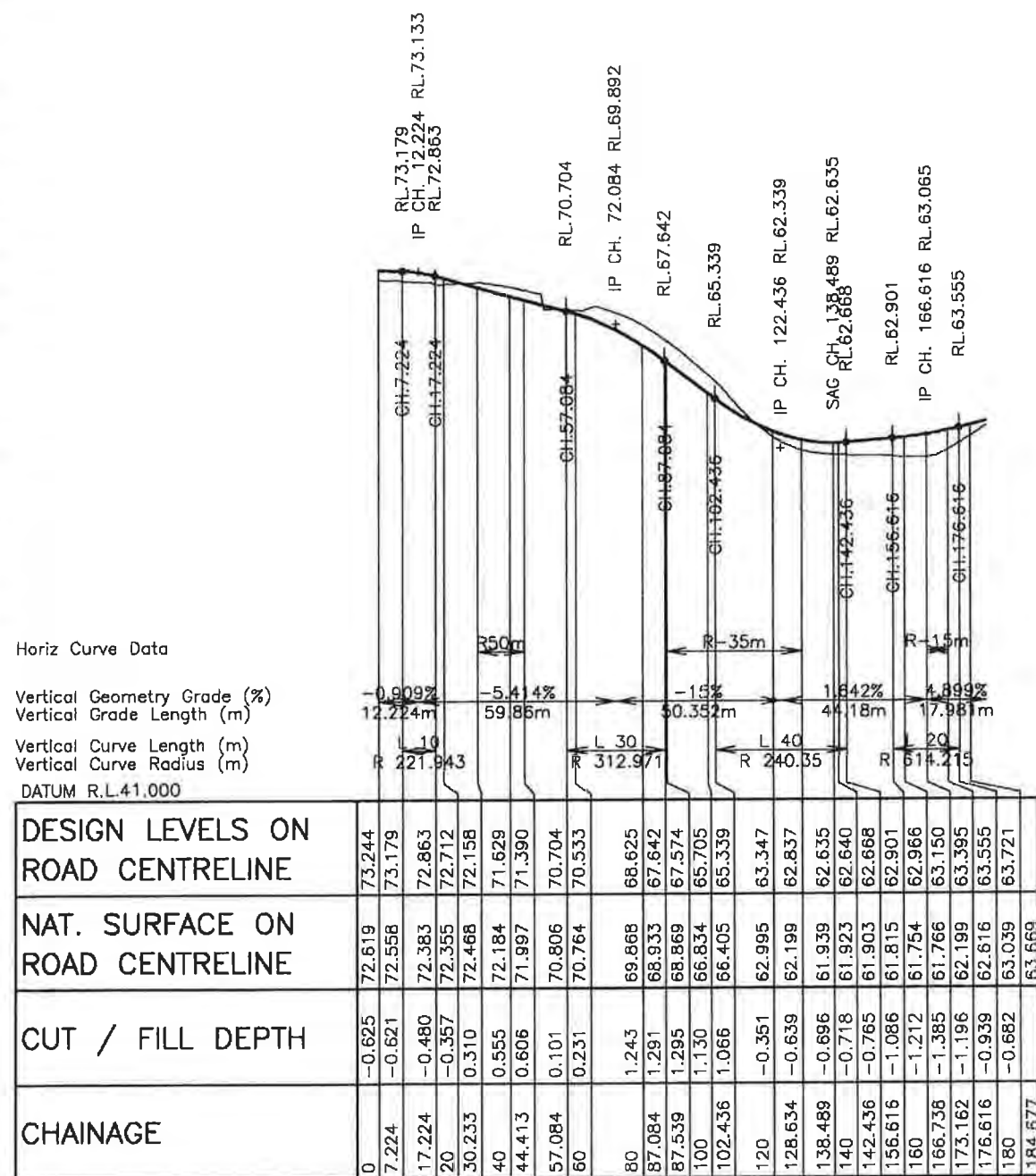
A.B.N. 79 086 342 065

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WALMSLEYS ROAD & STOTT STREET
BILAMBIL HEIGHTS N.S.W.

FIGURE 12.0

ROAD 5 LONGITUDINAL SECTION
AND TYPICAL CROSS SECTION

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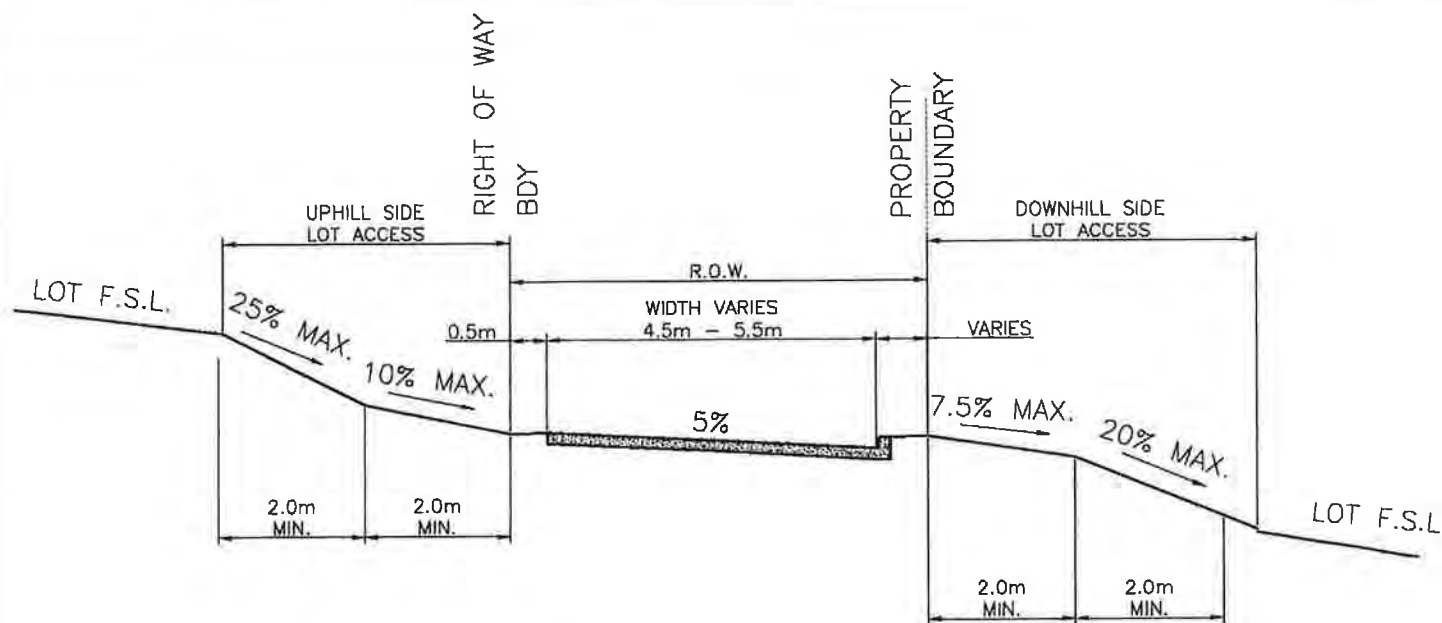


A.B.N. 79 086 342 065

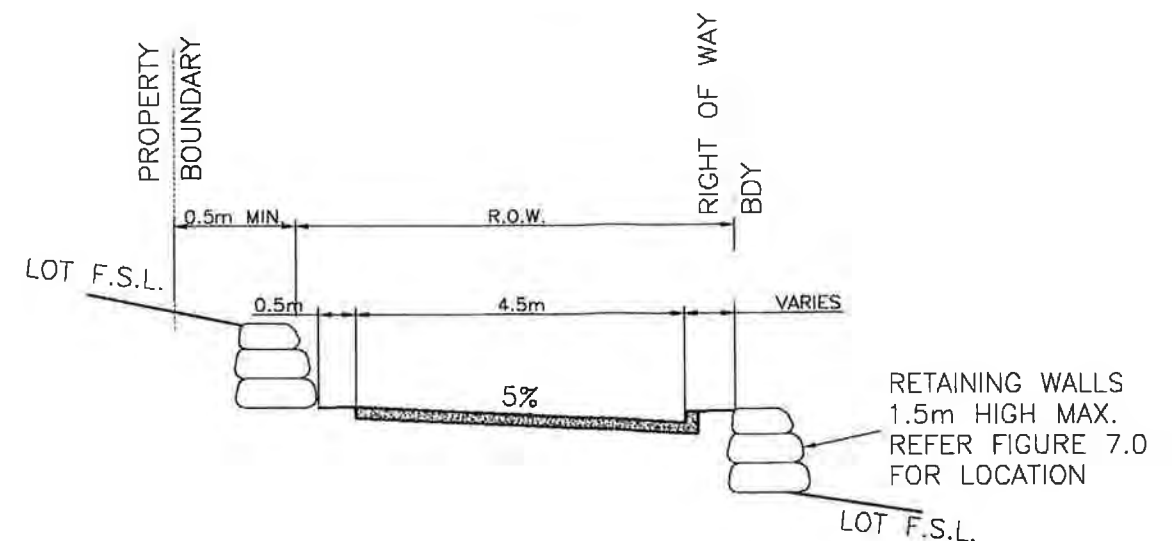
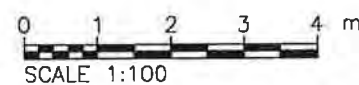
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JUNE, 2005

OCTOBER, 2011
SEPTEMBER 2010
AUGUST, 2010



TYPICAL SECTION CH00 TO CH70 and CH85 TO END



TYPICAL SECTION CH 70 to 85

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Horiz Curve Data

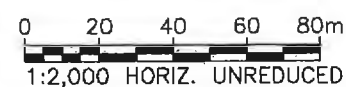
Vertical Geometry Grade (%)
Vertical Grade Length (m)

Vertical Curve Length (m)
Vertical Curve Radius (m)

DATUM R.L.45.000

NAT. SURFACE ON ROAD CENTRELINE	75.721	77.114	76.746	76.227	75.210	71.778	69.722	68.516	68.517	68.670	68.670	68.675	67.977	67.206	66.428
CUT / FILL DEPTH	-0.011	1.945	1.975	2.322	2.346	0.729	-0.080	0.666	0.670	1.490	1.830	2.027	1.712		
DESIGN LEVELS ON ROAD CENTRELINE	75.732	75.168	74.771	73.906	73.864	71.050	69.802	67.850	67.846	67.180	66.845	65.951	65.494		
CHAINAGE	0	20	30.294	40	40.294	60	68.517	80	80.02	83.941	85.911	91.91	95.911	100	

LONGITUDINAL SECTION



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WALMSLEYS ROAD & STOTT STREET
BILAMBIL HEIGHTS N.S.W.

FIGURE 12.1

RIGHT OF CARRIAGEWAY No.1
LONGITUDINAL SECTION
AND TYPICAL CROSS SECTIONS

OPUS QANTEC McWILLIAM



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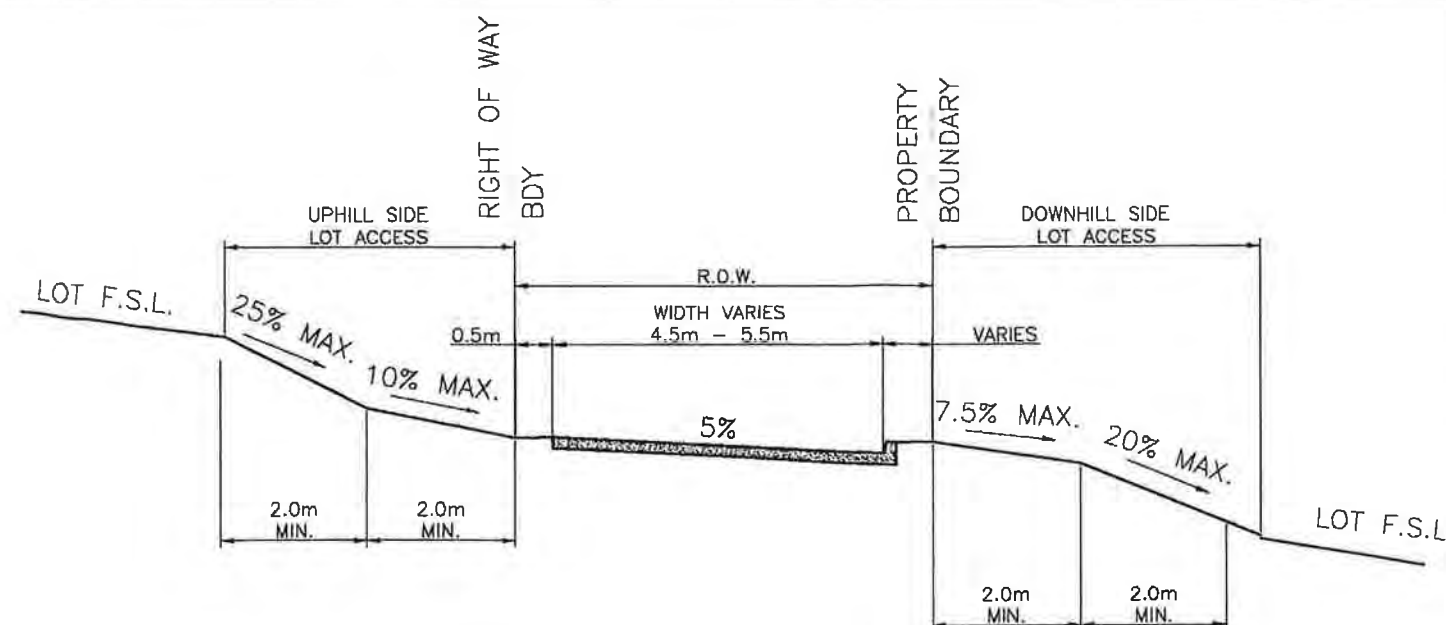
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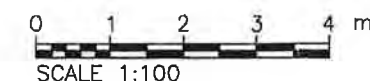
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TYPICAL SECTION CH00 TO CH70 and CH85 TO END



Horiz Curve Data

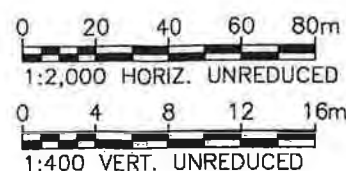
Vertical Geometry Grade (%)
Vertical Grade Length (m)

Vertical Curve Length (m)
Vertical Curve Radius (m)

DATUM R.L.10.000

NAT. SURFACE ON ROAD CENTRELINE	72.000	72.000	72.000	71.863	70.791	68.567	67.994	66.479	66.459	64.827	63.199	63.151	62.590	60.445	60.545	60.780
CUT / FILL DEPTH	-0.895	0.563	1.000	1.497	1.811	0.248	0.132	-0.441	-0.449	-0.567	-0.159	-0.155	-0.181	-1.240	-1.061	
DESIGN LEVELS ON ROAD CENTRELINE	72.895	71.437	71.000	70.365	68.980	68.319	67.861	66.920	66.908	65.393	63.359	63.305	62.771	61.685	61.607	
CHAINAGE	0	16.204	20	26.204	40	46.38	50.796	59.877	60	69.877	80	80.305	83.374	93.374	95.193	97.558

LONGITUDINAL SECTION



PETER WALMSLEY,
LES & JIM DICKINSON

PROPOSED RESIDENTIAL
SUBDIVISION

WALMSLEYS ROAD & STOTT STREET
BILAMBIL HEIGHTS N.S.W.

FIGURE 12.2

RIGHT OF CARRIAGEWAY No.2
LONGITUDINAL SECTION
AND TYPICAL CROSS SECTIONS

OPUS QANTEC McWILLIAM



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1/10 Rivendell
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Telephone: (07) 5523 1755
Facsimile: (07) 5523 9664
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Horiz Curve Data

Vertical Geometry Grade (%)
Vertical Grade Length (m)

2.544% +10.0%
4.27m 47.569m

Vertical Curve Length (m)
Vertical Curve Radius (m)

DATUM R.L.39.000

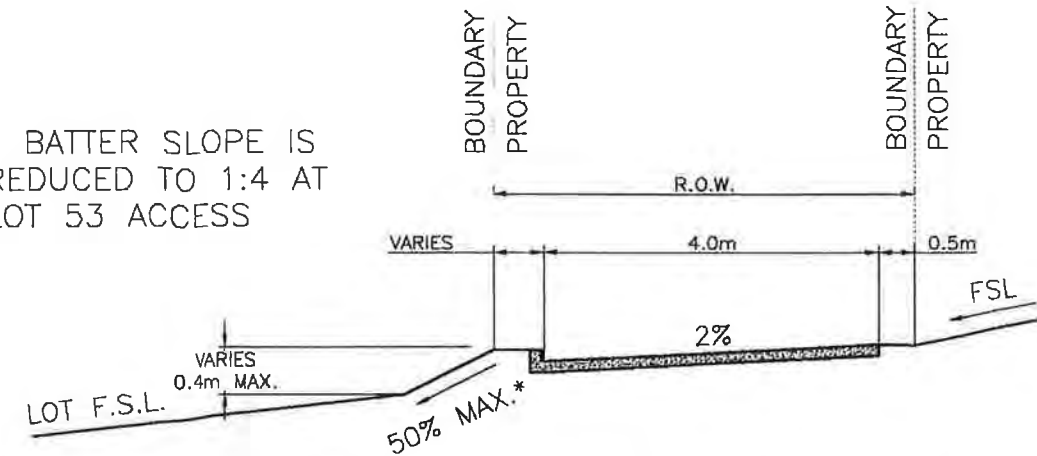
NAT. SURFACE ON ROAD CENTRELINE	65.584	63.381	61.515	60.488
CUT / FILL DEPTH	1.515	0.855	1.089	1.305
DESIGN LEVELS ON ROAD CENTRELINE	64.069	62.604	60.604	59.420
CHAINAGE	0	20	40	51.839

RIGHT OF CARRIAGEWAY — LOTS 53 & 60

0 20 40 60 80m
1:2,000 HORIZ. UNREDUCED

0 4 8 12 16m
1:400 VERT. UNREDUCED

* BATTER SLOPE IS
REDUCED TO 1:4 AT
LOT 53 ACCESS



TYPICAL LOT ACCESS DRIVEWAY— LOTS 53 & 60

0 1 2 3 4 m
SCALE 1:100

PETER WALMSLEY,
LES & JIM DICKINSON

PROPOSED RESIDENTIAL
SUBDIVISION

WALMSLEYS ROAD & STOTT STREET
BILAMBIL HEIGHTS N.S.W.

FIGURE 12.3

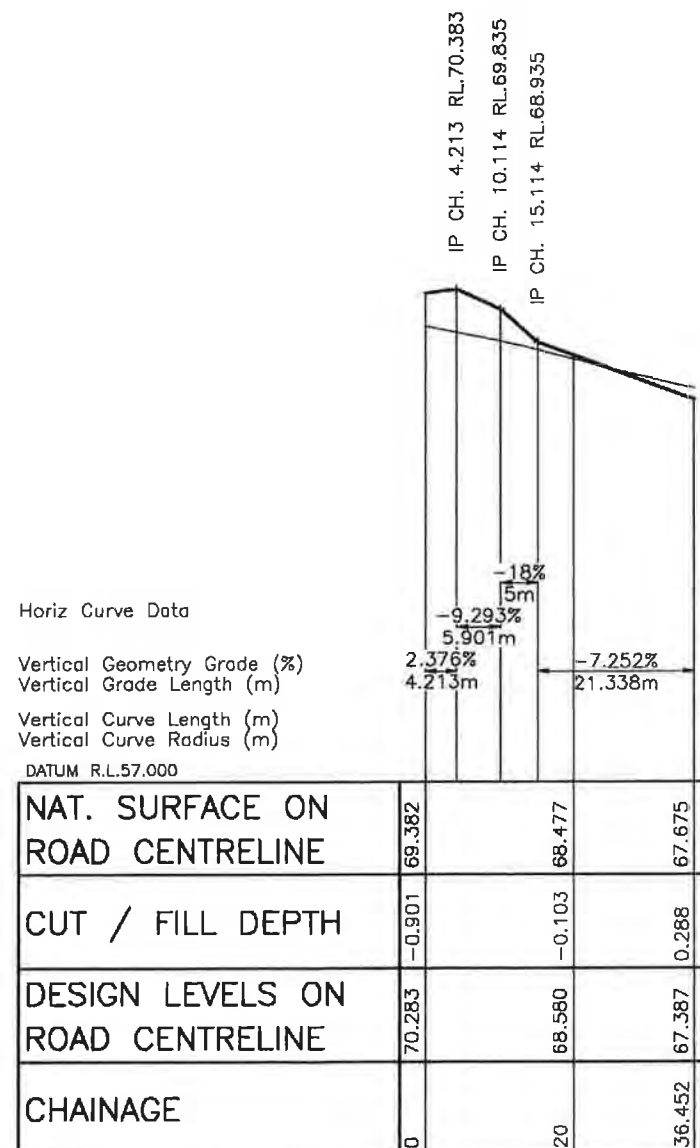
RIGHT OF CARRIAGEWAY No. 3
LONGITUDINAL SECTION
AND TYPICAL CROSS SECTION

OPUS QANTEC McWILLIAM

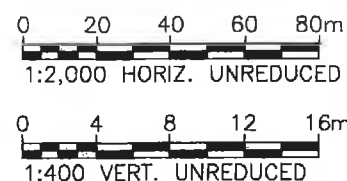


A.B.N. 79 086 342 065

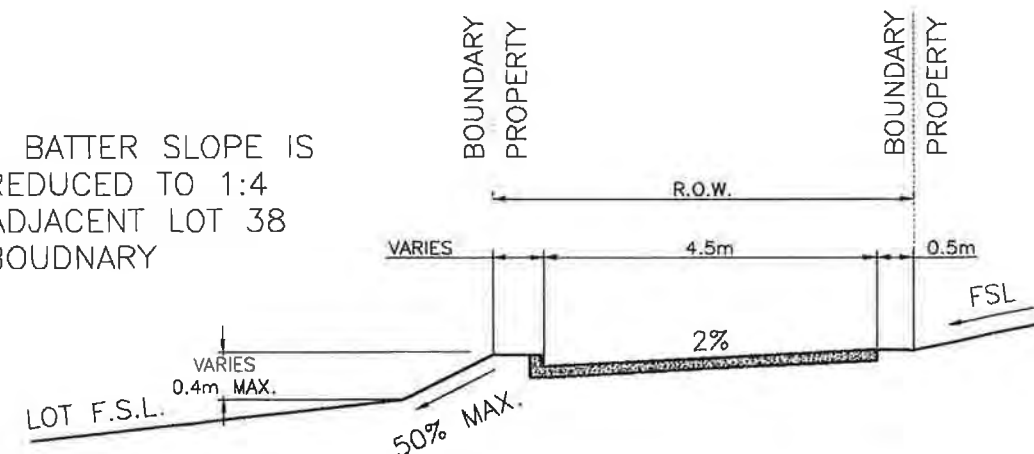
1/10 Rivendell
PO Box 6389
Tweed Heads South NSW 2486
Telephone: (07) 5523 1755
Facsimile: (07) 5523 9664
E-Mail: tweedheads@opusqmcw.com.au



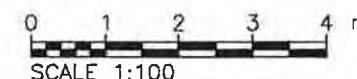
RIGHT OF CARRIAGEWAY – LOTS 35 TO 37



* BATTER SLOPE IS
REDUCED TO 1:4
ADJACENT LOT 38
BOUDNARY



TYPICAL LOT ACCESS DRIVEWAY– LOTS 35 TO 37



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WALMSLEYS ROAD & STOTT STREET
BILAMBIL HEIGHTS N.S.W.

FIGURE 12.4

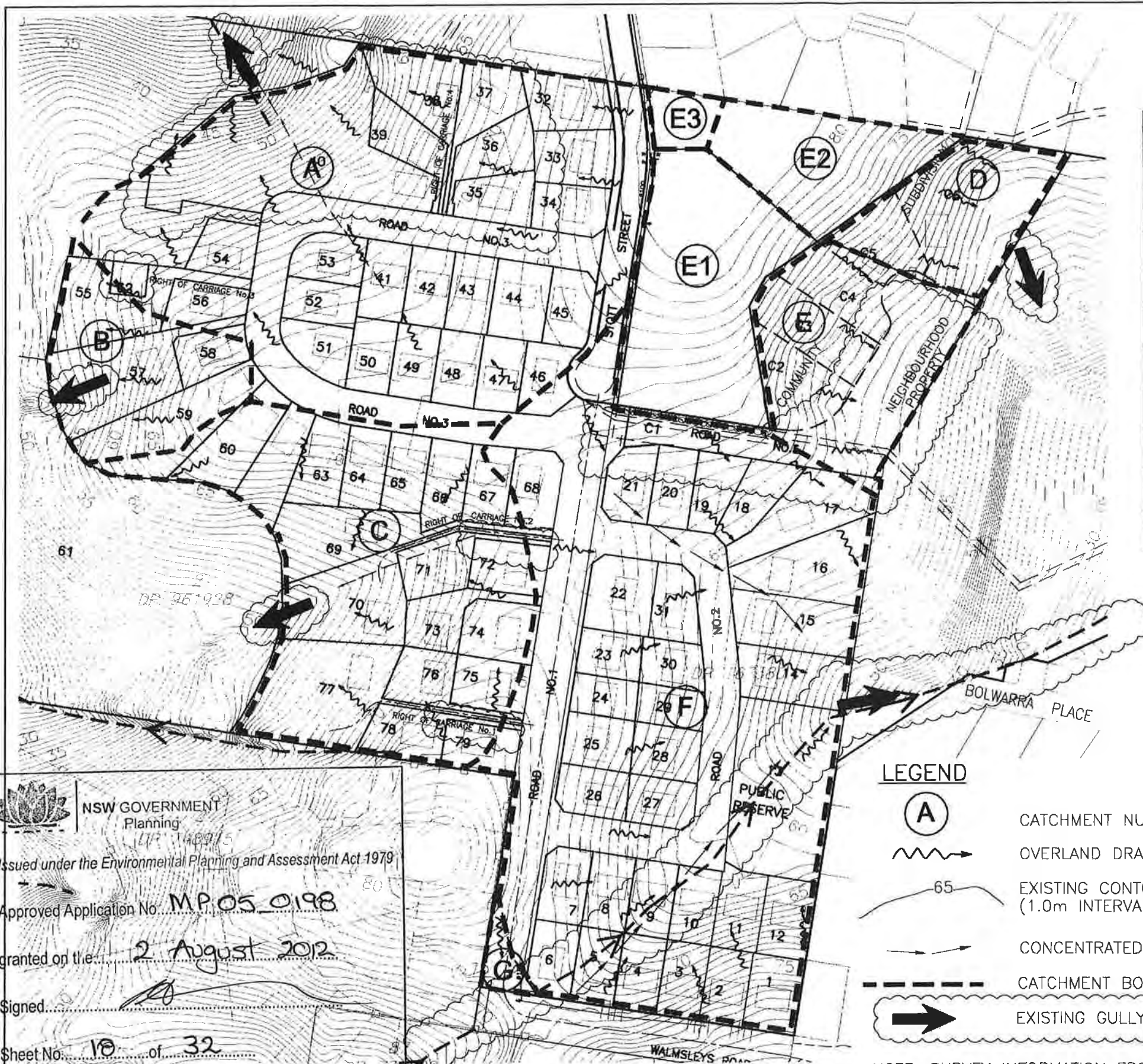
RIGHT OF CARRIAGEWAY No. 4
LONGITUDINAL SECTION
AND TYPICAL CROSS SECTION

OPUS QANTEC McWILLIAM



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DRAINAGE CALCULATIONS

CATCHMENT	AREA (ha)	t_c (min)	I_5 (mm/hr)	C_5	Q_5 (m ³ /s)	I_{100} (mm/hr)	C_{100}	Q_{100} (m ³ /s)
(A)	3.3	16	126.46	0.665	0.771	199.40	0.840	1.535
(B)	0.57	13	138.51	0.665	0.146	217.40	0.840	0.289
(C)	1.95	12	143.29	0.665	0.516	224.53	0.840	1.022
(D)	0.39	11	148.57	0.665	0.107	232.37	0.840	0.211
(E)	0.76	12	143.29	0.665	0.201	224.53	0.840	0.398
(F)	4.19	18	119.87	0.665	0.928	189.52	0.840	1.853
(G)	0.05	10	154.43	0.665	0.014	241.07	0.840	0.028
(E1)	0.72	10	154.43	0.817	0.252	241.07	1.032	0.498
(E2)	0.40	8	168.44	0.817	0.153	261.83	1.032	0.300
(E3)	0.08	13	138.51	0.817	0.025	217.40	1.032	0.050

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WALMSLEYS ROAD
BILAMBIL HEIGHTS

FIGURE 13.0

WATER CYCLE MANAGEMENT PLAN
PRE-DEVELOPMENT

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APRIL, 2009
OCTOBER, 2008
OCTOBER, 2007
OCTOBER, 2006
AUGUST, 2005
FEBRUARY, 2005

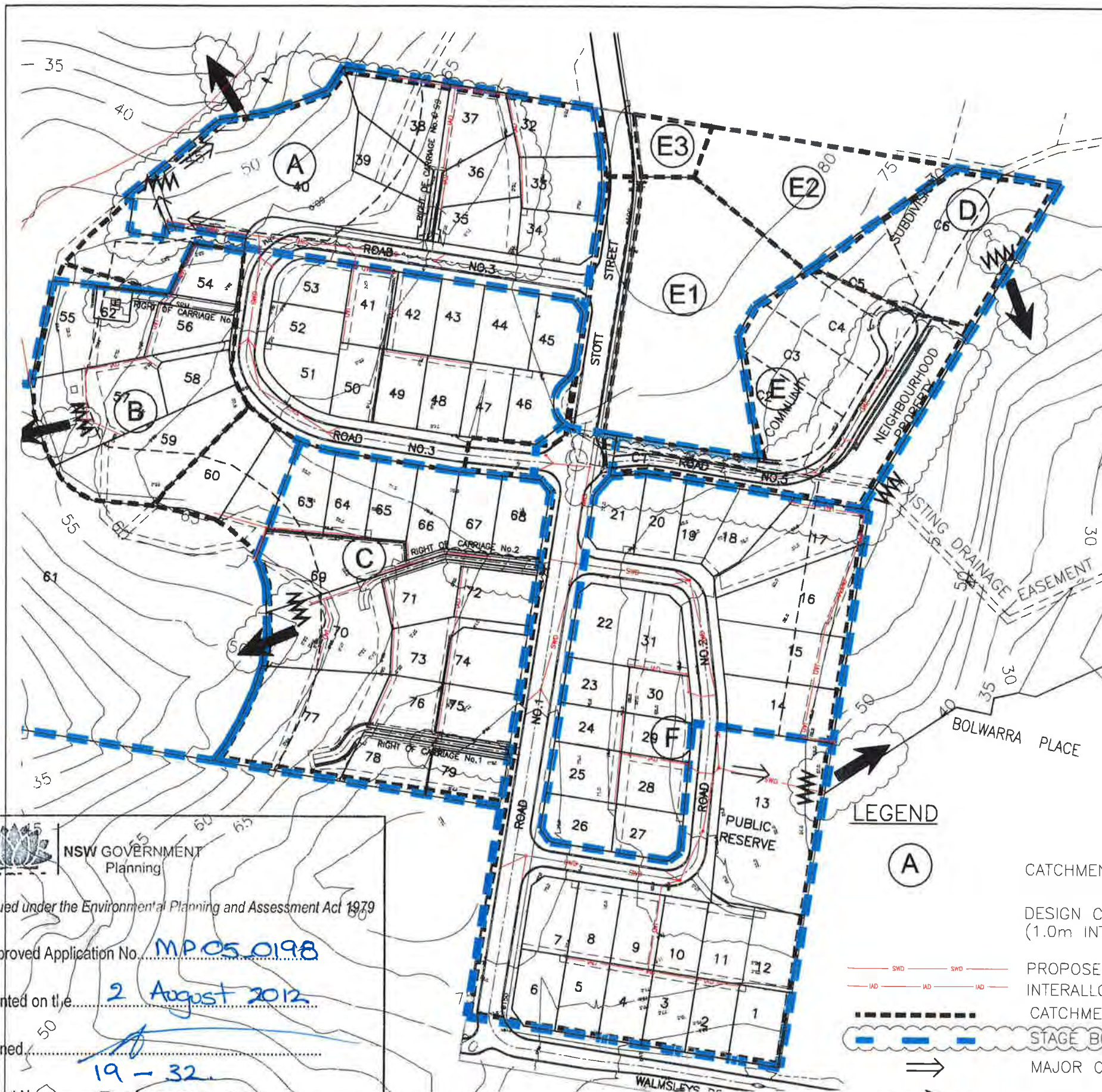
OCTOBER, 2011
JUNE, 2011
APRIL, 2010

0 20 40 60 80m
1:2,000 UNREDUCED

LEGEND

- (A) CATCHMENT NUMBER
- ~~~~~ OVERLAND DRAINAGE DIRECTION
- 65 EXISTING CONTOURS (1.0m INTERVAL)
- CONCENTRATED FLOW PATH
- CATCHMENT BOUNDARY
- EXISTING GULLY

NOTE: SURVEY INFORMATION FROM MCLAUCHLAN
SURVEYING DRAWING NUMBER 37401



DRAINAGE CALCULATIONS

CATCHMENT	AREA (ha)	t_c (min)	I^5 (mm/hr)	c_s	Q_5 (m ³ /s)	I_{100} (mm/hr)	C_{100}	Q_{100} (m ³ /s)
(A)	3.15	12	143.29	0.741	0.929	224.53	0.936	1.838
(B)	0.63	10	154.43	0.741	0.200	241.07	0.936	0.390
(C)	2.02	10	154.43	0.741	0.640	241.07	0.936	1.270
(D)	0.45	7	176.99	0.741	0.164	274.44	0.936	0.321
(E)	0.86	10	154.43	0.741	0.273	241.07	0.936	0.539
(F)	4.06	10	154.43	0.741	1.291	241.07	0.936	2.545
(E1)	0.72	10	154.43	0.817	0.252	241.07	1.032	0.498
(E2)	0.40	8	168.44	0.817	0.153	261.83	1.032	0.300
(E3)	0.08	13	138.51	0.817	0.025	217.40	1.032	0.050

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WALMSLEYS ROAD
BILAMBIL HEIGHTS

FIGURE 14.0
WATER CYCLE MANAGEMENT PLAN
POST DEVELOPMENT

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Sheet No. **05**

OCTOBER, 2007

OCTOBER, 2006

AUGUST, 2005

JUNE, 2005

FEBRUARY, 2005

OCTOBER, 2011

JUNE, 2011

APRIL, 2010

APRIL, 2009

OCTOBER, 2008

A3 203057

0 20 40 60 80m
1:2,000 UNREDUCED

CATCHMENT NUMBER

DESIGN CONTOURS
(1.0m INTERVAL)

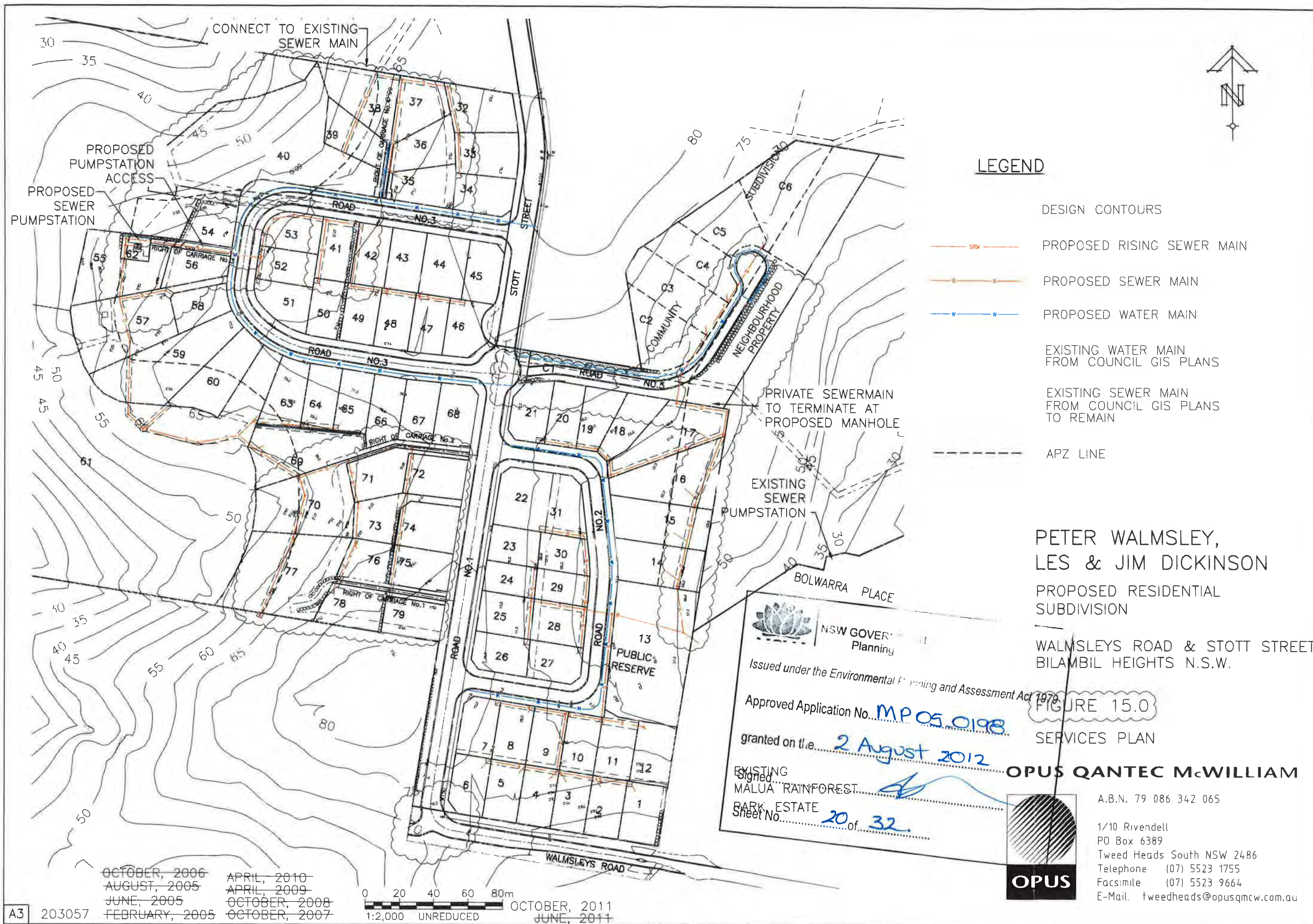
PROPOSED STORMWATER/
INTERALLOTMENT DRAINAGE
CATCHMENT BOUNDARY

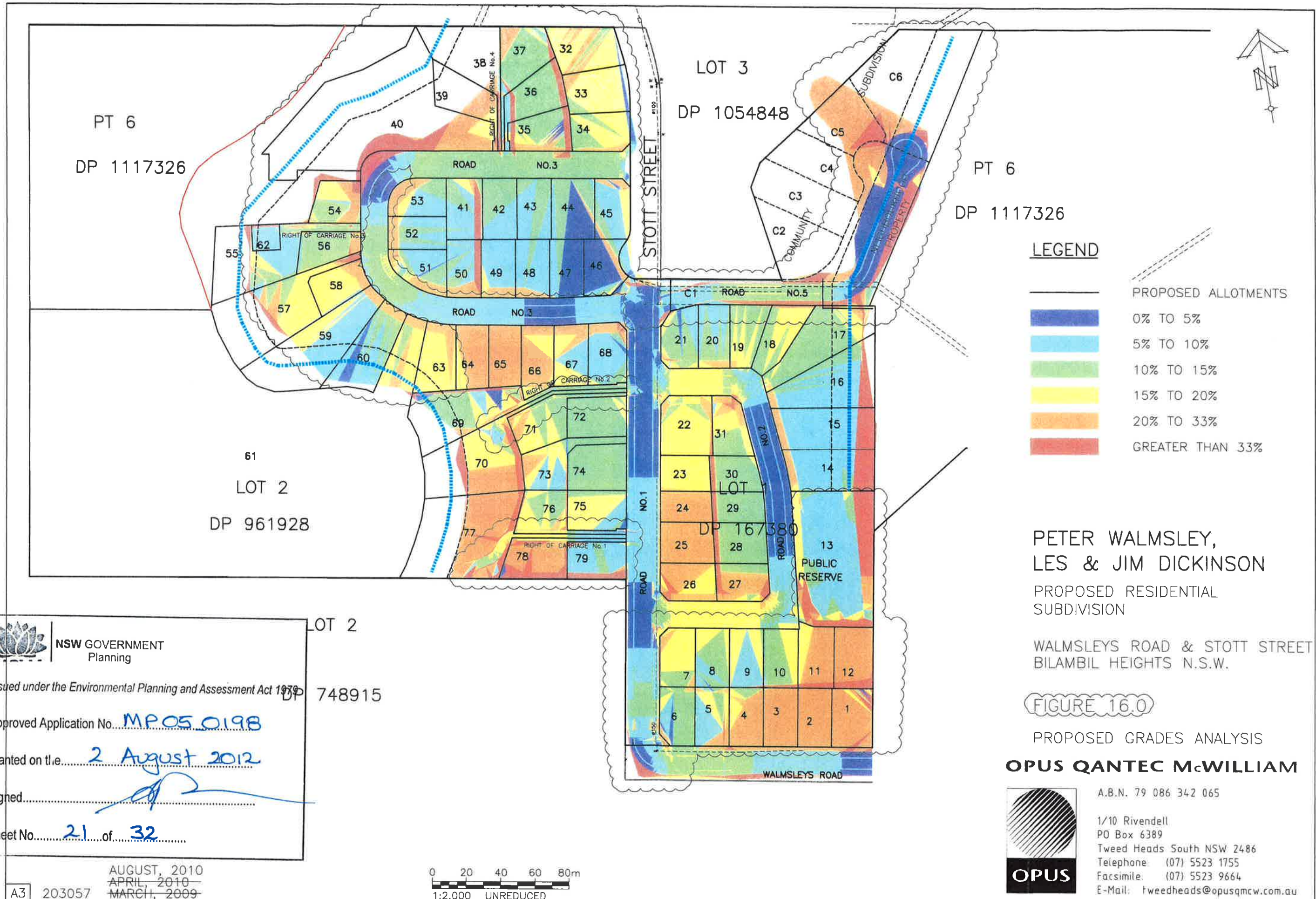
STAGE BOUNDARY

MAJOR OVERLAND FLOW PATH

EXISTING GULLY

PROPOSED ENERGY
DISSIPATER/ LEVEL SPREADER





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A3 203057

AUGUST, 2010
APRIL, 2010
MARCH, 2009

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WALMSLEYS ROAD & STOTT STREET
BILAMBIL HEIGHTS N.S.W.

FIGURE 16.0

PROPOSED GRADES ANALYSIS

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FOR
DISCUSSION
PURPOSES ONLY

LEGEND

- PROPOSED RETAINING WALL
- PROPOSED EASEMENTS (INDICATIVE ONLY)
- PROPOSED BATTER
- EMA PROPOSED ENVIRONMENTAL MANAGEMENT AREA
- PROPOSED BUILDING ENVELOPE

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SKETCH SK20100303

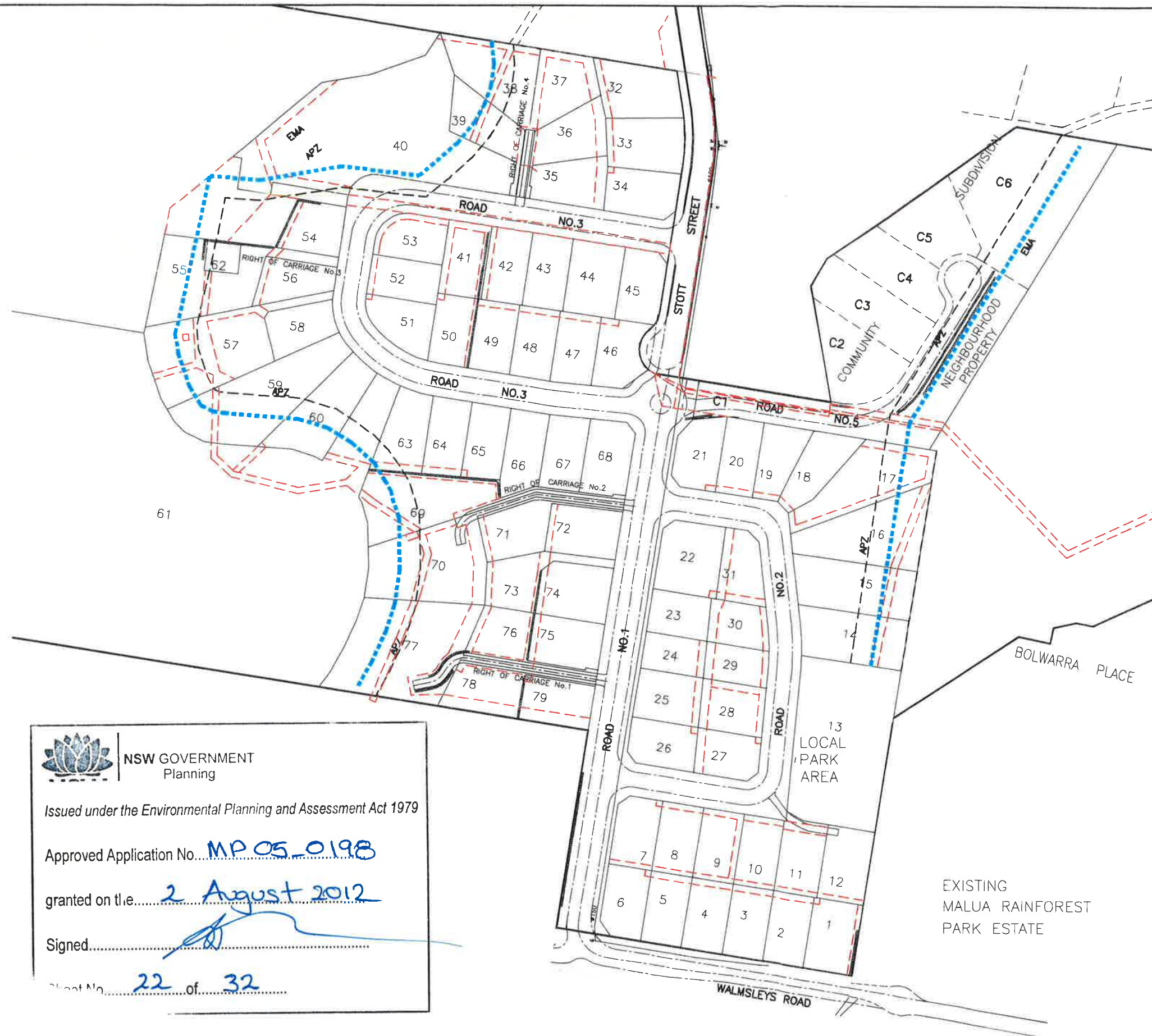
INDICATIVE RESTRICTION OF USE
LAYOUT PLAN

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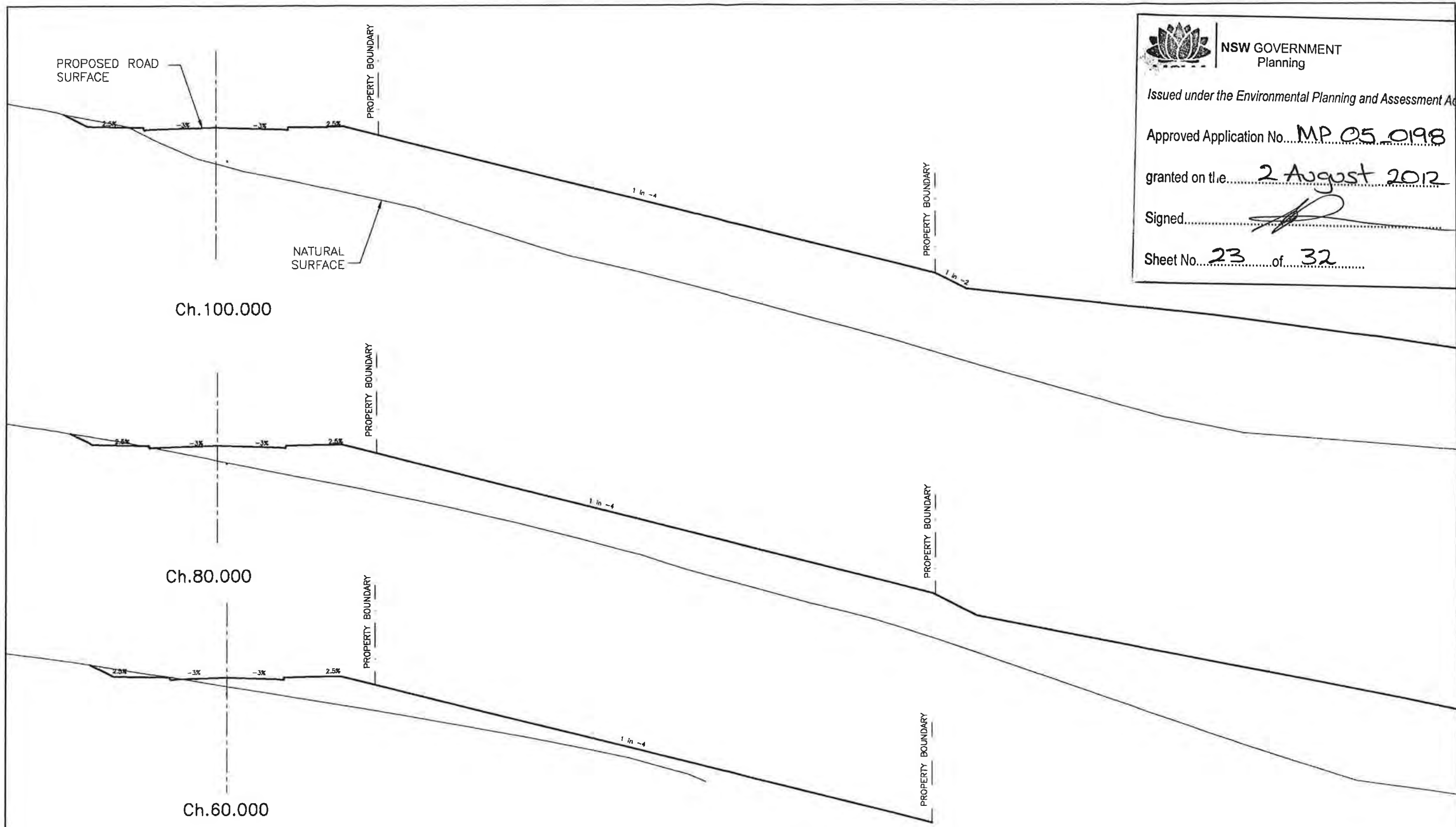
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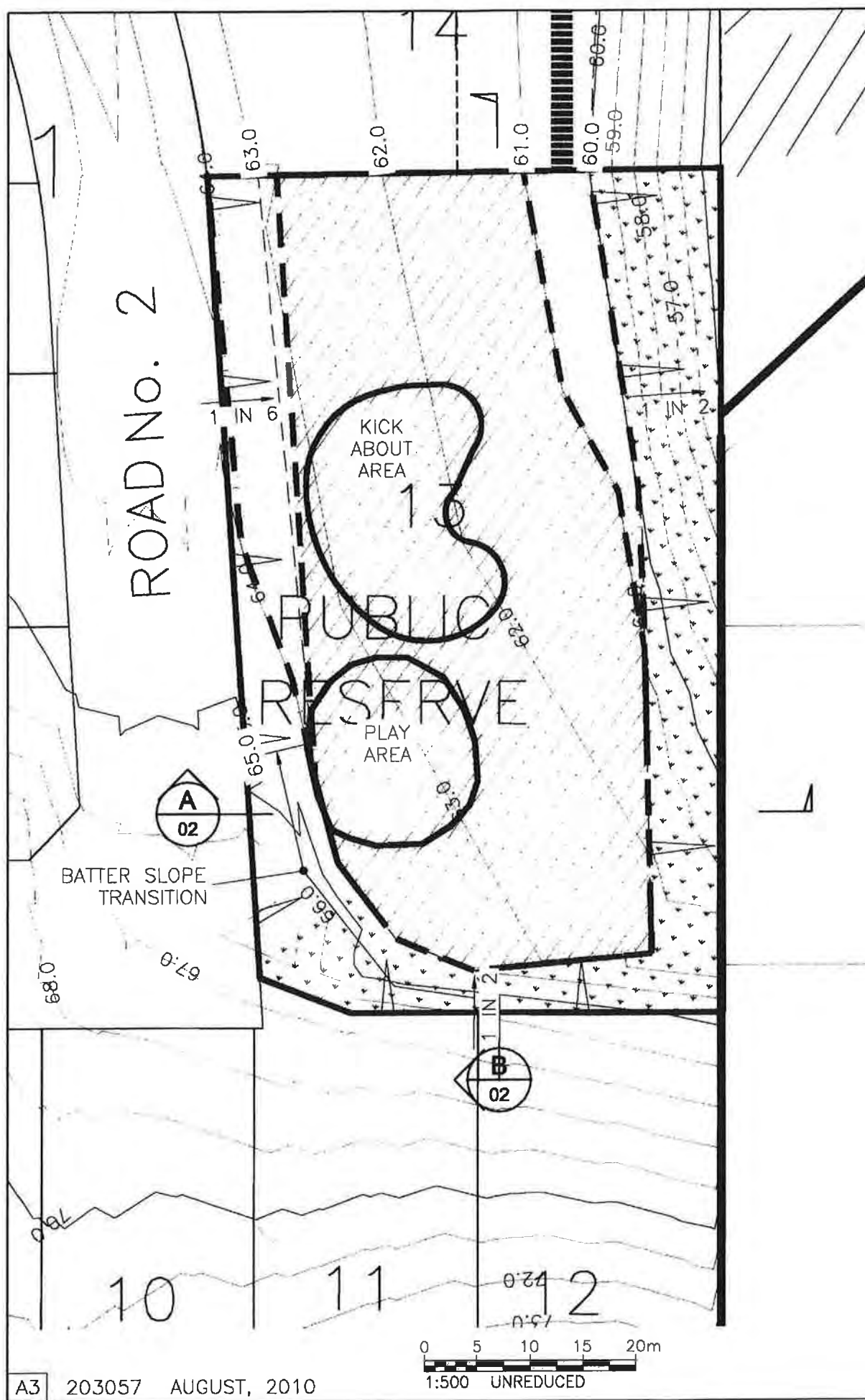
WALMSLEYS ROAD & STOTT STREET
BILAMBIL HEIGHTS N.S.W.

SKETCH SK20100713
WALMSLEY ROAD EXTENSION
PROPOSED 1 in 4 BATTER

OPUS



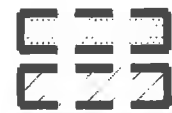
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Facsimile: (07) 5523 9664
E-Mail: tweedheads@opus.com.au



LEGEND



TOTAL SITE AREA OF LOCAL PARK
3,652m²



ACTUAL AREA OF LOCAL PARK (1:6 SLOPES OR LESS) = 2562m²

AREA OF LOCAL PARK NO GREATER THAN 8% = 2120m²



STEEP BATTERS (1:2 MAX) TO BE DENSELY
VEGETATED

COMPLIANCE CALCULATIONS

MIN. TSC AREA FOR LOCAL PARK = 2500m²

ACTUAL AREA FOR LOCAL PARK = 2562m²

COMPLIES WITH TSC DCP REQUIREMENT

% OF AREA NO GREATER THAN 8% SLOPE

=2120m² / 2562m²

=82.7%

COMPLIES WITH TSC DCP REQUIREMENT

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WALMSLEYS ROAD & STOTT STREET
BILAMBIL HEIGHTS N.S.W.

SK20100809 - 01 REV A

PROPOSED LOCAL PARK
GRADE COMPLIANCE SCHEMATIC

OPUS



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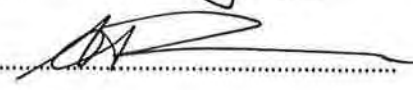
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Facsimile: (07) 5523 9664
E-Mail: tweedheads@opus.com.au

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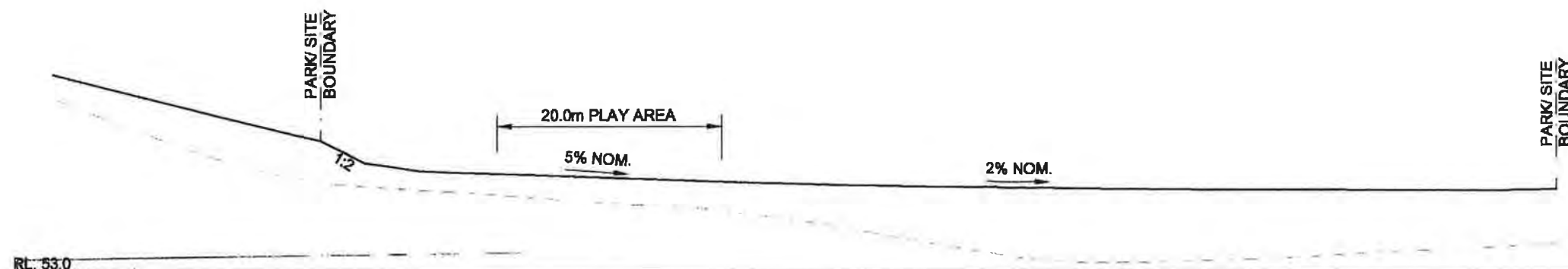
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RL. 53.0



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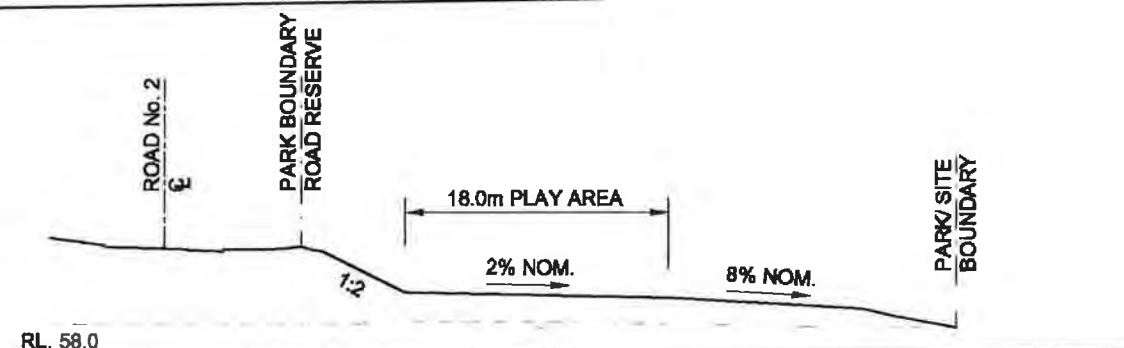
Approved Application No. MP 05 0198

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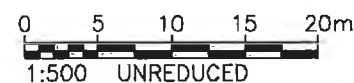
Sheet No. 25 of 32

SECTION **B**
1:500 01



RL. 58.0

SECTION **A**
1:500 01



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WALMSLEYS ROAD & STOTT STREET
BILAMBIL HEIGHTS N.S.W.

SK20100809 - 02 REV A

PROPOSED LOCAL PARK
GRADE COMPLIANCE SCHEMATIC

OPUS



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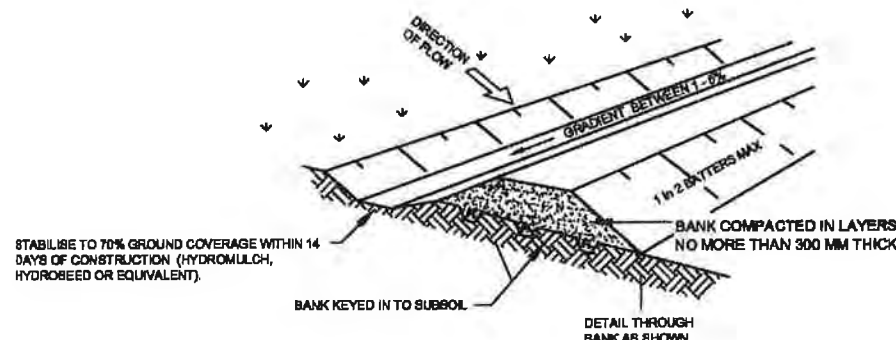
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PO Box 6389

Tweed Heads South NSW 2486

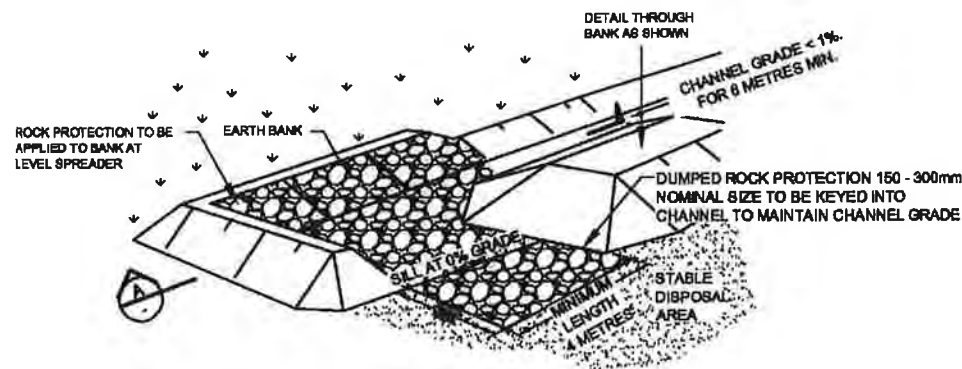
Telephone: (07) 5523 1755

Facsimile: (07) 5523 9664

E-Mail: tweedheads@opus.com.au



TYPICAL SECTION

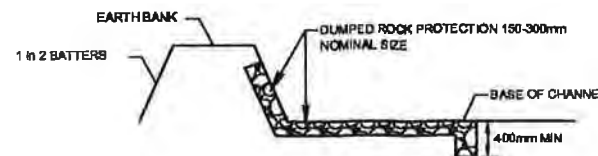


LEVEL SPREADER

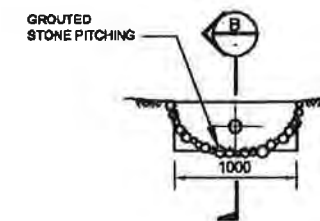
EARTH BANK DETAIL

SCALE N.T.S.

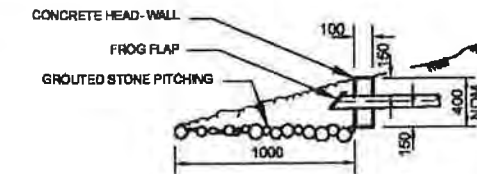
- NOTES:
1. CONSTRUCT DRAINS WITH CIRCULAR, PARABOLIC OR TRAPEZOIDAL CROSS SECTIONS RATHER THAN V SHAPED.
 2. CHANNEL AND LEVEL SPREADER TO BE MAINTAINED AFTER EVERY RAINFALL EVENT TO REMOVE ACCUMULATED SEDIMENT AND ENSURE INTEGRITY OF DUMPED ROCK.



SECTION A
SCALE N.T.S.

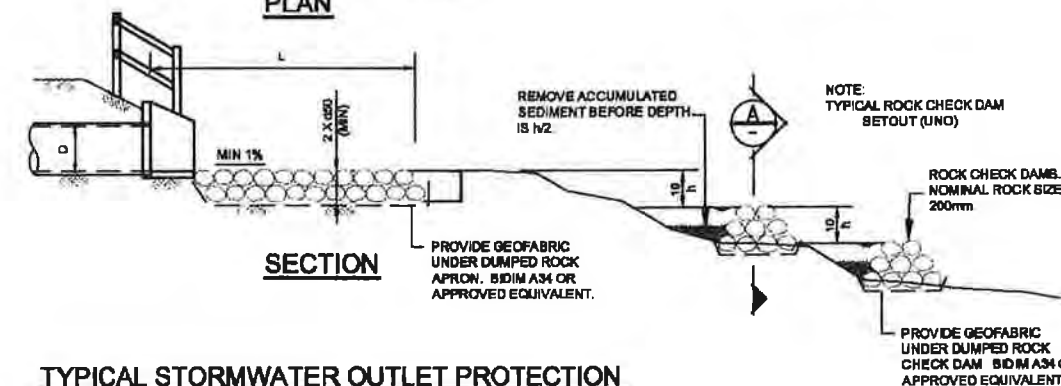
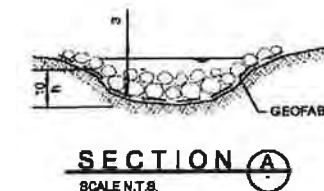
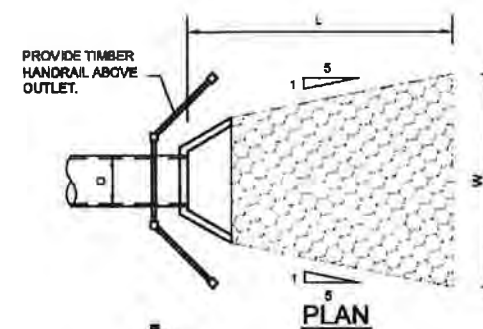


ELEVATION



SECTION B

OUTLET TO NATURAL SURFACE FOR PIPES < 225Ø
SCALE N.T.S.



TYPICAL STORMWATER OUTLET PROTECTION
SCALE N.T.S.

HEADWALL NOTES:

1. PRECISE LOCATION OF ALL OUTLETS TO BE CONFIRMED ON SITE BY SUPERINTENDENT PRIOR TO CONSTRUCTION. HEADWALLS TO BE LOCATED TO ACHIEVE MINIMUM DISTURBANCE AND IMPACT ON EXISTING VEGETATION.
2. ALL HEADWALLS TO BE INSTALLED IN ACCORDANCE WITH QDMR STD DWG 1305



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WALMSLEYS ROAD & STOTT STREET
BILAMBIL HEIGHTS N.S.W.

SKETCH SK20100921

PROPOSED ENERGY DISIPATOR &
LEVEL SPREADERS



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FIG. 01

LANDSCAPE MASTERPLAN

91105 | 08 DEC 10 | DA03 | NORTH | SCALE 1:2000 @ A3
PROJECT BILAMBIL HEIGHTS | CLIENT DICKINSON AND WALMSLEY

01 LANDSCAPE BACKGROUND

The existing landscape of Walmsley Road is that of old farming land on the crest of the ridge, largely cleared of original vegetation and

- Flanked on the east and west by steeper slopes covered with camphor laurel infested stands of vegetation, and
- Flanked on the north and south by standard suburban sub-divisions
- Within the camphor laurel forest are
- A number of identifiable vegetation communities of lesser extent as well as
- A number of small sites of rare or threatened endemic flora

The flora situation is described in the Ecological and Bushfire Planning Assessment of Lot 1 DP 167380, Lot 2 DP 961928 & Lot 4 DP 1054848 prepared by Biolink Ecological Consultants in June 2008.

02 LANDSCAPE OBJECTIVES IN THE VMP

In the current VMP (Proposed Vegetation Management Plan prepared by Biolink Ecological Consultants) one of the proposed objectives is

- Enhancing a measure of east-west connectivity across the proposed development precinct
- This objective states that tree species utilised for streetscape purposes should be
- Native rainforest species endemic to the local area and
- Selected from early-later secondary and mature phase rainforest species.

03 LANDSCAPE MASTERPLAN

A meshing of the subdivisional development objectives and the ecological objectives results in a landscape consisting broadly of

A functional and visual street hierarchy consisting of

- Primary residential streets - a central road corridor (future bus route) connecting the existing residential subdivisions to the north and south of the site
- Secondary residential streets and private roads
- Residential allotments flanking the central road corridor
- A small local park within the residential area
- Large areas on the east and west sides of the site set aside as conservation areas to protect and maintain the EEC's (Endangered Ecological Communities)
- APZ's (Asset Protection Zones) lying across the rear of the residential properties on the boundary of the conservation areas.
- An east/west tree/fauna corridor lining the east/west roads connecting the major conservation areas including the EEC's

LANDSCAPE DESIGN INTENT

91105 | 08 DEC 10 | DA03

PROJECT BILAMBIL HEIGHTS | CLIENT DICKINSON AND WALMSLEY

04 LANDSCAPE PLANNING AND DESIGN RESPONSIBILITIES

The planning and design responsibilities for the overall landscape fall into two categories

- Landscape conservation works directed by Biolink Ecological Consultants - all works required in the conservation areas, the EEC's and the APZ's
- Urban landscape works directed by Form Landscape Architects - all public works within the sub-division area (other than APZ work) including streetscapes and the park. Within this document this is described as the Landscape Masterplan

05 URBAN LANDSCAPE STRATEGY

The design intent of the Landscape Strategy Plan is to enhance the public spaces of the proposed subdivision by creating a landscape that responds to various ecological, cultural and visual objectives. Specific intentions are

- To meet Objective 4 as stated in the VMP by providing an east/west tree/fauna corridor connecting the major conservation areas
- To utilise trees and other plant species that meet one or more of the criteria stated below. The more criteria that are met the better the selection.
- Species that are endemic to the area
- Species that are native and suitable to the regional bioclimate
- Species that are of low water requirement
- Species that are drought tolerant
- Species that are generally available through commercial plant nurseries
- To create a visual street hierarchy through appropriate tree selection and ground finishes
- To merge seamlessly with the local and regional landscape character of Bilambil Heights which includes both remnant rainforest and suburbia.

06 PLANT SUITABILITY LISTS

The lists displayed below are categorised according to the landscape situations on site and are drawn as much as possible from the Biolink reports and VMP for the site.

07 LANDSCAPE SITUATIONS

The principal landscape categories requiring different plant selections include

- The roundabout
- Primary streets - Walmsley Rd
- Secondary streets - other streets and private road
- The public park
- Park generally
- Better planting

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08 TREES TO THE ROUNDABOUT

The roundabout is to form a major visual focal point within the road network and will contain one or more iconic native rainforest trees such as native figs. Minimum planting container size should be 200L if planted as a single specimen or 100 L each for trees planted as a small cluster.

09 TREES TO MAJOR STREETS

To create a sense of street hierarchy the major streets will be lined with native rainforest trees having an iconic form and /or iconic colour such as Hoop Pine, Blue Quandong or Illawarra Flame Tree. Minimum planting container size should be 45L.

10 TREES TO SECONDARY STREETS

These streets should be less formal than the major streets and planted with a range of native rainforest trees to create the east/west fauna connections recommended by Biolink. Commonly available suitable street trees include Brush Box, Tuckeroo and Macaranga. Minimum planting container size should be 45L.

11 TREE PLANTING GENERALLY

Tree locations shown on plans are indicative of the proposed location and density. They are subject to detail study of roads and road conditions. Minimum planting container size should be 45L.

12 UNDERSTOREY PLANTING

Understorey planting generally will be plants native to the area where possible or native to the Tweed Valley Region. Planting categories consist of

- Shrubs for use in streets and parks
eg Acacia bakeri, Alpinia caerulea, Cordyline petiolaris, Cordyline stricta, Cyathea cooperi, Doodia aspera, Pittosporum undulatum, Syzgium australe, Westringia fruticosa
- Strap leaf clump forming plants to 1.0m high for use in streets and park
eg Dianella, Isolepis nodosa, Liriope, Lomandra hystrix, Lomandra longifolia

Ornamental grasses and sedges
eg Pennesetum, Poa, Isolepis nodosa

- Ground covers of various types
eg Hardenbergia violacea, Myoporum parviflorum
- Spreading ground covers for bank planting in park
eg Cissus antarctica

Minimum planting container size should be tube stock.

Minimum plant density should be an average of 4 plants per square metre.

13 TURF

The choice of turf should be one of the commonly available drought tolerant turf grasses such as

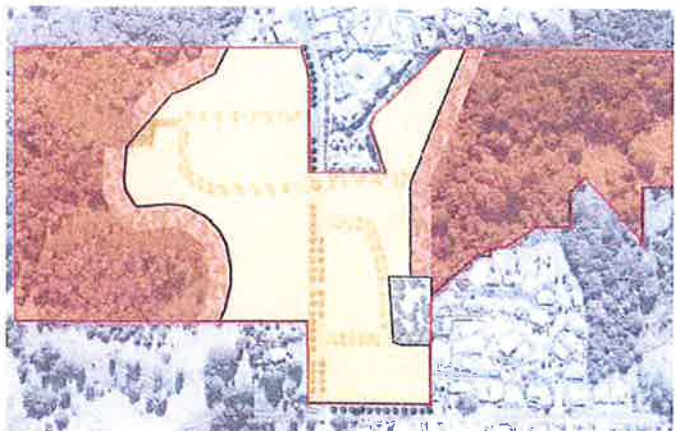
- Cynodon dactylon Green couch

14 GROUND FINISHES

The choice of ground finishes should reflect concerns for local character, the use of recycled materials and site specific functions including maintenance. Proposed finishes include

- Decorative gravel
- Hoop pine bark
- Recycled concrete or brick

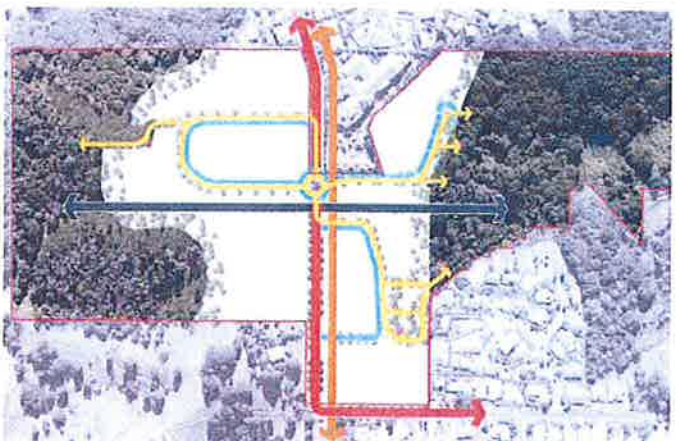
FIG. 02



LANDSCAPE PLANNING AND DESIGN RESPONSIBILITIES

- ☒ LANDSCAPE CONSERVATION WORKS DIRECTED BY CONSULTING ECOLOGIST
- ☐ LANDSCAPE URBAN WORKS DIRECTED BY CONSULTING LANDSCAPE ARCHITECT

FIG. 03



URBAN LANDSCAPE STRATEGY

- ☒ EAST/WEST TREE/FAUNA CORRIDORS
- ☒ PRIMARY STREETS
- ☒ MERGE VEGETATION CHARACTER WITH CONSERVATION AREAS
- ☒ SECONDARY STREETS
- ☒ MERGE VEGETATION AND BUILT FORM CHARACTER WITH SURROUNDING SUBDIVISIONS
- ☒ TERTIARY STREETS



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LANDSCAPE MASTERPLAN – TREES IN PUBLIC PLACES

91105 | 08 DEC 10 | DA03 | NORTH  | SCALE 1:2000 @ A3
PROJECT BILAMBIL HEIGHTS | CLIENT DICKINSON AND WALMSLEY

NOTE: TREE NUMBERS AND SPACINGS ARE INDICATIVE ONLY.
FIG. 05

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FIG. 06



LANDSCAPE MASTERPLAN – PUBLIC PARK CONCEPT

91105 | 08 DEC 10 | DA03 | NORTH | SCALE 1:500 @ A3

PROJECT BILAMBIL HEIGHTS | CLIENT DICKINSON AND WALMSLEY

TREES - ROUNDABOUT		REF
Ficus obliqua	Small Leafed Fig	1
Ficus rubignosa	Port Jackson Fig	1
Ficus virens	White Fig	1
Ficus watkinsiana	Strangler Fig	1
TREES - PRIMARY STREETS		
Araucaria cunninghamii	Hoop Pine	1
Brachychiton acerifolius	Illawarra Flame Tree	1
Elaeocarpus grandis	Blue Quandong	
TREES - SECONDARY STREETS		
Alphitonia excelsa	Red Ash	1
Brachychiton acerifolius	Illawarra Flame Tree	1
Cupaniopsis anacardioides	Tuckeroo	1
Diploglottis australis	Native Tamarind	1
Elaeocarpus reticulatus	Blueberry Ash	1
Flindersia bennettiana	Bennetts Ash / Crows Ash	1
Lepiderema pulchella	Fine Leafed Tuckeroo	1, 2
Lophostemon confertus	Brush Box	1
Macaranga tanarius	Macaranga	1
Melaleuca quinquinervia	Broad Leaved Paperbark	1
Stenocarpus salignus	Fire Wheel Tree	1
TREES - PARK		
Alphitonia excelsa	Red Ash	1
Araucaria cunninghamii	Hoop pine	1
Archontophoenix cunninghamiana	Bangalow Palm	1
Brachychiton acerifolius	Illawarra Flame Tree	1
Corymbia intermedia	Pink Bloodwood	1
Cupaniopsis anacardioides	Tuckeroo	1
Diploglottis australis	Native Tamarind	1
Elaeocarpus reticulatus	Blueberry Ash	1
Eucalyptus microcorys	Tallowwood	1
Eucalyptus propinqua	Grey gum	1
Flindersia bennettiana	Bennetts Ash / Crows Ash	1
Lepiderema pulchella	Fine Leafed Tuckeroo	1, 2
Lophostemon confertus	Brush Box	1
Macaranga tanarius	Macaranga	1
Melaleuca quinquinervia	Broad Leaved Paperbark	1
Stenocarpus salignus	Fire Wheel Tree	1

UNDERPLANTING	
SHRUBS	
Acacia bakeri	Marblewood
Alpinia caerulea	Native Ginger
Cordyline petiolaris	Broad Leaved Palm Lily
Cordyline stricta	Narrow Palm Lily
Cyathea cooperi	Cooper's Tree Fern
Dianella caerulea	Flax/Paroo Lilly
Doodia aspera	Prickly Rasp Fern
Melaleuca thymifolia	Thyme-leaf Honey-myrtle
Pittosporum undulatum	Sweet Pittosporum
Syzigum australe	Lilly Pilly / Bush Christmas
Westringia fruticosa	Coastal Rosemary
Austromyrtus dulcis	Midgen Berry
Hovea acutifolia	Hovea
CLUMP FORMING PLANTS	
Dianella	Flax Lily
Isolepsis nodosa	Knobby Club Rush
Liriope	Liriope
Lomandra hystrix	Slender Mat Rush
Lomandra Little Joey	Dwarf Lomandra
Lomandra longifolia	Mat Rush
ORNAMENTAL GRASSES	
Pennisetum	
Poa	
Isolepsis nodosa	Knobby Club Rush
GROUND COVERS	
Hardenbergia violacea	Happy Wanderer
Myoporum parviflorum	Creeping Boobialla
SPREADING GROUND COVERS	
Cissus antarctica	Kangaroo Vine

References

1. Species present on site in existing simple notophyll rainforest. Identified in Ecological & Bushfire Assessment report by Biolink Ecological Consultants dated June 2008.
2. Species present on site and classed as threatened flora. Identified in Ecological & Bushfire Assessment report by Biolink Ecological Consultants dated June 2008.



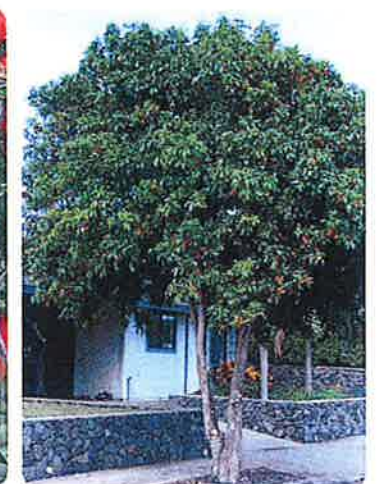
ARAUCARIA CUNNINGHAMIA
HOOP PINE



BRACHYCHITON ACERIFOLIUS
FLAME TREE



CALLISTEMON VIMINALIS
BOTTLEBRUSH



CUPANIOPSIS ANACARDIOIDES
TUCKEROO



WATERHOUSIA FLORIBUNDA
WEEPING LILLY PILLY



SYZYGIVM LEUHAMII
SMALL LEAVED LILLY PILLY

PLANT SUITABILITY LIST

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