



EVT / Kosciuszko Thredbo Pty Ltd



Department of Planning
and Environment

Issued under the Environmental Planning and Assessment Act 1979

Approved Application No 22/5788

Granted on the 15 August 2022

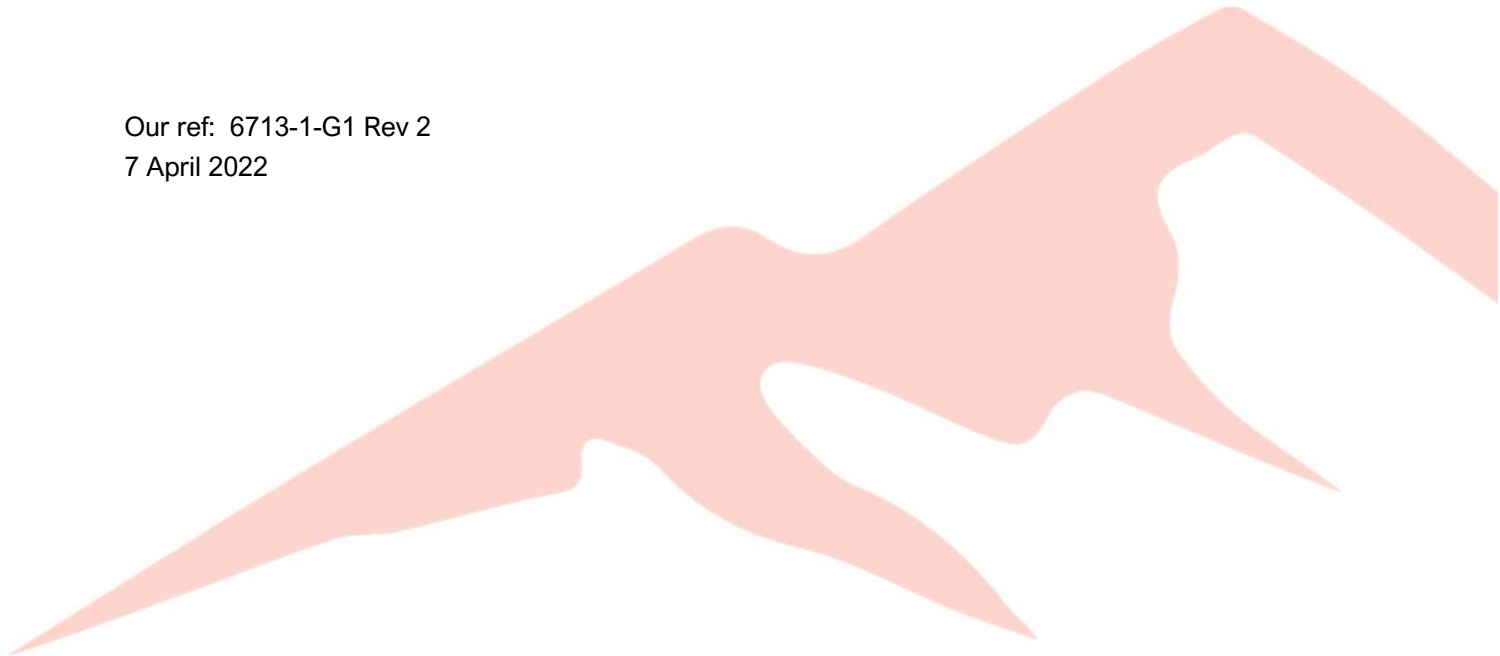
Signed M Brown

Sheet No 5 of 23

Merritts Mountain House Restaurant – Sewer and Water Services Thredbo NSW

Geotechnical Assessment

Our ref: 6713-1-G1 Rev 2
7 April 2022



Your trusted engineering professionals

Form 4 – Minimal Impact Certification

DA Number: _____

This form may be used where minor construction works which present minimal or no geotechnical impact on the site or related land are proposed to be erected within the “G” line area of the geotechnical maps.

A geotechnical engineer or engineering geologist must inspect the site and/or review the proposed development documentation to determine if the proposed development requires a geotechnical report to be prepared to accompany the development application. Where the geotechnical engineer determines that such a report is not required then they must complete this form and attach design recommendations where required. A copy of Form 4 with design recommendation, if required, must be submitted with the development application.

Please contact the Alpine Resorts Team in Jindabyne for further information - phone 02 6456 1733.

To complete this form, please place a cross in the appropriate boxes ☐ and complete all sections.

1. Declaration made by geotechnical engineer or engineering geologist in relation to a nil or minimal geotechnical impact assessment and site classification

I,
 Mr ☒ Ms ☐ Mrs ☐ Dr ☐ Other

First Name	Family Name
Mark	Bartel

OF
 Company/organisation

certify that I am a geotechnical engineer /engineering geologist as defined by the “Policy” and I have inspected the site and reviewed the proposed development known as

As a result of my site inspection and review of the following documentation

(List of documentation reviewed)

Services Upgrade Plans by EPES Consulting Engineers & Triaxial Consulting as attached to Report 2713-1-G1 Rev 2 dated 7 April 2022

I have determined that;

- ☒ the current load-bearing capacity of the existing building will not be exceeded or adversely impacted by the proposed development, and
- ☒ the proposed works are of such a minor nature that the requirement for geotechnical advice in the form of a geotechnical report, prepared in accordance with the "Policy", is considered unnecessary for the adequate and safe design of the structural elements to be incorporated into the new works, and
- ☒ in accordance with AS 2870.1 Residential Slabs and Footings, the site is to be classified as a type
(insert classification type)

Class P

- ☒ I have attached design recommendations to be incorporated in the structural design in accordance with this site classification.

I am aware that this declaration shall be used by the Department as an essential component in granting development consent for a structure to be erected within the "G" line area (as identified on the geotechnical maps) of Kosciuszko Alpine Resorts without requiring the submission of a geotechnical report in support of the development application.

2. Signatures

Signature

Mark Bartel

Chartered professional status

CPEng 35641 NER (Civil)

Name

Mark Bartel

Date

7 April 2022

3. Contact details

Alpine Resorts Team

Shop 5A, 19 Snowy River Avenue

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Email: alpineresorts@planning.nsw.gov.au

Document Authorization

Prepared for EVT / Kosciuszko Thredbo Pty Ltd

Our ref: 6713-1-G1 Rev 2

7 April 2022

For and on behalf of

AssetGeoEnviro



Mark Bartel

BE, MEngSc, GMQ, CPEng, RPEQ/NER(Civil), DEP/PRE (NSW)
Managing Director | Senior Principal Geotechnical Engineer

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Document Status

Rev	Revision Details	Author	Reviewer		Approved for Issue		
			Name	Initials	Name	Initials	Date
0	Initial issue	M. Bartel			M. Bartel	MAB	9 March 2022
1	Minor revisions	M. Bartel			M. Bartel	MAB	24 March 2022
2	Plans updated	M. Bartel			M. Bartel	MAB	7 April 2022



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- A Information Sheets
- B Site Photos

1. Introduction

1.1 General

This report presents the results of a geotechnical assessment for proposed water and sewer service upgrade for the Merritts Mountain House Restaurant at Thredbo, NSW (Merritts). The assessment was commissioned in an email on 21 January 2022 by Ben Devaney of Event Hospitality & Entertainment (EVT) as an extension to a Consultancy Agreement dated 28 October 2021. The work was carried out in accordance with the email proposal by AssetGeoEnviro (Asset) dated 19 January 2022, reference 6713-1-P1.

Documents supplied to us for this assessment comprised:

- Services Upgrade Plans (prepared by: EPES Consulting Engineers and Triaxial Consulting; Project No: TX16479.00; Drawings: as attached).

We understand that the project involves upgrading services to the redevelopment of the Merritts Mountain House Restaurant, comprising:

- New sewer line to replace existing.
- New water supply pipe.
- Extension of 150mm diameter ring main.
- Power upgrade to UV treatment building.
- Extend existing UV water treatment building for new pump station and upgrade power supply.

The route alignment and key notes are provided on the supplied plans. The new sewer and water supply pipe will mostly be located within the existing vehicle track except for a small section near Merritts that will be through an existing partly disturbed corridor, and a section coming off the existing UV treatment building where the new water supply and water ring main extension will follow an existing path. The power upgrade will follow the existing power conduit.

The work is to be conducted under a Development Application (DA), which will require geotechnical considerations for trenching for the various services.

1.2 Scope of Work

The main objectives of the investigation were to assess the surface and subsurface conditions and to provide comments and recommendations relating to:

- Landslide risk assessment as per AGS 2007¹.
- Geotechnical constraints.

The following scope of work was carried out to achieve the project objectives:

- A review of existing regional maps and reports relevant to the site held within our files.
- Visual observations of surface features.
- Engineering assessment and reporting.

¹ Landslide Risk Management, Australian Geomechanics, Vol 42, No. 1, March 2007.

This report must be read in conjunction with the attached “Important Information about your Geotechnical Report” and “Important Information about your Landslide Risk Assessment” in Appendix A. Attention is drawn to the limitations inherent in site investigations and the importance of verifying the subsurface conditions inferred herein. Landslide risk considerations presented in this report must be read in conjunction with the attached GeoGuides for Slope Management and Maintenance.

2. Regional Topography

The regional topography comprises moderately to steeply sloping terrain flanking the north-easterly flowing Thredbo River, with ground slopes over the land flanking the river generally ranging from 10° to 30° and some locally steeper sections, and more gentle slopes over the river shoulders. Numerous drainage depressions and watercourses flow towards the river, with some of the persistent watercourses to the north of the river carved several metres into the underlying granite bedrock. Side slopes to creeks and watercourses are typically steeper at 20 to 35°, and typically include numerous granite boulders and cobbles.

The site lies within an area designated as “G” as defined in the maps accompanying DIPNR’s “Geotechnical Policy – Kosciuszko Alpine Resorts”, November 2003, and therefore a geotechnical report is required to accompany the development application as per the requirements of the Geotechnical Policy.

3. Site Observations

The site is located within Thredbo, north of the Alpine Way and north of the Thredbo River. The works is located within a corridor running uphill from the Woodridge Apartments to the existing UV treatment building, then joining an existing vehicle track up to and past mid station for the Gondola, continuing uphill to Merritts.

The new services are to be laid within disturbed ground comprising mostly the vehicle track up to Merritts but also some pedestrian pathways and some existing services corridors. The trenching is understood to generally be relatively shallow (less than about 1m depth below ground level). The trenching for the vehicle track is proposed to be laid in the middle of the formation width.

Photographs of selected sections of the route are included in Appendix B.

There was no obvious evidence of existing or potential landslides affecting the pipe alignment except for some road shoulder support works on the eastern (downhill) side of the vehicle track up to Merritts. It is noted that the potential failure mechanism for the track is assessed to be a shallow slump extending to just outside edge of the vehicle traffic path which is well away from the centre of the track where the services are to be located. After remedial works, the landslide risk is assessed to be **Low** with respect to property and **Acceptable** with respect to life.

4. Discussions & Recommendations

The proposed works will have 'minimal or no geotechnical impact' on the site, based on the relatively shallow depths of excavation required, the lack of obvious signs of landslide observed or expected, and previous observations by the undersigned in the area. We therefore consider that a geotechnical report prepared in accordance with the Geotechnical Policy for Kosciuszko Alpine Resorts (2003) is not required. A completed Form 4 – Minimal Impact Certification is provided on the second page of this report.

The following recommendations are provided for the development:

- Based on our site observations and previous test over the mountain side, we expect that due to previous site disturbance and observed slopes, the site is Class 'P', in accordance with AS2870-2011 'Residential slabs and footings'.
- Excavation is anticipated to be predominantly within soils of variable nature including completely weathered granite and cobbles and boulders. Excavation could be achieved by suitably sized excavator.
- Excavation sides may be cut vertically for the trenches up to maximum 1m depth. Excavation for the UV building extension may also be cut vertically up to maximum 1.5m depth (due to the limited lateral extent and gentle slopes in the area).
- Footings for the UV building should be formed on completely weathered or better granite, or dense or very dense sands, or very stiff or hard clays, and may be designed for a maximum allowable bearing pressure of 150 kPa. Further geotechnical advice should be sought if poorer foundation soils are exposed at footing excavation level.
- Filling may comprise the excavated soils provided they are not wet and do not contain too much organic matters that prevents achieving reasonable compaction levels. The fill should be placed in layers not more than 0.2m loose thickness and compacted using wheel roller on an excavator or other suitable compaction equipment (e.g., whacker-packer). Compaction should continue until no further subsidence or compression of the compacted surface is observed.
- Erosion protection measures must be maintained to prevent concentrated flows. For the access track, this has been achieved with regularly spaced berms to direct flows across the track and downslope of the road embankment via corrugated open channel. Consideration could be given to use of polymer binders to reduce erosion. Sections of pipeline through disturbed terrain should be vegetated over after construction to aid with erosion control.

5. Limitations

In addition to the limitations inherent in site investigations (refer to the attached Information Sheets), it must be pointed out that the recommendations in this report are based on assessed subsurface conditions from limited investigations.

It is recommended that a qualified and experienced Geotechnical Engineer be engaged to provide further input and review during the design development; including site visits during construction (either in-person or by remote with assistance of suitably experienced site personnel) to verify the site conditions and provide advice where conditions vary from those assumed in this report.

This report may have included geotechnical recommendations for design and construction of temporary works (e.g., temporary batter slopes or temporary shoring of excavations). Such temporary works are expected to perform adequately for a relatively short period only, which could range from a few days (for temporary batter slopes) up to six months (for temporary shoring). This period depends on a range of factors including but not limited to: site geology; groundwater conditions; weather conditions; design criteria; and level of care taken during construction. If there are factors which prevent temporary works from being completed and/or which require temporary works to function for periods longer than originally designed, further advice must be sought from the Geotechnical Engineer.

This report and details for the proposed development should be submitted to relevant regulatory authorities that have an interest in the property (e.g., Department of Planning) or are responsible for services that may be within or adjacent to the site for their review.

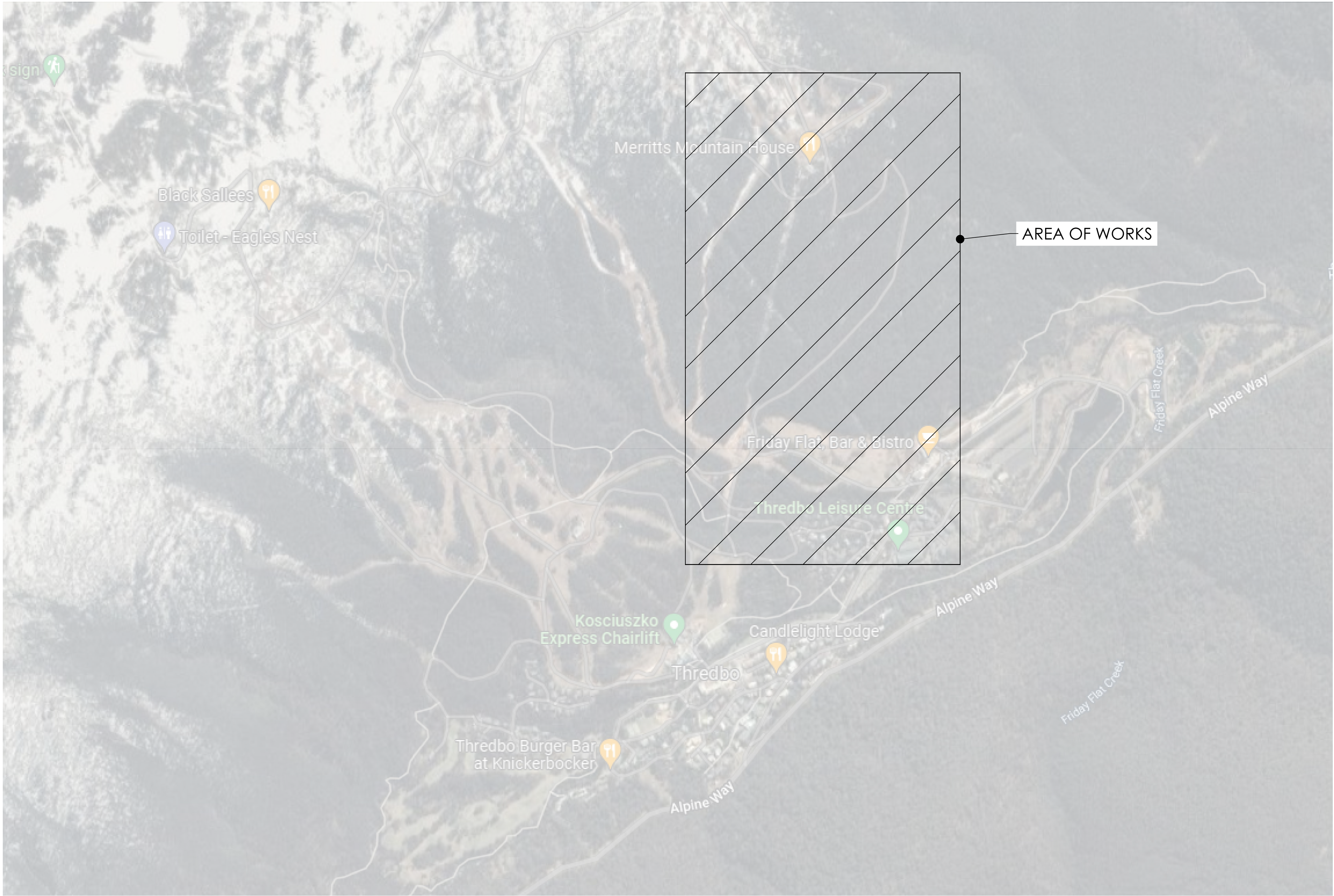
Asset accepts no liability where our recommendations are not followed or are only partially followed. The document “Important Information about your Geotechnical Report” in Appendix A provides additional information about the uses and limitations of this report.

Services Upgrade Plans

Source: EPES Consulting Engineers / Triaxial Consulting

- C1.00 Rev B: Cover Sheet
- C2.00 Rev B: Key Plan
- C3.00 Rev D: Rising Main Plan Sheet 1 of 5
- C3.01 Rev D: Rising Main Plan Sheet 2 of 5
- C3.02 Rev D: Rising Main Plan Sheet 3 of 5
- C3.03 Rev D: Rising Main Plan Sheet 4 of 5
- C3.04 Rev D: Rising Main Plan Sheet 5 of 5
- C4.00 Rev B: Merritts Mountain House Site Plan, Access Track, Typical Section
- C5.00 Rev B: Sewer and Water Long Section Sheet 1 of 5
- C5.01 Rev C: Sewer and Water Long Section Sheet 2 of 5
- C5.02 Rev C: Sewer and Water Long Section Sheet 3 of 5
- C5.03 Rev B: Sewer and Water Long Section Sheet 4 of 5
- C5.04 Rev B: Sewer and Water Long Section Sheet 5 of 5
- C5.05 Rev D: Power Conduit Long Section, Trench Details & Water Supply Details

MERRITS MOUNTAIN HOUSE
TOP OF MERRITS GONDOLA,
THREDBO NSW 2625
PROPOSED SEWER PRESSURE MAIN AND WATER SUPPLY



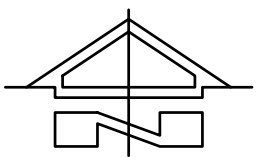
DRAWINGS LIST

- C1.00 COVER SHEET
- C1.00 COVER SHEET
- C2.00 KEY PLAN
- C3.00 RISING MAIN PLAN SHEET 1 OF 5
- C3.01 RISING MAIN PLAN SHEET 2 OF 5
- C3.02 RISING MAIN PLAN SHEET 3 OF 5
- C3.03 RISING MAIN PLAN SHEET 4 OF 5
- C3.04 RISING MAIN PLAN SHEET 5 OF 5
- C4.00 MERRITS MOUNTAIN HOUSE SITE PLAN, ACCESS TRACK TYPICAL SECTION
- C5.00 SEWER AND WATER LONG SECTION SHEET 1 OF 5
- C5.01 SEWER AND WATER LONG SECTION SHEET 2 OF 5
- C5.02 SEWER AND WATER LONG SECTION SHEET 3 OF 5
- C5.03 SEWER AND WATER LONG SECTION SHEET 4 OF 5
- C5.04 SEWER AND WATER LONG SECTION SHEET 5 OF 5
- C5.05 POWER CONDUIT LONG SECTION, TRENCH DETAILS AND WATER SUPPLY PUMP DETAILS

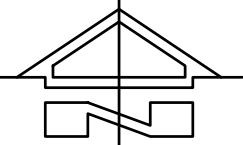
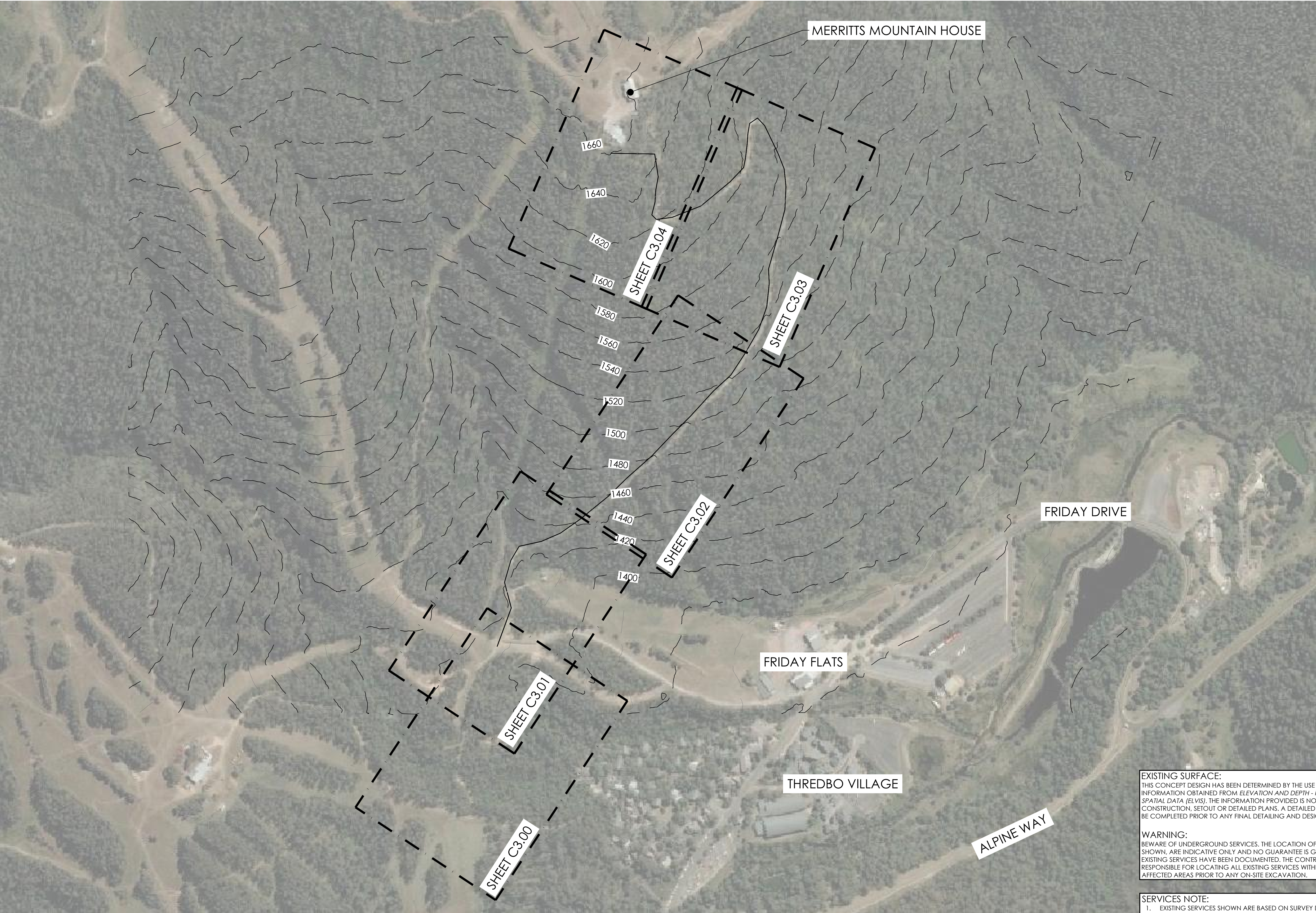
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SERVICES NOTE:
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2. ALL EXISTING SERVICES ARE SHOWN DIAGRAMMATIC ONLY. ALL SERVICES ARE TO BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION.



LOCATION PLAN
SCALE NTS



KEY PLAN
N.T.S.

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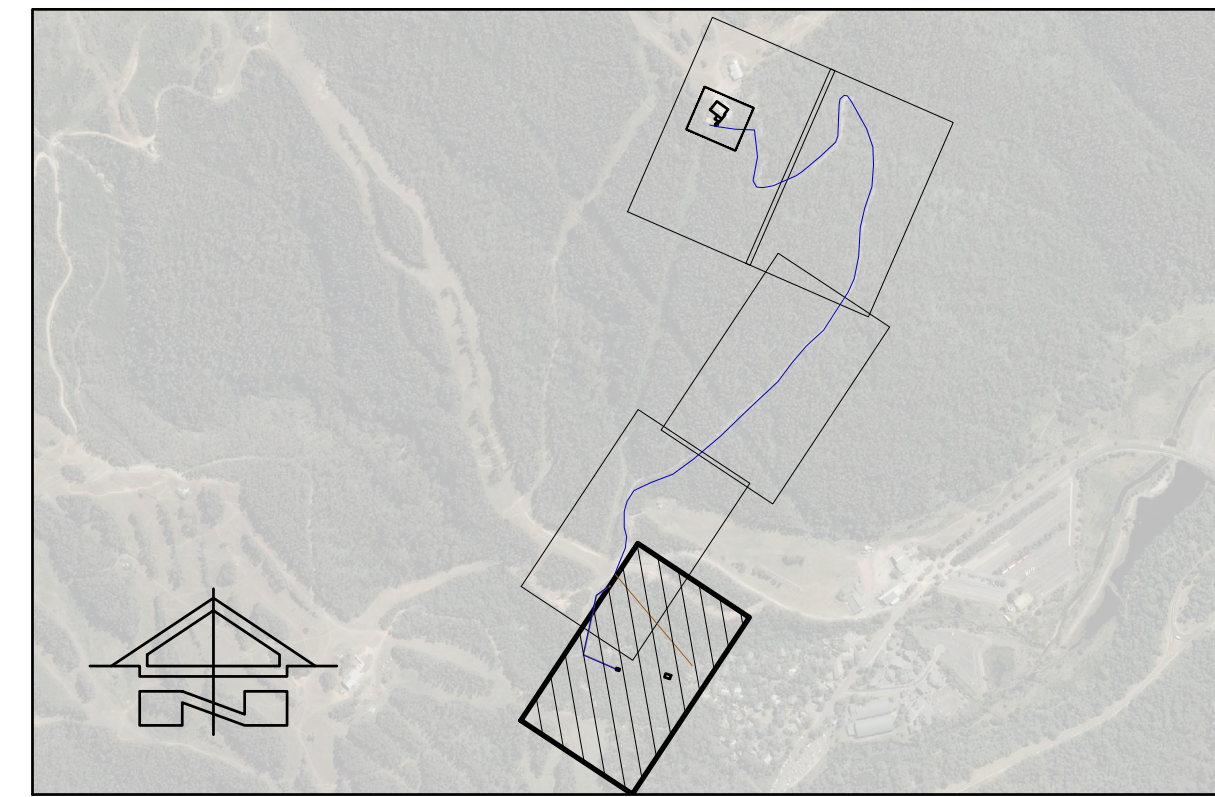
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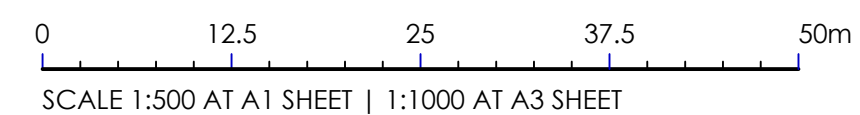
SYMBOL	DESCRIPTION
	CONTOUR MAJOR (5m)
	CONTOUR MINOR (1m)
	PROPOSED ELECTRICAL CONDUIT 150mm NOM
	EXISTING SEWER (APPROX. LOCATION)
	SEWER PRESSURE - DN75 PE100 SDR11
	WATER SUPPLY - DN100 DICL PN35
	WATER LINE - RING MAIN

NOTE:
SUBJECT TO CONFIRMATION OF DETAILED HYDRAULIC ANALYSIS THE DN100 DICL PN35 WATER SUPPLY PIPELINE MAY TRANSITION TO HDPE TOWARDS THE UPPER ELEVATION OF THE PIPELINE



KEY PLAN

RISING MAIN PLAN 1 OF 5
SCALE 1:500 AT A1



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ISSUED FOR DA	18.03.22	B	N.K	
ISSUED FOR DA	16.02.22	A	N.K	
AMENDMENTS	DATE	ISSUE	BY	

NOT FOR CONSTRUCTION

CIENT	PROJECT	DESIGNED	DRAWN	DATE	SIZE	CAD REF
EVENT	MERRITS MOUNTAIN HOUSE	C.W	N.K	MAR 22	A1	TX16479.00 - C01
HOSPITALITY AND ENTERTAINMENT	TOP OF MERRITS GONDOLA					
	THREDBO					

EPES Consulting Engineers

OFFICE | 1/6 DONNISON ST WEST, WEST GOSFORD NSW 2250
POSTAL | PO BOX 106, AVOCA BEACH, NSW 2251 AUSTRALIA
WWW.EPES.COM.AU | INFO@EPES.COM.AU

TRIAxIAL CONSULTING

COMPLEX PROBLEMS
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1300 874 294 | TRIAxIAL.COM.AU
SUITE 12, LEVEL 14, 327 PITT STREET, SYDNEY NSW 2000
PO BOX A203, SYDNEY SOUTH NSW 1235
TO BE PRINTED IN COLOUR

DRAWING TITLE	PROJECT No.	DRAWING No.	ISSUE
RISING MAIN PLAN SHEET 1 OF 5	TX16479.00 - C3.00		D

ADJOINS SHEET C3.00

ADJOINS SHEET C3.02



KEY PLAN

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	CONTOUR MINOR (1m)
	PROPOSED ELECTRICAL CONDUIT 150mm NOM
	EXISTING SEWER (APPROX. LOCATION)
	SEWER PRESSURE - DN75 PE100 SDR11
	WATER SUPPLY - DN100 DICL PN35
	WATER LINE - RING MAIN

NOTE:
SUBJECT TO CONFIRMATION OF DETAILED HYDRAULIC ANALYSIS THE DN100 DICL PN35 WATER SUPPLY PIPELINE MAY TRANSITION TO HDPE TOWARDS THE UPPER ELEVATION OF THE PIPELINE

RIISING MAIN PLAN 2 OF 5

SCALE 1:500 AT A1

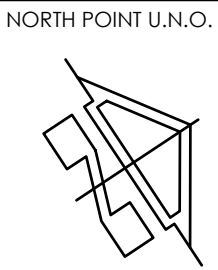
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ISSUED FOR DA	18.03.22	B	N.K
ISSUED FOR DA	16.02.22	A	N.K
AMENDMENTS	DATE	ISSUE	BY

NOT FOR CONSTRUCTION



CIENT
EVENT
HOSPITALITY
AND ENTERTAINMENT

PROJECT
MERRITTS MOUNTAIN HOUSE
TOP OF MERRITTS GONDOLA
THREDBO

DESIGNED C.W
DRAWN N.K
DATE MAR 22
SIZE A1
CAD REF TX16479.00 - C01



1300 874 294 | TRIAXIAL.COM.AU
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PO BOX A203, SYDNEY SOUTH NSW 1235
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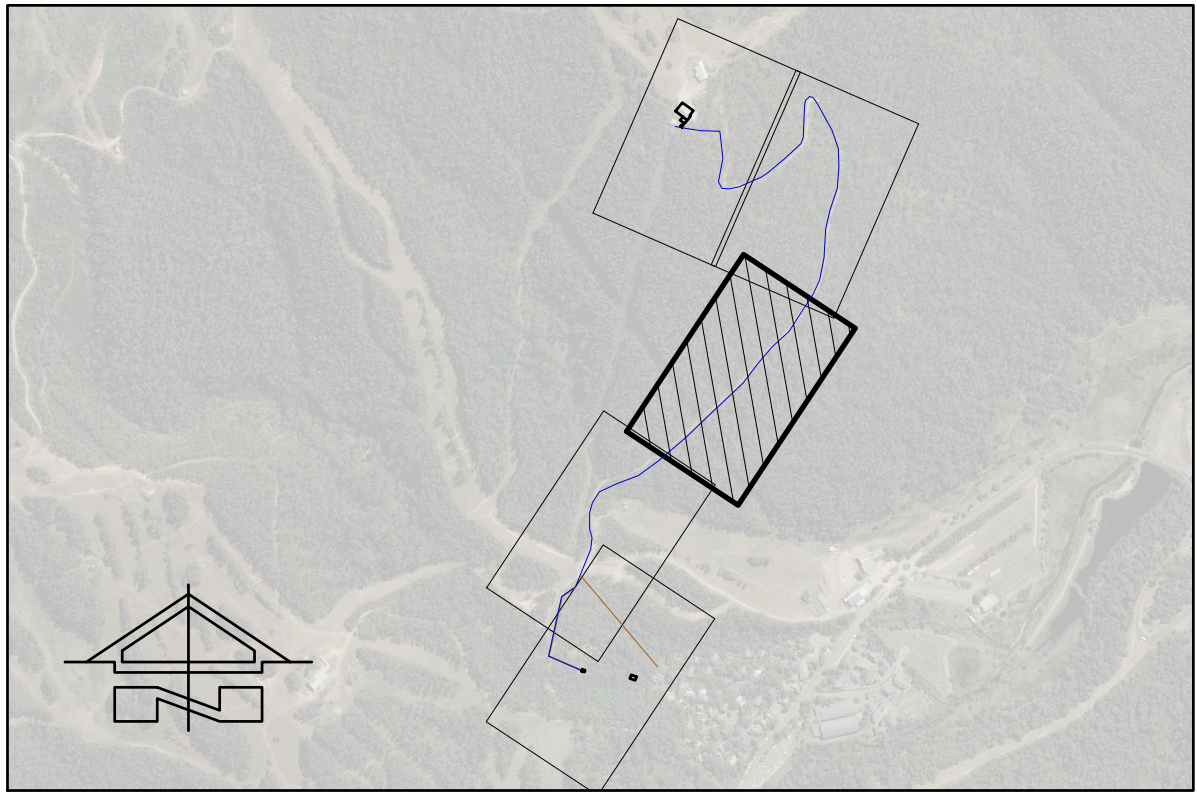
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KEY PLAN

LEGEND	
SYMBOL	DESCRIPTION
	CONTOUR MAJOR (5m)
	CONTOUR MINOR (1m)
	PROPOSED ELECTRICAL CONDUIT 150mm NOM
	EXISTING SEWER (APPROX. LOCATION)
	SEWER PRESSURE - DN75 PE100 SDR11
	WATER SUPPLY - DN100 DICL PN35
	WATER LINE - RING MAIN

NOTE:
SUBJECT TO CONFIRMATION OF DETAILED HYDRAULIC ANALYSIS THE DN100 DICL PN35 WATER SUPPLY PIPELINE MAY TRANSITION TO HDPE TOWARDS THE UPPER ELEVATION OF THE PIPELINE

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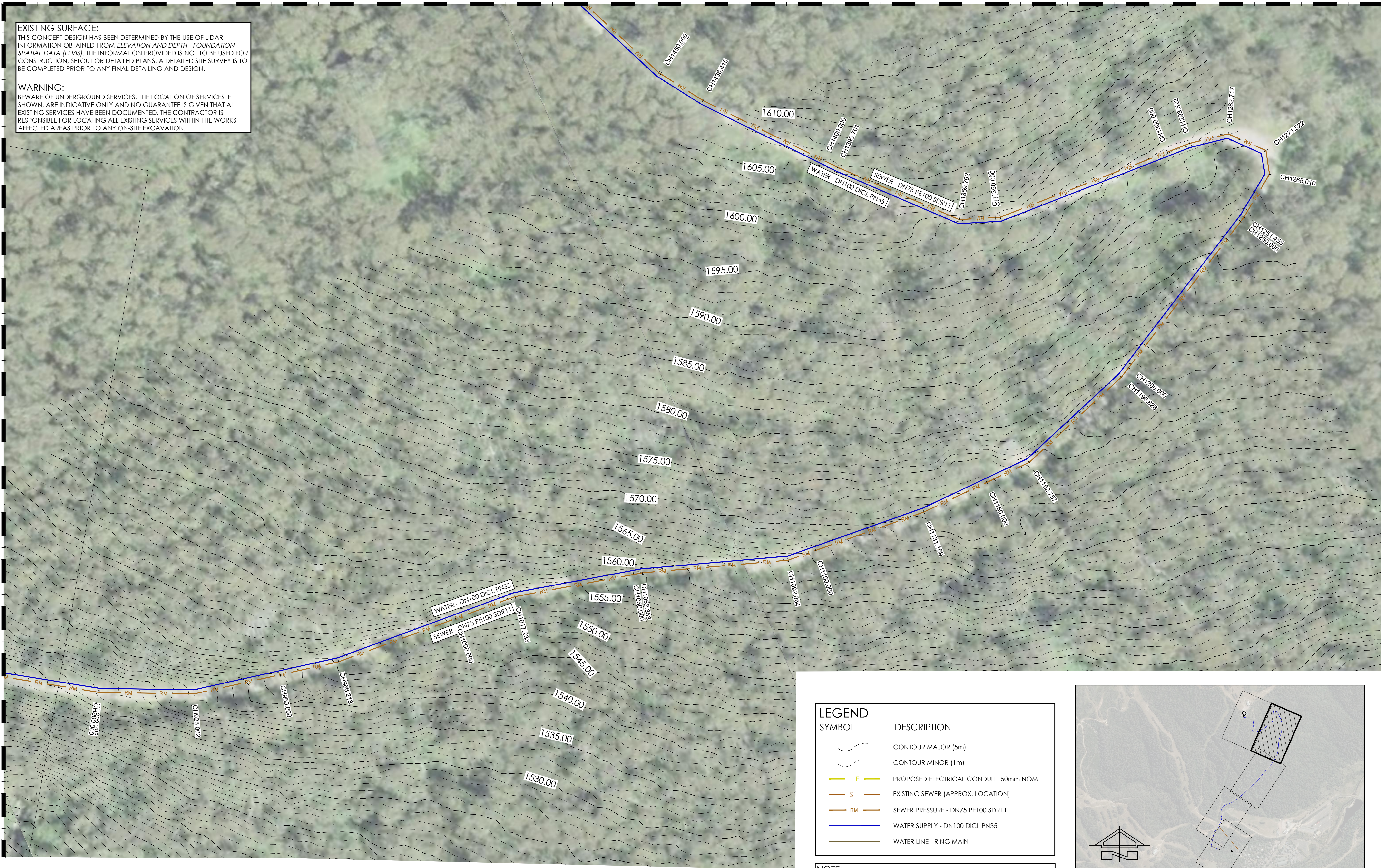
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WARNING:

BEWARE OF UNDERGROUND SERVICES. THE LOCATION OF SERVICES IF SHOWN, ARE INDICATIVE ONLY AND NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES HAVE BEEN DOCUMENTED. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING SERVICES WITHIN THE WORKS AFFECTED AREAS PRIOR TO ANY ON-SITE EXCAVATION.

ADJOINS SHEET C3.02



LEGEND	
SYMBOL	DESCRIPTION
	CONTOUR MAJOR (5m)
	CONTOUR MINOR (1m)
	PROPOSED ELECTRICAL CONDUIT 150mm NOM
	EXISTING SEWER (APPROX. LOCATION)
	SEWER PRESSURE - DN75 PE100 SDR11
	WATER SUPPLY - DN100 DICL PN35
	WATER LINE - RING MAIN

NOTE:
SUBJECT TO CONFIRMATION OF DETAILED HYDRAULIC ANALYSIS THE DN100 DICL PN35 WATER SUPPLY PIPELINE MAY TRANSITION TO HDPE TOWARDS THE UPPER ELEVATION OF THE PIPELINE



KEY PLAN

RIISING MAIN PLAN 4 OF 5

SCALE 1:500 AT A1

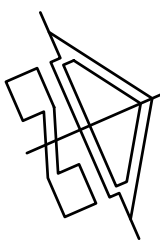
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SCALE 1:500 AT A1 SHEET | 1:1000 AT A3 SHEET

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NOT FOR CONSTRUCTION

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CLIENT
EVENT

HOSPITALITY
AND ENTERTAINMENT

PROJECT
MERRITTS MOUNTAIN HOUSE
TOP OF MERRITTS GONDOLA
THREDBO

DESIGNED C.W
DRAWN N.K
DATE MAR 22
SIZE A1
CAD REF TX16479.00 - C01



EPES Consulting Engineers

OFFICE | 1/6 DONNINGTON ST WEST, WEST GOSFORD NSW 2250
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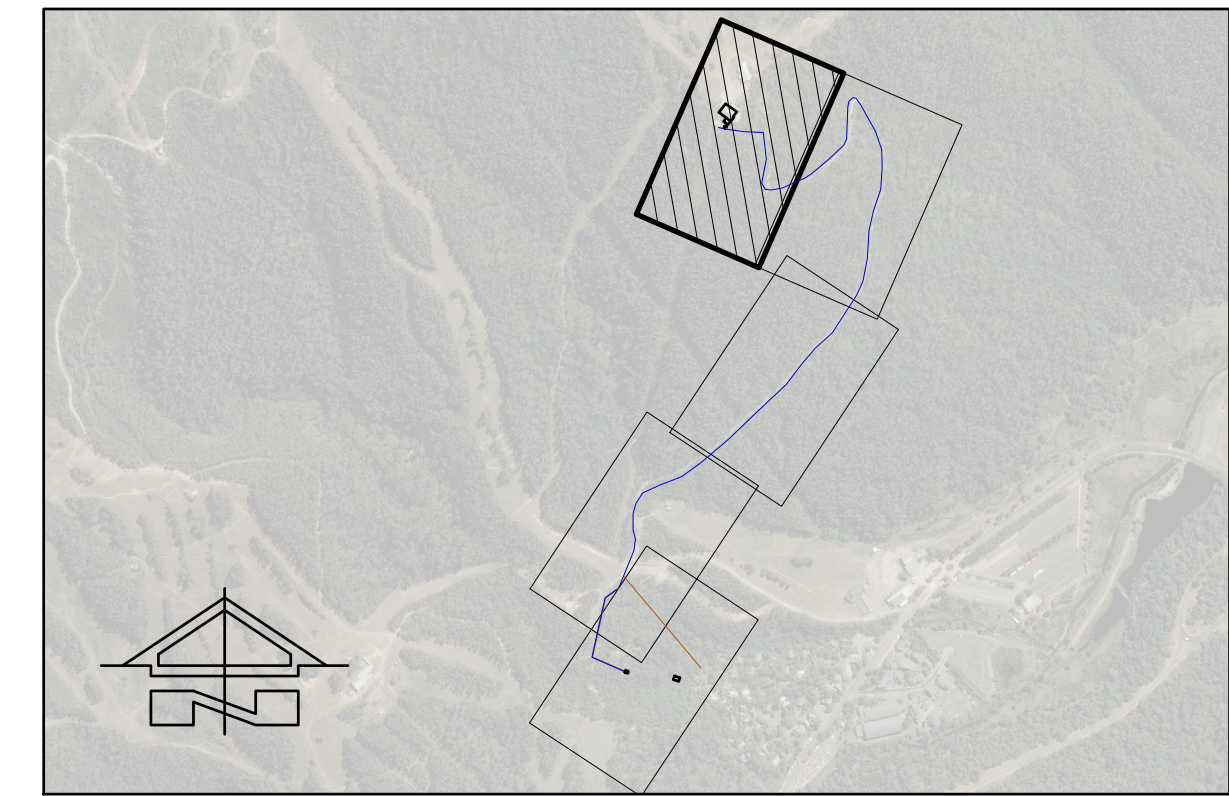
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DRAWING TITLE
RIISING MAIN PLAN SHEET 4 OF 5

PROJECT No. TX16479.00 - C3.03
DRAWING No. D
ISSUE



KEY PLAN

LEGEND

SYMBOL	DESCRIPTION
	CONTOUR MAJOR (5m)
	CONTOUR MINOR (1m)
	PROPOSED ELECTRICAL CONDUIT 150mm NOM
	EXISTING SEWER (APPROX. LOCATION)
	SEWER PRESSURE - DN75 PE100 SDR11
	WATER SUPPLY - DN100 DICL PN35
	WATER LINE - RING MAIN

NOTE:
SUBJECT TO CONFIRMATION OF DETAILED HYDRAULIC ANALYSIS THE DN100 DICL PN35 WATER SUPPLY PIPELINE MAY TRANSITION TO HDPE TOWARDS THE UPPER ELEVATION OF THE PIPELINE



EXISTING SURFACE:
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ADJOINS SHEET C3.03

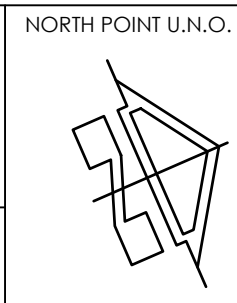
RIISING MAIN PLAN 5 OF 5

SCALE 1:500 AT A1

0 12.5 25 37.5 50m
SCALE 1:500 AT A1 SHEET | 1:1000 AT A3 SHEET

ISSUED FOR DA	05.04.22	D	B.R
ISSUED FOR DA	23.03.22	C	N.K
ISSUED FOR DA	18.03.22	B	N.K
ISSUED FOR DA	16.02.22	A	N.K
AMENDMENTS	DATE	ISSUE	BY

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CIENT
EVENT

HOSPITALITY
AND ENTERTAINMENT

PROJECT
MERRITTS MOUNTAIN HOUSE
TOP OF MERRITTS GONDOLA
THREDBO

DESIGNED C.W
DRAWN N.K
DATE MAR 22
SIZE A1
CAD REF TX16479.00 - C01



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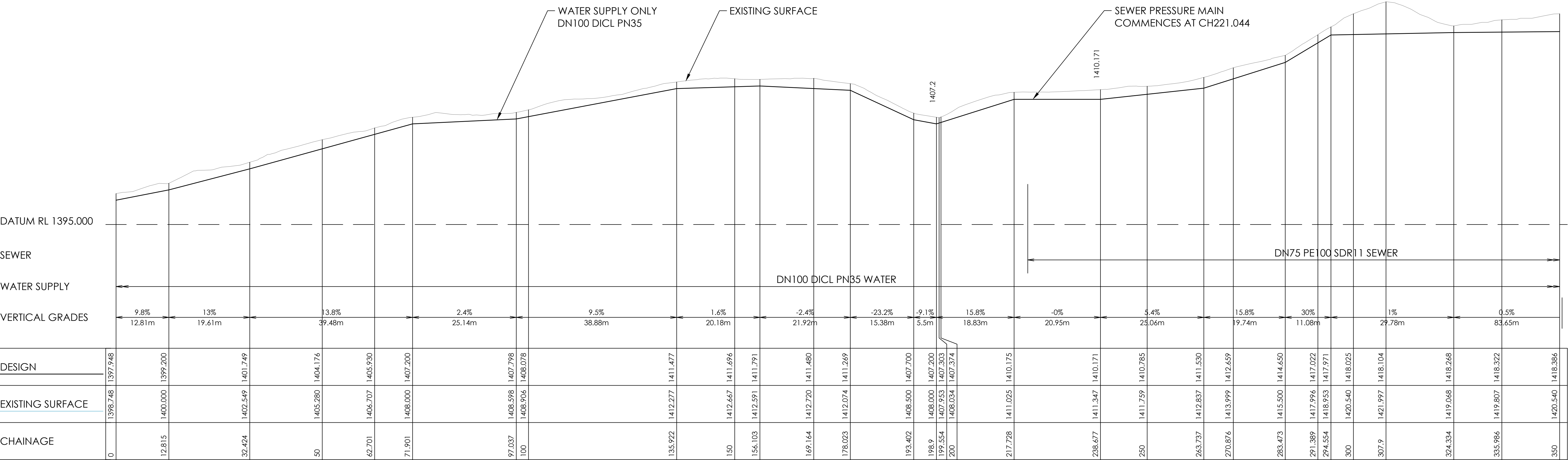
DRAWING TITLE
RIISING MAIN PLAN SHEET 5 OF 5

PROJECT No. TX16479.00 - C3.04
DRAWING No. D
ISSUE

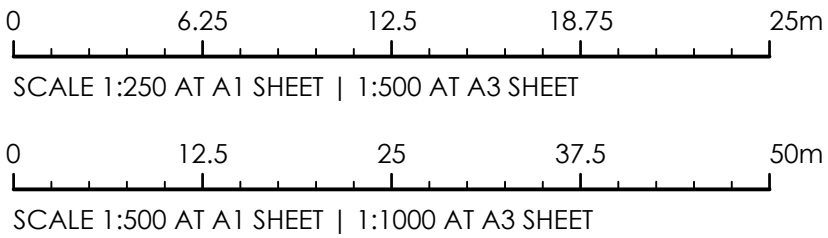
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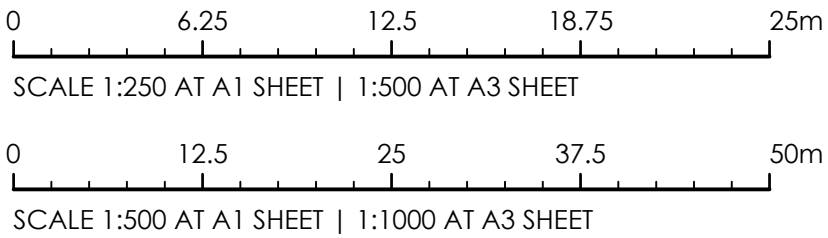
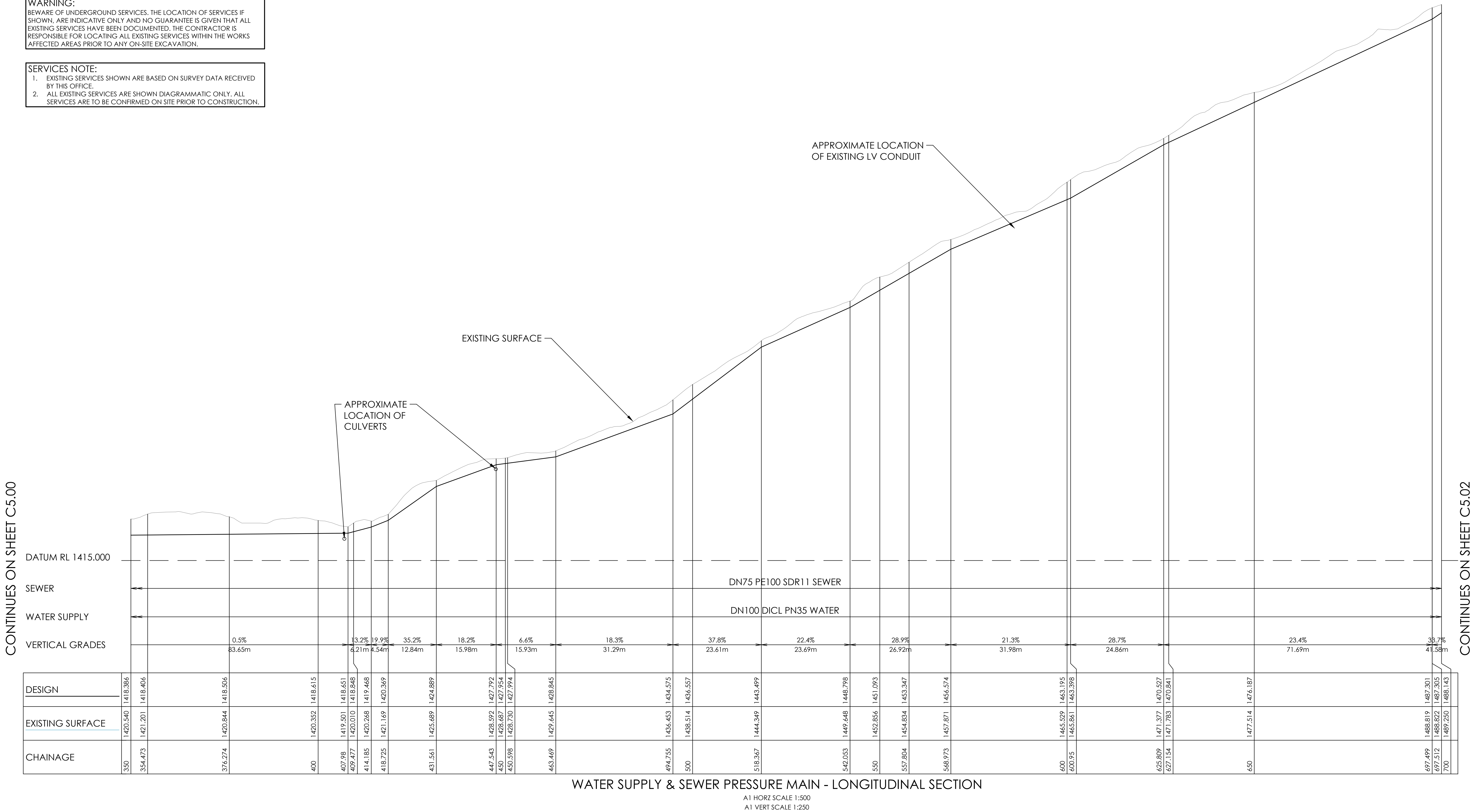
WATER SUPPLY & SEWER PRESSURE MAIN - LONGITUDINAL SECTION
A1 HORZ SCALE 1:500
A1 VERT SCALE 1:250



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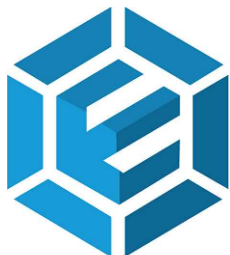
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ISSUED FOR DA	18.03.22	B	B.R
ISSUED FOR DA	16.03.22	A	B.R
AMENDMENTS	DATE	ISSUE	BY

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CUIENT
EVENT
HOSPITALITY
AND ENTERTAINMENT

PROJECT
MERRITTS MOUNTAIN HOUSE
TOP OF MERRITTS GONDOLA
THREDBO
DESIGNED C.W
DRAWN N.K
DATE MAR 22
SIZE A1
CAD REF TX16479.00 - C01



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Engineers
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SEWER AND WATER LONG
SECTION SHEET 2 OF 5

PROJECT No. TX16479.00 - C5.01
DRAWING No. C
ISSUE

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CONTINUES ON SHEET C5.03

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ISSUED FOR DA	16.03.22	A	B.R
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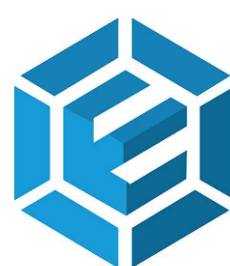
EVENT

HOSPITALITY
AND ENTERTAINMENT

PROJECT

MERRITTS MOUNTAIN HOUSE
TOP OF MERRITTS GONDOLA
THREDBO

DESIGNED	DRAWN	DATE	SIZE	CAD REF
C.W	N.K	MAR 22	A1	TX16479.00 - C01



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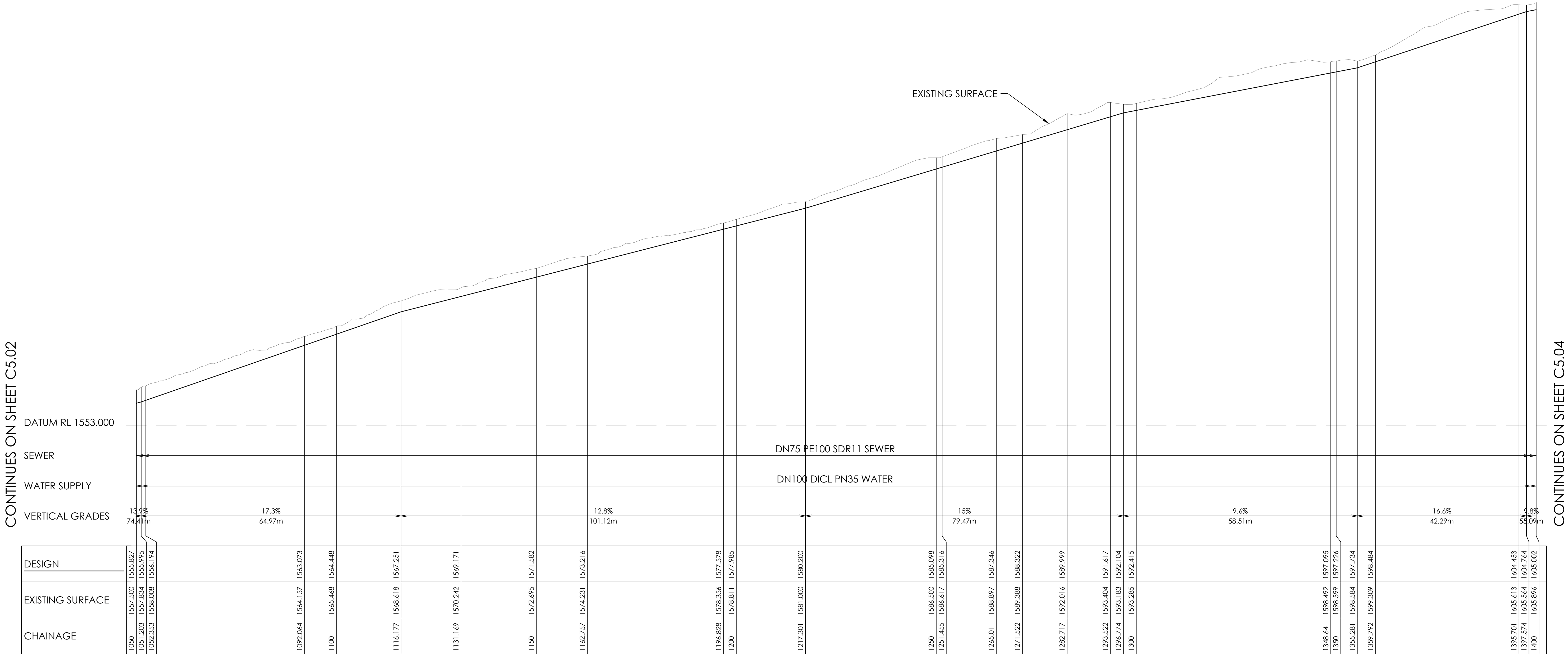
SEWER AND WATER LONG
SECTION SHEET 3 OF 5

PROJECT No. TX16479.00 - DRAWING No. C5.02 ISSUE C

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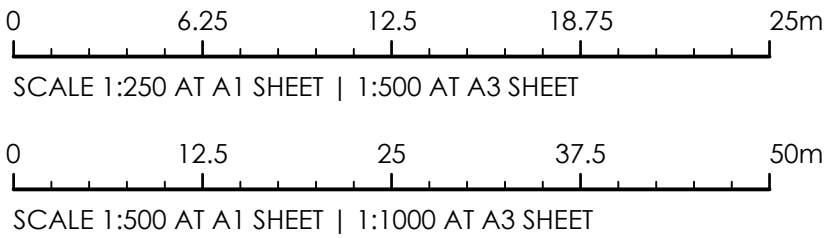
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WATER SUPPLY & SEWER PRESSURE MAIN - LONGITUDINAL SECTION

A1 HORZ SCALE 1:500
A1 VERT SCALE 1:250



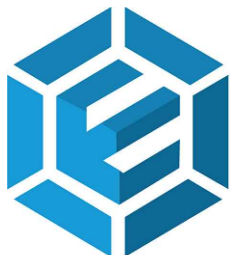
ISSUED FOR DA 18.03.22 B B.R
ISSUED FOR DA 16.03.22 A B.R
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HOSPITALITY
AND ENTERTAINMENT

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TOP OF MERRITTS GONDOLA
THREDBO
DESIGNED C.W
DRAWN N.K
DATE MAR 22
SIZE A1
CAD REF TX16479.00 - C01



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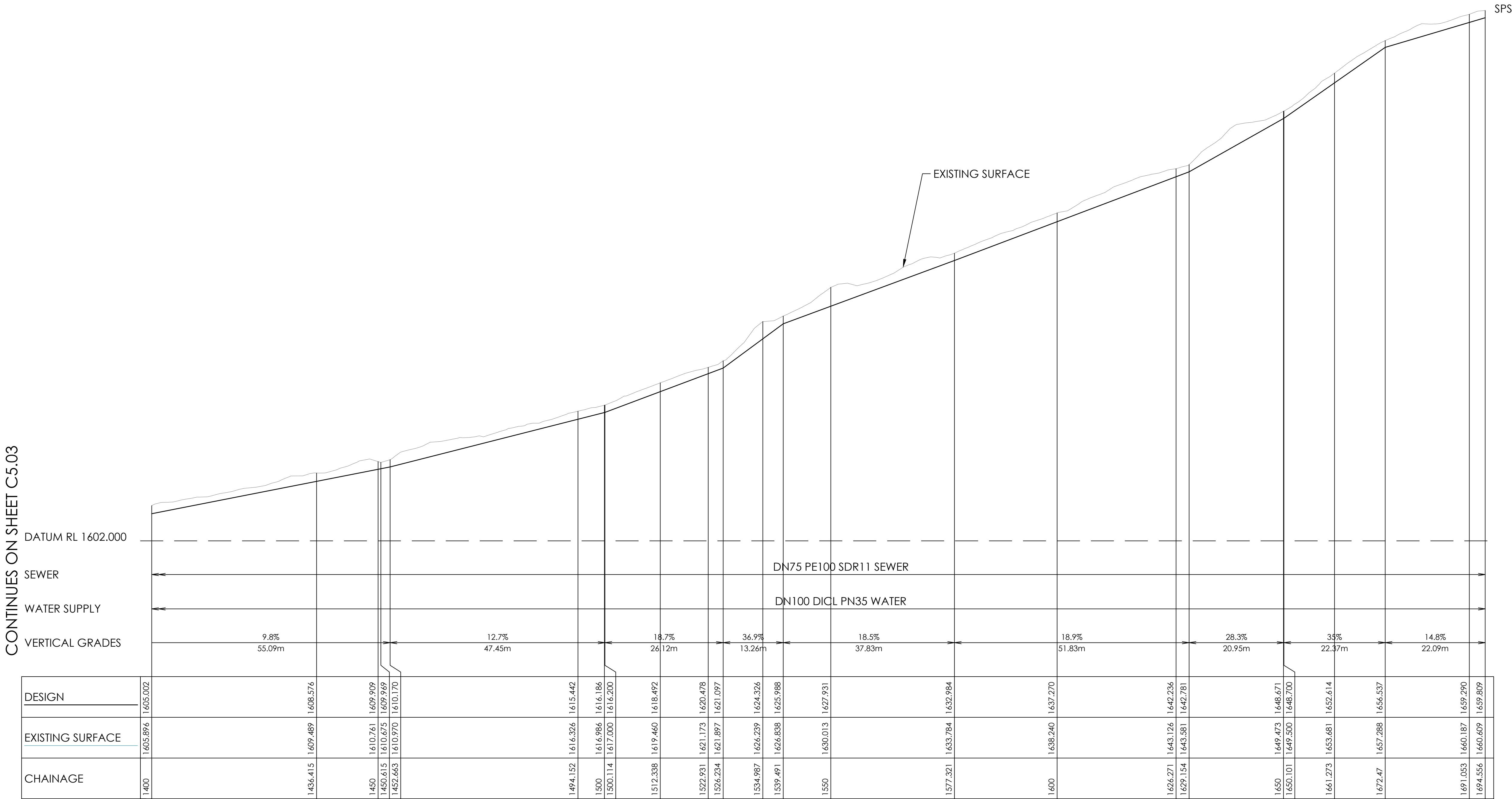
DRAWING TITLE
SEWER AND WATER LONG
SECTION SHEET 4 OF 5

PROJECT No. TX16479.00 - C5.03
DRAWING No. ISSUE B

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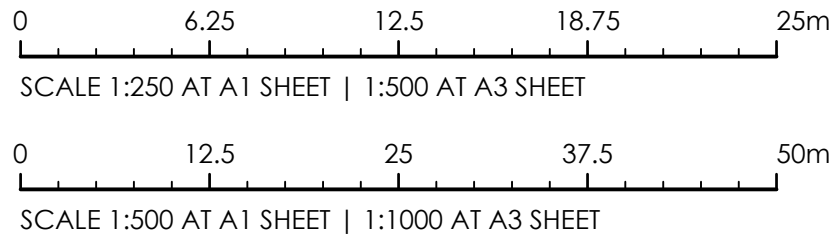
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WATER SUPPLY & SEWER PRESSURE MAIN - LONGITUDINAL SECTION

A1 HORZ SCALE 1:500
A1 VERT SCALE 1:250



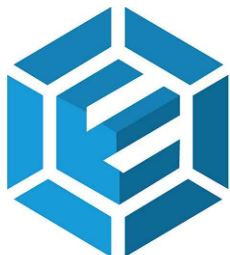
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ISSUED FOR DA 16.03.22 A B.R
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TOP OF MERRITTS GONDOLA
THREDBO
DESIGNED C.W
DRAWN N.K
DATE MAR 22
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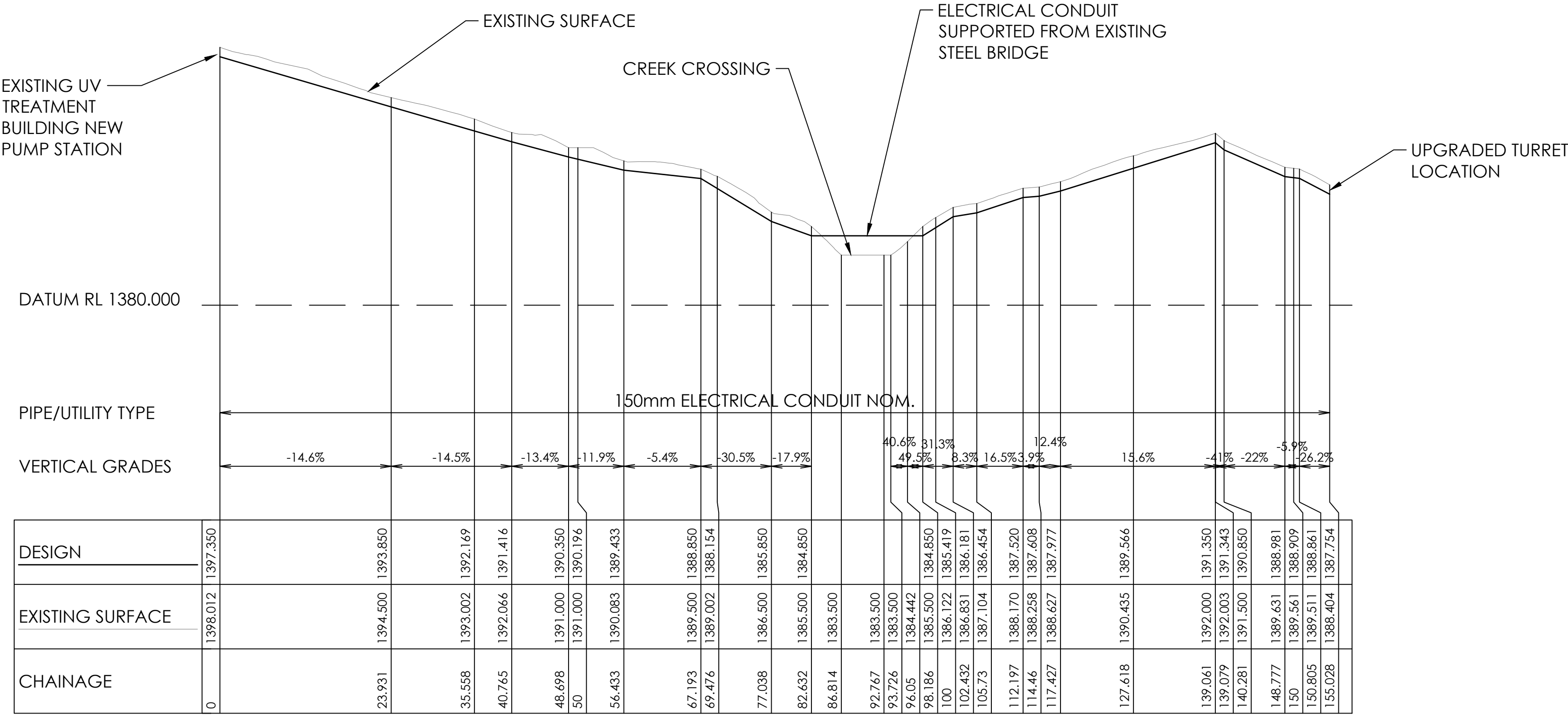
DRAWING TITLE
SEWER AND WATER LONG
SECTION SHEET 5 OF 5

PROJECT No. TX16479.00 - C5.04
DRAWING No. B
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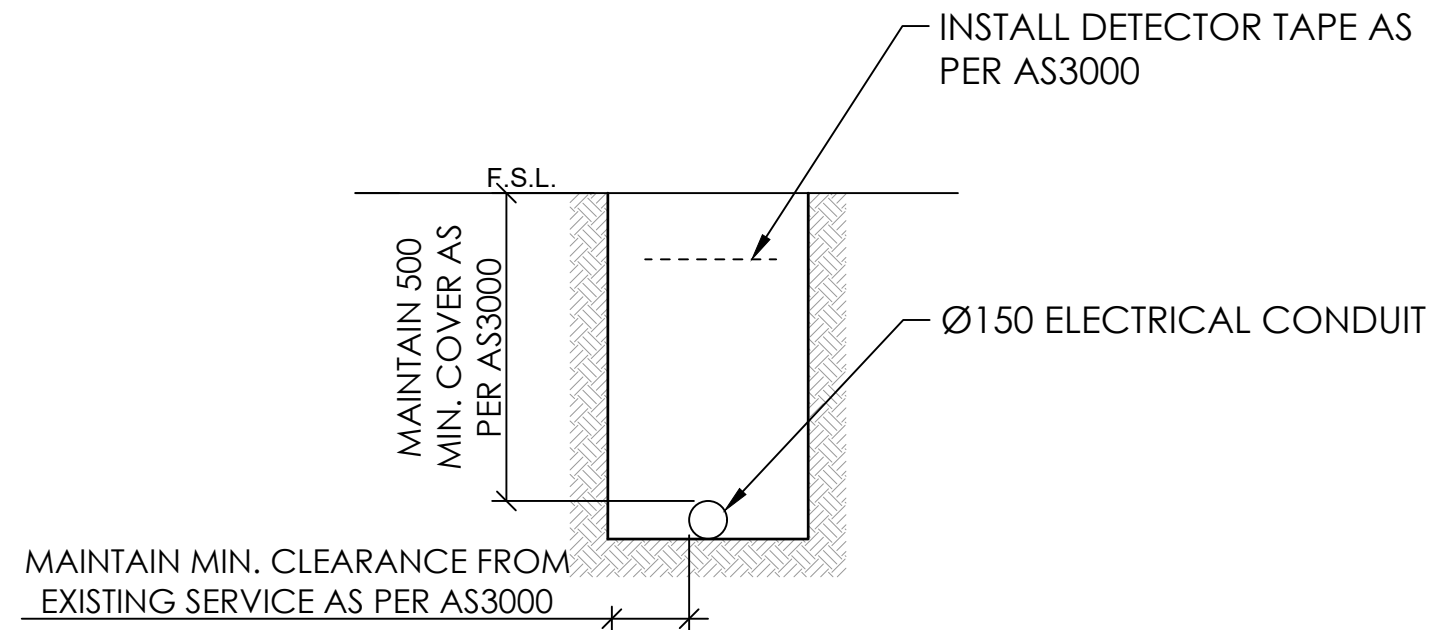
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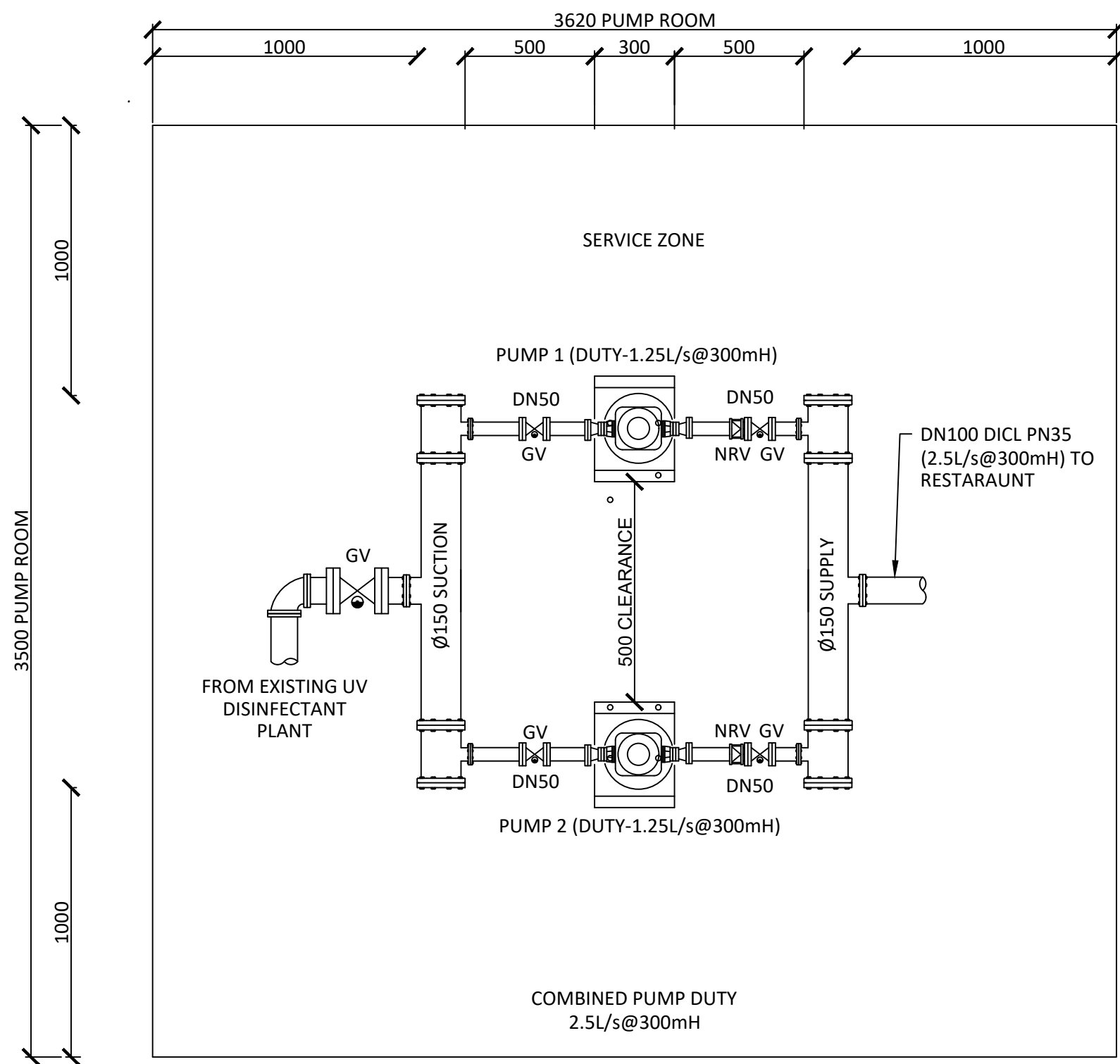
POWER CONDUIT - LONGITUDINAL SECTION

A1 HORIZ SCALE 1:500
A1 VERT SCALE 1:250



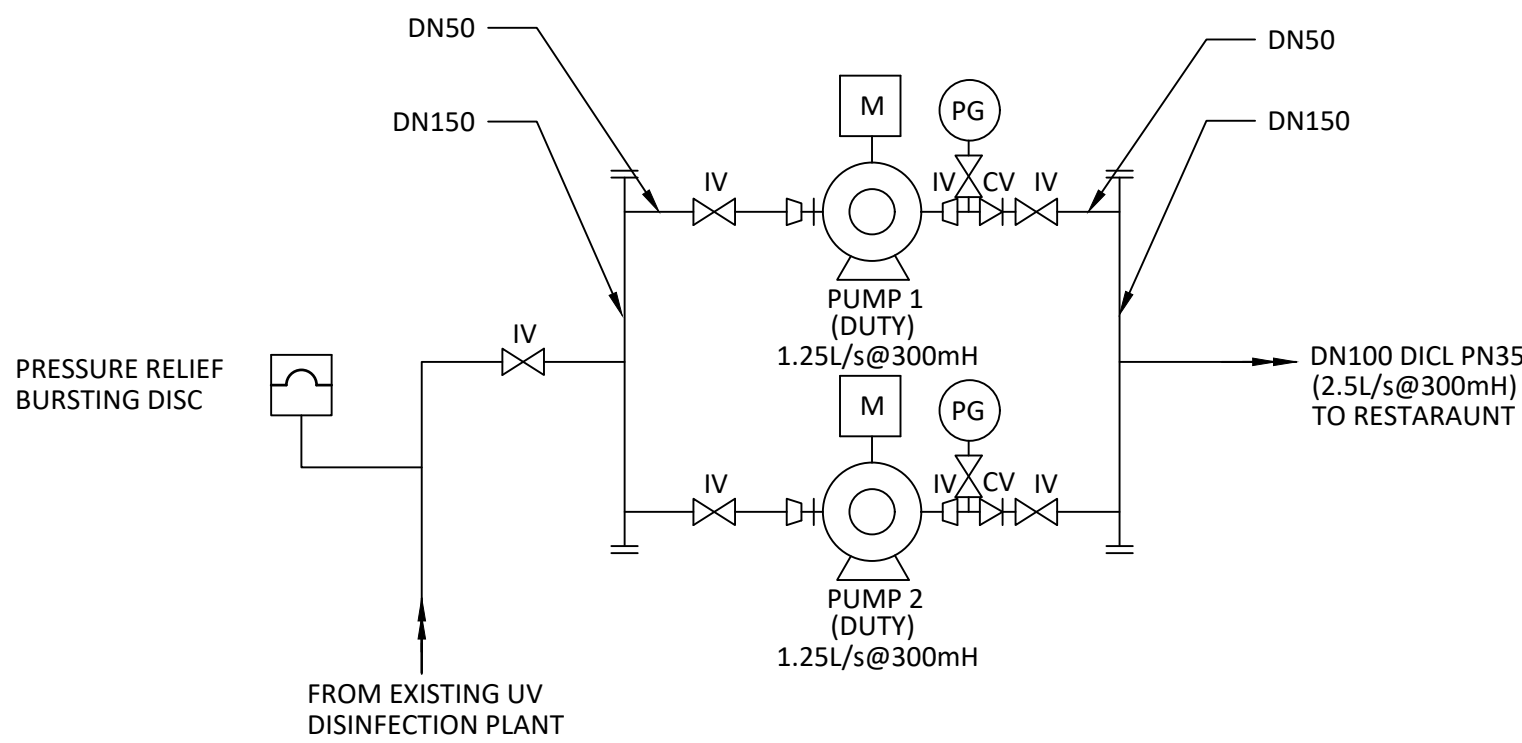
NEW POWER SUPPLY TO PUMP HOUSE
TYPICAL CROSS SECTION

N.T.S.



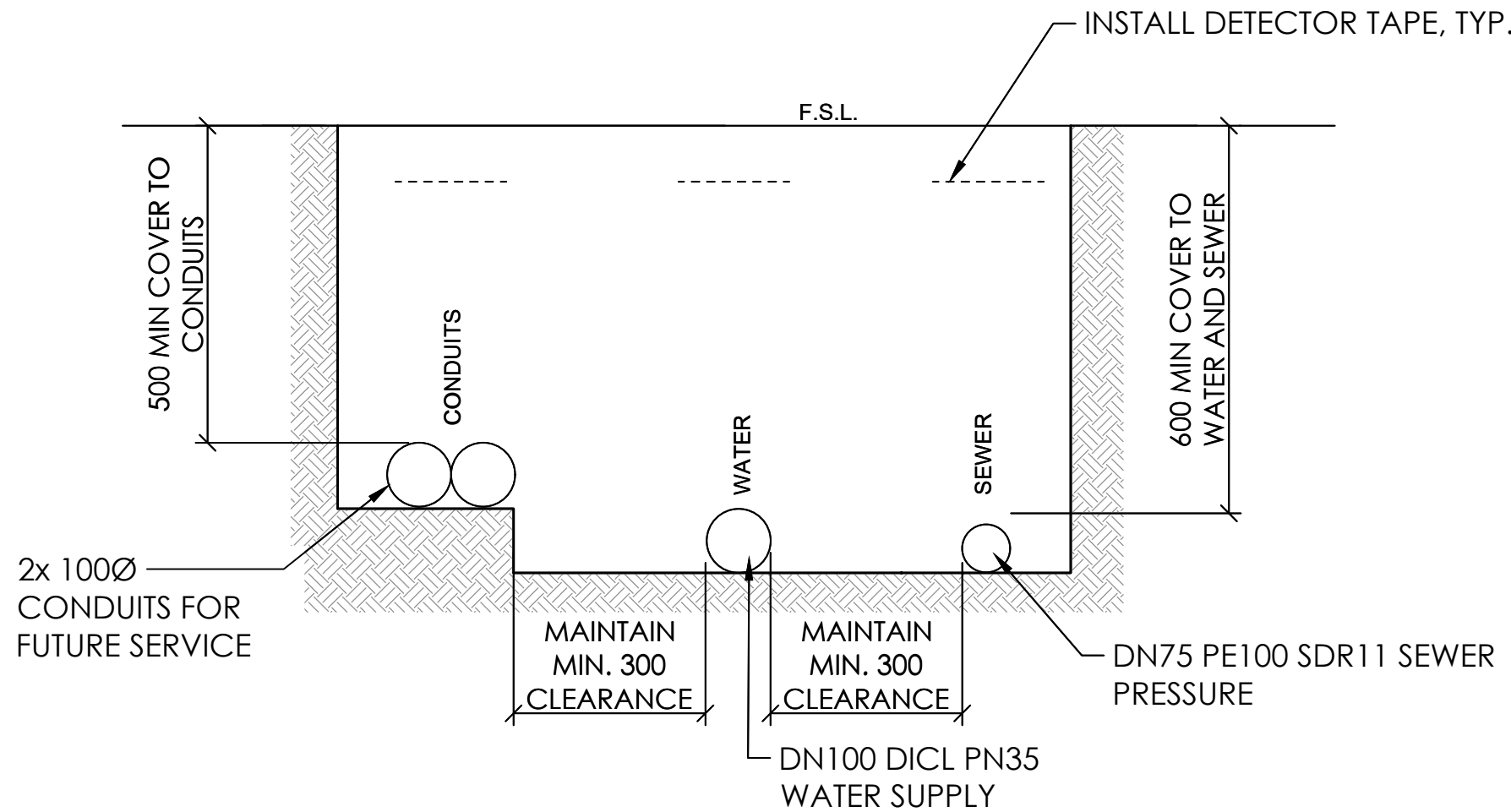
INDICATIVE WATER PUMP STATION LAYOUT

N.T.S.



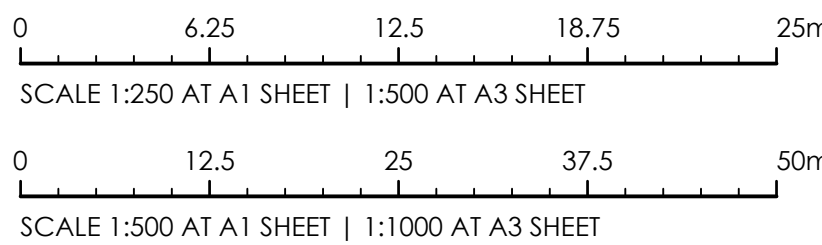
TYPICAL WATER PUMP SCHEMATIC DETAIL

N.T.S.



NEW WATER SUPPLY & SEWAGE PRESSURE MAIN TRENCH
TYPICAL CROSS SECTION

N.T.S.



ISSUED FOR DA 05.04.22 D B.R.

ISSUED FOR DA 23.03.22 C B.R.

ISSUED FOR DA 18.03.22 B B.R.

ISSUED FOR DA 16.03.22 A B.R.

AMENDMENTS DATE ISSUE BY

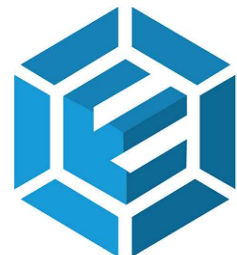
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EVENT
HOSPITALITY
AND ENTERTAINMENT

PROJECT
MERRITS MOUNTAIN HOUSE
TOP OF MERRITS GONDOLA
THREDBO

DESIGNED C.W. DRAWN N.K. DATE MAR 22 SIZE A1 CAD REF TX16479.00 - C01



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DRAWING TITLE
POWER CONDUIT LONG
SECTION, TRENCH DETAILS &
WATER SUPPLY PUMP DETAILS
PROJECT No. TX16479.00 - C5.05
DRAWING No. D

Appendix A

Important Information about your Geotechnical Report
Soil & Rock Explanation Sheets

Scope of Services

The geotechnical report ("the report") has been prepared in accordance with the scope of services as set out in the contract, or as otherwise agreed, between the Client and Asset Geotechnical Engineering Pty Ltd ("Asset"), for the specific site investigated. The scope of work may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

The report should not be used if there have been changes to the project, without first consulting with Asset to assess if the report's recommendations are still valid. Asset does not accept responsibility for problems that occur due to project changes if they are not consulted.

Reliance on Data

Asset has relied on data provided by the Client and other individuals and organizations, to prepare the report. Such data may include surveys, analyses, designs, maps and plans. Asset has not verified the accuracy or completeness of the data except as stated in the report. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations ("conclusions") are based in whole or part on the data, Asset will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Asset.

Geotechnical Engineering

Geotechnical engineering is based extensively on judgment and opinion. It is far less exact than other engineering disciplines. Geotechnical engineering reports are prepared for a specific client, for a specific project and to meet specific needs, and may not be adequate for other clients or other purposes (e.g. a report prepared for a consulting civil engineer may not be adequate for a construction contractor). The report should not be used for other than its intended purpose without seeking additional geotechnical advice. Also, unless further geotechnical advice is obtained, the report cannot be used where the nature and/or details of the proposed development are changed.

Limitations of Site Investigation

The investigation program undertaken is a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions. The data derived from the site investigation program and subsequent laboratory testing are extrapolated across the site to form an inferred geological model, and an engineering opinion is rendered about overall subsurface conditions and their likely behavior with regard to the proposed development. Despite investigation, the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies.

The engineering logs are the subjective interpretation of subsurface conditions at a particular location and time, made by trained personnel. The actual interface between materials may be more gradual or abrupt than a report indicates.

Therefore, the recommendations in the report can only be regarded as preliminary. Asset should be retained during the project implementation to assess if the report's recommendations are valid and whether or not changes should be considered as the project proceeds.

Subsurface Conditions are Time Dependent

Subsurface conditions can be modified by changing natural forces or man-made influences. The report is based on conditions that existed at the time of subsurface exploration. Construction operations adjacent to the site, and natural events such as floods, or ground water fluctuations, may also affect

subsurface conditions, and thus the continuing adequacy of a geotechnical report. Asset should be kept apprised of any such events, and should be consulted to determine if any additional tests are necessary.

Verification of Site Conditions

Where ground conditions encountered at the site differ significantly from those anticipated in the report, either due to natural variability of subsurface conditions or construction activities, it is a condition of the report that Asset be notified of any variations and be provided with an opportunity to review the recommendations of this report. Recognition of change of soil and rock conditions requires experience and it is recommended that a suitably experienced geotechnical engineer be engaged to visit the site with sufficient frequency to detect if conditions have changed significantly.

Reproduction of Reports

This report is the subject of copyright and shall not be reproduced either totally or in part without the express permission of this Company. Where information from the accompanying report is to be included in contract documents or engineering specification for the project, the entire report should be included in order to minimize the likelihood of misinterpretation from logs.

Report for Benefit of Client

The report has been prepared for the benefit of the Client and no other party. Asset assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of Asset or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own inquiries and obtain independent advice in relation to such matters.

Data Must Not Be Separated from The Report

The report as a whole presents the site assessment, and must not be copied in part or altered in any way.

Logs, figures, drawings, test results etc. included in our reports are developed by professionals based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These data should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Partial Use of Report

Where the recommendations of the report are only partially followed, there may be significant implications for the project and could lead to problems. Consult Asset if you are not intending to follow all of the report recommendations, to assess what the implications could be. Asset does not accept responsibility for problems that develop where the report recommendations have only been partially followed if they have not been consulted.

Other Limitations

Asset will not be liable to update or revise the report to take into account any events or emergent circumstances or fact occurring or becoming apparent after the date of the report.

Log Abbreviations & Notes

METHOD

borehole logs

AS	auger screw *
AD	auger drill *
RR	roller / tricone
W	washbore
CT	cable tool
HA	hand auger
D	diatube
B	blade / blank bit
V	V-bit
T	TC-bit

* bit shown by suffix e.g. ADV

excavation logs

NE	natural excavation
HE	hand excavation
BH	backhoe bucket
EX	excavator bucket
DZ	dozer blade
R	ripper tooth

coring

NMLC, NQ, PQ, HQ

SUPPORT

borehole logs

N	nil
M	mud
C	casing
NQ	NQ rods

excavation logs

N	nil
S	shoring
B	benched

CORE-LIFT

|| casing installed

└─ barrel withdrawn

NOTES, SAMPLES, TESTS

D	disturbed
B	bulk disturbed
U50	thin-walled sample, 50mm diameter
HP	hand penetrometer (kPa)
SV	shear vane test (kPa)
DCP	dynamic cone penetrometer (blows per 100mm penetration)
SPT	standard penetration test
N*	SPT value (blows per 300mm)
	* denotes sample taken
Nc	SPT with solid cone
R	refusal of DCP or SPT

USCS SYMBOLS

GW	Gravel and gravel-sand mixtures, little or no fines.
GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels
GM	Gravel-silt mixtures and gravel-sand-silt mixtures.
GC	Gravel-clay mixtures and gravel-sand-clay mixtures.
SW	Sand and gravel-sand mixtures, little or no fines.
SP	Sand and gravel sand mixtures, little or no fines.
SM	Sand-silt mixtures.
SC	Sand-clay mixtures.
ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity.
CL, CI	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays.
OL	Organic silts
MH	Inorganic silts
CH	Inorganic clays of high plasticity.
OH	Organic clays of medium to high plasticity, organic silt
PT	Peat, highly organic soils.

MOISTURE CONDITION

D	dry
M	moist
W	wet
Wp	plastic limit
Wl	liquid limit

CONSISTENCY

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable

DENSITY INDEX

VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Graphic Log

Soil

	Fill
	Peat, Topsoil
	Clay
	Silty Clay
	Gravelly Clay
	Sandy Clay
	Silt
	Sandy Silt
	Clayey Silt
	Gravelly Silt
	Gravel
	Sandy Gravel
	Clayey Gravel
	Silty Gravel
	Sand
	Gravelly Sand
	Silty Sand
	Clayey Sand

Rock

	Sandstone
	Shale
	Clayey Shale
	Siltstone
	Conglomerate
	Claystone
	Dolerite, Basalt
	Granite
	Limestone
	Tuff
	Porphyry
	Pegmatite
	Gneiss, Schist
	Quartzite
	Coal

Other

	Asphalt
	Concrete
	Brick

Water

	Level
	Inflow
	Outflow (complete)
	Outflow (partial)

Boundaries

	Known
	Probable
	Possible

WEATHERING

XW	extremely weathered
HW	highly weathered
MW	moderately weathered
SW	slightly weathered
FR	fresh

STRENGTH

VL	very low
L	low
M	medium
H	high
VH	very high
EH	extremely high

RQD (%)

$$= \frac{\text{sum of intact core pieces} > 2 \times \text{diameter}}{\text{total length of core run drilled}} \times 100$$

DEFECTS:

type		coating	
JT	joint	cl	clean
PT	parting	st	stained
SZ	shear zone	ve	veneer
SM	seam	co	coating

shape

pl	planar
cu	curved
un	undulating
st	stepped
ir	irregular

roughness

po	polished
sl	slickensided
sm	smooth
ro	rough
vr	very rough

inclination

measured above axis and perpendicular to core

AS1726-2017

Soils and rock are described in the following terms, which are broadly in accordance with AS1726-2017.

Soil

MOISTURE CONDITION

Term	Description
Dry	Looks and feels dry. Fine grained and cemented soils are hard, friable or powdery. Uncemented coarse grained soils run freely through hand.
Moist	Soil feels cool and darkened in colour. Fine grained soils can be moulded. Coarse soils tend to cohere.
Wet	As for moist, but with free water forming on hand.
Moisture content of cohesive soils may also be described in relation to plastic limit (W _p) or liquid limit (W _L) [\gg much greater than, $>$ greater than, $<$ less than, $<<$ much less than].	

CONSISTENCY OF FINE-GRAINED SOILS

Term	Su (kPa)	Term	Su (kPa)
Very soft	< 12	Very Stiff	$> 100 - \leq 200$
Soft	$> 12 - \leq 25$	Hard	> 200
Firm	$> 25 - \leq 50$	Friable	-
Stiff	$> 50 - \leq 100$		

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Term	Density Index (%)	Term	Density Index (%)
Very Loose	< 15	Dense	$65 - 85$
Loose	$15 - 35$	Very Dense	> 85
Medium Dense	$35 - 65$		

PARTICLE SIZE

Name	Subdivision	Size (mm)
Boulders		> 200
Cobbles		$63 - 200$
Gravel	coarse	$19 - 63$
	medium	$6.7 - 19$
	fine	$2.36 - 6.7$
Sand	coarse	$0.6 - 2.36$
	medium	$0.21 - 0.6$
	fine	$0.075 - 0.21$
Silt & Clay		< 0.075

MINOR COMPONENTS

Term	Proportion by Mass:	
	<u>coarse grained</u>	<u>fine grained</u>
Trace	$\leq 15\%$	$\leq 5\%$
With	$> 15\% - \leq 30\%$	$> 5\% - \leq 12\%$

SOIL ZONING

Layers	Continuous across exposures or sample.
Lenses	Discontinuous, lenticular shaped zones.
Pockets	Irregular shape zones of different material.

SOIL CEMENTING

Weakly	Easily broken up by hand pressure in water or air.
Moderately	Effort is required to break up by hand in water or in air.

USCS SYMBOLS

Symbol	Description
GW	Gravel and gravel-sand mixtures, little or no fines.
GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels.
GM	Gravel-silt mixtures and gravel-sand-silt mixtures.
GC	Gravel-clay mixtures and gravel-sand-clay mixtures.
SW	Sand and gravel-sand mixtures, little or no fines.
SP	Sand and gravel-sand mixtures, little or no fines.
SM	Sand-silt mixtures.
SC	Sand-clay mixtures.
ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity.
CL, CI	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays.
OL	Organic silts
MH	Inorganic silts
CH	Inorganic clays of high plasticity.
OH	Organic clays of medium to high plasticity, organic silt
PT	Peat, highly organic soils.

Rock

SEDIMENTARY ROCK TYPE DEFINITIONS

Rock Type	Definition (more than 50% of rock consists of)
Conglomerate	... gravel sized ($> 2\text{mm}$) fragments.
Sandstone	... sand sized (0.06 to 2mm) grains.
Siltstone	... silt sized ($< 0.06\text{mm}$) particles, rock is not laminated.
Claystone	... clay, rock is not laminated.
Shale	... silt or clay sized particles, rock is laminated.

LAYERING

Term	Description
Massive	No layering apparent.
Poorly Developed	Layering just visible. Little effect on properties.
Well Developed	Layering distinct. Rock breaks more easily parallel to layering.

STRUCTURE

Term	Spacing (mm)	Term	Spacing
Thinly laminated	< 6	Medium bedded	$200 - 600$
Laminated	$6 - 20$	Thickly bedded	$600 - 2,000$
Very thinly bedded	$20 - 60$	Very thickly bedded	$> 2,000$
Thinly bedded	$60 - 200$		

STRENGTH (NOTE: Is50 = Point Load Strength Index)

Term	Is50 (MPa)	Term	Is50 (MPa)
Extremely Low	< 0.03	High	$1.0 - 3.0$
Very low	$0.03 - 0.1$	Very High	$3.0 - 10.0$
Low	$0.1 - 0.3$	Extremely High	> 10.0
Medium	$0.3 - 1.0$		

WEATHERING

Term	Description
Residual Soil	Material is weathered to an extent that it has soil properties. Rock structures are no longer visible, but the soil has not been significantly transported.
Extremely	Material is weathered to the extent that it has soil properties. Mass structures, material texture & fabric of original rock is still visible.
Highly	Rock strength is significantly changed by weathering; rock is discolored, usually by iron staining or bleaching. Some primary minerals have weathered to clay minerals.
Moderately	Rock strength shows little or no change of strength from fresh rock; rock may be discolored.
Slightly	Rock is partially discolored but shows little or no change of strength from fresh rock.
Fresh	Rock shows no signs of decomposition or staining.

DEFECT DESCRIPTION

Type	
Joint	A surface or crack across which the rock has little or no tensile strength. May be open or closed.
Parting	A surface or crack across which the rock has little or no tensile strength. Parallel or sub-parallel to layering/bedding. May be open or closed.
Sheared Zone	Zone of rock substance with roughly parallel, near planar, curved or undulating boundaries cut by closely spaced joints, sheared surfaces or other defects.
Seam	Seam with deposited soil (infill), extremely weathered insitu rock (XW), or disoriented usually angular fragments of the host rock (crushed).

Shape

Planar	Consistent orientation.
Curved	Gradual change in orientation.
Undulating	Wavy surface.
Stepped	One or more well defined steps.
Irregular	Many sharp changes in orientation.

Roughness

Polished	Shiny smooth surface.
Slickensided	Grooved or striated surface, usually polished.
Smooth	Smooth to touch. Few or no surface irregularities.
Rough	Many small surface irregularities (amplitude generally $< 1\text{mm}$). Feels like fine to coarse sandpaper.
Very Rough	Many large surface irregularities, amplitude generally $> 1\text{mm}$. Feels like very coarse sandpaper.

Coating

Clean	No visible coating or discolouring.
Stained	No visible coating but surfaces are discolored.
Veneer	A visible coating of soil or mineral, too thin to measure; may be patchy
Coating	Visible coating = 1mm thick. Thicker soil material described as seam.

Appendix B

Site Photos



Photo 1

View of track down
from Merritts
Mountain House
Restaurant past
storage tanks



Photo 2

View of track
adjacent to storage
tanks (reverse view
of Photo 1)



Photo 3

Typical view of track erosion south of Merritts Mountain House Restaurant



Photo 4

View of track near Mid Chair Lift



Photo 5

View of earthworks
for nearby
Sundowner
Snowmaking
Upgrade



Photo 6

View of track
heading towards UV
Treatment building



Photo 7

View of UV
Treatment building,
showing location of
new pump extension



Photo 8

View of elevated
sewer across creek