

POSTAL:  
PO BOX 401  
ROMSEY VIC 3634

EMAIL:  
JAKE@MRLS.COM.AU

PHONE:  
0403 222 537



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LEGEND	
— CCB	GENERAL COMMUNICATIONS
— FCB	GENERAL FIBRE OPTIC
— NBN	NBN
— OPTUS	OPTUS
— TELSTRA	TELSTRA
— VRCB	VIAROADS COMMS
— VTECB	VIAROADS ELECTRICITY
— EWB	EARTH WIRE
— HVCB	HIGH VOLTAGE ELECTRICITY
— HVO	HV ELEC OVERHEAD
— IECB	IRRIGATION ELECTRICITY
— LECB	LIGHTING ELECTRICITY
— LVCB	LOW VOLTAGE ELECTRICITY
— LVCO	LOW VOLTAGE ELEC OVERHEAD
— VRCB	VIAROADS ELECTRICITY
— VTECB	VIAROADS ELECTRICITY
— STCB	RAIL SIGNALS
— GCB	GAS
— GTCB	GAS TRANSMISSION
— PCB	PRODUCT LINES AND PIPELINES
— WCB	POTABLE WATER
— RWCB	RECYCLED WATER
— IVCB	IRRIGATION WATER
— FCB	FIRE SERVICE
— SLB	STEAM LINE
— SCB	SEWER
— SRB	SEWER RISING MAIN
— TWB	TRADE WASTE
— SWCB	STORM WATER
— PCB	CATHODIC PROTECTION
— ECB	ELECTROLYSIS
—	UNKNOWN
— GPR	GROUND PENETRATING RADAR
— CAB	COMPRESSED AIR
— //	FENCE
△	TBM
6000	DRAINAGE PIPE DIAMETER IN MM
IL	INVERT LEVEL
CL	COVER LEVEL
DTI	DEPTH TO INVERT
BSL	BELOW SURFACE LEVEL
AHD	AUSTRALIAN HEIGHT DATUM
BDK	BACK OF CURB
COL	CHANGE OF LEVEL
EDT	END OF TRACE
0.55	DEPTH BELOW SURFACE LEVEL (m)
3.603	AUSTRALIAN HEIGHT DATUM LEVEL
⊙	LIGHT POLE
⊙	CATHODIC PROTECTION
⊙	TEST POINT
⊙	TAP
⊙	WATER METER/GAS METER
⊙	VALVE
⊙	FIRE PLUG
⊙	FIRE HYDRANT
⊙	HOSE REEL
⊙	HYDRANT BOOSTER
⊙	ELEVATED JON (TELSTRA)
⊙	OVERFLOW RELIEF GULLY
⊙	INSPECTION SHAFT (SEWER)
⊙	INSPECTION SHAFT (STORM WATER)
⊙	SPINKLER HEAD (IRRIGATION)

**NOTES**

- TRACABILITY OF SERVICE MATERIAL TYPES.** THE ABILITY TO LOCATE UNDERGROUND SERVICES USING ELECTRONIC (RADIO) DETECTION IS HEAVILY DEPENDENT ON THE TYPE OF MATERIAL A GIVEN UNDERGROUND SERVICE IS MADE FROM. TO SUMMARISE, METALLIC PIPES AND ELECTRICAL CABLES CAN OFTEN BE IDENTIFIED AS THESE ARE CONDUCTIVE MATERIALS SUITABLE FOR LOCATING USING ELECTRONIC DETECTION. CONDUITS (ENCASING NON-CONDUCTIVE CABLES E.G. FIBRE OPTIC), SEWER PIPES AND STORM WATER PIPES DO NOT THEMSELVES CONDUCT ELECTRICITY. TO LOCATE THESE TYPES OF MATERIALS A CONDUCTIVE TRACING ROD IS FED INTO THE UNDERGROUND SERVICE AND THE SIGNAL EMITTED FROM THE ROD OR TRACING HEAD (SONDE) IS THEN LOCATED. A LIMITATION OF ELECTRONIC DETECTION IS WHEN AN UNDERGROUND SERVICE IS MADE FROM NON CONDUCTIVE MATERIAL SUCH AS POLY VINYL CHLORIDE (PVC) OR POLYETHYLENE (POLY) ETC AND WHERE THE SERVICE IS ALSO UNDER PRESSURE I.E. CANNOT BE OPENED OR ACCESSED LIKE A CONDUIT OR DRAINAGE PIPE. EXAMPLES OF THESE ARE PVC WATER PIPES, POLY IRRIGATION PIPES, POLY GAS PIPES, SEALED AND FLOODED GRAVITY FED STORM WATER HARVESTING SYSTEMS AND PRESSURISED RISING SEWER MAINS. WITHOUT THE PRESENCE OF AN ACCESSIBLE TRACE WIRE, ACCURATE PLANS OR CAPABILITY TO ISOLATE AND ACCESS THE SERVICE, ABILITY TO LOCATE THESE SERVICES IS LIMITED.
- INFORMATION REGARDING UNDERGROUND SERVICE DEPTHS.** DEPTHS OF SERVICES PROVIDED ON THIS DRAWING ARE OBTAINED USING ELECTRONIC DETECTION (QL-B) UNLESS OTHERWISE STATED. ACCURACY OF THESE READINGS IS HIGHLY DEPENDENT ON THE ENVIRONMENT. DEPTHS SHOULD BE TAKEN AS A GUIDE ONLY AND SERVICE DEPTHS SHOULD BE PROVEN MANUALLY ON SITE WHEN EXCAVATING WITHIN THE VICINITY OF THE SERVICE.
- INFORMATION REGARDING DEPTHS OF STORM WATER AND SEWER PIPES.** DEPTHS OF STORM WATER AND SEWER PIPES ARE PROVIDED IN VARIOUS MANDORS ON THIS PLAN UNLESS OTHERWISE STATED. DEPTHS OF PIPES MEASURED FROM PIT ACCESS POINTS/MAIN HOLES) ARE NOTED FROM TOP OF PIT TO PIPE INVERT LEVEL (IL) IN MM IN SOME CASES AUSTRALIA HEIGHT DATUM (AHD) LEVELS ARE PROVIDED. THIS CAN BE USED TO DERIVE THE IL/AHD OF THE PIPE. IN SOME CASES THIS MAY ALREADY BE CALCULATED AND NOTED AS X.XXIL/AHD.
- METHODS OF OBTAINING DEPTHS FOR STORM WATER & SEWER:**
  - DEPTH MEASURED USING ELECTRONIC DETECTION:** THE METHOD OF DETERMINING THE IL AT SPECIFIC POINTS ALONG ANY GIVEN PIPE IS OBTAINED USING ELECTRONIC DETECTION. AN IN-DEPTH EXPLANATION OF HOW THIS IS ACHIEVED IS AS FOLLOWS: A TRACING ROD IS FED INTO THE PIPE FROM AN ACCESS POINT. FOR EXAMPLE A JUNCTION PIT OR MANHOLE. THE TRACING ROD HAS A LOCATING SONDE ATTACHED TO THE HEAD. THE ROD IS FED INTO THE PIPE SO THE HEAD IS DIRECTLY BELOW THE SPECIFIC POINT WITH THE TRANSMITTING SONDE SITTING ON THE BOTTOM OF THE INSIDE OF THE PIPE. ELECTRONIC DEPTH IS OBTAINED AND NOTED AT APPROXIMATELY XMM BELOW THE SURFACE LEVEL. ADDITIONALLY IF REQUIRED AND IF NOT ALREADY PROVIDED, SURFACE LEVELS ARE THEN MEASURED USING A TOPCON ROVING SURVEYOR'S GPS. ELECTRONIC DEPTH IS THEN SUBTRACTED FROM THE MEASURED GPS SURFACE LEVEL AND TO ASCERTAIN AN APPROXIMATE INVERT LEVEL AND.
  - DEPTH MEASURED USING INFERRED DEPTH:** THIS METHOD ASSUMES CONSISTENT AND LINEAR FALL ON A PIPE. FIRST, DEPTH IS OBTAINED USING DEPTHS MEASURED AT ACCESS POINTS FOR THE PIPE. FOR EXAMPLE AT 2 SEPARATE JUNCTION PITS OR MANHOLES. APPROXIMATE DEPTH CAN THEN BE DERIVED FOR A PARTICULAR POINT ALONG THE PIPE BY CONSIDERING CALCULATED GRADE, INVERT LEVELS AND SURFACE LEVEL, AND AT THE GIVEN POINT.
- WE ARE NOT LICENSED SURVEYORS THEREFORE CERTIFIED LEVELS CAN ONLY BE ATTAINED BY EXPOSING THE UTILITY BY EXCAVATION AND HAVING IT SURVEYED BY A LICENSED SURVEYOR.** DEPENDING ON THE NATURE OF THE WORKS, REASON FOR SURVEY AND FIELD CONDITIONS DETERMINES IF AND WHAT METHOD WILL BE USED AND HOW MUCH INFORMATION IS PROVIDED. EVERY ATTEMPT WILL BE MADE TO PROVIDE ALL RELEVANT INFORMATION HOWEVER, SHOULD ADDITIONAL INFORMATION BE REQUIRED SUBSEQUENT SITE VISITS AND/OR TECHNIQUES MAY BE NEEDED.

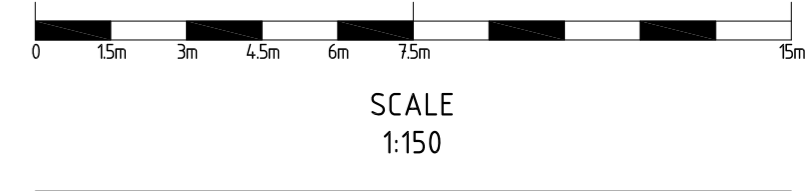
**NOTES REGARDING QUALITY LEVELS. TAKEN FROM AS/NZS 5488 2013**  
QUALITY LEVEL IS DEFINED AS "A CLASSIFICATION REFLECTING THE PRECISION AND ACCURACY OF UTILITY LOCATION AND ATTRIBUTE INFORMATION."  
QUALITY LEVELS WILL BE REPRESENTED ON THE LINE TYPE AS A SINGLE LETTER (A,B,C OR D) IN BRACKETS PROCEEDING THE UTILITY DESCRIPTION. SEE BELOW.

- LVCB — QUALITY LEVEL A - POT-HOLING TO PROVE A UTILITY LOCATION
- LVCB — QUALITY LEVEL B - USE OF LOCATING EQUIPMENT/ELECTRONIC DETECTION TO LOCATE A UTILITY.
- LVCO — QUALITY LEVEL C - USING FEATURES ABOVE THE SURFACE TO MAKE ALIGNMENTS. FOR EXAMPLE, FIRE HYDRANTS, UTILITY PITS.
- LVCB — QUALITY LEVEL D - FROM PLANS, ANECDOTAL EVIDENCE.

WHERE THE WHOLE LINE SEGMENT CANNOT BE VERIFIED BY LINE OF SIGHT, QUALITY LEVEL A SHALL NOT BE ATTRIBUTED TO THE LINE SEGMENT BETWEEN VALIDATED POINTS. QUALITY LEVELS MAY VARY ON SEPARATE SECTIONS OF A SINGLE SUBSURFACE UTILITY, DEPENDING ON THE SOURCE INFORMATION AVAILABLE FOR EACH SECTION.

**WARNING**  
**ACCURACY OF UNDERGROUND SERVICES INFORMATION**  
UNDERGROUND SERVICES SHOWN ON THIS PLAN HAVE BEEN LOCATED TO THE QUALITY LEVEL INDICATED IN THE LINE TYPE DESCRIPTION. THE LOCATION AND DEPTHS STATED SHOULD BE TREATED AS APPROXIMATE AND CAN ONLY BE VERIFIED VIA PROPER METHODS MANUAL EXPOSURE NON-DESTRUCTIVE DIGGING 91-48 OF WHICH, UNLESS OTHERWISE AGREED UPON, IS THE RESPONSIBILITY OF THE CONTRACTOR.  
THERE IS NO GUARANTEE ALL SERVICES THAT EXIST IN THE AREA COVERED ON THIS PLAN ARE SHOWN.

UNDERGROUND SERVICES PLAN FOR



GDA/MGA94 ZONE 55  
LOCATING: JS / DRAWING: JS  
DATE OF SURVEY: 10/02/2022  
DATE OF DRAWING: 10/02/2022  
ORIGINAL SHEET SIZE: A1  
SHEET NUMBER 1 OF 1

