Appendix C Environmental

- List of Vascular Flora, Fauna and Ecological Communities of conservation significance potentially occurring in, or utilising the study area.

List of Vascular Flora, Fauna and Ecological Communities of conservation significance potentially occurring in, or utilising the study area.

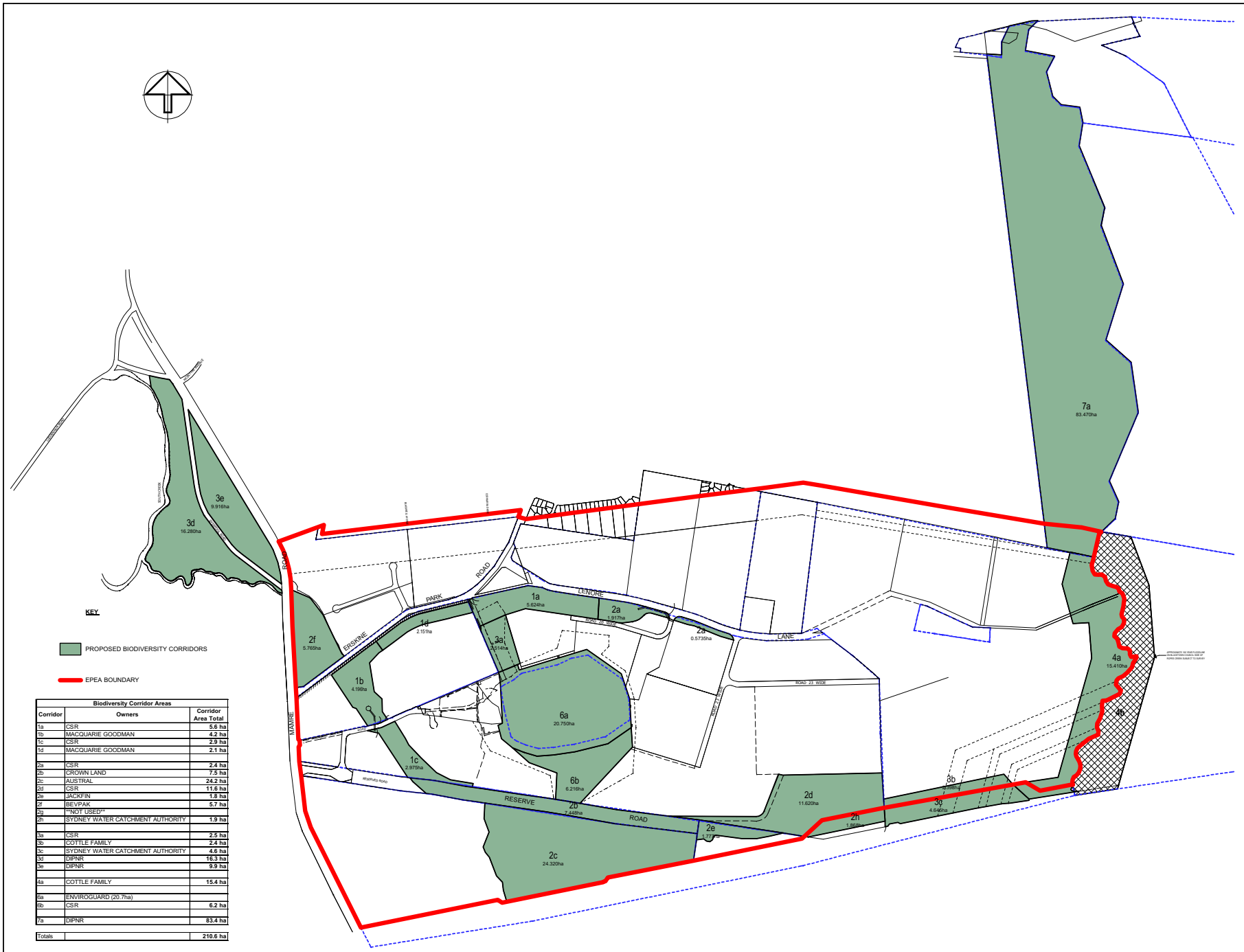
Scientific Name	Common Name	Legal Status	
		TSC Act	EPBC Act
Fauna			
Invertebrates			
Meridolum corneovirens	Cumberland Plain Land Snail	E1	V
Birds			
Lathamus terates	Swift Parrot		E
Rostratula australis	Australian Painted Snipe		V
Xanthomyza terate	Regent Honeyeater	E1	E
Frogs			
Heleioporus australiacus	Giant Burrowing Frog		V
Litoria aurea	Green and Golden Bell Frog	E1	V
Mixophyes balbus	Stuttering Frog, Southern Barred Frog (in Victoria)		V
Mixophyes terates	Southern Barred Frog, Giant Barred Frog		E
Litoria littlejohni	Littlejohn's Tree Frog, Heath Frog		V
Mammals			
Chalinolobus dwyeri	Large-eared Pied Bat, Large Pied Bat		V
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)		E
Petrogale penicillata	Brush-tailed Rock-wallaby		V
Potorous tridactylus tridactylus	Long-nosed Potoroo (SE mainland)		V
Pteropus poliocephalus	Grey-headed Flying-fox		V
Ray-finned fishes			
Macquaria australasica	Macquarie Perch		E
Prototroctes maraena	Australian Grayling		V
Reptiles			
Hoplocephalus bungaroides	Broad-headed Snake		V
Migratory Terrestrial Species			
Haliaeetus leucogaster	White-bellied Sea-Eagle		M
Hirundapus caudacutus	White-throated Needletail		M
Monarcha melanopsis	Black-faced Monarch		M
Myiagra cyanoleuca	Satin Flycatcher		M
Rhipidura rufifrons	Rufous Fantail		M
Xanthomyza phrygia	Regent Honeyeater		M
Migratory Wetland Species			
Gallinago hardwickii	Latham's Snipe, Japanese Snipe		M
Rostratula benghalensis s. lat.	Painted Snipe		M

Scientific Name	Common Name	Legal Status	
		TSC Act	EPBC Act
Flora			
Acacia bynoeana	Bynoe's Wattle, Tiny Wattle		V
Acacia pubescens	Downy Wattle, Hairy Stemmed Wattle		V
Cynanchum elegans	White-flowered Wax Plant		E
Darwinia biflora	Dillwynia tenuifolia		V
Allocasuarina glareicola			E
Cryptostylis hunteriana	Leafless Tongue-orchid		V
Cynanchum elegans	White-flowered Wax Plant		E
Dillwynia tenuifolia			V
Eucalyptus benthamii	Camden White Gum, Nepean River Gum		V
Grevillea parviflora subsp. Parviflora			V
Melaleuca deanei	Deane's Melaleuca		V
Micromyrtus minutiflora			V
Persoonia hirsuta			E
Persoonia nutans			E
Pimelea curviflora var. curviflora			V
Pimelea spicata			E
Pomaderris brunnea	Rufous Pomaderris		V
Pultenaea glabra	Smooth bush-pea, Swamp bush		
Pultenaea parviflora			V
Hypsela sessiliflora		E1	
Grevillea juniperina subsp. Juniperina		V	
Ecological Community	Cumberland Plain Woodlands		E
Ecological Community	Shale/Sandstone Transition Forest		E
Ecological Community	Turpentine-Ironbark Forest in the Sydney Basin Bioregion		CE

TSC Act: *Threatened Species Conservation Act 1995*
EPBC Act: *Environmental Protection and Biodiversity Conservation Act*
E1: *Endangered*
E: *Endangered*
V: *Vulnerable*
CE: *Critically Endangered*
M: *Migratory*
Note: *Listed Marine Species were not included due to lack of suitable habitat*

Appendix D Supporting Information

- Proposed Biodiversity Area – Penrith LGA
- CSR Concept Plan – Penrith LGA
- Fitzpatrick Lands – Penrith LGA
- Concept Master Plan – Blacktown LGA



Biodiversity Corridor Areas		
Corridor	Owners	Corridor Area Total
1a	CSR	5.6 ha
1b	MACQUARIE GOODMAN	4.2 ha
1c	CSR	2.9 ha
1d	MACQUARIE GOODMAN	2.1 ha
2a	CSR	2.4 ha
2b	CROWN LAND	7.5 ha
2c	AUSTRAL	24.2 ha
2d	CSR	11.6 ha
2e	JACKFIN	1.8 ha
2f	BEYPAK	5.7 ha
2g	**NOT USED**	
2h	SYDNEY WATER CATCHMENT AUTHORITY	1.9 ha
3a	CSR	2.5 ha
3b	COTTLE FAMILY	2.4 ha
3c	SYDNEY WATER CATCHMENT AUTHORITY	4.6 ha
3d	DIPNR	16.3 ha
3e	DIPNR	9.9 ha
4a	COTTLE FAMILY	15.4 ha
6a	ENVIROGUARD (20.7ha)	
6b	CSR	6.2 ha
7a	DIPNR	83.4 ha
Totals		210.6 ha

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ALL LEVELS AND DIMENSIONS TO BE VERIFIED PRIOR TO COMMENCEMENT OF WORK.

USE FIGURED DIMENSIONS ONLY. DO NOT SCALE.

ALL STRUCTURAL DRAINAGE AND LANDSCAPING WORK TO CONSULTANTS DETAILS.

ALL WORK TO COMPLY WITH ALL CURRENT REGULATIONS AND S.A.A. STANDARDS.

ISSUE	DATE	COMMENT

AMENDMENT / ISSUE LOG

LANDSCAPE ADVISER
Kevin Mills and Associates
114 North Currarmore Road
Jamberoo
NSW 2533
ph 4236 0620
fax 4236 0664

LANDSCAPE ARCHITECT
John Lock and Associates
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Crows Nest
NSW 2065
ph 9966 0633
fax 9966 0688

TRAFFIC CONSULTANT
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Level 2, 55 Mountain Street
Broadway
NSW 2007
ph 9211 3352
fax 9211 2740

TOWN PLANNER
BBC Consulting
Level 2, 55 Mountain Street
Broadway
NSW 2007
ph 9211 4099
fax 9211 2740

SURVEYOR
Lean and Haywood Pty. Limited
3 Chamberlain Street
Campbelltown
NSW 2560
ph 4625 9133
fax 4626 1056

COST PLANNER
McCredie Richmond and Partners
Level 5, 8 West Street
North Sydney
NSW 2060
ph 9929 0966
fax 9929 7414

GEOTECHNICAL CONSULTANT
Douglas Partners
96 Hermitage Road
West Ryde
NSW 2114
ph 9809 0666
fax 9809 4095

ENVIRONMENTAL
HLA-Envirosciences Pty Limited
Level 2,
55 - 65 Grandview Street
Pymble
NSW 2073
ph 9988 4422
fax 9988 4441

CIVIL, STORMWATER, SEWER, WATER, FIRE, GAS, ELECTRICAL AND COMMUNICATIONS
WP Brown and Partners
Level 2, 82 Waterloo Road
North Ryde
NSW 2113
ph 9900 1000
fax 9900 1099

PROJECT MANAGER
CGP Management Pty Limited
Level 5, 97 Pacific Highway
North Sydney
NSW 2059
ph 9955 3988
fax 9955 0772

ARCHITECT
morrisbray architects
186-188 Willoughby Road
Crows Nest NSW 2065
ph 61 2 9439 6622
fax 61 2 9436 4873

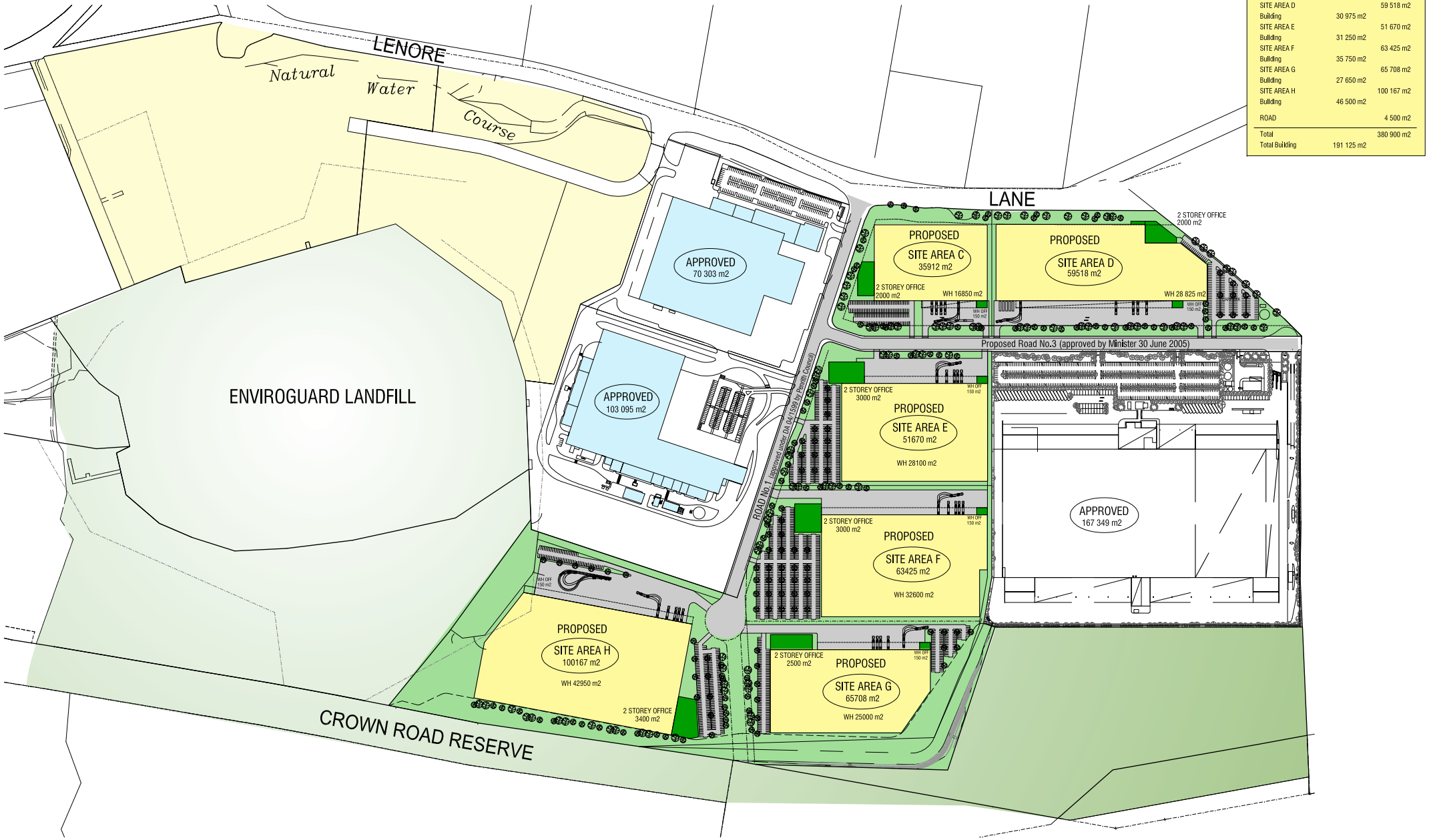
CLIENT
CSR

NORTH / SCALE BAR
0 50 100 150 200 250300m
SCALE 1:7,500

PROJECT / LOCATION
CSR SITE
LENORE LANE AND MAMRE ROAD
ERSKINE PARK

DRAWING TITLE
Proposed Biodiversity Areas

JOB NUMBER	DRAWING NUMBER	ISSUE
03103	ST-01	P13
SCALE 1:7500 @A1	DRAWN MB/JM	CHECKED BY
PROJECT PATH Biodiversity_01t		SHEET SIZE A1
PLOT DATE Thursday, 9 June 2005		



DEVELOPMENT SCHEDULE OF AREAS

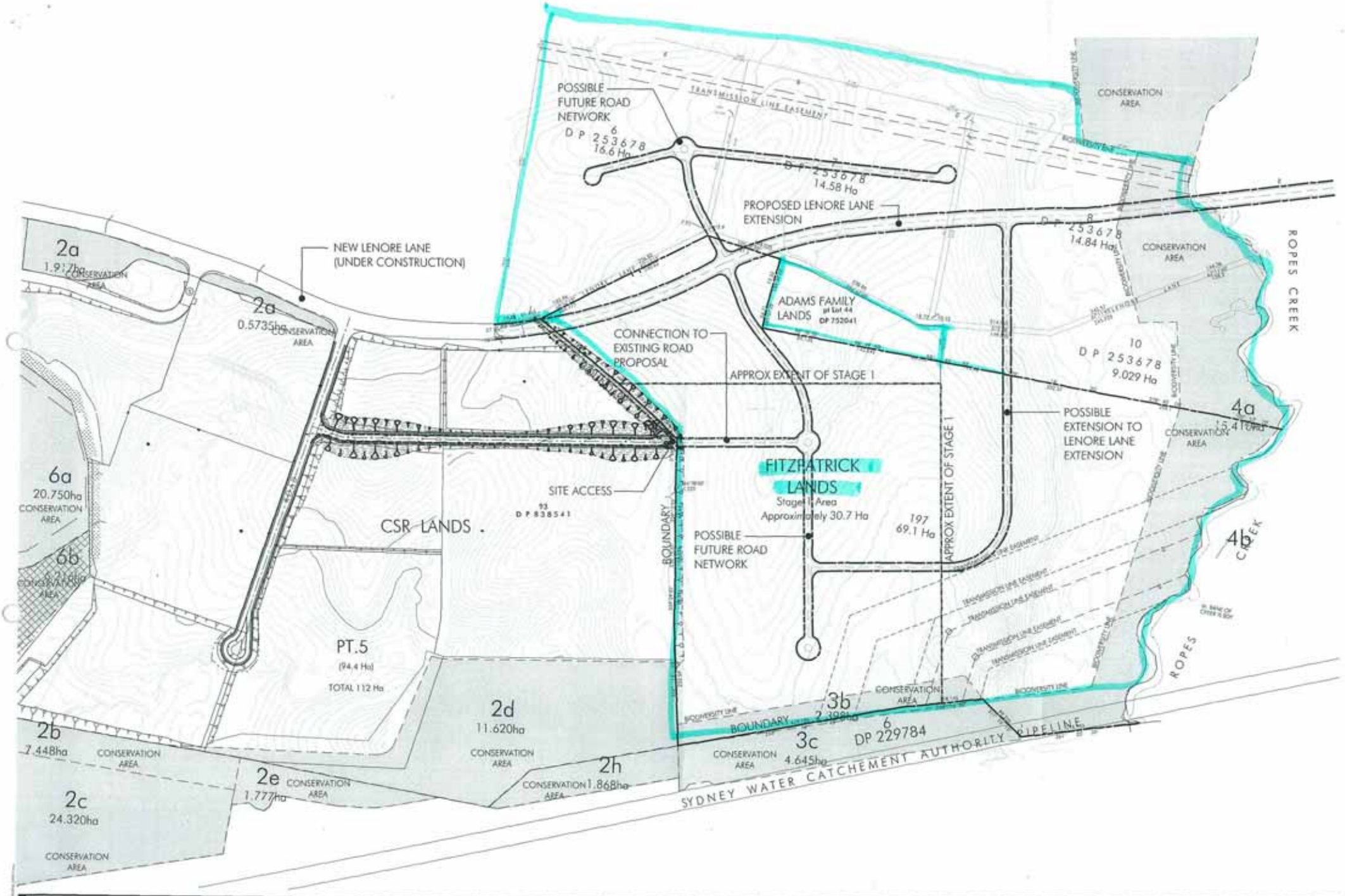
PROPOSED		
SITE AREA C		35 912 m2
Building	19 000 m2	
SITE AREA D		59 518 m2
Building	30 975 m2	
SITE AREA E		51 670 m2
Building	31 250 m2	
SITE AREA F		63 425 m2
Building	35 750 m2	
SITE AREA G		65 708 m2
Building	27 650 m2	
SITE AREA H		100 167 m2
Building	46 500 m2	
ROAD		4 500 m2
Total		380 900 m2
Total Building	191 125 m2	

CSR™

CONCEPT PLAN

Lenore Lane, Erskine Park | NSW

scale 1:2000 @ A1 | date 17.03.06 | drawing no. EPcsr-MP10 rev A



FDC Construction & Fitout

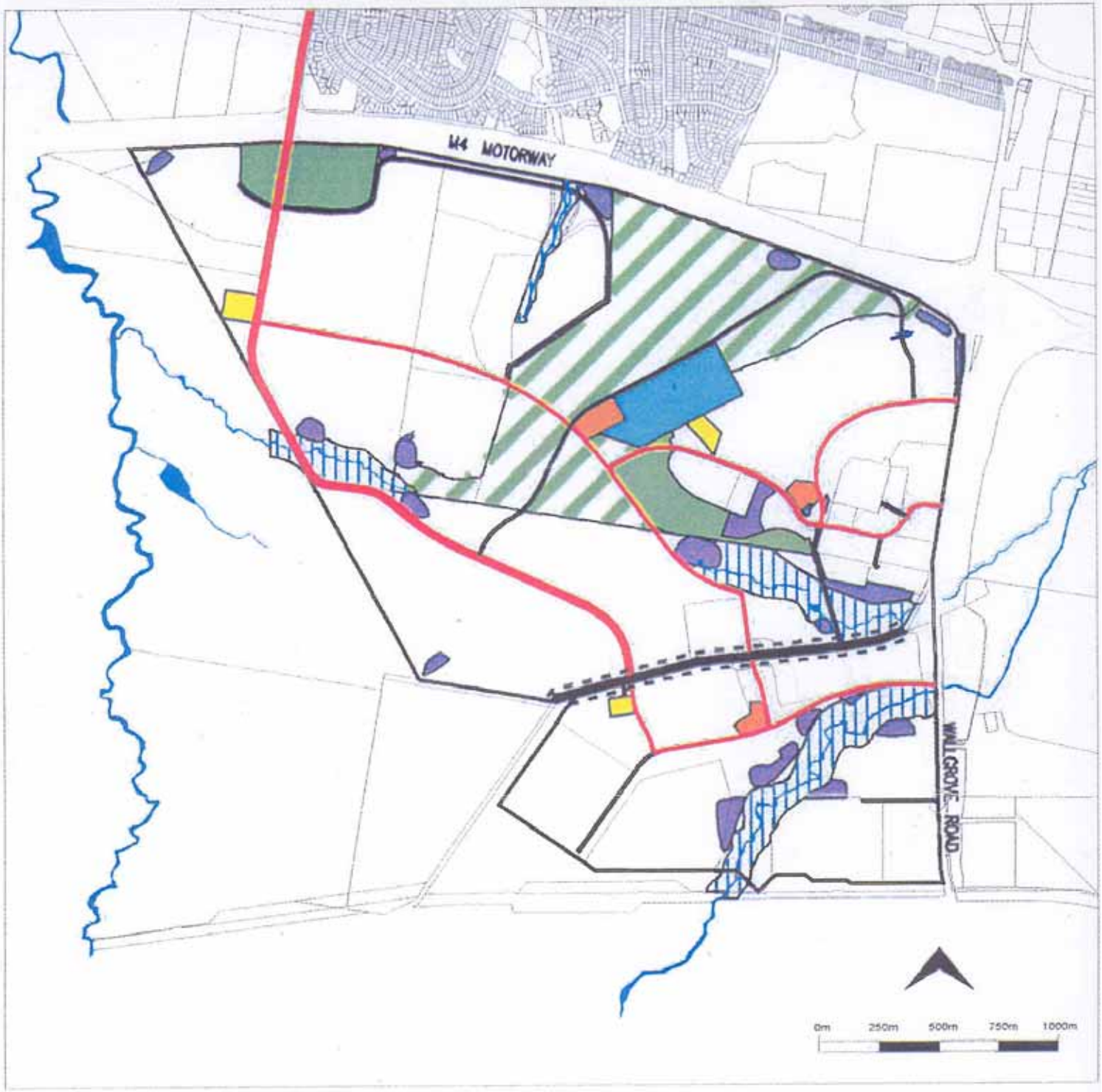
FDC

FITZPATRICK LANDS MASTERPLAN
ERSKINE PARK

PROPOSED SITE MASTERPLAN

2946_DA02-A

nettletontribe



Conservation Area

Potential Conservation Area

Neighbourhood Centre

Electricity Zone Substation

Reservoir

Drainage Detention Basin/Wetland

Riparian Corridor

Sub-arterial Road

Main Collector Road

Standard Collector Road

Local Road

Future Road Widening

Figure ... - Concept Masterplan

Appendix E Water

- Authority Discussions
- Work as Executed Drawings

Authority Discussions

With regards to the Sydney water supply pipeline road crossings, we have been advised that it is Sydney Water's policy not to comment on designs for pipe crossings submitted to them for review and not to advise/recommend on design solutions to be incorporated. Rather all plans should be submitted for review through a Water Servicing Coordinator (3rd party) for design work.

With this in mind Mr Steve Rimmer who is employed as a Water Servicing Coordinator was contacted on the 22nd March 2006. He is familiar with the pipe line in question and various techniques for the road crossing of the pipeline were discussed. Possible structures for crossing the pipeline include:

a) A bridging structure; or
b) A concrete encased pipeline in fill structure.

Both structures would be acceptable to Sydney Water (subject to review). It was advised that a bridging structure would require substantial clearance to provide access for maintenance plant. Four other existing pipeline crossings with the local area were also mentioned. These are crossings at: Luddenham Road; Mamre Road; Old Wallgrove Road and Wallgrove Road/M7. All four crossings were concrete encased pipeline in fill.

Existing plans for the Old Wallgrove Road crossing were obtained from Sydney Water. These plans are provided for information on the following pages of this appendix.

W/O 30306

SHEET 6

No. OF SHEETS 6 of 6

DATE OF ISSUE
6-12-63
25-7-66
23-11-67
4-10-67
26-2-68
29-5-68

WORK AS EXECUTED

COMPLETED 4-12-67

ASST. ENGINEER Hazell Anderson

OVERSEER J. Shaw

CONTRACTOR Day Labour

..... DISTRICT ENGINEER

..... DISTRICT

Typical Diagram of Security Rope Anchors

Boundary post at 33.71 from BM on face of Anchor No 33 at 90 degrees and 24.80 from Anchor No 33

LETTER & DETAIL OF AMENDMENTS	MADE BY	APPROVED

(S) Denotes Anchor Block No

APPROVED

1.12.68

ENGR.-IN-CHIEF

EXAMINED	SUBMITTED
SUP. DRAFTSMAN	
CHIEF SURVEYOR	CHIEF PLANNING ENGR.
INSPECTING ENGR.	RECOMMENDED
CHIEF CONSTN ENGR.	DEPUTY ENGR.-IN-CHIEF

STANDARD DATUM: NATIONAL SURVEY

WARRAGAMBA PIPE LINE No 2

120' SECTION

MUNICIPALITY OF BERRIMA SHIRE OF WINGECARRIBEE

SCALE FOR PLAN 100' TO AN INCH

DESIGNED		FILE NO. 6/7500	CONT. NO.
DRAWN		SENIOR DESIGNING ENGR.	
CHECKED		INSPECTING ENGR.	
DESIGNING ENGR.		CHIEF DESIGNING ENGR.	

1026
401

CAT NO. IN

SYDNEY WATER
THIS PLAN IS NOT NECESSARILY UP TO DATE OR CORRECT AND SYDNEY WATER ACCEPTS NO RESPONSIBILITY IN THAT REGARD

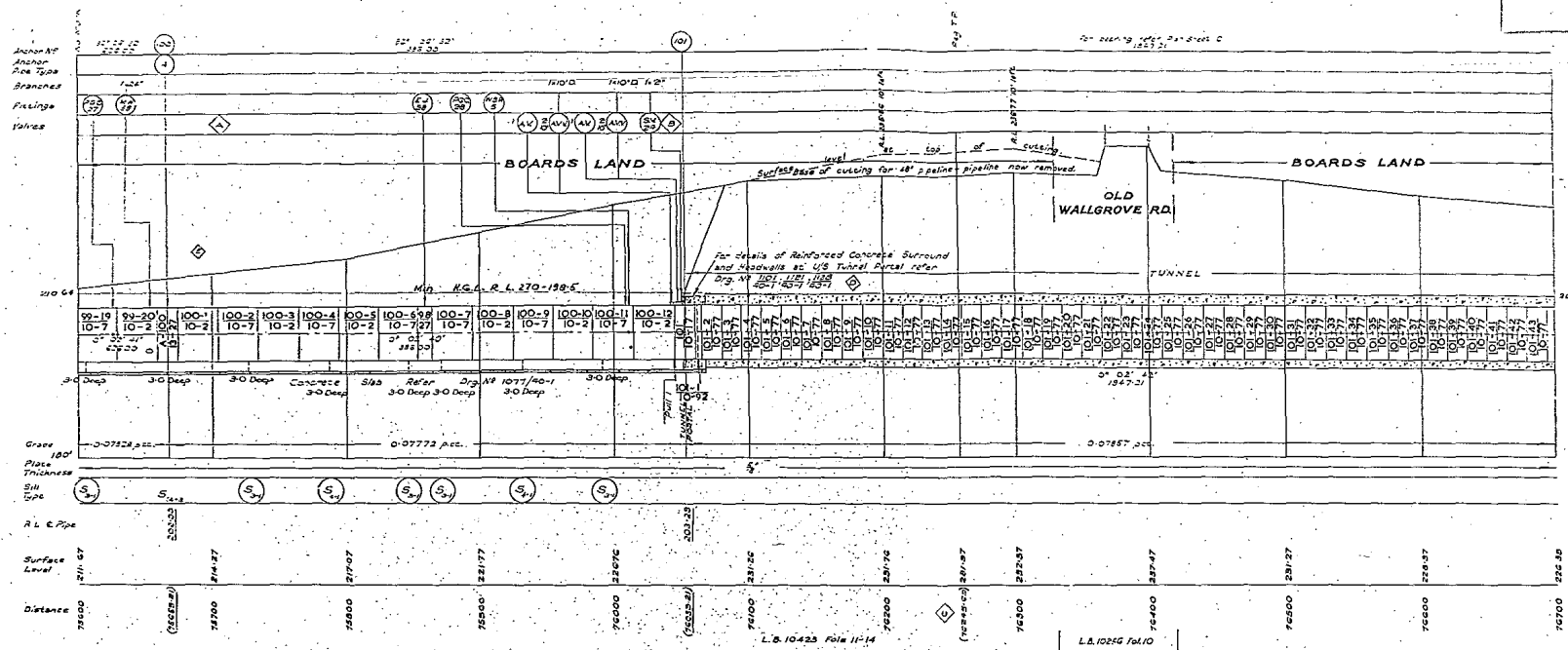
SYDNEY WATER
THIS PLAN IS NOT NECESSARILY UP TO DATE OR CORRECT AND SYDNEY WATER ACCEPTS NO

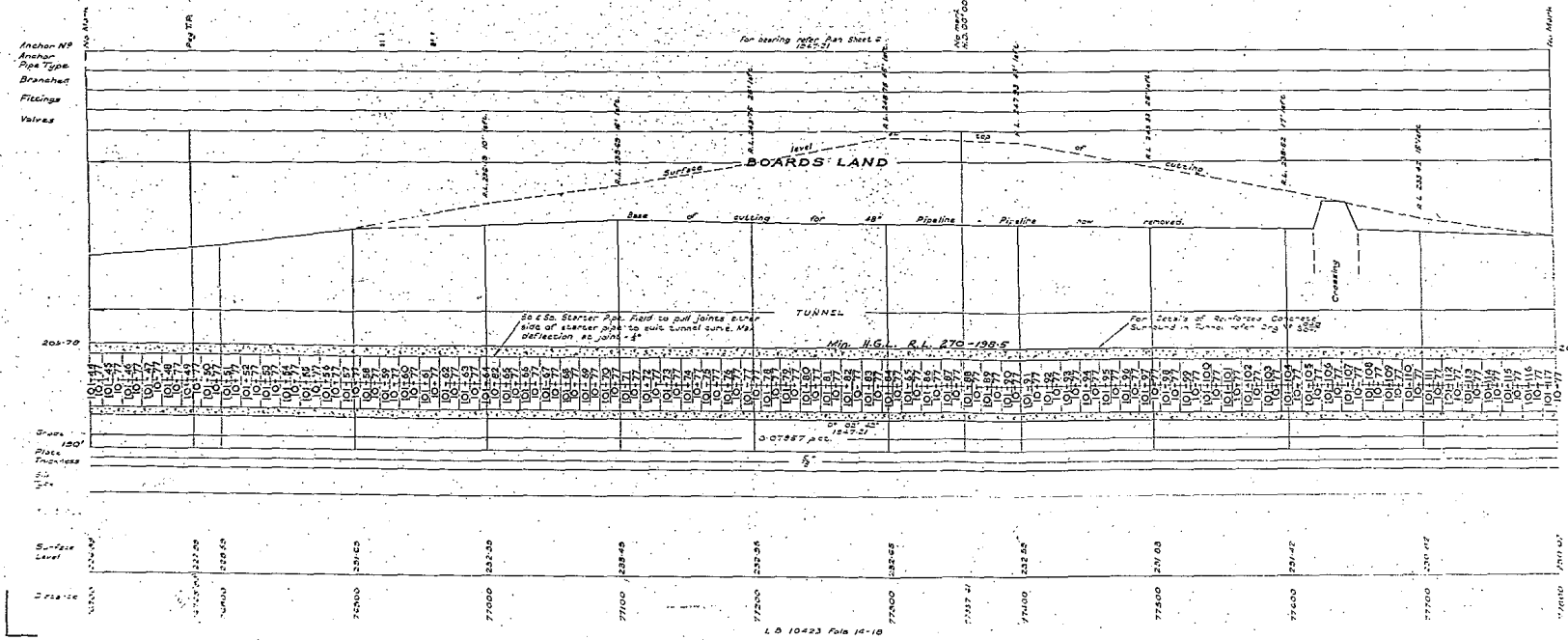
W/O 30306

SHEET 36

No OF SHEETS [illegible]

DATE OF ISSUE	WORK AS EXECUTED
22-2-66	COMPLETED 28-12-67
2-12-66	ASST. ENGINEER Surveyor, Parkes
28-2-66	OVERSEER Wright
25-7-66	CONTRACTOR Day Labour
23-1-67	L.A. Bayliss DISTRICT ENGINEER
16-10-67	Parkes DISTRICT
22.2.68	
28.6.68	





E	32° Anchor only Offtake deleted	SFY 6.68	[illegible]
D	00 Nos Altered	SFY 2.68	[illegible]
C	Chainage for TP3 amended	SFY 2.68	[illegible]
B	(S.V.) amended to (S.V.)	SFY 2.68	[illegible]
A	2" SV deleted	SFY 2.68	[illegible]
LETTER & DETAIL OF AMENDMENT		MADE BY	APPROVED

NOTES

1. EXCEPT WHERE OTHERWISE SHOWN S TO S DISTANCE BETWEEN SILLS IS AS PER DRG. N° 923/40-1
2. FOR LOCATION OF FITTINGS TO BE WELDED ON PIPES BY SUPPLY CONTRACTOR REFER DRG. N° 1030/40-1
3. FOR LOCATION OF BRANCHES AND FITTINGS TO BE WELDED ON PIPES BY MAINLAYING CONTRACTOR REFER DRG. N° 1031/40-1 1032/40-1
4. CHAINAGES NOT BRACKETED ARE TAKEN ALONG THE ROUTE OF THE 48" PIPELINE NOW REMOVED.
5. SILL TYPES TO BE ENTERED IN SILL TYPE CIRCLES BY DISTRICT OFFICE.
6. FOR LOCATION OF 2" BRANCHES FOR (S.V.) AND BRANCHES FOR (A.V.V.) REFER DRG. N° 1137 x 1117 40-1 40-1

PIPE MARKING SYSTEM

1 — 9 / 11 — 8	ANCHOR N° — PIPE NUMBERED FROM 1S ANCHOR; PLATE THICKNESS IN 1/16" — MARK N° AS PER CONTRACT DRGS.
D — 14 — 33	" ANCHOR PIPE TYPE — ANCHOR N°; " PLATE THICKNESS IN 1/16" — MARK N° AS PER CONTRACT DRGS.
3 / 26	EXPANSION JOINT N° / CONTRACT ITEM N° (SCHEDULE A1)

SCALES

HOR.

VERT.

LEGEND

- (4) ANCHOR N°
- (A) ANCHOR PIPE TYPE
- (E.J. 3) EXPANSION JOINT
- (M.H. 6 A) MANHOLE
- (S.V. 3) SCOUR VALVE
- (A.S.V. 2 S.V. 1) AUXILIARY SCOUR VALVE
- (S.V.) STOP VALVE
- (A.V.V.) ANTI-VACUUM VALVE
- (A.V.) AIR VALVE
- (P.R.V. 5) PRESSURE RELIEF VALVE
- (P.G. 4 A) PRESSURE GAUGE CONNECTION
- (W.S.P. 3) WATER SAMPLING POINT
- (W.C. 5) WELDING COLLAR

ALL VALVES TO BE 400FT HEAD

ORIGIN OF CHAINAGE
D/S FACE OF 84" FLANGE ON WARRAGAMBA DAM VALVE HOUSE MANIFOLD

HYDRAULIC GRADE
MINIMUM H.G.L. R.L. 270
AT DAM FACE (CH. - 258 17)
R.L. 198·5 AT OUTLET (CH 9 U 12)

STANDARD DATUM

WATER SUPPLY
WARRAGAMBA PIPE LINE N° 3.
1908 SCHEME

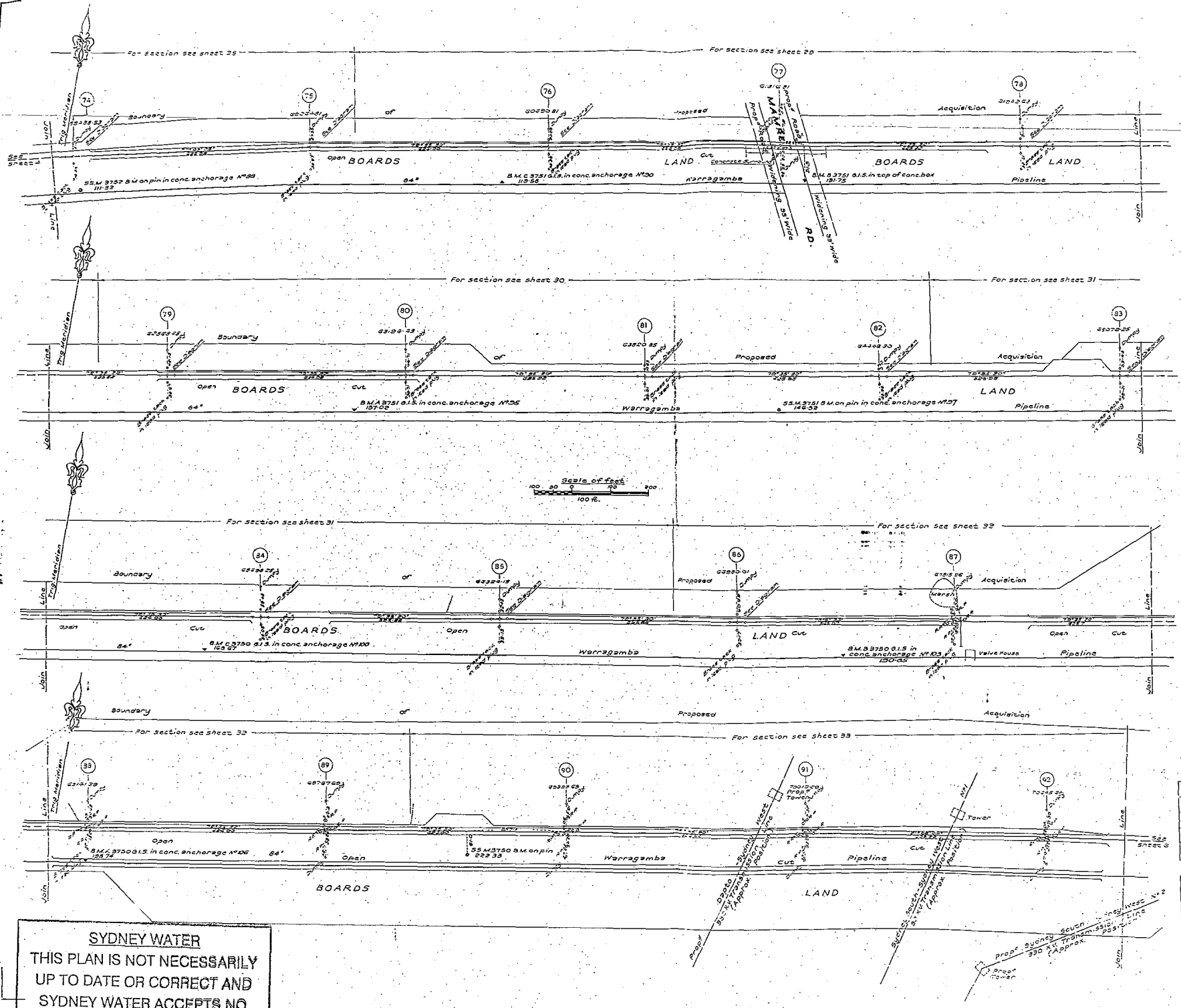
Numerals to be of position on the 5 & 6 mm line

SCALES HOR. 40 FEET TO AN INCH
VERT. 10 FEET TO AN INCH

DESIGNED [illegible] FILE NO. [illegible] CONT NO.
GRADING DETAILS [illegible] SENIOR DESIGNING ENGINEER
CHECKED [illegible] ASSISTANT ENGINEER
DESIGNING ENGR [illegible] CHIEF DESIGNING ENGINEER

L.B.D. 20-1

MICROBOX 77-149



W/O 30306
SHEET 5
No. OF SHEETS 55-91

DATE OF ISSUE
6-12-65
25-7-66
29-1-67
16-10-67
26-2-68
23-2-68

WORK AS EXECUTED
COMPLETED 30-11-67
ASST. ENGINEER Hazell, Australian
OVERSEER Various
CONTRACTOR Day, Lunan
L.M. Keyes DISTRICT ENGINEER
Prospect DISTRICT

Typical Diagram of Recovery Pegs as Anchors
Recovery pegs are 6"x6" steel set in concrete & shown as R.P. All distances are as shown unless otherwise indicated

LETTER & DETAIL OF AMENDMENT	MADE BY	APPROVED

(5) Denotes Anchor Block No

APPROVED
30/11/65
ENGR.-IN-CHIEF

EXAMINED 24/11/65	SUBMITTED
SUP. DRAFTSMAN 26/11/65	30-11-65
CHIEF SURVEYOR 29/11/65	CHIEF PLANNING ENGR.
INSPECTING ENGR. 29/11/65	RECOMMENDED
CHIEF CONSTN. ENGR.	1/12/65
	DEPUTY ENGR.-IN-CHIEF

STANDARD DATUM
WATER SUPPLY
WARRAGAMBA PIPE LINE No 2
120° SECTION
MUNICIPALITY OF PENRITH SHIRE OF BLACKTOWN
SCALE HOR. 200 FT. TO AN INCH

DESIGNED G.T.C. P.A.W.	FILE NO. 81/2470
DRAWN D.A.W. G.T.C. P.A.W.	SENIOR DESIGNING ENGR.
CHECKED G.T.C. P.A.W.	INSPECTING ENGR. A.W.
DESIGNING ENGR. A.W.	CHIEF DESIGNING ENGR.

1026
30-1
CAT NO.

SYDNEY WATER
THIS PLAN IS NOT NECESSARILY UP TO DATE OR CORRECT AND SYDNEY WATER ACCEPTS NO RESPONSIBILITY IN THAT REGARD

W/O 30306

SHEET 29

No. OF SHEETS 29

DATE OF ISSUE
6-12-65
29-2-66
25-7-66
23-1-67
18-3-67
22-2-68
29-6-68

WORK AS EXECUTED

COMPLETED 30-4-67

ASS'T. ENGINEER Assistant Surveyor

OVERSEER Assistant Manager, Engineering Services

CONTRACTOR Day Dawson

L.M. Bayley DISTRICT ENGINEER

Prospect DISTRICT

LETTER & DETAIL OF AMENDMENT	MADE BY	APPROVED
G	Drg. N° 1028 added	SRY	
F	Theoretical length of E.J. added	SRY	
E	Welding Collar added	SRY	
D	Pipe 3'30 now 3'02	SRY	
C	Pipe 3'15 now 3'02	SRY	
B	Step for Conc. Surround thickened	SRY	
A	Drg. N° Conc. Surround added	SRY	

NOTES

1. EXCEPT WHERE OTHERWISE SHOWN ℄ TO ℄ DISTANCE BETWEEN SILLS 15 AS PER DRG. N° 923/40-1
2. FOR LOCATION OF FITTINGS TO BE WELDED ON PIPES BY SUPPLY CONTRACTOR REFER DRG. N° 1030/40-1
3. FOR LOCATION OF BRANCHES AND FITTINGS TO BE WELDED ON PIPES BY MAINLAYING CONTRACTOR REFER DRG. N° 1031/40-1 1032/40-1
4. CHAINAGES NOT BRACKETED ARE TAKEN ALONG THE ROUTE OF THE 48" PIPELINE NOW REMOVED.
5. SILL TYPES TO BE ENTERED IN SILL TYPE CIRCLES BY DISTPICT OFFICE
6. FOR LOCATION OF 2" BRANCHES FOR (SV) AND BRANCHES FOR (AVV) REFER DRG. N° 1137/40-1 AND 1117/40-1

PIPE MARKING SYSTEM

1 – 9 / 11 – 8	ANCHOR N° — PIPE NUMBERED FROM U.S. ANCHOR PLATE THICKNESS IN 1/16" — MARK N° AS PER CONTRACT DRGS.
D – 4 / 14 – 33	ANCHOR PIPE TYPE — ANCHOR N° PLATE THICKNESS IN 1/16" — MARK N° AS PER CONTRACT DRGS.
3 / 28	EXPANSION JOINT N° CONTRACT ITEM N° (SCHEDULE A1)

SCALES

HOR. 40 10 0 40 80 — 40'

VERT. 10 5 0 10 20 — 10'

LEGEND

- (A) ANCHOR NO.
- (A) ANCHOR PIPE TYPE
- (E.J.) EXPANSION JOINT
- (M.H.) MANHOLE
- (S.V.) SCOUR VALVE
- (A.S.V.) AUXILIARY SCOUR VALVE
- (S.V.) STOP VALVE
- (AVV) ANTI-VACUUM VALVE
- (A.V.) AIR VALVE
- (P.R.V.) PRESSURE RELIEF VALVE
- (P.G.C.) PRESSURE GUAGE CONNECTION
- (W.S.P.) WATER SAMPLING POINT
- (W.C.) WELDING COLLAR

ALL VALVES TO BE 400 FT. HEAD

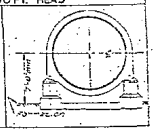
ORIGIN OF CHAINAGE

D/S FACE OF 84" FLANGE ON WARRAGAMBA DAM VALVE HOUSE MANIFOLD

HYDRAULIC GRADE

MINIMUM H.G.L. R.L. 270 AT DAM FACE (CH. 258-17)

R.L. 198-5 AT OUTLET (CH. 91,112)



STANDARD DATUM

WATER SUPPLY

WARRAGAMBA PIPE LINE N°2

120° SECTION

Municipality of Penrith Shire of Blacktown

SCALES HOR. 40 FEET TO 1 INCH

VERT. 10 feet TO 1 INCH

DESIGNED	FILE N°. S 32000	CONT. N°
GRADING DETAILS	SENIOR DESIGNING ENGR.	
CHECKED	INSPECTING ENGR.	
DESIGNING ENGR.	CHIEF DESIGNING ENGR.	

1026/40-1

CAT. N°.

L.B. 10537 Fols 6-9

L.B. 10537 Fols 8-10

L.B. 10537 Fol 6
L.B. 10226 Fol 11

MICROBOX 77-149

Appendix F Power

- Authority Discussions
- Clearances from Ground

Cuthbert, Chris

From: Raymond Wood [Raymond.Wood@integral.com.au]
Sent: Friday, 12 May 2006 2:51 PM
To: Cuthbert, Chris
Subject: TRANSMISSION LINES

NEW ROAD MAMRE ROAD.doc (40 KB...

Chris
Re out telephone conversation
I have attached a list of general restrictions which may be of some help I am not aware of any document that might help you However you might contact Col Brown Transmission Mains Manager on 02
9853 7042 for any more technical information. He may also help with line route drawings I am only able to talk about the management of existing easements

Ray Wood

Raymond Wood
Easement Officer
9853 4670
0418 217 985
Fax 02 9853 4622
woodr@integral.com.au

Reference is made to your letter requesting information about the powerlines and their easements, which effect the property between Mamre road and Old Wallgrove.

This property is traversed by the following power-lines and their respective easements: -

- The 1323kv Transmission Line feeder number 219 between Mamre Road zone substation to Mt Druitt zone sub station.
- The 1323kv Transmission Line feeder number 939 between Sydney West Transmission Station to Mamre Road zone Sub Station,
- The 132kv-transmission line, feeder number 223/237, between Sydney West Transmission Station and Rooty Hill/BHP zone sub station.

Please note that the area is also traversed by several Transgrid powerlines.

It is advised that transmission line easements have been acquired by Integral Energy to provide adequate working space along the route of the line for construction and maintenance work. These easements are also acquired to ensure that no work or other activity is undertaken under or near the line or the structures that could either by accident or otherwise create an unsafe situation for persons or for the security of the line

GENERAL RESTRICTIONS

Integral Energy wish to provide the following list of "General Restrictions" applicable to the easement area. It should be noted that these are indicative guidelines only. All applications to encroach into easement areas are individually assessed taking into account the site specific circumstances and risks of the proposal. As existing ground levels throughout the easement are unknown, it is assumed that minimum design clearances exist within the easement area. As such, references to permissible heights on any activity may alter from that stated within this document. **Written approval must be sought for any activity within the easement area. For such approval, detailed plans drawn to scale and fully dimensioned showing property boundaries and other relevant information should be forwarded to Integral Energy**. Approval to encroach into the easement area will not be granted where an alternate site clear of the easement area exists. **All approvals granted are subject to the encroachments being removed or relocated, at the owner's expense should Integral Energy require this for cable maintenance, construction or emergency works.**

A. **Unobstructed access to the easement area and associated structures must be available at all times. Integral Energy reserves the right to restrict access, to part or all, the easement area for maintenance, further construction, emergency works, issues of public safety or to provide a safe work area for Integral Energy staff in accordance with Occupational Health and Safety and Workcover requirements.**

B. **Houses, buildings, site sheds, other substantial structures or parts thereof, shall not be erected within the easement area.**

C. Structures such as detached garages, sheds, stables, carports, unroofed verandah's fixed plant, equipment and in-ground swimming pools, will only be approved if no other practicable alternative site is available clear of the easement area. Above ground swimming pools are not permitted No approvals will be granted for any of the above where they are proposed within 15 metres of the closest structure, closer than 5 metres from the vertical projection of the closest conductor, if access is restricted or safety clearances are not maintained. Furthermore, any proposed structures must not exceed 3 metres in height and the floor area of the encroachment must not exceed 20m2.

D. **No encroachment into the easement will be permitted within 15 metres of the closest structure and 5 metres from the vertical projection of the closest conductor**

O. Dogs and livestock shall not be kept within the easement area if they are likely to create a dangerous situation for Integral Energy staff and thus restrict access.

P. Burning off is not permitted within the easement area without the prior written approval of Integral Energy.

Q. Garbage, refuse or fallen timber is not permitted within the easement area.

R. The installation or use of irrigation equipment within the easement area is normally permitted however, is subject to the submission of drawings showing the location of the proposed system and its effects on the conductors.

S. Normal agricultural pursuits are permitted however, care should be taken when ploughing or operating mobile machinery in the vicinity of structures or supporting guys. Earthing systems are particularly prone to damage from such activities. It is imperative that access to the easement area and structures be available at all times. Whilst reasonable care will be taken, Integral Energy will not be responsible for any damage to crops caused whilst accessing and working within the easement area The restrictions applying to the heights of mobile plant and equipment must be observed.

In addition to the above, details of some fencing restrictions are provided for your information. Written approval must be sought prior to the commencement of work. All metallic fences are to be earthed and isolated in accordance with Integral Energy's specifications.

A. Brick, masonry walls or other substantial structures or parts thereof shall not be erected within the easement area.

B. All other types of fencing erected within the easement area are subject to a height limitation of 3.0 metres.

C. The erection of any fencing is not permitted within 15 metres of a structure or guy and is not permitted in a location that could create an unsafe working area for Integral Energy staff.

D. **Gates are required in boundary fences to facilitate longitudinal access to the easement area and associated structures. All access gates are to include Integral Energy locks in the locking system.**

For any further assistance in this matter please do not hesitate to contact Integral Energy

Cuthbert, Chris

From: Hobbs Graham [Graham.Hobbs@transgrid.com.au]
Sent: Tuesday, 9 May 2006 11:16 AM
To: Cuthbert, Chris
Subject: RE: Design Clearances

Chris

Just a quick note. (further details will sent in a letter shortly)

On the assumption the road is proposed to the north of TransGrid's Property Not the south.

Attached is a snapshot showing TransGrid's transmission line in and out of Sydney west Substation.

It should be noted that your map does not show all the Power Lines, particularly heading North west where TransGrid have one 330kv double circuit line, two single circuit 330kv lines and one double circuit 132kv transmission line.

What is not shown on your map or TransGrid's Snapshot is another Transmission line owned by Integral Energy which runs parallel to TransGrid's.

You should contact Lesa Bunn or Ray Wood at Integral Energy on phone Number 131 081.
TransGrid also have three circuits running West, one double circuit 330kv transmission line and a single circuit 330kv transmission line.

Further details are to sent shortly.

Regards Graham Hobbs
for the Manager Central Region

From: Cuthbert, Chris [mailto:Chris.Cuthbert@maunsell.com]
Sent: Tuesday, 9 May 2006 9:37 AM
To: Hobbs Graham
Subject: RE: Design Clearances

Graham,

Thank you for responding to my initial email.

Please find attached a location plan of the area of the proposed road network under consideration. The proposed road network will be developed upon confirmation of the local constraints. We would like to be able to consider the impact of a section of road crossing under each transmission line shown on the map and would appreciate your feedback as listed in the initial email.

The proposed road network will be travelling in a west to east direction and will form a link between Lenore Lane in the west and Old Wallgrove Road to the east.

Please do not hesitate to contact me should you require any further clarification or wish to discuss. My contact number is 02 8295 3600.

Regards,

Chris Cuthbert

From: Hobbs Graham [mailto:Graham.Hobbs@transgrid.com.au]
Sent: Monday, 8 May 2006 1:23 PM
To: Cuthbert, Chris
Subject: RE: Design Clearances

Chris the clearances vary depending on the voltage of the power line and the type of road proposed.

I suggest you give us a location of the proposed road so I can identify the transmission line or lines and their voltages.

I also need to assure they are TransGrid's Assets not Integral Energy's

Regards Graham Hobbs

For the Manager Central Region

From: Cuthbert, Chris [mailto:Chris.Cuthbert@maunsell.com]
Sent: Thursday, 4 May 2006 2:53 PM
To: Hobbs Graham
Subject: Design Clearances

Hi Graham,

A TransGrid colleague of yours suggested I contact you as you may be able to help me.

I am a Highway Design Engineer with Maunsell Australia and I am developing a concept design for a road network local to TransGrid's Sydney West Substation in the Blacktown, Eastern Creek area. It is likely that sections of the road will cross underneath power lines and pass close to electricity towers.

I would appreciate it if you could advise me on the following:

- What is the minimum vertical clearance between the road surface and an overhead power line;
- What is the desirable horizontal clearance between the road boundary and the electricity pylon; and
- Is there a document (or documents) I could refer to and reference for the benefit of a design report that would list these clearances?

Please feel free to contact me if you require further clarification or wish to discuss. My contact details are listed below.

Regards,
Chris Cuthbert
Maunsell Australia Pty Ltd
Level 11, 44 Market Street, Sydney, NSW 2000
PO Box Q410, QVB Post Office, Sydney, NSW 1230
Australia
ABN 20 093 846 925
Tel +61 2 8295 3600
Fax +61 2 9262 5060
chris.cuthbert@maunsell.com

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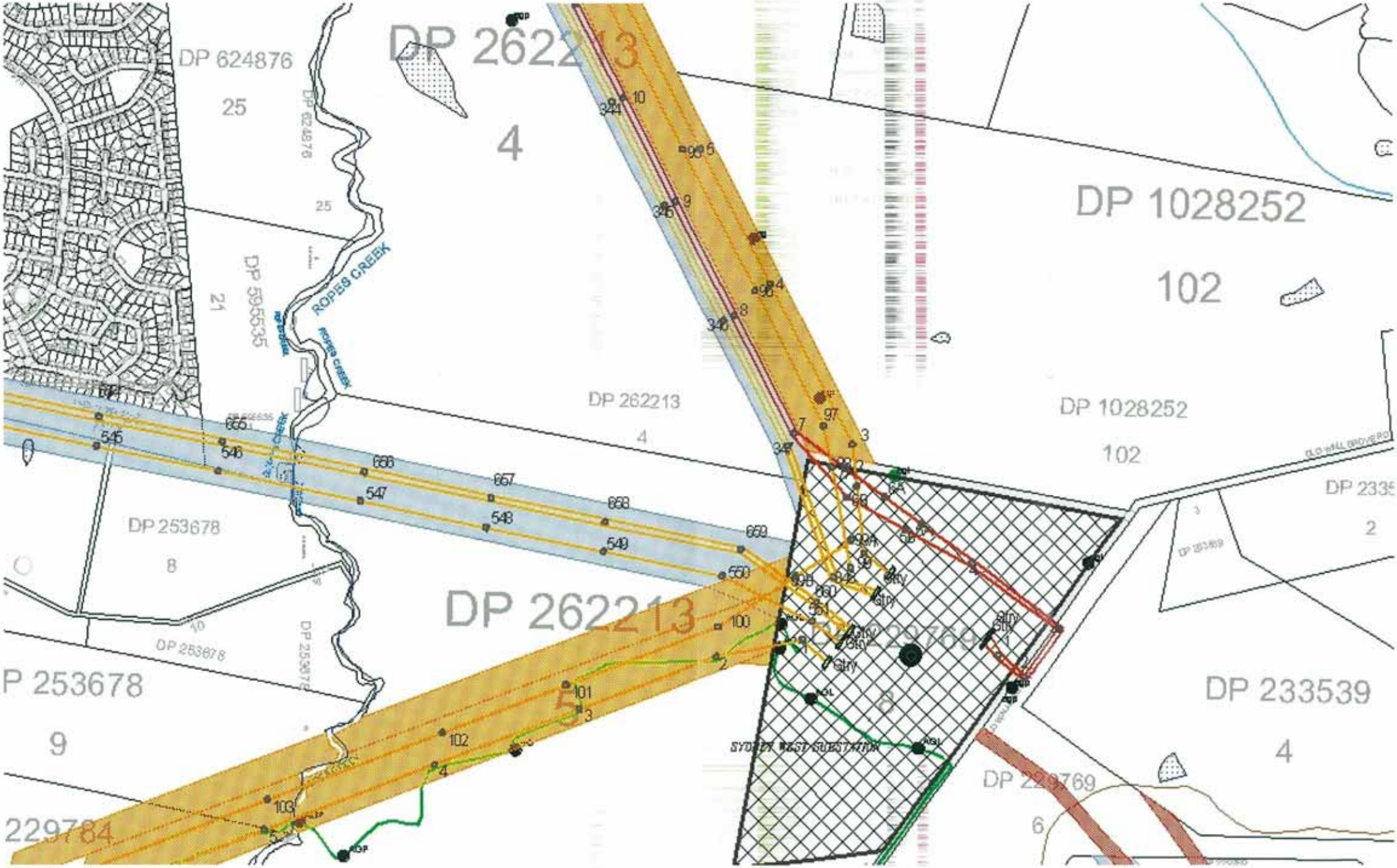
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DP 595535
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ROPES CREEK
DP 1028252
102
DP 253678
8
DP 262213
DP 1028252
102
DP 253678
9
DP 233539
4
DP 229769
6
229784
SYDNEY WEST SUBSTATION

SECTION 8 CLEARANCES FROM GROUND

8.1 LINES OTHER THAN INSULATED SERVICE LINES

This Clause covers all overhead lines except insulated conductors of an overhead service line and facade mounted insulated cable systems.

The aerial conductors or cables of an overhead line should be located so that the distances to level or sloping ground in any direction from any position to which any part of such conductors may either sag at Maximum Design Temperature or move as a result of wind pressure, should not be less than the distances specified in Table 8.1.

Departures from these specified distances are permissible where a comprehensive risk management assessment has been carried out using the methodology outlined in Appendix G or similar.

TABLE 8.1

CLEARANCE FROM GROUND, LINES OTHER THAN INSULATED SERVICE LINES

Nominal system voltage U	Distance to ground in any direction m		
	Over the carriageway of roads	Over land other than the carriageway of roads	Over land which due to its steepness or swampiness is not traversable by vehicles
Bare or insulated conductor or any other cable U ≤ 1000 V OR Insulated conductor with earthed screen U > 1000 V	5.5	5.5	4.5
Insulated conductor without earthed screen U > 1000 V	6.0	5.5	4.5
Bare or covered conductor			
1000 V <U ≤ 33 kV	6.7	5.5	4.5
33 V <U ≤ 132 kV	6.7	6.7	5.5
132 kV <U ≤ 275 kV	7.5	7.5	6.0
275 kV <U ≤ 330 kV	8.0	8.0	6.7
330 kV <U ≤ 500 kV	9.0	9.0	7.5

NOTES:

1 *For the purpose of this Clause, the term 'ground' includes any unroofed elevated area accessible to plant or vehicles.*

2 *In the case of cliff faces or cuttings the clearances specified in the column headed 'Over land which due to its steepness or swampiness is not traversable by vehicles' shall apply.*

3 *In the case of waterways, flood plains and snowfields, the clearances should be determined having regard to local conditions and requirements. Refer to Appendix L for guidelines for obtaining approvals for water crossings.*

4 *Where the usage of land is such that vehicles of unusual height are likely to pass under an overhead line, the clearances given in this clause may need to be increased.*