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29th June 2017

EG

Governor Phillip Tower, Level 21
1 Farrer Place
Sydney NSW 2000

Your Ref:

Our Ref: 17-472-C001-03

Direct phone: 02 9439 1777

Attention

Darya Fatah DFatah@eg.com.au

Michael Bacik Mbacik@eg.com.au

Dear Darya,

STORMWATER AND INFRASTRUCTURE REPORT FOR 16-26 CHAPMAN AVENUE AND 17-27 DAWES AVENUE, CASTLE HILL

Further to recent discussions and correspondence on the proposed development of 16-26 Chapman Ave and 17-27 Dawes Ave, Castle Hill please find below a summary of the preliminary servicing strategy and infrastructure requirements.

Our investigations of the site were carried out based on a Dial Before You Dig (DBYD) search, a detailed site survey prepared by StrataSurv on 24th-25th May 2017 and an Indicative Estate Masterplan documentation prepared by PTW on 24th May 2017.

The site is located within The Hills Shire Council LGA and consists of multiple lots with a total area of approximately 1.13Ha. Refer to Figure 1 for the site location.

The proposed site includes the following lots:

- 16 Chapman Ave, Castle Hill
- 18 Chapman Ave, Castle Hill
- 20 Chapman Ave, Castle Hill
- 22 Chapman Ave, Castle Hill
- 24 Chapman Ave, Castle Hill
- 26 Chapman Ave, Castle Hill
- 17 Dawes Ave, Castle Hill
- 19 Dawes Ave, Castle Hill
- 21 Dawes Ave, Castle Hill
- 23 Dawes Ave, Castle Hill
- 25 Dawes Ave, Castle Hill
- 27 Dawes Ave, Castle Hill



Figure 1 - Site Location (Courtesy of Nearmaps)

EXISTING SITE

The existing site consists of 12 lots with single residential dwellings on each lot and is currently zoned R2 Low Density Residential, in accordance with The Hills LEP 2012. The site is bordered by Chapman Ave to the North-East, Dawes Ave to the South-West and single residential houses on the North-West and South-East.

The site generally falls from the east to the west corner of the site. There is an existing 525mm dia. stormwater pipe which runs through the middle of the site (within 22 Dawes Ave and 22 Chapman Ave) and there are existing council stormwater kerb inlet pits on both street frontages, which ultimately direct flows into Cattai Creek to the North-west. The level in the east corner of the site, adjacent to Chapman Ave, is approximately RL112.16, which falls to approximately RL104.20 in the west, adjacent Dawes Ave.

Refer to Appendix B and Figure 2 for site survey and existing site levels, the site survey shows existing utilities infrastructure and stormwater within the development site extents.

The purpose of this report is to provide preliminary advice with regards to:

- Locations of existing services and the likely connection points to supply the site;
- Potential service upgrades required to ensure adequate capacity to the site;
- Timing of likely service upgrades (if any);
- Indicative works required to upgrade or provide new services; and
- Stormwater infrastructure requirements.

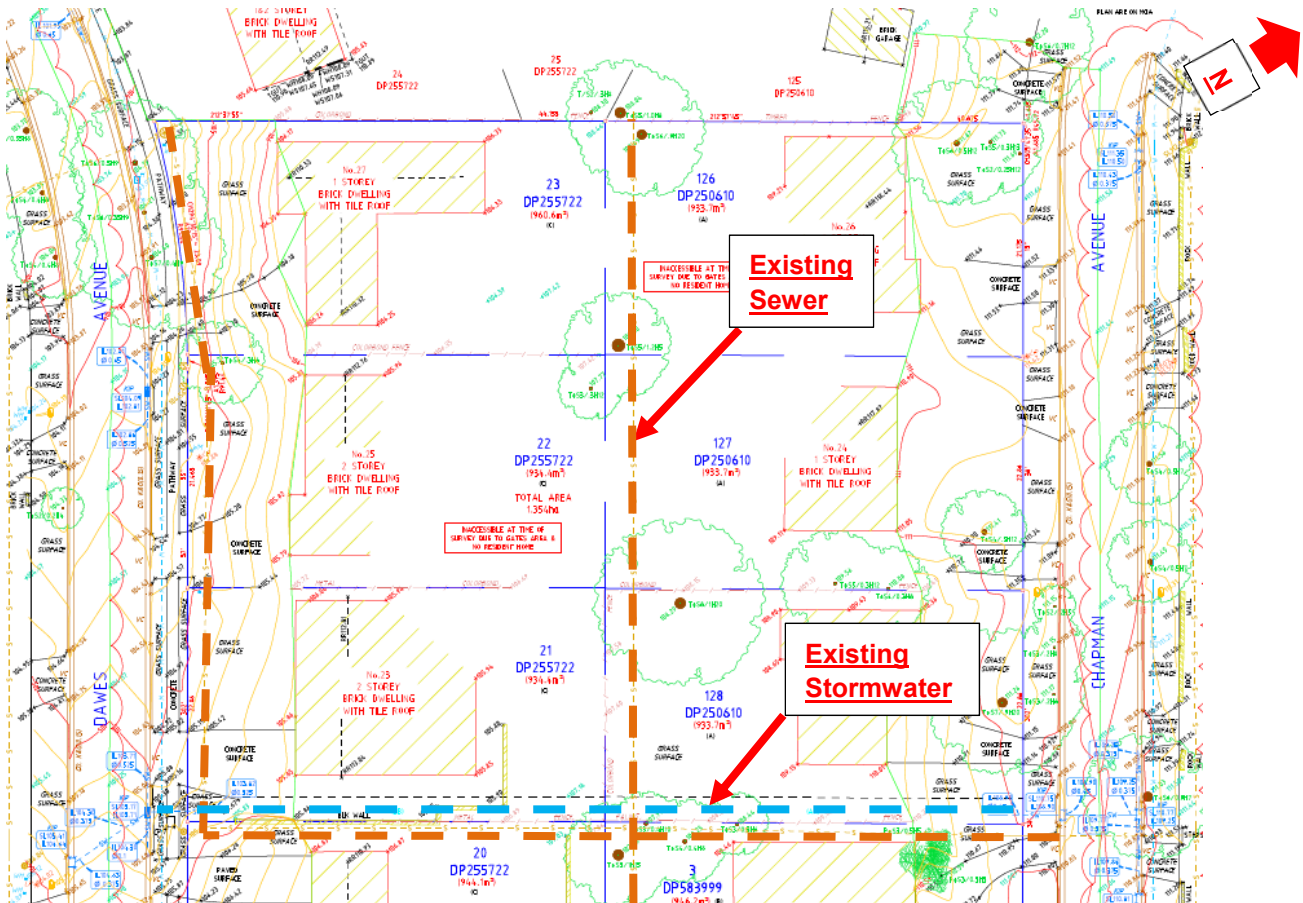


Figure 2 – Site Survey (Courtesy of StrataSurv)

PROPOSED DEVELOPMENT

The proposal for the development of the is to create the following:

- One consolidated lot;
- Proposed 8 to 19 storeys apartment buildings (Buildings A-D) with childcare and café tenancies on the ground floor;
- Four levels of basement car parking;
- Land dedication of open space totalling 2,879 m²;
- Through site link totalling 400m² between buildings A and B; and
- Through site link totalling 377m² between building d and Chapman Avenue Reserve.

Refer to Appendix A for indicative layout plan.

EXISTING SERVICES

Water

From Dial Before You Dig (DBYD) information, the following water services were located within the area:

- 1 x 100mm CICL (Cast Iron Cement Lined) main in the northern verge of Dawes Ave;
- 1 x 100mm CICL (Cast Iron Cement Lined) main in the northern verge of Chapman Ave;
- A 375mm CICL (Cast Iron Cement Lined) to the south-east of the site in the main the eastern verge of Fishburn Cres.

Refer to Appendix C for Sydney Water map and Appendix D for proposed works sketch.

In order to service the proposed development either 100mm dia. watermain is required to be upgraded to a minimum 200mm dia. watermain from Fishburn Crescent to the subject site (approximately 220m) in length. Refer to Appendix C for Sydney Water map and Appendix D for proposed works sketch.

Summary

A feasibility application needs to be submitted to Sydney Water to determine the likely connection points and confirm the upgrades required to service the development. This feasibility study can take between 4-6 weeks however for the sake of this servicing report it is assumed the development can be serviced with water.

Sewer

From Dial Before You Dig (DBYD) information, the following sewer services were located within the area:

- 1 x 150mm VC (Vitrified Clay) within the southern boundary of the lots fronting Chapman Ave.
- 1 x 150mm VC (Vitrified Clay) through the western boundaries of 20 Chapman Ave and 21 Dawes Ave.
- 1 x 150mm along the southern boundary of 23, 25 and 27 Chapman Ave.

Refer to Appendix C for Sydney Water map and Appendix D for proposed works sketch.

The existing sewer mains within the proposed development lot will need to be realigned during construction in accordance with Sydney Water requirements, with all appropriate temporary diversions in place. Due to the size of the sewer mains within the immediate vicinity of the proposed development, it is likely Sydney Water will require no upgrades to the infrastructure to service the proposed development. The on-lot sewer will be captured within the site and discharge into the existing Sewer main connection at 27 Dawes Ave.

A feasibility application needs to be submitted to Sydney Water to determine the likely connection points and confirm the upgrades (if any) required to service the development. This feasibility study can take between 4-6 weeks however for the sake of this servicing report it is assumed the development can be serviced for sewer.

Power

From Dial Before You Dig records there are existing electrical ducts and high voltage cables owned by Ausgrid within the southern verge of Chapman Ave. There are no overhead cables in either Chapman or Dawes Ave. Refer to Appendix E for Endeavour Energy Electrical Services Map.

It is recognised that the planning proposal is one of a number occurring in the surrounding area. While a coordinated approach will most likely be undertaken, initial advice from a Level 3 Accredited Service Provider confirms the following:

Existing Electricity supply

The subject site is currently used as low density residential lots and is supplied via an underground 11,000 volt feeder cable number S326 originating from West Castle Hill Zone. West Castle Hill Zone Substation is located on the corner of Salisbury Ave and Victoria Road Castle Hill approximately 1.7kilometres (cable route length) from the site. Cheriton Zone Substation which is located on the corner of Cheriton Ave and Showground Road is closer to the subject site at approximately 1.1 kilometres (cable route length) provided a public pathway can be utilised.

Proposed load

The anticipated indicative load for the proposed 380 living units, childcare centre and café is in the order of 1.8MVA. This figure has been calculated using the following assumptions for after diversity maximum demand and will be subject to the building services engineer's final calculations:

- 4.5kVA per residential unit (based on gas hot water, gas cooktops and a single split system air conditioner in each unit); and

- Indicative estimate loads for the child care and cafe.

Method of supply

An 11kV feeder can typically supply up to 4.5MVA. The anticipated load of 1.8MVA equates to 40% of a feeder which is under the 50% figure which would trigger a mandatory new feeder from a Zone substation. Typically Endeavour Energy would consider supplying a load of this size by either:

1. Connecting the site to the nearest feeder cable where the spare capacity is available,
2. Offloading customers onto other feeders by switching to free up capacity on the nearest feeder
3. Augmenting feeders
4. A new feeder cable from a Zone substation

Upon submission of a formal application for load or an enquiry to Endeavour Energy, they will determine the point of connection and which of the above options or possibly another option will be required. Endeavour Energy will also advise whether the initial stages of the development can be supplied from the existing 11kV reticulation near the site.

Internal reticulation

The load can be supplied by either two single 1000kVA distribution transformer substations (either an outdoor pad mount type or an indoor type) or a twin 1,000 kVA indoor substation although this will depend on the final development and building layout and the title of the lots. As a worst case, a single substation may be required for each of the four (4) proposed buildings.

Indicative construction costs

- 11kV feeder (lead in works): The cost here could range from near Zero if the adjacent feeder can be utilised or up to \$1,4M if a new feeder is required from West Castle Hill Zone Substation. As the load is less than 50% of a feeder capacity there is a small chance Endeavour Energy may fund a portion of the work if a new feeder is required provided the other 60% capacity can be utilised in their view (likely in this area).
- Internal reticulation.
 - o Allow \$140k for each single transformer pad mount type substation
 - o Allow \$160k for each single transformer indoor type substation
 - o Allow \$200k for each twin transformer indoor type substation.

Summary

Preliminary investigations of the site and the area has identified several options for extending and delivering services and utilities to the land. These will be finalised following progression of discussions with Endeavour Energy to agree on the most suitable and cost-effective servicing solution for the planning proposal, as well as other rezoning proposals in the area to achieve a coordinated delivery of necessary upgrades and maximise cost benefits.

Gas

From Dial Before You Dig (DBYD) information, the following gas services were located within the area:

- 50mm dia. Steel Gas main (210kPa) in the northern verge of Chapman Ave; and
- 32mm dia. Steel Gas main (210kPa) in the northern verge of Dawes Ave.

Refer to Appendix G for Jemena Gas Network map.

Summary

Preliminary investigation of the site has identified the site should be able to be serviced with gas. Confirmation and approval will need to be sought by Jemena as owners of these gas mains for all connections into their network.

Communications

From Dial Before You Dig records there is record of existing Telstra telecommunications cables within both Chapman Ave and Dawes Ave. Refer to Appendix H for Telstra Telecommunications Map.

Summary

Preliminary investigation of the site has identified the site would be able to be serviced with telecommunications. Confirmation and approval will need to be sought by Telstra and Optus as owners of these telecommunication mains for all connections into their network.

Stormwater

As mentioned previously the site drains from the south-eastern corner of the site to the north-western corner. Survey records indicate multiple kerb inlet pits on both Chapman Ave and Dawes Ave, which will serve as potential connection points from the site. In addition, there is an existing underground stormwater pipe that runs through the middle of the site via an easement. Confirmation will need to be sought at the DA design stages to confirm the most appropriate connection points, taking into consideration the existing easement, on-site restraints, existing pipe capacities and Council consultation. Refer to attached survey drawings for the existing Stormwater network.

Council have confirmed all stormwater drainage will need to be designed in accordance with The Hills Shire Council "Design Guidelines Subdivision/Developments". Within these guidelines is the installation of On-Site-Detention (OSD) systems. The site falls within the Hawkesbury River Catchment and as such OSD need to comply with the Hawkesbury River Catchment Area Permissible Site Discharge (PSD) rates and Site Storage Volume (SSR) requirements. The proposed site has a slope of approximately 5% and, in accordance with *The Hills Shire Council, Design Guidelines – 4.22. On-site Stormwater Detention*, the following rates apply:

- Permissible Site Discharge (PSD) = 92L/sec/Ha
- Site Storage Volume (SSR) = 396m³/Ha

Given the site is approximately 1.13Ha in area this equates to a PSD of **103L/sec** and SSR of **447.5m³**. It is likely the total site storage volume will be achieved by the construction of aboveground and/or underground storage tanks. The location and extent of these basins/tanks is to correspond with the existing overland flow paths off site will be determined at the DA design stage.

Summary

Based on discussions with The Hills Shire Council the proposed development will be able to connect into the existing Council stormwater network Dawes Ave. This is provided the internal stormwater network is designed to meet the Council engineering guidelines. Further investigations into the existing 525mm dia. stormwater pipe through the site will be required to confirm if the pipe remains in its existing location or is diverted around the site in the developed case.

Water Sensitive Urban Design

The Hills Shire Council have Water Urban Sensitive Urban Design (WSUD) objectives are:

- Reduce water demand;
- Reduce water discharge to receiving environments;
- Maximum opportunities for water harvesting and re-use; and
- Reduce water pollution.

Council will likely be looking at a number of methods to implement WSUD into the development. These will include the use of (but not limited to):

- Rainwater tanks;
- Gross Pollutant traps;
- Bio-filtration;

- Bio-retention;
- Detention basins;
- Swales;
- Porous paving/ surfaces; and
- Wetlands.

Detailed stormwater designs will be developed and submitted to Council during the development application stage, however allowances should be made to incorporate Gross Pollutant Traps within the stormwater design as a minimum level to achieve WSUD reduction targets. The following reduction targets are in accordance with the Water Sensitive Urban Design Guidelines for Western Sydney (NSW Government Stormwater Trust and UPRCT, May 2004).

Pollutant	Reduction Targets
Total Suspended Solids	80%
Total Phosphorus	45%
Total Nitrogen	45%
Hydrocarbons	90%

Table 1: WSUD Technical Guidelines for Western Sydney Pollutant Reductions

It is also highly likely rainwater harvest tanks will also be required to recycle the roof water generated from the site, in accordance with industry best practices.

Flooding

From Council overland flow maps downloaded from the Hills Shire website and a 149(2) Planning Certificate which was obtained for 21 Dawes Ave, Castle Hill, it can be assumed that the subject lots are not flood affected. As such, no further flooding investigations are necessary for the proposed development. The standard flood protection of residential floor levels and potential basement entries are still to be provided. This would be in line with the Hills Shire Council Engineering Guidelines. Refer to Appendix F for Overland Flow Path Map.

Conclusion

Based on our preliminary investigations and discussions with the relevant authorities, it is our recommendation that this site can be adequately serviced with all required utilities and that the most appropriate options for providing each utility are coordinated with the relevant service providers.

Please feel free to discuss if you have any queries.

Yours sincerely



Glen James BEng Civil MIEAust
Civil Engineer
02 9439 1777

Appendices

- Appendix A – Chapman Gardens Planning Proposal
- Appendix B – Survey Drawings
- Appendix C – Sydney Water Map
- Appendix D – Proposed Potable Water and Sewer Works
- Appendix E – Endeavour Energy Electrical Services Map
- Appendix F – Substation Locations Castle Hill
- Appendix G – Overland Flow Path
- Appendix H – Jemena
- Appendix I – Telstra
- Appendix J – 149(2) Certificate
- Appendix K – AECOM Documentation

Appendix A

Chapman Gardens Planning Drawings

02 LANDSCAPE MASTERPLAN

Chapman Gardens adopts the concept of 'buildings in a park'.



PROGRAMME

- | | | | | |
|--|--------------------------------------|---------------------------------------|--|--------------------------------------|
| 1 Timber boardwalk entry to building | 8 Wetland filtering rainwater runoff | 15 Giant swing | 22 "The Carousel" | 29 Potential Kiss & Ride location |
| 2 Cumberland Plains planting | 9 Water spiller to water pond | 16 "The Slide" | 23 Fern garden - lush | 30 Potential street carpark location |
| 3 "The Lawn" for passive recreational uses | 10 Precast steppers | 17 Childcare outdoor | 24 Childcare indoor | |
| 4 "The Green" for residents' use | 11 Steel staircase | 18 Picnic shelter with BBQ facilities | 25 Retaining wall | |
| 5 Main pedestrian walkways | 12 Viewing deck | 19 Cricket nets | 26 New pedestrian footpath | |
| 6 Water pond | 13 "The Spring" | 20 Climbing net | 27 Seating area | |
| 7 Cafe | 14 Natural playground area | 21 Tennis court | 28 Swale with informal natural play area | |

Appendix B

Survey Drawings

NOTES

- * NO BOUNDARY HAS BEEN SURVEYED OR MARKED, ALL BOUNDARY DIMENSIONS HAVE BEEN COMPILED FROM DEPOSITED PLANS ONLY AND NOT BY FIELD MEASUREMENTS. THIS PLAN SHOULD NOT BE USED FOR BUILDING TO BOUNDARY, OR TO PRESCRIBED SET-BACKS WITHOUT FURTHER BOUNDARY SURVEY.
- * RELATIONSHIP OF IMPROVEMENTS AND DETAIL TO BOUNDARIES IS DIAGRAMMATIC AND IF CRITICAL SHOULD BE CONFIRMED BY A FURTHER BOUNDARY SURVEY.
- * THERE ARE DISCREPANCIES IN THE BOUNDARY DIMENSIONS OF THE BASE PLAN OF THE LAND AND ADVISE THAT A PLAN OF SURVEY IS REQUIRED TO ACCURATELY DETERMINE THE DIMENSIONS OF LAND AVAILABLE.
- * THE ORIENTATION OF TRUE NORTH ON THIS PLAN IS AS PER THE SCMS SURVEY MARK REPORT.
- * CONTOURS ARE AN INDICATION OF THE TOPOGRAPHY AND SHOULD ONLY BE USED FOR PLANNING PURPOSES. IF DETAILED DESIGN IS TO BE UNDERTAKEN, SPOT LEVELS SHOULD BE USED.
- * LOT AREA(S) SHOWN ON THIS PLAN HAVE BEEN CALCULATED FROM COMPILED BOUNDARIES. LOT AREA(S) SHOWN ON TITLE DIAGRAM MAY DIFFER.
- * NO SERVICE SEARCH HAS BEEN UNDERTAKEN. ONLY THOSE VISIBLE ABOVEGROUND SERVICES WITHIN THE PROPERTY VISIBLE AT THE TIME OF SURVEY HAVE BEEN LOCATED AND SOME SERVICES MAY HAVE BEEN OBSCURED BY PLANT AND MATERIALS.
- * THIS DRAWING REMAINS THE COPYRIGHT OF STRATASURV P/L AND CANNOT BE REPRODUCED OR ALTERED WITHOUT PRIOR WRITTEN CONSENT.
- * DIMENSIONS SHALL NOT BE OBTAINED BY SCALING THE DETAIL FROM THE DRAWING.
- * ALL DIMENSIONS IN METRES UNLESS OTHERWISE SHOWN.
- * DETAILED DESIGN SHOULD CONSIDER THE ACCURACY OF THE DATUM PROVIDED BY STATE SURVEY MARKS AND PERMANENT MARKS NOTING THAT THE LANDS DEPT. MAY AT ANY TIMES RE-ADJUST ITS HEIGHT WITHIN THE NETWORK.
- * TITLE(S) SCHEDULES AND NOTATIONS NOT INVESTIGATED.
- * NOT ALL INTERNAL SUBJECT LOT DETAIL SHOWN. PLAN FOR PURPOSE OF SHOWING SITE LEVELS & SIGNIFICANT STRUCTURES ONLY.
- * FLOOR LEVEL(S) HAVE BEEN TAKEN AT ACCESSIBLE POINTS INDICATED. (IEG. THRESHOLD) INTERNAL FLOOR LEVELS MAY DIFFER FROM INDICATED LEVEL AND SHOULD BE CONFIRMED IF CRITICAL.
- * RIDGE, EAVE AND GUTTER HEIGHTS HAVE BEEN OBTAINED BY AN INDIRECT METHOD AND ARE ACCURATE FOR PLANNING PURPOSES ONLY.
- * ADJOINING BUILDINGS AND DWELLINGS HAVE BEEN PLOTTED FOR DIAGRAMMATIC PURPOSES ONLY.
- * KERB LEVELS SHOWN ARE INVERT UNLESS OTHERWISE STATED.
- * TREE SPREADS & TREE HEIGHTS ARE INDICATIVE ONLY & IF CRITICAL, TREE POSITIONS SHOULD BE VERIFIED BY AN ON-SITE INVESTIGATION PRIOR TO CONSTRUCTION.
- * THESE NOTES ARE AN INTEGRAL PART OF THIS PLAN. REPRODUCTION OF THIS PLAN OR ANY PART OF IT WITHOUT THIS NOTE BEING INCLUDED IN FULL WILL RENDER THE INFORMATION SHOWN ON SUCH REPRODUCTION INVALID AND NOT SUITABLE FOR USE.

LEGEND:

- IL INVERT LEVEL
- KIP KERB INLET PIT
- K&G(0.15) CONCRETE KERB & GUTTER HEIGHT
- RR ROOF RIDGE
- SL PIT SURFACE LEVEL
- TGUT TOP OF GUTTER
- VC VEHICLE CROSSING
- WH WINDOW HEAD
- WS WINDOW SILL
- Ø DIAMETER
- WM WATER METER
- HYDRANT
- STANDARD SEWER MANHOLE
- SEWER LAMP HOLE/ SEWER INSPECTION PIT
- LP LIGHT POLE
- STANDARD TELECOMMUNICATION PIT
- TREE SPREAD (RADIUS)/TRUNK DIAMETER/HEIGHT
- PALM SPREAD (RADIUS)/TRUNK DIAMETER/HEIGHT
- S SEWER LINE UG (APPROX. POSITION)
- W WATER LINE UG (APPROX. POSITION)
- SW STORMWATER LINE UG (APPROX. POSITION)

EXISTING EASEMENTS:

- (AA) EASEMENT TO DRAIN WATER (VIDE DP250610)
- (BB) EASEMENT TO DRAIN WATER (VIDE DP255722)
- (CC) EASEMENT FOR TRANSITION OF ELECTRICITY (VIDE DP253971)
- (A) RESTRICTIONS AS TO USER (VIDE DP250610)
(RELATES TO BUILDING USE, TYPE, MATERIAL & FENCING & EXCAVATION)
- (B) RESTRICTIONS AS TO USER (VIDE DP246981)
(RELATES TO BUILDING USE, TYPE, MATERIAL & FENCING & EXCAVATION)
- (C) RESTRICTIONS AS TO USER (VIDE DP255722)
(RELATES TO BUILDING USE, TYPE, MATERIAL)

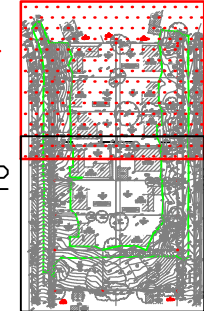


WARNING: ONLY SYDNEY WATER ASSETS SHOWN. UNDERGROUND SERVICE LOCATIONS ARE INDICATIVE ONLY AND REPRESENT THE EXISTANCE OF SERVICES IN THE AREA. A DETAILED STUDY OF THE LOCATION OF UNDERGROUND SERVICES WILL NEED TO BE UNDERTAKEN PRIOR TO COMMENCEMENT OF DESIGN WORK OR EXCAVATION. POT-HOLING OR UNDERGROUND SERVICE LOCATOR ADVISED IF DESIGN IS CRITICAL.

CLIENT DETAILS

SHOWGROUND PRECINCT
DEVELOPMENT PTY LTD

KEY:



REV	DATE	REVISION DETAILS	DESIGN	SURV	DWN	CHK
A	29.05.17	ADDING OTHER SIDE OF ROADS AND RESERVE	AI	AI	PS	
B	19.12.16	PLAN ISSUED	AI/JM	PS/AI	PS	

DATE OF SURVEY	12-15.12.16 & 24-25.05.17
ORIGIN OF RL'S	SSM62667 RL103.505
DATUM/CLASS/ORDER	AHD/B/2
CONTOUR INTERVAL	0.2m
CAD REF FILE:	3986DT01b1.dwg

PROJECT:

No.16-26 CHAPMAN AVE &
17-27 DAWES AVE, CASTLE HILL

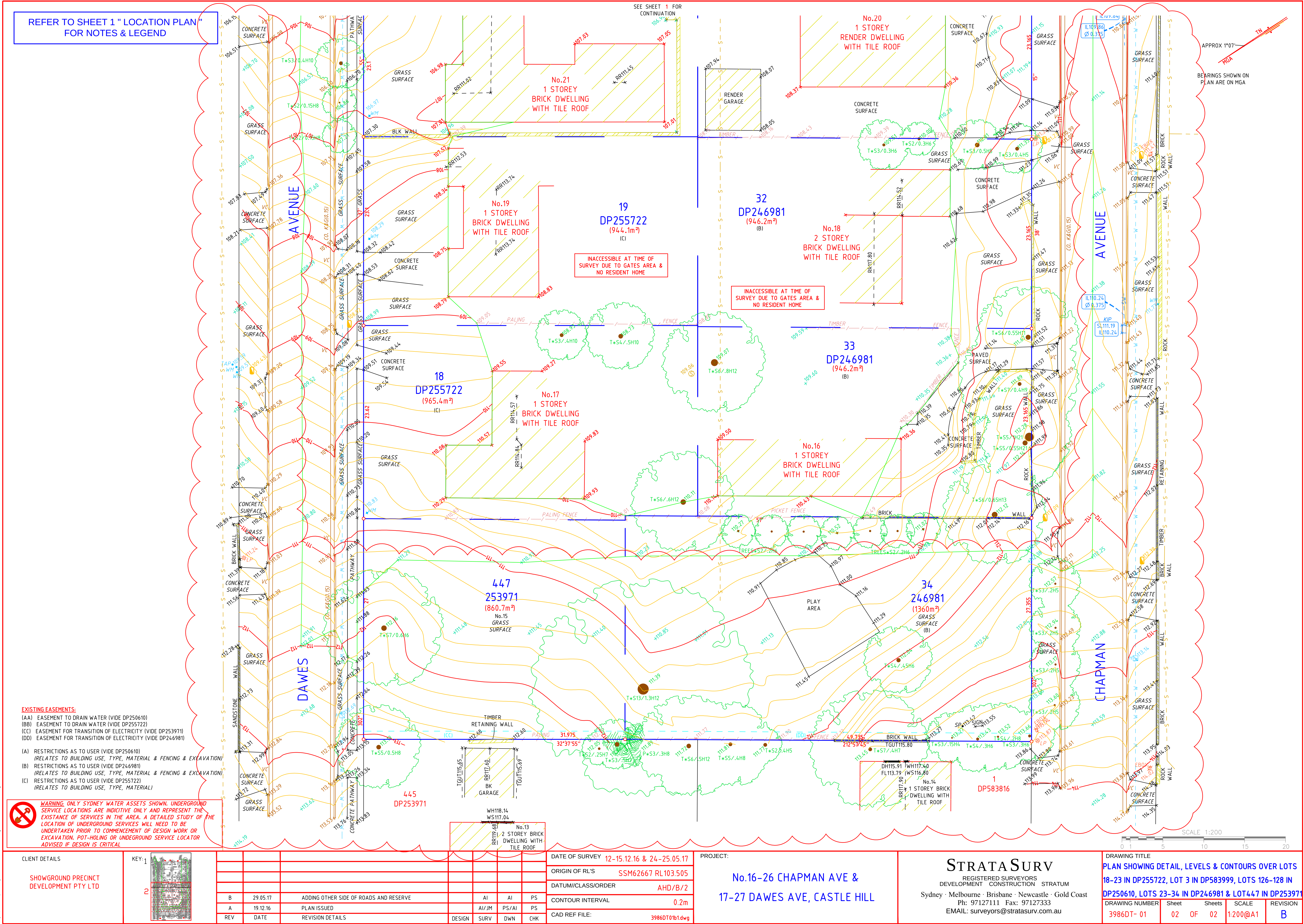
STRATA SURV

REGISTERED SURVEYORS
DEVELOPMENT CONSTRUCTION STRATUM
Sydney · Melbourne · Brisbane · Newcastle · Gold Coast
Ph: 97127111 Fax: 97127333
EMAIL: surveyors@stratasurv.com.au

DRAWING TITLE

PLAN SHOWING DETAIL, LEVELS & CONTOURS OVER LOTS
18-23 IN DP255722, LOT 3 IN DP583999, LOTS 126-128 IN
DP250610, LOTS 23-34 IN DP246981 & LOT447 IN DP253971

DRAWING NUMBER	Sheet	Sheets	SCALE	REVISION
3986DT- 01	01	OF 02	1:200@A1	B



REFER TO SHEET 1 " LOCATION PLAN " FOR NOTES & LEGEND

EXISTING EASEMENTS:
(AA) EASEMENT TO DRAIN WATER (VIDE DP250610)
(BB) EASEMENT TO DRAIN WATER (VIDE DP255722)
(CC) EASEMENT FOR TRANSITION OF ELECTRICITY (VIDE DP253971)
(DD) EASEMENT FOR TRANSITION OF ELECTRICITY (VIDE DP246981)

(A) RESTRICTIONS AS TO USER (VIDE DP250610)
(RELATES TO BUILDING USE, TYPE, MATERIAL & FENCING & EXCAVATION)
(B) RESTRICTIONS AS TO USER (VIDE DP246981)
(RELATES TO BUILDING USE, TYPE, MATERIAL & FENCING & EXCAVATION)
(C) RESTRICTIONS AS TO USER (VIDE DP255722)
(RELATES TO BUILDING USE, TYPE, MATERIAL)

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CLIENT DETAILS		KEY: 1	
SHOWGROUND PRECINCT DEVELOPMENT PTY LTD		2	

REV		DATE		REVISION DETAILS		DESIGN		SURV		DWN		CHK	
B		29.05.17		ADDING OTHER SIDE OF ROADS AND RESERVE		AI		AI		PS			
A		19.12.16		PLAN ISSUED		AI/JM		PS/AI		PS			

DATE OF SURVEY	12-15.12.16 & 24-25.05.17
ORIGIN OF RL'S	SSM62667 RL103.505
DATUM/CLASS/ORDER	AHD/B/2
CONTOUR INTERVAL	0.2m
CAD REF FILE:	3986DT01b1.dwg

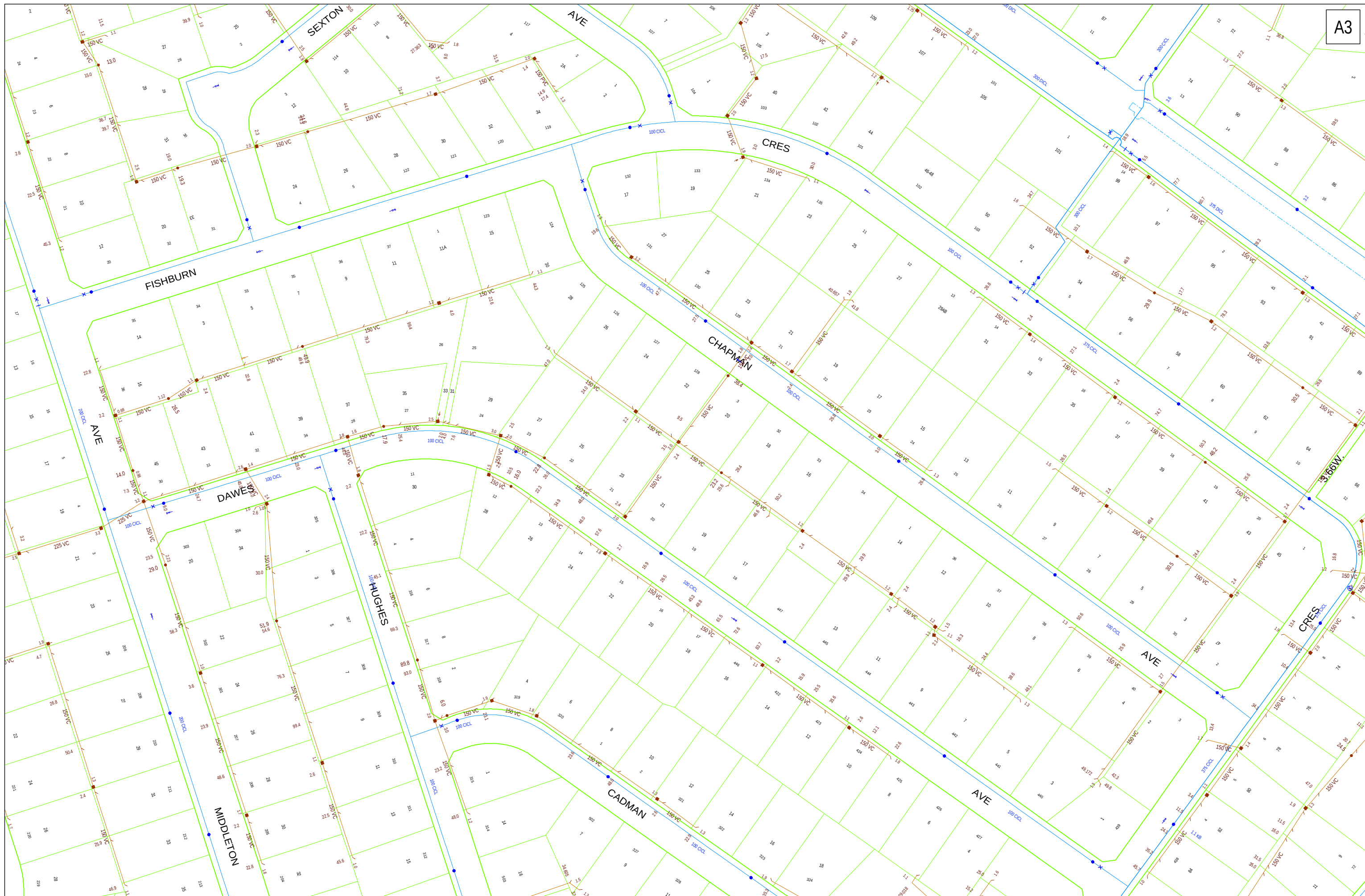
PROJECT: No.16-26 CHAPMAN AVE & 17-27 DAWES AVE, CASTLE HILL

STRATA SURV
REGISTERED SURVEYORS
DEVELOPMENT CONSTRUCTION STRATUM
Sydney · Melbourne · Brisbane · Newcastle · Gold Coast
Ph: 97127111 Fax: 97127333
EMAIL: surveyors@stratasurv.com.au

DRAWING TITLE		PLAN SHOWING DETAIL, LEVELS & CONTOURS OVER LOTS 18-23 IN DP255722, LOT 3 IN DP583999, LOTS 126-128 IN DP250610, LOTS 23-34 IN DP246981 & LOT 447 IN DP253971	
DRAWING NUMBER	3986DT- 01	Sheet	02 OF 02
SCALE	1:200@A1	REVISION	B

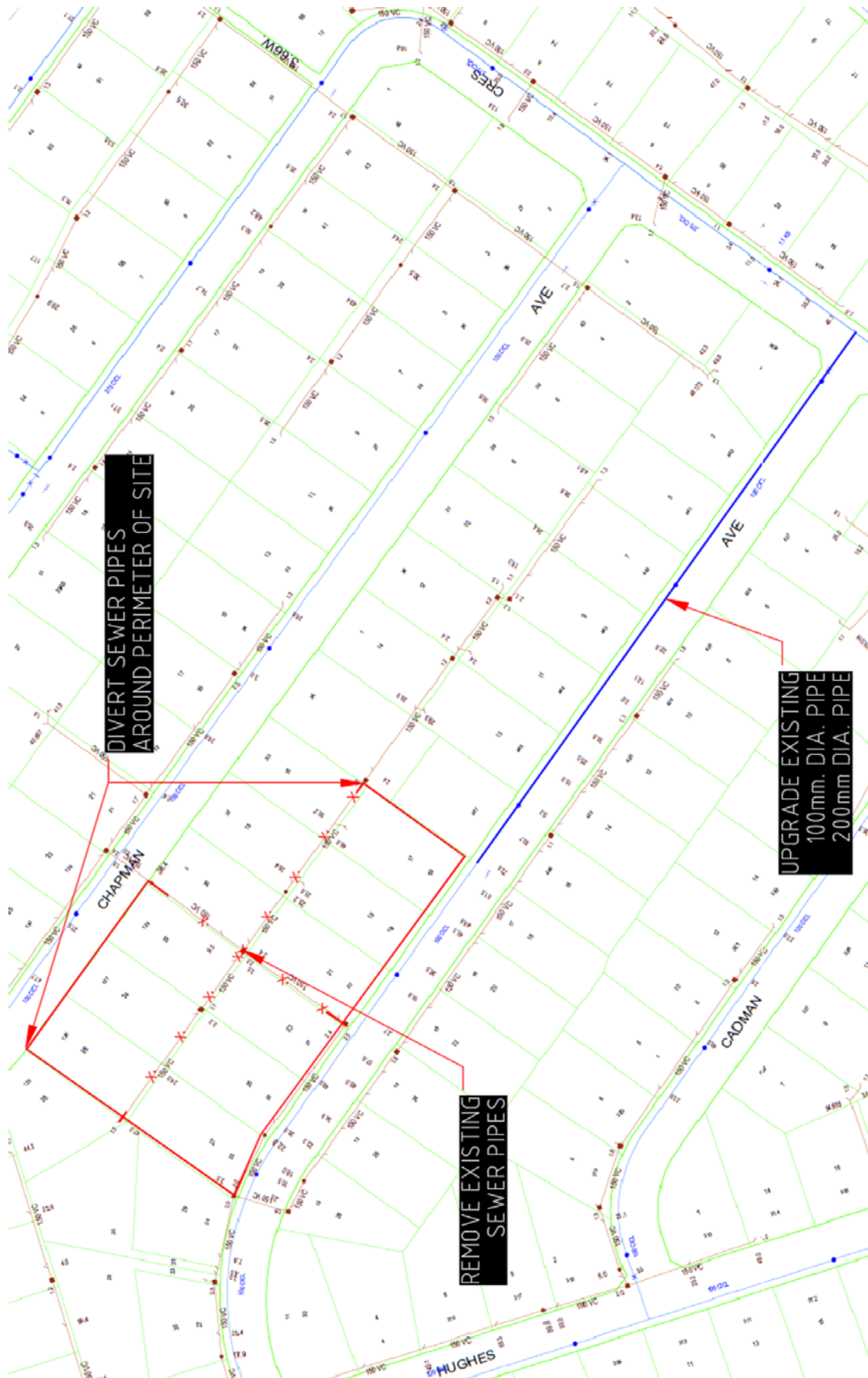
Appendix C

Sydney Water Map



Appendix D

Proposed Potable Water and Sewer works



Appendix E

Endeavour Energy Electrical Services Map

If further clarification is required, please contact:
Endeavour Energy
Phone: (02) 9853 4161 (8:00am-4:30pm Mon-Fri)
Emergency Phone Number: 131 003



DBYD Underground Search Report

Date: 22/05/2017

DBYD Sequence No: 61347543

DBYD Job No: 12358963

ENDEAVOUR ENERGY ASSETS AFFECTED

To:	Mr Jack Mort	Company:	AT&L
Address:	Level 7 153 Walker Street, North Sydney, NSW 2060		
Cust. ID:	1712632	Email:	jackm@atl.net.au
Phone:	0294391777	Mobile:	Not Supplied
		Fax:	Not Supplied
Enquiry Location:	26 Chapman Avenue, Castle Hill, NSW 2154		

Our Search has shown that **UNDERGROUND ASSETS ARE PRESENT** on our plans within the nominated enquiry location. This search is based on the graphical position of the excavation site as denoted in the DBYD customer confirmation sheet.

WARNING

- **All electrical apparatus shall be regarded as live until proved de-energised.** Contact with live electrical apparatus will cause severe injury or death.
- In accordance with the *Electricity Supply Act 1995*, you are obliged to report any damage to Endeavour Energy Assets immediately by calling **131 003**.
- The customer must obtain a new set of plans from Endeavour Energy if work has not been started or completed within twenty (20) working days of the original plan issue date.
- The customer must contact Endeavour Energy if any of the plans provided have blank pages, as some underground asset information may be incomplete.
- Endeavour Energy underground earth grids may exist and their location **may not** be shown on plans. Persons excavating are expected to exercise all due care, especially in the vicinity of padmount substations, pole mounted substations, pole mounted switches, transmission poles and towers.
- Endeavour Energy plans **do not** show any underground customer service mains or information relating to service mains within private property.
- Asbestos or asbestos-containing material may be present on or near Endeavour Energy's underground assets.
- Organo-Chloride Pesticides (OCP) may be present in some sub-transmission trenches.
- All plans must be printed and made available at the worksite where excavation is to be undertaken. Plans must be reviewed and understood by the crew on site prior to commencing excavation.

SUPPLEMENTARY MATERIAL

Material	Purpose	Location
DBYD Cover Letter	Endeavour Energy DBYD response Cover Letter	Attached
DBYD Important Information & Disclaimer	Endeavour Energy disclaimer, responsibilities and information on understanding plans	Attached
DBYD Response Plans	Endeavour Energy DBYD plans	Attached
Work Cover NSW "Work near underground assets: Guide"	Guideline for anyone involved in construction work near underground assets	Contact Work Cover NSW for a copy
Work Cover NSW "Excavation work: Code of practice"	Practical guidance on managing health and safety risks associated with excavation	URL [Click Here]
Safe Work Australia "Working in the vicinity of overhead and underground electric lines guidance material"	Provides information on how to manage risks when working in the vicinity of overhead and underground electric lines at a workplace	URL [Click Here]
Endeavour Energy Safety Brochures & Guides	To raise awareness of dangers of working on or near Endeavour Energy's assets	URL [Click Here]

228
N16

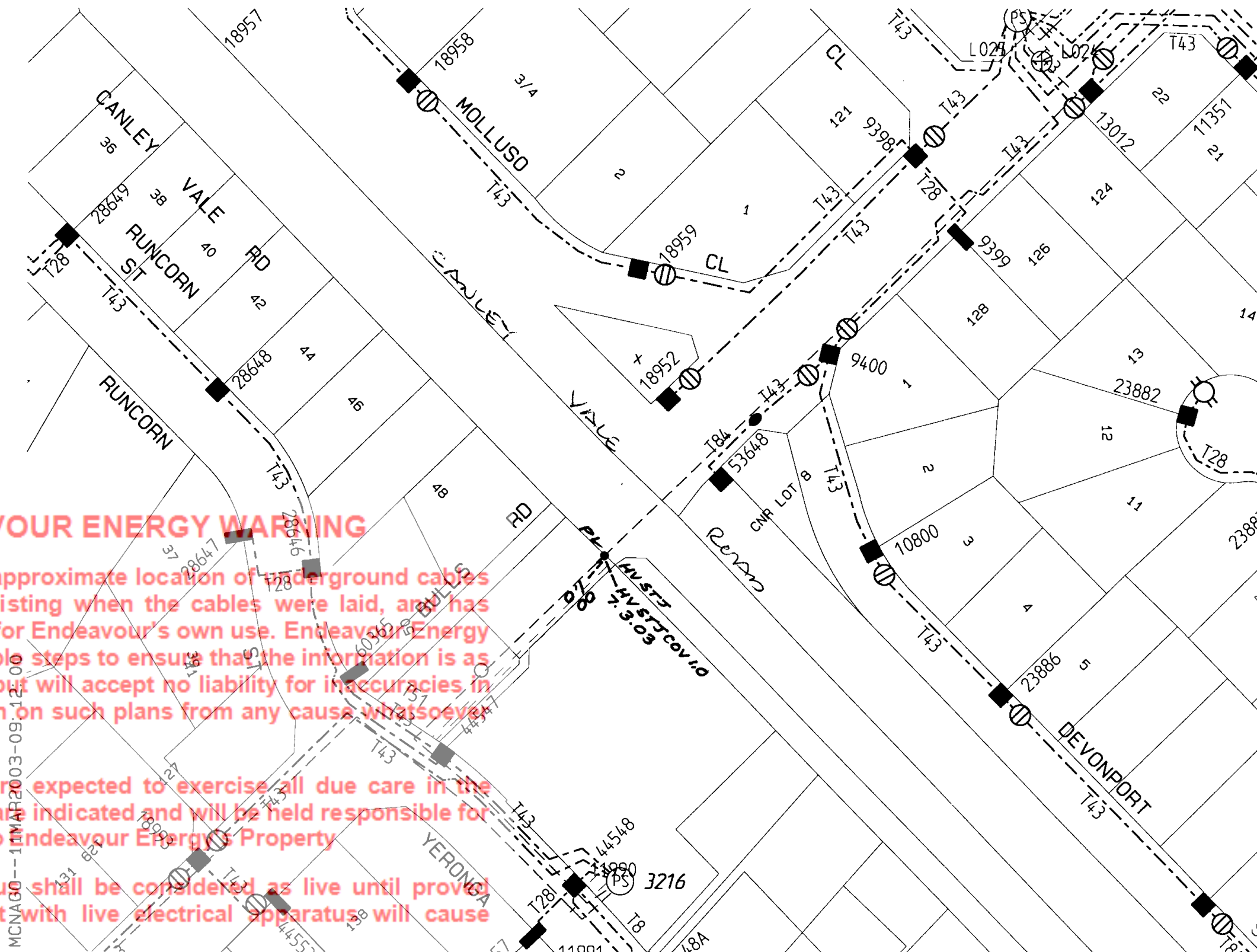
ENDEAVOUR ENERGY WARNING

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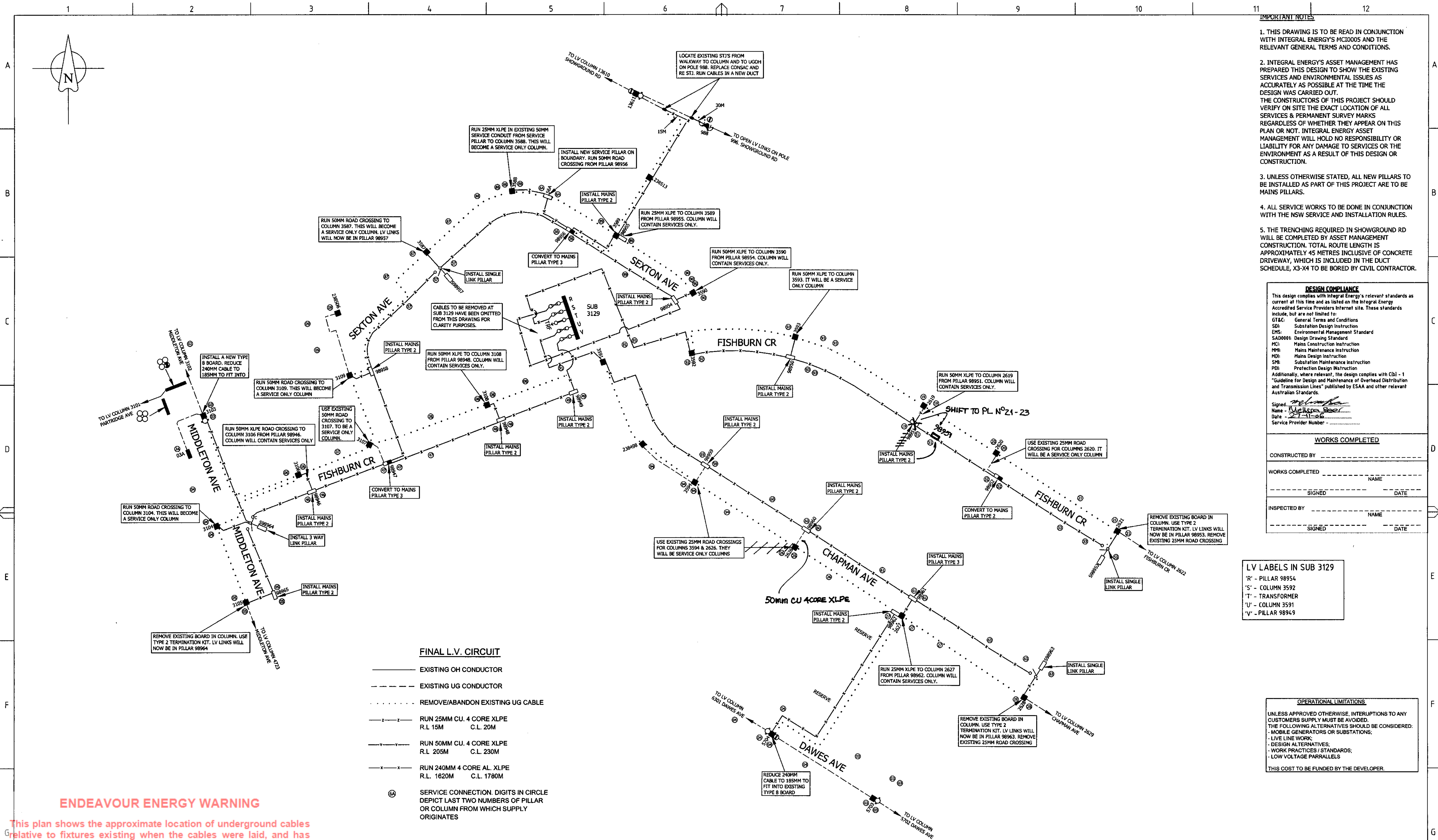
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FB 279570
COMM 7-03-03 COMP 7.3.03
SHEET 9145-4.1
DUCT
RECORDED BY G. McNALLY
INSTALLED BY

Issue Date: 22/05/2017, DBYD Sequence No: 61347543

279570



- IMPORTANT NOTES**
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH INTEGRAL ENERGY'S MC0005 AND THE RELEVANT GENERAL TERMS AND CONDITIONS.
 2. INTEGRAL ENERGY'S ASSET MANAGEMENT HAS PREPARED THIS DESIGN TO SHOW THE EXISTING SERVICES AND ENVIRONMENTAL ISSUES AS ACCURATELY AS POSSIBLE AT THE TIME THE DESIGN WAS CARRIED OUT. THE CONSTRUCTORS OF THIS PROJECT SHOULD VERIFY ON SITE THE EXACT LOCATION OF ALL SERVICES & PERMANENT SURVEY MARKS REGARDLESS OF WHETHER THEY APPEAR ON THIS PLAN OR NOT. INTEGRAL ENERGY ASSET MANAGEMENT WILL HOLD NO RESPONSIBILITY OR LIABILITY FOR ANY DAMAGE TO SERVICES OR THE ENVIRONMENT AS A RESULT OF THIS DESIGN OR CONSTRUCTION.
 3. UNLESS OTHERWISE STATED, ALL NEW PILLARS TO BE INSTALLED AS PART OF THIS PROJECT ARE TO BE MAINS PILLARS.
 4. ALL SERVICE WORKS TO BE DONE IN CONJUNCTION WITH THE NSW SERVICE AND INSTALLATION RULES.
 5. THE TRENCHING REQUIRED IN SHOWGROUND RD WILL BE COMPLETED BY ASSET MANAGEMENT CONSTRUCTION. TOTAL ROUTE LENGTH IS APPROXIMATELY 45 METRES INCLUSIVE OF CONCRETE DRIVEWAY, WHICH IS INCLUDED IN THE DUCT SCHEDULE, X3-X4 TO BE BORED BY CIVIL CONTRACTOR.

DESIGN COMPLIANCE

This design complies with Integral Energy's relevant standards as current at this time and as listed on the Integral Energy Accredited Service Providers Internet site. These standards include, but are not limited to:

- GT&C: General Terms and Conditions
- SDI: Substation Design Instruction
- EMS: Environmental Management Standard
- SAD0006: Design Drawing Standard
- MCU: Mains Construction Instruction
- MMI: Mains Maintenance Instruction
- MDI: Mains Design Instruction
- SMI: Substation Maintenance Instruction
- PDI: Protection Design Instruction

Additionally, where relevant, the design complies with Cbl - 1 "Guideline for Design and Maintenance of Overhead Distribution and Transmission Lines" published by ESAA and other relevant Australian Standards.

Signed: *[Signature]*
 Name: *[Name]*
 Date: 22/05/17
 Service Provider Number: *[Number]*

WORKS COMPLETED

CONSTRUCTED BY: _____

WORKS COMPLETED: _____ NAME: _____

SIGNED: _____ DATE: _____

INSPECTED BY: _____ NAME: _____

SIGNED: _____ DATE: _____

LV LABELS IN SUB 3129

- 'R' - PILLAR 98954
- 'S' - COLUMN 3592
- 'T' - TRANSFORMER
- 'U' - COLUMN 3591
- 'V' - PILLAR 98949

OPERATIONAL LIMITATIONS

UNLESS APPROVED OTHERWISE, INTERRUPTIONS TO ANY CUSTOMERS SUPPLY MUST BE AVOIDED. THE FOLLOWING ALTERNATIVES SHOULD BE CONSIDERED:

- MOBILE GENERATORS OR SUBSTATIONS
- LIVE LINE WORK
- DESIGN ALTERNATIVES
- WORK PRACTICES / STANDARDS
- LOW VOLTAGE PARALLELS

THIS COST TO BE FUNDED BY THE DEVELOPER.

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REFERENCE DRAWING'S		WORK ORDERS		CAP / SAMP No.	
		GENERAL		AM PROJ. No.	DSN00033
		OVERHEAD		HV SWITCHING	
		UNDERGROUND		UBD/PENGUIN REF	151 M13
		SUBSTATIONS		GIS MAP No	U916032
				HV OP DIAGRAM	
				LOCAL GOV AREA	BAULKHAM HILLS

ORIGINAL SCALE	1:1000
DRAWN	MLT
DATE	30/08/06
DESIGN	MLT

DO NOT SCALE	DIMENSIONS IN METRES
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INTEGRAL ENERGY	PO BOX 6366, BLACKTOWN, NSW, 2148	PHONE - 131 081
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CHAPMAN AVE	CASTLE HILL	DSN00033
CONSAC REPLACEMENT		

A1	307587	A
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SHEET No 2 OF 2 SHEETS



SCANNED

NOTE:
THIS PLAN IS
PRINTED AT A
RATIO OF 1:800

15/7/96
LH/96
23-12-96
21-2-01
8-03-2001

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1266250 N									
CABLE MODIFICATIONS									
CODE	CABLE NO	TYPE	FB	CODE	CABLE NO	TYPE	FB	CODE	CABLE NO
65	12767	2.1KV ALUM	3972	67	3687	2.1KV ALUM	3972	69	3687
71	3701	2.1KV ALUM	3972	72	3702	2.1KV ALUM	3972	73	3703
74	3704	2.1KV ALUM	3972	75	3705	2.1KV ALUM	3972	76	3706
77	3707	2.1KV ALUM	3972	78	3708	2.1KV ALUM	3972	79	3709
80	3710	2.1KV ALUM	3972	81	3711	2.1KV ALUM	3972	82	3712
83	3713	2.1KV ALUM	3972	84	3714	2.1KV ALUM	3972	85	3715
86	3716	2.1KV ALUM	3972	87	3717	2.1KV ALUM	3972	88	3718
89	3719	2.1KV ALUM	3972	90	3720	2.1KV ALUM	3972	91	3721
92	3722	2.1KV ALUM	3972	93	3723	2.1KV ALUM	3972	94	3724
95	3725	2.1KV ALUM	3972	96	3726	2.1KV ALUM	3972	97	3727
98	3728	2.1KV ALUM	3972	99	3729	2.1KV ALUM	3972	100	3730
101	3731	2.1KV ALUM	3972	102	3732	2.1KV ALUM	3972	103	3733
104	3734	2.1KV ALUM	3972	105	3735	2.1KV ALUM	3972	106	3736
107	3737	2.1KV ALUM	3972	108	3738	2.1KV ALUM	3972	109	3739
110	3740	2.1KV ALUM	3972	111	3741	2.1KV ALUM	3972	112	3742
113	3743	2.1KV ALUM	3972	114	3744	2.1KV ALUM	3972	115	3745
117	3746	2.1KV ALUM	3972	118	3747	2.1KV ALUM	3972	119	3748
120	3749	2.1KV ALUM	3972	121	3750	2.1KV ALUM	3972	122	3751
124	3752	2.1KV ALUM	3972	125	3753	2.1KV ALUM	3972	126	3754
128	3755	2.1KV ALUM	3972	129	3756	2.1KV ALUM	3972	130	3757
131	3758	2.1KV ALUM	3972	132	3759	2.1KV ALUM	3972	133	3760
135	3761	2.1KV ALUM	3972	136	3762	2.1KV ALUM	3972	137	3763
139	3764	2.1KV ALUM	3972	140	3765	2.1KV ALUM	3972	141	3766
143	3767	2.1KV ALUM	3972	144	3768	2.1KV ALUM	3972	145	3769
147	3770	2.1KV ALUM	3972	148	3771	2.1KV ALUM	3972	149	3772
150	3773	2.1KV ALUM	3972	151	3774	2.1KV ALUM	3972	152	3775
154	3776	2.1KV ALUM	3972	155	3777	2.1KV ALUM	3972	156	3778
159	3779	2.1KV ALUM	3972	160	3780	2.1KV ALUM	3972	161	3781
163	3782	2.1KV ALUM	3972	164	3783	2.1KV ALUM	3972	165	3784
167	3785	2.1KV ALUM	3972	168	3786	2.1KV ALUM	3972	169	3787
170	3788	2.1KV ALUM	3972	171	3789	2.1KV ALUM	3972	172	3790
174	3791	2.1KV ALUM	3972	175	3792	2.1KV ALUM	3972	176	3793
178	3794	2.1KV ALUM	3972	179	3795	2.1KV ALUM	3972	180	3796
182	3797	2.1KV ALUM	3972	183	3798	2.1KV ALUM	3972	184	3799
186	3800	2.1KV ALUM	3972	187	3801	2.1KV ALUM	3972	188	3802
190	3803	2.1KV ALUM	3972	191	3804	2.1KV ALUM	3972	192	3805
194	3806	2.1KV ALUM	3972	195	3807	2.1KV ALUM	3972	196	3808
198	3809	2.1KV ALUM	3972	199	3810	2.1KV ALUM	3972	200	3811
202	3812	2.1KV ALUM	3972	203	3813	2.1KV ALUM	3972	204	3814
206	3815	2.1KV ALUM	3972	207	3816	2.1KV ALUM	3972	208	3817
210	3818	2.1KV ALUM	3972	211	3819	2.1KV ALUM	3972	212	3820
214	3821	2.1KV ALUM	3972	215	3822	2.1KV ALUM	3972	216	3823
218	3824	2.1KV ALUM	3972	219	3825	2.1KV ALUM	3972	220	3826
222	3827	2.1KV ALUM	3972	223	3828	2.1KV ALUM	3972	224	3829
226	3830	2.1KV ALUM	3972	227	3831	2.1KV ALUM	3972	228	3832
230	3833	2.1KV ALUM	3972	231	3834	2.1KV ALUM	3972	232	3835
234	3836	2.1KV ALUM	3972	235	3837	2.1KV ALUM	3972	236	3838
238	3839	2.1KV ALUM	3972	239	3840	2.1KV ALUM	3972	240	3841
242	3842	2.1KV ALUM	3972	243	3843	2.1KV ALUM	3972	244	3844
246	3845	2.1KV ALUM	3972	247	3846	2.1KV ALUM	3972	248	3847
250	3848	2.1KV ALUM	3972	251	3849	2.1KV ALUM	3972	252	3850
254	3851	2.1KV ALUM	3972	255	3852	2.1KV ALUM	3972	256	3853
258	3854	2.1KV ALUM	3972	259	3855	2.1KV ALUM	3972	260	3856
262	3857	2.1KV ALUM	3972	263	3858	2.1KV ALUM	3972	264	3859
266	3860	2.1KV ALUM	3972	267	3861	2.1KV ALUM	3972	268	3862
270	3863	2.1KV ALUM	3972	271	3864	2.1KV ALUM	3972	272	3865
274	3866	2.1KV ALUM	3972	275	3867	2.1KV ALUM	3972	276	3868
278	3869	2.1KV ALUM	3972	279	3870	2.1KV ALUM	3972	280	3871
282	3872	2.1KV ALUM	3972	283	3873	2.1KV ALUM	3972	284	3874
286	3875	2.1KV ALUM	3972	287	3876	2.1KV ALUM	3972	288	3877
290	3878	2.1KV ALUM	3972	291	3879	2.1KV ALUM	3972	292	3880
294	3881	2.1KV ALUM	3972	295	3882	2.1KV ALUM	3972	296	3883
298	3884	2.1KV ALUM	3972	299	3885	2.1KV ALUM	3972	300	3886
302	3887	2.1KV ALUM	3972	303	3888	2.1KV ALUM	3972	304	3889
306	3890	2.1KV ALUM	3972	307	3891	2.1KV ALUM	3972	308	3892
310	3893	2.1KV ALUM	3972	311	3894	2.1KV ALUM	3972	312	3895
314	3896	2.1KV ALUM	3972	315	3897	2.1KV ALUM	3972	316	3898
318	3899	2.1KV ALUM	3972	319	3900	2.1KV ALUM	3972	320	3901
322	3902	2.1KV ALUM	3972	323	3903	2.1KV ALUM	3972	324	3904
326	3905	2.1KV ALUM	3972	327	3906	2.1KV ALUM	3972	328	3907
330	3908	2.1KV ALUM	3972	331	3909	2.1KV ALUM	3972	332	3910
334	3911	2.1KV ALUM	3972	335	3912	2.1KV ALUM	3972	336	3913
338	3914	2.1KV ALUM	3972	339	3915	2.1KV ALUM	3972	340	3916
342	3917	2.1KV ALUM	3972	343	3918	2.1KV ALUM	3972	344	3919
346	3920	2.1KV ALUM	3972	347	3921	2.1KV ALUM	3972	348	3922
350	3923	2.1KV ALUM	3972	351	3924	2.1KV ALUM	3972	352	3925
354	3926	2.1KV ALUM	3972	355	3927	2.1KV ALUM	3972	356	3928
358	3929	2.1KV ALUM	3972	359	3930	2.1KV ALUM	3972	360	3931
362	3932	2.1KV ALUM	3972	363	3933	2.1KV ALUM	3972	364	3934
366	3935	2.1KV ALUM	3972	367	3936	2.1KV ALUM	3972	368	3937
370	3938	2.1KV ALUM	3972	371	3939	2.1KV ALUM	3972	372	3940
374	3941	2.1KV ALUM	3972	375	3942	2.1KV ALUM	3972	376	3943
378	3944	2.1KV ALUM	3972	379	3945	2.1KV ALUM	3972	380	3946
382	3947	2.1KV ALUM	3972	383	3948	2.1KV ALUM	3972	384	3949
386	3950	2.1KV ALUM	3972	387	3951	2.1KV ALUM	3972	388	3952
390	3953	2.1KV ALUM	3972	391	3954	2.1KV ALUM	3972	392	3955
394	3956	2.1KV ALUM	3972	395	3957	2.1KV ALUM	3972	396	3958
398	3959	2.1KV ALUM	3972	399	3960	2.1KV ALUM	3972	400	3961
402	3962	2.1KV ALUM	3972	403	3963	2.1KV ALUM	3972	404	3964
406	3965	2.1KV ALUM	3972	407	3966	2.1KV ALUM	3972	408	3967
410	3968	2.1KV ALUM	3972	411	3969	2.1KV ALUM	3972	412	3970
414	3971	2.1KV ALUM	3972	415	3972	2.1KV ALUM	3972	416	3973
418	3974	2.1KV ALUM	3972	419	3975	2.1KV ALUM	3972	420	3976
422	3977	2.1KV ALUM	3972	423	3978	2.1KV ALUM	3972	424	3979
426	3980	2.1KV ALUM	3972	427	3981	2.1KV ALUM	3972	428	3982
430	3983	2.1KV ALUM	3972	431	3984	2.1KV ALUM	3972	432	3985
434	3986	2.1KV ALUM	3972	435	3987	2.1KV ALUM	3972	436	3988
438	3989	2.1KV ALUM	3972	439	3990	2.1KV ALUM	3972	440	3991
442	3992	2.1KV ALUM	3972	443	3993	2.1KV ALUM	3972	444	3994
446	3995	2.1KV ALUM	3972	447	3996	2.1KV ALUM	3972	448	3997
450	3998	2.1KV ALUM	3972	451	3999	2.1KV ALUM	3972	452	4000
454	4001	2.1KV ALUM	3972	455	4002	2.1KV ALUM	3972	456	4003
458	4004	2.1KV ALUM	3972	459	4005	2.1KV ALUM	3972	460	4006
462	4007	2.1KV ALUM	3972	463	4008	2.1KV ALUM	3972	464	4009
466	4010	2.1KV ALUM	3972	467	4011	2.1KV ALUM	3972	468	4012
470	4013	2.1KV ALUM	3972	471	4014	2.1KV ALUM	3972	472	4015
474	4016	2.1KV ALUM	3972	475	4017	2.1KV ALUM	3972	476	4018
478	4019	2.1KV ALUM	3972	479	4020	2.1KV ALUM	3972	480	4021
482	4022	2.1KV ALUM	3972	483	4023	2.1KV ALUM	3972	484	4024
486	4025	2.1KV ALUM	3972	487	4026	2.1KV ALUM	3972	488	4027
490	4028	2.1KV ALUM	3972	491	4029	2.1KV ALUM	3972	492	4030
494	4031	2.1KV ALUM	3972	495	4032	2.1KV ALUM	3972	496	4033
498	4034	2.1KV ALUM	3972	499	4035	2.1KV ALUM	3972	500	4036
502	4037	2.1KV ALUM	3972	503	4038	2.1KV ALUM	3972	504	4039
506	4040	2.1KV ALUM	3972	507	4041	2.1KV ALUM	3972	508	4042
510	4043	2.1KV ALUM	3972	511	4044	2.1KV ALUM	3972	512	4045
514	4046	2.1KV ALUM	3972	515	4047	2.1KV ALUM	3972	516	4048
518	4049	2.1KV ALUM	3972	519	4050	2.1KV ALUM	3972	520	4051
522	4052	2.1KV ALUM	3972	523	4053	2.1KV ALUM	3972	524	4054
526	4055	2.1KV ALUM	3972	527	4056	2.1KV ALUM	3972	528	4057
530	4058	2.1KV ALUM	3972	531	4059	2.1KV ALUM	3972	532	4060
534	4061	2.1KV ALUM	3972	535	4062	2.1KV ALUM	3972	536	4063
538	4064	2.1KV ALUM	3972	539	4065	2.1KV ALUM	3972	540	4066
542	4067	2.1KV ALUM	3972	543	4068	2.1KV ALUM	3972	544	4069
546	4070	2.1KV ALUM	3972	547	4071	2.1KV ALUM	3972	548	4072
550	4073	2.1KV ALUM	3972	551	4074	2.1KV ALUM	3972	552	4075
554	4076	2.1KV ALUM	3972	555	4077	2.1KV ALUM	3972	556	4078
558	4079	2.1KV ALUM	3972	559	4080	2.1KV ALUM	3972	560	4081
562	4082	2.1KV ALUM	3972	563	4083	2.1KV ALUM	3972	564	4084
566	4085	2.1KV ALUM	3972	567	4086				



3/7/96

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[illegible]

AMENDMENTS									
CH		BY	CH'D	DATE	N _o	REVISION	BY	CH'D	DATE
2/29	ADD	R/N	FEB	9-9-76	L	PG 901 & PT 402 Added	J.S	JMMV	2-8-76
DED		PJC	FEB	9-9-77	M	PG 402 & 59/47 Added	WA	MSD	2-8-76
DED		B.H.	FEB	9-3-77	N	PG 4 93 & 758 ADDED	G.J.S		
DED		R/N	JAN	9-6-77	O	F.B. 1753 ADDED	B.Q.	MC	8-1-82
ADD	6507 & 610000	R/N	JAN	9-6-77	P	FB 2100 ADDED	DC	MSW	7-1-82

PROSPECT COUNTY COUNCIL	DRAWN	C.J.M.	SCALE	1:750
	CHECKED	OK	DATE	28-6-74
U.G. RETICULATION CASTLE HILL	SUP U'MAN	145	9160-3-2-3	

Issue Date: 22/05/2017, DBYD Sequence No: 61347543



SCANNED

0 10 20 30 40 50 60 70m

ISSUE DATE: 15-0-94
23-8-96
6-11-96
20-10-98

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CABLE DATA										REVISIONS									
NO.	CABLE NO.	TYPE	DATE	BY	CHKD	REMARKS	NO.	CABLE NO.	TYPE	DATE	BY	CHKD	REMARKS	NO.	CABLE NO.	TYPE	DATE	BY	CHKD
1	10956	1.0	15/0/94				1	10956	1.0	15/0/94				1	10956	1.0	15/0/94		
2	10957	1.0	15/0/94				2	10957	1.0	15/0/94				2	10957	1.0	15/0/94		
3	10958	1.0	15/0/94				3	10958	1.0	15/0/94				3	10958	1.0	15/0/94		
4	10959	1.0	15/0/94				4	10959	1.0	15/0/94				4	10959	1.0	15/0/94		
5	10960	1.0	15/0/94				5	10960	1.0	15/0/94				5	10960	1.0	15/0/94		
6	10961	1.0	15/0/94				6	10961	1.0	15/0/94				6	10961	1.0	15/0/94		
7	10962	1.0	15/0/94				7	10962	1.0	15/0/94				7	10962	1.0	15/0/94		
8	10963	1.0	15/0/94				8	10963	1.0	15/0/94				8	10963	1.0	15/0/94		
9	10964	1.0	15/0/94				9	10964	1.0	15/0/94				9	10964	1.0	15/0/94		
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11	10966	1.0	15/0/94				11	10966	1.0	15/0/94				11	10966	1.0	15/0/94		
12	10967	1.0	15/0/94				12	10967	1.0	15/0/94				12	10967	1.0	15/0/94		
13	10968	1.0	15/0/94				13	10968	1.0	15/0/94				13	10968	1.0	15/0/94		
14	10969	1.0	15/0/94				14	10969	1.0	15/0/94				14	10969	1.0	15/0/94		
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84	11039	1.0	15/0/94																



LIVE INTEGRAL ENERGY CABLES & OTHER SERVICES IN THIS AREA. PLEASE CONTACT DIAL BEFORE YOU DIG ON TEL: 1100 FOR SEARCHES TWO DAYS PRIOR TO EXCAVATION.

CONTRACTOR SHALL CONTACT NETWORK DATA ON:
9853-6657 TWO DAYS PRIOR TO THE INSTALLATION
OF DUCTS FOR RECORDING PURPOSES

1. LOCATE, PROVE & INSTALL JETLINE IN EXISTING ROAD CROSSINGS TO BE USED. ROAD CROSSINGS THAT WILL NOT BE USED ARE INDICATED ON THE DRAWING
2. SHOULD OPEN CUTTING BE REQUIRED FOR THE INSTALLATION OF ANY DUCTS, PERMISSION IS TO BE SOUGHT FROM THE PROJECT MANAGER PRIOR TO COMMENCEMENT
3. OPEN POINTS ARE TO BE ESTABLISHED AT ALL PILLAR LOCATIONS AND ALL ROAD CROSSINGS UNLESS OTHERWISE STATED ON THE DRAWING
4. PRIOR TO COMMENCING WORK, THE CONTRACTOR IS TO ADVISE CUSTOMERS AFFECTED BY DUCT INSTALLATION IN WRITING

DESIGN AND CONSTRUCTION

This design covers the design of Energy's relevant standards as current at this time and as listed on the Integral Energy Accredited Service Providers Internet site. These standards do not, but are not limited by:

- ET&C: General Terms and Conditions
- ND: Substation design instructions
- DWG: Environmental and Safety Standard
- SAD0001: Design Drawing Standard
- ND: Main Construction Instruction
- ND: Main Maintenance Instruction
- ND: Main Design Instruction
- DWG: Substation Maintenance Instruction
- ND: Design Drawing Instruction

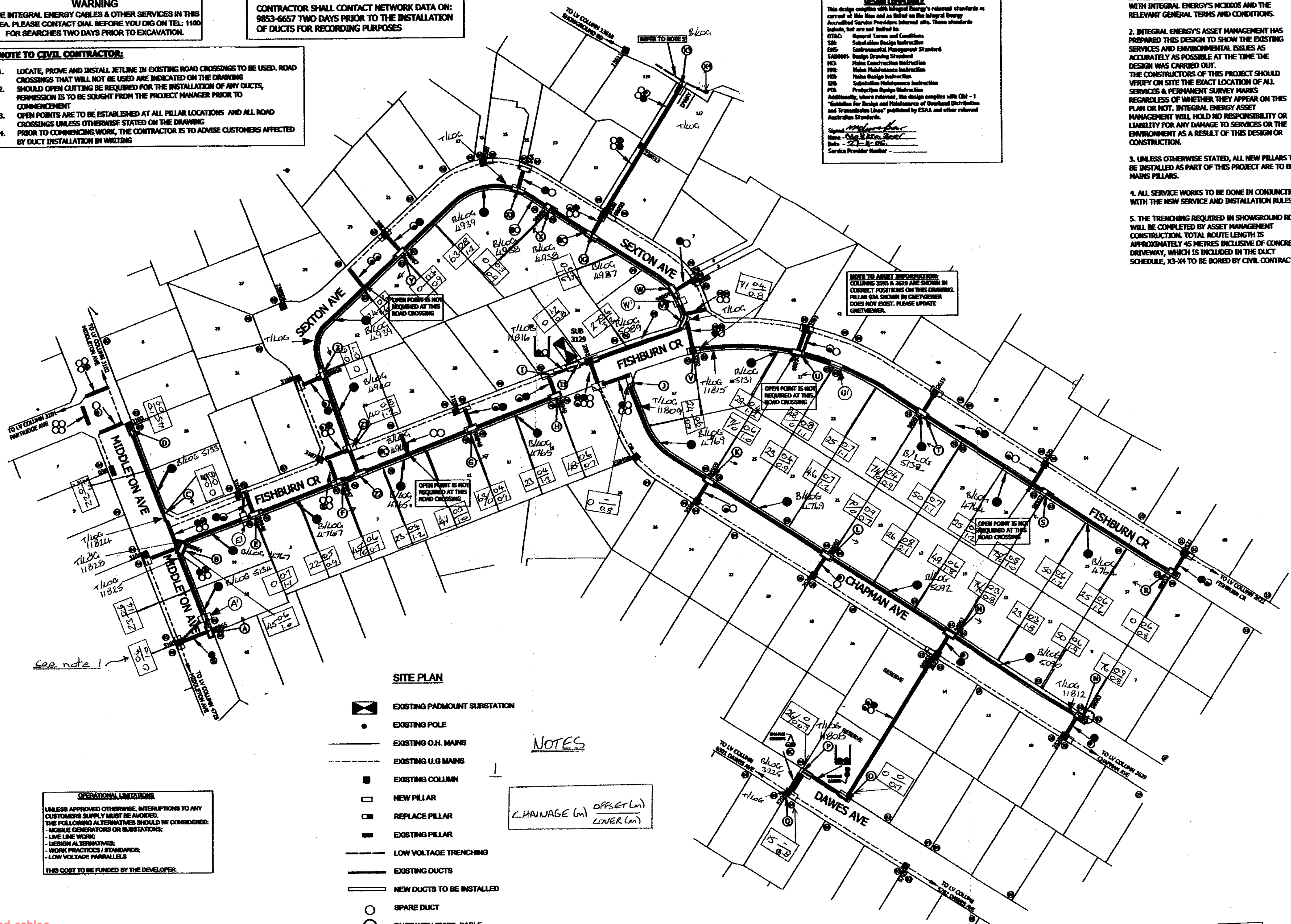
Additionally, where relevant, the design complies with Cbi - 1

Guidelines for Design and Maintenance of Overhead Distribution and Underground Lines published by ESA and other relevant Australian Standards.

Signature:
Name: Mr. Mark A. M. Steel
Date: 22-11-2010
Service Provider Number: _____

3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH INTEGRAL ENERGY'S MISCDOCS AND THE RELEVANT GENERAL TERMS AND CONDITIONS.
4. INTEGRAL ENERGY'S ASSET MANAGEMENT HAS PREPARED THIS DESIGN TO SHOW THE EXISTING SERVICES AND ENVIRONMENTAL ISSUES AS ACCURATELY AS POSSIBLE AT THE TIME THE DESIGN WAS CARRIED OUT. THE CONSTRUCTORS OF THIS PROJECT SHOULD VERIFY ON SITE THE EXACT LOCATION OF ALL SERVICES & PERMANENT SURVEY MARKS REGARDLESS OF WHETHER THEY APPEAR ON THIS PLAN OR NOT. INTEGRAL ENERGY'S ASSET MANAGEMENT WILL HOLD NO RESPONSIBILITY OR LIABILITY FOR ANY DAMAGE TO SERVICES OR THE ENVIRONMENT AS A RESULT OF THIS DESIGN OR CONSTRUCTION.
5. UNLESS OTHERWISE STATED, ALL NEW PILLARS TO BE INSTALLED AS PART OF THIS PROJECT ARE TO BE: MAINS PILLARS.
6. ALL SERVICE WORKS TO BE DONE IN CONJUNCTION WITH THE NEW SERVICE AND INSTALLATION RULES.
7. THE TRENCHING REQUIRED IN SHOWGROUND RD WILL BE COMPLETED BY ASSET MANAGEMENT CONSTRUCTION. TOTAL ROUTE LENGTH IS APPROXIMATELY 45 METRES INCLUSIVE OF CONCRETE DRIVEWAY, WHICH IS INCLUDED IN THE DUCT SCHEDULE. 13-14 TO BE BORED BY CIVIL CONTRACTOR.

●	A TO B UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 45M)	A-B
●	C TO D UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 47M)	C-D
●	B TO E UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 42M)	B-E
●	E TO F UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 45M)	E-F
1	F TO Z2 (Do not cut the driveway) TRENCH AND LAY 2 X 125MM HD DUCT (R.L. 30M)	F-Z2
●	Z2 TO G UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 60M)	Z2-G
●	G TO H UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 48M)	G-H
1	I TO II TRENCH AND LAY 2 X 125MM HD DUCT (R.L. 30M)	I-II
●	J TO K UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 60M)	J - K
●	K TO L UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 70M)	K-L
●	L TO M UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 24M)	L-M
●	M-N UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 30M)	M-N
1	O TO P TRENCH AND LAY 2 X 125MM HD DUCT (R.L. 30M)	O-P
●	P TO Q UNDERBORE AND LAY 2 X 125MM HD DUCTS (R.L. 15M)	P-Q
●	R TO S UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 75M)	R-S
●	S TO T UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 50M)	S-T
●	T TO U UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 47M)	T-U
●	U TO V UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 35M)	U-V
●	II TO VI UNDERBORE AND LAY 2 X 125MM HD DUCT (R.L. 30M)	II-VI
1	VI TO W TRENCH AND LAY 2 X 125MM HD DUCT (R.L. 30M)	VI-W
●	W TO X2 UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 35M)	W-X2
●	X2 TO X UNDERBORE AND LAY 2 X 125MM HD DUCTS (R.L. 30M)	X2-X
1	X3 TO X4 (Do not cut concrete driveway) UNDERBORE - 1x125mm (5m), Trench 1x125mm (20m)	X3-X4
●	X TO XI UNDERBORE AND LAY 2 X 125MM HD DUCTS (R.L. 15M)	X-XI
●	XI TO Y UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 30M)	XI-Y
●	Y TO Z UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 70M)	Y-Z
●	Z TO Z1 UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 20M)	Z-Z1
●	Z1 TO Z2 UNDERBORE AND LAY 2 X 125MM HD DUCT (R.L. 30M)	Z1-Z2



 EXISTING PADMOUNT SUBSTATION
 • EXISTING POLE
 ——— EXISTING O.H. MAINS
 - - - - - EXISTING U.G. MAINS
 ■ EXISTING COLUMN
 □ NEW PILLAR
 ■ REPLACE PILLAR
 ■ EXISTING PILLAR
 - - - - - LOW VOLTAGE TRENCHING
 ——— EXISTING DUCTS
 ——— NEW DUCTS TO BE INSTALLED
 ○ SPARE DUCT
 ○ DUCT WITH EXIST. CABLE
 ● DUCT WITH NEW CABLE
 ⊕ SERVICE CONNECTION. DIGITS IN CIRCLE DEPICT LAST TWO NUMBERS OF PILLAR OR COLUMN FROM WHICH SUPPLY ORIGINATES
 ——— ACTUAL ALIGNMENT
 □ OPEN POINT

$$\text{CHAINAGE (m)} \frac{\text{OFFSET (m)}}{\text{LOSER (m)}}$$

UNLESS APPROVED OTHERWISE, INTERRUPTIONS TO ANY CUSTOMERS SUPPLY MUST BE AVOIDED. THE FOLLOWING ALTERNATIVES SHOULD BE CONSIDERED:

- MOBILE GENERATORS OR SUBSTANCES;
- LIVE LINE WORK;
- DESIGN ALTERNATIVES;
- WORK PRACTICES / STANDARDS;
- LOW VOLTAGE PARALLELS

THIS COST TO BE FUNDED BY THE DEVELOPER.

TO REPLACE ALL CONSAC CABLE BEING
SUPPLIED BY SUB 3129 WITH 240MM 4 CORE
XLPE AS PART OF REFURBISHMENT

COMM COMP
UG MAP No
DUCT DWG
RECORDED BY LINDSEY POWERS
INSTALLED BY I. C.

This plan shows the approximate location of underground utilities relative to fixed structures. The locations of all utilities were laid out and has been prepared under the Engineer's sole responsibility. Endeavour Engineering has taken all reasonable steps to ensure that the information contained herein is as accurate as possible, but will accept no liability for inaccuracies shown in the information shown on such plans from any cause whatsoever arising.

CONSTRUCTED BY		101 Construction Construction	
WORKS COMPLETED		Indyay Karamchi	
SIGNED	DATE	800P	FIBD
SIGNED BY	NAME	699257	2839
SIGNED	DATE		

Persons excavating are expected to exercise all due care in the vicinity where cables are indicated and will be held responsible for any damage caused to Endeavour Energy's Property

All Electrical apparatus shall be considered as live until proved de-energised. Contact with live electrical apparatus will cause severe injury or death.

Those excavating near Endeavour Energy's cables should be aware that ASBESTOS OR ASBESTOS - CONTAINING MATERIAL MAY BE PRESENT in Endeavour Energy's underground assets and that Organo-Chloride Pesticides(OCP) may be present in some sub-transmission trenches

REFERENCE DRAWINGS		WORK ORDERS		CAP / SAMP No.			ORIGINAL SCALE	DO NOT SCALE	 INTEGRAL ENERGY PO BOX 6562, BLACKTOWN, NSW, 2148 PHONE - 131 6811								
				AM PROJ. No.			1:1000										
		GENERAL		HY SWITCHING			DRAWN	MLT	DIMENSIONS IN METRES	CHAPMAN AVE CASTLE HILL DSN00033					A1	307587	A
		OVERHEAD		UBD/PENGUN REF	ESD HD												
		UNDERGROUND		GIS MAP No.	U916032	DATE	30/08/86	CONCAC REPLACEMENT					SHEET No 1 of 2 SHEETS				
		SUBSTATIONS		HY OP DIAGRAM		EXTD										DESIGN	MLT
				LOCAL GOV AREA	BANIKHAN HILLS												

WARNING

- **All electrical apparatus shall be regarded as live until proved de-energised.** Contact with live electrical apparatus will cause severe injury or death.
- In accordance with the *Electricity Supply Act 1995*, you are obliged to report any damage to Endeavour Energy Assets immediately by calling **131 003**.
- The customer must obtain a new set of plans from Endeavour Energy if work has not been started or completed within twenty **(20)** working days of the original plan issue date.
- The customer must contact Endeavour Energy if any of the plans provided have blank pages, as some underground asset information may be incomplete.
- Endeavour Energy underground earth grids may exist and their location **may not** be shown on plans. Persons excavating are expected to exercise all due care, especially in the vicinity of padmount substations, pole mounted substations, pole mounted switches, transmission poles and towers.
- Endeavour Energy plans **do not** show any underground customer service mains or information relating to service mains within private property.
- Asbestos or asbestos-containing material may be present on or near Endeavour Energy's underground assets.
- Organo-Chloride Pesticides (OCP) may be present in some sub-transmission trenches.
- All plans must be printed and made available at the worksite where excavation is to be undertaken. Plans must be reviewed and understood by the crew on site prior to commencing excavation.

INFORMATION PROVIDED BY ENDEAVOUR ENERGY

- Any plans provided pursuant to this service are intended to show the approximate location of underground assets relative to road boundaries, property fences and other structures at the time of installation.
- Depth of underground assets may vary significantly from information provided on plans as a result of changes to road, footpath or surface levels subsequent to installation.
- Such plans have been prepared solely for use by Endeavour Energy staff for design, construction and maintenance purposes.
- All enquiry details and results are kept in a register.

DISCLAIMER

Whilst Endeavour Energy has taken all reasonable steps to ensure that the information contained in the plans is as accurate as possible it will accept no liability for inaccuracies in the information shown on such plans.

LEGEND

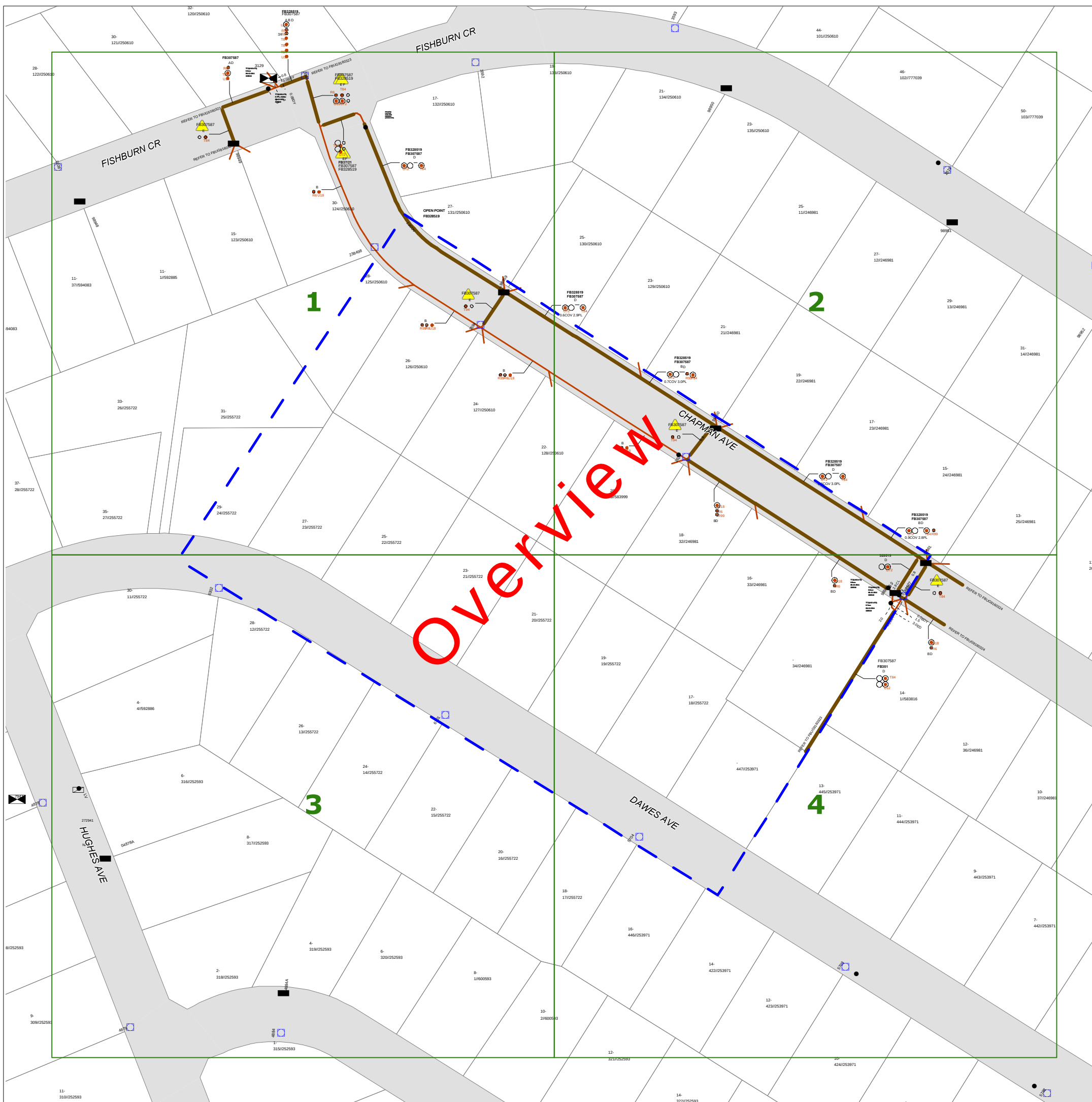
- or ■ Street light column
- ▤ Padmount substation
- or ■ Overground pillar (O.G.Box)
- ▤ Underground pit
- Duct run
- Cable run
- ⊙ Typical duct section
- ▲ Asbestos warning

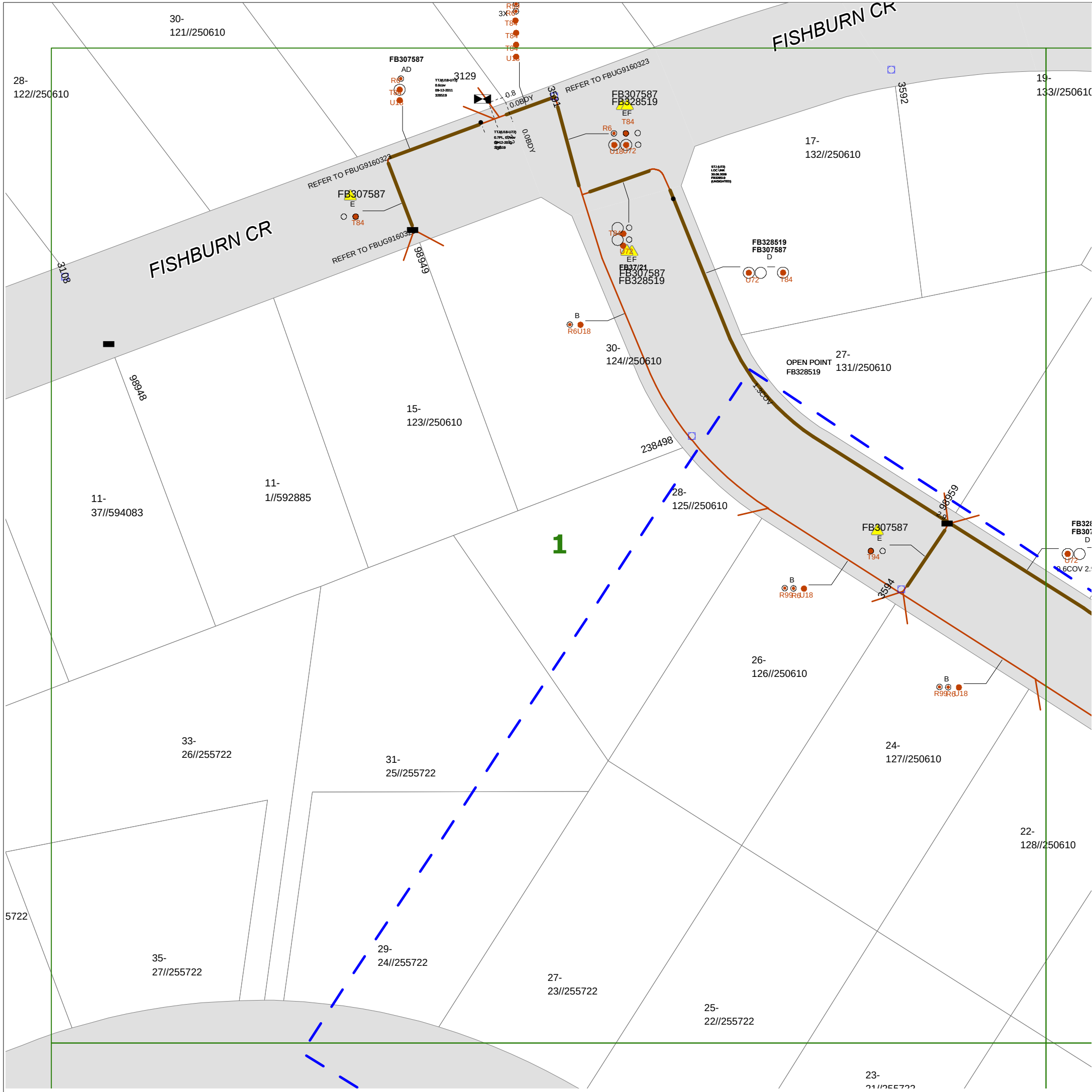


NOT TO SCALE

DBYD Sequence No.:	61347543
Issued Date:	22/05/2017

Cadastre: © Land and Property Information 2015, 2016





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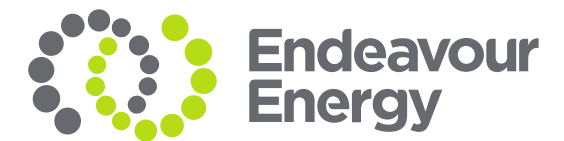
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Cadastre: © Land and Property Information 2015, 2016



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- The customer must contact Endeavour Energy if any of the plans provided have blank pages, as some underground asset information may be incomplete.
- Endeavour Energy underground earth grids may exist and their location **may not** be shown on plans. Persons excavating are expected to exercise all due care, especially in the vicinity of padmount substations, pole mounted substations, pole mounted switches, transmission poles and towers.
- Endeavour Energy plans **do not** show any underground customer service mains or information relating to service mains within private property.
- Asbestos or asbestos-containing material may be present on or near Endeavour Energy's underground assets.
- Organo-Chloride Pesticides (OCP) may be present in some sub-transmission trenches.
- All plans must be printed and made available at the worksite where excavation is to be undertaken. Plans must be reviewed and understood by the crew on site prior to commencing excavation.

INFORMATION PROVIDED BY ENDEAVOUR ENERGY

- Any plans provided pursuant to this service are intended to show the approximate location of underground assets relative to road boundaries, property fences and other structures at the time of installation.
- Depth of underground assets may vary significantly from information provided on plans as a result of changes to road, footpath or surface levels subsequent to installation.
- Such plans have been prepared solely for use by Endeavour Energy staff for design, construction and maintenance purposes.
- All enquiry details and results are kept in a register.

DISCLAIMER

Whilst Endeavour Energy has taken all reasonable steps to ensure that the information contained in the plans is as accurate as possible it will accept no liability for inaccuracies in the information shown on such plans.

LEGEND

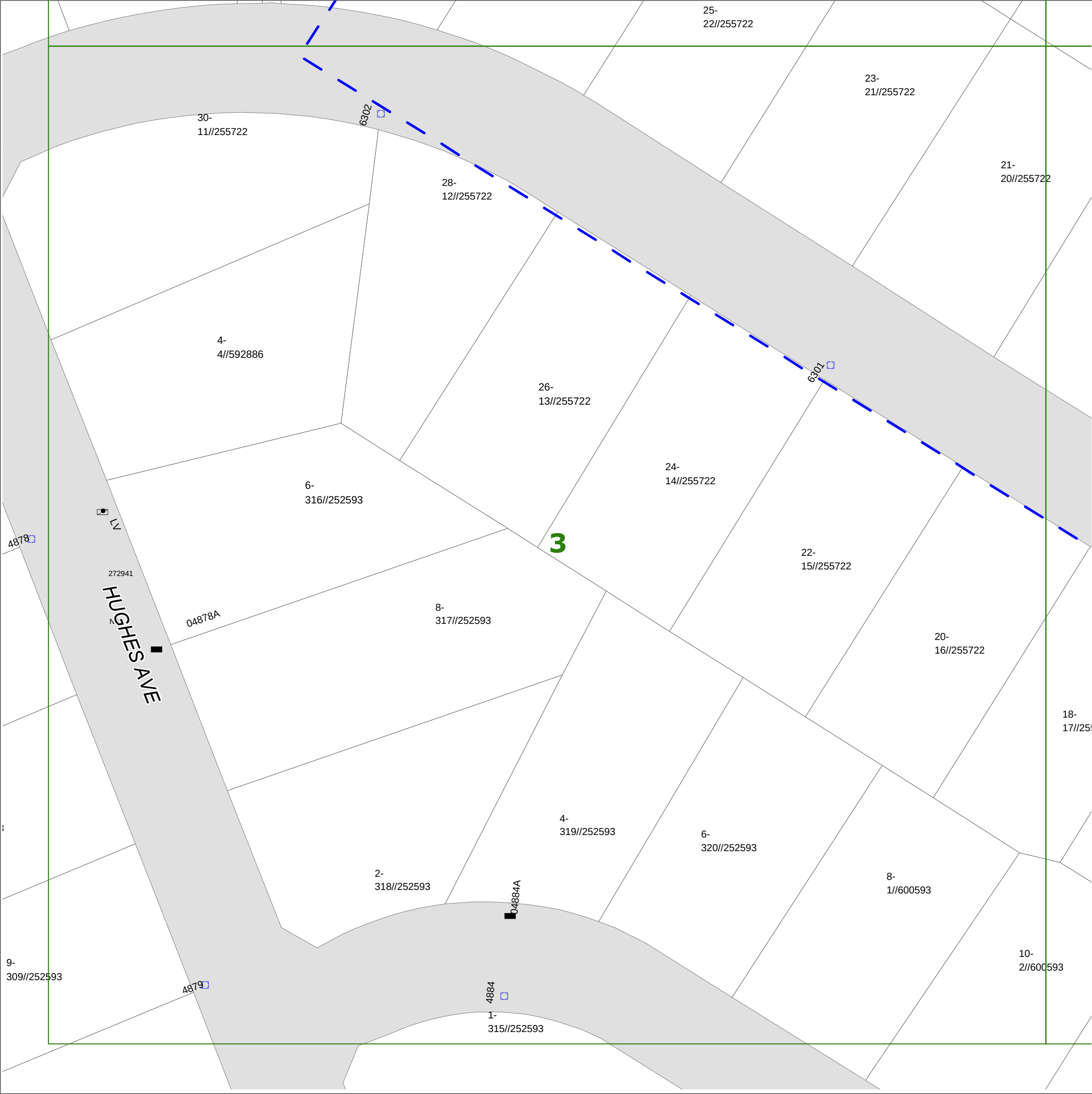
- | | | | |
|---|----|---|-----------------------------|
|  | or |  | Street light column |
|  | | | Padmount substation |
|  | or |  | Overground pillar (O.G.Box) |
|  | | | Underground pit |
|  | | | Duct run |
|  | | | Cable run |
|  | | | Typical duct section |
|  | | | Asbestos warning |



NOT TO SCALE

DBYD Sequence No.:	61347543
Issued Date:	22/05/2017

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LEGEND

- or ■ Street light column
- ▤ Padmount substation
- or ■ Overground pillar (O.G.Box)
- ▨ Underground pit
- ▬ Duct run
- ▬ Cable run
- ⊙ Typical duct section
- ▲ Asbestos warning



NOT TO SCALE

DBYD Sequence No.:	61347543
Issued Date:	22/05/2017

If further clarification is required, please contact:
Endeavour Energy
Phone: (02) 9853 4161 (8:00am-4:30pm Mon-Fri)
Emergency Phone Number: 131 003



DBYD Underground Search Report

Date: 22/05/2017

DBYD Sequence No: 61348150

DBYD Job No: 12359078

ENDEAVOUR ENERGY ASSETS AFFECTED

To:	Mr Jack Mort	Company:	AT&L
Address:	Level 7 153 Walker Street, North Sydney, NSW 2060		
Cust. ID:	1712632	Email:	jackm@atl.net.au
Phone:	0294391777	Mobile:	Not Supplied
		Fax:	Not Supplied
Enquiry Location:	26 Chapman Avenue, Castle Hill, NSW 2154		

Our Search has shown that **UNDERGROUND ASSETS ARE PRESENT** on our plans within the nominated enquiry location. This search is based on the graphical position of the excavation site as denoted in the DBYD customer confirmation sheet.

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SUPPLEMENTARY MATERIAL

Material	Purpose	Location
DBYD Cover Letter	Endeavour Energy DBYD response Cover Letter	Attached
DBYD Important Information & Disclaimer	Endeavour Energy disclaimer, responsibilities and information on understanding plans	Attached
DBYD Response Plans	Endeavour Energy DBYD plans	Attached
Work Cover NSW "Work near underground assets: Guide"	Guideline for anyone involved in construction work near underground assets	Contact Work Cover NSW for a copy
Work Cover NSW "Excavation work: Code of practice"	Practical guidance on managing health and safety risks associated with excavation	URL [Click Here]
Safe Work Australia "Working in the vicinity of overhead and underground electric lines guidance material"	Provides information on how to manage risks when working in the vicinity of overhead and underground electric lines at a workplace	URL [Click Here]
Endeavour Energy Safety Brochures & Guides	To raise awareness of dangers of working on or near Endeavour Energy's assets	URL [Click Here]

228
N16

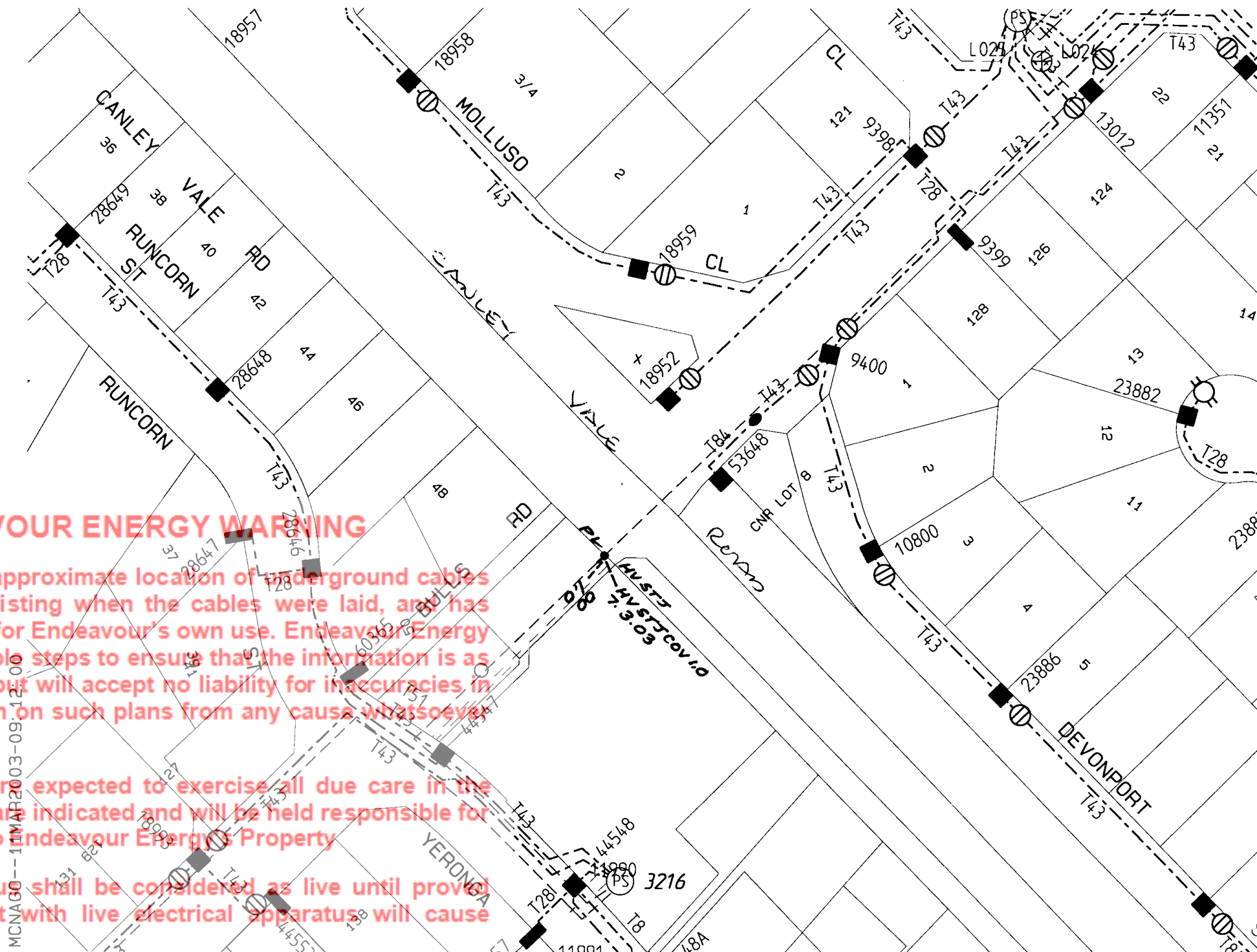
ENDEAVOUR ENERGY WARNING

This plan shows the approximate location of underground cables relative to fixtures existing when the cables were laid, and has been prepared solely for Endeavour's own use. Endeavour Energy has taken all reasonable steps to ensure that the information is as accurate as possible but will accept no liability for inaccuracies in the information shown on such plans from any cause whatsoever arising.

Persons excavating are expected to exercise all due care in the vicinity where cables are indicated and will be held responsible for any damage caused to Endeavour Energy's Property.

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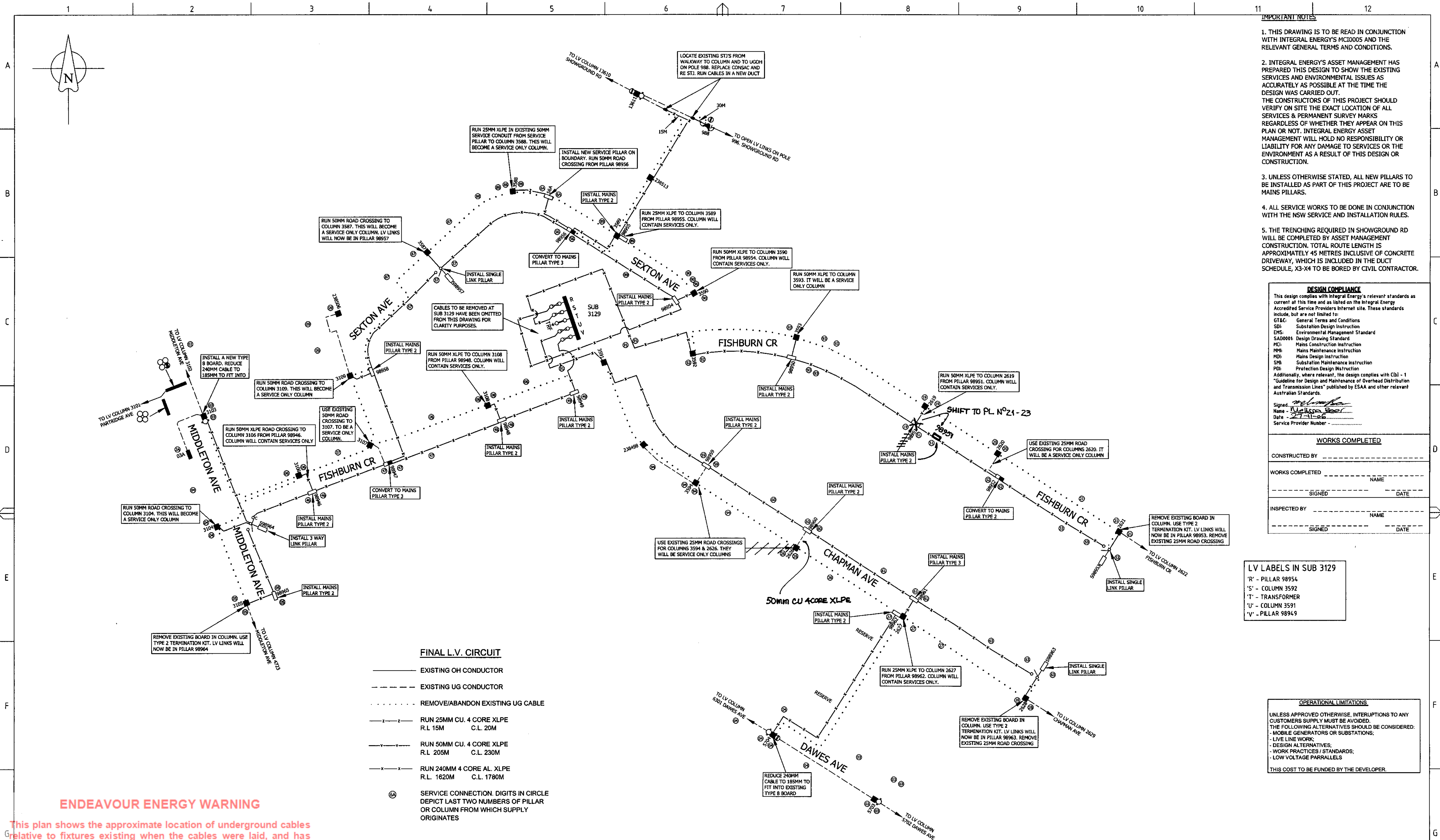
Those excavating near Endeavour Energy's cables should be aware that ASBESTOS OR ASBESTOS - CONTAINING MATERIAL MAY BE PRESENT in Endeavour Energy's underground assets and that Organo-Chloride Pesticides(OCP) may be present in some sub-transmission trenches.



FB 279570
COMM 7-03-03 COMP 7.3.03
SHEET 9145-4.1
DUCT
RECORDED BY G. McNally
INSTALLED BY

Issue Date: 22/05/2017, DBYD Sequence No: 61348150

279570



- IMPORTANT NOTES**
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH INTEGRAL ENERGY'S MC0005 AND THE RELEVANT GENERAL TERMS AND CONDITIONS.
 2. INTEGRAL ENERGY'S ASSET MANAGEMENT HAS PREPARED THIS DESIGN TO SHOW THE EXISTING SERVICES AND ENVIRONMENTAL ISSUES AS ACCURATELY AS POSSIBLE AT THE TIME THE DESIGN WAS CARRIED OUT. THE CONSTRUCTORS OF THIS PROJECT SHOULD VERIFY ON SITE THE EXACT LOCATION OF ALL SERVICES & PERMANENT SURVEY MARKS REGARDLESS OF WHETHER THEY APPEAR ON THIS PLAN OR NOT. INTEGRAL ENERGY ASSET MANAGEMENT WILL HOLD NO RESPONSIBILITY OR LIABILITY FOR ANY DAMAGE TO SERVICES OR THE ENVIRONMENT AS A RESULT OF THIS DESIGN OR CONSTRUCTION.
 3. UNLESS OTHERWISE STATED, ALL NEW PILLARS TO BE INSTALLED AS PART OF THIS PROJECT ARE TO BE MAINS PILLARS.
 4. ALL SERVICE WORKS TO BE DONE IN CONJUNCTION WITH THE NSW SERVICE AND INSTALLATION RULES.
 5. THE TRENCHING REQUIRED IN SHOWGROUND RD WILL BE COMPLETED BY ASSET MANAGEMENT CONSTRUCTION. TOTAL ROUTE LENGTH IS APPROXIMATELY 45 METRES INCLUSIVE OF CONCRETE DRIVEWAY, WHICH IS INCLUDED IN THE DUCT SCHEDULE, X3-X4 TO BE BORED BY CIVIL CONTRACTOR.

DESIGN COMPLIANCE

This design complies with Integral Energy's relevant standards as current at this time and as listed on the Integral Energy Accredited Service Providers Internet site. These standards include, but are not limited to:

- GT&C: General Terms and Conditions
- SDI: Substation Design Instruction
- EMS: Environmental Management Standard
- SAD0006: Design Drawing Standard
- MCU: Mains Construction Instruction
- MMI: Mains Maintenance Instruction
- MDI: Mains Design Instruction
- SMI: Substation Maintenance Instruction
- PDI: Protection Design Instruction

Additionally, where relevant, the design complies with Cbl - 1 "Guideline for Design and Maintenance of Overhead Distribution and Transmission Lines" published by ESAA and other relevant Australian Standards.

Signed: *[Signature]*
Name: *[Name]*
Date: *[Date]*
Service Provider Number: *[Number]*

WORKS COMPLETED

CONSTRUCTED BY: _____

WORKS COMPLETED: _____ NAME: _____

SIGNED: _____ DATE: _____

INSPECTED BY: _____ NAME: _____

SIGNED: _____ DATE: _____

LV LABELS IN SUB 3129

'R' - PILLAR 98954
'S' - COLUMN 3592
'T' - TRANSFORMER
'U' - COLUMN 3591
'V' - PILLAR 98949

OPERATIONAL LIMITATIONS

UNLESS APPROVED OTHERWISE, INTERRUPTIONS TO ANY CUSTOMERS SUPPLY MUST BE AVOIDED. THE FOLLOWING ALTERNATIVES SHOULD BE CONSIDERED:

- MOBILE GENERATORS OR SUBSTATIONS;
- LIVE LINE WORK;
- DESIGN ALTERNATIVES;
- WORK PRACTICES / STANDARDS;
- LOW VOLTAGE PARALLELS

THIS COST TO BE FUNDED BY THE DEVELOPER.

FINAL L.V. CIRCUIT

- EXISTING OH CONDUCTOR
- - - EXISTING UG CONDUCTOR
- ... REMOVE/ABANDON EXISTING UG CABLE
- RUN 25MM CU, 4 CORE XLPE
R.L. 15M C.L. 20M
- RUN 50MM CU, 4 CORE XLPE
R.L. 205M C.L. 230M
- RUN 240MM 4 CORE AL XLPE
R.L. 1620M C.L. 1780M
- Ⓢ SERVICE CONNECTION. DIGITS IN CIRCLE DEPICT LAST TWO NUMBERS OF PILLAR OR COLUMN FROM WHICH SUPPLY ORIGINATES

DEFECTS TO BE COMPLETED BY INTEGRAL ENERGY

EQUIP NO.	FIELD COLUMN NO.	DEFECT W/O NO.	DESCRIPTION	DEFECT W/O CLOSED IN ELLIPSE	COMMENTS
699252	2628	ENK76061	REPAIR SERVICE CONNECTIONS		

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REFERENCE DRAWING'S		WORK ORDERS		CAP / SAMP No.	
		GENERAL		AM PROJ. No.	DSN00033
		OVERHEAD		HV SWITCHING	
		UNDERGROUND		UBD/PENGUIN REF	151 M13
		SUBSTATIONS		GIS MAP No	U916032
				HV OP DIAGRAM	
				LOCAL GOV AREA	BAULKHAM HILLS

ORIGINAL SCALE 1:1000	DO NOT SCALE DIMENSIONS IN METRES
DRAWN MLT	DATE 30/08/06
DESIGN MLT	

INTEGRAL ENERGY
PO BOX 6366, BLACKTOWN, NSW, 2148
PHONE - 131 081

CHAPMAN AVE
CASTLE HILL
DSN00033
CONSAC REPLACEMENT

FIELD BOOK 307587
COMM. 28/11/06 COMP. 17/2/07
UG MAP NO.
DUCT DWG.
RECORDED BY: *[Signature]*
INSTALLED BY: *[Signature]*

A1 307587 A
SHEET No 2 OF 2 SHEETS



SCANNED

NOTE:
THIS PLAN IS
PRINTED AT A
RATIO OF 1:800

15/7/96
LH/96
23-12-96
21-2-01
8-03-2001

ENDEAVOUR ENERGY WARNING

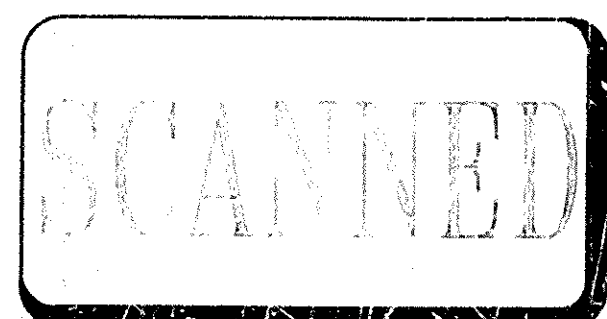
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1266250 N										CABLE MODIFICATIONS										CABLES	
CODE	CABLE NO	TYPE	FB	CODE	CABLE NO	TYPE	FB	CODE	CABLE NO	TYPE	FB	CODE	CABLE NO	TYPE	FB	CODE	CABLE NO	TYPE	FB		
65	1266250	1. 1KV ALUM	9972	67	9987	1. 2. COMBAC	9972	69	1000	1. 2. COMBAC	9972	71	9971	1. 2. COMBAC	9971	73	9973	1. 2. COMBAC	9973		
71	9971	1. 2. COMBAC	9971	73	9973	1. 2. COMBAC	9973	75	9975	1. 2. COMBAC	9975	77	9977	1. 2. COMBAC	9977	79	9979	1. 2. COMBAC	9979		
73	9973	1. 2. COMBAC	9973	75	9975	1. 2. COMBAC	9975	77	9977	1. 2. COMBAC	9977	79	9979	1. 2. COMBAC	9979	81	9981	1. 2. COMBAC	9981		
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151	1051	1. 2. COMBAC	1051	153	1053	1. 2. COMBAC	1053	155	1055	1. 2. COMBAC	1055	157	1057	1. 2. COMBAC	1057	159	1059	1. 2. COMBAC	1059		
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155	1055	1. 2. COMBAC	1055	157	1057	1. 2. COMBAC	1057	159	1059	1. 2. COMBAC	1059	161	1061	1. 2. COMBAC	1061	163	1063	1. 2. COMBAC	1063		
157	1057	1. 2. COMBAC	1057	159	1059	1. 2. COMBAC	1059	161	1061	1. 2. COMBAC	1061	163	1063	1. 2. COMBAC	1063	165	1065	1. 2. COMBAC	1065		
159	1059	1. 2. COMBAC	1059	161	1061	1. 2. COMBAC	1061	163	1063	1. 2. COMBAC	1063	165	1065	1. 2. COMBAC	1065	167	1067	1. 2. COMBAC	1067		
161	1061	1. 2. COMBAC	1061	163	1063	1. 2. COMBAC	1063	165	1065	1. 2. COMBAC	1065	167	1067	1. 2. COMBAC	1067	169	1069	1. 2. COMBAC	1069		
163	1063	1. 2. COMBAC	1063	165	1065	1. 2. COMBAC	1065	167	1067	1. 2. COMBAC	1067	169	1069	1. 2. COMBAC	1069	171	1071	1. 2. COMBAC	1071		
165	1065	1. 2. COMBAC	1065	167	1067	1. 2. COMBAC	1067	169	1069	1. 2. COMBAC	1069	171	1071	1. 2. COMBAC	1071	173	1073	1. 2. COMBAC	1073		
167	1067	1. 2. COMBAC	1067	169	1069	1. 2. COMBAC	1069	171	1071	1. 2. COMBAC	1071	173	1073	1. 2. COMBAC	1073	175	1075	1. 2. COMBAC	1075		
169	1069	1. 2. COMBAC	1069	171	1071	1. 2. COMBAC	1071	173	1073	1. 2. COMBAC	1073	175	1075	1. 2. COMBAC	1075	177	1077	1. 2. COMBAC	1077		
171	1071	1. 2. COMBAC	1071	173	1073	1. 2. COMBAC	1073	175	1075	1. 2. COMBAC	1075	177	1077	1. 2. COMBAC	1077	179	1079	1. 2. COMBAC	1079		
173	1073	1. 2. COMBAC	1073	175	1075	1. 2. COMBAC	1075	177	1077	1. 2. COMBAC	1077	179	1079	1. 2. COMBAC	1079	181	1081	1. 2. COMBAC	1081		
175	1075	1. 2. COMBAC	1075	177	1077	1. 2. COMBAC	1077	179	1079	1. 2. COMBAC	1079	181	1081	1. 2. COMBAC	1081	183	1083	1. 2. COMBAC	1083		
177	1077	1. 2. COMBAC	1077	179	1079	1. 2. COMBAC	1079	181	1081	1. 2. COMBAC	1081	183	1083	1. 2. COMBAC	1083	185	1085	1. 2. COMBAC	1085		
179	1079	1. 2. COMBAC	1079	181	1081	1. 2. COMBAC	1081	183	1083	1. 2. COMBAC	1083	185	1085	1. 2. COMBAC	1085	187	1087	1. 2. COMBAC	1087		
181	1081	1. 2. COMBAC	1081	183	1083	1. 2. COMBAC	1083	185	1085	1. 2. COMBAC	1085	187	1087	1. 2. COMBAC	1087	189	1089	1. 2. COMBAC	1089		
183	1083	1. 2. COMBAC	1083	185	1085	1. 2. COMBAC	1085	187	1087	1. 2. COMBAC	1087	189	1089	1. 2. COMBAC	1089	191	1091	1. 2. COMBAC	1091		
185	1085	1. 2. COMBAC	1085	187	1087	1. 2. COMBAC	1087	189	1089	1. 2. COMBAC	1089	191	1091	1. 2. COMBAC	1091	193	1093	1. 2. COMBAC	1093		
187	1087	1. 2. COMBAC	1087	189	1089	1. 2. COMBAC	1089	191	1091	1. 2. COMBAC	1091	193	1093	1. 2. COMBAC	1093	195	1095	1. 2. COMBAC	1095		
189	1089	1. 2. COMBAC	1089	191	1091	1. 2. COMBAC	1091	193	1093	1. 2. COMBAC	1093	195	1095	1. 2. COMBAC	1095	197	1097	1. 2. COMBAC	1097		
191	1091	1. 2. COMBAC	1091	193	1093	1. 2. COMBAC	1093	195	1095	1. 2. COMBAC	1095	197	1097								



0 10 20 30 40 50 60 70m

ISSUE DATE: 28-2-96

3/7/96

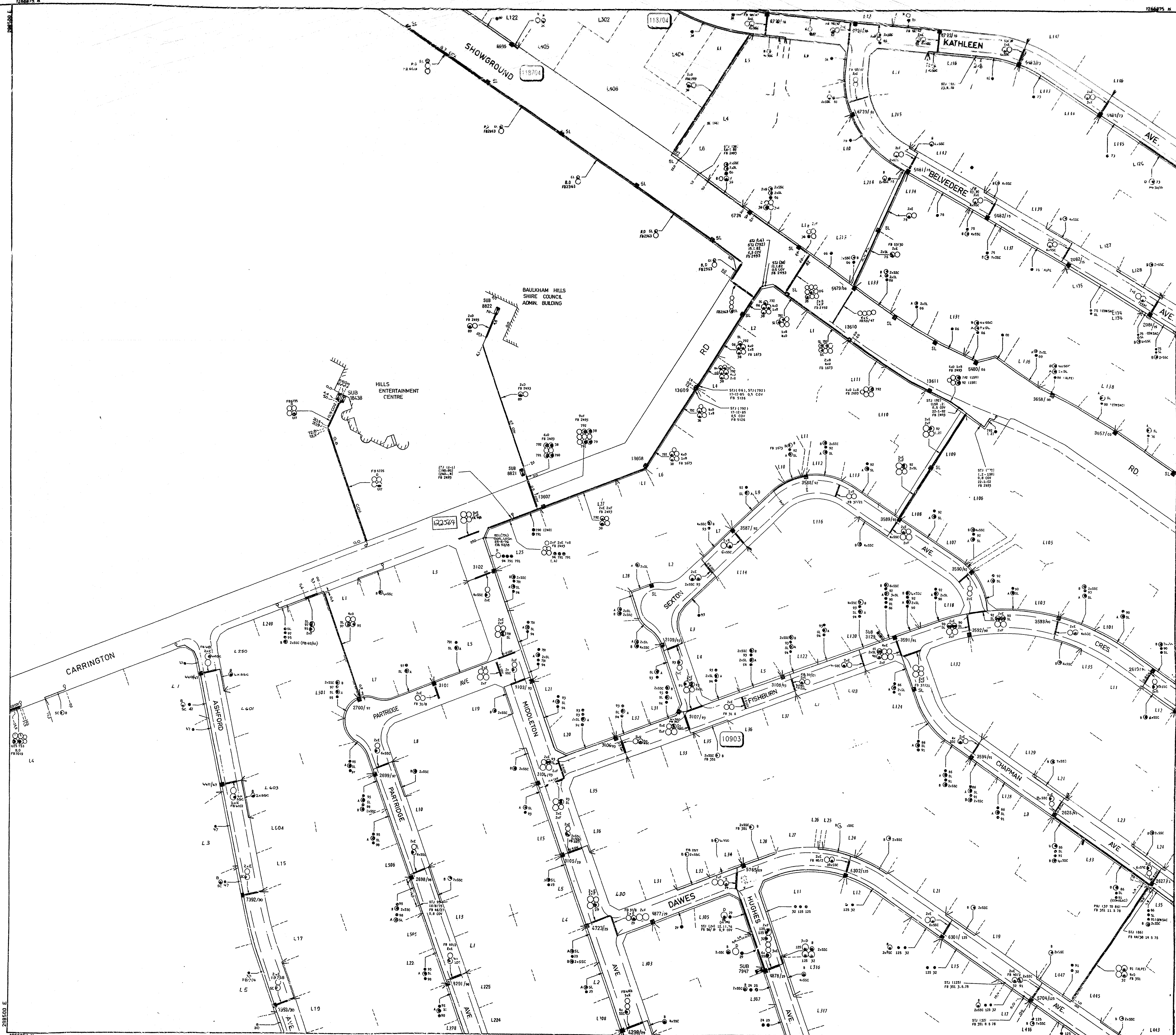
ENDEAVOUR ENERGY WARNING

This plan shows the approximate location of underground cables relative to fixtures existing when the cables were laid, and has been prepared solely for Endeavour's own use. Endeavour Energy has taken all reasonable steps to ensure that the information is as accurate as possible but will accept no liability for inaccuracies in the information shown on such plans from any cause whatsoever arising.

Persons excavating are expected to exercise all due care in the vicinity where cables are indicated and will be held responsible for any damage caused to Endeavour Energy's Property

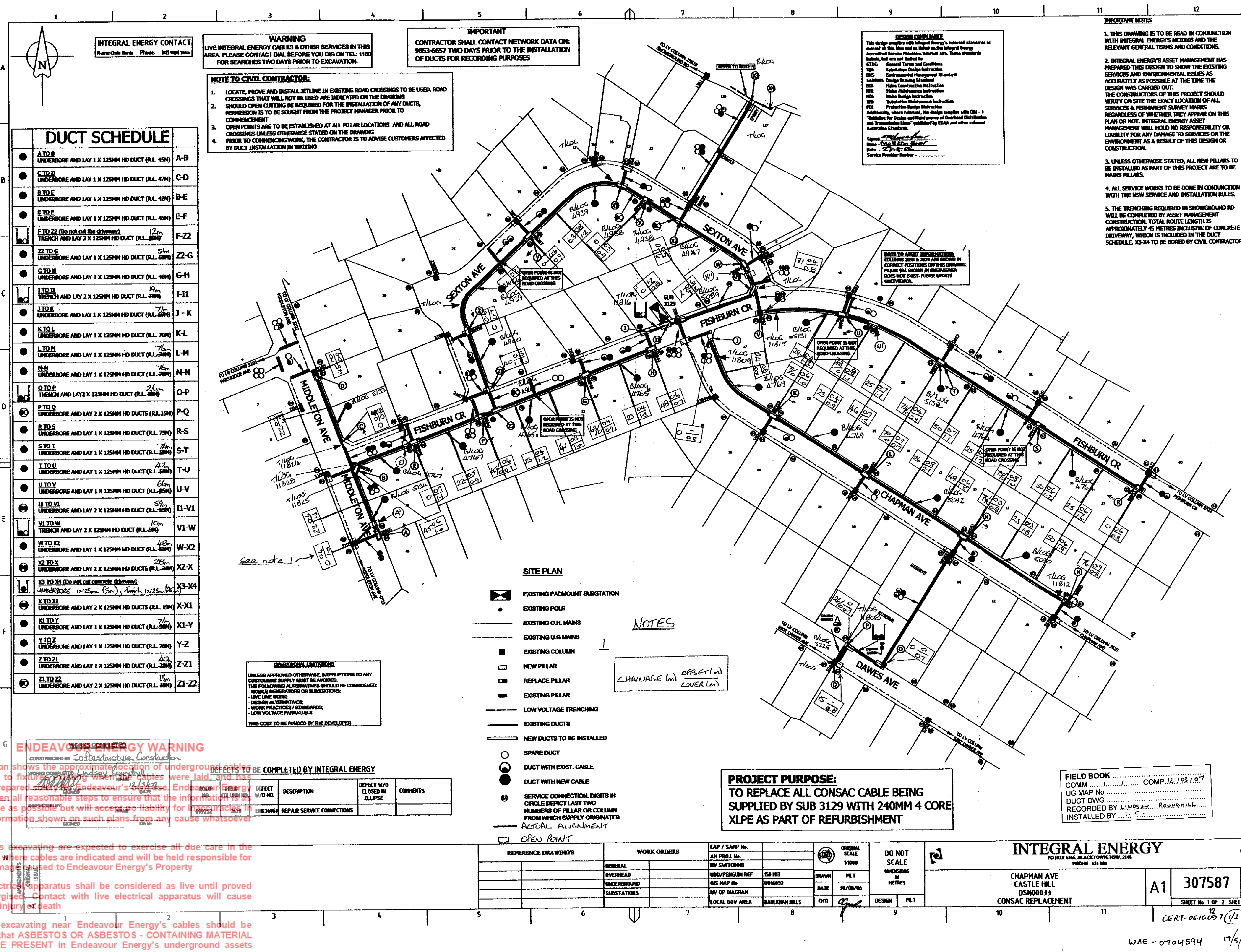
All Electrical apparatus shall be considered as live until proved de-energised. Contact with live electrical apparatus will cause severe injury or death

Those excavating near Endeavour Energy's cables should be aware that ASBESTOS OR ASBESTOS-CONTAINING MATERIAL MAY BE PRESENT in Endeavour Energy's underground assets and that Organo-Chloride Pesticides(OCP) may be present in some sub-transmission trenches



17600/200 N										SERV. EQUIPMENT										LEGEND									
CODE	CABLE NO.	TYPE	FB	CODE	CABLE NO.	TYPE	FB	CODE	CABLE NO.	TYPE	FB	CODE	CABLE NO.	TYPE	FB	CODE	CABLE NO.	TYPE	FB										
01	1006	1.0 OMVAC	1006	02	1007	1.0 OMVAC	1007	03	1008	1.0 OMVAC	1008	04	1009	1.0 OMVAC	1009	05	1010	1.0 OMVAC	1010										
06	1011	1.0 OMVAC	1011	07	1012	1.0 OMVAC	1012	08	1013	1.0 OMVAC	1013	09	1014	1.0 OMVAC	1014	10	1015	1.0 OMVAC	1015										
11	1016	1.0 OMVAC	1016	12	1017	1.0 OMVAC	1017	13	1018	1.0 OMVAC	1018	14	1019	1.0 OMVAC	1019	15	1020	1.0 OMVAC	1020										
16	1021	1.0 OMVAC	1021	17	1022	1.0 OMVAC	1022	18	1023	1.0 OMVAC	1023	19	1024	1.0 OMVAC	1024	20	1025	1.0 OMVAC	1025										
21	1026	1.0 OMVAC	1026	22	1027	1.0 OMVAC	1027	23	1028	1.0 OMVAC	1028	24	1029	1.0 OMVAC	1029	25	1030	1.0 OMVAC	1030										
26	1031	1.0 OMVAC	1031	27	1032	1.0 OMVAC	1032	28	1033	1.0 OMVAC	1033	29	1034	1.0 OMVAC	1034	30	1035	1.0 OMVAC	1035										
31	1036	1.0 OMVAC	1036	32	1037	1.0 OMVAC	1037	33	1038	1.0 OMVAC	1038	34	1039	1.0 OMVAC	1039	35	1040	1.0 OMVAC	1040										
36	1041	1.0 OMVAC	1041	37	1042	1.0 OMVAC	1042	38	1043	1.0 OMVAC	1043	39	1044	1.0 OMVAC	1044	40	1045	1.0 OMVAC	1045										
41	1046	1.0 OMVAC	1046	42	1047	1.0 OMVAC	1047	43	1048	1.0 OMVAC	1048	44	1049	1.0 OMVAC	1049	45	1050	1.0 OMVAC	1050										
46	1051	1.0 OMVAC	1051	47	1052	1.0 OMVAC	1052	48	1053	1.0 OMVAC	1053	49	1054	1.0 OMVAC	1054	50	1055	1.0 OMVAC	1055										
51	1056	1.0 OMVAC	1056	52	1057	1.0 OMVAC	1057	53	1058	1.0 OMVAC	1058	54	1059	1.0 OMVAC	1059	55	1060	1.0 OMVAC	1060										
56	1061	1.0 OMVAC	1061	57	1062	1.0 OMVAC	1062	58	1063	1.0 OMVAC	1063	59	1064	1.0 OMVAC	1064	60	1065	1.0 OMVAC	1065										
61	1066	1.0 OMVAC	1066	62	1067	1.0 OMVAC	1067	63	1068	1.0 OMVAC	1068	64	1069	1.0 OMVAC	1069	65	1070	1.0 OMVAC	1070										
66	1071	1.0 OMVAC	1071	67	1072	1.0 OMVAC	1072	68	1073	1.0 OMVAC	1073	69	1074	1.0 OMVAC	1074	70	1075	1.0 OMVAC	1075										
71	1076	1.0 OMVAC	1076	72	1077	1.0 OMVAC	1077	73	1078	1.0 OMVAC	1078	74	1079	1.0 OMVAC	1079	75	1080	1.0 OMVAC	1080										
76	1081	1.0 OMVAC	1081	77	1082	1.0 OMVAC	1082	78	1083	1.0 OMVAC	1083	79	1084	1.0 OMVAC	1084	80	1085	1.0 OMVAC	1085										
81	1086	1.0 OMVAC	1086	82	1087	1.0 OMVAC	1087	83	1088	1.0 OMVAC	1088	84	1089	1.0 OMVAC	1089	85	1090	1.0 OMVAC	1090										
86	1091	1.0 OMVAC	1091	87	1092	1.0 OMVAC	1092	88	1093	1.0 OMVAC	1093	89	1094	1.0 OMVAC	1094	90	1095	1.0 OMVAC	1095										
91	1096	1.0 OMVAC	1096	92	1097	1.0 OMVAC	1097	93	1098	1.0 OMVAC	1098	94	1099	1.0 OMVAC	1099	95	1100	1.0 OMVAC	1100										
96	1101	1.0 OMVAC	1101	97	1102	1.0 OMVAC	1102	98	1103	1.0 OMVAC	1103	99	1104	1.0 OMVAC	1104	100	1105	1.0 OMVAC	1105										
101	1106	1.0 OMVAC	1106	102	1107	1.0 OMVAC	1107	103	1108	1.0 OMVAC	1108	104	1109	1.0 OMVAC	1109	105	1110	1.0 OMVAC	1110										
106	1111	1.0 OMVAC	1111	107	1112	1.0 OMVAC	1112	108	1113	1.0 OMVAC	1113	109	1114	1.0 OMVAC	1114	110	1115	1.0 OMVAC	1115										
111	1116	1.0 OMVAC	1116	112	1117	1.0 OMVAC	1117	113	1118	1.0 OMVAC	1118	114	1119	1.0 OMVAC	1119	115	1120	1.0 OMVAC	1120										
116	1121	1.0 OMVAC	1121	117	1122	1.0 OMVAC	1122	118	1123	1.0 OMVAC	1123	119	1124	1.0 OMVAC	1124	120	1125	1.0 OMVAC	1125										
121	1126	1.0 OMVAC	1126	122	1127	1.0 OMVAC	1127	123	1128	1.0 OMVAC	1128	124	1129	1.0 OMVAC	1129	125	1130	1.0 OMVAC	1130										
126	1131	1.0 OMVAC	1131	127	1132	1.0 OMVAC	1132	128	1133	1.0 OMVAC	1133	129	1134	1.0 OMVAC	1134	130	1135	1.0 OMVAC	1135										
131	1136	1.0 OMVAC	1136	132	1137	1.0 OMVAC	1137	133	1138	1.0 OMVAC	1138	134	1139	1.0 OMVAC	1139	135	1140	1.0 OMVAC	1140										
136	1141	1.0 OMVAC	1141	137	1142	1.0 OMVAC	1142	138	1143	1.0 OMVAC	1143	139	1144	1.0 OMVAC	1144	140	1145	1.0 OMVAC	1145										
141	1146	1.0 OMVAC	1146	142	1147	1.0 OMVAC	1147	143	1148	1.0 OMVAC	1148	144	1149	1.0 OMVAC	1149	145	1150	1.0 OMVAC	1150										
146	1151	1.0 OMVAC	1151	147	1152	1.0 OMVAC	1152	148	1153	1.0 OMVAC	1153	149	1154	1.0 OMVAC	1154	150	1155	1.0 OMVAC	1155										
151	1156	1.0 OMVAC	1156	152	1157	1.0 OMVAC	1157	153	1158	1.0 OMVAC	1158	154	1159	1.0 OMVAC	1159	155	1160	1.0 OMVAC	1160										
156	1161	1.0 OMVAC	1161	157	1162	1.0 OMVAC	1162	158	1163	1.0 OMVAC	1163	159	1164	1.0 OMVAC	1164	160	1165	1.0 OMVAC	1165										
161	1166	1.0 OMVAC	1166	162	1167	1.0 OMVAC	1167	163	1168	1.0 OMVAC	1168	164	1169	1.0 OMVAC	1169	165	1170	1.0 OMVAC	1170										
166	1171	1.0 OMVAC	1171	167	1172	1.0 OMVAC	1172	168	1173	1.0 OMVAC	1173	169	1174	1.0 OMVAC	1174	170	1175	1.0 OMVAC	1175										
171	1176	1.0 OMVAC	1176	172	1177	1.0 OMVAC	1177	173	1178	1.0 OMVAC	1178	174	1179	1.0 OMVAC	1179	175	1180	1.0 OMVAC	1180										
176	1181	1.0 OMVAC	1181	177	1182	1.0 OMVAC	1182	178	1183	1.0 OMVAC	1183	179	1184	1.0 OMVAC	1184	180	1185	1.0 OMVAC	1185										
181	1186	1.0 OMVAC	1186	182	1187	1.0 OMVAC	1187	183	1188	1.0 OMVAC	1188	184	1189	1.0 OMVAC	1189	185	1190	1.0 OMVAC	1190										
186	1191	1.0 OMVAC	1191	187	1192	1.0 OMVAC	1192	188	1193	1.0 OMVAC	1193	189	1194	1.0 OMVAC	1194	190	1195	1.0 OMVAC	1195										
191	1196	1.0 OMVAC	1196	192	1197	1.0 OMVAC	1197	193	1198	1.0 OMVAC	1198	194	1199	1.0 OMVAC	1199	195	1200	1.0 OMVAC	1200										
196	1201	1.0 OMVAC	1201	197	1202	1.0 OMVAC	1202	198	1203	1.0 OMVAC	1203	199	1204	1.0 OMVAC	1204	200	1205	1.0 OMVAC	1205										
201	1206	1.0 OMVAC	1206	202	1207	1.0 OMVAC	1207	203	1208	1.0 OMVAC	1208	204	1209	1.0 OMVAC	1209	205	1210	1.0 OMVAC	1210										
206	1211	1.0 OMVAC	1211	207	1212	1.0 OMVAC	1212	208	1213	1.0 OMVAC	1213	209	1214	1.0 OMVAC	1214	210	1215	1.0 OMVAC	1215										
211	1216	1.0 OMVAC	1216	212	1217	1.0 OMVAC	1217	213	1218	1.0 OMVAC	1218	214	1219	1.0 OMVAC	1219	215	1220	1.0 OMVAC	1220										
216	1221	1.0 OMVAC	1221	217	1222	1.0 OMVAC	1222	218	1223	1.0 OMVAC	1223	219	1224	1.0 OMVAC	1224	220	1225	1.0 OMVAC	1225										
221	1226	1.0 OMVAC	1226	222	1227	1.0 OMVAC	1227	223	1228	1.0 OMVAC	1228	224	1229	1.0 OMVAC	1229	225	1230	1.0 OMVAC	1230										
226	1231	1.0 OMVAC	1231	227	1232	1.0 OMVAC	1232	228	1233	1.0 OMVAC	1233	229	1234	1.0 OMVAC	1234	230	1235	1.0 OMVAC	1235										
231	1236	1.0 OMVAC	1236	232	1237	1.0 OMVAC	1237	233	1238	1.0 OMVAC	1238	234	1239	1.0 OMVAC	1239	235	1240	1.0 OMVAC	1240										
236	1241	1.0 OMVAC	1241	237	1242	1.0 OMVAC	1242	238	1243	1.0 OMVAC	1243	239	1244	1.0 OMVAC	1244	240	1245	1.0 OMVAC	1245										
241	1246	1.0 OMVAC	1246	242	1247	1.0 OMVAC	1247	243	1248	1.0 OMVAC	1248	244	1249	1.0 OMVAC	1249	245	1250	1.0 OMVAC	1250										
246	1251	1.0 OMVAC	1251	247	1252	1.0 OMVAC	1252	248	1253	1.0 OMVAC	1253	249	1254	1.0 OMVAC	1254	250	1255	1.0 OMVAC	1255										
251	1256	1.0 OMVAC	1256	252	1257	1.0 OMVAC	1257	253	1258	1.0 OMVAC	1258	254	1259	1.0 OMVAC	1259	255	1260	1.0 OMVAC	1260										
256	1261	1.0 OMVAC	1261	257	1262	1.0 OMVAC	1262	258	1263	1.0 OMVAC	1263	259	1264	1.0 OMVAC	1264	260	1265	1.0 OMVAC	1265										
261	1266	1.0 OMVAC	1266	262	1267	1.0 OMVAC	1267	263	1268	1.0 OMVAC	1268	264	1269	1.0 OMVAC	1269	265	1270	1.0 OMVAC	1270										
266	1271	1.0 OMVAC	1271	267	1272	1.0 OMVAC	1272	268	1273	1.0 OMVAC	1273	269	1274	1.0 OMVAC	1274	270	1275	1.0 OMVAC	1275										
271	1276	1.0 OMVAC	1276	272	1277	1.0 OMVAC	1277	273	1278	1.0 OMVAC	1278	274	1279	1.0 OMVAC	1279	275	1280	1.0 OMVAC	1280										
276	1281	1.0 OMVAC	1281	277	1282	1.0 OMVAC	1282	278	1283	1.0 OMVAC	1283	279	1284	1.0 OMVAC	1284	280	1285	1.0 OMVAC	1285										
281	1286	1.0 OMVAC	1286	282	1287	1.0 OMVAC	1287	283	1288	1.0 OMVAC	1288	284	1289	1.0 OMVAC	1289	285	1290	1.0 OMVAC	1290										
286	1291	1.0 OMVAC	1291	287	1292	1.0 OMVAC	1292	288	1293	1.0 OMVAC	1293	289	1294	1.0 OMVAC	1294	290	1295	1.0 OMVAC	1295										
291	1296	1.0 OMVAC	1296	292	1297	1.0 OMVAC	1297	293	1298	1.0 OMVAC	1298	294	1299	1.0 OMVAC	1299	295	1300	1.0 OMVAC	1300										
296	1301	1.0 OMVAC	1301	297	1302	1.0 OMVAC	1302	298	1303	1.0 OMVAC	1303	299	1304	1.0 OMVAC	1304	300	1305	1.0 OMVAC	1305										
301	1306	1.0 OMVAC	1306	302	1307	1.0 OMVAC	1307	303	1308	1.0 OMVAC	1308	304	1309	1.0 OMVAC	1309	305	1310	1.0 OMVAC	1310										
306	1311	1.0 OMVAC	1311	307	1312	1.0 OMVAC	1312	308	1313	1.0 OMVAC	1313	309	1314	1.0 OMVAC	1314	310	1315	1.0 OMVAC	1315										

- | MEMORANDUM | | | | | | | | | | PROSPECT | COUNTY | COUNCIL | DRAWN | C.J.M. | SCALE | 1:750 | |
|------------|---------|-------|-------------|-------|--------|-------|-------------|-------|--------|----------|--------|---------|-------|--------|-------|-------|--|
| BY | DATE | BY | DATE | BY | DATE | BY | DATE | BY | DATE | | | | | | | | |
| A | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| B | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| C | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| D | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| E | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| F | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| G | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| H | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| I | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| J | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| K | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| L | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| M | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| N | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| O | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| P | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| Q | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| R | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| S | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| T | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| U | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| V | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| W | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| X | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| Y | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | ADJ. F. 252 | ADDED | F. 252 | ADDED | | | | | | | |
| Z | 1/18/67 | ADDED | ADJ. F. 252 | ADDED | F. 25 | | | | | | | | | | | | |



INTEGRAL ENERGY CONTACT
Name: Dave Gards Phone: 082 983 3445

WARNING
LIVE INTEGRAL ENERGY CABLES & OTHER SERVICES IN THIS AREA. PLEASE CONTACT DIAL BEFORE YOU DIG ON TEL: 1100 FOR SEARCHES TWO DAYS PRIOR TO EXCAVATION.

IMPORTANT
CONTRACTOR SHALL CONTACT NETWORK DATA ON: 9853-6657 TWO DAYS PRIOR TO THE INSTALLATION OF DUCTS FOR RECORDING PURPOSES

NOTE TO CIVIL CONTRACTOR:

1. LOCATE, PROBE AND INSTALL JETLINE IN EXISTING ROAD CROSSINGS TO BE USED. ROAD CROSSINGS THAT WILL NOT BE USED ARE INDICATED ON THE DRAWING.
2. SHOULD OPEN CUTTING BE REQUIRED FOR THE INSTALLATION OF ANY DUCTS, PERMISSION IS TO BE SOUGHT FROM THE PROJECT MANAGER PRIOR TO COMMENCEMENT.
3. OPEN POINTS ARE TO BE ESTABLISHED AT ALL PILLAR LOCATIONS AND ALL ROAD CROSSINGS UNLESS OTHERWISE STATED ON THE DRAWING.
4. PRIOR TO COMMENCING WORK, THE CONTRACTOR IS TO ADVISE CUSTOMERS AFFECTED BY DUCT INSTALLATION IN WRITING.

DESIGN COMPLIANCE
This design complies with Integral Energy's relevant standards as current at this time and is based on the Integral Energy Accredited Service Providers Internal standards. These standards include, but are not limited to:
- IEC 60364: General Rules and Regulations
- AS/NZS 4777: Solar Photovoltaic Systems
- AS/NZS 4778: Solar Photovoltaic Systems
- AS/NZS 4779: Solar Photovoltaic Systems
- AS/NZS 4780: Solar Photovoltaic Systems
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- AS/NZS 4999: Solar Photovoltaic Systems
- AS/NZS 5000: Solar Photovoltaic Systems

IMPORTANT NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH INTEGRAL ENERGY'S METHODS AND THE RELEVANT GENERAL TERMS AND CONDITIONS.
2. INTEGRAL ENERGY'S ASSET MANAGEMENT HAS PREPARED THIS DESIGN TO SHOW THE EXISTING SERVICES AND ENVIRONMENTAL ISSUES AS ACCURATELY AS POSSIBLE AT THE TIME THE DESIGN WAS CARRIED OUT. THE CONTRACTORS OF THIS PROJECT SHOULD VERIFY ON SITE THE EXACT LOCATION OF ALL SERVICES & PERMANENT SURVEY MARKS REGARDLESS OF WHETHER THEY APPEAR ON THIS PLAN OR NOT. INTEGRAL ENERGY ASSET MANAGEMENT WILL HOLD NO RESPONSIBILITY OR LIABILITY FOR ANY DAMAGE TO SERVICES OR THE ENVIRONMENT AS A RESULT OF THIS DESIGN OR CONSTRUCTION.
3. UNLESS OTHERWISE STATED, ALL NEW PILLARS TO BE INSTALLED AS PART OF THIS PROJECT ARE TO BE MAINS PILLARS.
4. ALL SERVICE WORKS TO BE DONE IN CONJUNCTION WITH THE NSW SERVICE AND INSTALLATION RULES.
5. THE TRENCHING REQUIRED IN SHOWGROUND RD WILL BE COMPLETED BY ASSET MANAGEMENT CONSTRUCTION. TOTAL ROUTE LENGTH IS APPROXIMATELY 45 METRES INCLUDING OF CONCRETE DRIVEWAY, WHICH IS INCLUDED IN THE DUCT SCHEDULE. XS-X4 TO BE BORED BY CIVIL CONTRACTOR.

DUCT SCHEDULE		
●	A TO B UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 45M)	A-B
●	C TO D UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 47M)	C-D
●	B TO E UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 42M)	B-E
●	E TO F UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 45M)	E-F
●	F TO Z2 (Do not cut the driveway) TRENCH AND LAY 2 X 125MM HD DUCT (R.L. 40M)	F-Z2
●	Z2 TO G UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 60M)	Z2-G
●	G TO H UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 40M)	G-H
●	I TO J TRENCH AND LAY 2 X 125MM HD DUCT (R.L. 50M)	I-J
●	J TO K UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 50M)	J-K
●	K TO L UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 70M)	K-L
●	L TO M UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 70M)	L-M
●	M TO N UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 70M)	M-N
●	O TO P TRENCH AND LAY 2 X 125MM HD DUCT (R.L. 30M)	O-P
●	P TO Q UNDERBORE AND LAY 2 X 125MM HD DUCTS (R.L. 15M)	P-Q
●	R TO S UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 75M)	R-S
●	S TO T UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 70M)	S-T
●	T TO U UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 50M)	T-U
●	U TO V UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 50M)	U-V
●	V TO W UNDERBORE AND LAY 2 X 125MM HD DUCT (R.L. 50M)	V-W
●	W TO X2 UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 50M)	W-X2
●	X2 TO X UNDERBORE AND LAY 2 X 125MM HD DUCTS (R.L. 30M)	X2-X
●	X3 TO X4 (Do not cut concrete driveway) TRENCH AND LAY 2 X 125MM HD DUCTS (R.L. 20M)	X3-X4
●	X TO X1 UNDERBORE AND LAY 2 X 125MM HD DUCTS (R.L. 15M)	X-X1
●	X1 TO Y UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 50M)	X1-Y
●	Y TO Z UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 70M)	Y-Z
●	Z TO Z1 UNDERBORE AND LAY 1 X 125MM HD DUCT (R.L. 30M)	Z-Z1
●	Z1 TO Z2 UNDERBORE AND LAY 2 X 125MM HD DUCT (R.L. 40M)	Z1-Z2

OPERATIONAL LIMITATIONS
UNLESS APPROVED OTHERWISE, INTERRUPTIONS TO ANY CUSTOMERS SUPPLY MUST BE AVOIDED. THE FOLLOWING ALTERNATIVES SHOULD BE CONSIDERED:
- LIVE LINE WORK
- DESIGN ALTERNATIVES
- WORK PRACTICES / STANDARDS
- LOW VOLTAGE PARALLELS
THIS COST TO BE FUNDED BY THE DEVELOPER.

- SITE PLAN**
- EXISTING PADMOUNT SUBSTATION
 - EXISTING POLE
 - EXISTING O.H. MAINS
 - EXISTING U.G. MAINS
 - EXISTING COLUMN
 - NEW PILLAR
 - REPLACE PILLAR
 - EXISTING PILLAR
 - LOW VOLTAGE TRENCHING
 - EXISTING DUCTS
 - NEW DUCTS TO BE INSTALLED
 - SPARE DUCT
 - DUCT WITH EXIST. CABLE
 - DUCT WITH NEW CABLE
 - SERVICE CONNECTION DIGITS IN CIRCLE DETECT LAST TWO NUMBERS OF PILLAR OR COLUMN FROM WHICH SUPPLY ORIGINATES
 - ACTUAL ALIGNMENT
 - OPEN POINT

NOTES

CHAINAGE (m) OFFSET (m) LOWER (m)

PROJECT PURPOSE:
TO REPLACE ALL CONSAC CABLE BEING SUPPLIED BY SUB 3129 WITH 240MM 4 CORE XLPE AS PART OF REFURBISHMENT

FIELD BOOK
COMM COMP 12.1.98.1.97
UG MAP No
DUCT DWG
RECORDED BY
INSTALLED BY
DATE

END EAVEOUR ENERGY WARNING
This plan shows the approximate location of underground cables relative to fixtures. Endeavour Energy's Property has been prepared to ensure the information is as accurate as possible but will accept no liability for inaccuracies in the information shown on such plans from any cause whatsoever arising.

Persons excavating are expected to exercise all due care in the vicinity where cables are indicated and will be held responsible for any damage caused to Endeavour Energy's Property

All Electrical apparatus shall be considered as live until proved de-energised. Contact with live electrical apparatus will cause severe injury or death

Those excavating near Endeavour Energy's cables should be aware that ASBESTOS OR ASBESTOS - CONTAINING MATERIAL MAY BE PRESENT IN Endeavour Energy's underground assets and that Organo-Chloride Pesticides (OCP) may be present in some sub-transmission trenches

REFERENCE DRAWINGS		WORK ORDERS		CAP / SAMP No.		ORIGINAL SCALE		DO NOT SCALE		INTEGRAL ENERGY	
GENERAL		OVERHEAD		AM PROJ No.		1:1000		OVERSEAS		CHAPMAN AVE	
UNDERGROUND		UNDERGROUND		UBO/PENGUN REF	150 M2	MLT		IN METRES		CASTLE HILL	
SUBSTATIONS		SUBSTATIONS		GIS MAP No.	UP1632	DATE	30/08/06			DSN00033	
				HV OP DIAGRAM						CONSAC REPLACEMENT	
				LOCAL GOV AREA	BAIKUNHAM HILLS	OWN					

WARNING

- **All electrical apparatus shall be regarded as live until proved de-energised.** Contact with live electrical apparatus will cause severe injury or death.
- In accordance with the *Electricity Supply Act 1995*, you are obliged to report any damage to Endeavour Energy Assets immediately by calling **131 003**.
- The customer must obtain a new set of plans from Endeavour Energy if work has not been started or completed within twenty **(20)** working days of the original plan issue date.
- The customer must contact Endeavour Energy if any of the plans provided have blank pages, as some underground asset information may be incomplete.
- Endeavour Energy underground earth grids may exist and their location **may not** be shown on plans. Persons excavating are expected to exercise all due care, especially in the vicinity of padmount substations, pole mounted substations, pole mounted switches, transmission poles and towers.
- Endeavour Energy plans **do not** show any underground customer service mains or information relating to service mains within private property.
- Asbestos or asbestos-containing material may be present on or near Endeavour Energy's underground assets.
- Organo-Chloride Pesticides (OCP) may be present in some sub-transmission trenches.
- All plans must be printed and made available at the worksite where excavation is to be undertaken. Plans must be reviewed and understood by the crew on site prior to commencing excavation.

INFORMATION PROVIDED BY ENDEAVOUR ENERGY

- Any plans provided pursuant to this service are intended to show the approximate location of underground assets relative to road boundaries, property fences and other structures at the time of installation.
- Depth of underground assets may vary significantly from information provided on plans as a result of changes to road, footpath or surface levels subsequent to installation.
- Such plans have been prepared solely for use by Endeavour Energy staff for design, construction and maintenance purposes.
- All enquiry details and results are kept in a register.

DISCLAIMER

Whilst Endeavour Energy has taken all reasonable steps to ensure that the information contained in the plans is as accurate as possible it will accept no liability for inaccuracies in the information shown on such plans.

LEGEND

- or ■ Street light column
- ▤ Padmount substation
- or ■ Overground pillar (O.G.Box)
- ▤ Underground pit
- Duct run
- Cable run
- ⊙ Typical duct section
- ▲ Asbestos warning

**NOT TO SCALE**

DBYD Sequence No.:	61348150
Issued Date:	22/05/2017

Cadastre: © Land and Property Information 2015, 2016

WARNING

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LEGEND

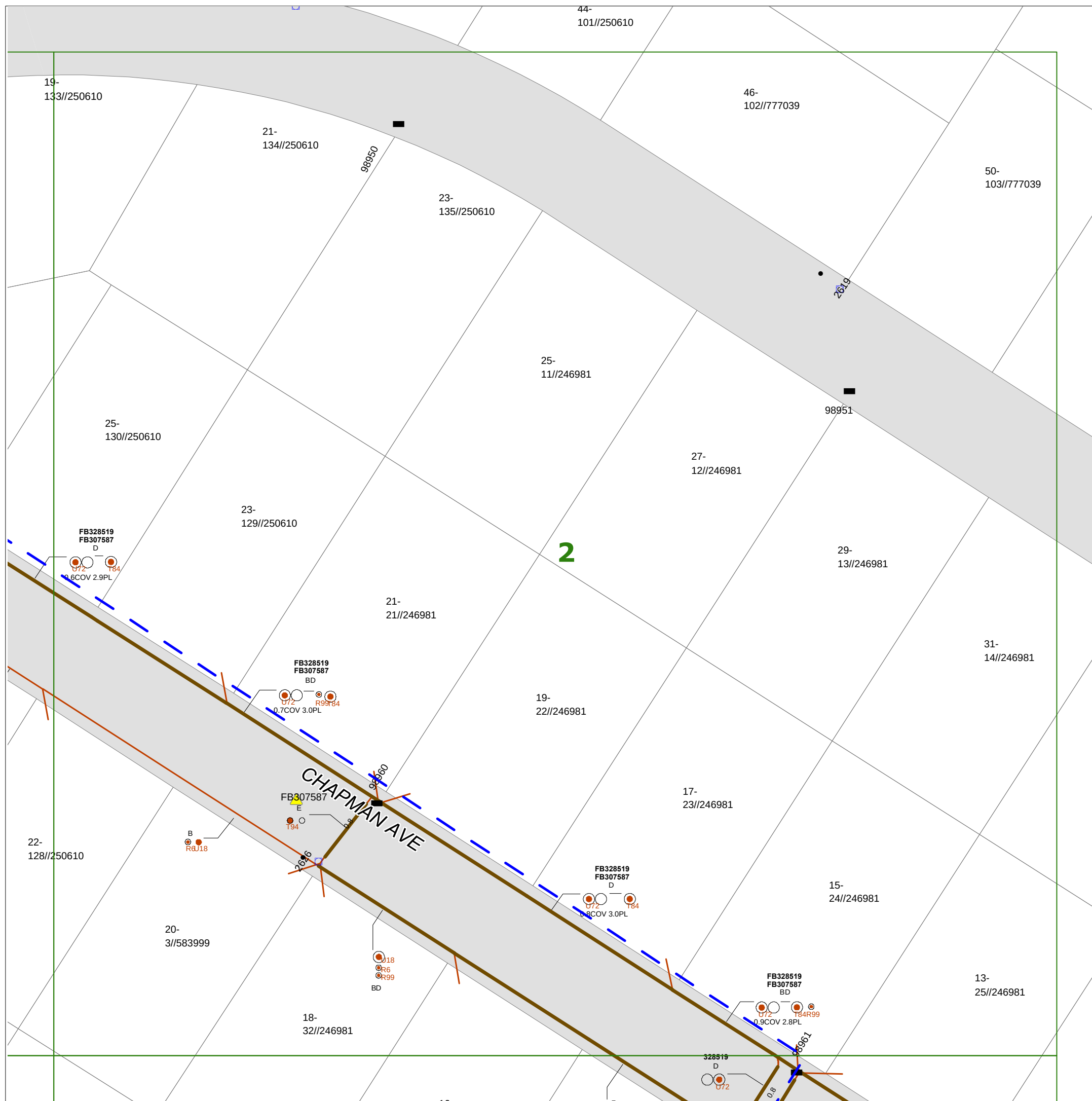
- or ■ Street light column
- ▭ Padmount substation
- or ■ Overground pillar (O.G.Box)
- ▭ Underground pit
- Duct run
- Cable run
- Typical duct section
- ▲ Asbestos warning

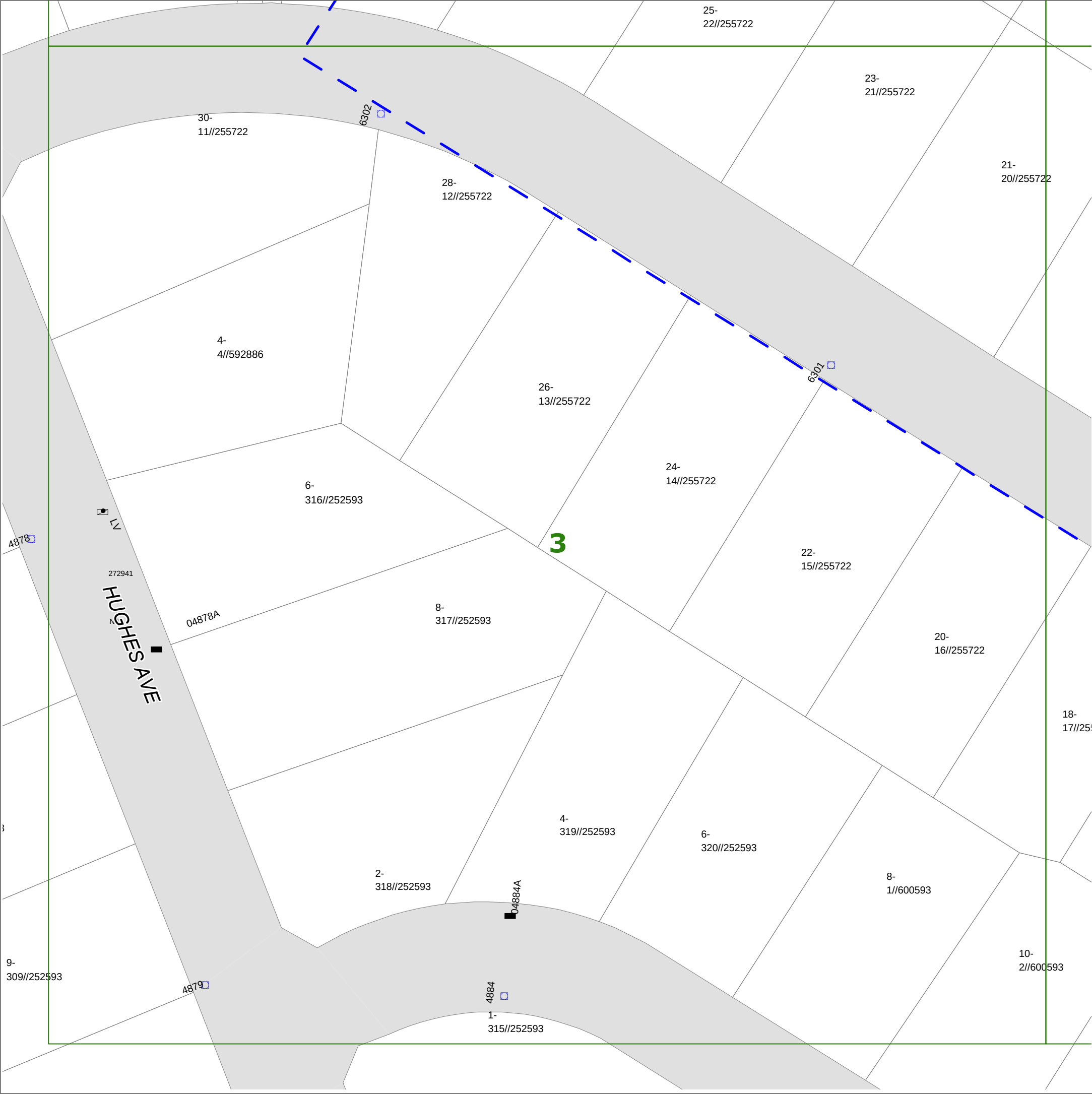


NOT TO SCALE

DBYD Sequence No.:	61348150
Issued Date:	22/05/2017

Cadastre: © Land and Property Information 2015, 2016





WARNING

- **All electrical apparatus shall be regarded as live until proved de-energised.** Contact with live electrical apparatus will cause severe injury or death.
- In accordance with the *Electricity Supply Act 1995*, you are obliged to report any damage to Endeavour Energy Assets immediately by calling **131 003**.
- The customer must obtain a new set of plans from Endeavour Energy if work has not been started or completed within twenty **(20)** working days of the original plan issue date.
- The customer must contact Endeavour Energy if any of the plans provided have blank pages, as some underground asset information may be incomplete.
- Endeavour Energy underground earth grids may exist and their location **may not** be shown on plans. Persons excavating are expected to exercise all due care, especially in the vicinity of padmount substations, pole mounted substations, pole mounted switches, transmission poles and towers.
- Endeavour Energy plans **do not** show any underground customer service mains or information relating to service mains within private property.
- Asbestos or asbestos-containing material may be present on or near Endeavour Energy's underground assets.
- Organo-Chloride Pesticides (OCP) may be present in some sub-transmission trenches.
- All plans must be printed and made available at the worksite where excavation is to be undertaken. Plans must be reviewed and understood by the crew on site prior to commencing excavation.

INFORMATION PROVIDED BY ENDEAVOUR ENERGY

- Any plans provided pursuant to this service are intended to show the approximate location of underground assets relative to road boundaries, property fences and other structures at the time of installation.
- Depth of underground assets may vary significantly from information provided on plans as a result of changes to road, footpath or surface levels subsequent to installation.
- Such plans have been prepared solely for use by Endeavour Energy staff for design, construction and maintenance purposes.
- All enquiry details and results are kept in a register.

DISCLAIMER

Whilst Endeavour Energy has taken all reasonable steps to ensure that the information contained in the plans is as accurate as possible it will accept no liability for inaccuracies in the information shown on such plans.

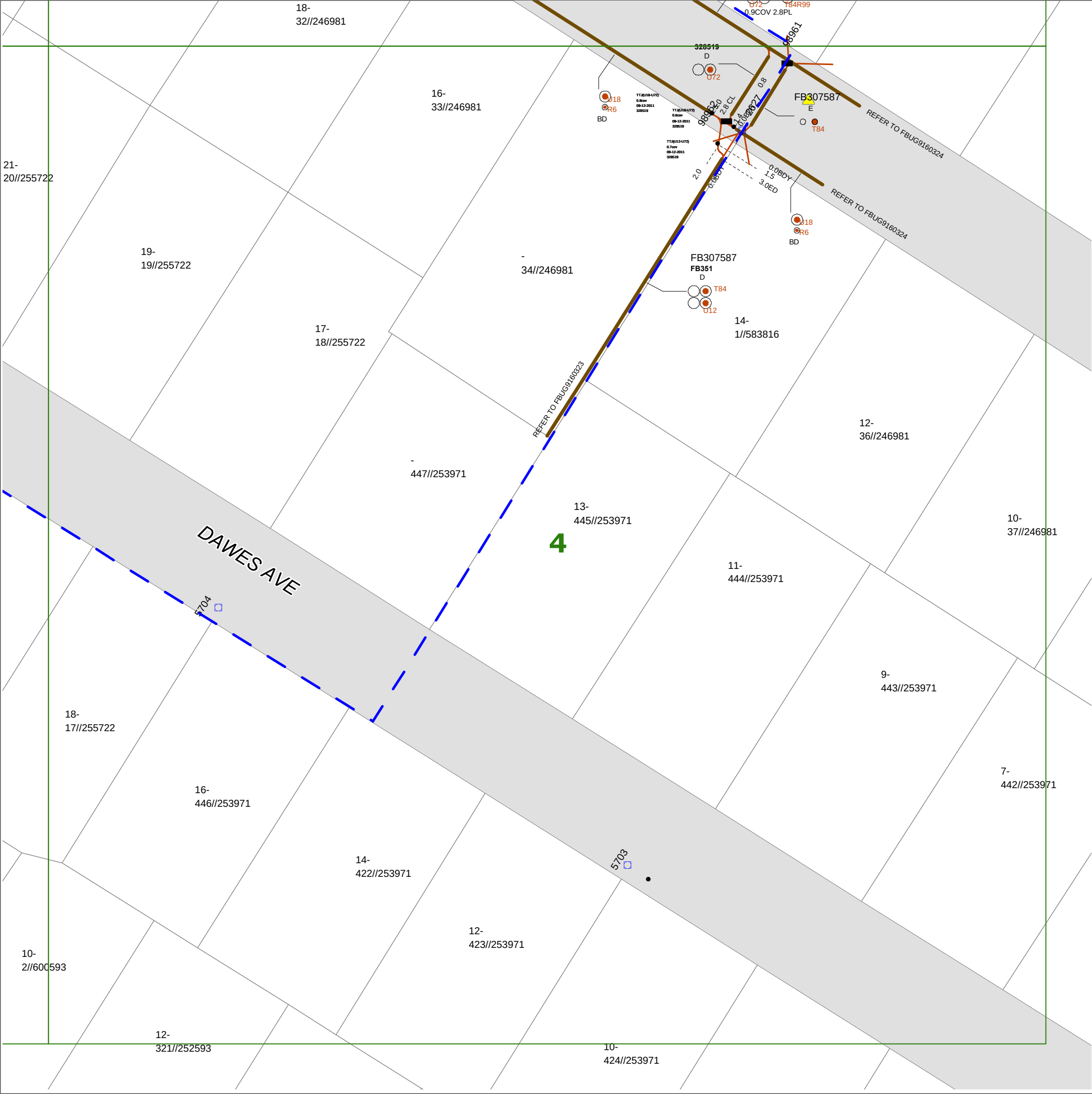
LEGEND

- or ■ Street light column
- ⬢ Padmount substation
- or ■ Overground pillar (O.G.Box)
- ⊠ Underground pit
- Duct run
- Cable run
- ⊙ Typical duct section
- ▲ Asbestos warning



NOT TO SCALE

DBYD Sequence No.:	61348150
Issued Date:	22/05/2017



WARNING

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- All enquiry details and results are kept in a register.

DISCLAIMER

Whilst Endeavour Energy has taken all reasonable steps to ensure that the information contained in the plans is as accurate as possible it will accept no liability for inaccuracies in the information shown on such plans.

LEGEND

- or ■ Street light column
- ▤ Padmount substation
- ▭ or ▨ Overground pillar (O.G.Box)
- ▩ Underground pit
- ▬ Duct run
- ▬ Cable run
- ⊙ Typical duct section
- ▲ Asbestos warning



NOT TO SCALE

DBYD Sequence No.:	61348150
Issued Date:	22/05/2017

BEFORE COMMENCING EXCAVATION YOU MUST READ AND UNDERSTAND ALL INFORMATION PROVIDED IN THE DBYD RESPONSE AND LISTED BELOW

BACKGROUND

Endeavour Energy is able to make available plans of its underground assets to persons who intend to undertake excavation works in Endeavour Energy's distribution area. Any plans provided to you are made available subject to the provisions set out below, in the provided plans, and in the Endeavour Energy DBYD response Cover Letter.

We have set out below important information regarding the recommended procedures that should be followed when using this service and also the extent of our responsibility in respect of any plans provided. It is very important that you read and understand all the information and disclaimers provided below before excavating.

Information Provided by Endeavour Energy:

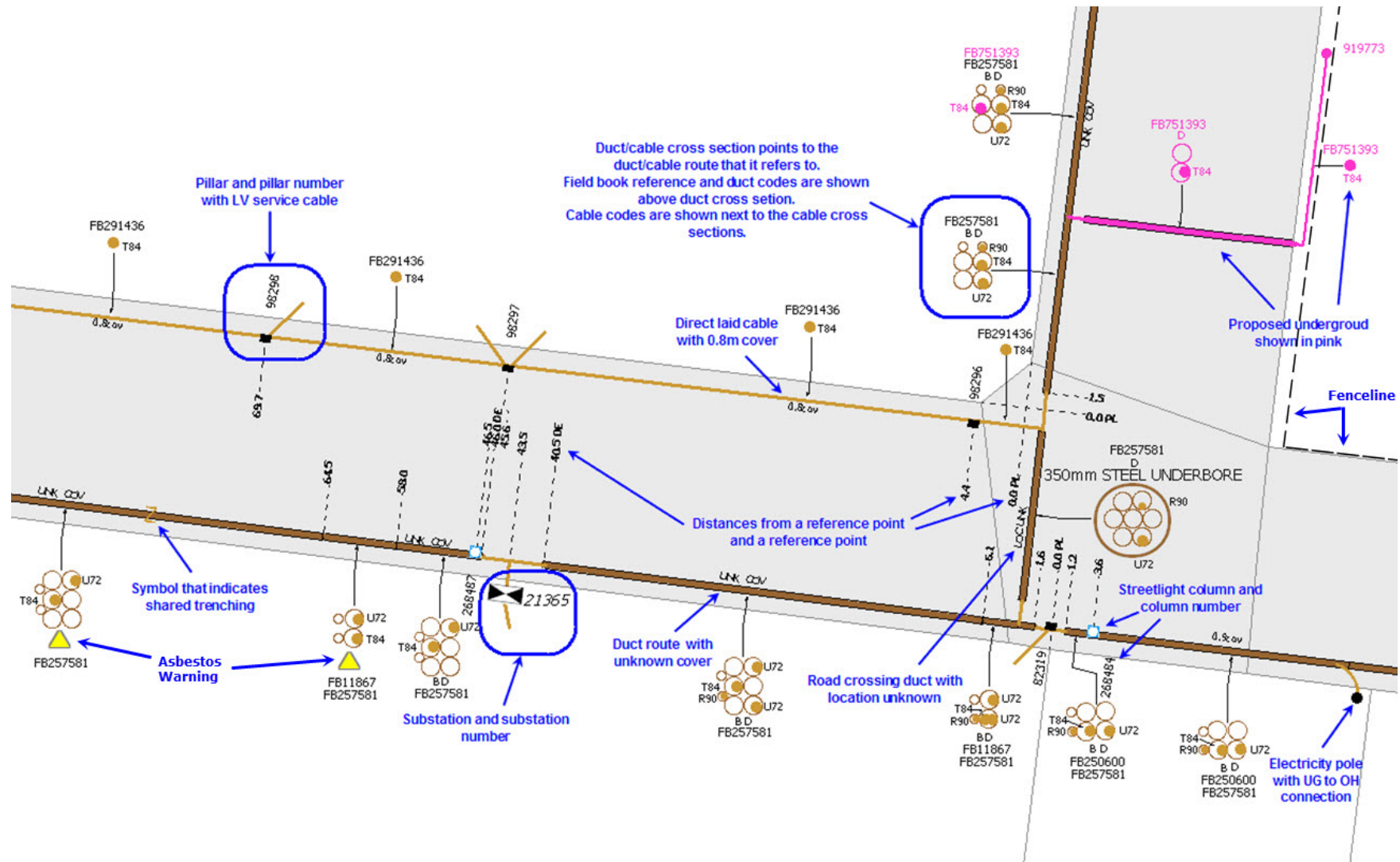
- Any plans provided pursuant to this service are intended to show the approximate location of underground assets relative to road boundaries, property fences and other structures at the time of installation.
- Depth of underground assets may vary significantly from information provided on plans as a result of changes to road, footpath or surface levels subsequent to installation.
- Such plans have been prepared solely for use by Endeavour Energy staff for design, construction and maintenance purposes.
- All enquiry details and results are kept in a register.

DISCLAIMER

Whilst Endeavour Energy has taken all reasonable steps to ensure that the information contained in the plans is as accurate as possible it will accept no liability for inaccuracies in the information shown on such plans.

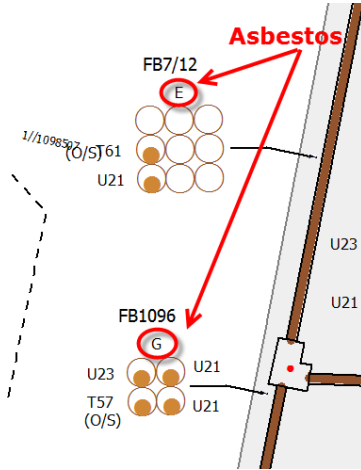
CUSTOMER REQUESTS AND RESPONSIBILITIES

- Endeavour Energy expects to be able to provide relevant plans within 48 hours after a request is made.
- If the enquiry falls within the Transmission Mains area, additional notification requirements shall be complied with as per the instructions in the response Cover Letter.
- Endeavour Energy retains copyright over all plans and details provided in response to a customer's request.
- Persons excavating are expected to exercise all due care in the vicinity where underground assets are indicated and will be held responsible for any damage to any underground assets (including any Endeavour Energy property) or any other loss caused (including consequential losses) as a result of such excavations.
- All underground assets should be visually located by soft digging (pot holing) or hand digging.
- A person who undertakes excavation work is subject to duties and responsibilities under the [Work Health and Safety Act 2011](#) and [Work Health and Safety Regulation 2011](#). Please refer to the Work Cover NSW "Work near underground assets: Guide" and "Excavation work: Code of practice" which contain practical advice for working near underground utility services.
- Any damage to Endeavour Energy's assets must be immediately reported on **131 003**.
- In all cases of electric shock or suspected electric shock the victim shall immediately be transported to hospital or medical centre for treatment.
- If conduit material cannot be identified, it should be assumed to contain asbestos material.
- Endeavour Energy plans are frequently updated to record changes to underground assets. All plans are valid for **20** working days from the date of issue.



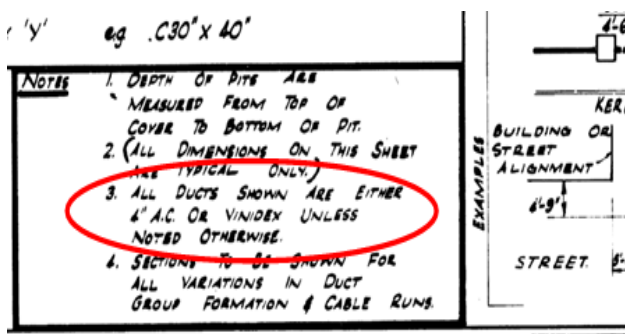
IDENTIFYING ASBESTOS DUCTS

1. Duct codes **E, F** and **G** identify Fibro Conduits

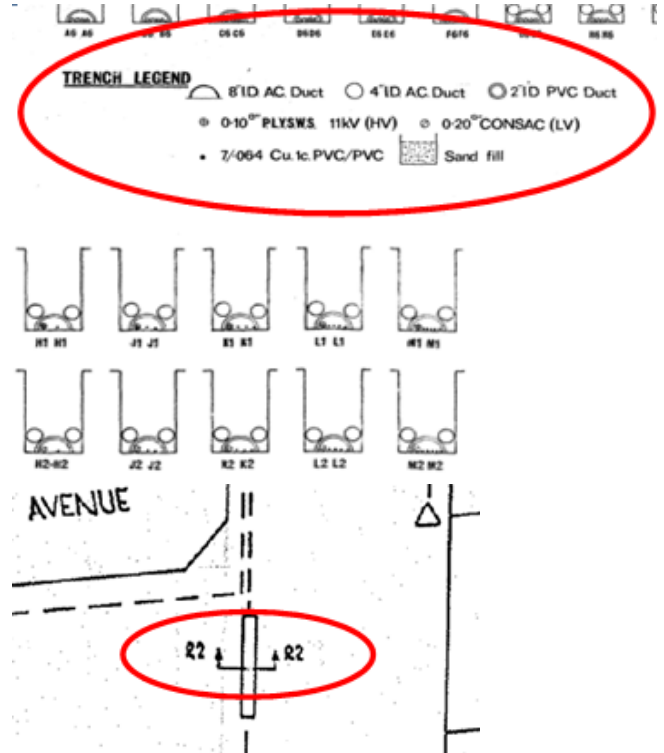


If underground details have not been captured and drawings are used, the method for identifying asbestos ducts and standards are different for the different utilities that amalgamated with Endeavour Energy. Using Reticulation Drawings, there are numerous ways to determine if a duct route has asbestos ducts, refer to following examples:

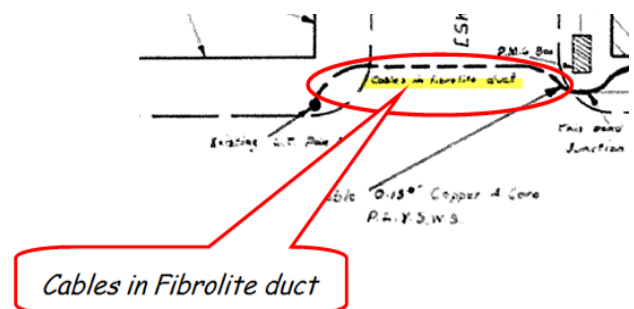
3. **AC** (Asbestos Cement) acronym



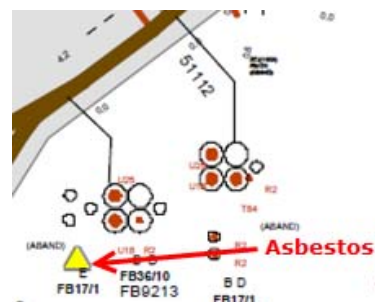
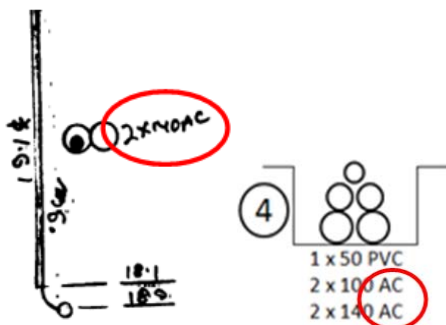
2. The duct codes **G,H,J,K,L,M Q,R,S,T,U,V,W & X** under each configuration are used on old Blue Mountains drawings to identify Asbestos



4. **Fibrolite** (asbestos) ducts



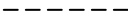
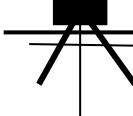
5. Yellow **triangle** identifies Fibro Conduits



STANDARD UNDERGROUND SYMBOLS / LABELS

NOTE: If symbology has not been provided on the plan use symbols as shown below.

SYMBOLS & ACRONYMS

 or 	Street light column
	Padmount substation
 or 	Overground pillar (O.G.Box)
	Underground pit
	Duct run
	Cable run
	Typical duct section
	Typical underbore section
	Blocked duct
	Cable section
	Asbestos warning
	STJ, PBJ, TTJ
STJ	Straight through joint
PBJ	Parallel branch joint
TTJ	Transition through joint
	Underground to overhead pole
SL	Streetlight conductor
SC	Service cable
SE	Cable sealed end
SF	Service Feeder
OS	Out of Service
O.A.M.	Over awning main
U.A.M.	Under awning main
N.I.S.	Not in service
	Fence/dimensioning
	Shared trenching
	Service point of attachment

DUCT CODE LABELS

B	= 50 mm PVC
D	= 125mm PVC
E	= 100mm Fibro Conduit (Asbestos)
F	= 140mm Fibro Conduit (Asbestos)
G	= 150mm Fibro Conduit (Asbestos)

DEPTH & LOCATION LABELS

0.5- 0.7 COV	= 0.5m – 0.7m
0.9 COV	= 0.9m Depth
UNK COV	= Depth Unknown
LOC UNK	= Location Unknown
0.9 PL	= Located 0.9m from Property Line

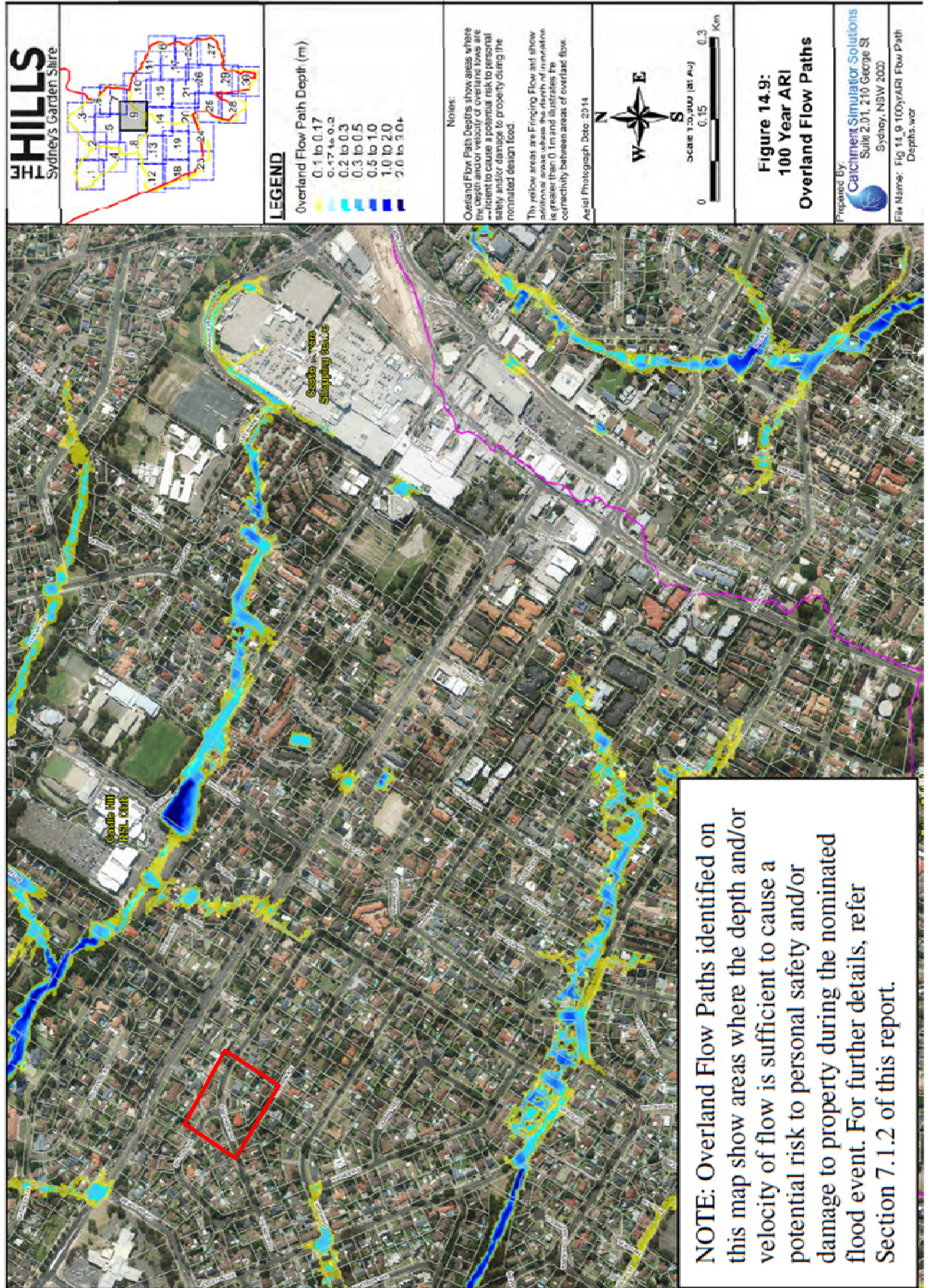
Appendix F

Substation Locations Castle Hill



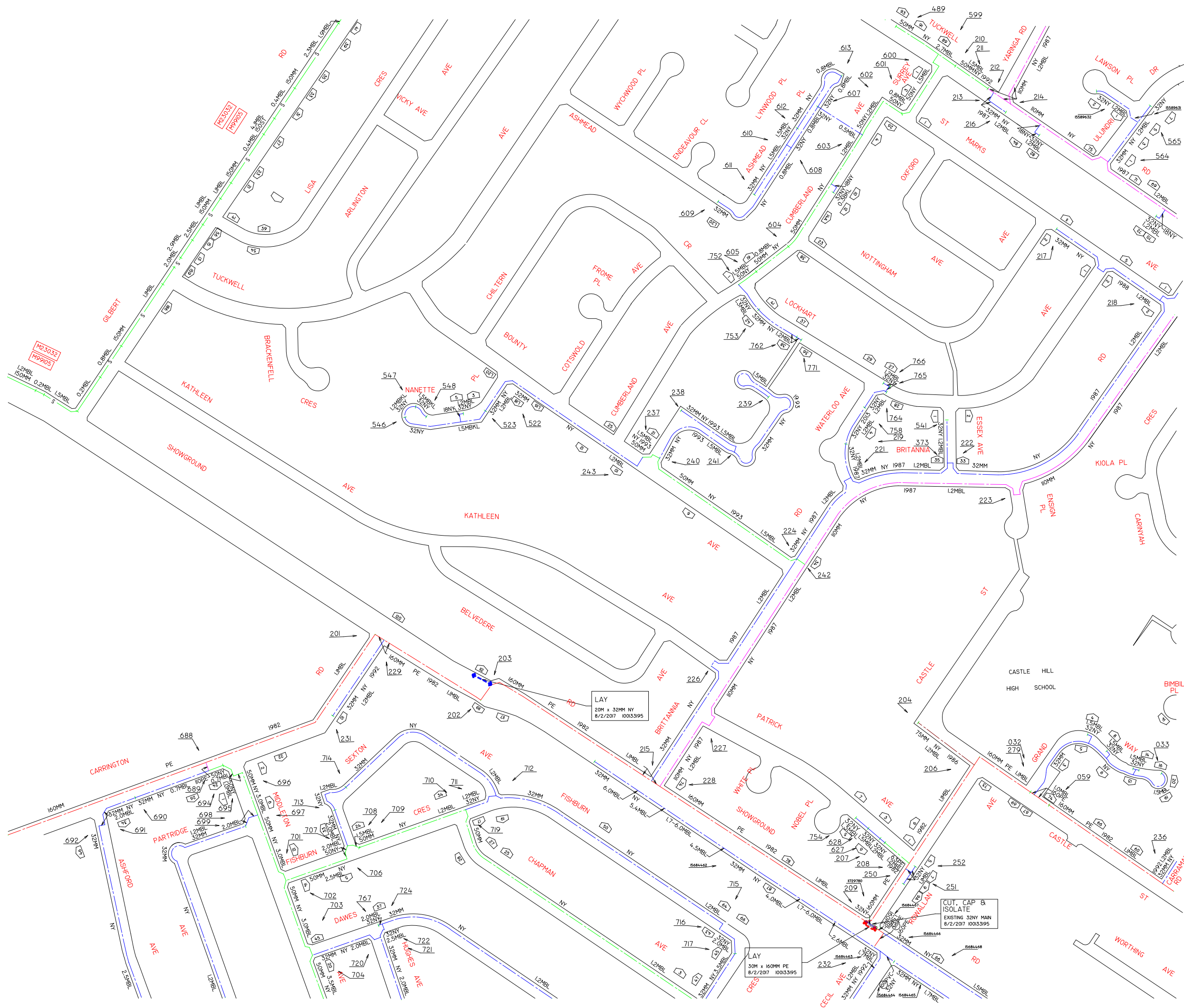
Appendix G

1:100 year ARI Overland Flow Path Map

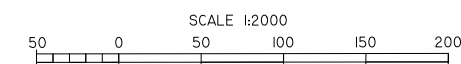


Appendix H

Jemena



BLACKTOWN
3B



THIS MAP UPDATED ON 8/02/2017
THIS PLAN IS DIAGRAMATIC ONLY. DISTANCES
SCALED FROM THIS PLAN MAY NOT BE ACCURATE.
DATE ALTERED:..... BY:.....

R09C	R09D	D7C
B3A	B3B	EIA
B3C	B3D	EIC

ADJOINING MAPS

Diagram illustrating the components of the address: 542 and BAULKHAM HILLS.

NETWORK AREA

MUNICIPALITY AREA

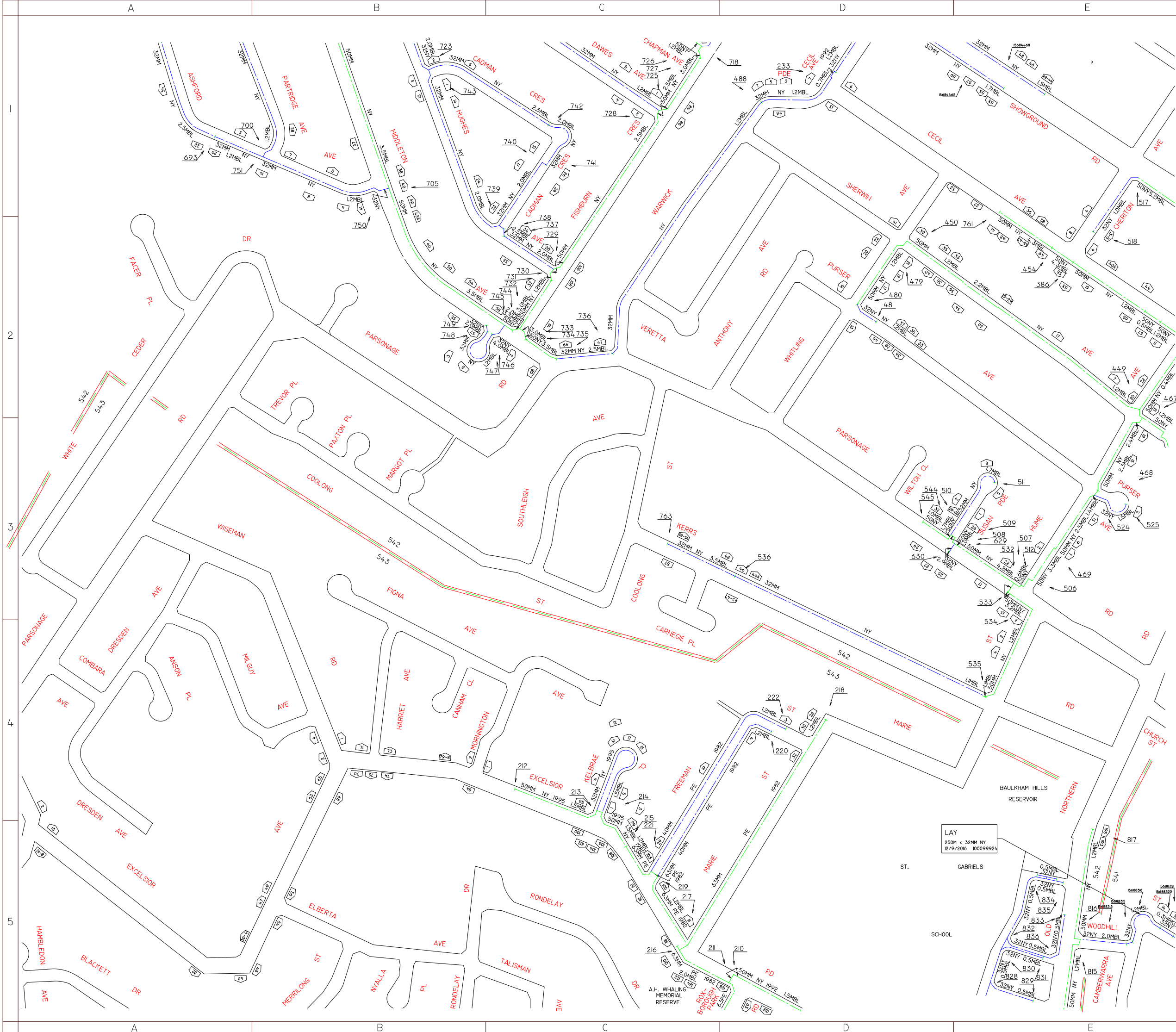
Jemena

KEY

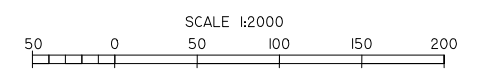
MAX ALLOWABLE OPERATING PRESSURE		
— T —	TRUNK PIPELINE	7000 kPa
— P —	PRIMARY MAIN	3500 kPa
— S —	SECONDARY MAIN	1050 kPa
— 400 —	NETWORK MAIN	400 kPa
— — —	NETWORK MAIN	300 kPa
— — —	NETWORK MAIN	210 kPa
— 100 —	NETWORK MAIN	100 kPa
— 30 —	NETWORK MAIN	30 kPa
— — —	NETWORK MAIN	7 kPa
— — —	NETWORK MAIN	2 kPa
◀ — — — — — ▶	PROPOSED MAINS	

PR II-2 3	STEEL MAIN PROJECT NUMBER
	PRESSURE MONITORING STATION
	VALVE
	SYSTEM PRESSURE REGULATOR
	SIPHON
	NETWORK NODE
	NETWORK VALVE NODE
	VALVE NUMBER
	6 INCH CAST IRON MAIN
150MM	150MM STEEL MAIN
110MM PE/NY	110MM POLYETHYLENE/NYLON MAIN
 50MM NY	50MM NYLON INSERTED INTO
	6NB MAIN CAST IRON MAIN
1.2MBL	DISTANCE IN METRES OF MAIN FROM
	BOUNDARY LINE
1957	YEAR LAID
- + + + -	MUNICIPALITY BOUNDARY
	NETWORK BOUNDARY
	HOUSE NUMBER

BLACKTOWN 3B



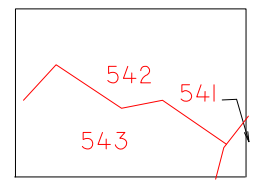
BLACKTOWN 3D



THIS MAP UPDATED ON 22/12/2016
THIS PLAN IS DIAGRAMATIC ONLY. DISTANCES
SCALED FROM THIS PLAN MAY NOT BE ACCURATE.
DATE ALTERED:..... BY:.....

B3A	B3B	E1A
B3C	B3D	E1C
B6A	B6B	E4A

ADJOINING MAPS



NETWORK AREA



MUNICIPALITY AREA

Jemena

KEY

MAX ALLOWABLE OPERATING PRESSURE		
	TRUNK PIPELINE	7000 kPa
	PRIMARY MAIN	3500 kPa
	SECONDARY MAIN	1050 kPa
	NETWORK MAIN	400 kPa
	NETWORK MAIN	300 kPa
	NETWORK MAIN	210 kPa
	NETWORK MAIN	100 kPa
	NETWORK MAIN	30 kPa
	NETWORK MAIN	7 kPa
	NETWORK MAIN	2 kPa
	PROPOSED MAINS	

PR II-2 3	STEEL MAIN PROJECT NUMBER
	PRESSURE MONITORING STATION
	VALVE
	SYSTEM PRESSURE REGULATOR
	SIPHON
	NETWORK NODE
	NETWORK VALVE NODE
	VALVE NUMBER
6NB	6 INCH CAST IRON MAIN
150MM	150MM STEEL MAIN
110MM PE/NY	110MM POLYETHYLENE/NYLON MAIN
⑥NB 50MM NY	50MM NYLON INSERTED INTO 6NB MAIN CAST IRON MAIN
1.2MBL	DISTANCE IN METRES OF MAIN FROM BOUNDARY LINE
1957	YEAR LAID
- + + + -	MUNICIPALITY BOUNDARY
	NETWORK BOUNDARY
	HOUSE NUMBER

BLACKTOWN 3D



Network Protection

Assets Affected

In reply to your enquiry, there are gas mains at the location of your intended work as per the attached map. For an explanation of the map, please see the key below. The following excavation guidelines apply.

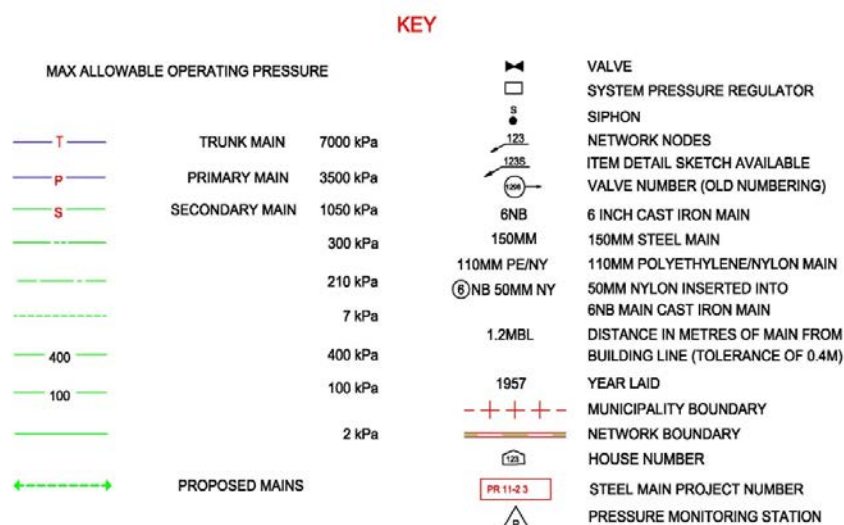
Excavation Guidelines:

It is essential the location of gas pipe/s are confirmed by carefully pot-holing by hand excavation prior to proceeding with mechanical excavation in the vicinity of gas pipes. If you cannot locate the gas main, contact the local depot.

In accordance with clause 34(5) of the Gas Supply (Safety and Network Management) Regulation 2013 (NSW), you should be informed that all excavation, (including pot-holing by hand to confirm the location of pipes) should be performed in accordance with “**Work Near Underground Assets Guideline**” published in 2007 by the Work Cover Authority.

A copy of this Guideline is available at: www.workcover.nsw.gov.au

DBYD Administration 1300 880 906



Warning: The enclosed plans show the position of Jemena Gas Networks (NSW) Ltd's underground gas mains and installations in public gazetted roads only. **Individual customers' services and services belonging to other third parties are not included** on these plans. These plans have been prepared solely for the use of Jemena Gas Networks (NSW) Ltd and Jemena Asset Management Pty Ltd (together “**Jemena**”) and any reliance placed on these plans by you is entirely at your own risk. The plans may show the position of underground mains and installations relative to fences, buildings etc., as they existed at the time the mains etc were installed. The plans may not have been updated to take account of any subsequent change in the location or style of those features since the time at which the plans were initially prepared. Jemena makes no warranty as to the accuracy or completeness of the enclosed plans and does not assume any duty of care to you nor any responsibility for the accuracy, adequacy, suitability or completeness of the plans or for any error, omission, lack of detail, transmission failure or corruption in the information provided. Jemena does not accept any responsibility for any loss that you or anyone else may suffer in connection with the provision of these plans, however that loss may arise (including whether or not arising from the negligence of Jemena, its employees, agents, officers or contractors). The recipient of these plans must use their own care and diligence in carrying out their works and must carry out further surveys to locate services at their work site. Persons excavating or carrying out other earthworks will be held responsible for any damage caused to Jemena's underground mains and equipment. In accordance with the Work Near Underground Assets Guideline published in 2007 by Work Cover Authority, Jemena recommends that you carry out potholing by hand to accurately confirm the location of gas mains and installation prior to commencing excavations.

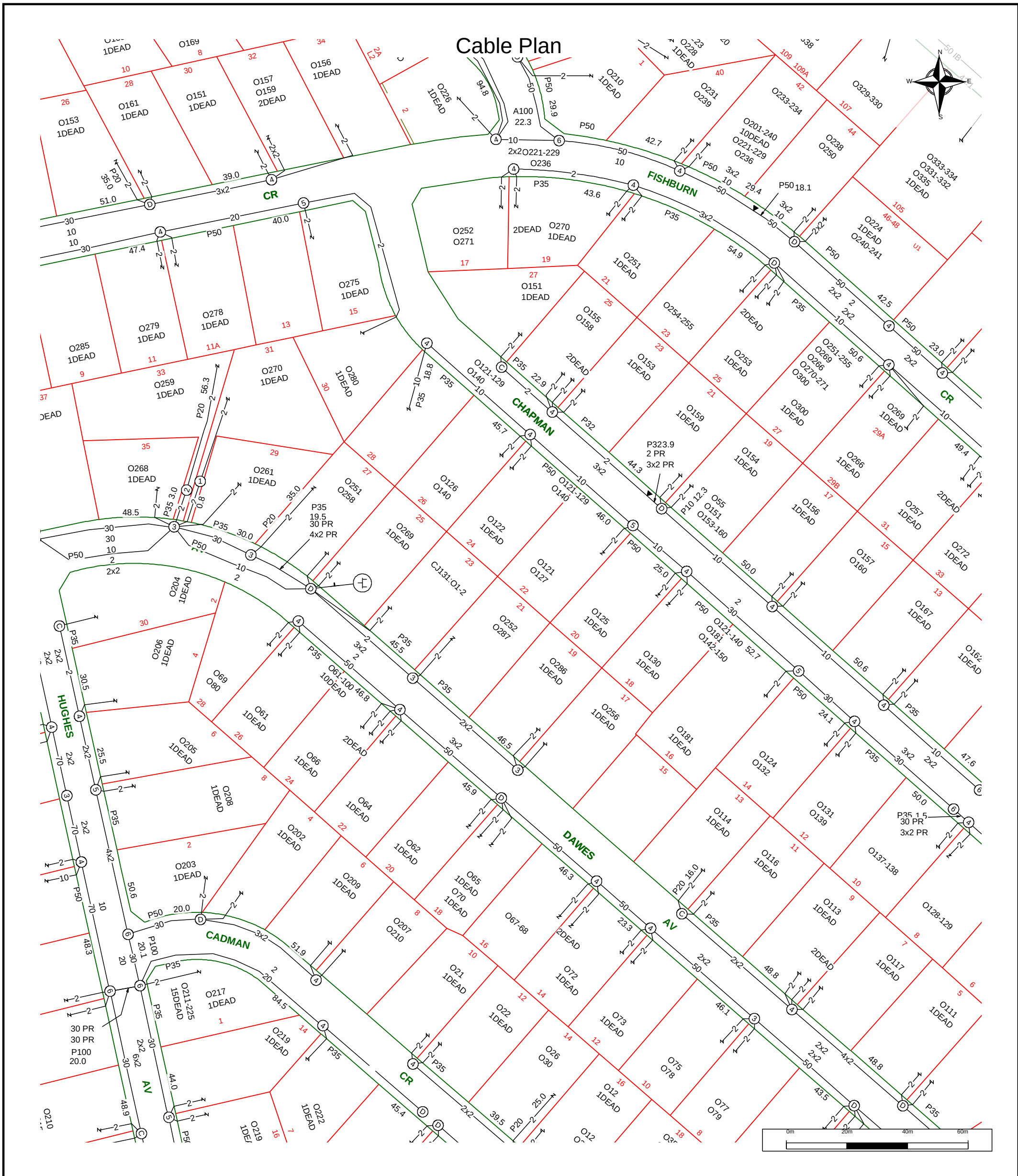
In case of Emergency Phone 131 909 (24 hours)

Admin
1300 880 906

Jemena Asset Management Pty Ltd ABN 53 086 013 461
for and on behalf of Jemena Gas Networks (NSW) Ltd ABN 87 003 004 322

Appendix I

Telstra



	For all Telstra DBYD plan enquiries - email - Telstra.Plans@team.telstra.com For urgent onsite contact only - ph 1800 653 935 (bus hrs)	Sequence Number: 61348153 Please read Duty of Care prior to any excavating
TELSTRA CORPORATION LIMITED A.C.N. 051 775 556		
Generated On 22/05/2017 13:29:41		

The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

It is your responsibility to locate Telstra's underground plant by careful hand pot-holing prior to any excavation in the vicinity and to exercise due care during that excavation.

Please read and understand the information supplied in the duty of care statement attached with the Telstra plans. TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT.

Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.

Mains Cable Plan

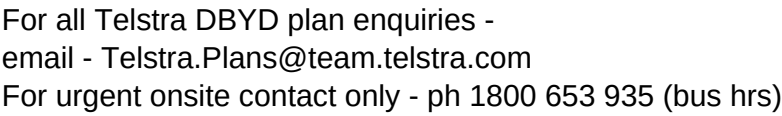
Diagram illustrating the layout of mains cables, showing various cable runs and labels:

- CR** (Cable Run)
- FISHBURN**
- CHAPMAN**
- AV** (Aerial Voltage)
- HUGHES**
- CADMAN**
- DAWES**
- AN** (Aerial Neutral)

Additional labels and notes on the right side of the plan:

- EL I No.1
- WARNING
- POWER C.
- E5010/C1-30 30 CI
- 3012/GK-CILF/1-2 2F/-
- POWER CABLE:10PR

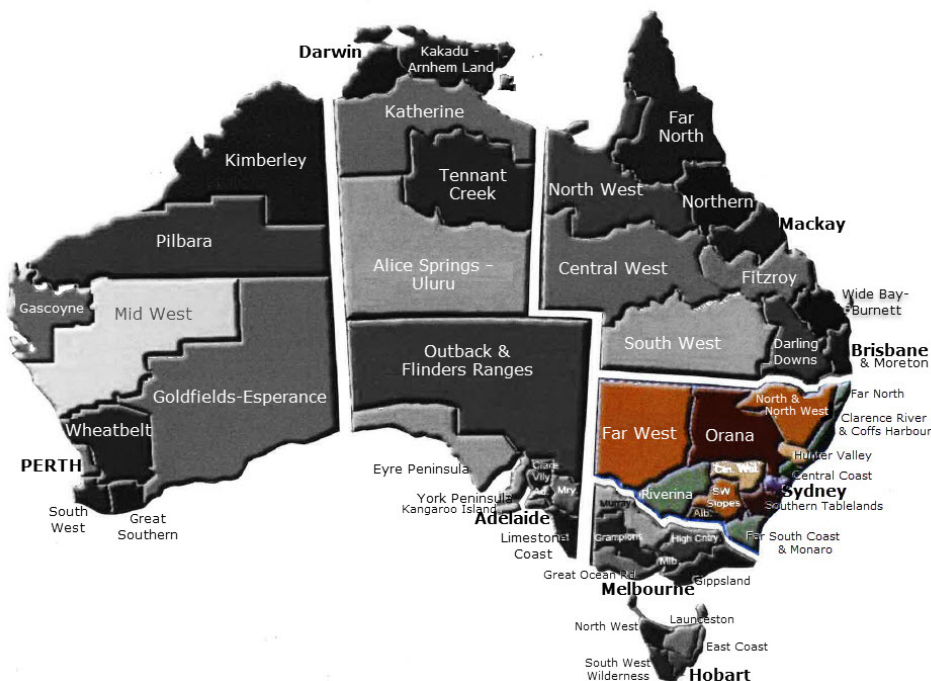
Scale bar: 0m, 20m, 40m, 60m.



Generated On 22/05/2017 13:29:45

Please read Duty of Care prior to any excavating

Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.



TELSTRA ACCREDITED PLANT LOCATORS – NEW SOUTH WALES. CENTRAL REGION

Region NSW Central

Telstra plans are intended to be indicative only. A plant location service (Telstra accredited) is required to identify the exact location of the plant and ensure that the asset is protected during construction work. It is your responsibility as part of your “Duty of Care” to engage an Accredited Plant Locator.

***Optic fibre cable locations** must be performed by a locator with Telstra optic fibre location accreditation.

Locators with Telstra optic fibre cable location accreditation are indicated by either a ‘yes’ in the ‘Fibre’ column or the DBYD Certified Locator Symbol.



Please contact a Telstra accredited locator from the pages following (fees apply).

Telstra Accredited Plant Locators – New South Wales. CENTRAL NSW Central.

Company Name & service areas	*Fibre	Contact	
Abitek Pty Ltd		02 4580 9883 0413 327 243 02 4580 9884 abitek@bigpond.com	Phone Mobile Fax Email Web
Advanced Ground Locations Newcastle, Hunter Valley, Central Coast		02 4930 3195 0412 497 488 02 4930 3222 steve_agl@hotmail.com www.advancedgroundlocations.com	Phone Mobile Fax Email Web
All About Pipes All of NSW		1300 634 200 0408 790 010 02 9606 2325 work@allaboutpipes.com.au www.allaboutpipes.com.au	Phone Mobile Fax Email Web
Aquabend Utility Detection Central Coast, Upper Hunter, Hunter Valley, Mid North Coast and surrounding areas.		0488 925 432 aquabend@hotmail.com	Phone Mobile Fax Email Web
Australian Locating Services Pty Ltd All of ACT & NSW		1300 761 545 0412 227 434 02 9531 2169 admin@locating.com.au www.locating.com.au	Phone Mobile Fax Email Web
Australian Subsurface Pty Ltd All of ACT & NSW		0427 879 600 admin@australiansubsurface.com www.australiansubsurface.com	Phone Mobile Fax Email Web
Australian Underground Utility Locations Eurobodalla Shire, Bega Valley Shire, Snowy River Shire, Batemans Bay to Vic border, Far South Coast NSW		0418 329 370 moceanfabrications@gmail.com www.auul.com.au	Phone Mobile Fax Email Web
Australian Utilities Management Pty Ltd		0424 537 952 bookings@ausutilities.net.au www.ausutilities.net.au	Phone Mobile Fax Email Web
Bradmac Locating Services Pty Ltd Sydney Metro, Bathurst, Lithgow, Mudgee, Mittagong, Campbelltown		0434 157 409 brad.mac@bigpond.com	Phone Mobile Fax Email Web
Brandon Construction Services Pty Ltd Sydney metro & surrounding districts, other country NSW areas on request		0438 044 008 liam.bolger@hotmail.com	Phone Mobile Fax Email Web
Cardno ACT Sydney, Wollongong, Nowra, Newcastle, Central Coast and Coffs Harbour		1300 224 664 02 8783 8492 cardnoaus@cardno.com.au	Phone Mobile Fax Email Web
Chris Bates & Associates Mid North Coast, Newcastle, Hunter Valley and Central Coast		02 4928 1519 0408 427 391 chrisbatesandassociates@yahoo.com.au	Phone Mobile Fax Email
Coastal Cable Locators Pty Ltd Bawley Point, Wollongong to Eden, Braidwood, Bungendore, Goulburn		02 4457 1258 0427 975 777 02 4457 1258 skomalley@bigpond.com	Phone Mobile Fax Email Web

Telstra Accredited Plant Locators – New South Wales. CENTRAL

Dowds Pipe & Cable Locating Wollongong, South Coast and the Highlands areas.		0434 635 134 accounts@pipeandcable.com www.pipeandcable.com.au	Phone Mobile Fax Email Web
Down Under Detection Services		02 9371 7744 downunderdetections@bigpond.com	Phone Mobile Fax Email
Down Under Pipeline Surveys Pty Ltd Orangeville and surrounding districts		02 4653 1286 0418 675 374 02 4653 1747 office@dups.com.au www.dups.com.au	Phone Mobile Fax Email Web
Durkin Construction Pty Ltd All Areas		02 9712 0308 0452 202 212 02 9647 1984 info@durkinconstruction.com.au www.durkinconstruction.com.au	Phone Mobile Fax Email Web
Dynamic Excavations Brisbane, Gold Coast, Toowoomba, Sunshine Coast, Northern NSW, Ballina, Sydney and surrounding districts		07 5564 8142 0418 596 066 marco@dynamicexcavation.com.au www.dynamicexcavations.com.au	Phone Mobile Fax Email Web
Electrostar NSW North West including Tablelands (Armidale, Glenn Innes) Hunter Valley, Newcastle to Grafton		0429 620 999 0428 658 707 02 6762 0213 admin@electrostar.com.au www.electrostar.com.au	Phone Mobile Fax Email Web
Epoca Environmental Pty Ltd Sydney Metro, All of NSW & ACT	YES	02 4739 2465 0430 606 948 evelyn@epocaenvironmental.com.au www.epocaenvironmental.com.au	Phone Mobile Fax Email Web
G B Geotechnics (Australia) Pty Ltd All areas of New South Wales	NO	02 9890 2122 0403 153 651 jamie@gbgoz.com.au	Phone Mobile Fax Email Web
G MAC LOCATING Dubbo, Young, Wagga, Yass, Goulburn, Bathurst, Orange, Temora, West Wyalong & most NSW country regions		0488 520 482 0408 822 428 enquiries@gmaclocating.com.au	Phone Mobile Fax Email Web
Geoscope Utility Detection Services Pty Ltd Sydney areas and parts of NSW		1300 750 350 0432 296 323 info@geoscopelocating.com.au www.geoscopelocating.com.au	Phone Mobile Fax Email Web
Geotrace Pty Ltd All Areas, Hills District, Sydney, Wollongong, Newcastle, ACT, Sutherland, Bankstown, Richmond, Burwood, Rose Bay, Balmain		02 8824 6654 0417 147 945 02 8824 5637 info@geotrace.com.au www.geotrace.com.au	Phone Mobile Fax Email Web
Ground Scan Locating Central West and surrounding districts		0414 640 640 02 6332 2599 gscan1@bigpond.com	Phone Mobile Fax Email Web
Hunter Ground Search Central Coast, Newcastle, Hunter Valley, Mid North Coast and west to Tamworth, Liverpool Plains and Dubbo.		02 4953 1244 0418 684 819 02 4953 1233 huntergroundsearch@bigpond.com	Phone Mobile Fax Email Web
Hunter Smith Management Pty Ltd All of NSW & ACT, other regions e.g. Victoria as requested		02 8090 2695 0422 224 761 huntersmith@iprimus.com.au www.hsmlocating.com.au	Phone Mobile Fax Email Web

Telstra Accredited Plant Locators – New South Wales. CENTRAL

Hydro Digga All of NSW, ACT & South East Qld.		0447 774 000 locator@hydrodigga.com	Phone Mobile Fax Email Web
Landmark Surveys Pty Ltd Southern NSW and ACT areas		02 6280 9608 0413 832 038 phil@landmarksurveys.com.au www.landmarksurveys.com.au	Phone Mobile Fax Email Web
Laneyrie Electrical Pty Ltd Helensburgh to Ulladulla, Southern Highlands		02 4237 9865 0412 079 079 02 4237 9939 bindy@laneyrielectrical.com.au www.laneyrielectrical.com.au	Phone Mobile Fax Email Web
Locate & Map Pty Ltd Sydney, Wollongong and the Central Coast		0431 191 669 tim@locateandmap.com.au www.locateandmap.com.au	Phone Mobile Fax Email Web
Locaters Pty Ltd Sydney, Penrith, Richmond, Macarthur, Wollongong		02 8214 8911 info@locaters.com.au www.locaters.com.au	Phone Mobile Fax Email Web
Locating Services Pty Ltd Hawesbury, Canberra and all of NSW.		0403 065 510 sam.romano1@outlook.com	Phone Mobile Fax Email Web
Lower Mountains Electrical Blue Mountains, Penrith, Hawksbury, Lithgow and surrounding areas	NO	0414 446 422 info@lowermountainelectrical.com.au	Phone Mobile Fax Email
Lynet Communications (Lynco Pty Ltd) Dubbo depot, covering Forbes, Grenfell, Parkes, Bourke, Bourke North, Nyngan, Coonabarabran, Coonamble, Mudgee, Narromine, Wellington, Orange, Molong, Yeoval, Coolah, Dunedoo, Gilgandra, Mendooran		0409 811 673 lynnet@bigpond.com.au	Phone Mobile Fax Email Web
Meek Design & Construction Pty Ltd Bathurst, Orange, Lithgow, Oberon, Mudgee and surrounding areas		0419 633 483 ron@meekdesign.com.au	Phone Mobile Fax Email Web
Mr Mac Group Bathurst, Orange, Yass and Goulburn.		0447 818 260 locatemrmac@gmail.com	Phone Mobile Fax Email Web
Newcastle Locating Services Newcastle, Hunter Valley, Upper Hunter Valley, Port Stephens		02 4933 5160 0410 698 599 02 4933 5150 afarcas@bigpond.com	Phone Mobile Fax Email Web
On Point Utility Locating Pty Ltd Sydney, Parramatta, Penrith, Wollongong, Central Coast, Highlands, Goulburn, Blue Mountains		1300 ON POINT 0405 149 529 info@onpointlocating.com.au www.onpointlocating.com.au	Phone Mobile Fax Email Web
Online Pipe & Cable Locating Pty Ltd Sydney, Newcastle, Canberra, Central Coast, Wollongong, Blue Mountains and Port Macquarie		1300 665 384 0418 402 234 02 9676 6127 office@onlinepipe.com.au	Phone Mobile Fax Email Web
Pipesure Australia Pty Ltd Sydney and surrounding areas		02 9625 9222 02 9625 9200 info@pipesure.com.au	Phone Mobile Fax Email Web

Telstra Accredited Plant Locators – New South Wales. CENTRAL

Riteway Traffic Control Pty Ltd Central Coast – Newcastle/Hunter		0419 212 969 kbrowne@ritewaytc.com.au	Phone Mobile Fax Email Web
Riverina Cable Location Pty Ltd Wagga Wagga and surrounding areas	YES	02 6931 6565 0428 958 632 desdammeffencing@msn.com	Phone Mobile Fax Email Web
RPS Australia East Pty Ltd Sydney regions and surrounding areas		02 8270 8300 0437 348 346 02 9248 9810 stanley.tan@rpsgroup.com.au	Phone Mobile Fax Email Web
Rubicof Pty Ltd Gosford, Newcastle, Taree		02 4990 5718 0418 683 451 02 4991 2600 rubicof@optusnet.com.au	Phone Mobile Fax Email Web
Rutherford Electrical Engineering Services		02 4932 7344 02 4932 5219 kmurphy@rutherford.com.au	Phone Mobile Fax Email Web
SEEK LOCATIONS (Zane Pye) Foster, Glouster, Taree, Port Macquarie, Karuah, Kempsey		0407 256 858 seek@seeklocations.com.au www.seeklocations.com.au	Phone Mobile Fax Email Web
Signal Support Services Pty Ltd Goulburn, Southern Highlands, Canberra.		02 4821 8334 0418 237 668 ted@signalsupport.com.au	Phone Mobile Fax Email Web
Steger & Associates Registered Land Surveyors NSW & ACT		02 6296 4089 02 6296 4090 enquiries@leachsteger.com.au	Phone Mobile Fax Email Web
SureSearch NSW = Sydney, Penrith, Richmond, Wollongong, Katoomba, Macarthur, Central Coast, Newcastle Maitland, Hunter Valley, Port Macquarie		1300 884 520 0408 221 046 info@suresearch.com.au www.suresearch.com.au	Phone Mobile Fax Email Web
Utility I.D. – Underground Service & Cable Locators All areas Queensland and New South Wales		0401 202 515 info@utilityid.com.au www.utilityid.com.au	Phone Mobile Fax Email Web
Utility Locating Services		0404 087 555	Phone Mobile Fax Email Web
Utility Mapping (Aust) Pty Ltd Sydney and surrounding areas		1300 MAPPING sydney@utilitymapping.com.au www.utilitymapping.com.au	Phone Mobile Fax Email Web
Vac Group Operations Pty Ltd t/as Earthspy		1300 822 834 0447 466 331 www.vacgroup.com.au	Phone Mobile Fax Email Web
Vertex Power & Process NSW areas – Broken Hill, Menindee, Wilcannia, Ivanhoe & surrounding areas. SA areas – Eastern regions of SA including Olary Mingary & Cockburn.		08 8088 4301 0428 154 450 08 8087 5729 admin@vertexpp.com.au www.vertexpp.com.au	Phone Mobile Fax Email Web

DUTY OF CARE

TELSTRA CORPORATON ACN 051 775 556

IMPORTANT:

When working in the vicinity of telecommunications plant you have a "Duty of Care" that must be observed. Please read and understand all the information and disclaimers provided below.

Telstra network is complex and requires expert knowledge to interpret information, to identify and locate components, to pothole underground assets for validation and to safely work around assets without causing damage. If you are not an expert and/or qualified in these areas then you should not be attempting these activities. Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers.

The 4 essential steps that must be undertaken to prevent damage to Telstra assets are listed below. Construction activities must not commence without first undertaking these 4 steps. If your project is dependent on the position of the underground network then it is recommended you validate the position of the network prior to finalising your design.

(The following pages contain more detail on each step below and the contact details to seek further advice. AS5488-2013 is the Australian Standard for the Classification of Subsurface Utility Information.)

1 Dial Before You Dig -Telstra Plans :

The essential first step in preventing damage -

You must have current Telstra plans via the DBYD process. Telstra advises that the accuracy of the information provided by Telstra conforms to Quality Level D as defined in AS5488-2013. This means the information is indicative only, not a precise location. **The actual location may differ substantially from that shown on the plans** - refer to steps 2 & 3 to determine actual location prior to commencing construction.

2 Telstra Accredited Plant Locator :

The essential second step in preventing damage -

To be able to trace and identify individual subsurface cables and ducts requires access to Telstra pits and manholes. Only a Telstra Accredited Plant Locator (TAPL) is authorised to access Telstra network for locating purposes. A TAPL can interpret plans, validate visible assets and access pits and manholes to undertake electronic detection of underground assets prior to further validation. All Telstra assets must be located, validated and protected prior to commencing construction. **If you are not authorised to do so by Telstra, you should not be accessing Telstra network or locating Telstra network.**

3 Validation :

The essential third step in preventing damage -

All Telstra assets must be positively identified (i.e. validated), by physically sighting them. For underground assets this can be done by potholing by hand or using non-destructive vacuum extraction methods (Refer to 'validation' as defined in AS5488-2013 QL-A). **Underground assets located by electronic detection alone (step 2), are not deemed to be 'validated' and should not be used for construction purposes.** Some TAPL's can assist with non-destructive potholing for validation purposes. **If you cannot validate the Telstra network you should not proceed with construction.** Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers.

4 Protection :

The essential fourth step in preventing damage -

Telstra assets must be protected to avoid damage from construction activities. Minimum working distances around Telstra network must be maintained. These distances are provided in this document. Telstra can also provide advice and assistance in regards to protection – refer to the following pages.

STEP 1 – Dial Before You Dig -Telstra Plans:

The actual location of Telstra assets may differ substantially from that shown on the plans. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for the accuracy shown on the plans. Steps 2 and 3 must also be undertaken to determine actual location of network.

- Telstra DBYD plans are not suitable for displaying Telstra network within a Telstra exchange site. For advice on Telstra network within a Telstra exchange site contact Telstra Plan Services.
- Telstra owns and retains the copyright in all plans and details provided in conjunction with the applicant's request. The applicant is authorised to use the plans and details only for the purpose indicated in the applicant's request. The applicant must not use the plans or details for any other purpose.
- Telstra plans or other details are provided only for the use of the applicant, its servants, agents or Telstra Accredited Plant Locators. The applicant may not give the plans or details to any parties other than these, and may not generate profit from commercialising the plans or details.
- Please contact Telstra Plan Services immediately should you locate Telstra assets not indicated on these plans.
- Telstra, its servants or agents shall not be liable for any loss or damage caused or occasioned by the use of plans and or details so supplied to the applicant, its servants and agents, and the applicant agrees to indemnify Telstra against any claim or demand for any such loss or damage.
- Please ensure Telstra plans and information provided remains on-site at all times throughout the inspection, location and construction phase of any works.
- Telstra plans are valid for 60 days after issue and should be replaced if required after the 60 days.
- **Emergency situations - receiving Telstra plans** Telstra's automated mapping system (TAMS) will provide a fast response for emergency situations (faster than an operator can provide manually via a phone call - see below for fast response requirements). Automated responses are normally available 24/7.

To receive a fast automated response from Telstra your request must -

- Be a web request lodged at DBYD (www.1100.com.au). The request will be then forwarded to Telstra.
- Contain your current email address so you can receive the automated email response.
- Be for the purposes of 'mechanical excavation' or other ground breaking DBYD activity. (Requests with activity types such as conveyancing, planning & design or other non-digging activities may not be responded to until the next business day).
- Be for an area less than 350 metres in size to obtain a PDF map (over 350 metres will default to DWF due to size) this does not include congested CBD areas where only DWF may be supplied.
- Be for an area less than 2500 metres in size to obtain a DWF map (CBD's less)
- **Data Extraction Fees.** In some instances a data extraction fee may be applicable for the supply of Telstra information. Typically a data extraction fee may apply to large projects or requests to be supplied in non-standard formats. For further details contact Telstra Plan Services.
- **Electronic plans - PDF and DWF maps** If you have received Telstra maps via email you will have received the maps as either a PDF file (for smaller areas) or DWF file (for larger area requests). All requests over approximately *350m or in congested CBD areas can only be supplied in DWF format. There are size limits on what can be provided. (* actual size depends on geographic location of requested area). If you are unable to launch any one of the softcopy files for viewing and printing, you may need to download and install one or more of the free viewing and printing products such as Adobe Acrobat Reader (for PDF files) or Autodesk Design Review (for DWF files) available from the internet
 - **Pdf files** - PDF is the default softcopy format for all requests for areas up to approx *350m in length. (*depends on geographic location of request). The PDF file is nominally formatted to A3 portrait sheet however it can be printed on any size sheet that your printer supports, e.g. either as the full sheet or selected areas to suit needs and legibility. (to print a selected area zoom up and print 'current view') If there are multiple layers of Telstra network you may receive up to 2 sheets in the single PDF file attachment supplied. There are three types or layers of network normally recorded - local network, mains cables or a combined layer of local and mains (usually displayed for rural or semi-rural areas). If mains cable network is present in addition to local cables (i.e. as separate layer in a particular area), the mains will be shown on a separate sheet. The mains cable information should be read in conjunction with the local cable information.
 - **DWF files** – DWF is the default softcopy format for all requests for areas that are over 350m in length. Maximum length for a DWF automated response is approx 2500m - depending on geographic

location of request (manually-processed plans may provide larger coverage). The DWF files differ from PDF in that DWF are vector files made up of layers that can be turned on or off and are not formatted to a specific sheet size. This makes them ideal for larger areas and for transmitting electronically.

- **How to view Telstra DWF files –**

Telstra DWF files come with all layers turned on. You may need to turn individual layers on or off for viewing and printing clarity. Individual layer names are CC (main cable/conduit), DA (distribution area network) and sometimes a combined layer - CAC. Layer details can be viewed by either picking off the side menu or by selecting 'window' then 'layers' off the top menu bar. Use 'layers' to turn individual layers off or on (double click or right click on layer icon).

- **How to print Telstra DWF files –**

DWF files can be printed on any size sheet – either their entirety or by selected areas of interest. Some DWF coverage areas are large and are not suited to printing legibly on a single A4 sheet - you may need several prints if you only have an A4 printer. Alternatively, an A3, A1 or larger printer could be used. To print, zoom in or out and then, by changing the 'print range' settings, you can print what is displayed on your screen to suit your paper size. If you only have a small printer, e.g. A4, you may need to zoom until the text is legible for printing (which is why you may need several prints). To print what is displayed on your screen the 'view' setting should be changed from 'full page' to 'current view'. The 'current sheet' setting should also be selected. You may need to print layers separately for clarity and legibility. (Details above on how to turn layers on or off)

- **How to change the background colour from white to black (when viewing) Telstra DWF files –**

If using Autodesk Design Review the background colour can be changed by selecting 'Tools' then 'options' then 'sheet'. Tick the box 'override published paper colours' and select the colour required using the tab provided.

STEP 2 - Telstra Accredited Plant Locator (TAPL):

Utilising a TAPL is an essential part of the process to identify network and to trace subsurface network prior to validating. A TAPL can provide plan interpretation, identification and electronic detection. This will assist in determining the position of subsurface assets prior to potholing (validating). Some TAPL's can also assist in validating underground detected network. Electronic detection is only an indication of the existence of underground network and can be subject to interference from other services and local conditions. Electronic detection should not be used solely to determine location for construction purposes. The electronic (indicative) subsurface measurements must be proven by physically sighting the asset (see step 3 - Validation).

- All TAPL's locating Telstra network must be able to produce a current photo ID card issued by Telstra. A list of TAPL's is provided with the Telstra Dial Before You Dig plans.
- Telstra does not permit external parties (non-Telstra) to access or conduct work on our network. Only Telstra staff, Telstra contractors or locators whom are correctly accredited are authorised to work on or access our manholes, pits, ducts, cables etc. This is for safety as well as for legal reasons.

It is a criminal offence under the *Criminal Code Act 1995 (Cth)* to tamper or interfere with communication facilities owned by a carrier. Heavy penalties may apply for breach of this prohibition, and any damages suffered, or costs incurred by Telstra as a result of any such unauthorised works may be claimed against you.

- Optic fibre cable locations must be performed by a locator with Telstra optic fibre cable location accreditation. The locators with optic fibre cable location accreditation are indicated by a 'yes' in the column headed 'Fibre' in the lists of locators that are published with the Telstra DBYD plans. Telstra Accredited Plant Locators that are DBYD Certified Locators are also fibre accredited. Inspection of photo ID cards will confirm whether locators are just copper accredited or copper + fibre accredited.
- The details of any contract, agreement or retainer for site assistance to locate telecommunications plant shall be for you to decide and agree with the Telstra Accredited Plant Locator engaged. Telstra is not a party to any contract entered into between you and a Telstra Accredited Plant Locator.
- Payment for the site assistance will be your responsibility and payment details should be agreed before the engagement is confirmed.

- Telstra does not accept any liability or responsibility for the performance of or advice given by a Telstra Accredited Plant Locator. Accreditation is an initiative taken by Telstra towards the establishment and maintenance of competency standards. However, performance and the advice given will always depend on the nature of the individual engagement.
- Neither the Telstra Accredited Plant Locator nor any of its employees are an employee or agent for Telstra. Telstra is not liable for any damage or loss caused by the Telstra Accredited Plant Locator or its employees.

- **Electronically derived subsurface measurements (e.g. depths/alignments by locating devices)**

All locator provided measurements for Telstra assets must have the AS5488-2013 quality level specified - (e.g. QL-A, B, C or D). These quality levels define the accuracy of subsurface information and are critical for determining how the information is later used – for example if suitable for excavation purposes.

1) An example of a subsurface measurement with no quality level specified – (i.e. not to be used)

Telstra cover - **0.9m**

*The measurement above has no AS5488-2013 quality level specified and **should not be provided by a locator or used for design or construction.** This is because it is not known whether the measurement is actual or derived (where 'actual' means validated and 'derived' means assumed and not validated, e.g. electronic or other). Typically damages occur by constructors incorrectly using unvalidated measurements as actual measurements.*

2) An example of a subsurface measurement with quality level B specified –

Telstra cover - **0.9m (QL-B)**

Where (QL-B) complies with AS5488-2013 QL-B (for example an electronic location that complies with QL-B)

(Note QL-B means it has not been validated and should not be used for construction purposes around Telstra network, however it would assist further investigation to determine the actual location)

3) An example of a subsurface measurement with the quality level A specified –

Telstra cover - **0.6m (QL-A)**

Where (QL-A) complies with AS5488-2013 QL-A (and is deemed suitable for excavation purposes). In this example the asset has been electronically located first, (QL-B) and then physically exposed (QL-A).

Note -Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers if unvalidated subsurface measurements are used for construction and subsequently result in damage to Telstra assets. Only measurements conforming to AS5488-2013 (QL-A) are deemed by Telstra to be validated measurements.

- **Rural landowners** Where Telstra-owned cable crosses agricultural land, Telstra may provide on-site assistance with cable location. **You must contact Telstra Plan Services to determine eligibility and to request the service.**

Please note the following –

- If eligible, the location assistance must be approved and organised by Telstra. Telstra will not pay for a location that has not been approved and facilitated by Telstra (Telstra is not responsible for payment assistance when a customer engages a locator directly).
- The exact location, including depth of cables, must be validated by potholing, which may not be covered by this service.
- This service is nominally only available to assist private rural land owners.
- This service nominally covers one hour on-site only. Any time required in addition to Telstra-funded time can be purchased directly from the assigned Telstra Accredited Plant Locator.
- This service does not apply to previously located network at the same location (i.e. it is a once off).
- This service does not apply to other carriers' cables (marked as 'OC' on Telstra plans).

STEP 3 – *Validation:

After utilising a Telstra Accredited Plant Locator and prior to commencing construction, any electronically detected underground network must be positively identified (validated) by physically sighting it. This can be done by careful hand digging or using non-destructive water jet methods to expose the network.

*Validation as defined in AS5488-2013 (QL-A).

Manual potholing needs to be undertaken with extreme care and by employing techniques least likely to damage cables. For example, align shovel blades and trowels parallel to the cable rather than digging across the cable. Some Telstra Accredited Plant Locators are able to provide or assist with non-destructive potholing methods to enable validation of underground cables and ducts.

If you cannot validate the underground network then you should not proceed with construction. Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers.

Important note: The construction of Telstra's network dates back over many years. Some of Telstra's pits and ducts were manufactured from asbestos-containing cement. You must take care in conducting any works in the vicinity of Telstra's pits and ducts. You must refrain from in any way disturbing or damaging Telstra's network infrastructure when conducting your works. We recommend that before you conduct any works in the vicinity of Telstra infrastructure that you ensure your processes and procedures eliminate any possibility of disturbing, damaging or interfering in any way with Telstra's infrastructure. Your processes and procedures should incorporate appropriate measures having regard to the nature of this risk. For further information -

<http://ucm.in.telstra.com.au/about/media/emergencies-incidents/asbestos/index.htm?ssSourceSiteId=consumer-advice>

STEP 4 – Protection:

You must maintain the following minimum clearance distances between construction activity and the validated position of Telstra plant.

Jackhammers/Pneumatic Breakers	<i>Not within 1.0m of actual validated location.</i>
Vibrating Plate or Wacker Packer Compactor	<i>Not within 0.5m of actual validated location of Telstra ducts. 300mm compact clearance cover before compactor can be used across Telstra ducts.</i>
Boring Equipment (in-line, horizontal and vertical)	<i>Not within 2.0m of actual validated location. Constructor to hand dig or use non-destructive water jet method (pothole) and expose plant.</i>
Heavy Vehicle Traffic (over 3 tonnes)	<i>Not to be driven across Telstra ducts (or plant) with less than 600mm cover. Constructor to check actual depth via hand digging.</i>
Mechanical Excavators, Farm ploughing and Tree Removal	<i>Not within 1.0m of actual validated location. Constructor to hand dig or use non-destructive water jet method (pot-hole) and expose plant.</i>

- For blasting or controlled fire burning please contact Telstra Plan Services for advice.
- If conducting roadworks all existing Telstra pits and manholes should be a minimum of 1.2m in from the back of kerb after the completion of your work.
- After the completion of any ground work in footways (or under roads), all Telstra conduits must have a depth of cover which is compliant with the current specifications of the road owner e.g. the local council or road

authority. Depth specification will vary across different authorities in different states. For clarification please contact Telstra Network Integrity.

- For clearance distances relating to Telstra pillars, cabinets and RIMs/RCMs please contact Telstra Plan Services.
- If Telstra plant is situated wholly or partly where you plan to work (i.e. in conflict), then Telstra's Network Integrity Group must be contacted to discuss possible engineering solutions.
Please phone **1800 810 443** or email NetworkIntegrity@team.telstra.com
- You are not permitted to relocate or alter or repair any Telstra assets or network under any circumstances.

It is a criminal offence under the *Criminal Code Act 1995* (Cth) to tamper or interfere with communication facilities owned by a carrier. Heavy penalties may apply for breach of this prohibition, and any damages suffered, or costs incurred by Telstra as a result of any such unauthorised works may be claimed against you.

Only Telstra and its contractors may access and conduct works on Telstra's network (including its plant and assets). This requirement is to ensure that Telstra can protect the integrity of its network, avoid disruption to services and ensure that the relocation meets Telstra's requirements.

- If Telstra relocation or protection works are part of the agreed solution, then payment to Telstra for the cost of this work shall be the responsibility of the principal developer, constructor or person for whom the work is performed. The principal developer or constructor will be required to provide Telstra with the details of their proposed work showing how Telstra's plant is to be accommodated and these details must be approved by the Regional Network Integrity Manager prior to the commencement of site works.
Please phone 1800 810 443 or email NetworkIntegrity@team.telstra.com
Further information - <https://www.telstra.com.au/consumer-advice/digging-construction/relocating-network-assets>

Damage to Telstra's network must be reported immediately -

<https://service.telstra.com.au/customer/general/forms/report-damage-to-telstra-equipment>

- You will be held responsible for all plant damage that occurs or any impacts to Telstra's network as a result of your construction activities. This includes interfering with plant, conducting unauthorised modification works and interfering with Telstra's assets in a way that prevents Telstra from accessing or using its assets in the future.
- Telstra reserves all rights to recover compensation for loss or damage to its cable network or other property including consequential losses.

FURTHER INFORMATION:

NATURAL DISASTERS

Natural Disasters include (amongst other things) earthquakes, cyclones, floods and tsunamis. In the case of such events, urgent requests for plans or information relating to the location of Telstra network can be made directly to Telstra Network Integrity Team Managers as follows:

NSW – John McInerney 0419 485 795
QLD – Glenn Swift 0419 660 147
VIC/TAS - David Povazan 0417 300 947
SA/NT - Mick Weaver 0419 828 703
WA - Angus Beresford-Peirse 0419 123 589

TELSTRA PLAN SERVICES - for all Telstra Dial Before You Dig related enquiries

Email - Telstra.Plans@team.telstra.com

Phone - 1800 653 935 (general enquiries, business hours only)

*Telstra DBYD plan information - Shalin 07 3455 2997
Anthony 07 3455 2365

Advice on preventing damage - Glen 07 3455 1011
Lachlan 07 3455 3132

Accredited plant locator enquiries - Mike 0477 377 036
Taylor 0477 365 666

Road closures - Megan 07 3455 0834
Lachlan 07 3455 3132

Telstra easements - Glen 07 3455 1011

**Please note - to make a Telstra plan enquiry the plans must be current (within 60 days of issue). If your plans have expired you will need to submit a new request via DBYD prior to contacting Telstra Plan Services.*

Information for new developments (developers, builders, home owners)

Telstra Smart Communities - <https://www.telstra.com.au/smart-community>

Asset relocations

Please phone 1800 810 443 or email NetworkIntegrity@team.telstra.com

<https://www.telstra.com.au/consumer-advice/digging-construction/relocating-network-assets>

Telstra offers free Cable Awareness Presentations, if you believe you or your company would benefit from this offer please contact Network Integrity on 1800 810 443 or

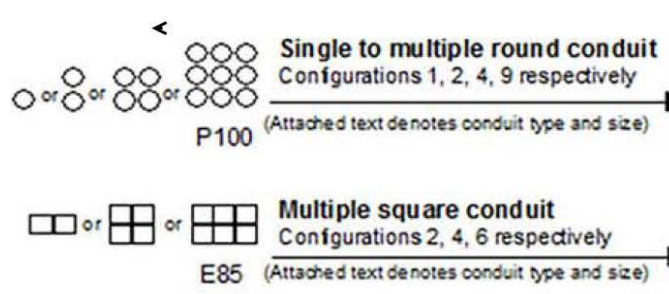
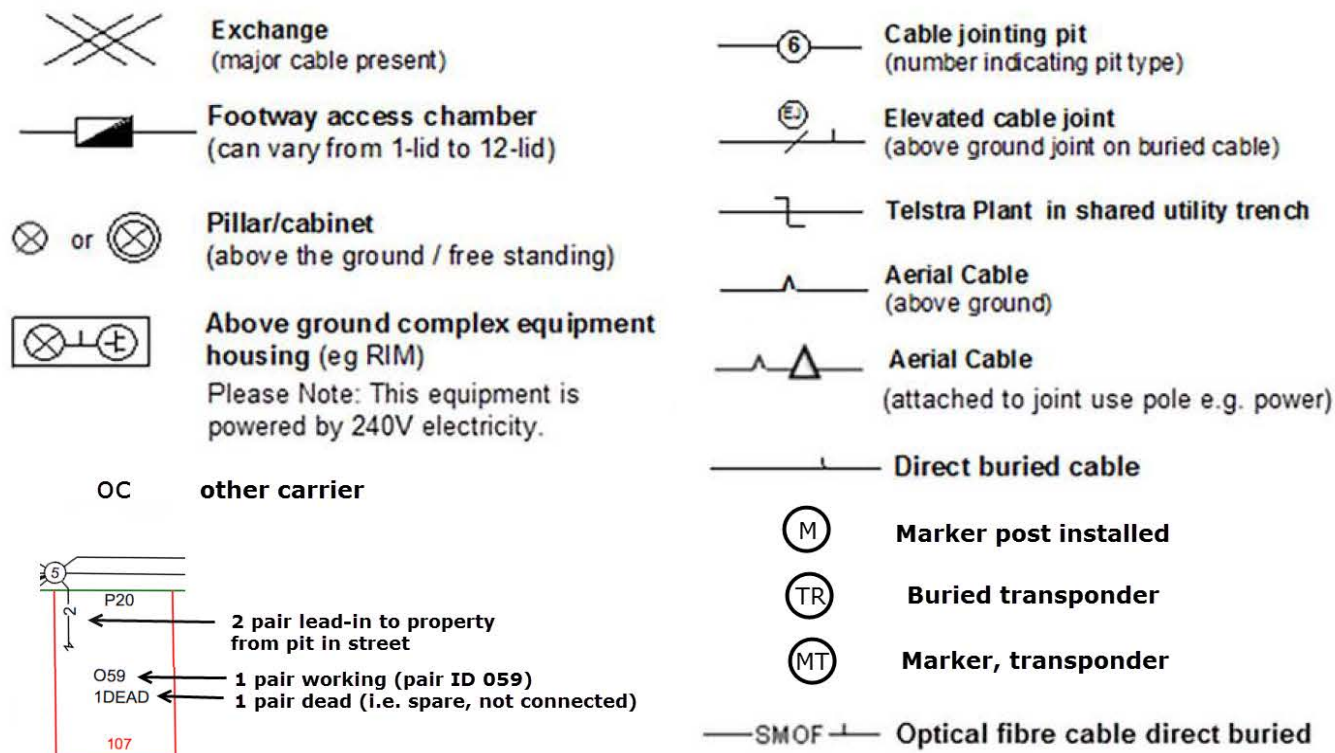
NetworkIntegrity@team.telstra.com

PRIVACY NOTE

Your information has been provided to Telstra by DBYD to enable Telstra to respond to your DBYD request. Telstra keeps your information in accordance with its privacy statement entitled "Protecting Your Privacy" which can be obtained from Telstra either by calling 1800 039 059 or visiting our website at www.telstra.com.au/privacy



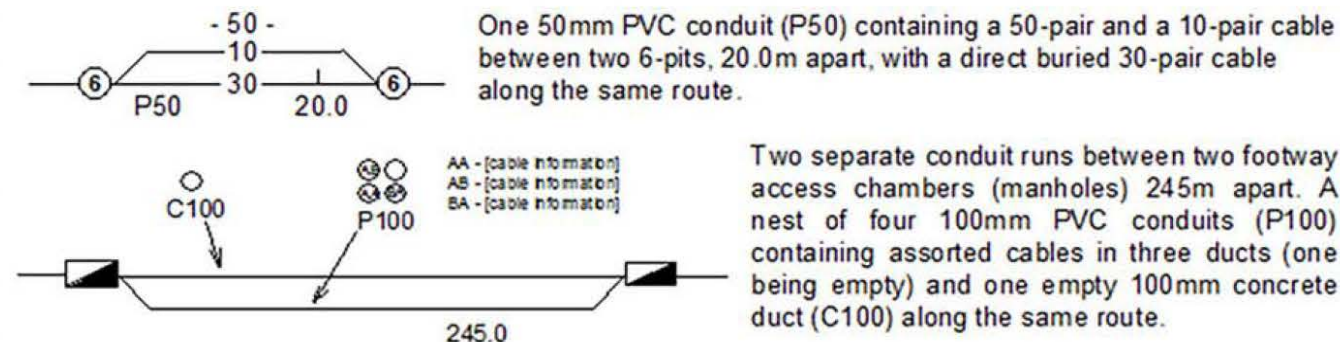
For more info contact a Telstra Accredited Locator or Telstra Plan Services 1800 653 935



Some examples of conduit type and size:
A - Asbestos cement, P - PVC / plastic, C - Concrete, GI - Galvanised iron, E - Earthenware.
Conduit sizes *nominally* range from 20mm to 100mm.

P50	50mm PVC conduit
P100	100mm PVC conduit
A100	100mm asbestos cement conduit
E 85	85mm square earthenware conduit

Some examples of how to read Telstra plans:



WARNING: Telstra plans and location information conform to Quality Level 'D' of the Australian Standard AS 5488 - Classification of Subsurface Utility Information. As such, Telstra supplied location information is indicative only. Spatial accuracy is not applicable to Quality Level D. Refer to AS 5488 for further details. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans. FURTHER ON SITE INVESTIGATION IS REQUIRED TO VALIDATE THE EXACT LOCATION OF TELSTRA PLANT PRIOR TO COMMENCING CONSTRUCTION WORK. A plant location service is an essential part of the process to validate the exact location of Telstra assets and to ensure the asset is protected during construction works. The exact position of Telstra assets can only be validated by physically exposing it. Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers.

Appendix J

149(2) Certificate

THE HILLS SHIRE COUNCIL

3 Columbia Court, Baulkham Hills NSW 2153
PO Box 7064, Baulkham Hills BC NSW 2153

Telephone +61 2 9843 0555

Facsimile +61 2 9843 0409

DX 9966 Norwest

Email council@thehills.nsw.gov.au

www.thehills.nsw.gov.au

ABN No. 25 034 494 656

PLANNING CERTIFICATE UNDER SECTION 149 (2)

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 AS AMENDED.

Certificate Number: **92074**
Reference: ATL001:87833
Issue Date: 1 June 2017
Receipt No: 5480889
Fee Paid: \$ 53.00

ADDRESS: 21 Dawes Avenue, CASTLE HILL NSW 2154
DESCRIPTION: Lot 20 DP 255722

The land is zoned:
Zone R2 Low Density Residential

The following prescribed matters apply to the land to which this certificate relates:

The Environmental Planning and Assessment Amendment Act 1997 commenced operation on 1 July 1998. As a consequence of this Act, the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment Regulation 2000.

PLEASE NOTE: THIS CERTIFICATE IS AUTOMATICALLY GENERATED. IT MAY CONTAIN EXCESSIVE SPACES AND/OR BLANK PAGES.

THIS CERTIFICATE IS DIRECTED TO THE FOLLOWING MATTERS
PRESCRIBED UNDER SECTION 149 (2) OF THE ABOVE ACT.

1. Names of relevant planning instruments and DCPs

- (1) The name of each environmental planning instrument that applies to the carrying out of development on the land.

(A) **Local Environmental Plans**

The Hills Local Environmental Plan 2012, as amended, applies to all land in the Shire unless otherwise stated in this certificate.

State Environmental Planning Policies

SEPP No.19 - Bushland In Urban Areas
 SEPP No.21 - Caravan Parks
 SEPP No.30 - Intensive Agriculture
 SEPP No.33 - Hazardous And Offensive Development
 SEPP No.50 - Canal Estate Development
 SEPP No.55 - Remediation Of Land
 SEPP No.62 - Sustainable Aquaculture
 SEPP No.64 - Advertising And Signage
 SEPP No.65 - Design Quality Of Residential Flat Development
 SEPP No.70 - Affordable Housing (Revised Schemes)
 SEPP (Building Sustainability Index: Basix) 2004
 SEPP (Major Development) 2005
 SEPP (Mining, Petroleum Production And Extractive Industries) 2007
 SEPP (Miscellaneous Consent Provisions)2007
 SEPP (Infrastructure) 2007
 SEPP (Exempt and Complying Development Codes) 2008
 SEPP (Affordable Rental Housing) 2009
 SEPP (State and Regional Development) 2011
 Sydney Regional Environmental Plan No. 9 Extractive Industries (No.2) - Amendment No.1
 Sydney Regional Environmental Plan No. 20 Hawkesbury – Nepean River (No.2 – 1997)

The following SEPP's may apply to the land. Please refer to '**Land to which Policy applies**' for each individual SEPP.

SEPP (Housing For Seniors Or People With A Disability) 2004

- (2) The name of each **proposed environmental planning instrument** that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Secretary has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved).

(A) **Proposed Local Environmental Plans**

Proposed The Hills Local Environmental Plan 2012 (Amendment No.) applies to this land.

Refer Attachment 1(2)(A)

(B) **Proposed State Environmental Planning Policies**

Draft State Environmental Planning Policy (Educational Establishments & Child Care Facilities)

Draft Vegetation State Environmental Planning Policy

- (3) The name of each development control plan that applies to the carrying out of development on the land.

The Hills Development Control Plan 2012

- (4) In this clause, proposed environmental planning instrument includes a planning proposal for a LEP or a draft environmental planning instrument.

2. Zoning and land use under relevant LEPs

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP).

- (A) The Hills Local Environmental Plan 2012 applies to the land unless otherwise stated in this certificate and identifies the land to be:

Zone R2 Low Density Residential

A Planning Proposal applies to the land and identifies the land to be:

Zone R4 High Density Residential

Also refer Attachment 1 (2)(A) for proposed amendment to The Hills Local Environmental Plan 2012

- (B) The purposes for which the instrument provides that development may be carried out within the zone without development consent:

**Refer Attachment 2(B)
and 2(B)(1)**

Also refer to the applicable instrument for provisions regarding Exempt Development

Also refer Attachment 1 (2)(A) for proposed amendment to The Hills Local Environmental Plan 2012

- (C) The purposes for which the instrument provides that development may not be carried out within the zone except with development consent:

**Refer Attachment 2(B)
and 2(B)(1)**

Also refer to the applicable instrument for provisions
regarding Complying Development

Also refer Attachment 1 (2)(A) for proposed amendment to The Hills Local Environmental Plan 2012

- (D) The purposes for which the instrument provides that development is prohibited in the zone:

**Refer Attachment 2(B)
and 2(B)(1)**

Also refer Attachment 1 (2)(A) for proposed amendment to The Hills Local Environmental Plan 2012

- (E) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed?

The Hills Local Environmental Plan 2012?

NO

Any other Planning Proposal?

YES

Clause 4.1B of The Hills Local Environmental Plan 2012 provides, in part, minimum land dimensions for the erection of a dwelling house on land zoned R3 Medium Density Residential or R4 High Density Residential where it is undertaken as a single development application in conjunction with the subdivision of land.

- (F) Whether the land includes or comprises critical habitat?

The Hills Local Environmental Plan 2012?

NO

Any other Planning Proposal?

NO

- (G) Whether the land is in a conservation area (however described)?

The Hills Local Environmental Plan 2012?

NO

Any Other Planning Proposal?

NO

- (H) Whether an item of environmental heritage (however described) is situated on the land?

The Hills Local Environmental Plan 2012?

NO

Any other Planning Proposal?

NO

2A. Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

To the extent that the land is within any zone (however described) under:

- (a) Part 3 of the *State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (the 2006 SEPP)*, or
 - (b) a Precinct Plan (within the meaning of the 2006 SEPP), or
 - (c) a proposed Precinct Plan that is or has been the subject of community consultation or on public exhibition under the ACT.
- (A) State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan) applies to the land unless otherwise stated in this certificate and identifies the land to be:

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan) does not apply.

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan) applies to the land unless otherwise stated in this certificate and identifies the land to be:

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan) does not apply.

Note: This precinct plan applies to land within the Box Hill Precinct or Box Hill Industrial Precinct.

- (B) The purposes for which the instrument provides that development may be carried out within the zone without development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Exempt Development.

- (C) The purposes for which the instrument provides that development may not be carried out within the zone except with development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Complying Development

- (D) The purposes for which the instrument provides that development is prohibited in the zone:

Refer Attachment 2(B)

- (E) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed?

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

Any amendments to Proposed State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

Any amendments to Proposed State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

- (F) Whether the land includes or comprises critical habitat?

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

- (G) Whether the land is in a conservation area (however described)?

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

- (H) Whether an item of environmental heritage (however described) is situated on the land?

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

3. Complying Development

- (1) The extent to which the land is land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.
- (2) The extent to which complying development may not be carried out on that land because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of that Policy and the reasons why it may not be carried out under those clauses.
- (3) If the council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land, a statement that a restriction applies to the land, but it may not apply to all of

the land, and that council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land.

General Housing Code and Rural Housing Code

Complying Development under the General Housing Code and Rural Housing Code **may be** carried out on the land.

Housing Alterations Code and General Development Code

Complying Development under the Housing Alterations Code and General Development Code **may be** carried out on the land.

Commercial and Industrial (New Buildings and Additions) Code

Complying Development under the Commercial and Industrial (New Buildings and Additions) Code **may be** carried out on the land.

Commercial and Industrial Alterations, Subdivision, Demolition and Fire Safety Codes

Complying Development under the Commercial and Industrial Alterations, Subdivision, Demolition and Fire Safety Codes **may be** carried out on the land.

Note: Where reference is made to an applicable map, this information can be sourced from the following websites:

The Hills Local Environmental Plan 2012 - www.thehills.nsw.gov.au
 State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct) or (Appendix 11 The Hills Growth Centre Precincts Plan) – <http://www.planning.nsw.gov.au/Plans-for-your-area/Priority-Growth-Areas-and-Precincts/North-West-Priority-Growth-Area>

4. Coastal protection

Whether or not the land is affected by the operation of Section 38 or 39 of the *Coastal Protection Act 1979*, but only to the extent that the council has been so notified by the Department of Finance, Services and Innovation?

NO

4A. Certain information relating to beaches and coasts

- (1) In relation to a coastal council - whether an order has been made under Part 4D of the *Coastal Protection Act 1979* in relation to temporary coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with.

NO

- (2) In relation to a coastal council:

(a) whether the council has been notified under section 55X of the *Coastal Protection Act 1979* that temporary coastal protection works (within the meaning of that Act) have been placed on the land (or on public land adjacent to that land), and

(b) if works have been so placed – whether the council is satisfied that the works have been removed and the land restored in accordance with that Act.

NO

- (3) (Repealed)

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

Whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

NO

Note. "Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the Local Government Act 1993.

5. Mine subsidence

Whether or not the land is proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961?

NO

6. Road widening and road realignment

Whether or not the land is affected by any road widening or road realignment under -

- (A) Division 2 of Part 3 of the Roads Act 1993; or

NO

- (B) any environmental planning instrument; or

NO

- (C) any resolution of council?

- a) The Hills Development Control Plan 2012?

NO

- b) Any other resolution of council?

NO

7. Council and other public authority policies on hazard risk restrictions

Whether or not the land is affected by a policy:

- (a) adopted by council, or

- (b) adopted by any other public authority and notified to the council for the express purpose of its adoption by that

authority being referred to in planning certificates issued by the council,

that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding)?

Council's policies on hazard risk restrictions are as follows:

(i) Landslip

a) By The Hills Local Environmental Plan 2012 zoning?

NO

No resolution has been adopted but attention is directed to the fact that there are areas within the Shire liable to landslip.

b) By The Hills Local Environmental Plan 2012 local provision?

NO

No resolution has been adopted but attention is directed to the fact that there are areas within the Shire liable to landslip.

c) By The Hills Development Control Plan 2012 provision?

NO

No resolution has been adopted but attention is directed to the fact that there are areas within the Shire liable to landslip.

(ii) Bushfire

YES

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by bushfire. That question is answered in Section 11 of this certificate.

Council has adopted the NSW Rural Fire Service Guidelines entitled 'Planning for Bushfire Protection 2006'. Development subject to bushfire risk will be required to address the requirements in these guidelines and can be downloaded off the RFS web site www.rfs.nsw.gov.au

The Development Control Plan may also contain provisions for development on Bushfire Prone Land and Bushfire Hazard Management. Refer Part 1(3) of this certificate for the applicable Development Control Plan.

(iii) Tidal inundation

NO

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by tidal inundation.

(iv) **Subsidence**

NO

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by subsidence.

(v) **Acid sulphate soils**

NO

(vi) **Land contamination**

NO

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by contamination or potential contamination.

(vii) **Any other risk**

NO

7A. Flood related development controls information

- (1) Whether or not development on that land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls?

NO

Please note this is a statement of flood related development controls and is NOT a statement on whether or not the property is subject to flooding.

- (2) Whether or not development on that land or part of the land for any other purpose is subject to flood related development controls?

NO

Please note this is a statement of flood related development controls and is NOT a statement on whether or not the property is subject to flooding.

- (3) Words and expressions in this clause have the same meanings as in the standard instrument set out in the Standard Instrument (Local Environmental Plans) Order 2006.

8. Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

The Hills Local Environmental Plan 2012?

NO

Any other Planning Proposal?

NO

State Environmental Planning Policy?

NO

Proposed State Environmental Planning Policy?

NO

9. Contributions plans

The name of each contributions plan applying to the land:

THE HILLS SECTION 94A

9A. Biodiversity Certified Land

Whether the land is biodiversity certified land within the meaning of Part 7AA of the Threatened Species Conservation Act 1995?

NO

10. Biobanking Agreements

Whether the land is land to which a biobanking agreement under part 7A of the Threatened Species Conservation Act 1995 relates, (but only if the council has been notified of the existence of the agreement by the Chief Executive of the Office of Environment and Heritage)?

NO

11. Bush fire prone land

Has the land been identified as bush fire prone land?

NO

12. Property vegetation plans

Has the council been notified that a property vegetation plan under the Native Vegetation Act 2003 applies to this land?

NO

13. Orders under Trees (Disputes Between Neighbours) Act 2006

Whether an order has been made under the *Trees (Disputes Between Neighbours) Act 2006* to carry out work in relation to a tree on this land (but only if the council has been notified of the order)?

NO

14. Directions under Part 3A

Whether there is a direction by the Minister in force under section 75P (2)(c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect?

NO

15. Site compatibility certificates and conditions for seniors housing

(a) Whether there is a current site compatibility certificate (seniors housing) of which council is aware, issued under *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* in respect of proposed development on the land?

NO

(b) Whether there are any terms of a kind referred to in clause 18(2) of *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* that have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land?

NO

16. Site compatibility certificates for infrastructure

Whether there is a valid site compatibility certificate (infrastructure), of which the council is aware, in respect of proposed development on the land?

NO

17. Site compatibility certificates and conditions for affordable rental housing

(1) Whether there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land?

NO

(2) Whether there are any terms of a kind referred to in clause 17(1) or 38(1) of *State Environmental Planning Policy (Affordable Rental Housing) 2009* that have been imposed as a condition of consent to a development application in respect of the land?

NO

18. Paper subdivision information

- (1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.

NO DEVELOPMENT PLAN APPLIES

- (2) The date of any subdivision order that applies to the land.

NO SUBDIVISION ORDER APPLIES

- (3) Words and expressions used in this clause have the same meaning as they have in Part 16C of this Regulation.

19. Site verification certificates

Whether there is a current site verification certificate, of which the council is aware, in respect of the land?

NO

Note. A site verification certificate sets out the Secretary's opinion as to whether the land concerned is or is not biophysical strategic agricultural land or critical industry cluster land - see Division 3 of Part 4AA of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*.

20. Loose-fill asbestos insulation

Does the land include any residential premises (within the meaning of Division 1A of Part 8 of the *Home Building Act 1989*) that is listed on the Loose-Fill Asbestos Insulation Register that is required to be maintained under that Division?

Council has **not** been notified by NSW Fair Trading that the land includes any residential premises that are listed on the register. Refer to the NSW Fair Trading website at www.fairtrading.nsw.gov.au to confirm that the land is not listed on this register.

Note: There is potential for loose-fill asbestos insulation in residential premises that are not listed on the Register. Contact NSW Fair Trading for further information.

Note. The following matters are prescribed by section 59 (2) of the *Contaminated Land Management Act 1997* as additional matters to be specified in a planning certificate:

- (a) that the land to which the certificate relates is significantly contaminated land within the meaning of that Act – if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,

NO

- (b) that the land to which the certificate relates is subject to a management order within the meaning of that Act – if it is subject to such an order at the date when the certificate is issued,

NO

(c) that the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act – if it is the subject of such an approved proposal at the date when the certificate is issued,

NO

(d) that the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of the Act – if it is subject to such an order at the date when the certificate is issued,

NO

(e) that the land to which the certificate relates is the subject of a site audit statement within the meaning of the Act – if a copy of such a statement has been provided at any time to the local authority issuing the certificate.

NO

THE HILLS SHIRE COUNCIL

MICHAEL EDGAR
ACTING GENERAL MANAGER

Per: 

PLEASE NOTE: COUNCIL RETAINS THE ELECTRONIC ORIGINAL OF THIS CERTIFICATE. WHERE THIS CERTIFICATE REFERS TO INFORMATION DISPLAYED ON COUNCIL'S WEBSITE OR TO ANY EXTERNAL WEBSITE, IT REFERS TO INFORMATION DISPLAYED ON THE WEBSITE ON THE DATE THIS CERTIFICATE IS ISSUED.

ATTACHMENT 1(2)(A)**Sydney Metro Northwest Priority Precincts (Showground, Bella Vista and Kellyville)**

Draft Plans for the Sydney Metro Northwest Priority Precincts (Showground, Bella Vista and Kellyville) are currently being exhibited by the Department of Planning and Environment.

The draft Plans outline the vision for the Priority Precincts with respect to residential and employment growth, open space, retail and community facilities, built form and connectivity and sustainability. The draft Plans include proposed zonings, building heights, floor space ratios and Development Control Plans for each Precinct. The exhibition material also includes a number of specialist studies which have informed the proposed outcomes within each Precinct.

The draft Plans are on exhibition until 28 February 2016. The exhibition materials can be viewed on the Department of Planning and Environment website at the following link:

http://planspolicies.planning.nsw.gov.au/index.pl?action=job_listing&status=exhibition

ATTACHMENT 2(B)**Zone R2 Low Density Residential****1 Objectives of zone**

- To provide for the housing needs of the community within a low density residential environment.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.
- To maintain the existing low density residential character of the area.

2 Permitted without consent

Home business; Home occupations

3 Permitted with consent

Bed and breakfast accommodation; Boarding houses; Building identification signs; Business identification signs; Dual occupancies; Dwelling houses; Group homes; Health consulting rooms; Home-based child care; Roads; Any other development not specified in item 2 and 4

4 Prohibited

Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Car parks; Caravan parks; Cemeteries; Charter and tourism boating facilities; Child care centres; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Entertainment facilities; Environmental facilities; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Function centres; Health services facilities; Heavy industrial storage establishments; Helipads; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Information and education facilities; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Passenger transport facilities; Port facilities; Public administration buildings; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Research stations; Residential accommodation; Respite day care centres; Restricted premises; Rural industries; Service stations; Sewerage systems; Sex services premises; Signage; Storage premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres; Waste or resource management facilities; Water recreation structures; Water supply systems; Wharf or boating facilities; Wholesale supplies.

NOTE: This land use table should be read in conjunction with the Dictionary at the end of The Hills LEP 2012 which defines words and expressions for the purpose of the plan.

NOTE: Activities permitted without development consent are still subject to other provisions in Environmental Planning Instruments and/or Acts.

ATTACHMENT 2(B1)

A **proposed environmental planning instrument** applies to the land and identifies the land to be:

Zone R4 High Density Residential

1 Objectives of zone

- To provide for the housing needs of the community within a high density residential environment.
- To provide a variety of housing types within a high density residential environment.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.
- To encourage high density residential development in locations that are close to population centres and public transport routes.

2 Permitted without consent

Home businesses; Home occupations

3 Permitted with consent

Attached dwellings; Boarding houses; Building identification signs; Business identification signs; Child care centres; Community facilities; Dual occupancies; Dwelling houses; Home-based child care; Multi dwelling housing; Neighbourhood shops; Places

of public worship; Residential flat buildings; Respite day care centres; Roads; Shop top housing; Any other development not specified in item 2 or 4

4 Prohibited

Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Entertainment facilities; Environmental facilities; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Function centres; Heavy industrial storage establishments; Helipads; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Information and education facilities; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Passenger transport facilities; Port facilities; Public administration buildings; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Research stations; Residential accommodation; Restricted premises; Rural industries; Service stations; Sewerage systems; Sex services premises; Signage; Storage premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres; Waste or resource management facilities; Water recreation structures; Water supply systems; Wharf or boating facilities; Wholesale supplies.

NOTE: This land use table should be read in conjunction with the Dictionary at the end of The Hills LEP 2012 which defines words and expressions for the purpose of the plan.

NOTE: Activities permitted without development consent are still subject to other provisions in Environmental Planning Instruments and/or Acts.

Appendix K

Showground Station Precinct Hydrology and Drainage Report

Appendix K

Hydrology and Drainage Report

Showground Station Precinct



Planning &
Environment

Department of Planning &
Environment
Showground Station Precinct
Hydrology & Drainage Report

REP/H001

Issue | 20 August 2015

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 239035

Arup
Arup Pty Ltd ABN 18 000 966 165



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ARUP

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Figure 10 100 Year ARI Overland Flow Paths

Figure 11 100 Year ARI Overland Flow Paths - Severe Blockage Scenario

Figure 12 Proposed LEP Land Zoning Map

Figure 13 Proposed Precinct Plan - Land Uses

Figure 14 Flow Measurement Lines - Overland Flow Study

1 Introduction

This report has been prepared by Arup Pty Ltd (Arup) and provides an assessment of Hydrology and Drainage relating to the proposed rezoning of the Showground Station Precinct.

The Showground Station Precinct was announced by the NSW Government in August 2014. The precinct is one of number of Priority Precincts which aim to provide for more homes, jobs and improved public spaces close to transport and services. One of the key goals for Priority Precincts is to increase housing choice and affordability by delivering increased housing supply in an environmentally, socially and economically sustainable manner.

The Showground Station Precinct is located in The Hills Shire Local Government Area and covers approximately 271 hectares. The boundary of the precinct is generally based on the road boundary within a radius of 800 metres from the proposed Showground Station, which is normally considered to reflect a 10 minute walk. The boundary also takes in to account predominant land uses, built form and natural features.

The vision for the Showground Station Precinct is for a vibrant, mixed use centre comprising a mixture of offices, shops, community facilities, recreational, cultural and leisure activities, education, and a mix of housing types within walking distance of the new station.

The Showground Station Precinct is a long term project that will be delivered over the next 25 years.

2 Purpose

This report constitutes a desktop review of drainage and mainstream flooding / overland flow considerations that are important for The Showground Station Precinct (the Precinct).

This report is informed by a review of currently available existing hydrological, flooding and water sensitive urban design (WSUD) studies and policy documentation, including:

- local and site specific investigations undertaken during the assessment of the North West Rail Link (for civil and construction works);
- overland flow modelling and overland flow mapping data relevant to the Precinct (from Council's draft Urban Overland Flow Study);
- The Hills Local Environmental Plan 2012 (The Hills LEP 2012) flood provisions, and
- The Hills Development Control Plan 2012 (The Hills DCP 2012) flooding and water sensitive urban design controls.

Having undertaken the review of Council's existing instruments and hydrological / hydraulic information provided, this report further summarises and assesses stormwater quality and quantity considerations that will impact rezoning proposals for the Precinct. The assessment therefore aims to:

- Identify flood affected land and provide recommendations on how it should be considered in the precinct plans
- Advise on appropriate flood planning levels
- Identify any infrastructure works identified within the existing documentation required to manage flood levels
- Provide recommendations for any additional flooding or water sensitive design controls to be incorporated into Council's existing or new site-specific DCP.

3 Showground Station Precinct

3.1 Introduction

Located entirely within The Hills Local Government Area (The Hills LGA), Showground Station Precinct (the Precinct) covers approximately 271 hectares. The Precinct extends to Showground Road and slightly beyond to the north at Kathleen Avenue, Windsor Road to the west and south, and Fishburn Crescent to the south-east.

Figure 1 Showground Station Precinct Extents



3.2 Current Land Use and Runoff Potential

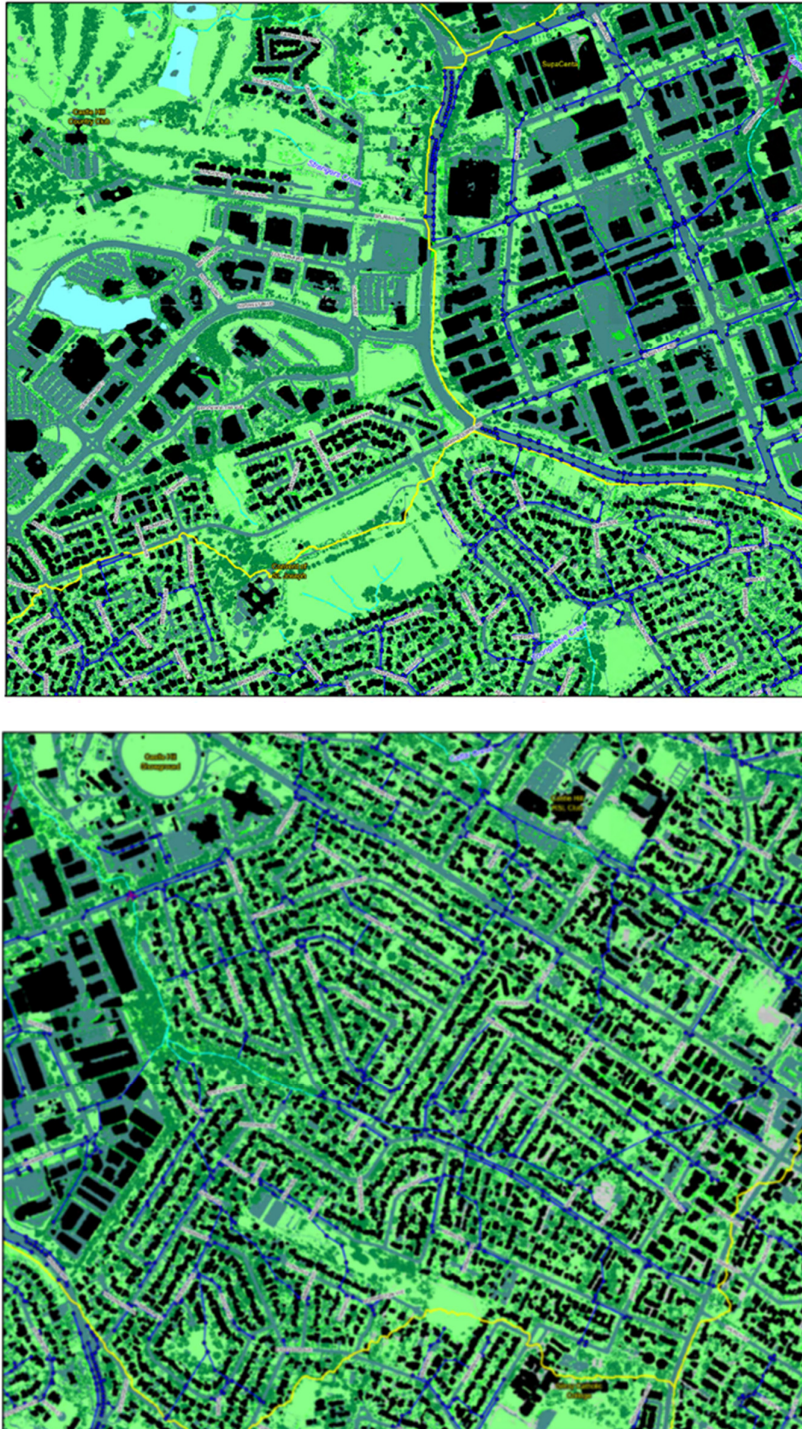
With reference to The Hills LEP 2012 land zoning map, the land use is mainly comprised of light industrial, business development and low density residential areas. The Castle Hill Showground, situated to the north-east of the site, is classified as a public recreation area along with part of Cattai Creek at Cockayne Reserve.

With respect to the potential for generation of stormwater run-off in a rainfall event, it can be seen that the light industrial and business development areas are predominantly hardstanding areas, as they consist of large building roofs and concrete surfaces / asphalt roads.

As can be seen in Figure 2 below, for the low density residential areas to the east and south east of the business district, and the Castle Hill Showground, the percentage of impermeable area (denoted in black and grey) is considerably lower.

Those areas in The Hills LEP 2012 land zoning map along Carrington Road that are currently classified as general residential and as an enterprise corridor represent the location of the proposed Showground North West Rail Link station.

Figure 2 Land Use - Surfacing Types



Source: The Hills Draft Urban Overland Flow Study

3.3 Topography

With reference to Figure 3, within the subject area, the topography ranges from 124m AHD (at the junction of Windsor Road and Showground Road) down to 64m AHD at Cattai Creek where it flows under Showground Road.

Figure 3 Topography within Subject Area



Source: Showground Structure Plan 2013. Precinct boundary has subsequently been amended.

3.4 Drainage and Watercourses

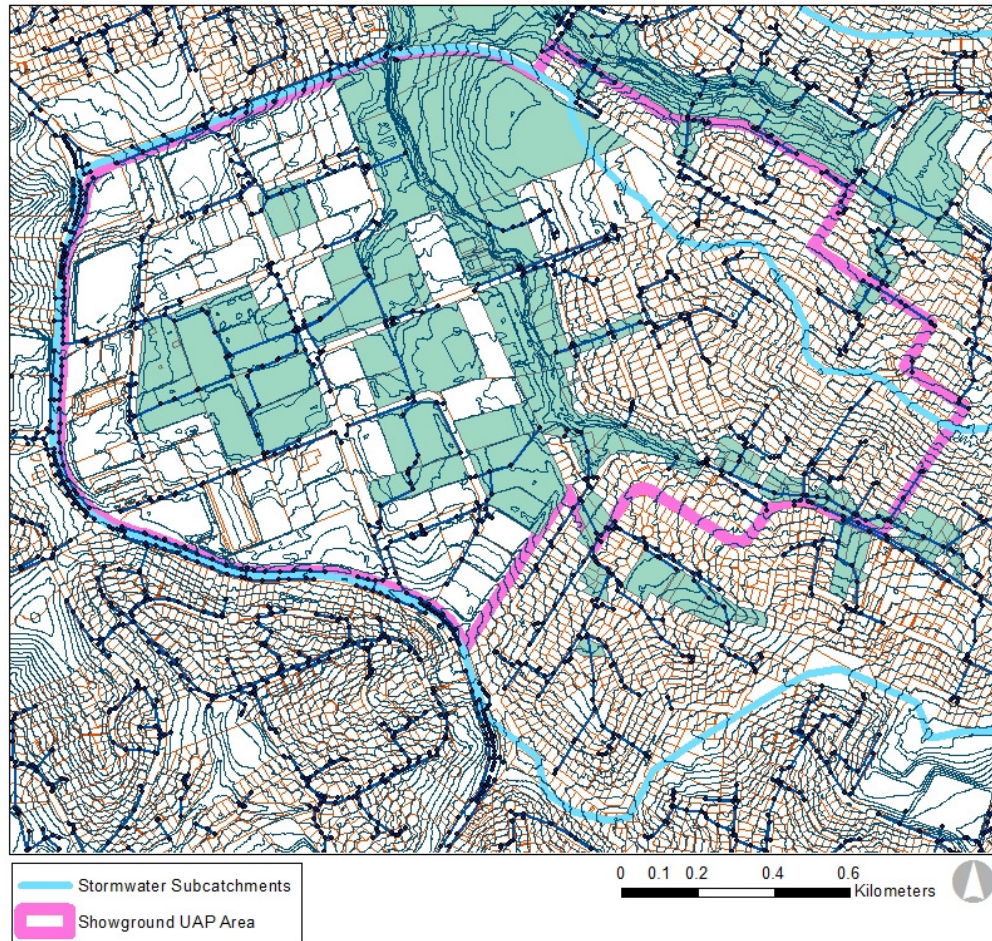
With reference to Figure 4, the Precinct extends over two subcatchments of Cattai Creek, a tributary of the Hawkesbury River. The majority of the Precinct area drains directly to Cattai Creek, which first becomes an open channel at Cockayne Reserve, and drains north (along the western boundary of Castle Hill Showground) towards Showground Road, just upstream of Fred Caterson Recreation Reserve.

A smaller portion of the Precinct to the north east drains to a tributary of Cattai Creek and becomes an open watercourse at Britannia Road. This channel joins at Fred Caterson Recreation Reserve, just to the north of the Precinct area.

As can also be seen in the drawing, there are subcatchments upstream of the Precinct extents to the south and east that drain to these tributaries. These areas are mostly comprised of low residential housing.

With reference to Figure 4, there is a considerable stormwater drainage network within this catchment which is owned and maintained by The Hills Shire Council (the Council). It is important to note that the condition of these pipes is not known.

Figure 4 Showground Station Precinct stormwater drainage network and upstream catchment



The only Sydney Water infrastructure within the catchment is for sewage and water supply. It has been noted that there is a Sydney Water sewer overflow into Cattai Creek near the Castle Hill Showground.

3.5 Riparian Features

Cattai Creek first becomes an open watercourse at Cockayne Reserve, where an 1800mm diameter stormwater pipe drains to this location from the upper reaches to the south east. These upper reaches are relatively steep and well developed.

From this location the creek flows northwards, past the Castle Hill Showground, where it discharges under Showground Road (the northern boundary of the Precinct) towards Fred Caterson Reserve. Along the creek itself, it appears to be heavily vegetated, with the EIS for The Showground NWRL station stating that this gives the potential to generate large amounts of debris in flood waters. It will therefore be important that any future flood modelling undertaken for this area addresses this issue through consideration of appropriate blockage scenarios.

4 Current Council Policy Documents

Proposed developments are currently subject to Council's DCP (2012) and LEP (2012). The "Design Guidelines for Subdivision Developments (Aug 2009)" provides engineering guidelines for the subdivision and development of land, and also prescribes the on-site stormwater detention requirements for a property.

Below is an outline of those sections of the above documents most relevant to the Precinct in relation to drainage, overland flows, and Water Sensitive Urban Design (WSUD).

4.1 LEP 2012

Clause 7.3 of the LEP outlines Council's flood planning requirements. The clause applies to all land at or below the flood planning level, which is defined in this clause as the 1:100 year ARI (average recurrence interval) flood plus 0.5m freeboard. The clause uses terminology consistent with NSW Floodplain Development Manual (2005) to allow accurate definition.

The clause states that *"Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development:*

- (a) is compatible with the flood hazard of the land; and*
- (b) is not likely to significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties, and*
- (c) incorporates appropriate measures to manage risk to life from flood, and*
- (d) is not likely to significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses, and*
- (e) is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding."*

4.2 DCP 2012

The DCP 2012 applies to all land within The Hills LGA, and aims to provide a comprehensive document that contains all development controls, standards and provisions that apply to land in The Hills LGA. This DCP also ensures that development incorporates the principles of Ecologically Sustainable Development (ESD).

Along with the LEP 2012, this document provides advice and outlines the objectives of stormwater management for various areas.

4.2.1 DCP Part B

The DCP provides different objectives for stormwater management depending on land use type. For those land use types currently within the LEP 2012 for the subject site, the range of objectives for stormwater management are as follows:

- B2 – Residential Areas

The objectives for stormwater management in residential areas are:

- To provide for the disposal of stormwater from the site in efficient and environmentally sensible ways in accordance with Council's ESD Objective 3.
 - To control stormwater and to ensure that developments do not increase downstream drainage flows or adversely impact adjoining or downstream properties.
 - To ensure the integrity of watercourses is protected and enhanced in accordance with Council's ESD Objective 4.
 - To provide for on-site detention of stormwater.
 - To encourage the reuse of stormwater
- **B6 – Business Areas**

For those cadastral lots within the Precinct that are classified as a business zone in accordance with the LEP, the objectives for stormwater management are as listed below:

- To ensure that commercial/retail development does not impact on the water quality of adjacent properties or creeks in accordance with Council's ESD Objective 2.
 - To ensure that development does not increase downstream flooding.
 - To encourage reuse, recycling and harvesting of stormwater to reduce wastage of water in accordance with Council's ESD Objective 2.
 - To encourage the re-use of stormwater for the irrigation of landscaped areas, particularly during establishment periods in accordance with Council's ESD Objective 2.
 - To provide for the disposal of stormwater from the site in efficient, equitable and environmentally sensible ways.
- **B7 – Industrial Areas**

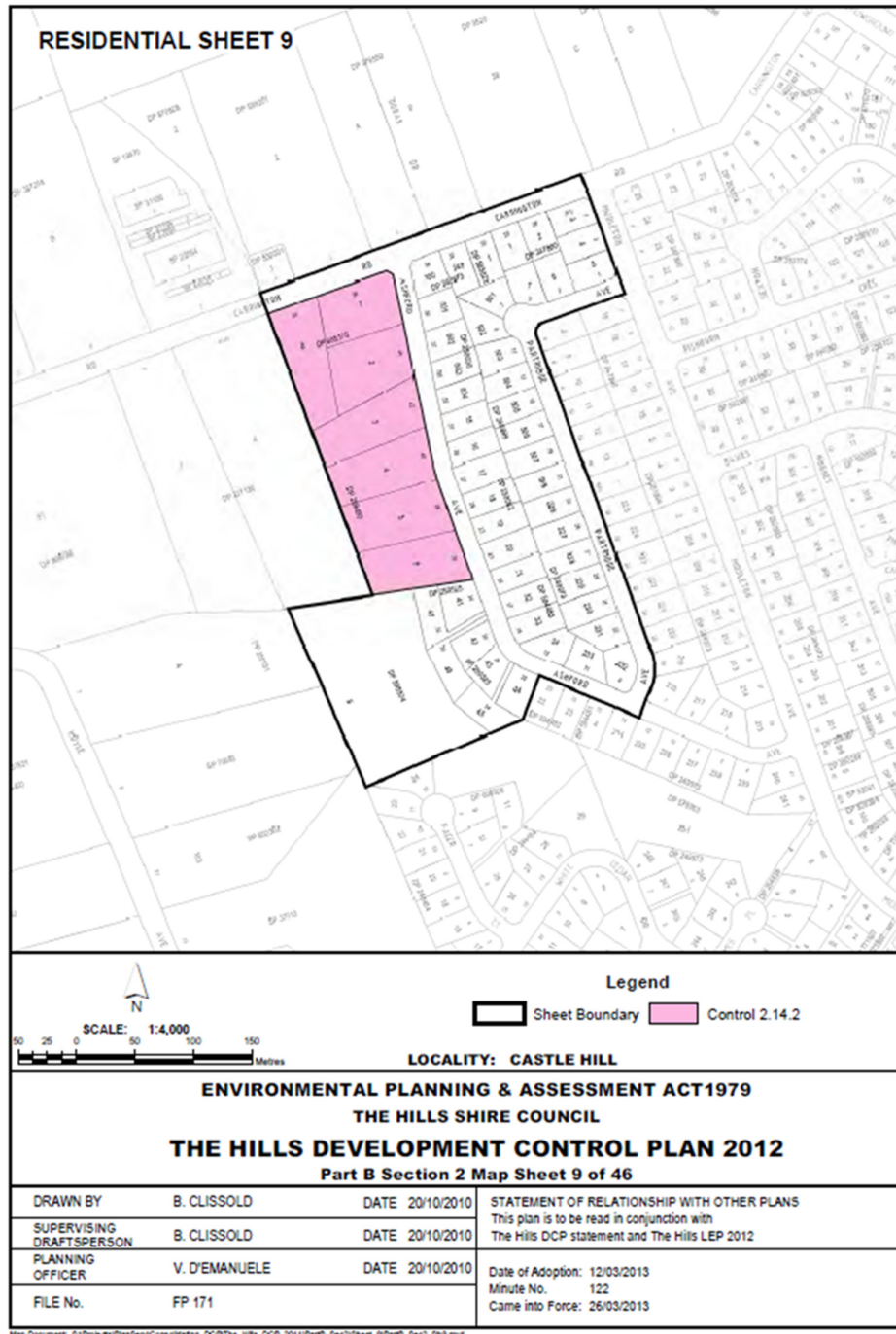
For those cadastral lots within the Precinct that are classified as a light industrial in accordance with the LEP, the objectives for stormwater management are as listed below:

- To ensure that industrial development does not impact on the water quality of adjacent properties or creeks.
- To provide for the disposal of stormwater from the site in efficient, equitable and environmentally sensible ways.
- To encourage the re-use of stormwater for the irrigation of landscaped areas, particularly during establishment periods.

4.2.2 Site Specific Objectives and Development Controls

There is one site within the Precinct which has specific development controls, as shown below, which has a maximum site coverage of 30%, compared to the normal 60%. As Cattai Creek runs through these cadastral lots, it is assumed that this reduction is to meet the objective of DCP Section 2.14.2 to “avoid the creation of drainage and runoff problems, through minimising the amount of impervious area in accordance with Councils’ ESD Objective 3”. Future planning for this site will need to consider and investigate further these constraints.

Figure 5 Specific Development Controls – Carrington Road / Ashford Avenue



4.2.3 Flood Controlled Land

Part C6 of the DCP provides advice on those lots that are classified as flood controlled land (i.e. land to which a flood related development control applies). The aim of this section of the DCP is to provide development controls to guide the management of flood risks associated with development by:

- Increasing public awareness of the hazard and extent of land affected by all potential floods, including floods greater than the 100 year average recurrence interval (ARI) flood and to ensure essential services and land uses are planned in recognition of all potential floods.
- Informing the community of Council's policy for the use and development of flood controlled land.
- Managing the risk to human life and damage to property caused by flooding through controlling development on land affected by potential floods.
- Minimising the potential impact of development and other activity upon the amenity, aesthetic, recreational and ecological value of the waterway corridors and the surrounding environment.

4.2.3.1 Flood Planning Levels

Part C6 of the DCP is the section that also provides guidance on how to apply appropriate flood planning levels for new developments. Section 1.6 outlines that *“a range of flood planning levels (FPL) may apply depending on the type of land use and the part of the development in consideration. In principle, a higher FPL will apply to land uses considered more sensitive to flood hazards or which may be critical to emergency management operations or the recovery of the community after a flood event”*.

Part C6 includes overarching development controls relating to ensuring the development does not increase flood effects to other properties.

In addition, four potential Flood Planning Levels are defined as shown in Table 1 below.

Table 1 Flood Planning References and Levels (DCP Part C6 Table 1)

Flood Planning Levels Reference	Flood Planning Level
FPL 1	20 year ARI
FPL 2	100 Year ARI
FPL3	100 Year ARI +0.5m Freeboard
FPL 4	PMF

These flood planning levels are then applied to six land use categories, as summarised in Table 2. Key flooding controls only have been included as the DCP provides detailed descriptions.

Table 2 Flood Planning Levels by Land Use Category

Land Use Category	Key Flood Planning Level Controls
Critical Uses and Facilities	Not suitable on flood affected land up to FPL 4
Sensitive Uses and Facilities	No development in floodway, flowpath or high hazard area up to FPL4 Habitable Floors: FPL4 Non habitable Floors: FPL3* Open car parks: as high as practical, minimum FPL1 Enclosed car parks (<20 vehicles): FPL 2 Enclosed car parks (>20 vehicles): FPL 3
Residential	No development in floodway, flowpath or high hazard area up to FPL2* Habitable Floors: FPL3 Non habitable Floors: FPL3 (preferred) FPL1 (minimum)* Open car parks: as high as practical, minimum FPL1 Enclosed car parks (<20 vehicles): FPL 2 Enclosed car parks (>20 vehicles): FPL 3
Commercial or Industrial	No development in floodway, flowpath or high hazard area up to FPL2* Habitable Floors: FPL3 Non habitable Floors: FPL3 (preferred) FPL1 (minimum)* Open car parks: as high as practical, minimum FPL1 Enclosed car parks (<20 vehicles): FPL 2 Enclosed car parks (>20 vehicles): FPL 3
Recreation or Non-urban Uses	No development in floodway, flowpath or high hazard area up to FPL2* All floor levels: FPL1* Open car parks: as high as practical
Concessional Development	No development in floodway, flowpath or high hazard area up to FPL2* New habitable floor levels: FPL3* Open car parks: no lower than design floor level or ground level*

* Unless justified by a site specific assessment

The existing development comprises predominantly residential, commercial or industrial and recreation land uses. Based on the table above, a flood planning level of 100 year ARI + 500mm freeboard would generally be applicable to new habitable flood levels.

4.2.4 Water Sensitive Urban Design

Appendix B of the DCP supplements the existing DCP 2012 requirements to provide WSUD in light industrial areas, and prescribes that two WSUD measures are to be selected from the following:

- M1 – Low Impact Building Design
- M2 – Low Impact Landscape Design
- M3 – Porous Paving
- M4 – Rainwater Utilisation – toilet, hot water

- M5 – On-site infiltration system
- M6 – Stormwater Treatment System
- M7 – Infiltration or Retention System
- M8 – Stormwater Utilisation – irrigation

4.3 Design Guidelines Subdivision / Developments

Other than the LEP 2012 and DCP 2012, the Design Guidelines Subdivision / Developments provides “*engineering guidelines for the subdivision and development of land and to facilitate the efficient processing of engineering plan submissions for subdivisions and developments*”.

Within these guidelines, Section 4 outlines the requirements for stormwater drainage design within the LGA. Some sections of note within this drainage guideline that are particularly applicable to the Precinct are as follows:

- Section 4.22: On-Site Stormwater Detention
- Section 4.25: Water Sensitive Urban Design

The Design Guidelines also state that all new development proposals are to incorporate Water Sensitive Urban Design (WSUD), with the aim being to provide “sustainable and integrated management of land and water resources, incorporating best practice stormwater management, water conservation and environmental protection measures.”

4.3.1 On-Site Stormwater Detention

The Hills LGA drains to two main catchments, the Upper Parramatta River Catchment and the Hawkesbury River Catchment. As the Precinct, and Cattai Creek, are subcatchments of the Hawkesbury River, the on-site stormwater detention (OSD) requirements applicable to the Precinct are as follows.

- “...where a proposed development drains to the Hawkesbury River Catchment OSD will be required.”
- *The Permissible Site Discharge (PSD) and Site Storage Volume (SSV) requirements shall be derived from Table 4.14 for that portion of the Hawkesbury River Catchment area that falls within the Shire.*

Site Slope	PSD (l/s/ha)	SSV (m³/ha)
Greater than 15%	136	298
Between 10% and 15%	115	336
Between 6% and 10%	104	362
Between 3% and 6%	92	396
Between 0% and 3%	87	412

Table 4.14 - PSD and SSV Requirements for the Hawkesbury River Catchment

Section 4.22 of the OSD guidelines state that sites within catchment areas draining to an existing approved detention system are exempted from the requirement for on-site detention. It is understood that this exemption typically applies to new release areas, but would also be applicable should a centralised OSD strategy be feasible for the Precinct.

4.3.2 Water Sensitive Urban Design

The section of the guidelines states that the “*objective of Water Sensitive Urban Design (WSUD) is for a post development water cycle to replicate or improve upon the pre-development water cycle through the use of design techniques to reduce development impact on receiving waters.*”

The guideline requires all proposals subject to a Development Application process to incorporate WSUD measures, and that those measures be designed with ongoing operation and maintenance in mind. A number of WSUD measures are recommended for consideration, including rainwater tanks, stormwater treatment devices, biofiltration, bioretention, detention basins, swales, porous paving/surfaces, wetlands and gross pollutant traps. The guideline requires WSUD measures to be designed and constructed in accordance with:

- Water Sensitive Urban Design Technical Guidelines for Western Sydney (NSW Government Stormwater Trust and UPRCT, May 2004); and
- Australian Runoff Quality (Engineers Australia 2005)

It is worth noting that neither the LEP 2012, DCP 2012, nor any other LGA-wide Hills Shire Council guideline appears to give a “target-based” approach for the reduction in stormwater pollutant generation, although this is however included in Table 2.7 of the Water Sensitive Urban Design, Technical Guidelines for Western Sydney which is referred to in the Council DCP. The targets in the Technical Guidelines for Western Sydney apply to “medium-scale developments” generally defined as those greater than 2,500m² total area.

Additionally, Hills Shire Council have included “target-based” water quality performance objectives within the North Kellyville DCP 2014 and Box Hill/Box Hill Industrial Precinct DCP 2014. The targets have been determined by the NSW Office of Environment and Heritage (OEH). A comparison of the targets from the Technical Guidelines for Western Sydney and the recent Hills Shire Council specific precinct DCP’s is provided in Table 3 below.

Table 3 Comparison of Stormwater Quality Performance Objectives

Pollutant	WSUD Technical Guidelines for Western Sydney	North Kellyville and Box Hill/Box Hill Industrial Precinct DCP's
Litter	70% of average annual litter load (greater than 5mm)	90% of average annual litter load (greater than 5mm)
Coarse Sediment	80% of average annual load for particles 0.5mm or less	85% of annual average load
Fine Particles	50% of average annual load for particles 0.1mm or less	-
Total Phosphorous	45% reduction in the post development mean annual load of Total Phosphorous	65% reduction in the post development mean annual load of Total Phosphorous
Total Nitrogen	45% reduction in the post development mean annual load of Total Nitrogen	45% reduction in the post development mean annual load of Total Nitrogen
Hydrocarbons, oil and grease	90% of average pollutant load.	-

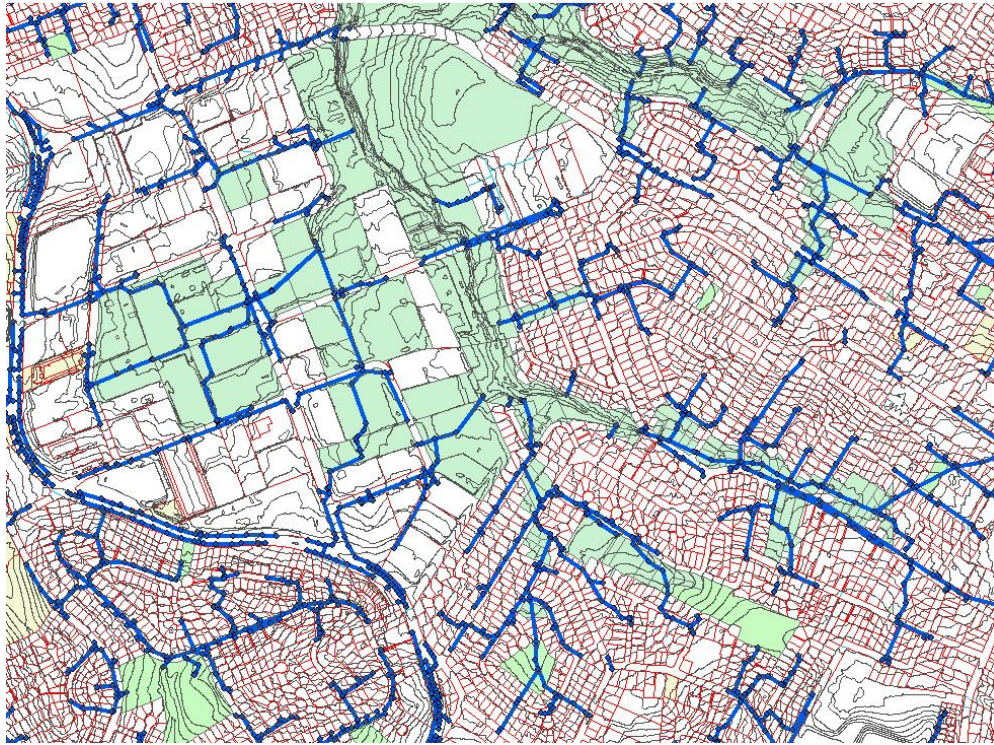
It is understood through consultation with Hills Shire Council that developers are to demonstrate compliance with the pollutant reduction targets above through industry standard MUSIC water quality modelling (or equivalent) and that this is undertaken upon the submission of the Preliminary Engineering Drainage Plans in a Development Application. Requirements for MUSIC modelling are explicitly stated within the submission are not explicit within Council's plans and policy documents North Kellyville DCP 2014 and Box Hill/Box Hill Industrial Precinct DCP 2014, but not within the general DCP 2012.

4.4 Identification of Flood Affected Land

The Council have an existing hierarchy of flood information, which varies in detail across The Hills LGA. Part of this information consists of flood control lot mapping (i.e. land to which a flood related development control applies), which has been supplied by the Council for the purposes of this study.

The following mapping illustrates properties (shaded green) within the Precinct and associated upstream catchment that are currently classified by Council as "Flood Control Lots" (i.e., lots subject to a flood-related development control). While development on these land parcels may be constrained, development is not prohibited.

Figure 6 Existing Flood Control Lot Mapping



Source: *The Hills DCP 2012*

Upon finalisation and adoption of the Urban Overland Flow Study, that this Flood Control Lot mapping may be reviewed by Council. An overview of the Urban Overland Flow Study is provided in Section 6.

5 Previous Hydrological & Hydraulic Studies / Existing Information

Arup have undertaken a desktop review of the information that has been provided to date by Council and the Department of Planning and Environment (the Department). This information has taken the form of guidelines, reports, and GIS information to date. The following sections summarise the initial findings of this review, and will be updated before the final submission if further information is received.

5.1 The Hills Shire Council Studies

It is understood that reports relating to the stormwater drainage catchment for the Precinct are as follows:

- Urban Overland Flowpath Mapping Project (2010)
- Cattai Ridge Road XP-RAFTS model
- The draft Urban Overland Flow Study Project (ongoing): discussed in Section 6 of this report.

5.1.1 Urban Overland Flowpath Mapping Project (2010)

An overview of the Urban Overland Flowpath Mapping Project (2010) has been provided in the current draft Urban Overland Flow Study.

As such, the Urban Overland Flowpath Mapping Project “...was prepared to identify land across the urban areas of the LGA that may be traversed by an overland flowpath. In doing so, the study was designed to assist Council in defining land that should be subject to a flood related development control (i.e., flood control lots).

The flow path start (i.e., initiation) points were defined using the following criteria:

- *Peak 100 Year ARI Discharge > 0.9 m³/s; or*
- *Peak 100 Year ARI Discharge > 0.4 m³/s and the terrain is ‘incised’ (i.e., channelised).*

Peak 100 year ARI discharges were estimated for each DEM cell using relationships that related discharge to the contributing catchment area and upstream impervious proportion.

The resulting flow path alignments were verified relative to lots that were previously identified by Council as flood controlled land. The alignments were also verified against lots where flood and drainage complaints had previously been received.

The outcomes of the study determined that the mapped flow paths provided a reasonable representation of the start location and alignment of urban overland flow paths across the LGA. However, the study does not provide any indication of the potential depth, extent and velocity of water along these flow paths.”

5.1.2 Cattai Ridge Road XP-RAFTS Model

An overview of the Cattai Ridge Road XP-RAFTS model has been provided in the current draft Urban Overland Flow Study. The XP-RAFTS model of the Cattai Creek catchment *“was originally developed as part of a proposed upgrade of the McClymonts Road causeway crossing to accommodate a fish passage. The model was subsequently extended further downstream to Cattai Ridge Road by Council.*

The model extension was completed as part of the proposed replacement of the Cattai Ridge Road crossing of Cattai Creek.

The upper sections of the XP-RAFTS model are contained within Drainage Catchment 4...” (the area pertaining to the catchment of the Precinct).

“Accordingly, the design discharge estimates generated by the XP-RAFTS model across this section of the catchment could be used to assist in the verification of the hydrology..” [for the current Urban Overland Flow Study].

Although the XP-RAFTS model was used to inform the current Urban Overland Flow Study used this XP-RAFTS model, the current study supersedes any information contained within this earlier study.

5.2 Other Council Flood Information

Other than the existing and previous hydrological / hydraulic studies that have been undertaken on behalf of Council, it is understood that Council also possess supplementary information related for the Hills LGA in relation to flooding, which include:

- Flood complaints database
- Historic Flood photographs

It is understood that this supplementary information has been used in the draft Urban Overland Flow Study.

5.3 Existing On Site Detention storage provisions

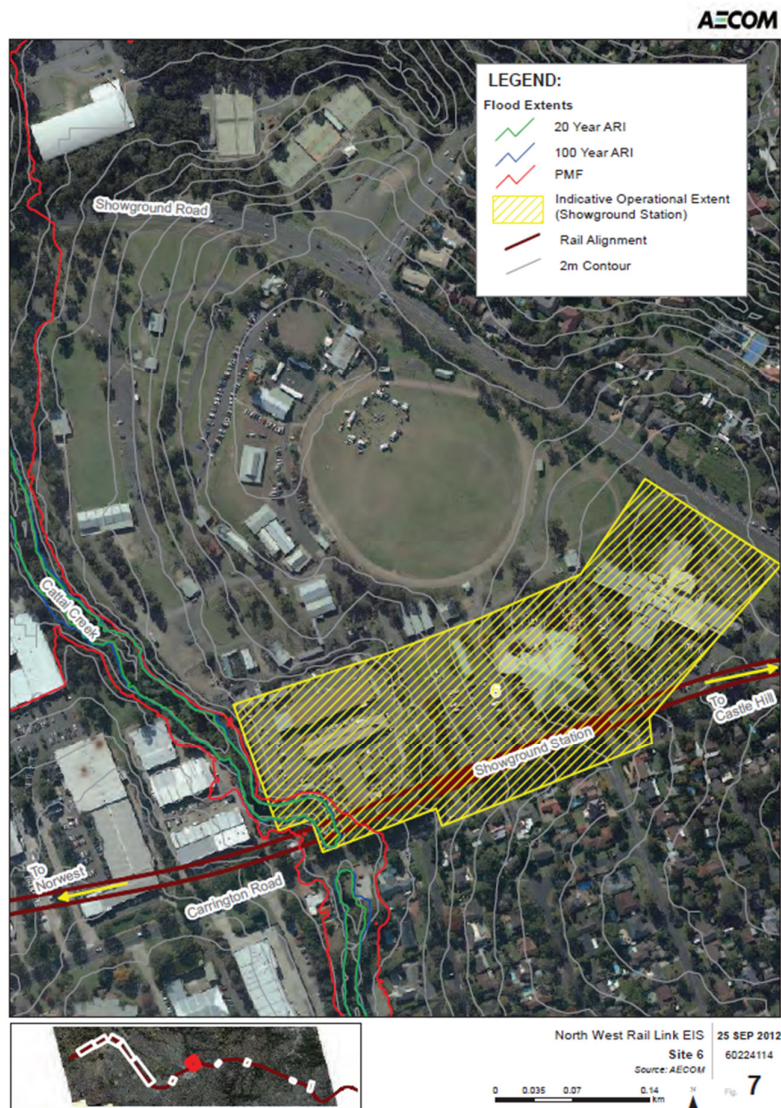
Other than the supplementary flood information, it is understood that Council also possess information in relation to those existing properties that have OSD storage installed within the lot, although much of the existing development pre-dates the commencement of Council's OSD policy (1991). This information was requested from Council but not received within the time constraints of this project.

5.4 Information prepared by Others

With regards to information or studies that have been undertaken by those other than Council, the most relevant hydraulic study that has been undertaken was as part of the Showground NWRL Station EIS, by AECOM on behalf of Department of Transport for NSW (TfNSW).

This work concentrated on Cattai Creek, as anecdotal evidence suggests that part of the Carrington Road area has been subject to flooding from Cattai Creek in the past. The study involved 1D modelling in HEC-RAS for a limited area of Cattai Creek only, and as such, the study does not consider flooding caused from overland flow. It does not therefore identify the flood risk to all properties within the Precinct, nor is it directly comparable to the more detailed studies being undertaken by Council. As can be seen in Figure 7, the land either side of the creek is at risk of flooding as expected, but it is mainly confined to existing open space areas in the LEP 2012 mapping.

Figure 7 Flood extents of Cattai Creek around Showground NWRL Station



Source: Showground NWRL Station EIS (Aecom on behalf of TfNSW).

5.5 Water Quality

Other than the high level information provided as part of the EIS in relation to water quality, there is little available information in relation to pollutant generation within the catchment, or the current ecological / water quality health of Cattai Creek. It is noted that a Sydney Water sewer overflow spills into Cattai Creek from the industrial estate. Information in relation to the spill volume or frequency however is not known.

6 The Hills Shire Council Urban Overland Flow Study (Draft)

As discussed previously, Council have commissioned Catchment Simulation Solutions to undertake an overland flow study for a 68km² area, primarily the older, existing urban areas of the LGA, to determine those cadastral lots that will be affected.

Council have advised that the overland flow results from this 1d/2d TUFLOW model are considered to be the most accurate information that will be available for the Precinct. As such, Arup assume that this takes precedence over all previous studies undertaken by or on behalf of Council or others.

At the time of completion Showground Urban Activation Precinct study, this project was still in progress. The draft Urban Overland Flow Study (Revision 1, October 2014) has been provided by Council for assessment. This section outlines the objectives of the report, the key features of the hydraulic model, and the main report findings.

6.1.1 Aims of The Hills Urban Overland Flow Study

The objectives of the Urban Overland Flow Study outlined by Council for the project included the following:

- Define flooding behaviour across the study area for existing topographic and development conditions;
- Produce information on flood levels, flood depths, flow velocities and discharges for the 10 year, 20 year and 100year ARI design floods;
- Use the results of the design flood simulations to define the variation in flood hazard across the study area for each design flood;
- Use the results of the design flood simulations to define the variation in hydraulic categories across the study area for each design flood;
- Identify properties within the study area where a flood related development control applies; and
- Document the outcomes of the study in a comprehensive report

In order to meet the above study objectives, the study included a review of available hydrological / hydraulic information, the compilation of a TUFLOW flood model to simulate historical flood events, verification of the historic flood information, and use of the verified TUFLOW model to derive design events for the 10 year, 20 year and 100 year ARI.

The study was not required to consider climate change.

6.1.2 Definition of Overland Flow

The report states that *"...the TUFLOW models were used to simulate design flood behaviour for the 10, 20 and 100 year ARI floods. The results of the TUFLOW simulations were subsequently "filtered" to identify those areas across each catchment where the depth and velocity of overland flows may present a*

significant hazard to people and/or cause damage to private and public properties.”

All overland flow paths show areas where the depth and/or velocity of overland flows are sufficient to cause a potential risk to personal safety and/or damage to property during the nominated flood event. For the purposes of the overland flow results mapping provided in Figure 8 through Figure 11, overland flows that meet any of the criteria listed in Table 4 below have been mapped.

Table 4 Adopted Depth & Velocity Criteria for presentation of Overland Flow Results

Criteria	Depth (m)		Velocity (m/s)		Velocity x Depth (m ² /s)
Instability of Children	≥0.5	OR	≥3.0	OR	≥0.4
Mobilisation of vehicles (floating)	≥0.3	AND	≥0.0	AND	≥0.3
Mobilisation of vehicles (sliding)	≥0.1	AND	≥3.0		
Overtopping of gutters/inundation of private/public property	≥0.17	AND			≥0.4
	≥0.3	AND	≥0.0		

Source: The Hills Draft Urban Overland Flow Study

6.1.3 Blockage Factors

It is important to note that these overland flow results are based on stormwater system inlets and culvert inlets using the following blockage factors (which are typical current guidance within available literature):

- “On grade” stormwater pits = 20% blockage
- “Sag” stormwater pits = 50% blockage
- Culverts with height < 3 metres or width < 5 metres = 20% blockage
- Culverts with height > 3 metres and width > 5 metres = 10% blockage

6.1.4 Draft Overland Flow Results

As planning for the Precinct will need to consider 100yr ARI overland flows, this review concentrates on those results. However, 10 yr and 20 yr ARI mapping has been included and discussed in this section in relation to potential drainage network infrastructure constraints.

6.1.4.1 10 Year and 20 Year ARI Results

Figure 8 (a and b) and Figure 9 (a and b) illustrate the 10 year ARI and 20 year ARI overland flow paths respectively (as defined in Table 4 above), extracted from the Hills Draft Urban Overland Flow Study.

Areas where overland flows are present in the 10 year ARI event indicate areas where Council's current stormwater drainage design standard is unlikely to be currently being met. These areas indicate opportunities for improvement in performance during the redevelopment of the Precinct.

With reference to Figure 8 (a), it can be seen that within the industrial and commercial estate, overland flows are evident in the 10 Year ARI event along the low lying areas in the natural topography, with one major and one minor overland flow paths from the Creek through to Victoria Avenue. Flow depths for these overland flow routes are typically less than 0.5m, with the primary overland flow path near to the bend of Salisbury Avenue indicating depths of 1.0m in limited areas.

The 20 year ARI results for the industrial and commercial estate (Figure 9a) indicate only limited increases in depths and extents of overland flows along the same flow lines as the 10 year ARI.

Within the residential estate to the south and east of the Creek, there are also two main overland flow paths that drain through existing residential blocks to Cockayne Reserve. Again there is very little difference in depth and extent of overland flow between the 1 in 10 year ARI and 1 in 20 year ARI, with flow depths in these flow paths ranging from 0.1m to between 0.5m and 1.0m.

The network of east-west streets within the precinct typically follows crest lines in the local topography rather than sag lines. Upgrading drainage infrastructure within the existing streets may therefore have limited potential in relieving flooding along the overland flow paths.

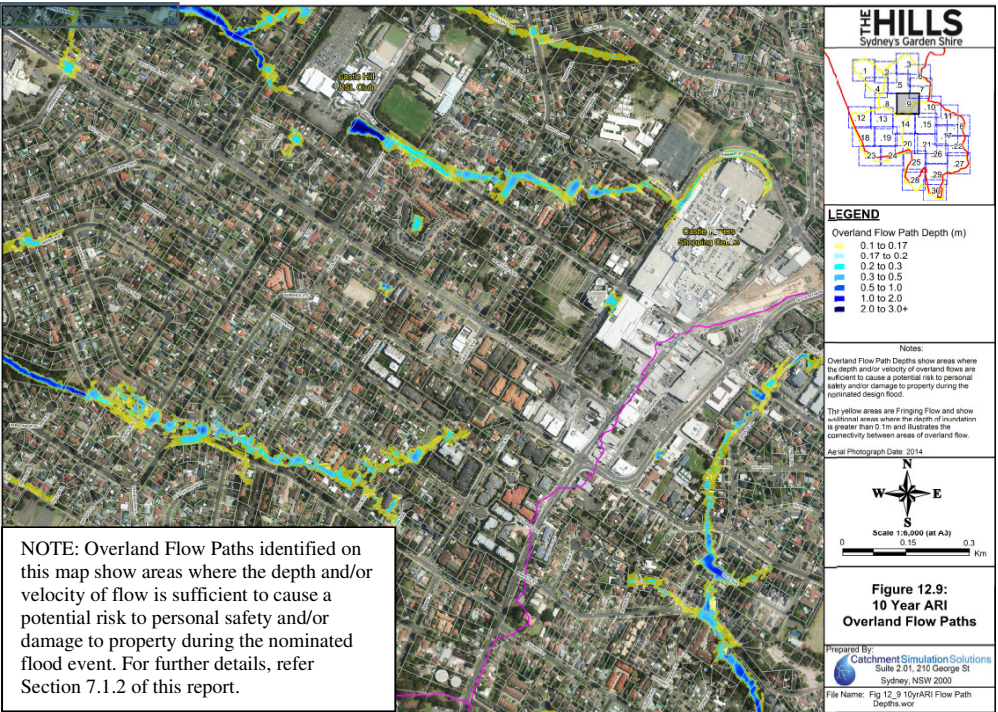
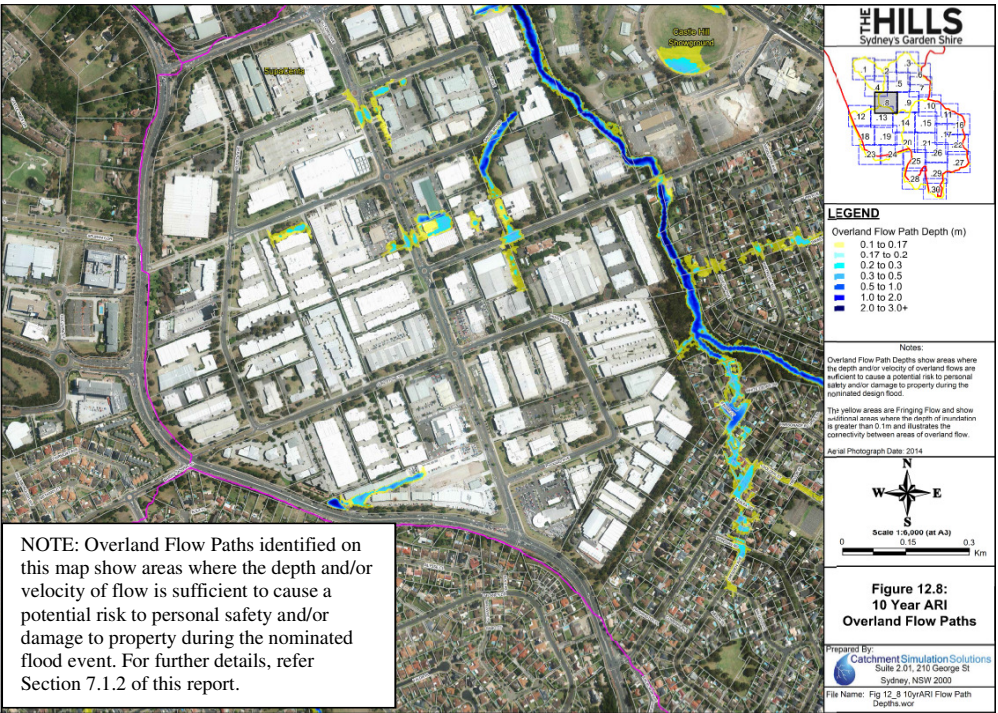
6.1.4.2 100 Year ARI Results

With reference to Figure 10 (a and b), it can be seen that within the industrial / commercial estate, overland flows follow similar lines to the 10 year and 20 year ARI events. Flow depths for these overland flow routes appear to range from 0.1m, to approximately 0.5m to 1.0m in limited areas.

Within the residential estate to the south east of the business area, overland flows also follow similar lines to the 10 year and 20 year ARI events. Again, the flow depths in these flow paths appear to range from 0.1m to between 0.5m and 1.0m.

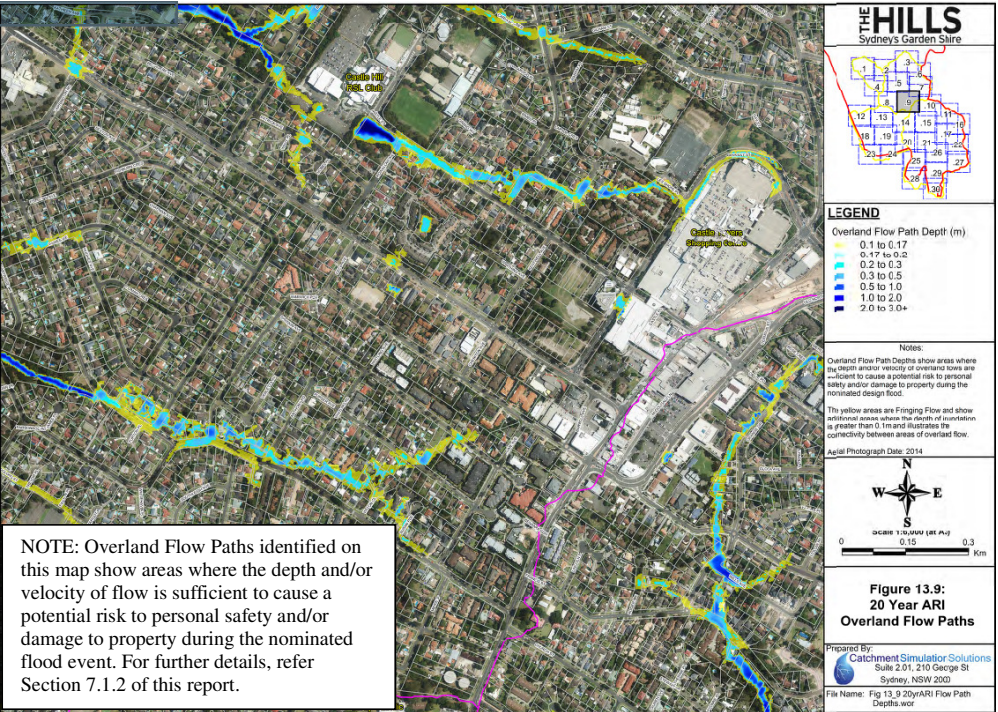
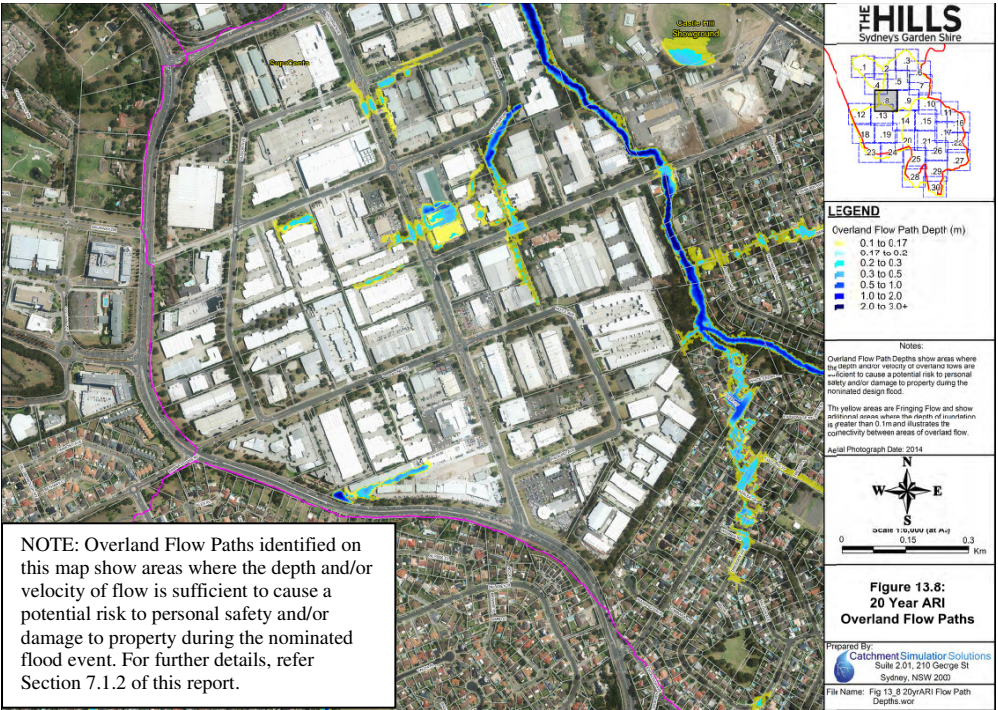
While there is an increase in overland flow path extent between the minor (10 year/20year) and major (100 year) events, the increase is relatively minor.

Figure 8 10 Year ARI Overland Flow Paths



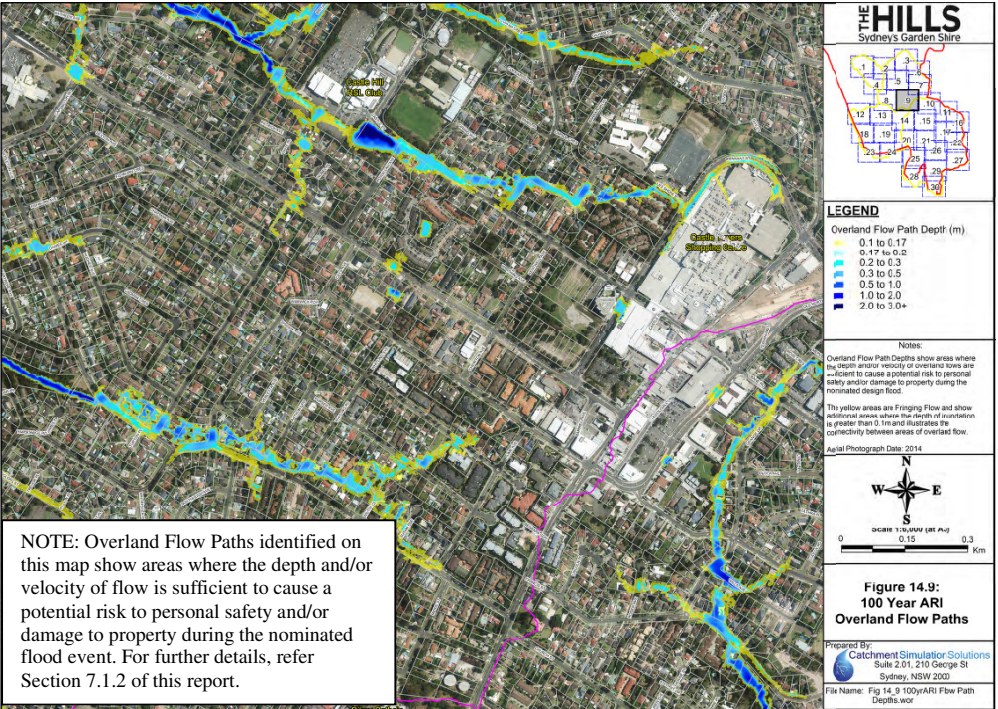
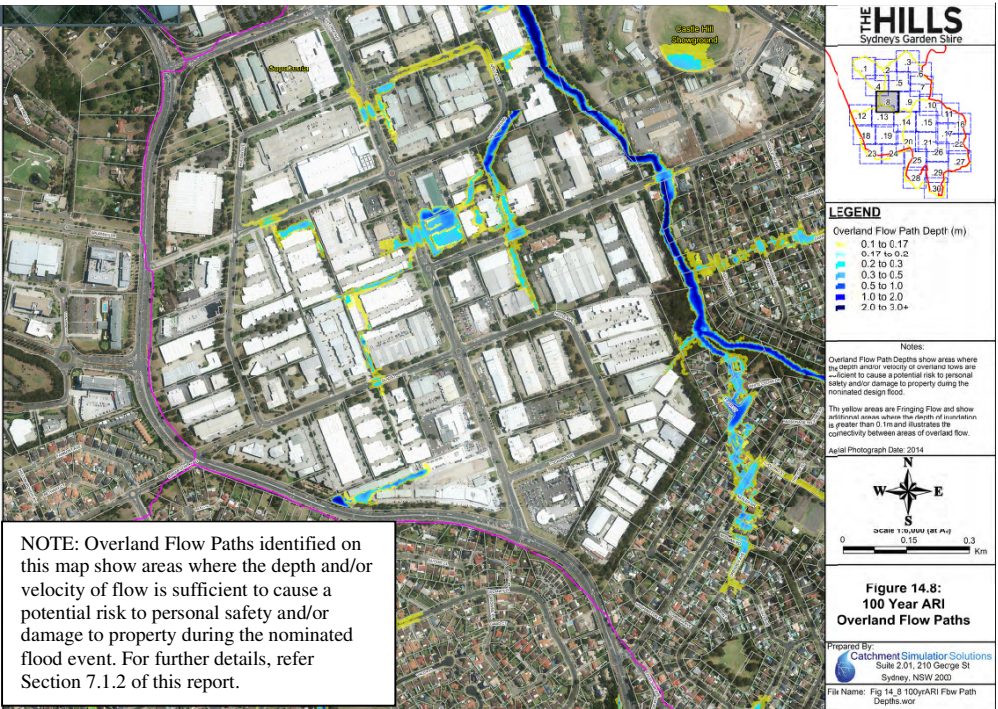
Figures extracted from The Hills Draft Urban Overland Flow Study

Figure 9 20 Year ARI Overland Flow Paths



Figures extracted from The Hills Draft Urban Overland Flow Study

Figure 10 100 Year ARI Overland Flow Paths



Figures extracted from The Hills Draft Urban Overland Flow Study

6.1.5 Blockage Assessment

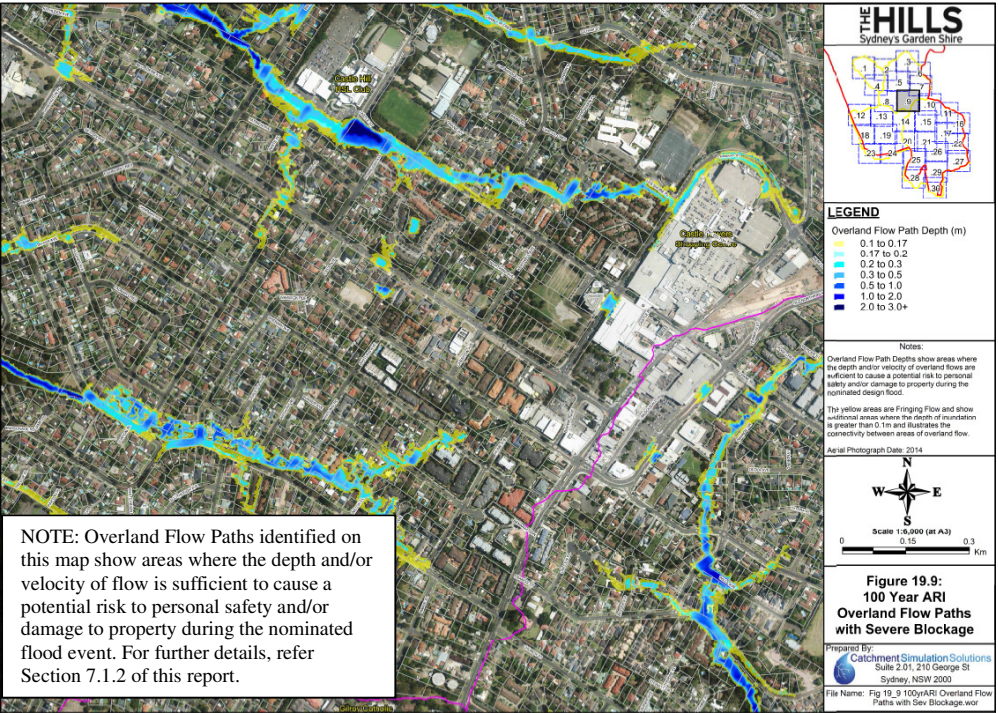
An important element of the study is that it also has undertaken a sensitivity analysis on blockage of the stormwater system and its main culverts (zero blockage and severe). “Severe” blockage has been assessed as being:

- 100% blockage of “On grade” stormwater pits
- 100% blockage of “Sag” stormwater pits = 50% blockage
- 100% blockage of Culverts with height < 3 metres or width < 5 metres
- 25% blockage of Culverts with height > 3 metres and width > 5 metres

Figure 11 (a and b) shows the effect of what is considered as a severe blockage to the stormwater system.

As would be expected, the extents of the overland flow paths are greater, affecting more cadastral lots than previous. The flow depths also appear to be deeper in some of these areas.

Figure 11 100 Year ARI Overland Flow Paths - Severe Blockage Scenario



Figures extracted from The Hills Draft Urban Overland Flow Study

7 Flooding Baseline for the Showground Station Urban Activation Precinct

7.1 Comparison of Flooding and Overland Flow Results

As it is understood that Council will use the information from the Urban Overland Flow Study to inform potential changes to their Flood Controlled Land mapping, a preliminary assessment of draft Overland Flow Results from the study against the existing mapping has been undertaken.

For this preliminary assessment, the flood control lot map was compared to the design 100yr ARI overland flow mapping.

The review has shown that there are more areas currently on the flood control lot mapping than appear to experience overland flows according to the new study. As such, Council may review their existing Flood Controlled Land mapping accordingly.

7.2 Recommendation

Given the time constraints of this project, it is recommended that the Precinct Structure Plan is developed in accordance with the existing flood control lot mapping and relevant flood planning levels, although the draft Overland Flow Study results have been used to inform the planning of the Precinct.

It is recommended that the Plan be reviewed once the results of the Overland Flow Study are adopted by Council.

8 Proposed Precinct Plan

With reference to the proposed LEP zoning map below, the main elements of the plan for the Showground Station UAP area are:

- Construction of new roads – These are proposed across all areas within the commercial/industrial area to the west of Cattai Creek, a new road over Cattai Creek, and further new roads within the residential areas to the east of the site and within the Castle Hill Showground area.
- Re-classification of lands to west of Cattai Creek – The proposed LEP re-zoning allows for the inclusion of an Enterprise Corridor (B6) and General Residential (R1). It also allows for increased heights of buildings within this area for existing light industrial areas.
- Re-classification of the existing Showground Area to Public Recreation (RE1) and a Local Centre (B2), which includes the NWRL Showground Railway Station.
- Re-classification of the residential area density to the east and south east to medium density (R3) and high density (R4)

Figure 12 Proposed LEP Land Zoning Map

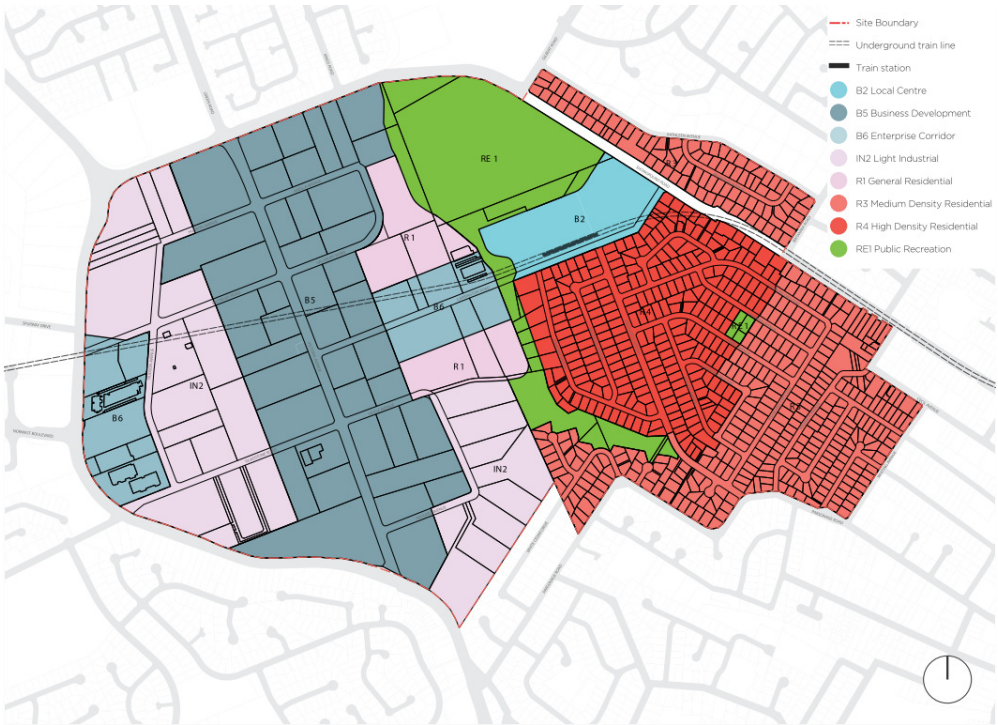
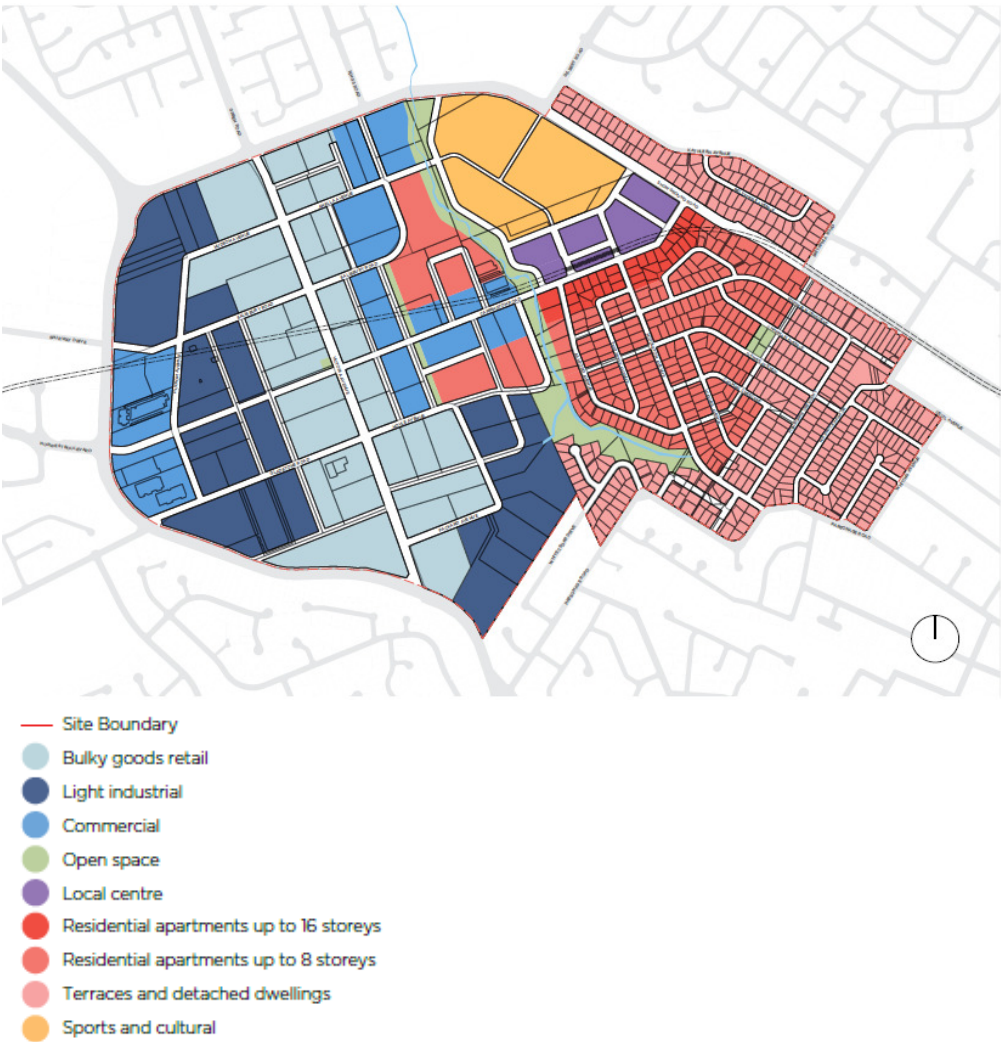


Figure 13 Proposed Precinct Plan - Land Uses



9 Precinct Plan Review

Having established the existing policies and guidelines for development within The Hills LGA, and reviewed the most current overland flow information, the following opportunities or constraints have been identified for the Precinct Plan with regards to flood mitigation/management, stormwater management and water quality treatment.

Flood mitigation/management infrastructure is discussed holistically for the precinct, whereas discussion on stormwater management and water quality treatment has been separated into the discrete elements of the Precinct Plan outlined in Section 8.

9.1 Flood mitigation/management infrastructure

Having reviewed the reports as listed in Sections 5 and 6, there do not appear to be any previously identified recommendations for flood mitigation/management infrastructure on a large scale within the Precinct or upstream.

Having reviewed the Precinct and the upstream catchment, there appears to be limited open space available for the potential provision of precinct-scale overland flow mitigation infrastructure solutions, which could typically include options such as retarding basins and channel modifications.

Although there are not many opportunities upstream of the catchment to provide large scale solutions, the provision of on-the-lot solutions (such as rainwater tanks) should be investigated to assist with the reduction of surface water run-off for more frequent events. An incentive for the installation of rainwater tanks on existing properties could be provided. It is assumed that any redeveloped residential property will be required to install these through BASIX requirements. The recent North Kellyville DCP 2014 and Box Hill/Box Hill Industrial Precinct DCP 2014 mandated that “All buildings must install rainwater tanks to meet a portion of supply such as outdoor use and toilets. All residential dwellings are required to provide a (minimum) 3,000 litre (3 KL) rainwater tank as part of the WSUD strategy, and such tank is to be connected for use in toilet flushing and external uses.” It should be noted that rainwater tanks are not recommended as a solution for significant rainfall events that will cause overland flooding.

Within the Precinct itself, as there will be significant redevelopment expected, there are potential opportunities to address the overland flow issues, as illustrated in the mapping shown in this report. For each road that is to be developed, additional stormwater infrastructure will need to be constructed. Should this be undertaken in a holistic manner in accordance with the existing OSD policy, it may assist in reducing the overland flows that exists within the area.

9.2 Stormwater Management and Water Quality Treatment

9.2.1 Overall Commentary

Although the Precinct should result in considerable redevelopment and opportunities to improve the stormwater management for the catchment, it is

anticipated that this redevelopment will generally be implemented in piecemeal fashion over a medium to long term period. As such, it will be difficult for Council to implement a large scheme that will result in an immediate improvement to overland flow or water quality issues.

With that being the case, it may be more advisable to implement any changes through the revision of the LEP and DCP, and to mitigate any known risks with regards to overland flows until the point that the catchment has been redeveloped to the extent that there is a reduction in peak flows.

As a considerable area within the extents of the Precinct may be re-developed, OSD implementation would be likely to have a positive impact on the current overland flow results as discussed, and subsequent benefit to flood mitigation within Cattai Creek. This could be investigated as an option in a potential future flood/overland flow modelling study by Council, that would examine the effects of the new development.

Other than further hydraulic modelling being undertaken to determine the effects of the Precinct development, a general Stormwater Masterplan for the Precinct could be undertaken to determine the other benefits that may be associated to sustainable stormwater management, such as stormwater harvesting and re-use for example.

There may be opportunities for improvement in the riparian corridor, such as examining the spill performance and spill frequency of the existing Sydney Water overflow that discharges to Cattai Creek. Redevelopment of the area to the west of Cattai Creek may identify any unknown stormwater connections and reduce the frequency of when this overflow discharges

Further opportunities for improvement to the riparian corridor, such as geomorphological improvements, could be made through the widespread implementation of rainwater tanks on private properties.

9.2.2 New Roads

The introduction of new roads will likely open up new routes for overland flow around the precinct, potentially reducing flood impacts to lots. The development of these roads may also increase surface water run-off within the Precinct Area, which should be mitigated through on site detention.

Should these new roads, along with the increase in density of the area, result in additional traffic, this will likely introduce additional water quality loadings (motor oils/hydrocarbons) to the area that would need to be addressed. As discussed above, road upgrades are anticipated to be delivered in a staged manner, accompanying adjacent developments, which makes integration of WSUD elements challenging. However, there is potential for raingardens/bioretention tree pits to be introduced (supplementing, rather than replacing the typical minor drainage network) to treat local flows from the road corridor.

9.2.3 Commercial/Industrial Area West of Cattai Creek

As described above, the introduction of new roads within this area may cause changes to the overland flow routes. With regards to the newly proposed B6 Enterprise Corridor and R1 General Residential, these appear to be within the 100

year ARI overland flow paths for the catchment, and are currently classified as flood control lots. It is assumed that additional measures will need to be undertaken to address the potential overland flows through these areas, and that Flood Planning Levels will be set to 100 year ARI plus 500mm freeboard in line with Part C6 of the DCP.

With regards to water quality and pollutant generation within the area, the reduction in light industrial areas may result in the reduction of some current pollution loading, particularly if WSUD elements are introduced to the area through its redevelopment.

9.2.4 Showground

Having assessed the available overland flow mapping for this area, it does not appear that there are considerable existing overland flow problems. The redevelopment of this part of the Precinct however, which could include an increase in impermeable area, may result in additional surface run-off compared to the existing situation. The introduction of more people and vehicles to the area, since it is proposed to be a local centre as part of the Precinct rezoning, is likely to generate additional pollutant loadings.

Although the proposed re-zoning may increase the surface water run-off and water quality pollutant generation, this area has significant opportunities for stormwater management and WSUD given that it is likely to be developed in a more holistic manner and within a shorter time frame than other parts of the precinct. There should be ample opportunities available to not only manage these increases, but to develop in a sustainable manner that should result in improving the existing situation.

A holistic stormwater management plan could be derived for this specific area, and given that this is to become a new local centre and potential showcase to entice further redevelopment within the area, it should be investigated whether this could become a Green Star community area.

The large available open space area would be likely to provide sufficient scope to introduce WSUD and detention for a wider catchment than simply the Showground's local catchment alone. However, the position of the Showground area close to the top of the catchment and to the north of Cattai Creek means that there is limited potential to use this area to treat and/or detain stormwater flows from the rest of the precinct.

9.2.5 Existing residential area

For the existing residential area to the east/south-east of the site, the Precinct Plan proposes an increase in density (to medium and high density housing), with the introduction of new roads. These density increases may result in the increase in impermeable areas, and therefore in an increase in surface water run-off. Mandating OSD in these areas should be considered to not only eliminate the potential increase in run-off, but to reduce it in comparison with the existing conditions.

It is noted that the proposed new road, a continuation of Dawes Avenue to the west towards Cattai Creek, would assist with the conveyance of overland flows

towards the creek. The construction of this road would require the demolition of existing properties that appear to be affected by overland flow.

As with other areas within the proposed precinct, the increase in density will most likely result in an increase in water quality pollutant loadings that will need to be addressed also, through on-lot WSUD measures.

10 Future Planning Controls

It is understood that The Hills Shire Council are currently in the process of revisiting the LEP and DCP for the whole Local Government Area, and that therefore there may be changes in relation to the management of stormwater, overland flows and water quality.

In determining potential future planning controls that could be incorporated into Hills Shire Council's DCP, it is acknowledged that it is important to achieve the best outcome for the community and the environment, whilst not impinging on the financial viability of redevelopment due to overly restrictive measures. As such, Arup have assessed the merit of the existing controls/guidelines.

The recent North Kellyville DCP 2014 and Box Hill/Box Hill Industrial Precinct DCP 2014 contain a number of stormwater quantity, quality and flooding provisions that are either not included or not as clearly articulated in the current DCP 2012, and these provide a good basis for future DCP provisions for the Precinct.

10.1 OSD Policy

As discussed earlier in this report, the existing OSD policy is set to the requirements of the Hawkesbury River Catchment OSD policy. It is assumed that the benefits that this current policy provides would therefore be mandated as a minimum should there be a change in the OSD policy. In examining the existing policy however, should the redevelopment of the Precinct result in the widespread implementation and construction of OSD tanks, the overland flows should reduce considerably. An example of this is the light industrial / commercial area to the west of Cattai Creek within the Precinct. The excerpt below is from the current Overland Flow Study (Drainage Catchment 4 Flow Locations), and shows flow measurement lines from which piped and overland flows have been extracted from the TUFLOW model for the 10 year, 20 year and 100 year design ARI events.

Figure 14 Flow Measurement Lines - Overland Flow Study



Figures extracted from *The Hills Draft Urban Overland Flow Study*

The corresponding Table 4 in the report provides the breakdown as follows:

ID	Location	Peak Discharge (m ³ /s)								
		10 Year ARI			20 Year ARI			100 Year ARI		
		Pipe	Overland	Total	Pipe	Overland	Total	Pipe	Overland	Total
40	Whitling Ave	4.77	4.86	9.63	4.96	6.65	11.6	4.77	10.3	15.1
41	DS Middleton Ave	4.83	8.51	13.3	5.07	12.0	17.1	5.56	15.9	21.5
42	White Cedar Dr	2.15	7.89	10.0	2.82	10.7	13.5	2.46	14.5	17.0
43	DS Carrington Rd	0.00	23.8	23.8	0.00	30.7	30.7	0.00	43.1	43.1
44	Victoria Av	7.22	1.63	8.85	8.78	2.53	11.3	9.86	4.94	14.8
45	Castle St/Grand Wy	3.24	7.44	10.7	3.53	9.48	13.0	3.72	13.6	17.3
46	Britannia Rd X Bounty Ave	2.56	4.22	6.78	2.80	5.19	7.99	3.12	7.41	10.5

Figures extracted from *The Hills Draft Urban Overland Flow Study*

Should there be little or no existing OSD within the area, the application of widespread OSD through redevelopment upstream of the flow check line at Victoria Avenue should result in considerable flow reductions.

Assuming that only two thirds (52 ha approx.) of the upstream catchment from this flow check line had OSD implemented in the future, the peak flow for the 100yr ARI for this whole area would be reduced to 4.5 m³/s, which is a considerable reduction pro-rata wise of the equivalent total of 9.8 m³/s for the 100 year ARI event. This estimation was on the basis that a Permissible Site Discharge

of 87 l/s/ha, in line with the Hawkesbury River Catchment OSD Policy, would be implemented.

10.2 WSUD

There is an opportunity to provide more up-to-date and binding WSUD consideration within Council's LEP and/or DCP, consistent across all types of development, including areas under 2,500m² in size. The existing 'target-based' pollutant reductions that are recommended in the Technical Guidelines for Western Sydney could be incorporated within the actual DCP, and demonstration of how these targets have been addressed by mandated as a DA submission requirement. The target values could be increased to match those included within the North Kellyville DCP 2014 and Box Hill/Box Hill Industrial Precinct DCP 2014, as provided in Table 3 of this report. Inclusion of a target for oils and greases is also recommended. As an example, Parramatta City Council's DCP requires no visible oils for flows up to 50% of the one-year ARI peak flow specific for particular development types.

10.3 Draft Controls

10.3.1 Objectives

- a. To adopt best practice techniques for stormwater quality management.
- b. To minimise flooding and reduce the effects of stormwater pollution on Cattai Creek.
- c. To ensure that land is appropriate to managing and minimising risks from flooding.
- d. To ensure an integrated approach to water management through the use of water sensitive urban design (WSUD) principles.

10.3.2 Controls

1. A comprehensive Stormwater Management Plan/Master Plan is to be prepared for the Precinct prior to approval of first development within the B2 zone. The Master Plan is to ensure the sustainable stormwater management within the Precinct and is to include consideration of various of sustainable practices including stormwater management, rainwater harvesting and re-use and water conservation.
2. All Stormwater drainage designs are to comply with the most up to date revision of Council's "Design Guidelines".
3. WSUD is to be adopted throughout all development, incorporating water quality management and attenuation of runoff to acceptable levels following development.
4. The following stormwater management objectives are to be achieved for all development within the Precinct:
 - 90% reduction in the post-development average annual gross pollutant load

- 85% reduction in the post-development average annual total suspended solids (TSS) load
 - 65% reduction in the post-development average annual total phosphorus (TP) load
 - 45% reduction in the post-development average annual total nitrogen (TN) load
5. For developments generating oils and grease, the additional objective of no visible oils for flows up to 50% of the one-year ARI peak flow shall be achieved.
 6. Design of new road corridors shall incorporate WSUD elements including raingardens/bioswales/bioretention tree pits to supplement the typical minor drainage network to treat local flows from the road corridor. Design and construction of these elements shall allow for ease of ongoing maintenance and for pedestrian crossings at appropriate locations.
 7. WSUD infrastructure elements are to be designed and constructed in accordance following publications:
 - Australian Runoff Quality (Engineers Australia 2005)
 - Water Sensitive Urban Design Technical Guidelines for Western Sydney (NSW Government Stormwater Trust and UPRCT, May 2004).
 8. Water quality modelling to support development proposals within the Precincts shall utilise MUSIC Version 5 or later and adopt modelling parameters in line with the most up to date version of the NSW Music Modelling Guidelines (CMA).
 9. To minimise the impact of stormwater on the health and amenity of Cattai Creek, stormwater is to be retained on development sites by:
 - collecting and storing water from roofs and hard surfaces
 - maximising porous surfaces and deep soil zones
 - draining paved surfaces to adjacent vegetation
 10. All buildings must install rainwater tanks to meet a portion of supply such as outdoor use and toilets. All residential dwellings are required to provide a (minimum) 3,000 litre (3 KL) rainwater tank, and such tank is to be connected for use in toilet flushing and external uses. Larger tanks than the requirement are permitted.
 11. Each rainwater tank is to be provided with potable water trickle top-up with a back flow prevention device, complying with Sydney Water requirements.
 12. On-site detention is to be provided in accordance with Section 4.22 of Council's Design Guidelines Subdivision / Developments.
 13. Within the Showground Precinct, Flood planning levels for new development shall comply with the requirements of Council's DCP (2012) Section C6.
 14. Development is to comply with the flood risk management provisions of Council's DCP 2102 Section C6.
 15. All landscaping is to be compatible with flood risk and not impede overland stormwater flows.

16. All vegetation species and structures, including paths, walls and fences, are to be able to withstand temporary flood inundation in any areas designated as detention basins.
17. During the construction phase of development, the relevant Stormwater Management Objectives for New Development as set out in the most up to date revision of "Managing Urban Stormwater: Soils and Construction" (NSW Department of Housing) must be complied with in full.
18. Erosion and sediment control measures are to be implemented and regularly maintained on site, while sediment trapping measures are to be located at all points where stormwater runoff can enter inlets to stormwater systems, or where runoff may leave the construction site.