

Design Requirements & Guidelines

Civil Works on, under or over VicTrack Land

Nov 2017



Table of Contents

1	When do these guidelines apply?	1
2	Design requirements	1
2.1	Design drawings must be rail specific	1
2.2	Rail specific designs	2
2.2.1	Underground Proposal	2
2.2.2	Overhead Proposals	4
3	Reference Drawings	6
APPENDIX A	i
	STANDARD CONDITIONS FOR ELECTRIC POWER OVERHEAD LINES ON OR OVER LAND VESTED IN VICTORIAN RAIL TRACK (VRT)	i
APPENDIX B	i
	VICTRACK SAMPLE DESIGN DRAWINGS	i

1 When do these guidelines apply?

If you are proposing works underneath, on or over VicTrack land or within 3 metres horizontally of the closest rail on other lands – under the Transport Integration Act 2010 and Rail Safety Act 2006, VicTrack require an application to be submitted for assessment prior to any access. It is recommended that you submit your application to VicTrack a minimum of 3 months prior to your intended start date, however the earlier you engage VicTrack, the more advantageous.

The below guidelines outline the typical requirements for parties wishing to install or maintain a utility or service which interacts with VicTrack land. These guidelines should only form part of your design study. A full investigation into the guidelines, regulations and standards which affect your design is an integral part of a good application and a safe design.

2 Design requirements

Designs submitted to VicTrack must comply with **ALL** relevant Standards adopted by the transport businesses **AND** the relevant Australian Standards. These may include:

- Victorian Rail Industry Operator Group Standards (referred to as “VRIOGS”).
- AS4799-2000 (Installation of underground utility services and pipelines within railway boundaries) for underground works
- Standard Conditions for Electric Power Overhead Lines on or Over Land Vested in Victorian Rail Track (VRT), for overhead electrical installations (see Appendix A)
- AS2566.1 Buried Flexible Pipelines – Structural design;
- AS3000 Electrical Installations
- Victorian Traction Industry Electrical Safety Rules 2014 (Orange Book)
- VicTrack Design Guidelines (this document) (as relevant)
- Rail operator specific standards – depending on the rail operator, they may have additional criteria which are required to be adhered to. Contact the relevant rail operator for these requirements
- Other relevant industry and Australian Standards.

2.1 Design drawings must be rail specific

In addition to the relevant industry and Australian Standards which apply to service installations (i.e. AS3000 for Electrical Installations). Design must also comply with rail industry standards and rail applicable Australian Standards.

When proposing to undertake any installations underground on VicTrack land, AS4799-2000 applies. All designs must be fully compliant with AS4799-2000 to be considered by VicTrack.

When proposing to undertake overhead electrified installations, the Standard Conditions for Electric Power Overhead Lines on or Over Land Vested in Victorian Rail Track (VRT) will apply. This is a VicTrack document which is attached in Appendix A. All overhead proposals must be fully compliant with this standard to be considered.

2.2 Rail specific designs

The below information details this basic fundamental requirements of both the proposed design, as well as the design drawing documentation.

2.2.1 Underground Proposal

2.2.1.1 Design Requirements

General design requirements include, but are not limited to;

1. All fluid (including gases) carrier pipe must be encased.
2. Encasing pipes MUST extend for the full width of the rail reserve, from boundary to boundary
3. For Natural Gas services, unless fully grouted between the encasement pipe and carrier pipe, a ventilation pipe must be incorporated in the design.
4. Service MUST cross perpendicular to the rail tracks (i.e. at 90 degrees)
5. Minimum depth of the service from top of conduit/pipe to top of each rail must be $\geq 2000\text{mm}$
6. Minimum clearance between all third party services is to be 600mm
7. Where a service is proposed to be installed within the statutory 3 metre exclusion zone either side of a pipeline carrying flammable product, express written consent from the pipeline owner must be supplied to VicTrack
8. There are to be no bends or change of direction of a service within the rail corridor;
9. Minimum offset from rail infrastructure of 3 metres - this includes but is not limited to;
 - 9.1. Signals and signal boxes
 - 9.2. Boom gates and flashing lights
 - 9.3. Overhead stanchions
 - 9.4. Other railway infrastructure not mentioned above which may be installed within the rail corridor within the location where works are proposed
10. All pits are to be located OUTSIDE of VicTrack land. This will enable the applicant to readily gain access for inspections and maintenance in the future without the requirement of seeking VicTrack or rail operator approval
11. Launch and retrieval pits need to be shown on the design drawing and shall be located outside of the VicTrack land. Details of reinstatement of bore pits to be provided
12. Launch and retrieval pits are not to be located over any existing third party assets

13. Where it is proposed that a bore is greater than 100mm, the rail operators require the bore head to be supported throughout the works. A notation to this effect is required to be included on the design drawing; where achievable, it is recommended to pursue borehole diameters of $\leq 100\text{mm}$
14. With regard to boring. Should the bore diameter be 50mm greater than the carrier pipe's outer diameter, this annulus must be filled with suitable grouting material.
15. Where proposed works involve trenching, compaction details are to be provided. Excavations are required to be backfilled and compacted with approved fine crushed road, sand, gravel or other approved materials
16. Market posts to be installed at entry and exit points of service on VicTrack land or at existing fence lines near to the boundaries with offset markers to be provided if the proposed route is in a trafficable area. Marker plates are to be installed in accordance with AS4799-2000 and MUST face inwards to the railway tracks
17. A copy of approved computations demonstrating the suitability for rail loadings considering the cover of the pipe from the top of existing rail level. Rail loadings i.e. live loads are to be computed as per 300 LA loadings (AS 5100). Table A1 on page 29 which provides average intensity of rail loadings for maximum depth of 4m.

2.2.1.2 Drawing Requirements

Design drawings lodged with VicTrack for review should be rail specific and must incorporate the following information:

1. Drawing to include aerial plan, longitudinal section (VicTrack boundary to boundary), cross-section of bore (detailing bore diameter, encasement pipe size & material (where required), carrier pipe size and material, cable placement within conduit (where applicable)) AND/OR details of trench (width, depth, length on VicTrack land, reinstatement details)
2. Material, inner diameter, outer diameter, wall thickness and cathodic protection status (for flammable substance carrying pipes) to be supplied on design drawing for all encasement and carrier pipes.
3. VicTrack land boundaries shown on all design sections;
4. Design drawing title block to provide updated drawing reference number and revision details;
5. Design drawings orientated so that north compass ALWAYS points to page top;
6. Name and direction to the nearest railway station to be provided on the drawing;
7. Statutory rail line name and railway chainage to be clearly shown on the design drawing (information available through services@victrack.com.au - a measurable sketch/schematic is required together with GPS coordinates of the entry and exits points to VicTrack land in order for this to be supplied)
8. VicTrack file reference clearly on drawings (contact services@victrack.com.au with all preliminary details of your proposal in order to be supplied a reference number)
9. Details of grouting to be used where applicable

10. Distance from the outer rail to where proposed project is to occur (metres) (in reference to launch and retrieval pits for undertrack bores, and offset to service for works along the railway)
11. Details and offset in millimetres (mm) of all utility and other third party services, structures and assets including water, sewer, drainage, gas, electricity and communications and infrastructure associated with these services located on site and shown on drawing.
12. All railway signal cables, railway signal high and/or low voltage cables, railway electricity overheads, electrolysis and any other associated railway infrastructure which may include but is not limited to drains, storm water drains, culverts, pits etc. located on site and shown on drawing.
13. All existing VicTrack optic fibre, copper communications cabling, pits and any other associated VicTrack telecommunications infrastructure indicated on the VicTrack Network protection drawings or as advised to you by the VicTrack Telecommunications Department located on site and shown on drawing.
14. Locality plan to be included as part of the design;
15. Complete marker details are to be shown on the design drawings. Design notes to clearly indicate construction methodology (i.e. pipe jacking, boring, trenching and how that is to be undertaken) and pipe materials to be utilised
16. Site survey measurements to provide accurate plan and long section details showing natural surface profile verses design profile across the FULL WIDTH of the railway corridor and actual vertical depth clearances from proposed design to natural surface features including existing underground services;

2.2.2 Overhead Proposals

2.2.2.1 Design Requirements

General design requirements include, but are not limited to;

1. Service MUST cross perpendicular to the rail tracks (i.e. at 90 degrees)
2. Guy/Stay wires to be installed to all poles adjacent to the rail corridor, such that should pole failure occur, it shall not foul the rail tracks.
3. Splices or joins are not to be made in conductors over rail crossing spans
4. Conductor to be terminated at each end of the span over rail land – such that connecting conductors shall not affect the conductor over railway land.
5. Cross arms to be fitted to the side of the pole which is not facing the rail tracks.
6. Conductors to be the following minimum height over each rail track;

Conductor (kV)	Height Above Rail
1 < kV < 66	7600mm

Conductor (kV)	Height Above Rail
66 < kV < 132	7900mm
132 < kV < 275	9000mm
275 < kV < 330	9800mm
330 < kV < 500	11300mm
≥ 500kV	11300mm + 300mm for every 33kV above 500kV

7. Poles installed within VicTrack land to be avoided. All supporting structures to be located external to VicTrack Land
8. Longitudinal installations along the rail reserve to be avoided

2.2.2.2 Drawing Requirements

Design drawings lodged with VicTrack for review should be rail specific and must incorporate the following information:

1. Aerial plan showing; VicTrack land boundaries, pole GPS location (long, lat), angle of crossing, statutory rail line, kV of conductor, distance from closest rail to each pole, relevant proposal annotations (denoting poles for removal, replacement or new installation etc.)
2. Elevation of installation showing; pole locations, conductor alignment, height of conductor over rail tracks under maximum sag conditions (greatest operational temperature), VicTrack land boundaries, distance from closest rail to each pole, relevant proposal annotations (denoting poles for removal, replacement or new installation etc.)
3. Design drawing title block to provide updated drawing reference number and revision details;
4. Design drawings orientated so that north compass ALWAYS points to page top;
5. Name and direction to the nearest railway station to be provided on the drawing;
6. Statutory rail line name and railway chainage to be clearly shown on the design drawing (information available through services@victrack.com.au - a measurable sketch/schematic is required together with GPS coordinates of pole locations in order for this to be supplied)
7. VicTrack file reference clearly displayed on drawings (contact services@victrack.com.au with all preliminary details of your proposal in order to be supplied a reference number)
8. Where penetration of VicTrack land is to occur, Details and offset in millimetres (mm) of all utility and other third party services, structures and assets including water, sewer, drainage, gas, electricity and communications and infrastructure associated with these services located on site and shown on drawing.

9. All railway signal cables, railway signal high and/or low voltage cables, railway electricity overheads, electrolysis and any other associated railway infrastructure which may include but is not limited to drains, storm water drains, culverts, pits etc. located on site and shown on drawing.
10. All existing VicTrack optic fibre, copper communications cabling, pits and any other associated VicTrack telecommunications infrastructure indicated on the VicTrack Network protection drawings or as advised to you by the VicTrack Telecommunications Department located on site and shown on drawing.
11. Locality plan to be included as part of the design;
12. Site survey measurements to provide accurate plan and long section details showing natural surface profile verses design profile across the FULL WIDTH of the railway corridor and actual vertical clearances from proposed design to natural surface features including existing underground services (where applicable to point 8 above)
13. Suitable legend detailing all drawing symbols and company jargons

3 Reference Drawings

A set of VicTrack's standard sample drawings can be found in Appendix B. These drawings should be closely mirrored in the creation of your final design drawings for submission to VicTrack.

The following sample drawings can be found in the attached Appendix B

- (A) OVERHEAD ELECTRICAL INSTALLATION (22KV) – METRO AREA – ELECTRIFIED RAIL TRACK
- (B) OVERHEAD ELECTRICAL INSTALLATION (22KV) – URBAN AREA – NON-ELECTRIFIED RAIL TRACK
- (C) UNDERGROUND ELECTRICAL CONDUIT INSTALLATION (22KV)
- (D) UNDERGROUND GAS MAIN INSTALLATION

All underground conduit/pipe/culvert proposals shall reflect drawings c) & d) with appropriate amendments to design notes and annotations made.

For any further information or queries on the information provided within this document, please forward an email to services@victrack.com.au

APPENDIX A

STANDARD CONDITIONS FOR ELECTRIC POWER OVERHEAD LINES ON OR OVER LAND VESTED IN VICTORIAN RAIL TRACK (VRT)

**STANDARD CONDITIONS FOR
ELECTRIC POWER OVERHEAD LINES ON OR OVER LAND
VESTED IN VICTORIAN RAIL TRACK (VRT)**

1. DEFINITIONS

In these conditions:-

- a. “**crossing span**” shall mean that portion of conductors between supports, which cross over the railway line, and/or the Corporation’s aerial lines.
- b. “**electrified railway**” shall mean any line of electric traction or any line on which electric traction is proposed at a future date and which the Corporation may direct to be regarded as being an electrified railway.
- c. “**high voltage**” shall mean a voltage of an aerial line carrying alternating current,exceeding low voltage.
- d. “**low voltage**” shall mean a voltage of an aerial line carrying alternating current, not exceeding 1000 volts.
- e. “**other cable system**” shall mean: -
 - telecommunication and control cables
 - electrolysis cables
 - aerial earthed cables
- f. “**overhead line**” shall mean a high and/or low voltage aerial line carrying alternating current, erected on or over the property of the Corporation and shall be deemed to include conductors supports and all appurtenances necessary for or incidental to the functioning of the overhead line
- g. “**the Corporation**” shall mean Victorian Rail Track.
- h. “**the Engineer**” shall mean the person nominated by the Corporation
- i. “**the Owner**” shall mean the owner of the overhead line.

and, unless the context otherwise requires, words importing the singular number shall mean and include the plural number and words importing the masculine gender shall mean and include the feminine gender and the neuter gender.

2. LICENCE

The Owner of an overhead line may be required to enter into an Agreement or to execute a Licence, and pay to the Corporation such fees as shall be fixed by the said Corporation from time to time.

3. INSTALLATION, MAINTENANCE AND REMOVAL OF OVERHEAD LINE

The Owner shall be responsible for the work of installation, maintenance and/or removal of the overhead line in accordance with these conditions. The Engineer will inspect crossings following completion of works and at other times if considered necessary, to confirm compliance with these conditions. Any remedial action by the Owner, to be carried out as directed by the Engineer.

4. COSTS

The Owner shall bear the total cost of installation, maintenance, and removal of any overhead line, including all costs which may be incurred by the Corporation in connection therewith. The Owner shall also bear the cost of any alterations to the installation which may be required by the Corporation and any subsequent expenditure to which the Corporation may be put resulting from the presence of the overhead line on or over the property of the Corporation.

5. TERMINATION OF AGREEMENT OR LICENCE

The Agreement or Licence may be terminated at any time by the Corporation giving notice in accordance with the terms thereof, and where notice is given because land is required for railway purposes such notice will be given as early as practicable.

6. INDEMNITY

The Owner of any overhead line shall compensate the Corporation its servants and agents for and release them from and indemnify them against any or any liability for loss damage expense or injury sustained incurred or suffered by the Corporation or the Owner or any person whomsoever or body whatsoever and which is caused or brought about by, or which arises out of or is in any way connected with the installation of the overhead line or its subsequent existence maintenance repair control or user.

7. SUBMISSION OF PLANS

Ten copies of a scale plan of the work to be executed, showing all relevant clearances, other features, the exact location of the crossing span with direction, distance to nearest railway kilometre post, main road and parish, shall be supplied by the Owner for approval by the Engineer.

8. APPLICATION FOR WORKS ON OVERHEAD LINES

Any renewal, replacement, alteration or removal of an overhead line, will require an application from the Owner and be subject to the requirements of these conditions.

9. LOCATION OF OVERHEAD LINES

- a. Overhead lines shall be located to cross tracks at 90 degrees, however, if not practicable, approval may be given to cross tracks at angles between 45 and 90 degrees.
- b. Overhead lines and supporting structures shall be erected clear of all railway structures, drains, access roads, signalling/communications equipment, overhead masts and buildings.
- c. Overhead lines erected longitudinally in the property of the Corporation shall be located as far as practicable from the track or structures. They shall not be located within 15000mm of the centre line of the nearest track, unless with the approval of the Engineer.
- d. The supporting structures at a level crossings shall be positioned so as not to be an obstruction to road users' view of approaching trains and/or level crossing protection, including signage and any flashing light signals.
- e. Low voltage aerial lines carrying alternating current and other cable systems, will not be permitted over electrified railways

10. DISPOSAL OF EXCAVATED MATERIAL

Material from excavations shall be deposited in a position and manner approved by the Engineer and shall be kept clear of track ballast so as to avoid fouling of ballast and blocking of track drainage. Under no circumstances shall soil be thrown directly onto the track ballast. The property of the Corporation shall be left in a clean and tidy condition.

11. CARRYING OUT WORKS

- a. No installation shall be commenced on or over the property of the Corporation until details of the proposal have been submitted in writing to, and approved by the Engineer and the conditions imposed have been agreed to in writing by the Owner.
- b. Work shall be carried out only in the manner and at such times as directed by the Engineer and to his satisfaction. The specified notice must be given prior to commencement of the work. Blasting shall only

be carried out in accordance with the conditions laid down by the Engineer.

- c. Any work within 4600mm of the vertical projection of the outer rails of any track or any other portion of the work so determined shall be carried out only in the presence of the Engineer's representative and in accordance with his directions.
- d. All overhead lines shall comply with the Victorian Electricity Safety Act and associated Regulations, also with those of New South Wales for work in that State, except insofar as they are modified by these conditions.
- e. Work or the use of mechanical appliances for excavating or lifting within 6400mm of the Corporations aerial direct current or high voltage alternating current lines is subject to the Train Infrastructure Electrical Safety Rules (High Voltage Rules).
- f. The Engineer shall have power to order the suspension of work if he considers that it is being performed in an unsafe or unsatisfactory manner and the carrying out of additional works to ensure compliance with these conditions.

12. CONDUCTORS

- a. The ultimate tensile strength of any conductor shall be, for high voltage, not less than 5.4kN, or for low voltage, not less than 3.1kN. In calculating the stresses on composite cables constructed with a neutral screen, the strength of the cable shall be considered to be the combined strength of the active conductors only. In composite cables constructed with a supporting catenary wire or wires, the strength of the cable shall be considered to be the strength of the supporting wire or wires. Each conductor shall consist of at least three separate strands.
- b. Regular inspections of crossing spans shall be made and conductors shall be renewed immediately there is any sign of defect.
- c. Splices or joins shall not be made in conductors of crossing spans.
- d. No current carrying connection of any kind shall be made to any portion of a crossing span which is under tension.

13. SUPPORTS

- a. The construction of supporting structures for crossing spans shall be such that, in the event of conductors breaking in an adjoining span, the conductors in the crossing span will maintain the clearances to those parts of the railway system specified in these conditions.

Crossings shall be terminated at each end of the span with strain type insulators and supporting structures shall be guyed, unless otherwise advised by the Engineer

- b. Overhead line supporting structures shall be erected so that the minimum distance from the: -
- centre line of the nearest track is 10000mm
 - aerial high voltage line is 5000mm
 - aerial low voltage line and Other Cable Systems is 3000mm
 - boundary fence is 4600mm
 - toe of banks or top of cuttings, is 3700mm

At least one structure shall be located as close as possible to the railway subject to the foregoing provisions.

- c. Where guys are on railway property, their position shall be approved by the Engineer. A strain insulator shall be inserted in the guy wires and the guy wire shall be fitted with a white painted hardwood batten not less than 75mm x 50mm (or an equivalent warning tube) for a vertical distance of 1800mm above ground level. Each guy shall be tensioned sufficiently to prevent excessive sag in the guy wire. The use of "Footpath Guys" is not permitted.
- d. Crossarms not fitted to the top of the pole, shall be fitted to that side of the pole which is farthest from the railway tracks. The use of "Offset Crossarms" is not permitted.
- e. Regular inspections of wooden poles shall be made by the Owner and any found not to be safe for the next inspection period, shall be suitably marked and replaced, as follows: -
- "Limited Life" – Changed within one year
 - "Unservicable" – Changed within six weeks
- Only "Unservicable" poles which are unable to be replaced in the above specified period, may be staked and then must be changed within one year.
- Staking of poles is permitted for urgent temporary repairs only, with the Corporation to be notified.
- The Corporation reserves the right to test poles if considered unsafe.

14. CLEARANCES

- a. An aerial line carrying alternating current, must not at any time, be closer to a part of a railway system specified in table 1, than the relevant minimum distances in that table.

- b. A high voltage aerial line carrying alternating current, crossing over an electrified railway, must not at any time, be closer than 900mm above a straight line joining the higher of the supporting points of the spans of the d.c. train traction conductors and other cable systems.

TABLE 1

Minimum Distance From Part Of A Railway System					
Nominal Voltage 'U' of Crossing (a.c.) Conductor	Other Cable Systems		Above Rail	Aerial Alternating (a.c.) and Direct Current (d.c.) Lines	
	From Conductors	From Supports		From Conductors	From Supports
$U \leq 1\text{kV}$	900mm	2700mm	7100mm	900mm (a.c. $U \leq 1\text{kV}$ only)	2700mm
$1\text{kV} < U \leq 22\text{kV}$	1800mm	4000mm	7600mm	1200mm	3700mm
$22\text{kV} < U \leq 66\text{kV}$	2400mm	4600mm	7600mm	1800mm	4600mm
$66\text{kV} < U \leq 132\text{kV}$	3000mm	4600mm	7900mm	2100mm	4600mm
$132\text{kV} < U \leq 275\text{kV}$	3700mm	6100mm	9000mm	3000mm	5500mm
$275\text{kV} < U \leq 330\text{kV}$	4600mm	7600mm	9800mm	4000mm	6400mm
$330\text{kV} < U \leq 500\text{kV}$	6100mm	9100mm	11300mm	5500mm	7900mm
Over 500kV	9100mm	10700mm	as for 500kV plus 300mm for every 33kV above.		

VRT STANDARD CONDITIONS – ELECTRIC POWER OVERHEAD LINES

Prior to entering railway property it will be necessary for contractors to have completed a track awareness course. Please contact Russell Frew at Rail Training International on 9619 0121 to enroll.

The asset and/or works shall be placed and/or carried out in accordance with the attached letter, sound engineering practice, appropriate statutes and the relevant conditions of the "STANDARD CONDITIONS FOR ELECTRIC POWER OVERHEAD LINES ON OR OVER LAND VESTED IN VICTORIAN RAIL TRACK (VRT)".

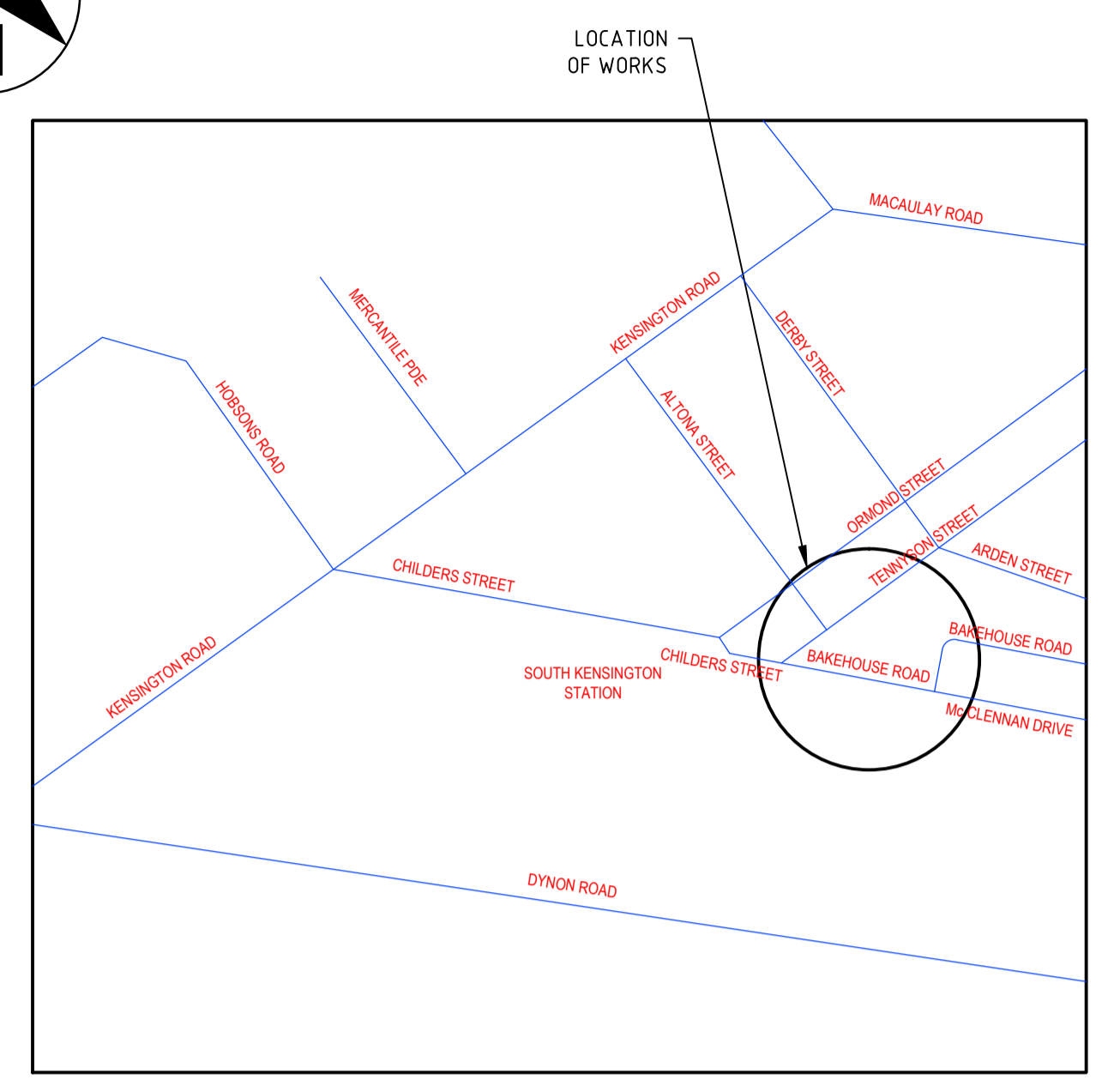
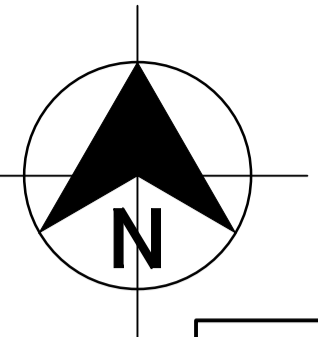
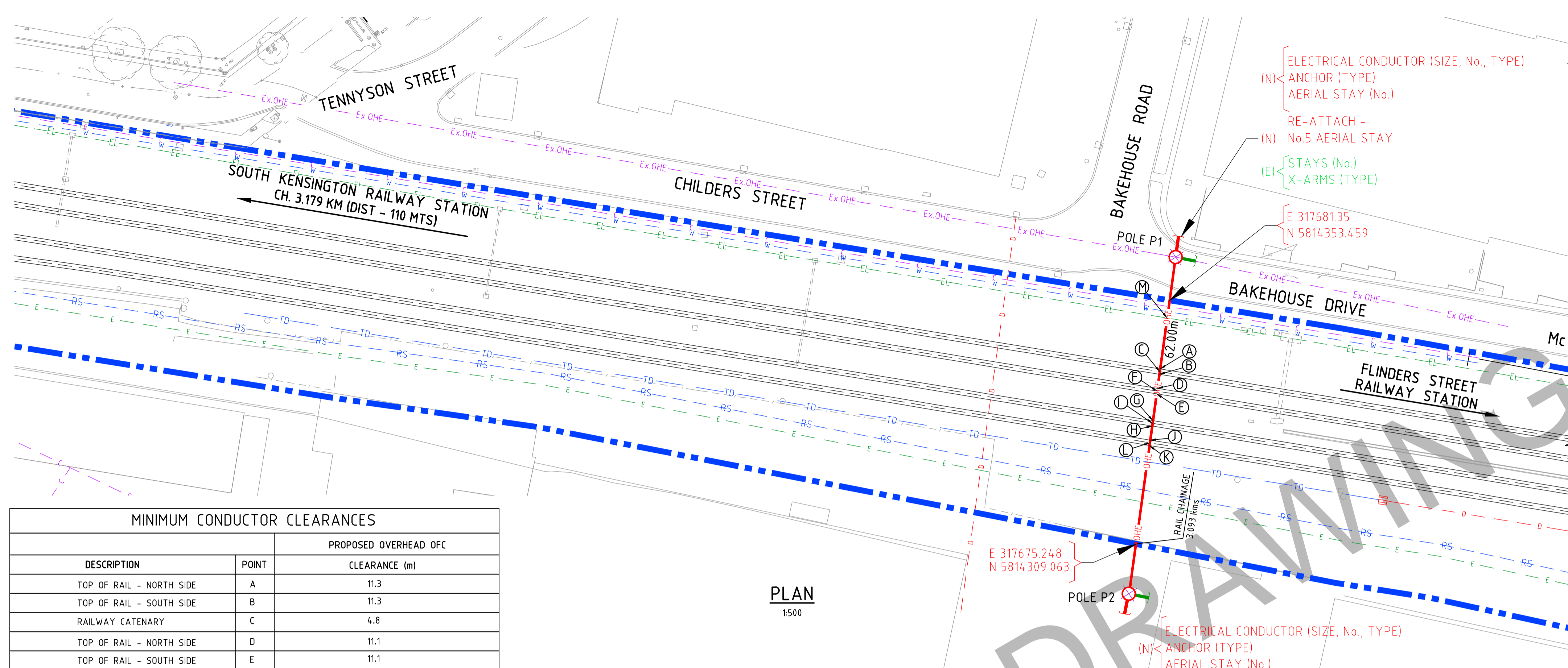
1. All materials and equipment, necessary to complete the work shall be readily available prior to the commencement of any work in the vicinity of VRT's facilities or on VRT land.
2. Ensure that any contractor is made aware of these requirements and complies therewith.
3. Notwithstanding the granting of permission to carry out works in the vicinity of VRT's facilities or on VRT land, the Applicant, its contractor or representative shall:
 - a. not erect or cause to be erected any temporary or permanent structure which intrudes within a vertical plane which is 3 metres away from the centre line of the nearest track;
 - b. not cross the railway tracks at other than approved road crossings with rubber tyred, steel wheeled or tracked construction plant or vehicles without the permission of the Maintenance Engineer. All vehicles shall be required to stop before crossing the railway tracks, and only proceed if no trains are in sight, unless signalled to proceed by an approved officer;
 - c. ensure that no works are carried out closer than ten metres from the centre line of the nearest track unless under conditions stipulated by the Maintenance Engineer. Any distance so authorised is the minimum clearance and shall not be infringed by the booms etc. of mobile equipment and mechanical plant. Stationary boring rigs etc may be required to be braced and/or guyed off in an approved manner;
 - d. construction plant such as cranes, excavators, etc. shall be made stationary and aerial elements (booms, buckets, etc.) shall be grounded during the passage of a rail vehicle, similarly, prior to relocation of such plant the aerial elements are to be returned to their normal rest positions to ensure stability of the equipment;
 - e. ensure that the effects of excavation, pile driving, dewatering, etc, upon the settlement of the tracks and structures of VRT are regularly monitored to the satisfaction of the Maintenance Engineer;
 - f. where necessary, ensure that temporary lighting to protect the works is provided and appropriately positioned to avoid confusion with signals. Only white lights shall be used and placed to the satisfaction of the Maintenance Engineer;
 - g. not use explosives as they are the subject of particular regulations, and are only to be utilised at the discretion of the Maintenance Engineer;
 - h. leave the site in a condition satisfactory to the Maintenance Engineer; and
 - i. no excavation is to be carried out within one metre of the base of any pole, or within three metres of the base of any electric traction wiring stanchion.
4. Any manhole pit and cover within the railway reserve or any reasonable access route thereto is to be designed for road vehicle loading and/or appropriately protected to the requirements of the Maintenance Engineer.

APPENDIX B

VICTRACK SAMPLE DESIGN DRAWINGS

(A)

OVERHEAD ELECTRICAL INSTALLATION (22KV) – METRO AREA – ELECTRIFIED RAIL TRACK



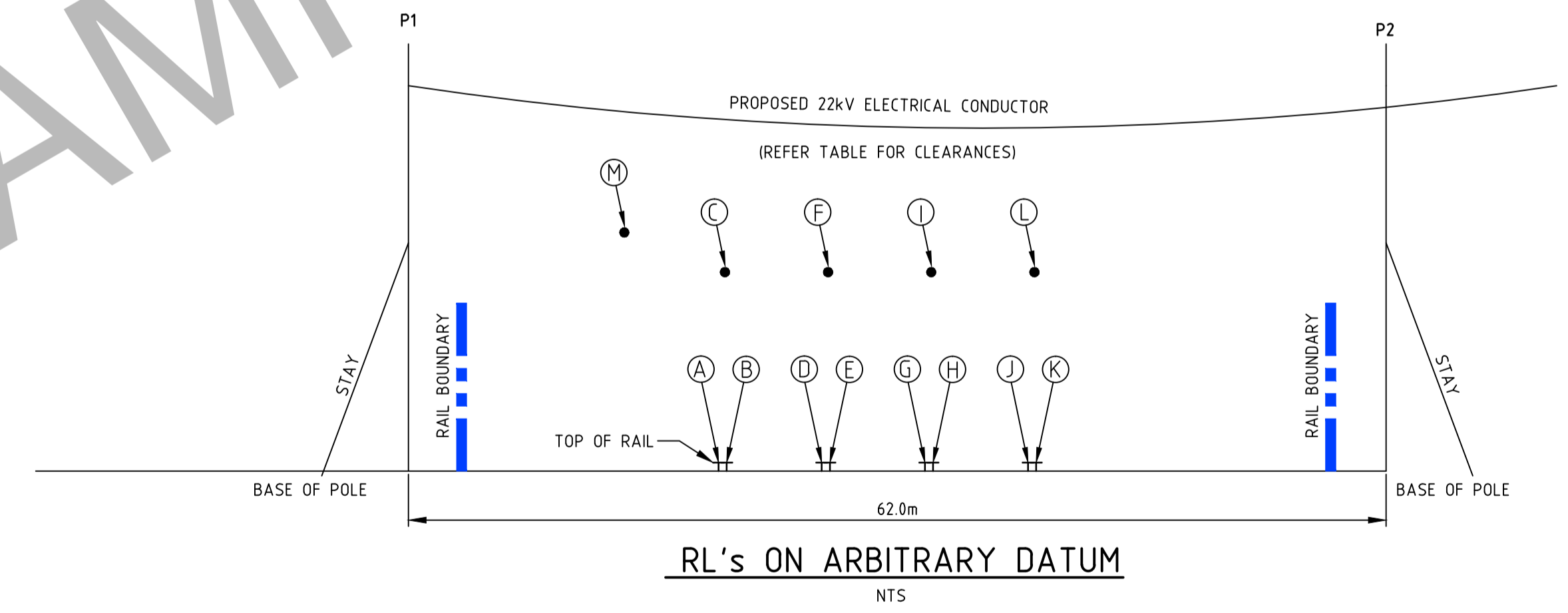
SITE LOCALITY PLAN
MEL REF 42 K4

MINIMUM CONDUCTOR CLEARANCES		
DESCRIPTION	POINT	PROPOSED OVERHEAD OFC CLEARANCE (m)
TOP OF RAIL - NORTH SIDE	A	11.3
TOP OF RAIL - SOUTH SIDE	B	11.3
RAILWAY CATENARY	C	4.8
TOP OF RAIL - NORTH SIDE	D	11.1
TOP OF RAIL - SOUTH SIDE	E	11.1
RAILWAY CATENARY	F	4.6
TOP OF RAIL - NORTH SIDE	G	11.1
TOP OF RAIL - SOUTH SIDE	H	11.1
RAILWAY CATENARY	I	4.6
TOP OF RAIL - NORTH SIDE	J	11.3
TOP OF RAIL - SOUTH SIDE	K	11.3
RAILWAY CATENARY	L	4.8
ELECTROLYSIS OVERHEAD	M	3.8

NOTES: CATENARY CLEARANCES ARE THE CLEARANCES BETWEEN THE LOWEST CONDUCTOR AND A STRAIGHT LINE JOINING ADJACENT CATENARY POINTS OF SUPPORT

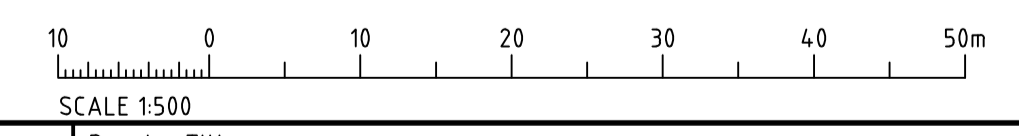
NOTES
THE INSTALLATION IS TO BE IN ACCORDANCE WITH THE "STANDARD CONDITIONS FOR ELECTRIC POWER OVERHEAD LINES ON OR OVER LAND VESTED IN VICTRACK"
CROSSARMS IF REQUIRED ARE TO BE FITTED TO THE SIDE OF POLE FARTHEST AWAY FROM RAIL TRACKS. THE SUPERVISING OFFICER WILL BE REQUIRED TO COMPLETE THE INSPECTION REPORT PROFORMA, PROVIDED BY VICTRACK ON COMPLETION OF THE WORK.
CONTRACTORS ARE TO COMPLY WITH MTM DOCUMENTS L1-CCO-PRO-001 (SITE ACCESS PROCEDURES), AND L0-SQE-PRO-014 (SAFETY AND ENVIRONMENTAL REQUIREMENTS FOR CONTRACTORS WORKING ON MTM PREMISES).
WARNING
NO CURRENT CARRYING CONNECTIONS ARE TO BE MADE TO THE CONDUCTORS IN THE CROSSING SPAN. i.e. MAKE CONNECTIONS TO THE CONDUCTOR TAILS.

SAMPLE DRAWING



CONDUCTOR SCHEDULE					
VOLTAGE	SERIES POLE NUMBERS	CONDUCTOR	MES	STRINGING CHART	ROUTE LENGTH
22 kV	POLE P1 - P2	3-6/1/3.75ACSR		EC271	62m

LEGEND	
	EXISTING POLE
	VICTRACK PROPERTY BOUNDARY
	PROPOSED OVERHEAD ELECTRIC (xx KV)
	EXISTING WATER MAIN
	EXISTING TABLE DRAIN
	EXISTING DRAINAGE PIPE AND PIT
	EXISTING FENCE
	EXISTING GAS MAIN
	EXISTING OVERHEAD ELECTRIC CONDUCTORS
	EXISTING COMMUNICATIONS CABLE
	EXISTING RAIL SIGNAL
	EXISTING UNDERGROUND ELECTRIC
	EXISTING OVERHEAD HV ELECTRIC
	EXISTING ELECTROLYSIS OVERHEAD
	EXISTING TREE
	STANCHIONS FOR ELECTRICAL OVERHEAD AND ELECTRICAL OVERHEAD
	EXISTING RAILWAY LINES
	EXISTING RAILWAY ELECTRIC OVERHEAD/CATENARY
	PROPOSED POLE
	RETIRE EXISTING
	PROPOSED STAY
	RETIRE STAY
	EXISTING STAY



WARNING AND DISCLAIMER
BEWARE OF UNDERGROUND SERVICES

The information provided in these drawings relating to the positions of underground services is intended to be only a guide for excavation works. (Designer's business entity) does not warrant or represent that the positions of those services shown on the drawings are accurate. Furthermore, services may exist of which (Designer's business entity) is unaware. The information provided should therefore not be relied upon and exact positions of services should be verified by hand excavation. Furthermore, (Designer's business entity) disclaims responsibility for damage or injury to any person caused directly or indirectly by any works affecting the services.

Dated: _____

Rev.	Date	Revision Details	Des.	Ver.	App.
A	15.05.12	CONSTRUCTION ISSUE	AM	LM	NEB

(CONSULTANT NAME)

Client: _____
(CLIENT NAME)

Project: _____
(ASSET OWNER) - VICTRACK APPLICATION (REF. NO.) (LOCATION)

Drawn	Signed	Date
Designed	Signed	Date
Verified	Signed	Date
Approved	Signed	Date

Drawing Title:
PROPOSED INSTALLATION FOR ELECTRICAL 22kV AERIAL NETWORK OVER ELECTRIFIED RAILWAY ON FLINDERS STREET - NEWPORT RAIL LINE AT CH-3.093KM (LOCATION)

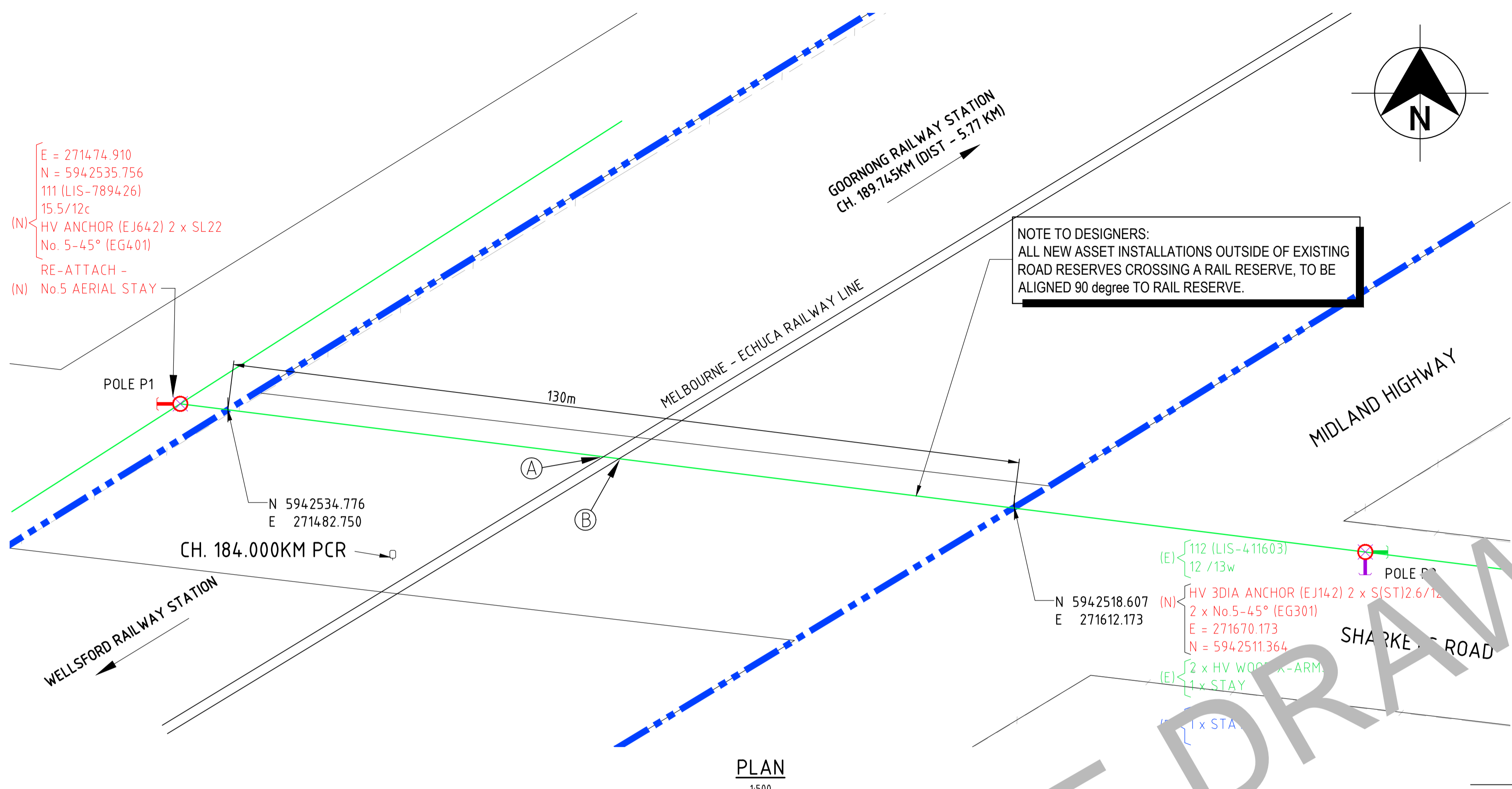
FOR CONSTRUCTION	
Project No.	222648
Scale	AS SHOWN
Sheet Size	A1
Drawing No.	STD E0091
Rev.	A

Use File: P:\CADD\DATA\PROJECTS\222648\222648-001\222648-001-Electrical-Aerial-Overhead-Flinders-Newport.dwg Plot Date: 22/07/2015 10:28:59 Name: Goran Stevanovic Xref: 222648-001-1100.DWG

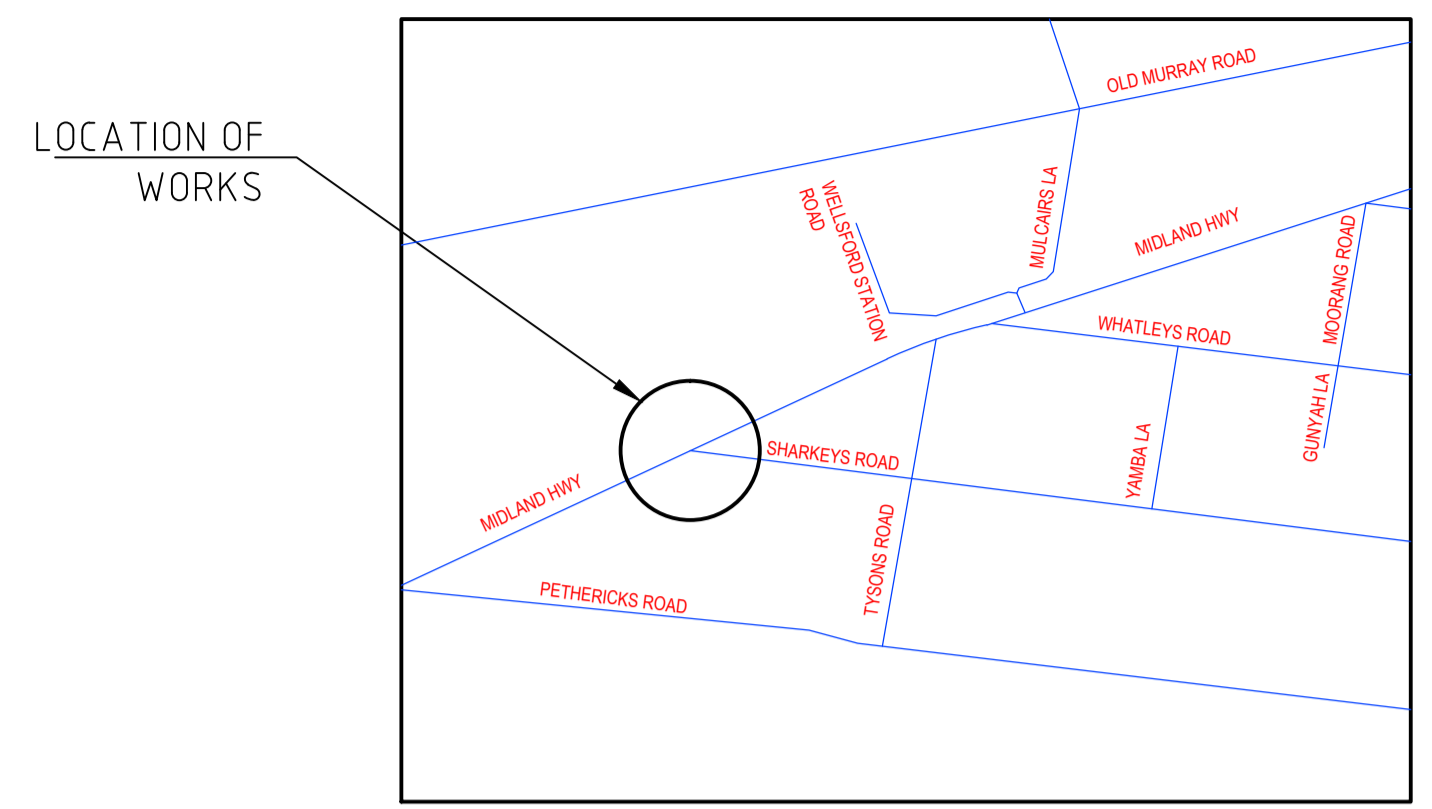
(B)

**OVERHEAD ELECTRICAL INSTALLATION (22KV) – URBAN AREA – NON-ELECTRIFIED RAIL
TRACK**

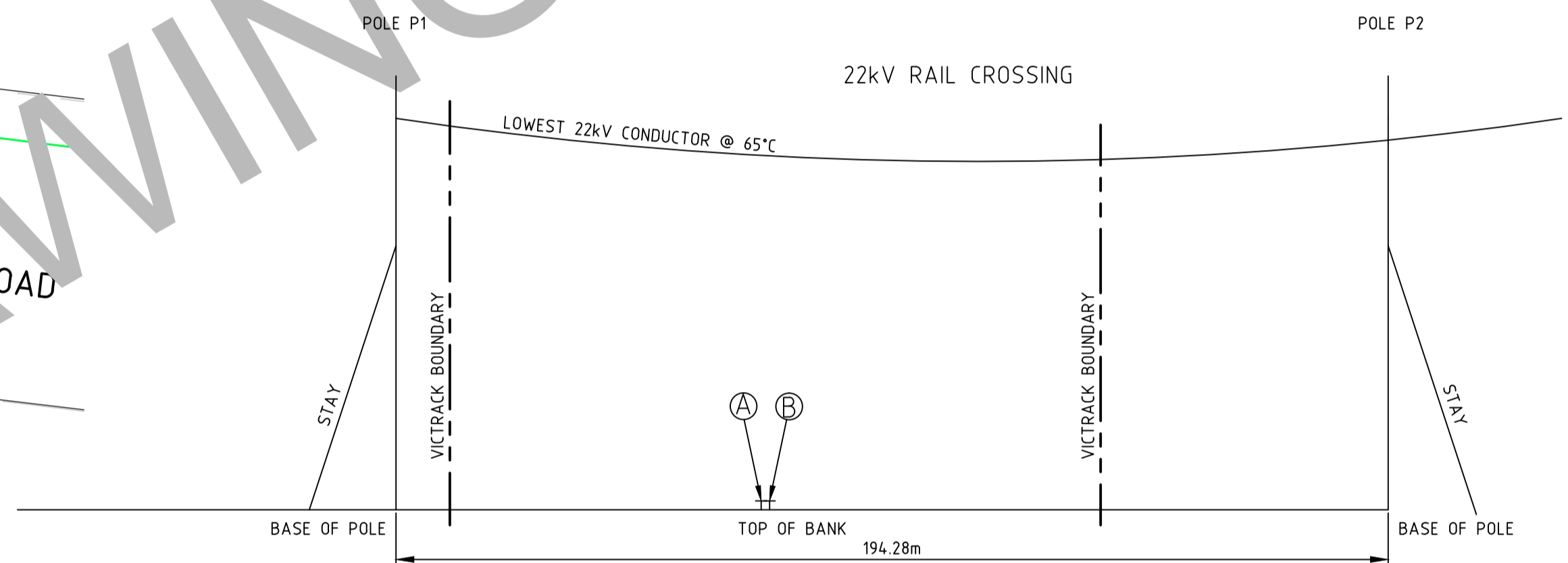
E = 2714.74.910
 N = 594.2535.756
 111 (LIS-7894.26)
 15.5/12c
 (N) HV ANCHOR (EJ642) 2 x SL22
 No. 5-45° (EG401)
 RE-ATTACH -
 (N) No.5 AERIAL STAY



NOTE TO DESIGNERS:
 ALL NEW ASSET INSTALLATIONS OUTSIDE OF EXISTING ROAD RESERVES CROSSING A RAIL RESERVE, TO BE ALIGNED 90 degree TO RAIL RESERVE.



SITE LOCALITY PLAN
 VICROADS REF 44 J4



RL's ON ARBITRARY DATUM
 NTS

LEGEND

- EXISTING POLE
- VICTRACK RAILWAY BOUNDARY
- EXISTING AERIAL CONDUIT
- EXISTING RAILWAY LINE
- PROPOSED POLE
- × RETIRE EXISTING
- ↓ PROPOSED STAY
- ↓ RETIRE STAY
- ↓ EXISTING STAY

NOTES
 THE INSTALLATION IS TO BE IN ACCORDANCE WITH THE "STANDARD CONDITIONS FOR ELECTRIC POWER OVERHEAD LINES ON OR OVER LAND VESTED IN VICTRACK".
 CROSSARMS ARE TO BE FITTED TO THE SIDE OF POLE FARTHEST AWAY FROM RAIL TRACKS.
 THE SUPERVISING OFFICER WILL BE REQUIRED TO COMPLETE THE INSPECTION REPORT PROFORMA, PROVIDED BY VICTRACK ON COMPLETION OF THE WORK.
 WARNING
 NO CURRENT CARRYING CONNECTIONS ARE TO BE MADE TO THE CONDUCTORS IN THE CROSSING SPAN. i.e. MAKE CONNECTIONS TO THE CONDUCTOR TAILS.

CONDUCTOR SCHEDULE					
VOLTAGE	SERIES POLE NUMBERS	CONDUCTOR	MES	STRINGING CHART	ROUTE LENGTH
22 kV	POLE P1 - P2	3-6/1/3.75ACSR		EC271	194.28m

MINIMUM CONDUCTOR CLEARANCES		
DESCRIPTION	POINT	LOWEST 22kV CONDUCTOR AT 65°C
		CLEARANCE (m)
TOP OF RAIL - WEST SIDE	A	7.9
TOP OF RAIL - EAST SIDE	B	7.9

NOTES:
 CATENARY CLEARANCES ARE THE CLEARANCES BETWEEN THE LOWEST 22kV CONDUCTOR AT 65°C AND A STRAIGHT LINE JOINING ADJACENT CATENARY POINTS OF SUPPORT

WARNING AND DISCLAIMER
 BEWARE OF UNDERGROUND SERVICES

The information provided in these drawings relating to the positions of underground services is intended to be only a guide for excavation works. (Designer's business entity) does not warrant or represent that the positions of those services shown on the drawings are accurate. Furthermore, services may exist of which (Designer's business entity) is unaware. The information provided should therefore not be relied upon and exact positions of services should be verified by hand excavation. Furthermore, (Designer's business entity) disclaims responsibility for damage or injury to any person caused directly or indirectly by any works affecting the services.



Rev.	Date	Revision Details	Drn	Ver.	App.
01	15.05.12	CONSTRUCTION ISSUE	AM	LM	NEB

(CONSULTANT NAME)

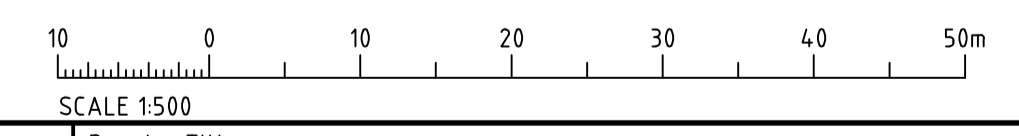
(CLIENT NAME)

(ASSET OWNER) - VICTRACK
 APPLICATION (REF. NO.)
 (LOCATION)

Drawn	Signed	Date
Designed	Signed	Date
Verified	Signed	Date
Approved	Signed	Date

Drawing Title:
PROPOSED INSTALLATION FOR ELECTRICAL 22kV AERIAL NETWORK OVER NON ELECTRIFIED RAILWAY ON MELBOURNE - ECHUCA RAIL LINE AT CH-183.975KM (LOCATION)

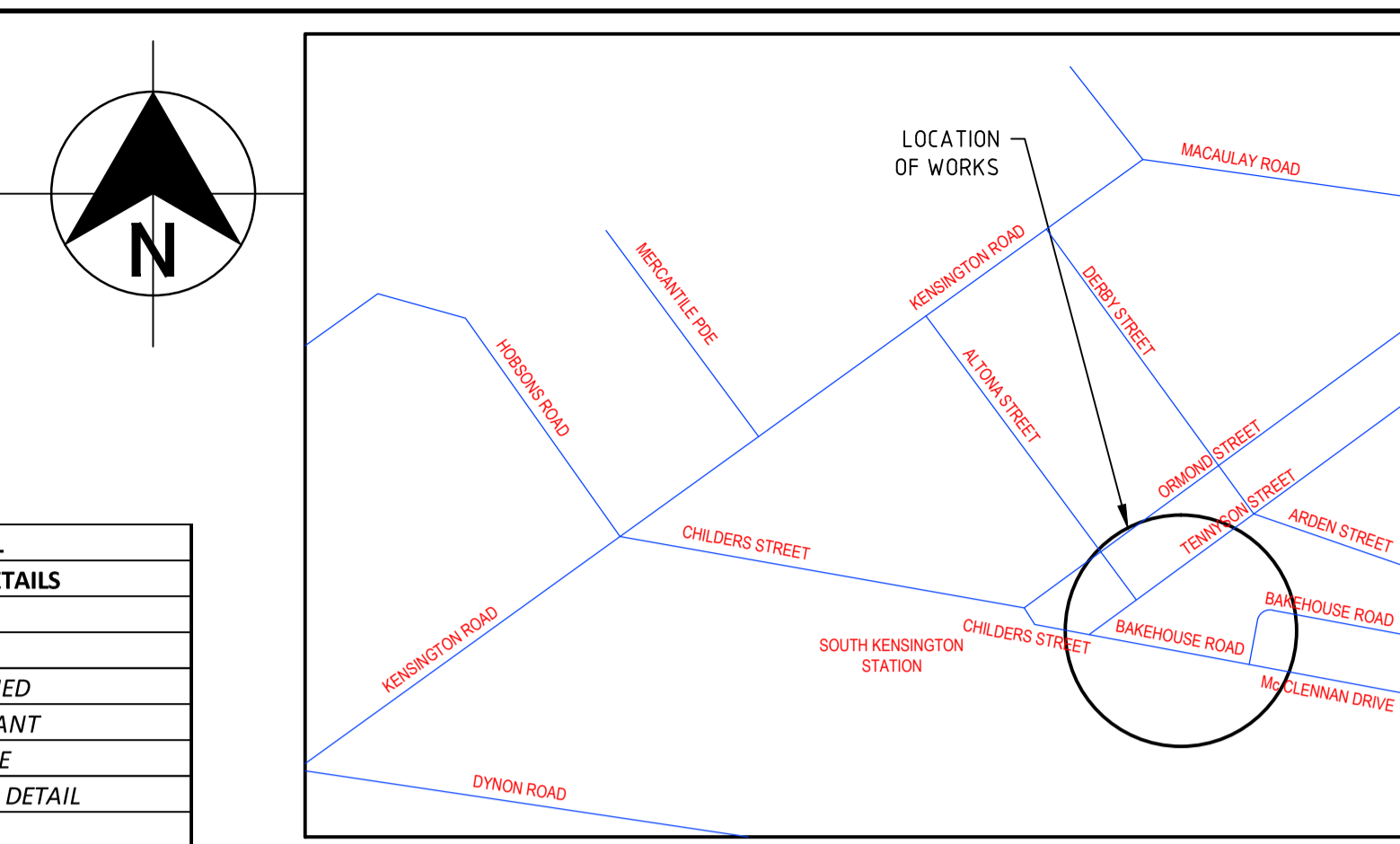
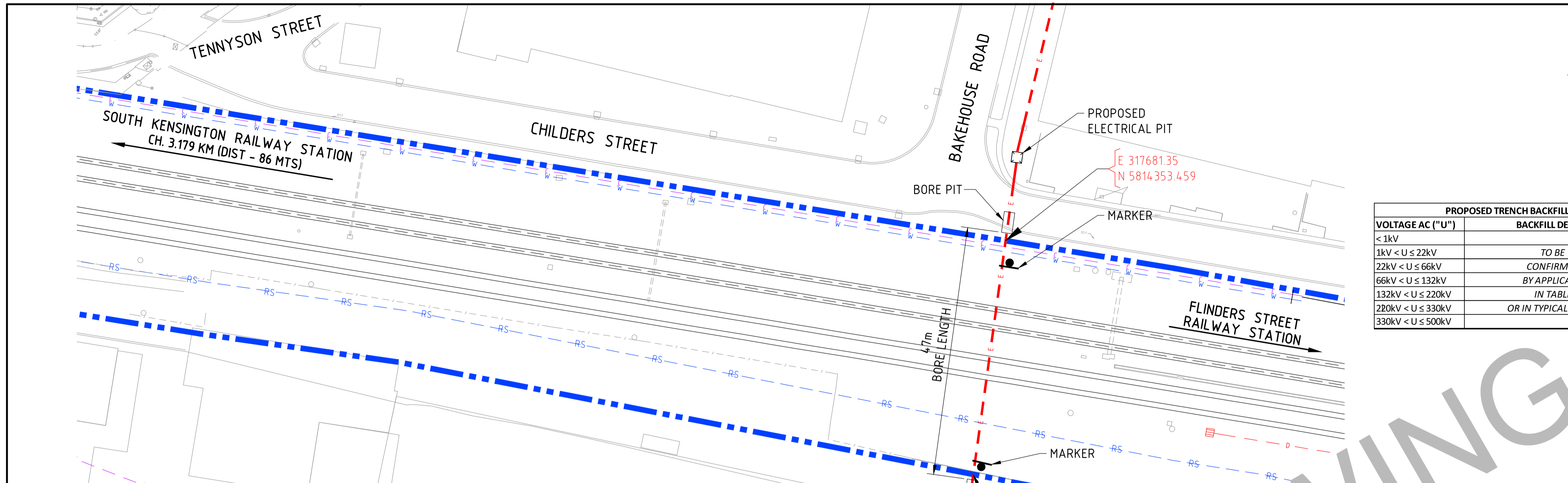
CONSTRUCTION ISSUE	
Project No.	200649.010
Scale	1:500
Sheet Size	A1
Drawing No.	STD E0093
Rev.	A



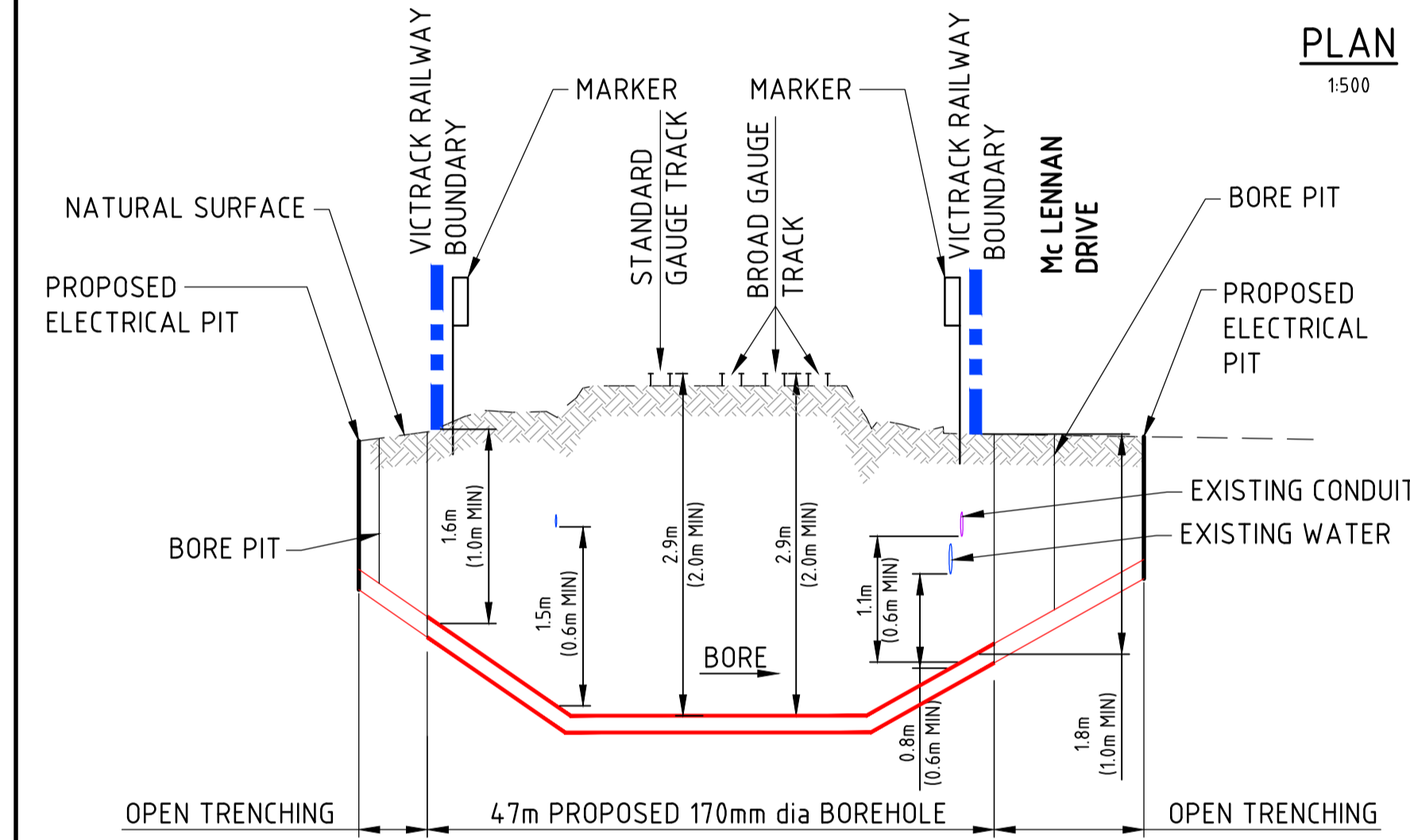
SAMPLE DRAWING

(C)

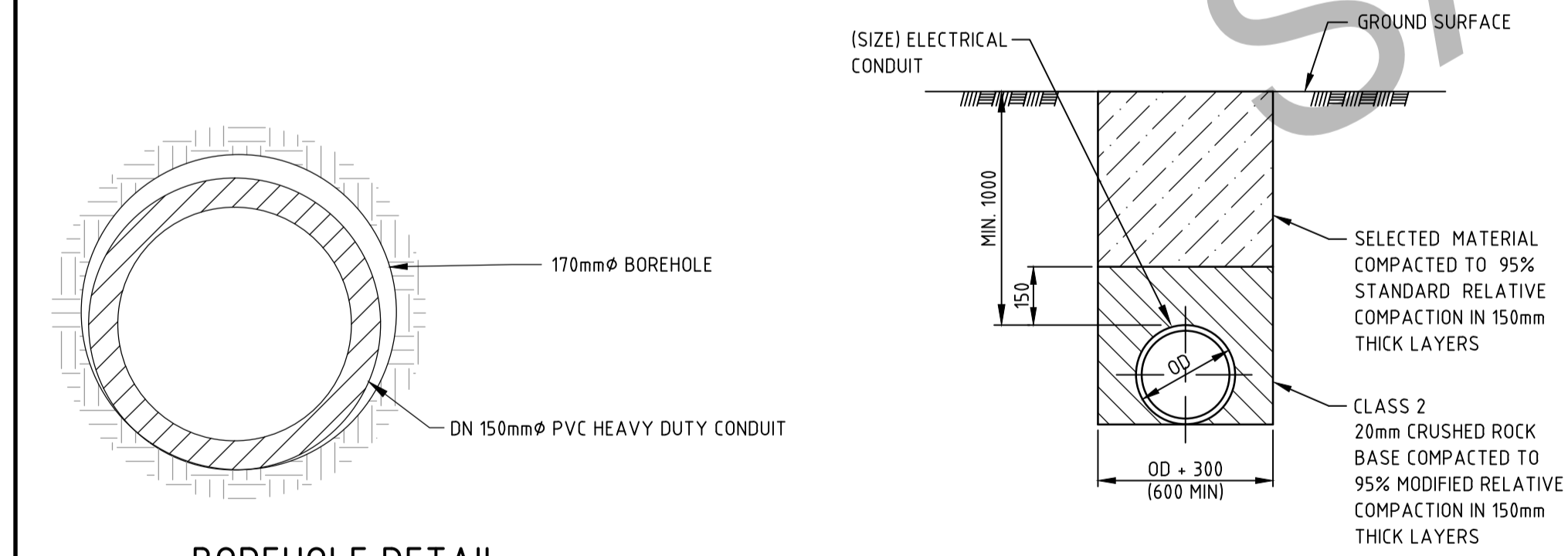
UNDERGROUND ELECTRICAL CONDUIT INSTALLATION (22KV)



VOLTAGE AC ("U")	BACKFILL DETAILS
< 1kV	TO BE
1kV < U ≤ 22kV	CONFIRMED
22kV < U ≤ 66kV	BY APPLICANT
66kV < U ≤ 132kV	IN TABLE
132kV < U ≤ 220kV	OR IN TYPICAL DETAIL
220kV < U ≤ 330kV	
330kV < U ≤ 500kV	



BOREHOLE LONGITUDINAL SECTION
SCALE H 1:500
SCALE V 1:50

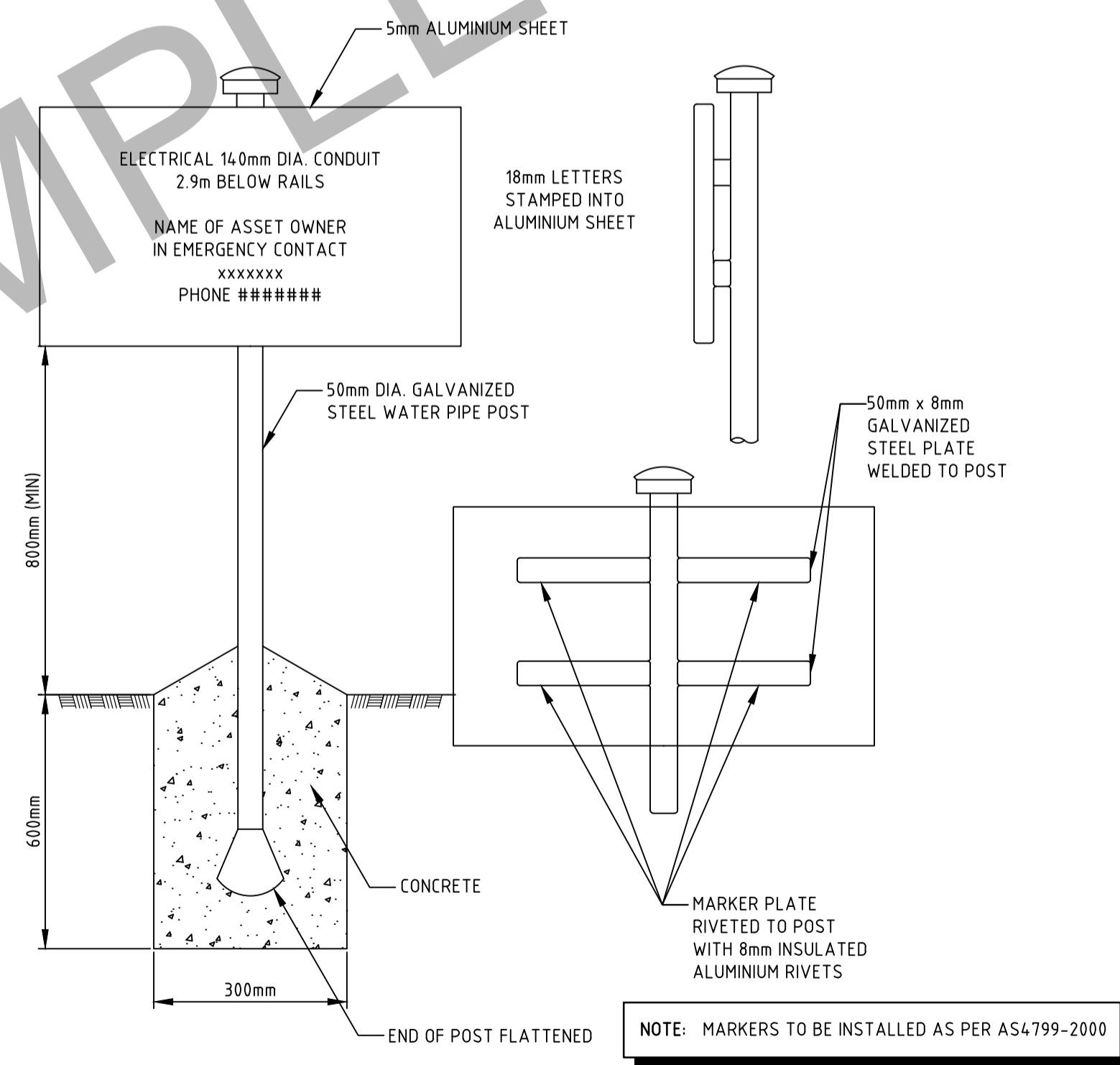


BOREHOLE DETAIL
N.T.S.



WARNING AND DISCLAIMER
BEWARE OF UNDERGROUND SERVICES
The information provided in these drawings relating to the positions of underground services is intended to be only a guide for excavation works. (Designer's business entity) does not warrant or represent that the positions of those services shown on the drawings are accurate. Furthermore, services may exist of which (Designer's business entity) is unaware. The information provided should therefore not be relied upon and exact positions of services should be verified by hand excavation. Furthermore, (Designer's business entity) disclaims responsibility for damage or injury to any person caused directly or indirectly by any works affecting the services.

Rev.	Date	Revision Details	Des.	Ver.	App.
A	15.05.12	CONSTRUCTION ISSUE	AM	LM	NEB



TYPICAL TRENCH DETAIL FOR ELECTRICAL CONDUIT
N.T.S.

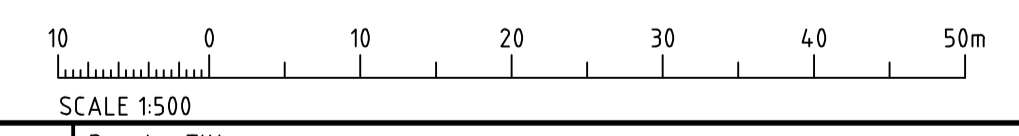
TYPICAL MARKER
N.T.S.

LEGEND

- VICTRACK PROPERTY BOUNDARY
- DN 150mmØ PVC HEAVY DUTY CONDUIT
- EXISTING WATER MAIN
- EXISTING DRAINAGE PIPE AND PIT
- EXISTING FENCE
- EXISTING COMMUNICATIONS CABLE
- EXISTING RAIL SIGNAL
- EXISTING TREE
- STAUNCHIONS
- EXISTING RAILWAY LINES
- EXISTING RAILWAY ELECTRIC OVERHEAD/CATENARY
- MARKER
- PROPOSED ELECTRICAL PIT

NOTE: METAL CONDUITS IN A ELECTRIFIED TRACTION AREA WILL REQUIRE CATHODIC PROTECTION

- NOTES:**
- EXISTING CONTOURS, LEVELS AND FEATURES ARE INDICATIVE ONLY AND ARE BASED UPON SURVEY DRAWINGS AND DATA SUPPLIED BY (SURVEYOR'S NAME).
 - ALL LEVELS ARE EXPRESSED IN METRES ABOVE AUSTRALIAN HEIGHT DATUM (AHD).
 - THE DRAWINGS SHALL NOT BE SCALED.
 - INSTALLATION OF THE ELECTRICAL CONDUIT SHALL BE CARRIED OUT IN ACCORDANCE WITH AS:4799-2000.
 - RAILWAY LAND, INCLUDING ANY OPEN DRAIN & MAINTENANCE TRACKS, SHALL BE REINSTATED IN ACCORDANCE WITH AS:4799-2000 AND TO THE SATISFACTION OF THE RAIL OPERATOR'S ENGINEER.
 - EXISTING SERVICES INFORMATION HAVE ALSO BEEN OBTAINED FROM www.1100.com.au AND VICTRACK RAILWAY COMMUNICATIONS CABLING DEPARTMENT AND INCLUDED ON THE DRAWINGS.
 - CONTRACTOR TO PROVIDE "AS BUILT" DRAWINGS IN ELECTRONIC FORMAT i.e. AUTOCAD AND PDF TO services.applications@victrack.com.au.
 - ALL EXISTING SERVICES INCLUDING RAILWAY SIGNALS, VICTRACK COMMUNICATIONS AND THIRD PARTY ASSETS HAVE BEEN LOCATED, DEPHTED AND DETAILS INCLUDED ON THE DRAWING. ALL EXISTING SERVICES LOCATIONS SHALL BE VERIFIED ON SITE BY THE CONTRACTOR BEFORE COMMENCING WORK AND PRODUCE A DETAILED EXISTING SERVICES PLAN.
 - IF THE PROPOSED INSTALLATION IS UNDER A OPERATOR ACCESS TRACKS, ANY REINSTATEMENT MUST BE TO THE SATISFACTION OF THE RAIL OPERATOR.
 - CONTRACTOR TO MAINTAIN MINIMUM 600mm CLEARANCE TO ANY EXISTING SERVICE AND MINIMUM 3.0m CLEARANCE TO ANY STRUCTURE.
 - CONTRACTOR TO NOTIFY DESIGNER OF ANY CHANGES TO SITE CONDITIONS THAT ARE NOT SHOWN ON THE DRAWINGS PRIOR TO THE INSTALLATION.
 - MARKER POSTS TO BE INSTALLED AT EVERY 200m INTERVALS, ANY CHANGE OF DIRECTION AND AT THE ENTRY AND EXIT POINTS OF VICTRACK PROPERTY. MARKER POSTS TO BE PLACED FACING THE RAIL TRACKS WITHIN VICTRACK PROPERTY.
 - ALL EXCESS MATERIALS TO BE DISPOSED OFF VICTRACK PROPERTY.
 - PRIOR TO COMMENCEMENT OF WORKS, THE CONTRACTOR SHALL SUBMIT A DETAILED SAFE WORK METHOD STATEMENT TO THE RAIL OPERATOR INCLUDING A DETAILED CONSTRUCTION METHODOLOGY FOR SITE ACCESS. V/LINE WILL NEED TO REVIEW SPECIFIC DETAILS FOR THIS PRIOR TO APPROVAL.
 - BOREHOLE TO BE SUPPORTED AT ALL TIMES FOLLOWING THE BORE HEAD. THE CASING MUST BE ADVANCED PROGRESSIVELY AS BORE PROCEEDS, SO THAT ANY RISK OF SETTLEMENT OR COLLAPSE AT THE FACE IS MINIMISED.
-NOTE TO DESIGNER: ANY DEVIATION FROM STANDARD WILL BE CONSIDERED, YET CONFIRMING GEOTECHNICAL ADVICE TO LARGER DIAMETER SHOULD BE PROVIDED. V/LINE WILL NEED TO REVIEW SPECIFIC DETAILS FOR THIS PRIOR TO APPROVAL.
 - DIAMETER OF BORED HOLE SHALL NOT EXCEED DIAMETER OF CONDUIT BY MORE THAN 50mm. ANNULUS TO BE GROUTED WITH AN APPROVED MATERIAL.
-NOTE TO DESIGNER: ANY DEVIATION FROM STANDARD WILL BE CONSIDERED, YET CONFIRMING GEOTECHNICAL ADVICE TO LARGER THAN 50mm GAPS SHOULD BE PROVIDED.
 - INSTALLATION OF CONDUIT IS TO BE BORED FROM OUTSIDE OF VICTRACK PROPERTY BOUNDARY TO OUTSIDE OF VICTRACK PROPERTY BOUNDARY.
-NOTE TO DESIGNER: VICTRACK PREFER INSTALLATION OF CONDUIT IS BORED AND ALL PITS BE LOCATED OUTSIDE OF RAIL PROPERTY BOUNDARIES. SHOULD BORE PIT LOCATIONS BE REQUIRED INSIDE RAIL BOUNDARIES, APPLICANT IS TO CONFIRM WITH VALID REASONS WHY THIS IS REQUIRED.
 - NOTE TO DESIGNER: BOTH STANDARD AND BROAD GAUGE TRACKS TO BE ANNOTATED ON THE LONGITUDINAL SECTION WITH VERTICAL CLEARANCE TO EACH TRACK.
 - CONTRACTORS ARE TO COMPLY WITH MTM DOCUMENTS L1-CCO-PRO-001 (SITE ACCESS PROCEDURES), AND L0-SQE-PRO-014 (SAFETY AND ENVIRONMENTAL REQUIREMENTS FOR CONTRACTORS WORKING ON MTM PREMISES).
 - CONTRACTORS ARE TO COMPLY WITH MTM DOCUMENTS L1-INF-PRO-001 (PROTECTION OF UNDERGROUND ASSETS AND SERVICES INTERIM PROCEDURE) AND AS-4799-2000 (INSTALLATION OF UNDERGROUND UTILITY SERVICES AND PIPELINES WITHIN RAILWAY BOUNDARIES).



FOR CONSTRUCTION

Project No.	222648
Scale	AS SHOWN
Sheet Size	A1
Drawing No.	STD E0081
Rev.	A

(CONSULTANT NAME)

(CLIENT NAME)

(ASSET OWNER) - VICTRACK APPLICATION (REF. NO.) (LOCATION)

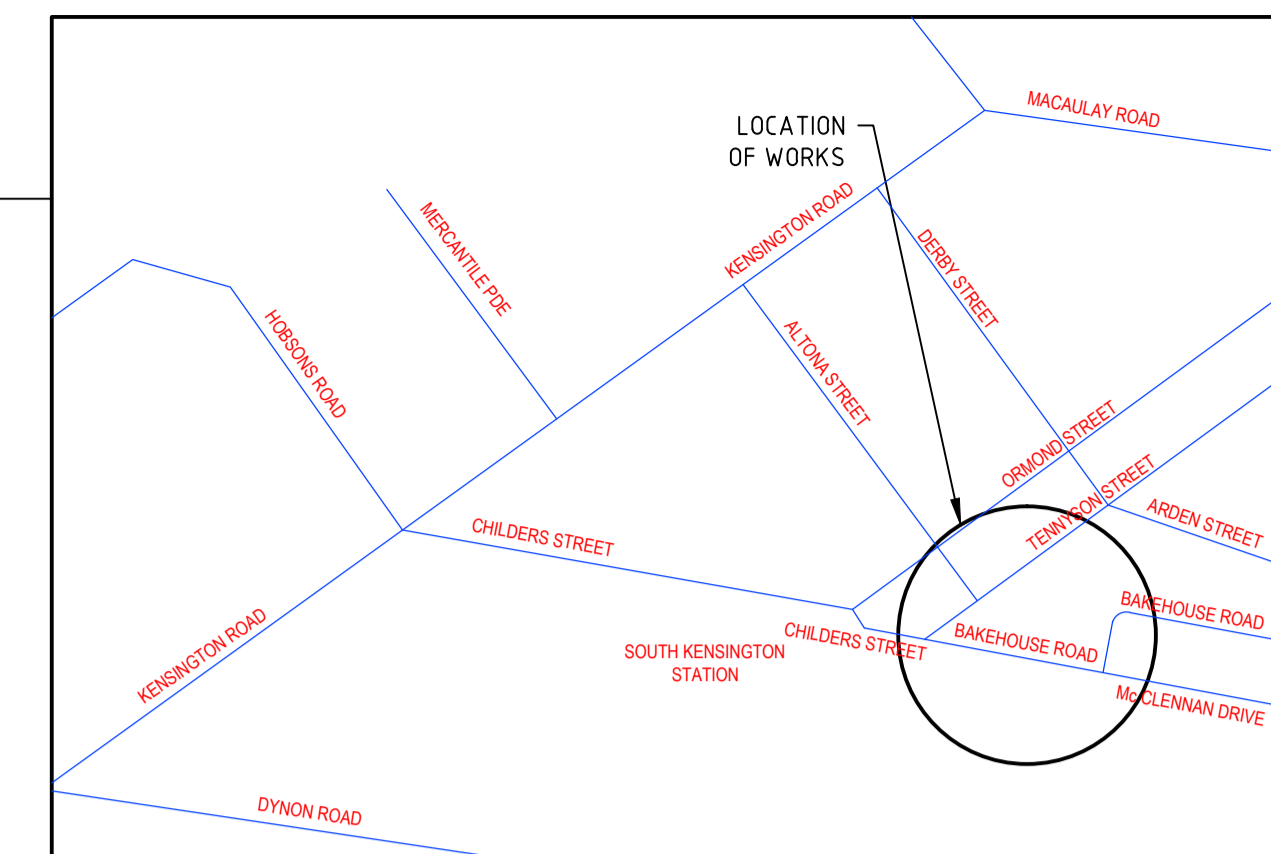
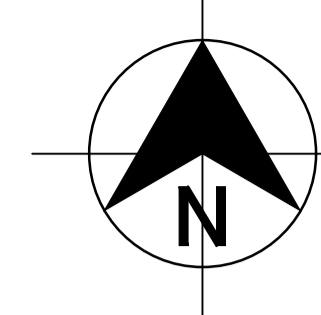
Drawn	Signed	Date
Designed	Signed	Date
Verified	Signed	Date
Approved	Signed	Date

Drawing Title:
PROPOSED INSTALLATION FOR ELECTRICAL 22kV NETWORK UNDER ELECTRIFIED RAILWAY ON FLINDERS STREET - NEWPORT RAIL LINE AT CH-3.093KM (LOCATION)

(D)

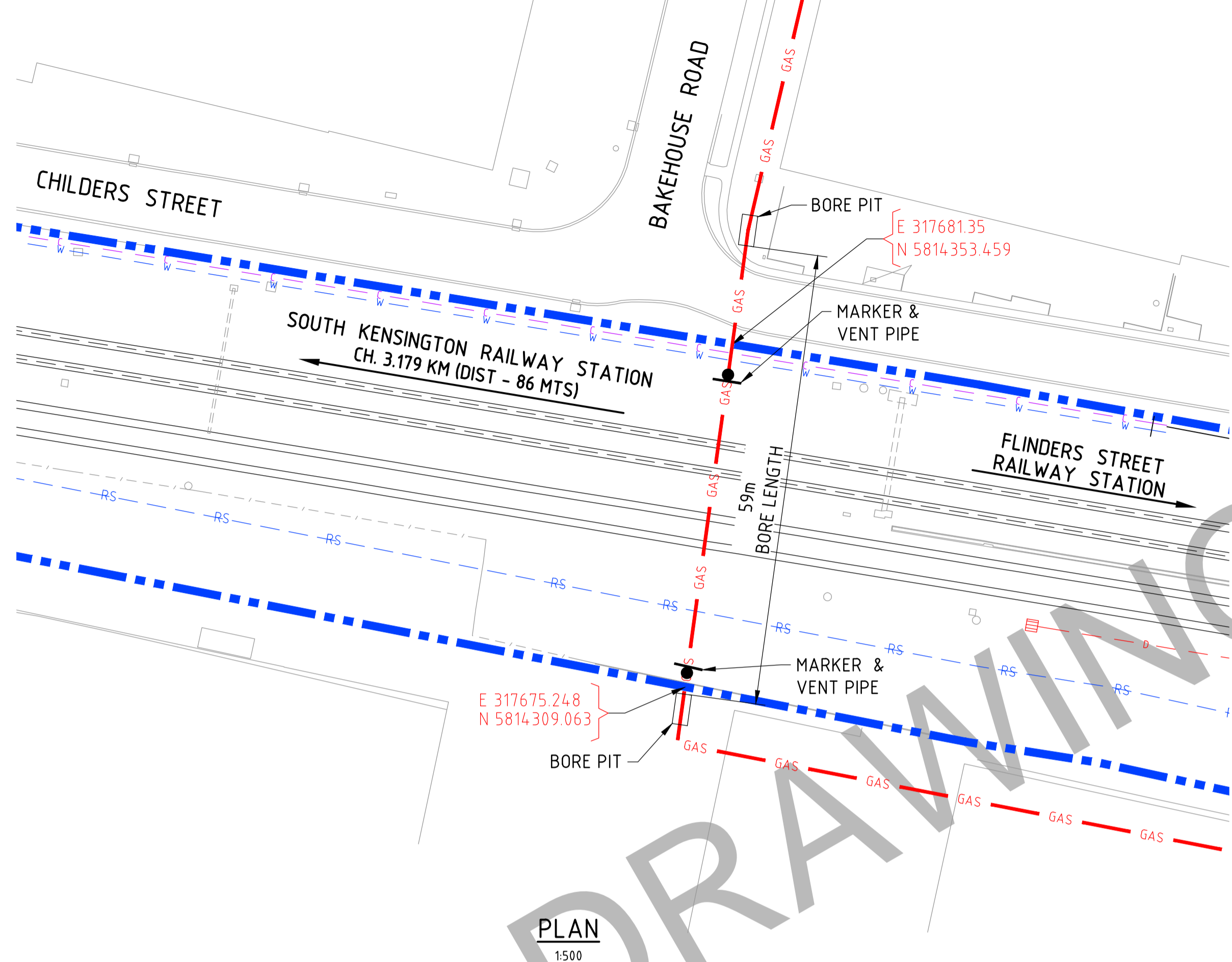
UNDERGROUND GAS MAIN INSTALLATION

PIPE SPECIFICATION		
	CARRIER PIPE	ENCASING PIPE
INTERNAL DIAMETER	485.8mm	800
PIPE MATERIAL	STEEL	RCP Jacking Pipe
SPECIFICATION & GRADE	5L GRADE x70	-
WALL THICKNESS	11.1mm	100mm
MAXIMUM WORKING PRESSURE	10.200MPa	N/A
TYPE OF JOINT	BUTT WELD	N/A
PIPE COATING	DUAL LAYER F.B.E	N/A
	CONCRETE COATED	
ELECTRICALLY CONTINUOUS	YES	N/A
CATHODIC PROTECTION	YES	N/A

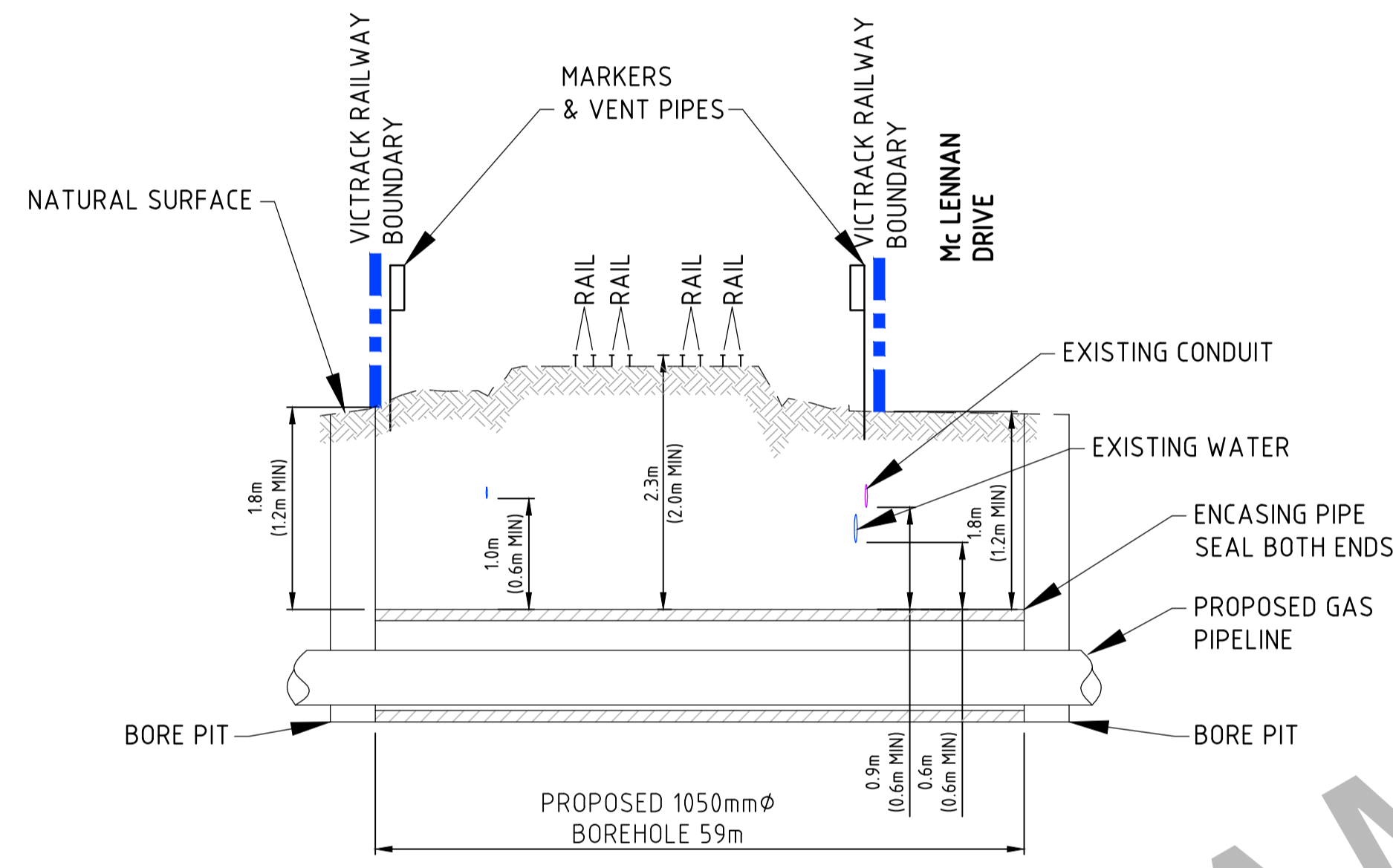


SITE LOCALITY PLAN
MEL REF 42 K4

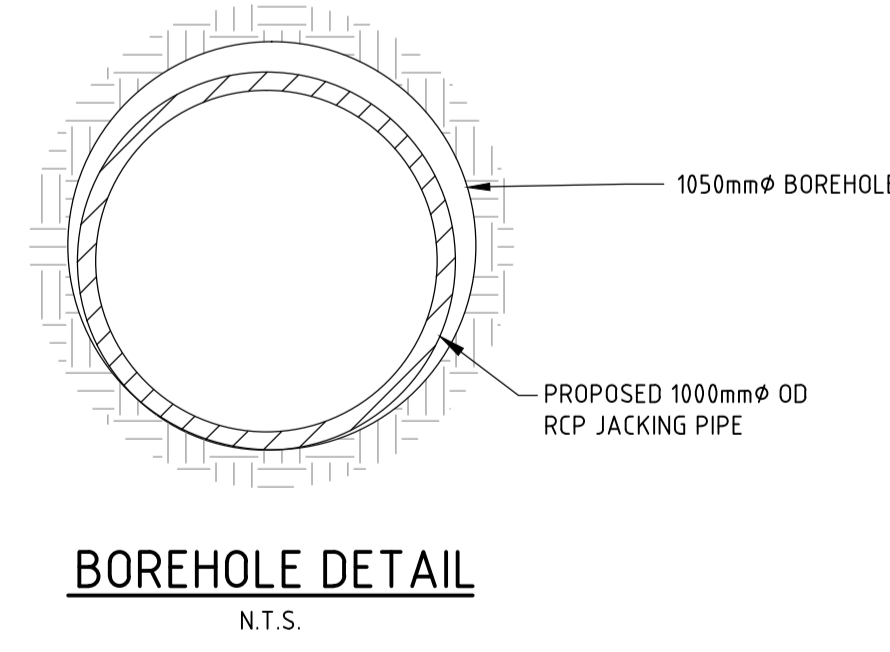
- NOTES:
- EXISTING CONTOURS, LEVELS AND FEATURES ARE INDICATIVE ONLY AND ARE BASED UPON SURVEY DRAWINGS AND DATA SUPPLIED BY (SURVEYOR'S NAME).
 - IT IS PREFERRED LEVELS ARE EXPRESSED IN METRES ABOVE AUSTRALIAN HEIGHT DATUM (AHD), OTHERWISE ARBITRARY DATUM TO BE IN METRES ALSO.
 - THE DRAWINGS SHALL NOT BE SCALED.
 - INSTALLATION OF THE GAS MAIN SHALL BE CARRIED OUT IN ACCORDANCE WITH AS:4799-2000.
 - RAILWAY LAND, INCLUDING ANY OPEN DRAIN & MAINTENANCE TRACKS, SHALL BE REINSTATED IN ACCORDANCE WITH AS:4799-2000 AND TO THE SATISFACTION OF THE RAIL OPERATOR'S ENGINEER.
 - EXISTING SERVICES INFORMATION HAVE ALSO BEEN OBTAINED FROM www.1100.com.au AND VICTRACK RAILWAY COMMUNICATIONS CABLING DEPARTMENT AND INCLUDED ON THE DRAWINGS.
 - CONTRACTOR TO PROVIDE "AS BUILT" DRAWINGS IN ELECTRONIC FORMAT i.e. AUTOCAD AND PDF TO services.applications@victrack.com.au.
 - ALL EXISTING SERVICES INCLUDING RAILWAY SIGNALS, VICTRACK COMMUNICATIONS AND THIRD PARTY ASSETS HAVE BEEN LOCATED, DEPTED AND DETAILS INCLUDED ON THE DRAWING. ALL EXISTING SERVICES LOCATIONS SHALL BE VERIFIED ON SITE BY THE CONTRACTOR BEFORE COMMENCING WORK AND PRODUCE A DETAILED EXISTING SERVICES PLAN.
 - IF THE PROPOSED INSTALLATION IS UNDER A OPERATOR ACCESS TRACKS, ANY REINSTATEMENT MUST BE TO THE SATISFACTION OF THE RAIL OPERATOR.
 - CONTRACTOR TO MAINTAIN MINIMUM 600mm CLEARANCE TO ANY EXISTING SERVICE AND MINIMUM 3.0m CLEARANCE TO ANY STRUCTURE.
 - CONTRACTOR TO NOTIFY DESIGNER OF ANY CHANGES TO SITE CONDITIONS THAT ARE NOT SHOWN ON THE DRAWINGS PRIOR TO THE INSTALLATION.
 - MARKER POSTS TO BE INSTALLED AT EVERY 200m INTERVALS, ANY CHANGE OF DIRECTION AND AT THE ENTRY AND EXIT POINTS OF VICTRACK PROPERTY. MARKER POSTS TO BE PLACED FACING THE RAIL TRACKS WITHIN VICTRACK PROPERTY.
 - ALL EXCESS MATERIALS TO BE DISPOSED OFF VICTRACK PROPERTY.
 - PRIOR TO COMMENCEMENT OF WORKS, THE CONTRACTOR SHALL SUBMIT A DETAILED SAFE WORK METHOD STATEMENT TO THE RAIL OPERATOR INCLUDING A DETAILED CONSTRUCTION METHODOLOGY FOR SITE ACCESS.
 - BOREHOLE TO BE SUPPORTED AT ALL TIMES FOLLOWING THE BORE HEAD. THE CASING MUST BE ADVANCED PROGRESSIVELY AS BORE PROCEEDS, SO THAT ANY RISK OF SETTLEMENT OR COLLAPSE AT THE FACE IS MINIMISED.
-NOTE TO DESIGNER: ANY DEVIATION FROM STANDARD WILL BE CONSIDERED, YET CONFIRMING GEOTECHNICAL ADVICE TO LARGER DIAMETER SHOULD BE PROVIDED. V/LINE WILL NEED TO REVIEW SPECIFIC DETAILS FOR THIS PRIOR TO APPROVAL.
 - DIAMETER OF BORED HOLE SHALL NOT EXCEED DIAMETER OF CONDUIT BY MORE THAN 50mm. ANNULUS TO BE GROUTED WITH AN APPROVED MATERIAL.
-NOTE TO DESIGNER: ANY DEVIATION FROM STANDARD WILL BE CONSIDERED, YET CONFIRMING GEOTECHNICAL ADVICE TO LARGER THAN 50mm GAPS SHOULD BE PROVIDED.
 - INSTALLATION OF CONDUIT IS TO BE BORED FROM OUTSIDE OF VICTRACK PROPERTY BOUNDARY TO OUTSIDE OF VICTRACK PROPERTY BOUNDARY.
-NOTE TO DESIGNER: VICTRACK PREFER INSTALLATION OF CONDUIT IS BORED AND ALL PITS BE LOCATED OUTSIDE OF RAIL PROPERTY BOUNDARIES. SHOULD BORE PIT LOCATIONS BE REQUIRED INSIDE RAIL BOUNDARIES, APPLICANT IS TO CONFIRM WITH VALID REASONS WHY THIS IS REQUIRED.
 - NOTE TO DESIGNER: BOTH STANDARD AND BROAD GAUGE TRACKS TO BE ANNOTATED ON THE LONGITUDINAL SECTION WITH VERTICAL CLEARANCE TO EACH TRACK.
 - BORE PITS TO BE LOCATED OUTSIDE PROPERTY BOUNDARY IN METRO AREA.
-NOTE TO DESIGNER: TRENCHING MAY BE UNDERTAKEN INSIDE VERY WIDE V/LINE RAIL RESERVE, SUBJECT TO APPROVAL.
 - CONTRACTORS ARE TO COMPLY WITH MTM DOCUMENTS L1-CCO-PRO-001 (SITE ACCESS PROCEDURES), AND L0-SQE-PRO-014 (SAFETY AND ENVIRONMENTAL REQUIREMENTS FOR CONTRACTORS WORKING ON MTM PREMISES).
 - CONTRACTORS ARE TO COMPLY WITH MTM DOCUMENTS L1-INF-PRO-001 (PROTECTION OF UNDERGROUND ASSETS AND SERVICES INTERIM PROCEDURE) AND AS-4799-2000 (INSTALLATION OF UNDERGROUND UTILITY SERVICES AND PIPELINES WITHIN RAILWAY BOUNDARIES).



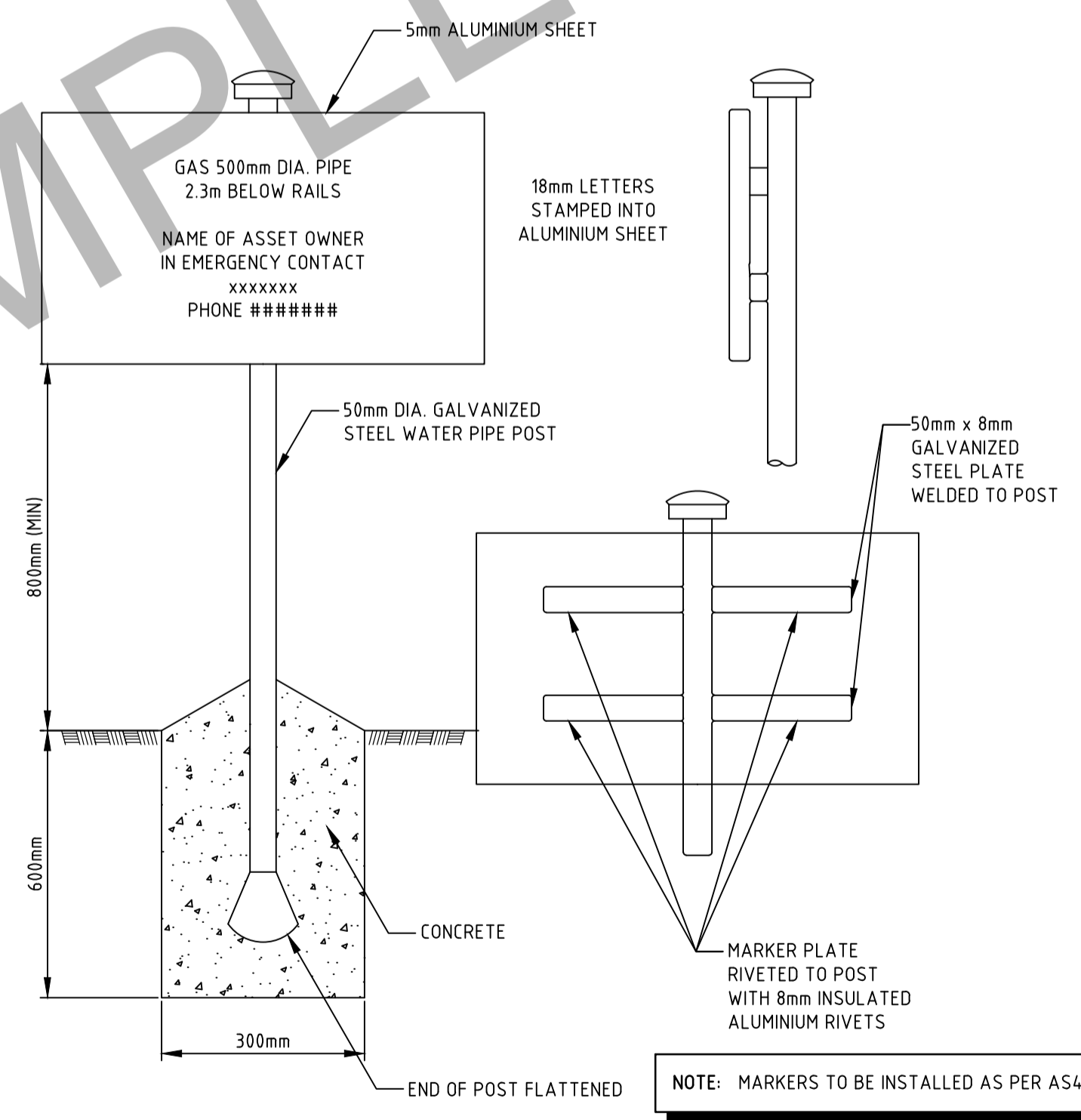
PLAN
1:500



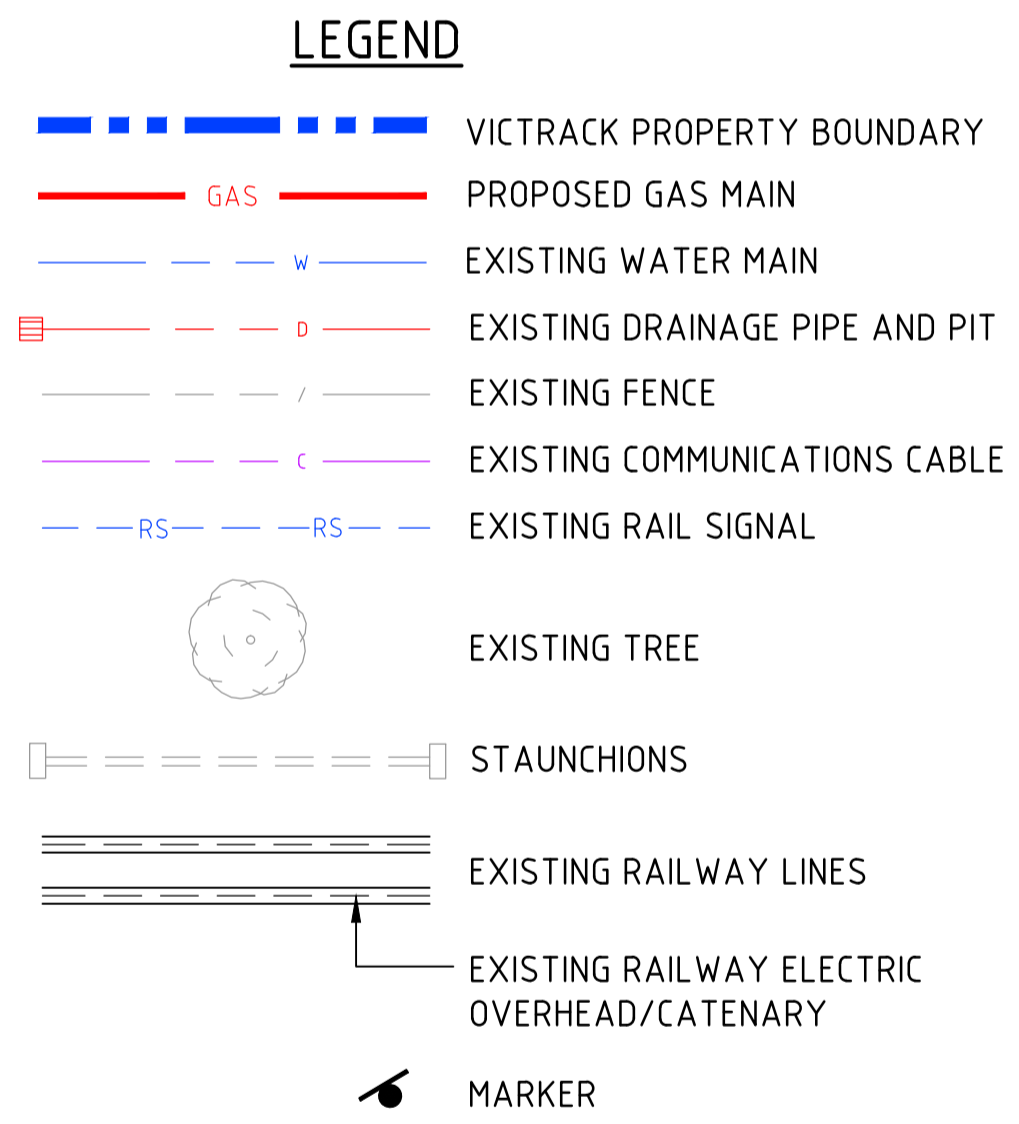
BOREHOLE LONGITUDINAL SECTION
SCALE H 1:500
SCALE V 1:50



BOREHOLE DETAIL
N.T.S.

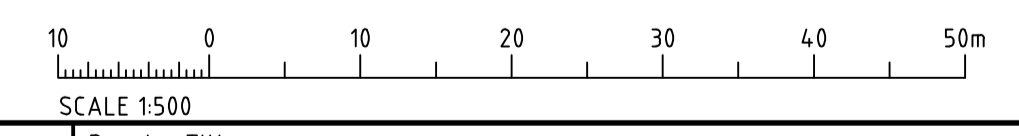


TYPICAL MARKER
N.T.S.



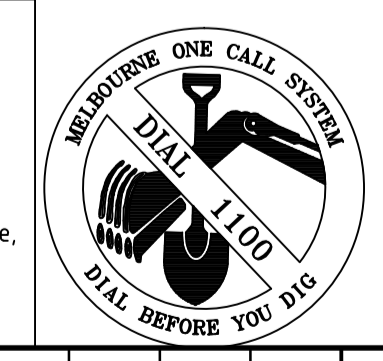
NOTE: METAL PIPES IN A ELECTRIFIED TRACTION AREA WILL REQUIRE CATHODIC PROTECTION

NOTE: MARKERS TO BE INSTALLED AS PER AS4799-2000



WARNING AND DISCLAIMER
BEWARE OF UNDERGROUND SERVICES

The information provided in these drawings relating to the positions of underground services is intended to be only a guide for excavation works. (Designer's business entity) does not warrant or represent that the positions of those services shown on the drawings are accurate. Furthermore, services may exist of which (Designer's business entity) is unaware. The information provided should therefore not be relied upon and exact positions of services should be verified by hand excavation. Furthermore, (Designer's business entity) disclaims responsibility for damage or injury to any person caused directly or indirectly by any works affecting the services.



Rev.	Date	Revision Details	Des.	Ver.	App.
A	15.05.12	CONSTRUCTION ISSUE	CD	LM	NEB

(CONSULTANT NAME)	Client:	(CLIENT NAME)	Project:	(ASSET OWNER) - VICTRACK APPLICATION (REF. NO.) (LOCATION)	Drawn	Signed	Date	Drawing Title: PROPOSED GAS PIPE UNDERLINE ON FLINDERS STREET - NEWPORT (INSERT NAME) RAIL LINE AT CHAINAGE 3.093 kms AT NORTH DYNON (LOCATION)	FOR CONSTRUCTION	
						Designed	Signed		Date	Project No. 228351
					Verified	Signed	Date		Scale AS SHOWN	Rev.
					Approved	Signed	Date		Drawing No. STD G0071	A

Use File P:\CADD\DATA\PROJECTS\228351\228351-001-UNDERLINE-GAS-Flinders-Newport.dwg Plot Date: 22/07/2015 10:29:39 AM Name: Goran Stevanovic Xref: 228351-001-AT1001.DWG