Preliminary Geotechnical Assessment

Lot. 2029, No 34A, Great Alpine Road, Hotham Heights, VIC, 3741

Submitted To

APD Engineering

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1 Introduction

APD Engineering have engaged Intrax Consulting Engineers Pty Ltd (Intrax) to conduct a preliminary geotchnical assessment at Lot. 2029, No 34A, Great Alpine Road, Hotham Heights, VIC, 3741. Due to the site currently being covered with snow, an onsite geotechnical investigation is not practical at this stage, therefore this preliminary assessment is desktop based. The scope of work and terms and conditions of our engagement are set out in the Intrax sales proposal QU1764514. Approval to proceed was given by the APD purchase order number PO10254 issued from Sandy Lei of ADP via email correspondence on 01/08/2023.

1.1 Project Description

APD Engineering has provided Intrax with layout drawings for review and to provide project background. The provided drawings, reference number V115026, Issue 1, dated: 16/03/2023, demonstrate that the development shall comprise the construction of a new 10 m high monopole telecommunications tower, to be connected to the existing Telstra exchange building. Intrax has received various site images from the client's site inspections to aid in our assessment. Intrax has been informed that the telecommunications tower location is proposed to be shifted west, to be located behind the existing Telstra exchange building at the top of the existing timber retaining wall.

The proposed foundation types, layouts or design loads have not been provided to Intrax for incorporation into this report. However, based on previous experience, the tower footing is expected to be either a pad footing, anchored pad footing, or concrete bored pier arrangement.

2 Completed Investigations

2.1 Desktop assessment

A review of geological maps from the Geological Survey of Victoria, aerial photography and a search of Intrax' internal project records were used to assess the anticipated site conditions and to aid in identification of the geological origin.

2.2 Previous Geotechnical Investigations

In addition to publicly available information, the following previous geotechnical investigations relating to the site were and sites in close proximity to the site were available to Intrax at the time this report was completed. The factual components of these reports have been reviewed and incorporated into Intrax' understanding of the site.

- Civiltest (2022), Geotechnical Report, Hotham Village - 4220185-1, 18 Nov 2022.
- Intrax (2022), Geotechnical Investigation, Lot. 202 Hotplate Drive, Hotham Heights, S#189005-P731183, 10 Jun 2022.
- GHD (2022), Geotechnical Investigation Report, Lot. 202 Hotplate Drive, Hotham Heights, 12553319, Revision 2, 24 Jan 2022.
- GHD (2021), Preliminary Geotechnical Risk Assessment, Lot. 202 Hotplate Drive, Hotham Heights, 12553319, Revision 00, 13 Oct 2021.
- Coffey (2019), Preliminary Geotechnical Assessment, Lot. 3, No. 5, Skyline Terrace, Hotham Heights, 754-MELGE232474AB_Rev01, 13 Aug 2019.
- Coffey (2019), Preliminary Geotechnical Assessment, Ultima, Higgi Drive, Mount Hotham, 754-MELGE229163AB, 13 Jun 2019.
- Intrax (2019), Site Classification Report, Lot. 3, No. 5, Skyline Terrace, Hotham Heights, S#126304-PRJ262389, Revision A, 24 May 2019.

The reader should familiarise themselves with the Civiltest report to broaden their understanding of the geotechnical conditions on site.

3 Site Conditions

3.1 Site Locality and Description

The site is located at Lot. 2029, No 34A, Great Alpine Road, Hotham Heights, VIC, 3741. (-36.98319056580845, 147.14290005437374).

The site is located within the existing Hotham Village at the peak of Mount Higginbotham. The crest of Mount Higginbotham is approximately 60 m higher than the site, located approximately 400 m to the south. The topography slopes steeply to the east towards the current ski-slope trails, and west towards the Alpine National Park.

Figure 1. Site Locality (Source: Google Earth) Image Dated 31/07/2023

The site is situated southwest of Great Alpine Road, with main access to the site is from Higgi Drive. The site is occupied by an existing telecommunications facility. Structures at the site are noted as steel sheet clad single storey storage structures founded on concrete slabs. It appears that previous excavations at the site, assumed to facilitate original access and construction, has created gentle slopes and minor retaining walls across the site.

A timber retaining wall is located on the southern elevation of the site, approximately 1.2 m high, spanning approximately 4 m. A dry stacked local rock wall is located on the western elevation of the site, adjoining a vehicle carpark. The wall is approximately 0.8 m to 1.0 m high, spanning approximately 10m. The site surface is mostly vegetated with grasses, shrubbery, and isolated trees. (Refer Appendix A for site plans).

3.2 Regional Geology

The surface geology underlying the site has been mapped from the Geological Survey of Victoria. The 1:50,000 Mount Feathertop map indicates there are three major geological units in the vicinity of the development site:

- ***Qr: Quaternary Aged Unnamed 'Rock Rivers' and boulder fields***; Periglacial. Angular to subrounded cobbles and boulders formed in aprons on the flanks of steep hills and around basalt caps, loose block formation with no matrix. Colluvial unit, material transported from Po1 Basalt rock unit.
- ***Po1: Quaternary Aged Unnamed Lava Flows***: Alkali olivine basalt, nepheline basalt, picrobasalt and nephelinite. Minor peridotite enclaves and amygdales, with interflow sediments and laminated mudstone of fluvial and lacustrine deposition.

- ***Oap: Ordovician Aged Pinnak Sandstone (Adaminaby Group)***; Deep Marine, Sandstone and Siltstone. Sandstone is very thick to thin bedded, moderately sorted and turbiditic, minor feldspar and detrital mica. Thick beds are mostly massive Bouma formations with granulestone bases, thinner beds are well formed laminated and cross bedded. Dark pale grey and green. Siltstone is well bedded with regular banding.

A review of the available site information indicates that the surface geological unit may be colluvial material (Rock Rive Qr) transported from the Unnamed Lava Flows (Po1) unit, or residual soils weathered from the Pinnak Sandstone (Oap) geological unit. The parent rock is noted to be bedded at approximately 55 degrees and dipping at approximately 60 degrees. No major shear zones are mapped in the vicinity of the development site. It should be noted that the Civiltest drilling program was conducted at the base of the retaining wall. The newly proposed siting is at the top of the wall; therefore, some level of fill material is expected over the natural soils. An extract of the local geological map is provided below.

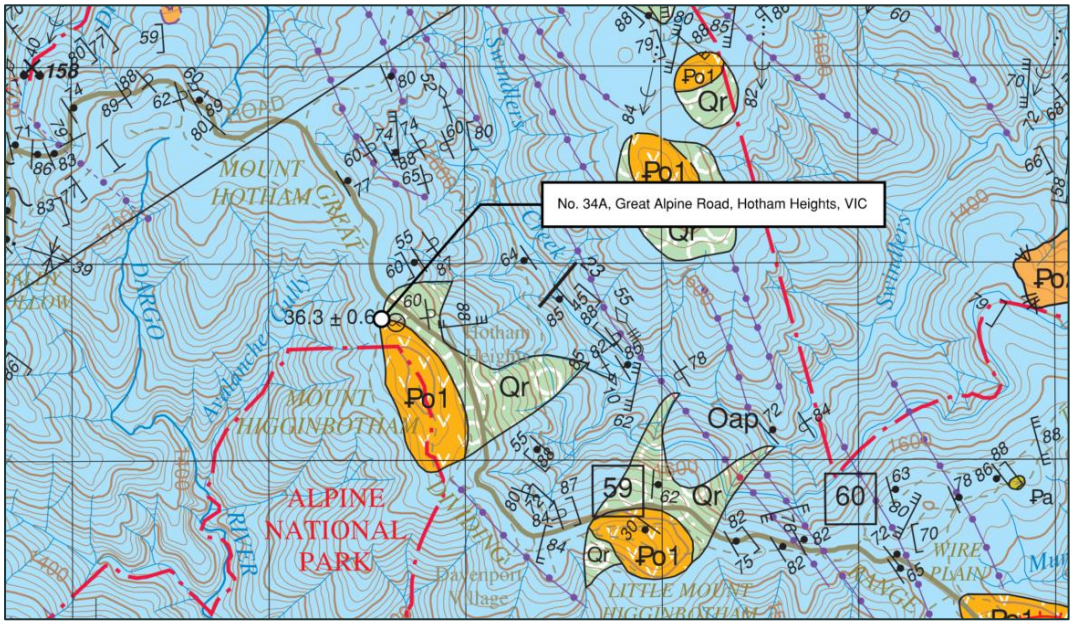

Figure 2: Extract of local geology, Geological Survey of Victoria (Source: Geoscience Australia)

3.3 Subsurface Conditions

Civiltest's drilling program completed three boreholes at the site, denoted as BH1 to BH3. The natural subsurface conditions encountered within the boreholes is consistent with the published geology.

The subsurface conditions are generally 1.0 m of low plasticity stiff to very stiff clay overlying 0.4 m of very dense gravelly sand before refusal on inferred medium to high strength weathered rock. The investigation does not make reference to the rock unit or rock structure, it is possible that the surface rock unit may be either colluvial rock boulders, basalt, or sandstone. No rock core recovery or laboratory testing of rock samples has been completed, therefore, assertions of rock strength and weathering are assumed to be classified according to auger rig penetration resistance.

Reviewing the available information, Intrax infer that the silty clay and clay soils within the boreholes may be volcanic colluvial soil or residual soil weathered from the sandstone rock mass. The gravelly sand soil encountered within the boreholes is likely extremely weathered sandstone rock, recovered as gravelly sand from disturbed from the mechanical auger. No groundwater was intersected or observed. Details of the materials encountered in the boreholes are presented within the Civiltest report provided in Appendix A.

4 Preliminary Landslide Risk Assessment

4.1 Terminology

This landslide risk assessment is conducted in accordance with the Australian Geomechanics Society Landslide Taskforce Guideline for Landslide Risk management 2007 (AGSLT, 2007). Terminology adopted within this assessment is presented below.

Landslide: The term landslide denotes "the movement of a mass of rock, debris or earth down a slope". The phenomena described as landslides are not limited to either the "land" or to "sliding", and usage of the word has implied a much more extensive meaning than its component parts suggest. Ground subsidence and collapse are excluded. Major types of landslides are presented below in Figure 3.

TYPE OF MOVEMENT		TYPE OF MATERIAL		
		BEDROCK	ENGINEERING SOILS	
			Predominantly Coarse	Predominantly Fine
FALLS		Rock fall	Debris fall	Earth fall
TOPPLES		Rock topple	Debris topple	Earth topple
SLIDES	ROTATIONAL	Rock slide	Debris slide	Earth slide
	TRANSLATIONAL			
LATERAL SPREADS		Rock spread	Debris spread	Earth spread
FLOWS		Rock flow (Deep creep)	Debris flow (Soil creep)	Earth flow
COMPLEX	Combination of two or more principle types of movement			

Figure 3: Major types of landslides (AGSLT, 2007)

Hazard: A condition with the potential for causing an undesirable consequence (the landslide or a type of landslide).

Risk: A measure of the probability and severity of an adverse effect to health, property or the environment. Risk is often estimated by the product of probability x consequences. However, a more general interpretation of risk involves a comparison of the probability and consequences in a non-product form.

Probability: A measure of the degree of certainty. This measure has a value between zero (impossibility) and 1.0 (certainty). It is an estimate of the likelihood of the magnitude of the uncertain quantity, or the likelihood of the occurrence of the uncertain future event (landslide).

There are two main interpretations:

(i) Statistical – frequency or fraction – Presented as a numerical value which is called an "objective" or relative frequentist probability because it exists in the real world and is in principle measurable by doing the experiment.

(ii) Subjective probability (degree of belief) – Quantified measure of belief, judgment, or confidence in the likelihood of an outcome, obtained by considering all available information honestly, fairly, and with a minimum of bias. Subjective probability is affected by the state of understanding of a process, judgment regarding an evaluation, or the quality and quantity of information. It may change over time as the state of knowledge changes.

Consequence: The outcomes or potential outcomes arising from the occurrence of a landslide expressed qualitatively or quantitatively, in terms of loss, disadvantage or gain, damage, injury or loss of life

Risk Assessment: The analysis or estimation of risk for a hazard

4.2 Potential Hazards

Based on a review of the publicly available slope instability data, provided geotechnical investigation data, and regional geotechnical reports. The following geotechnical hazards are identified that may impact the site through construction and/or over the design life course of the development:

- Rock fall of boulders emanating from uphill cuts
- Translational rockslide of material as a result of joint failures in bedrock up or down slope of the development
- Failure of existing retaining walls downslope of the proposed telecommunication tower.
- Translational earth slide of soil unit

4.3 Risk To Property

Table 1 below provides a brief risk assessment to highlight the potential risk of landslide and geotechnical failure events to the proposed development associated with the current hazards identified through the desktop review.

Table 1. Risk To Property Assessment

Hazard	Location	Initial Risk Rating			Control Measures	Residual Risk Rating		
		Likelihood	Consequence	Risk Rating		Likelihood	Consequence	Risk Rating
Temporary Conditions (During Construction)								
Failure of Existing Retaining Walls	Downslope of telecommunication tower	Possible. Where construction plant impose surcharges onto the top of the wall for building foundations or craning the tower into position, the retaining wall may locally fail by overturning.	Medium. Depending on the extent of failure, sections of the sleeper wall may require replacement. Where the dry stacked stone wall is impacted, further remediation is expected due to the interlocking bock construction requiring further remediation.	Moderate	An exclusion zone for plant loading should be implemented around the top of the wall. The exclusion zone should limit wall loading to a maximum of 5 kPa when working loads are imposed onto the retaining walls.	Unlikely. Where walls are not subject to additional surcharge imposed from plant loading, they are not expected to fail.	Medium	Low
Permanent Conditions								
Translational Rockslide	Within the site or uphill of the site	Barely Credible. Rock mass observed from road cuttings appears stable. The colluvial geology layer proves this event has occurred at one point in history, however for a significant rock slide to occur, the bedrock would	Catastrophic. In this event, the current site development would require complete reconstruction due to footing damage.	Low	N/A	N/A	N/A	N/A

		require highly persistent defects extending to steeper hill forms above the site. In the absence of these defects, a translational rockslide at the site is barely credible.						
Rock Fall	Slopes uphill of the site	Rare. Shallow soil cover is noted in geotechnical review. No large rock boulders are observed within the expected runoff distance to the site.	Minor. Rock mass may impact the existing structures within the development site, causing localised issues to existing structures.	Very Low	N/A	N/A	N/A	N/A
Earth Slide	On the site	Unlikely. The event may occur under exceptional circumstances where there is significant rainfall saturating the upper soils leading to an earth slide impacting the site. The soil layer at the site that may be saturated is relatively shallow (<1.5m), therefore significant earth volumes are not expected.	Major. A volume of earth may collide with existing structures, requiring rectification. The telecommunications tower may be overturned due to loss of footing bearing material	Moderate	The footing of the telecommunications tower should be embedded into competent rock.	Rare	Minor. The telecommunications tower is not expected to be impacted by an earth slide as footings are socketed into competent rock.	Very Low

4.4 Risk To Life

Risk to life is not considered to be credible based on the identified landslide hazards and possible geotechnical failures at the site.

4.5 Landslide Control Measures

To maintain and achieve a landslide risk rating of 'Low' the following control measures are required through design and construction of the development:

- An exclusion zone for plant loading should be implemented around the top of the wall. The exclusion zone should limit wall loading to a maximum of 5 kPa when working loads are imposed onto the retaining walls.
- Stockpiling of material is not to occur at the top of the retaining walls or at the crest of embankments.
- The footing should be embedded into highly weathered or better sandstone bedrock to alleviate thaw weakening and frost heave.
- Vegetation removal across the site should be minimised as much as possible through construction, where vegetation is removed, revegetation should be completed as soon as possible following construction.
- Construction works should be undertaken during dry months where possible, to avoid health and safety complications with working on wet steep slopes.
- Site surface drainage should be managed during and after construction to ensure flows are not concentrated on slopes or around footings.

Note, good hillside practices should be adopted at all times when building on sites that may become unstable. The AGS - GEOGUIDES outlines good hillside practices and can be found attached to this document.

4.6 Landslide Risk Conclusion

The qualitative assessment of the risk to property results in a residual risk rating of Low following the implementation of the landslide control measures listed in Section 4.5. Risk to life is not considered to be credible at the site based on the identified hazards that could impact the development.

5 Preliminary Geotechnical Design Parameters

5.1 Tower Foundation

5.1.1 Shallow Footings

Subject to design loads and settlement tolerances pad footings are considered a viable option monopole tower foundations. It is recommended that any pad footings for the tower are supported within the highly weathered medium strength sandstone. Allowable bearing capacities for tower pad footings are presented within table below. Allowable bearing pressures presented are anticipated to result in settlement of less than 25 mm. Where detailed settlement predictions are required, it is recommended that further laboratory testing is undertaken to accurately determine soil stress-strain characteristic, and footing is modelled in appropriate stress-strain software such as PLAXIS.

The founding level of pad footings shall be not less than 1.0 m below adjacent ground level to reduce the influence of shrink-swell and frost movements. The geometry of the pad is assumed to be 2 x 2m, if the pad is larger than this the geotechnical engineer should be consulted to assess the sensitivity.

Table 2: Allowable bearing capacities for tower pad footings

Unit	Material Strength	Founding Depth (mbgl)	Allowable Bearing Capacity (kPa)
HW Sandstone	Medium or better	1.5	1000

The pad shall be sufficiently sized such that the self-weight of the concrete footing is able to resist overturning moments and lateral shear forces developed at the base of the tower. Overturning moments, lateral shear and tension forces shall be determined by a suitably qualified and experienced structural engineer. Lateral forces and overturning moments shall be resisted by a combination of net passive resistance of the surrounding soil/rock, self-weight of the structure and shear resistance against the footing. Soil-structure frictional forces shall be influenced by the foundation material and treatment, best results will be achieved with a rough concrete finish.

5.1.2 Piled Foundations

Piled foundations area a suitable solution to support this monopole tower. The piled foundation design is anticipated to comprise a single large diameter bored pile. Bored piled foundations should be designed in accordance with AS2159-2009: Piling – Design and installation. AS2159-2009 requires that a geotechnical strength reduction factor (φ_g) be applied to the design ultimate geotechnical strength ($R_{d,ug}$) of the pile to provide the design geotechnical strength ($R_{d,g}$) of the pile. The $R_{d,g}$ should less than the design action effect (E_d) on the pile.

Intrax assess the average risk rating (ARR) of the pile to be 3.4, and the pile to be low redundancy, therefore we recommend that a basic geotechnical strength reduction factor (φ_g) of 0.48 is adopted and serviceability testing and integrity testing is carried out on the pile. Where no pile testing is conducted a φ_g of 0.4 is to be adopted in accordance with AS2159 Section 8.2.4 (c). Load testing would result in increased φ_g from the addition of the testing benefit factor. The design engineer may determine an alternative φ_g following the methodology of Section 4.3 of AS2159 and formula below.

$$\phi_g = \phi_{gb} + (\phi_{tf} - \phi_{gb})K \geq \phi_{gb}$$

where:

ϕ_{gb} = basic geotechnical strength reduction factor

ϕ_{tf} = intrinsic test factor (dependant on the type of load testing completed)

K = testing benefit factor

For estimation of the design ultimate geotechnical strength, the ultimate shaft resistance (Fs) and ultimate base resistance (Fb) are provided in table below

Table 3: Recommended ultimate pile resistance values

Unit	Material Strength	Depth (mbgl)		Ultimate Shaft Resistance (kPa)[1]	Ultimate Base Resistance (kPa)[2]
		From	To		
HW Sandstone	Medium or better	1.5		300	3000

[1]Shaft resistance is an average over the layer

[2]End bearing capacity taken at the bottom of layer depth

In addition to the above the following recommendations are made:

- The contribution of the uppermost soil profile shall be considered ineffective in providing geotechnical shaft resistance. The recommended ineffective depth is the larger of 1.0 m or 1.5D, where D is the pile diameter.
- Ultimate shaft friction values provided in table above shall be reduced by a factor of 0.8 for determination of tensile capacity. The pile self-weight may be included in tension capacities. The tension capacity shall also be limited by the lightweight of cone pull-out, a pull-out angle of 30 degrees from vertical commencing at the base of the pile may be adopted for initial estimation. Consideration to defects orientation and block sizes shall be made for pull-out in rock.
- Engagement of shaft resistance requires mobilisation of the pile. It is anticipated that settlement shall be in the order of 1% of the pile diameter to mobilise full shaft friction.
- Ultimate base resistance values provided in table above assume a minimum embedment of the lesser of 3D in soil and 1D or 1.0 m in competent rock, it is recommended that the pile design adopted these minimum embedment lengths.
- The values in table above assume the pile shafts are sound and free from remoulded material and pile base is clean and free from loose or soft debris.

The bored pile footing will be subject to lateral load and associated overturning moments. It is recommended that the Brinch-Hansen method for short rigid piles is used to determine the lateral resistance and a non-linear deflection software like LPile is used for serviceability movements. Pile movements may be numerically modelled in PLAXIS 3D.

Alternative approaches such as Brom's method and an elastic-spring stiffness model may be adopted. Unfactored properties provided in section 4 may be used for lateral capacity design. Recommended values for elastic-spring stiffness are presented in table below.

Table 4: Horizontal Modulus of subgrade reaction

Unit	Depth (mbgl)	Material Strength	Modulus of subgrade reaction Ks (kN/m3)	Limiting Pressure Pult (kPa)
	From			
HW Sandstone	1.5	Medium or better	600	2500

Notes: Ks: Horizontal Modulus of subgrade reaction determined using Vesic's simplified method assuming a 1.0 m diameter pile (Bowles, 1996, eq 9.6a)

Horizontal Modulus of subgrade reaction values above shall be sensitivity checked by using 50% and 200% of the recommended values. The analysis is to be verified against the limiting pressure. If exceedances occur, then the spring stiffness needs to be reduced and the pressures recalculated to ensure that the limiting values are not exceeded.

It is recommended that the upper 1.0 m or 1.5D is ignored for passive capacity, however this may be reduced by the design engineer in the presence of competent rock which cannot be easily excavated and will not be influenced by surface environmental factors like season weather. Serviceability deflection may assume the full ground profile is present with consideration given to potential future site excavation.

It is anticipated that any bored pile constructed at the site will be limited by the capability of the equipment onsite

5.1.3 Rock Anchors

Given the shallow rock present on this site a shallow pad foundation tied to the underlying material using anchors may be considered to resist overturning uplift forces. It is recommended that anchors are installed and tested during construction to demonstrate that working design loads are achieved onsite. For design, the ultimate bond stress for rock-grout interface are presented in table below. The values provided assume the use of air-flush drilling with good quality controls in place. Higher strength values may be achievable where a testing program and justify adoption. It is recommended that anchor design adopts a minimum bond length of 3 m, minimum free length of 1 m and maximum bonded length of 10 m. The embedded depth of rock anchors shall consider eccentric loading combinations.

It is recommended that anchors are designed and tested in accordance with Appendix B1 in Australian standard AS4678-2002. Testing shall be conducted under supervision by a specialist experienced in rock anchor design and installation.

Anchor foundation design shall also consider the pull-out capacity the anchor layout, such that the anchor design anchor capacity is not less than the self-weight of the rock/soil cone. The adopted cone angle will be dependent on the level of weathering and shall start from the midpoint of the bond length. Recommended cone pull-out angles are presented in table below.

Table 5: Rock anchor bond strength

Unit	Material Strength	Ultimate rock-grout bond stress (kPa)	Cone pull out angle (degrees)
HW Sandstone	Medium or better	400	90

Cone angle is the arc angle such that half the angle is present either side of anchor.

Note: no rock anchor design details shall be finalised until the weathering properties of underlying sandstone rock is confirmed. Intrax must be contacted during the excavation stage with additional pictorial information to confirm the integrity of the sandstone.

5.2 Construction Considerations

5.2.1 Piling & Bulk Excavation

Access to telecommunication tower sites typically restricts the equipment available to install piles to an excavator mounted machine. These piling rigs are less capable to penetrate through rock and depending on the specific machine may be refused in hard soils.

It is noted that the hard rock material is expected to provide significant resistance to piling machinery. The piling contractor should be consulted to ensure the drilling methodology can penetrate this layer.

It is recommended that a specialist piling contractor is consulted during the design process to determine the machinery limitations and suitable methodology for the site conditions prior to mobilising for construction.

Bulk excavation of the upper soils is anticipated to be achieved with standard earth works equipment (20 tonne excavator), progression through hard rock may require the use to hard ripping, rock breakers.

5.2.2 Trafficability

Trafficability is anticipated to be sufficient while soil conditions remain dry, however following significant or sustained rainfall periods trafficability is likely to be restricted to tracked machinery only. To improve trafficability during wet periods access roads can be created by stripping the saturated material most likely upper soils and removing from site, then placing a coarse aggregate non-descript crushed rock or similar if necessary. If adverse weather proceeds construction a geotextile may be required prior to placement of the crushed rock to prevent soft spot development.

5.3 Weather and Snow

Due to the site locality, heavy snowfall is expected during Winter, in addition to heavy rainfall creating difficult access conditions to the site. Construction should be planned for the drier summer months when access to the site is readily available for machinery and ground conditions are reasonable for earthworks progression.

6 Geotechnical Risks

The following geotechnical risks are associated with the site that require consideration for design and construction requirements:

- ***Thaw weakening, frost heave, adfreeze:*** Where foundations are placed in frost susceptible soils (cohesive soils), they may be impacted by reduced bearing capacities from thaw weakening. Serviceability conditions may be impacted by frost heave raising the footing, and adfreeze rotating the footing. Due to these conditions and the landslide risk management, tower foundations are required to be embedded into highly weathered or better sandstone bedrock.

7 Recommendations for Further Investigation

Intrax' review of the site geotechnical information and available desktop information suggests the following investigations:

- A complete geotechnical assessment should be completed including a diamond cored borehole to verify the rock unit, its structure, weathering, and strength characteristics to confirm design parameters for the telecommunication tower's footing. Whilst also assessing any preferential weaknesses within the rock mass that may lead to the actuation of the previously listed landslide hazards.
- A walkover of the site, and uphill and downhill sites should be conducted by a suitably qualified geotechnical engineer to confirm landslide hazards are in accordance with the desktop assumptions of this report and identify any hazards not previously described.

8 Geotechnical Conclusions

Based on this preliminary geotechnical investigation, the site is considered suitable for the proposed development, provided the recommendations for further investigation in Section 7 are undertaken, and considerations in Section 5 and 6 are adhered to.

Geotechnical hazards identified in the landslide risk assessment are to be mitigated by control measures detailed in Section 4.5

Subject to the findings of a complete geotechnical assessment, detailed recommendations regarding footing levels, founding material capacity, earthworks and retention recommendations, and any ongoing maintenance measures associated with the development will be reviewed and finalised during the design phase.

8.1.1 Inspections (Hold Points)

Intrax **should** be engaged in the following events for further clarification and advice:

1. In the event soil conditions encountered differ significantly from those described within this report.
2. If project design is altered significantly from drawings reviewed and outlined or project described within this report
3. To inspect and confirm the assumed design strength and capacity of founding materials are achieved during construction.

9 References

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10 Limitations of Report

1. The recommendations in this report are based on the following:
    a. Information about the site & its history, proposed site treatment and building type conveyed to us by the client and or their agent.
    b. Professional judgements and opinions using the most recent information in soil testing practice that is available to us.
    c. The location of our test sites and the information gained from this and other investigations.

    Should the client or their agent neglect to supply us with correct or relevant information, including information about previous buildings, trees or past activities on the site, or should changes be made to the building type, size and or/position, this report may be made obsolete, irrelevant or unsuitable. In such cases, Intrax will not accept any liability for the consequences and Intrax reserves the right to make an additional charge if more testing or a change to the report is necessary.
2. The recommendations made in this report may need to be reviewed should any site works disturb any soil below the proposed founding depth.
3. The descriptions of the soils encountered in the boreholes follow those outlined in AS1726-2017; Geotechnical Site Investigations. Colour descriptions can vary with soil moisture content and individual interpretation.
4. If the site conditions at the time of construction differ from those described in this report, then Intrax must be contacted so a site inspection can be carried out prior to any footing being poured. The owner/builder will be responsible for any fees associated with this additional work.
5. This report assumes that the soil profile(s) observed in the boreholes are representative of the entire site. If the soil profile and site conditions appear to differ substantially from those reported herein, then Intrax should be contacted immediately and this report may need to be reviewed and amended where appropriate. The owner/builder will be responsible for any fees associated with this additional work.
6. The user of this report must consider the following limitations. Soil and drilling depths are given to a tolerance reflective of the drilling methodology. Lower levels of accuracy are possible from wash boring or solid flight auger then is achievable from geoprobe sampling or diamond coring.

    It must be understood and a condition of acceptance of this report is that whilst every effort is made to identify fill material across the site, difficulties exist in determining fill material for example, well compacted site won or area derived fill, especially when utilising a small diameter auger. Consequently, Intrax emphasises that we will not be responsible for any financial losses, consequential or otherwise, that may occur as a result of not accurately determining the fill profile across the site.
7. Finally, no responsibility will be taken for this report if it is altered in any way or is not reproduced in full.

Appendix A

Site Plans

ADVERTISED PLAN

N

Intrax LAND

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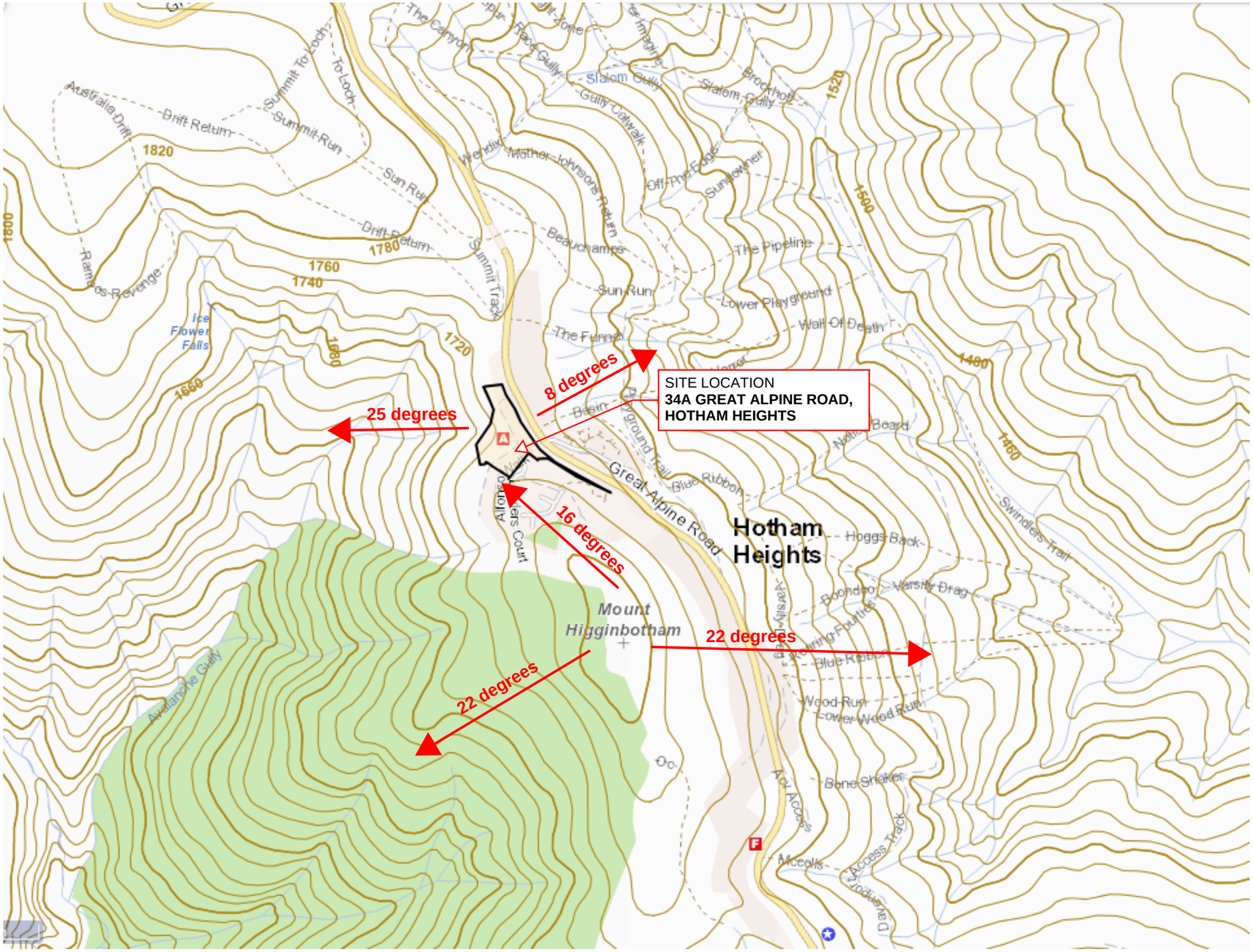
ABN 31 106 481 252
www.intrax.com.au

TITLE: Site Locality Plan		DRAWN: T.Reidy	PAGE SIZE: A3
		CHECKED: J.McPherson	SITE NO.: 210126
CLIENT: APD Engineering		SCALE: N.T.S	DOC ID: 210126-PRJ1010393-GEO-DWG-01
		DATE: 01/08/2023	VERSION: 0



ADVERTISED PLAN

IMAGE SOURCE:
maps.land.vic.gov.au/lassi/

N

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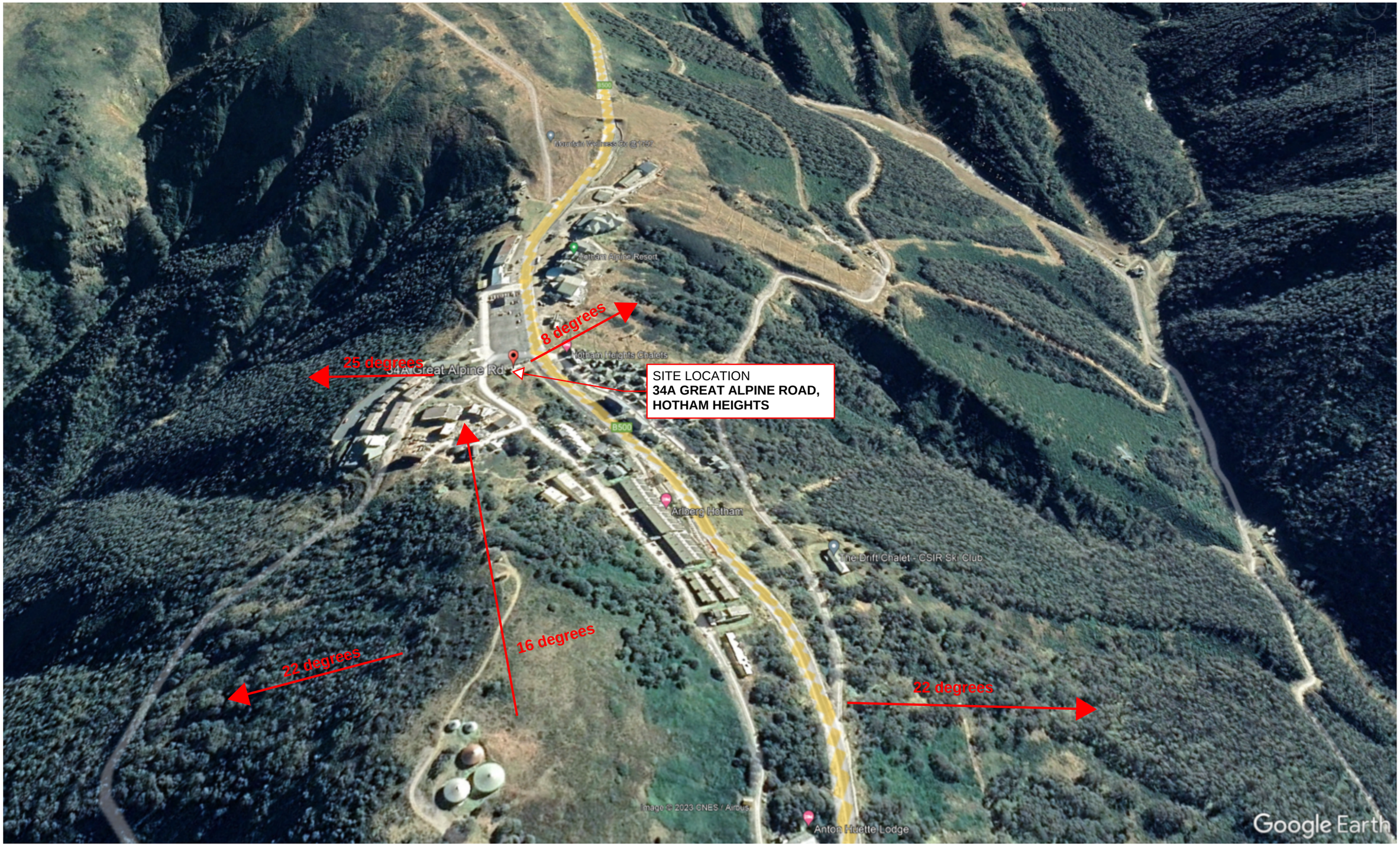
ABN 31 106 481 252
www.intrax.com.au

TITLE: Site Topographic Plan	DRAWN: T.Reidy	PAGE SIZE: A3
	CHECKED: J.McPherson	SITE NO.: 210126
CLIENT: APD Engineering	SCALE: N.T.S	DOC ID: 210126-PRJ1010393-GEO-DWG-01
	DATE: 01/08/2023	VERSION: 0



N

ADVERTISED PLAN

Intrax LAND

E: info@intrax.com.au
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ABN 31 106 481 252
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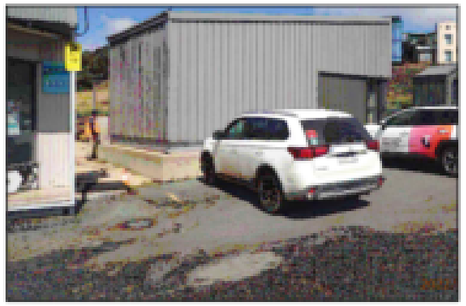
TITLE: Site Topographic Plan	DRAWN: T.Reidy	PAGE SIZE: A3
	CHECKED: J.McPherson	SITE NO.: 210126
CLIENT: APD Engineering	SCALE: N.T.S	DOC ID: 210126-PRJ1010393-GEO-DWG-01
	DATE: 01/08/2023	VERSION: 0

PROPOSED BASE OF POLE



CONSTRUCTION ACCESS

SITE LAYOUT

1m 0 1m 2m 3m 4m 5m SCALE 1:100

SERVICES LEGEND

- LEASE AREA BOUNDARIES
- OPTICAL FIBRE BELOW GROUND
- EARTH ROUTE
- BELOW GROUND ELECTRICAL SUPPLY
- PROPOSED SECTOR ARROW

PROPOSED TELSTRA SIGN(#13)(1 OFF) TO BE INSTALLED ON ENTRANCE DOOR OF THE BUILDING

PROPOSED TELSTRA 6mm² ACTIVE / NEUTRAL / EARTH ELECTRICAL SUBCIRCUIT & 10A MSB TO BE INSTALLED WITHIN EXISTING TELSTRA AC SWITCHBOARD. POINT OF SUPPLY AND M.E.N CONNECTION POINT

EXISTING AUSNET LV PIT. 16mm² 4C+E LV CABLE SUPPLY TO TELSTRA MSB IN H/D ORANGE PVC P63 CONDUIT AT 600 DEPTH

ELEVATION CHANGE ~2.1m

RETAINING WALL

PROPOSED MIN 6mm² EARTH CABLE IN CONDUIT AND TELSTRA EARTH PIT (WITH AC EARTH ELECTRODE INSIDE) TO BE INSTALLED AS ADDITIONAL LIGHTNING PROTECTIVE EARTH. REFER TO SHT 3 FOR FURTHER DETAILS

DRY STACKED STONE RETAINING WALL (1m HEIGHT)

WASTE DISPOSAL CABINETS

PROPOSED TELSTRA FIBRE TO BE HAULED U/G FROM NEAREST FAP TO PROPOSED TELSTRA PIT

EXISTING SIGN SHOW PRESSURE GAS PIPE

PROPOSED TELSTRA P5 PIT INSTALLED OVER PROPOSED TELSTRA FIBRE ROUTE. TELSTRA FIBRE TO BE HAULED FROM EXCHANGE TO P5 PIT TO POLE. PIT FINAL LOCATION SUBJECT TO FINAL TRANSMISSION DESIGN

APRROXIMATE PROPOSED TELECOMMUNICATIONS TOWER LOCATION (SHIFT PER EMAIL CORRESPONDENCE FROM RICHARD CHAN (10 JULY 2023)

TIMBER SLEEPER RETAINING WALL (1.2m HEIGHT)

EXCHANGE BUILDING

RETAINING WALL

GRATE

MIN 2000

BH1 GRASS

BH2 GRASS

BH3

A

A1

A2

A3

1

2

3

4602

10268

6523

2190

9015

6016

EXISTING TELSTRA EXCHANGE BUILDING. BUILDING IN AMPLITEL LEASE AREA

EXISTING TELSTRA EXCHANGE S.E.B BAR. PROPOSED 35mm² EARTH BONDING CONDUCTOR FROM PROPOSED TELSTRA EARTH GIRD TO S.E.B BAR THROUGH RISERS AND EXCHANGE FLOOR MOUNTED GLAND WINDOW. ALL CONNECTIONS AND JOINTS TO BE PROTECTED WITH DENSO TAPE. REFER TO AMPLITEL DRG. TP018ST204-2 FOR MORE DETAILS

PROPOSED TELSTRA ANTENNA L2600/NR2600 6525 / RADIO 4402 (3-OFF A1, A2, A3) AS PER MID-MOUNT MOUNTING DRG. 017866P187 SHT 91.
REFER TO TELSTRA ANTENNA TABLE FOR CONFIGURATION AND SHT 3 FOR MOUNTING AND FURTHER DETAILS

PROPOSED DWDM (1-OFF) AND AC SPLITTER JUNCTION BOX (1-OFF) TO BE MOUNTED AS PER MID-MOUNT MOUNTING DRG. 017866P187 SHT 91. REFER TO SHT 3 FOR MOUNTING AND FURTHER DETAILS

PROPOSED 10.00m HIGH AMPLITEL POLE #TBC TO BE INSTALLED WITHIN AMPLITEL LEASE AREA. STEELWORK, ANTENNAS AND TELSTRA SC SWITCHBOARD IN ENCLOSURE TO BE INSTALLED ON POLE PER SHEET 3

PROPOSED EARTH GRID TO BE INSTALLED PER AMPLITEL STEEL POLE EARTHING STANDARDS DRG. TP018ST205-1 & TP018ST205-2

ADVERTISED PLAN

NOTES:
- FOR SITE PHOTOS REFER TO SHEETS 1 & 3.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SPECIFIED OTHERWISE, AND MUST BE CHECKED ONSITE.
- FOR EME SIGNS NOTED AS (EX) REFER TO DOCUMENT

SHEET MUST BE PLOTTED IN COLOUR.
TO BE READ IN CONJUNCTION WITH SHEETS 1, 3 & 4

COMPLIANCE BOX
COMPLETED AS PER DESIGN ☐
ALTERATIONS IN RED ☐
NAME (PRINT)
SIGNATURE DATE

PRELIMINARY

N

Intrax LAND

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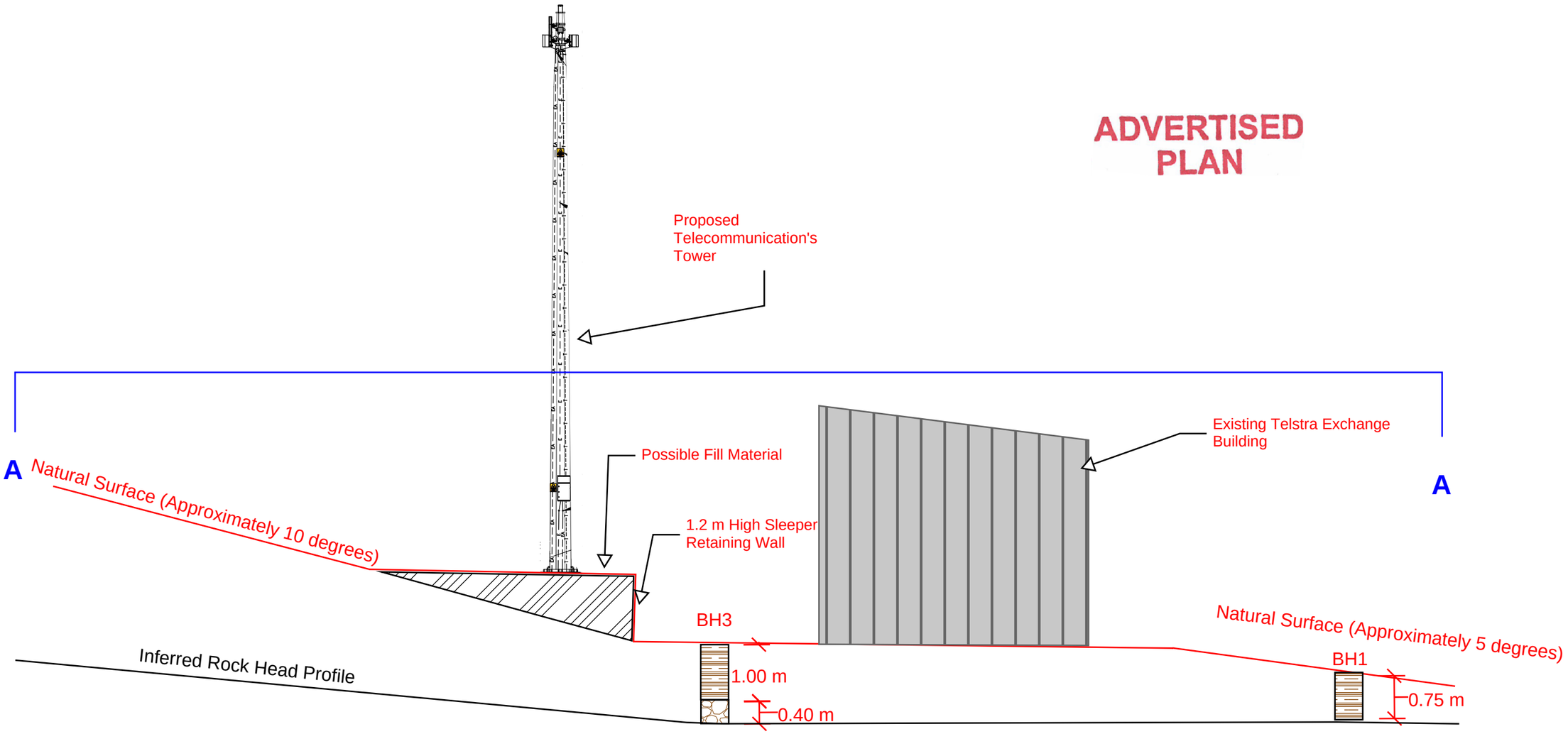
ABN 31 106 481 252
www.intrax.com.au

TITLE: Proposed Development Plan	DRAWN: T.Reidy	PAGE SIZE: A3
	CHECKED: J.McPherson	SITE NO.: 210126
CLIENT: APD Engineering	SCALE: N.T.S	DOC ID: 210126-PRJ1010393-GEO-DWG-01
	DATE: 01/08/2023	VERSION: 0



LEGEND

CLAY/SILTY CLAY

GRAVELLY SAND
(INFERRED XW SANDSTONE)

N

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LAND
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www.intrax.com.au

TITLE: Section A-A	DRAWN: T.Reidy	PAGE SIZE: A3	
	CHECKED: J.McPherson	SITE NO.: 210126	
CLIENT: APD Engineering	SCALE: N.T.S	DOC ID: 210126-PRJ1010393-GEO-DWG-01	
	DATE: 01/08/2023	VERSION: 0	

Appendix B

Client Supplied Information/Reports

REPORT NO : 4220185-1

CLIENT : Alliance Power & Data Pty Ltd (APD)
PO Box 7087
CLOISTERS SQUARE WA 3850

PROJECT : Hotham Village
Corner Great Alpine Road & Alfonso Walk
MOUNT HOTHAM VIC

PROPOSAL : It is proposed to construct a steel ingal pole at this site.

1. COMMISSION:

Carry out relevant insitu soil tests, log the test bore and recommend suitable bearing capacities and founding depths for the proposed structure.

All testing and observations carried out are to follow the relevant provisions of AS 1726:2017 (Geotechnical Site Investigations).

2. SITE GEOLOGY:

Geological maps of the area suggest that the site is in an area of Ordovician Sediments belonging to Pinnak Sanstone bordering on Tertiary Basalt. The natural soils and weathered ROCK encountered during the site investigation confirmed this.

3. SITE TOPOGRAPHY:

The ground surface over the site is gently inclined with the fall down to the north. The ground cover comprises of natural grasses. A photograph of the proposed ingal pole site taken during the site investigation is presented in **Figure 1**.

***Figure 1**: Site photograph showing the existing surface conditions*

4. INVESTIGATION:

Three bores were drilled by mechanical auger at the approximate locations shown on the attached plan.

Standard Penetration Testing (SPT) was not conducted in the boreholes due to auger refusal at shallow depths. That is, auger refusal at less than 1.5 metres depth.

The logs of the bores area attached showing the soil descriptions and depths along with any cohesive strengths measured and observed densities of non-cohesive soils.

5. FINDINGS:

The boreholes revealed that the natural soil profile consisted of silty CLAY overlying gravelly SAND, grading into weathered ROCK. It is assumed, based on the local geology, that auger refusal was on weathered ROCK of medium to high strength. A photograph of the exposed weathered ROCK within the vicinity of the proposed ingal pole site is provided in **Figure 2**.

Groundwater was not intersected in the boreholesduring the investigation.

***Figure 2:** Exposed weathered ROCK noted within the vicinity of the proposed tower site*

6. SITE CLASSIFICATION:

After considering the area geology, the soil profile encountered in the bore, the proposed superstructure and the climatic zone of the area, this site has been classified as CLASS M with respect to foundation construction (Australian Standard 2870 - 2011 Residential Slabs and Footings). However, this classification is technically not correct for the proposed type of structure, therefore is given as a guide only.

It is anticipated that the normal seasonal surface movement at this site, without the effect of abnormal moisture conditions, will not exceed 40mm.

It must be emphasised that the heave mentioned, and recommendations referred to in this report are based solely on the observed soil profile at the time of the investigation for this report without taking into account the effects of any abnormal moisture conditions that may develop after construction as defined in Clause 1.3.3 (A) (B) (C) (D) (E).

7. RECOMMENDATIONS FOR EQUIPMENT CABIN/SHELTER:

7.1 Edge Beams:

It is recommended that a CLASS M (Refer AS 2870 - 2011) slab on ground should be used at this site with edge beams founded not less than 200mm below the finished surface level surrounding the structure.

However, the founding depth must be at least 100mm into any of the naturally occurring silty CLAY as described in the logs of boring, which from the site investigation can be assumed to have an allowable bearing pressure of 80kPa at this depth.

As a guide to the founding depths with regard to the above, along with information obtained from the bore, the founding depth at this site will be approximately 200mm in relationship to the existing surface where this surface is to be the finished surface level surrounding the structure.

After excavations for the footings have been completed, if there is any doubt as to the bearing capacity of the founding soil, then this company should be contacted.

7.2 Slab and or Stiffening Beams:

Any organic and deleterious matter should be removed from under the proposed slab area to a depth of not less than 50mm and replaced with levelling fill (See 8.4 below) under the slab and internal beams. This excavated surface can be assumed to have an allowable bearing pressure of at least 60kPa.

After excavations for the footings have been completed, if there is any doubt as to the bearing capacity of the founding soil, then this company should be contacted.

7.3 Modulus of Subgrade Reaction:

The surface material will provide a subgrade for the slab and based on the field observations and testing, can be assumed to have a modulus of subgrade reaction of 30kPa/mm. This is providing that all the vegetation and any soil containing deleterious matter have been removed and any soft areas have been well compacted.

7.4 Levelling Fill:

Up to 300mm of site derived clayey or 600mm of site derived sandy or imported sandy levelling fill including existing fill material, if any, may be placed under the slab and internal beams providing that this filling is placed in 150mm thick layers and compacted in a moist condition using a light weight vibratory roller or vibratory plate tamper or similar to form a dense layer. Based on the likely condition of this levelling fill, an allowable bearing pressure of at least 50kPa can be assumed to exist beneath the slab and any internal beams founded in or on this filling.

If more than 300mm of site derived clayey or 600mm of site derived sandy or imported sandy fill including existing fill material, if any, is required, then the slab must be designed as a suspended slab and supported by a grid of beams founded through any fill material in accordance with the above edge beam recommendations (or see 10.2 below).

Due to the nature and composition of the soil profile found in the site, construction during or after wet weather may be difficult. Therefore, it is recommended that an open cut drain be constructed around the proposed site to a depth of not less than 300mm below the site foundation material, or CLAY, whichever occurs first to intercept any ground water. There is no need to maintain this drain after construction to ground level has been reached. At this stage the drain should be backfilled, failure to do so may have detrimental effects.

7.5 Foundations Adjacent to Easements:

It is recommended that where any footings are to be constructed next to existing underground services (sewers, etc.), then these footings or edge beams should be founded at a depth below the invert of the service at an angle of 45° for CLAYS and 30° for SANDS, unless special consideration has been given to the founding material.

After excavations for the footings have been completed, if there is any doubt as to the bearing capacity of the founding soil, then this company should be contacted.

8. RECOMMENDED TOWER FOUNDATIONS, ULTIMATE STRENGTH DESIGN:

8.1 Geotechnical Strength Reduction Factor:

A copy of Table 4.3.2(A) in AS2159 - 2009 used in the determination of Individual Risk Rating (IRR) and in turn the Average Risk Rating (ARR), is reproduced below. The relevant IRR values relating to the geotechnical investigation and established parameters have been included. It is recommended that the design engineer for the project should insert relevant IRR values for Design and Installation and determine the Average Risk Rating (ARR) and the corresponding Basic Geotechnical Strength Reduction Factor for use in Ultimate Strength Design.

Risk Factor	Weighting Factor (w_i)	IRR
SITE:		
Geological Complexity of the site	2	2
Extent of Ground Investigation	2	5
Amount & quality of Geotechnical Data	2	5
DESIGN:		
Experience with similar foundations in similar Geological Conditions	1	2
Method of Assessment of Geotechnical Parameters for Design	2	5
Design Methods adopted	1	
Method of utilising results of in situ test data and installation data	2	
INSTALLATION:		
Level of Construction Control	2	
Level of performance monitoring of the supported structure during and after construction	0.5	

Copies of Table 4.3.2(B) and Table 4.3.2(C) from AS2159 – 2009 are attached to assist the engineer in the determination of ARR and the geotechnical strength reduction factor.

8.2 Foundations:

Foundations of the tower may adopt mass concrete pad footings. The following ultimate bearing pressures can be used at the depths indicated. These must be factored using the above reduction factor, determined from the completed table above.

Material	Depth (m)	Ultimate Bearing Pressure (kPa)
Silty CLAY – Firm to stiff	0.5	450
Silty CLAY – Stiff to very stiff	1.0	850

An alternative foundation system to mass footings is bored piers. The pile foundation should be designed using the geotechnical properties given below and the specific pile properties, geometry and depth of embedment of the chosen pile foundation.

Material	Depth (m)	Ultimate Skin Friction (kPa)	Ultimate End Bearing (kPa)	Ultimate Lateral Resistance (kPa)
Gravelly SAND – Dense to very dense	1.4	Ignore	750	550
Distinctly weathered ROCK – Low to medium strength*	2.0	200	2000	2000
Distinctly weathered ROCK – High strength*	3.0	450	4500	4500

**Assumed founding material*

8.3 Material Parameters:

Material	γ_{bulk} (kN/m^3)	ϕ_u (deg)	ϕ' (deg)	C_u (kPa)	C' (kPa)	E (MPa)	ν	k_h (MN/m^3)
Silty CLAY	20.0	20	26	60	15	30	0.40	55
Gravelly SAND – Dense to very dense	19.5	35	45	0	0	50	0.27	65
Distinctly weathered ROCK	22.5	-	-	-	-	120,000	0.13	250 - 400

Where:
- γ_{bulk} = Unit weight of the soil
- ϕ_u = Undrained angle of shearing resistance
- ϕ' = Effective angle of shearing resistance
- C_u = Undrained cohesion
- C' = Effective cohesion
- E = Elastic (Young's) modulus
- UC = Unconfined compressive strength – only for ROCK
- ν = Poisson's ratio
- k_h = Horizontal subgrade modulus

The potential for liquefaction in the encountered soil profile is negligible.

After excavations for the footings have been completed, if there is any doubt as to the bearing capacity of the founding soil, then this company should be contacted.

9. CONDITIONS OF THE RECOMMENDATIONS:

9.1 Since the soil horizons and layers can vary in depth and thickness over the site, the depths and bearing pressures given above are given as a guide only. If the footings are founded at the minimum depth, as stated and are in the soil as described in the logs of boring for this site, then the requirements of this report have been met.

9.2 Where any filling is to be placed (other than under the floor slab, refer to 7.4 above) the footing founding depths recommended in this report will need to be increased accordingly by the depth of that fill unless one of the following occurs:-

9.2.1 The base of the footing is founded in the founding soil recommended in sections 7 and 8 above.

9.3 The description of the soils found in the borehole closely follow those outlined in AS 1726:2017 (Geotechnical Site Investigations). Colour descriptions can vary with soil moisture content. It should be noted therefore, colour and shade descriptions mentioned in this report are made when the soil is in a moist condition.

9.4 After excavations for the footings have been completed, if there is any doubt as to the bearing capacity of the founding soil, then this company should be contacted.

9.5 This report has been compiled and recommendations made based on information supplied in the brief to Civiltest Pty Ltd and from the field investigation and observations made including the extent of, if any, site filling. Every care has been taken within the terms of the brief to ensure that the field investigation is representative of the site. Therefore, if it is found that for any reason information received by Civiltest Pty Ltd is incorrect or conditions on site vary considerably during construction to those described in this report then the comments and recommendations made in this report may need to be amended.

9.6 To ensure acceptable long term performance of the footing systems recommended in this report, care should be taken that the fundamental building, landscaping and long term maintenance procedures are adhered to as set out in the CSIRO Division of Building, Construction and Engineering: Building Technology File 18-2011, "Foundation Maintenance and Footing Performance: A homeowners guide" which is available on the CSIRO website http://www.publish.csiro.au/home.htm. This information sheet forms an integral part of this report.

9.7 Abnormal moisture conditions:
The recommendations made in this report are based on current findings and investigations. Civiltest Pty Ltd cannot be held responsible for any financial loss and / or hardship in relation to the construction of the structure and future performance of the footing system if relevant historical information has not been supplied in writing by the client to Civiltest Pty Ltd. (For example, the recent removal of trees or buildings or any other activity that is likely to have created abnormal moisture conditions as defined in AS2870.)

9.8 Whilst CIVILTEST PTY LTD has accepted the commission for the work reported herein, the ownership of the report and any liabilities associated with it, remain with CIVILTEST PTY LTD until all relevant accounts have been paid.

9.9 Finally, no responsibility will be taken for this report if it is altered in any way or is not reproduced in full.

This report consists of ten pages including one site plan. Appendices A and B are attached.

FADY FANOUS
GEOTECHNICAL ENGINEER
CIVILTEST PTY LTD

REF: ML/FF/PO/hj

18 November 2022

LOCATION OF TEST SITES: HOTHAM VILLAGE

CORNER GREAT ALPINE ROAD & ALFONSO WALK MOUNT HOTHAM

N

⊕ Denotes Test Holes

THIS SKETCH IS NOT INTENDED TO BE AN ACCURATE DEPICTION OF THE NUMBER, SIZE OR LOCATION OF TREES AND/OR SHRUBS

NOT TO SCALE

APPENDIX A

ENGINEERING LOGS

ENGINEERING LOG

REPORT NO. 4220185-1 **BOREHOLE NO. 1** **DATE: 11-NOV-2022**
FIELD TECHNICIAN: ML **DRILLING METHOD: Land Cruiser Mounted Rig**
PROJECT LOCATION: Hotham Village MT HOTHAM

DEPTH (m) NOT TO SCALE	STRATA DESCRIPTION	NOTES	GRAPHIC LOG	TESTING				
				DEPTH (m) NOT TO SCALE	RESULTS			
					DCP Blows/100mm	FIELD CBR (%)	SPT	MC (%)	PP (kg/cm²)
	CL CLAY, silty, trace sand								
0.1	Dark brown; Moist; Firm								
	CL CLAY, silty, trace gravel								
	Brown; Moist; Stiff to very stiff								
0.75	Gravel is angular, fine grained								
	REFUSAL (11-Nov-2022)								

ENGINEERING LOG

REPORT NO. 4220185-1 **BOREHOLE NO. 2** **DATE: 11-NOV-2022**
FIELD TECHNICIAN: ML **DRILLING METHOD: Land Cruiser Mounted Rig**
PROJECT LOCATION: Hotham Village MT HOTHAM

DEPTH (m) NOT TO SCALE	STRATA DESCRIPTION	NOTES	GRAPHIC LOG	TESTING					
				DEPTH (m) NOT TO SCALE	RESULTS				
					DCP Blows/100mm	FIELD CBR (%)	SPT	MC (%)	PP (kg/cm²)
	CL CLAY, silty								
0.25	Dark brown; Moist; Firm								
	CL CLAY, silty, trace sand								
	Brown; Moist; Firm								
1.0	Sand is angular, fine grained								
	SP SAND, gravelly, with clay								
	Pale brown; Moist; Very dense								
	Sand is angular, medium to fine grained								
1.4	Gravel is angular, coarse to medium grained								
	REFUSAL (11-Nov-2022)								

ENGINEERING LOG

REPORT NO. 4220185-1 **BOREHOLE NO. 3** **DATE: 11-NOV-2022**
FIELD TECHNICIAN: ML **DRILLING METHOD: Land Cruiser Mounted Rig**
PROJECT LOCATION: Hotham Village MT HOTHAM

DEPTH (m) NOT TO SCALE	STRATA DESCRIPTION	NOTES	GRAPHIC LOG	TESTING					
				DEPTH (m) NOT TO SCALE	RESULTS				
					DCP Blows/100mm	FIELD CBR (%)	SPT	MC (%)	PP (kg/cm²)
	CL CLAY, silty, trace gravel								
	Dark brown; Moist; Stiff to very stiff								
0.8	Gravel is angular, medium to fine grained								
	CL CLAY, silty, trace sand								
	Brown; Moist; Firm								
1.0	Sand is angular, fine grained								
	SP SAND, gravelly, with clay								
	Pale brown; Moist; Very dense								
	Sand is angular, medium to fine grained								
1.4	Gravel is angular, coarse to medium grained								
	REFUSAL (11-Nov-2022)								

APPENDIX B

Table 4.3.2(B) and Table 4.3.2(C) from AS2159 – 2009

TABLE 4.3.2(B)

INDIVIDUAL RISK RATING (IRR)

Risk level	Individual risk rating (IRR)
Very low	1
Low	2
Moderate	3
High	4
Very high	5

TABLE 4.3.2(C)

BASIC GEOTECHNICAL STRENGTH REDUCTION FACTOR (ϕ_{gb}) FOR AVERAGE RISK RATING

Range of average risk rating (ARR)	Overall risk category	ϕ_{gb} for low redundancy systems	ϕ_{gb} for high redundancy systems
ARR ≤1.5	Very low	0.67	0.76
1.5 < ARR ≤2.0	Very low to low	0.61	0.70
2.0 < ARR ≤2.5	Low	0.56	0.64
2.5 < ARR ≤3.0	Low to moderate	0.52	0.60
3.0 < ARR ≤3.5	Moderate	0.48	0.56
3.5 < ARR ≤4.0	Moderate to high	0.45	0.53
4.0 < ARR ≤4.5	High	0.42	0.50
>4.5	Very high	0.40	0.47

DRAWING/DOCUMENT DESCRIPTION	DRAWING NUMBER	SHEET NO.	ISSUE NO.	ISSUE DATE	DRAWING STATUS				
					CANCELLED	PRELIMINARY	FOR CONSTRUCTION	AS BUILT	REFERENCE ONLY
SITE SPECIFIC NOTES	V115026	S0	1	16/03/23		✓			
PHOTOS AND LOCALITY PLAN	V115026	S1	1	16/03/23		✓			
PHOTOS AND SITE LAYOUT	V115026	S2	1	16/03/23		✓			
PHOTOS AND ELEVATIONS	V115026	S3	1	16/03/23		✓			
EME EXCLUSION ZONES	V115026	S4	1	16/03/23		✓			
CONNECTION SCHEMATIC	V115026	A2	1	16/03/23		✓			
AC POWER ELECTRICAL SPECIFICATION	V115026	E0	1	16/03/23		✓			
EQUIPMENT LAYOUT	V115026	E1	1	16/03/23			✓		
AC POWER CONNECTION	V115026	E2	1	16/03/23		✓			
SITE EARTHING	V115026	G4	1	16/03/23			✓		
STRUCTURAL DESIGN CERTIFICATION F01 PROJECT NO. BTS-22334	V115026	Z1	1	16/03/23			✓		
GEOTECHNICAL REPORT PROJ. NO. BTS-22334	V115026	Z1-1	1	16/03/23					✓
AS BUILT CONSTRUCTION CERTIFICATION F02 PROJECT NO. BTS-22334	V115026	Z1-3	1	16/03/23				✓	
AS BUILT CONSTRUCTION & EME COMPLIANCE CERTIFICATION F04 PROJECT NO. BTS-22334	V115026	Z1-X	1	16/03/23				✓	

AMPLITEL
Part of the Telstra Group

HOTHAM VILLAGE EXCHANGE SMALLCELL

TOWER AMS SITE REF: VIC008298

ADDRESS: 34A GREAT ALPINE ROAD (LOT 2029)
HOTHAM HEIGHTS
VIC 3741

ITEM	CADLINK O365 DRAWING / DOCUMENT DESCRIPTION	CADLINK O365 DRAWING NUMBER	CADLINK O365 WORKGROUP	SHEET NO.	ISSUE NO.	ISSUE DATE
NOTES	STANDARD CONSTRUCTION NOTES	017866P05	NATIONAL	1	2	19/11/10
ISOLATION SWITCH	AS 3000 COMPLIANT AC BREAKOUT - 3 WAY JUNCTION BOX WITH PLUGS - LAYOUT & SCHEMACTIC	017866P188	NATIONAL	24	1	29/07/21
ANTENNA MOUNT	AIR5322 OR 6525/4402 UNIVERSAL INTERFACE PLATE FOR CUE-DEE BRACKET - UNIVERSAL INTERFACE PLATE	017866P187	NATIONAL	75	2	23/08/21
ANTENNA MOUNT	AIR5322 OR 6525/4402 MULTIFACETED INSTALLATION - FOR CUE-DEE BRACKET - SINGLE BAND	017866P187	NATIONAL	91	1	01/08/22

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UNAPPROVED DRAWING

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TOWER AMS SITE VIC008298
HOTHAM VILLAGE EXCHANGE SMALLCELL
DRAWING INDEX AND DOCUMENT CONTROL
34A GREAT ALPINE ROAD (LOT 2029), HOTHAM HEIGHTS, VIC 3741

DWG NO. V115026 | SHT NO. DC

Cad file: TP003T02_Mount Hotham_Amplitel CAD.DWG A3

SITE SPECIFIC NOTES

STRUCTURE

TYPE: AMPLITEL POLE
FEEDER ENTRY WINDOW: FROM FOOTING, RUNNING INTERNALLY THROUGH POLE
REFERENCE DRAWING: TBC

ANTENNA ACCESS

TELSTRA: ELEVATED WORK PLATFORM

EARTHING DETAIL

WHEN A GENERIC EARTHING DESIGN IS ISSUED,
REFERENCE DRAWING: V115026 SHEET E2.
REFER TO 017866a07 EARTHING STANDARDS MANUAL.

ENVIRONMENTAL ISSUES

REFER TO ENVIRONMENTAL RISK ASSESSMENT CHECKLIST 018422f10.

POWER SUPPLY

INDICATIVE POWER SUPPLY (SINGLE PHASE/6 AMP)
FROM EXISTING LV PIT SUPPLY, METERED
AT MAIN SWITCHBOARD INSIDE HOTHAM EXCHANGE.
DIAL 1100 BEFORE YOU DIG.

PROPERTY SIGNAGE

SPECIFY PROPERTY SIGNAGE AS PER DOCUMENT 017866A12.
PROPERTY SIGN INCLUDES RFNSA SITE NUMBER.
SITE NAME: BRANDED SITE IDENTIFICATION REGULAR (BSr).
TELSTRA S/I NUMBER 187/00929.
JABAC PART NUMBER TFMS929-M.

SITE ACCESS

VIA MOUNT HOTHAM ALPINE RESORT CARPARK
REFER TO SHEET S1
SITE S.A.C. TO ADVISE C.D.C. LOCATION DETAILS

SITE SIGNAGE

ALL EME SIGNAGE IS REFERENCED ON DRAWINGS S1 & S3.
REFER TO DOCUMENT 005486 FOR DETAILS.

SITE HAZARDS

1. ASBESTOS
2. WORKING AT HEIGHTS
3. TRIP HAZARD
4. SLIPPERY ROAD
5. LOCAL TRAFFIC

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SPECIFIED OTHERWISE.
2. FEEDER CONNECTION DETAILS, ELECTRICAL AND MECHANICAL TILTS ARE TO BE OBTAINED FROM CANRAD REPORTS.
3. CONSTRUCTORS ARE TO BE AWARE OF TELSTRA DOCUMENT 007338-C8-11 AND IN PARTICULAR CLAUSE 7.3 & 10.3 WHICH DESCRIBES REQUIREMENTS PERSONNEL MUST UNDERTAKE IN RESPECT TO ASBESTOS MANAGEMENT AT TELSTRA FACILITIES.

EQUIPMENT ROOM

TYPE: ROOM IN EXISTING EXCHANGE BUILDING.
SIZE (mm): APPROX. 15.8m (L) x 10.6m (W).
BASE TYPE: CONCRETE SLAB
WALL TYPE: CORRUGATED STEEL
SUPPORT TYPE: CONCRETE FOUNDATION

ANTENNA MOUNTS

TYPE: DIRECT MOUNT MULTIFACETED
COLOUR: GALVANISED FINISH
REFERENCE DRAWING: 017866P187 SHT 91

ADVERTISED PLAN

SITE REFERENCE DETAILS

OCCUPIER	SITE NAME	SITE CODE
TELSTRA	HOTHAM VILLAGE EXCHANGE SMALLCELL	HVSY
RFNSA SITE NUMBER - 3741015 STRUCTURE OWNER - AMPLITEL		

LEGEND

1 / A1 — EXISTING TELSTRA ANTENNA SECTOR
1 / A1 — PROPOSED TELSTRA ANTENNA SECTOR

SERVICES LEGEND

- OPTICAL FIBRE ABOVE GROUND
- OPTICAL FIBRE BELOW GROUND
- ABOVE GROUND ELECTRICAL SUPPLY
- BELOW GROUND ELECTRICAL SUPPLY
- GAS SUPPLY BELOW GROUND
- HIGH VOLTAGE ELECTRICAL SUPPLY
- WATER SUPPLY ABOVE GROUND
- WATER SUPPLY BELOW GROUND
- SEWER LINE
- STORM WATER
- ABOVE GROUND FEEDER CABLES
- BELOW GROUND FEEDER CABLES

COMPLIANCE BOX
COMPLETED AS PER DESIGN ☐
ALTERATIONS IN RED ☐
NAME (PRINT)
SIGNATURE DATE

PRELIMINARY

TO BE READ IN CONJUNCTION WITH SHEETS S1, S1-x, S3 & S3-x.

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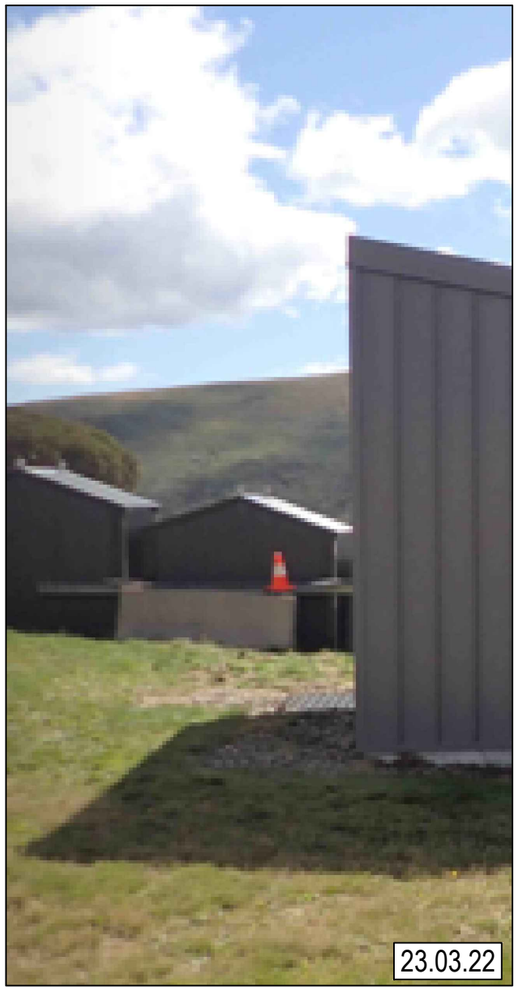
TOWER AMS SITE VIC008298
HOTHAM VILLAGE EXCHANGE SMALLCELL
SITE SPECIFIC NOTES
34A GREAT ALPINE ROAD (LOT 2029), HOTHAM HEIGHTS, VIC 3741

DWG NO. V115026 | SHT NO. S0

Cad file: TP003T02_Mount Hotham_Amplitel CAD.DWG A3



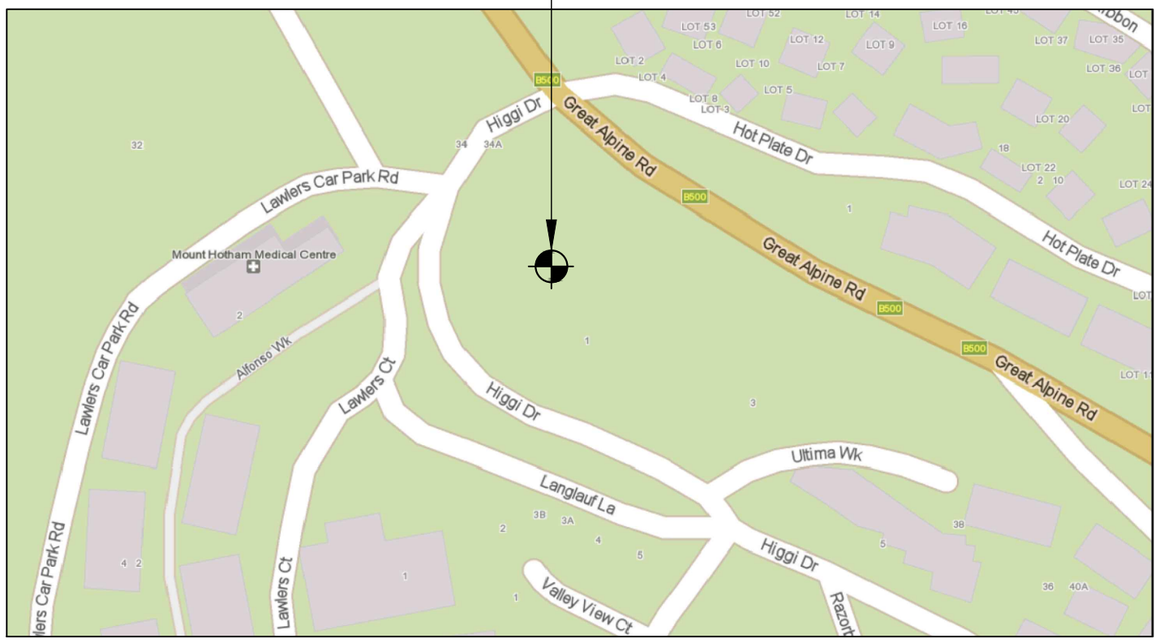
PRE-CONSTRUCTION PHOTO

POST CONSTRUCTION PHOTO

ADVERTISED PLAN

NODE CODE HVSY

RFNSA SITE NO. 3741015



LOCALITY PLAN

NOT TO SCALE

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NAME (PRINT)
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COMPLIANCE BOX
COMPLETED AS PER DESIGN ☐
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NAME (PRINT)
SIGNATURE DATE

PROPERTY DESCRIPTION

ROAD AUTHORITY - ALPINE SHIRE

ASSET DESCRIPTION

POLE OWNER - AMPLITEL
POLE NUMBER - TBC
POLE TYPE - TBC

SITE STRUCTURE CO-ORDINATES (GDA94) GPS READING ACCURACY: CENTRE OF MAST/POLE/TOWER	
LATITUDE	-36.98345 (GDA94)
LONGITUDE	147.14291 (GDA94)

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TO BE READ IN CONJUNCTION WITH SHEETS S1-x & S3.

PRELIMINARY

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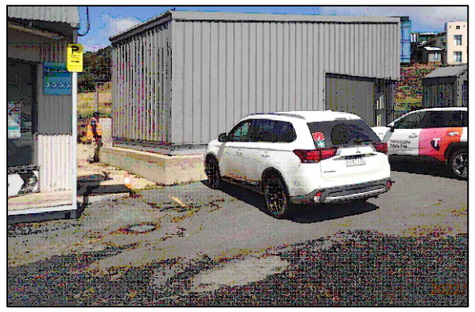
TOWER AMS SITE VIC008298
HOTHAM VILLAGE EXCHANGE SMALLCELL
PHOTOS AND LOCALITY PLAN
34A GREAT ALPINE ROAD (LOT 2029), HOTHAM HEIGHTS, VIC 3741

DWG NO. V115026 SHT NO. S1

Cad file: TP003T02_Mount Hotham_Amplitel CAD.DWG A3

PROPOSED BASE OF POLE

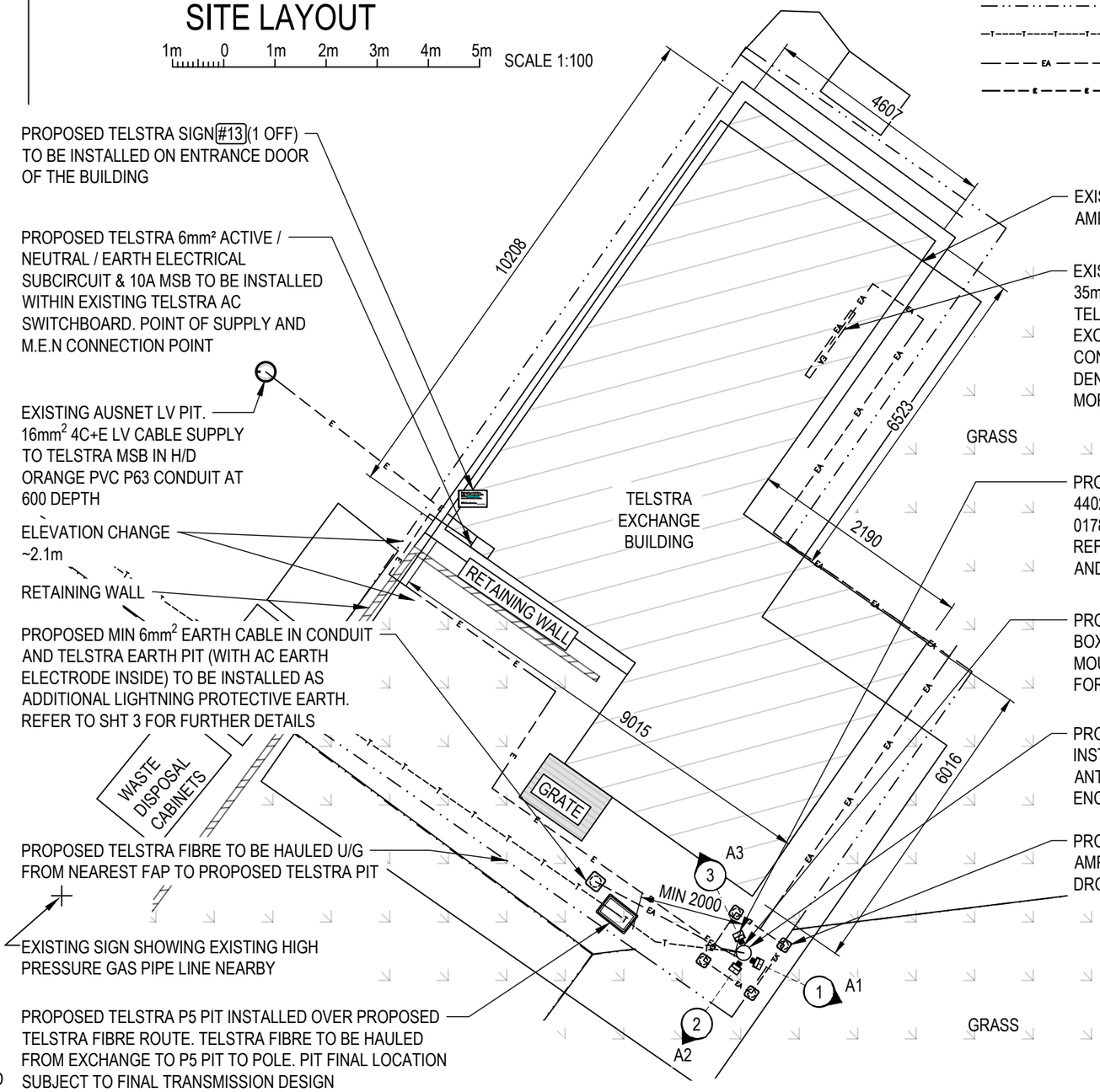


CONSTRUCTION ACCESS

TN

SITE LAYOUT

1m 0 1m 2m 3m 4m 5m SCALE 1:100



PROPOSED TELSTRA SIGN #13 (1 OFF) TO BE INSTALLED ON ENTRANCE DOOR OF THE BUILDING

PROPOSED TELSTRA 6mm² ACTIVE / NEUTRAL / EARTH ELECTRICAL SUBCIRCUIT & 10A MSB TO BE INSTALLED WITHIN EXISTING TELSTRA AC SWITCHBOARD. POINT OF SUPPLY AND M.E.N CONNECTION POINT

EXISTING AUSNET LV PIT. 16mm² 4C+E LV CABLE SUPPLY TO TELSTRA MSB IN H/D ORANGE PVC P63 CONDUIT AT 600 DEPTH

ELEVATION CHANGE ~2.1m

RETAINING WALL

PROPOSED MIN 6mm² EARTH CABLE IN CONDUIT AND TELSTRA EARTH PIT (WITH AC EARTH ELECTRODE INSIDE) TO BE INSTALLED AS ADDITIONAL LIGHTNING PROTECTIVE EARTH. REFER TO SHT 3 FOR FURTHER DETAILS

PROPOSED TELSTRA FIBRE TO BE HAULED U/G FROM NEAREST FAP TO PROPOSED TELSTRA PIT

EXISTING SIGN SHOWING EXISTING HIGH PRESSURE GAS PIPE LINE NEARBY

PROPOSED TELSTRA P5 PIT INSTALLED OVER PROPOSED TELSTRA FIBRE ROUTE. TELSTRA FIBRE TO BE HAULED FROM EXCHANGE TO P5 PIT TO POLE. PIT FINAL LOCATION SUBJECT TO FINAL TRANSMISSION DESIGN

SERVICES LEGEND

- LEASE AREA BOUNDARIES
- OPTICAL FIBRE BELOW GROUND
- EARTH ROUTE
- BELOW GROUND ELECTRICAL SUPPLY
- PROPOSED SECTOR ARROW

EXISTING TELSTRA EXCHANGE BUILDING. BUILDING IN AMPLITEL LEASE AREA

EXISTING TELSTRA EXCHANGE S.E.B BAR. PROPOSED 35mm² EARTH BONDING CONDUCTOR FROM PROPOSED TELSTRA EARTH GIRD TO S.E.B BAR THROUGH RISERS AND EXCHANGE FLOOR MOUNTED GLAND WINDOW. ALL CONNECTIONS AND JOINTS TO BE PROTECTED WITH DENSO TAPE. REFER TO AMPLITEL DRG. TP018ST204-2 FOR MORE DETAILS

PROPOSED TELSTRA ANTENNA L2600/NR2600 6525 / RADIO 4402 (3-OFF A1, A2, A3) AS PER MID-MOUNT MOUNTING DRG. 017866P187 SHT 91.
REFER TO TELSTRA ANTENNA TABLE FOR CONFIGURATION AND SHT 3 FOR MOUNTING AND FURTHER DETAILS

PROPOSED DWDM (1-OFF) AND AC SPLITTER JUNCTION BOX (1-OFF) TO BE MOUNTED AS PER MID-MOUNT MOUNTING DRG. 017866P187 SHT 91. REFER TO SHT 3 FOR MOUNTING AND FURTHER DETAILS

PROPOSED 10.00m HIGH AMPLITEL POLE #TBC TO BE INSTALLED WITHIN AMPLITEL LEASE AREA. STEELWORK, ANTENNAS AND TELSTRA SC SWITCHBOARD IN ENCLOSURE TO BE INSTALLED ON POLE PER SHEET 3

PROPOSED EARTH GRID TO BE INSTALLED PER AMPLITEL STEEL POLE EARTHING STANDARDS DRG. TP018ST205-1 & TP018ST205-2

NOTES:
1. FOR SITE PHOTOS REFER TO SHEETS 1 & 3.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SPECIFIED OTHERWISE, AND MUST BE CHECKED ONSITE.
3. FOR EME SIGNS NOTED AS #X REFER TO DOCUMENT 005486 FOR DETAILS.
4. SITE SHALL BE EARTHED AS PER AS3000, VICTORIAN SERVICE AND INSTALLATION REQUIREMENTS AND AMPLITEL ELECTRICAL REQUIREMENTS .
5. FOR ACCESS TO THE POLE ELECTRICAL ASSET, ANTENNA SHOULD BE ISOLATED BY FOLLOWING TELSTRA ISOLATION SWITCH PROCEDURE.
6. NO CONSTRUCTION WORKS IS TO OCCUR ON THE EXISTING BUILDING ITSELF.
7. INSTALLERS TO ENSURE U/G ASSETS ARE NOT AFFECTED DURING CONSTRUCTION STAGE.

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SHEET MUST BE PLOTTED IN COLOUR.
TO BE READ IN CONJUNCTION WITH SHEETS 1, 3 & 4.

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UNAPPROVED DRAWING

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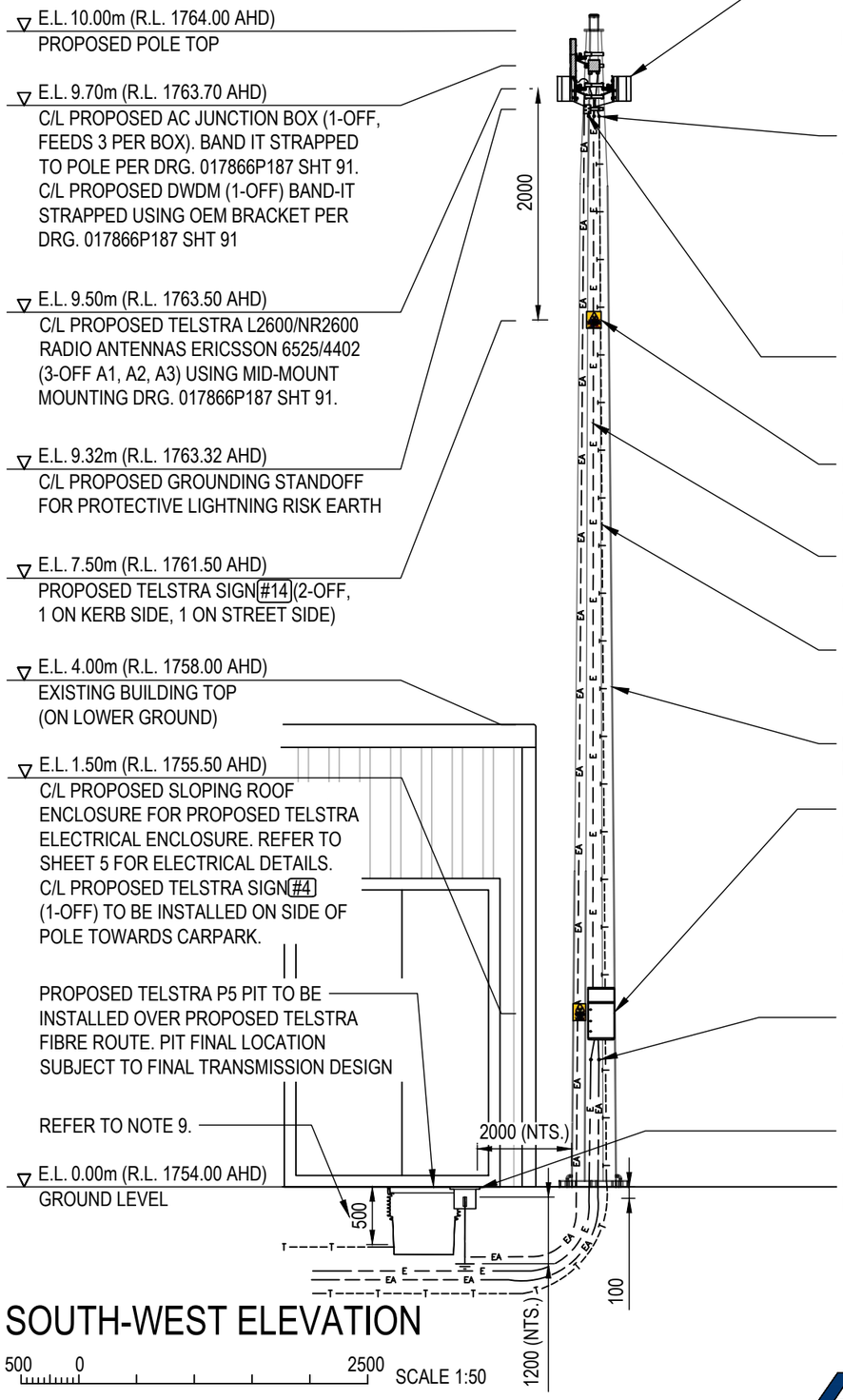
TOWER AMS SITE VIC008298
HOTHAM VILLAGE EXCHANGE SMALLCELL
PHOTOS AND SITE LAYOUT
34A GREAT ALPINE ROAD (LOT 2029), HOTHAM HEIGHTS, VIC 3741

DWG NO. V115026 | SHT NO. S2

Cad file: TP003T02_Mount Hotham_Amplitel CAD.DWG A3



SOUTH-WEST ELEVATION

500 0 2500 SCALE 1:50

TELSTRA ANTENNA CONFIGURATION TABLE

ANTENNA No	ANTENNA TYPE & SIZE H x W x D	ANTENNA ACTION REQUIRED	ANTENNA HEIGHT C/L A.G.L.	MECHANICAL TILT (+/- x°T)	PHYSICAL ANTENNA BEARING (x°T)	SECTOR NO. & TECHNOLOGY
A1	ERICSSON 6525/4402 213.5H X 200W X 147D	INSTALL	9.50m	+0°	115°	S1: L2600/NR2600
A2	ERICSSON 6525/4402 213.5H X 200W X 147D	INSTALL	9.50m	+0°	215°	S2: L2600/NR2600
A3	ERICSSON 6525/4402 213.5H X 200W X 147D	INSTALL	9.50m	+0°	335°	S3: L2600/NR2600

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SPECIFIED OTHERWISE, AND MUST BE CHECKED ONSITE.
2. FOR EME SIGNS NOTED AS #X REFER TO DOCUMENT 005486 FOR DETAILS.
3. PLEASE REFER TO CANRAD FOR ANTENNA CONFIGURATION DETAILS
4. ALL ELECTRICAL AND EARTH INSTALLATION TO BE COMPLETED AS PER AS3000, VICTORIAN SERVICE AND INSTALLATION REQUIREMENTS AND AMPLITEL ELECTRICAL REQUIREMENTS.
5. INSTALLERS TO ENSURE U/G ASSETS ARE NOT AFFECTED DURING CONSTRUCTION STAGE.
6. REFER TO 017866P187 SHT 73, 74, 78, 80 AND 114 FOR BRACKETS, MOUNTING ARRANGEMENTS AND ASSEMBLY BOM DETAILS.
7. POLE MOUNTED EQUIPMENT TO BE INSTALLED USING SIZE 12 BAND-IT STRAPS.
8. MINIMISE EXTERNAL RUNS ON POLE USING EXISTING ACCESS HOLES
9. ALL CONDUITS TO BE INSTALLED MIN 500 BELOW GROUND LEVEL.
10. HORIZONTAL SEPARATION OF 50 TO BE MAINTAINED FROM ALL 3RD PARTY POLE ATTACHED EQUIPMENT TO ALL TELSTRA EQUIPMENT.

ADVERTISED PLAN

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PHOTO TAKEN FROM SOUTH OF SITE

PHOTO TAKEN FROM SOUTH-WEST OF SITE

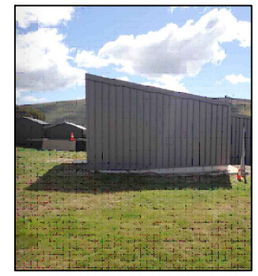

PHOTO TAKEN FROM SOUTH-EAST OF SITE

PRELIMINARY

SHEET MUST BE PLOTTED IN COLOUR.
TO BE READ IN CONJUNCTION WITH SHEETS 1, 2 & 4.

SERVICES LEGEND

BELOW GROUND ELECTRICAL SUPPLY
OPTICAL FIBRE BELOW GROUND
EARTH ROUTE

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TOWER AMS SITE VIC008298
HOTHAM VILLAGE EXCHANGE SMALLCELL
PHOTOS AND ELEVATIONS
34A GREAT ALPINE ROAD (LOT 2029), HOTHAM HEIGHTS, VIC 3741

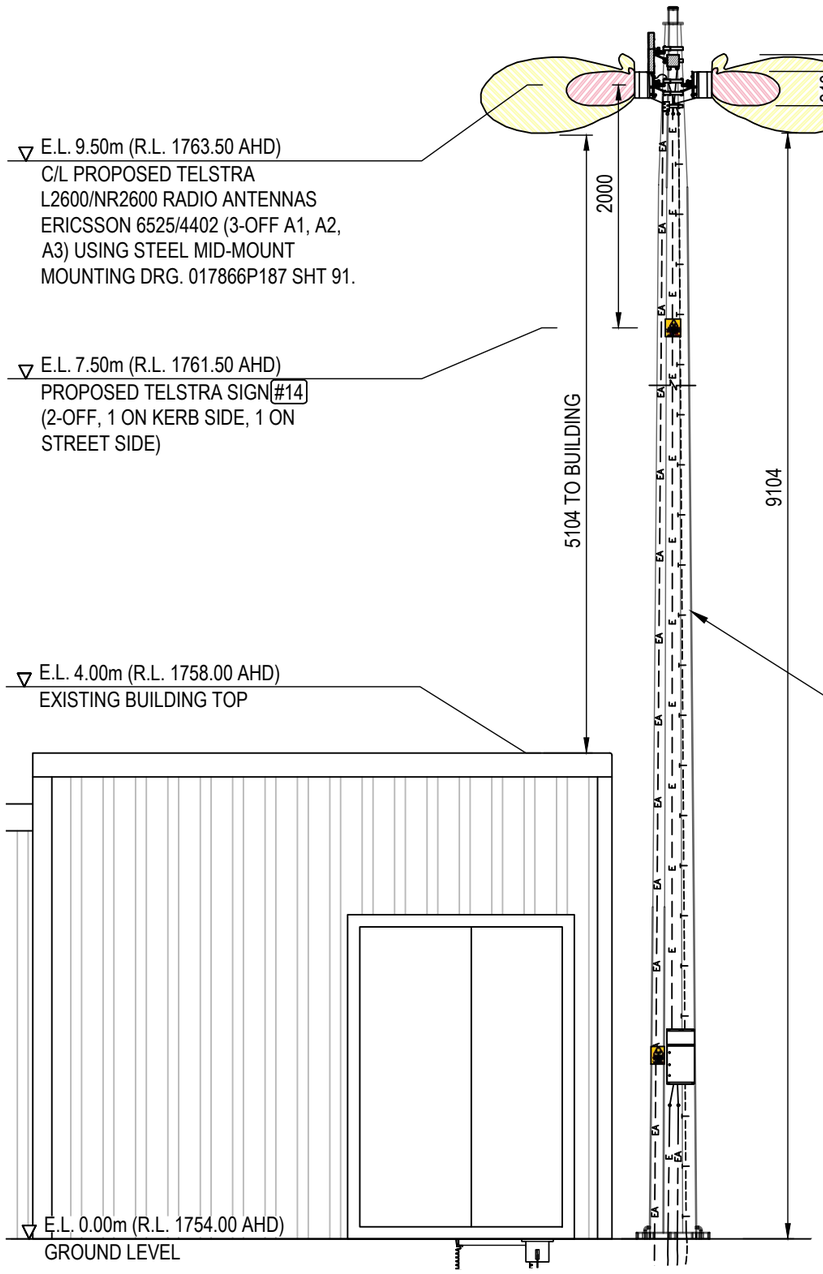
DWG NO. V115026 SHT NO. S3

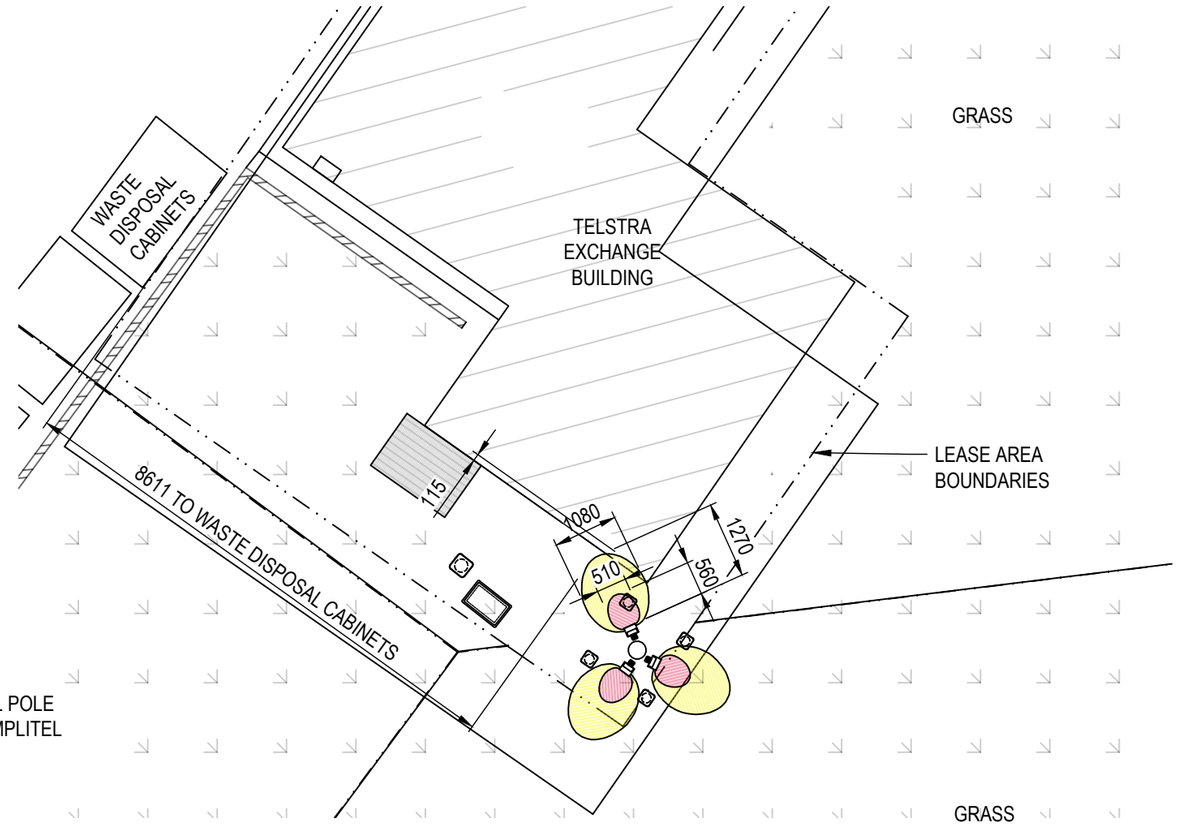
Cad file: TP003T02_Mount Hotham_Amplitel CAD.DWG

A3

ADVERTISED PLAN

NOTES:
1. FOR SITE PHOTOS REFER TO SHEETS 1 & 2, 3.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SPECIFIED OTHERWISE, AND MUST BE CHECKED ONSITE.
3. FOR EME SIGNS NOTED AS #X REFER TO DOCUMENT 005486 FOR DETAILS.
4. PLEASE REFER TO CANRAD FOR ANTENNA CONFIGURATION DETAILS





EME EXCLUSION ZONES SOUTH-WEST ELEVATION VIEW

ANTENNA TYPE - POWER (PER SECTOR):
ERICSSON 6525/4402 RADIO SOLUTION - 4 X 5.0W

500 0 2500 SCALE 1:50

EME EXCLUSION ZONES - PLAN VIEW

ANTENNA TYPE - POWER (PER SECTOR):
ERICSSON 6525/4402 RADIO SOLUTION - 4 X 5.0W

1m 0 1m 2m 3m 4m 5m SCALE 1:100

COMPLIANCE BOX
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PRELIMINARY

NOTE:
THE EME EXCLUSION ZONES SHOWN ON THIS DRAWING ARE BASED ON 3-OFF A1, A2, A3 PANEL ANTENNAS (1-OFF PER SECTOR)

EXCLUSION ZONE LEGEND
- AREAS ABOVE RPS3 OCCUPATIONAL LIMITS
- AREAS ABOVE RPS3 PUBLIC LIMITS

SHEET MUST BE PLOTTED IN COLOUR.
TO BE READ IN CONJUNCTION WITH SHEETS 1, 2 & 3.

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TOWER AMS SITE VIC008298
HOTHAM VILLAGE EXCHANGE SMALLCELL
EME EXCLUSION ZONES
34A GREAT ALPINE ROAD (LOT 2029), HOTHAM HEIGHTS, VIC 3741

DWG NO. V115026 SHT NO. S4

Cad file: TP003T02_Mount Hotham_Amplitel CAD.DWG A3

ADVERTISED
PLAN

REFER TO STD DWG V115026 SHEET E0 AND LCR0121 for NR/LTE 2600 CONNECTION SCHEMATIC ERICSSON 4402 RRUS/SECTOR

REFER TO CSDT FOR NR/LTE 2600 FOR RF CONNECTION SCHEMATICS

PRELIMINARY

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TOWER AMS SITE VIC008298
HOTHAM VILLAGE EXCHANGE SMALLCELL
CONNECTION SCHEMATIC
34A GREAT ALPINE ROAD (LOT 2029), HOTHAM HEIGHTS, VIC 3741

DWG NO. V115026
SHT NO. A2

A3

ELECTRICAL SPECIFICATION

1. GENERAL

THE ELECTRICAL INSTALLATION SHALL COMPLY WITH AS/NZ 3000 WIRING RULES AND OTHER RELEVANT STANDARDS, INCLUDING AS/NZ 1768 LIGHTNING PROTECTION AND AS 3015 EXTRA-LOW VOLTAGE DC POWER SUPPLIES AND SERVICE EARTHING WITHIN PUBLIC TELECOMMUNICATIONS NETWORKS. PRIOR TO PLACING THE INSTALLATION IN SERVICE, IT SHALL BE VERIFIED IN ACCORDANCE WITH AS 3017 VERIFICATION GUIDELINES.

2. STANDARD OF WORK

ALL INSTALLATION WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH SAFE AND SOUND WORK PRACTICES.

3. MAIN SUPPLY

THE CONSUMER MAINS SHALL BE TAKEN FROM THE POINT OF SUPPLY NOMINATED BY THE SUPPLY AUTHORITY. CABLE TYPE AND CONDUCTOR SIZE ARE SPECIFIED IN DRAWING SHEET E2.

4. SUBMAINS

CABLE TYPE AND CONDUCTOR SIZE ARE SPECIFIED IN DRAWING SHEET E2.

ADVERTISED PLAN

5. METERING

THE EXISTING TELSTRA POWER METER SHALL BE UTILISED IN ACCORDANCE WITH THE SUPPLY AUTHORITY REQUIREMENTS. REFER TO SHEET E2 FOR DETAILS.

6. LABELLING

THE CONTRACTOR IS TO CLEARLY LABEL ALL ITEMS OF ELECTRICAL EQUIPMENT INCLUDING METERS, FUSES, SWITCHES AND CIRCUIT BREAKERS. LABELS SHALL BE "TRAFFOLYTE", WITH BLACK LETTERING ON WHITE BACKGROUND.

7. NOTICES

THE INSTALLATION CONTRACTOR SHALL PROVIDE ALL NOTICES, MAKE RELEVANT APPLICATIONS, PAY FEES, OBTAIN PERMITS AND CO-ORDINATE WITH RELEVANT AUTHORITIES IN ORDER TO COMPLETE THE INSTALLATION.

8. UNDERGROUND SERVICES

BEFORE INSTALLING UNDERGROUND CONDUITS OR SERVICES, THE CONTRACTOR SHALL ESTABLISH THE EXACT LOCATION OF EXISTING UNDERGROUND SERVICES. SEARCHES SHOULD BE CONDUCTED BY "DIAL BEFORE YOU DIG" AND ACCREDITED UNDERGROUND SERVICES LOCATORS TO CONFIRM LOCATIONS.

9. EARTHING

REFER TO SHEET G4 (TBC) FOR SITE EARTHING PLAN. ALL EARTHING IS TO BE PROVIDED IN ACCORDANCE WITH TELSTRA DRAWINGS 017866P201TO 017866P208.

PRELIMINARY

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TOWER AMS SITE VIC008298
HOTHAM VILLAGE EXCHANGE SMALLCELL
AC POWER ELECTRICAL SPECIFICATION
34A GREAT ALPINE ROAD (LOT 2029), HOTHAM HEIGHTS, VIC 3741

DWG NO. V115026 | SHT NO. E0

Cad file: TP003T02_Mount Hotham_Amplitel CAD.DWG A3

ADVERTISED
PLAN

EQUIPMENT AND EXCHANGE LAYOUT TO BE COMPLETED BEFORE FINAL SUBMSSION PENDING TECHNICAL REVIEW

PRELIMINARY

ORDER	DRAWN	CHKD	AMENDMENT	EXAM	APPD	DATE	ISS
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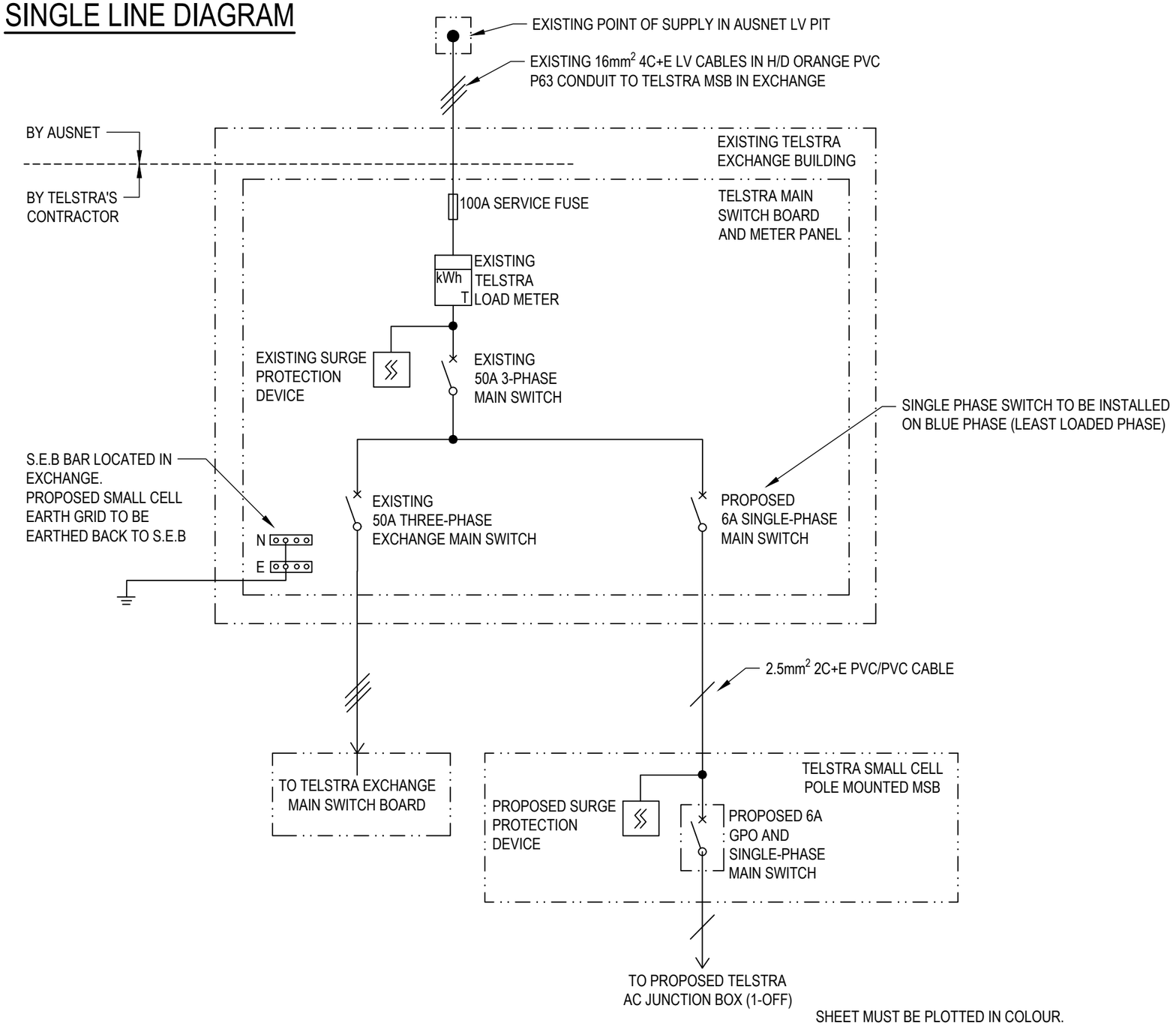
TOWER AMS SITE VIC008298
HOTHAM VILLAGE EXCHANGE SMALLCELL
EQUIPMENT LAYOUT
34A GREAT ALPINE ROAD (LOT 2029), HOTHAM HEIGHTS, VIC 3741

DWG NO. V115026
SHT NO. E1

A3

SINGLE LINE DIAGRAM



ADVERTISED PLAN

AC LINE DIAGRAM

NOTES:

1. ALL WORKS ARE TO COMPLY WITH AS/NZS 3000, AS/NZS 3008, AS/NZS 3015, AS/NZS 3017, AS/NZS 1768, ALL OTHER RELEVANT AUSTRALIAN STANDARDS, AND VICTORIAN SERVICE AND INSTALLATION RULES.
2. DBYD TO BE CONDUCTED PRIOR TO ANY UNDERGROUND WORKS. MAINTAIN MINIMUM CLEARANCES FOR ALL UNDERGROUND SERVICES AS OUTLINED IN AS/NZS 3000.
3. ISOLATION FROM THE POINT OF SUPPLY TO BE ARRANGED WITH A TRUCK APPOINTMENT IF NECESSARY.
4. ALL COMPONENTS OF THE TELSTRA ELECTRICAL INSTALLATION ARE TO BE LABELED.
5. PROPOSED 6A RCBO AS SITE SUPPLY CONTROL DEVICE.
6. TELSTRA SMALL CELL POLE MOUNTED MSB IN ENCLOSURE TO BE LOCKED WITH TELSTRA PADLOCK

COMPLIANCE BOX
COMPLETED AS PER DESIGN ☐
ALTERATIONS IN RED ☐
NAME (PRINT)
SIGNATURE DATE

PRELIMINARY

SHEET MUST BE PLOTTED IN COLOUR.
TO BE READ IN CONJUNCTION WITH SHEETS 1, 2, 3, 4 & 6.

APD ENGINEERING
T: 1300 273 797 | E: admin@APDeng.com.au
www.APDeng.com.au

ORDER	DRAWN	CHKD	AMENDMENT	EXAM	APPD	DATE	ISS
VT23421.01	DN	PH	PRELIMINARY - BTS-22334 L2600NR2600	FJ	VD	16/03/23	1

UNAPPROVED DRAWING

AMPLITEL Part of the Telstra Group

TOWER AMS SITE VIC008298
HOTHAM VILLAGE EXCHANGE SMALLCELL
AC POWER CONNECTION
34A GREAT ALPINE ROAD (LOT 2029), HOTHAM HEIGHTS, VIC 3741

DWG NO. V115026 | SHT NO. E2

Cad file: TP003102_Mount Hotham_Amplitel CAD.DWG A3

ADVERTISED
PLAN

SITE EARTHING STILL TO BE FINALISED BEFORE FINAL SUBMSSION PENDING TECHNICAL REVIEW

PRELIMINARY

ORDER	DRAWN	CHKD	AMENDMENT	EXAM	APPD	DATE	ISS
VT23421.01	DN	PH	PRELIMINARY - BTS 22334 L2600/NR2600	FJ	VD	16/03/23	1

UNAPPROVED DRAWING

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AMPLITEL
Part of the Telstra Group

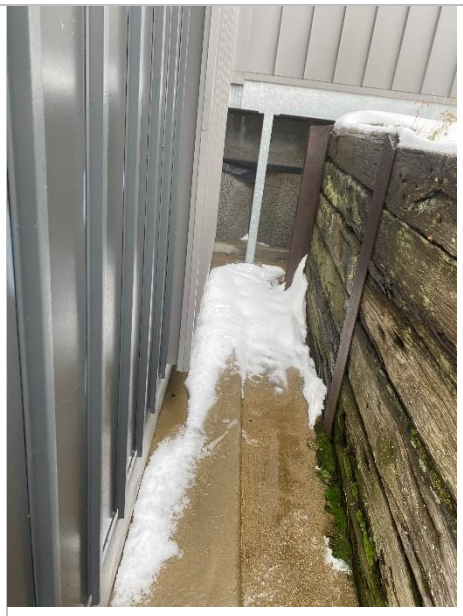
TOWER AMS SITE VIC008298
HOTHAM VILLAGE EXCHANGE SMALLCELL
SITE EARTHING
34A GREAT ALPINE ROAD (LOT 2029), HOTHAM HEIGHTS, VIC 3741

DWG NO. V115026
SHT NO. G4

A3

Appendix C

Client Supplied Site Photography



Appendix D

Landslide Risk Management and Good Hillside Practice

PRACTICE NOTE GUIDELINES FOR LANDSLIDE RISK MANAGEMENT 2007

APPENDIX C: LANDSLIDE RISK ASSESSMENT

QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY

QUALITATIVE MEASURES OF LIKELIHOOD

Approximate Annual Probability		Implied Indicative Landslide Recurrence Interval		Description	Descriptor	Level
Indicative Value	Notional Boundary					
10^{-1}	$5x10^{-2}$	10 years	20 years	The event is expected to occur over the design life.	ALMOST CERTAIN	A
10^{-2}	$5x10^{-3}$	100 years	200 years	The event will probably occur under adverse conditions over the design life.	LIKELY	B
10^{-3}	$5x10^{-4}$	1000 years	2000 years	The event could occur under adverse conditions over the design life.	POSSIBLE	C
10^{-4}	$5x10^{-5}$	10,000 years	20,000 years	The event might occur under very adverse circumstances over the design life.	UNLIKELY	D
10^{-5}	$5x10^{-6}$	100,000 years	200,000 years	The event is conceivable but only under exceptional circumstances over the design life.	RARE	E
10^{-6}		1,000,000 years		The event is inconceivable or fanciful over the design life.	BARELY CREDIBLE	F

Note: (1) The table should be used from left to right; use Approximate Annual Probability or Description to assign Descriptor, not *vice versa*.

QUALITATIVE MEASURES OF CONSEQUENCES TO PROPERTY

Approximate Cost of Damage		Description	Descriptor	Level
Indicative Value	Notional Boundary			
200%	100%	Structure(s) completely destroyed and/or large scale damage requiring major engineering works for stabilisation. Could cause at least one adjacent property major consequence damage.	CATASTROPHIC	1
60%	40%	Extensive damage to most of structure, and/or extending beyond site boundaries requiring significant stabilisation works. Could cause at least one adjacent property medium consequence damage.	MAJOR	2
20%	10%	Moderate damage to some of structure, and/or significant part of site requiring large stabilisation works. Could cause at least one adjacent property minor consequence damage.	MEDIUM	3
5%	1%	Limited damage to part of structure, and/or part of site requiring some reinstatement stabilisation works.	MINOR	4
0.5%		Little damage. (Note for high probability event (Almost Certain), this category may be subdivided at a notional boundary of 0.1%. See Risk Matrix.)	INSIGNIFICANT	5

Notes: (2) The Approximate Cost of Damage is expressed as a percentage of market value, being the cost of the improved value of the unaffected property which includes the land plus the unaffected structures.

(3) The Approximate Cost is to be an estimate of the direct cost of the damage, such as the cost of reinstatement of the damaged portion of the property (land plus structures), stabilisation works required to render the site to tolerable risk level for the landslide which has occurred and professional design fees, and consequential costs such as legal fees, temporary accommodation. It does not include additional stabilisation works to address other landslides which may affect the property.

(4) The table should be used from left to right; use Approximate Cost of Damage or Description to assign Descriptor, not vice versa

APPENDIX C: – QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY (CONTINUED)

QUALITATIVE RISK ANALYSIS MATRIX – LEVEL OF RISK TO PROPERTY

LIKELIHOOD		CONSEQUENCES TO PROPERTY (With Indicative Approximate Cost of Damage)				
	Indicative Value of Approximate Annual Probability	**1: CATASTROPHIC 200%**	**2: MAJOR 60%**	**3: MEDIUM 20%**	**4: MINOR 5%**	**5: INSIGNIFICANT 0.5%**
A – ALMOST CERTAIN	10^{-1}	VH	VH	VH	H	M or **L** (5)
B - LIKELY	10^{-2}	VH	VH	H	M	**L**
C - POSSIBLE	10^{-3}	VH	H	M	M	**VL**
D - UNLIKELY	10^{-4}	H	M	**L**	**L**	**VL**
E - RARE	10^{-5}	M	**L**	**L**	**VL**	**VL**
F - BARELY CREDIBLE	10^{-6}	**L**	**VL**	**VL**	**VL**	**VL**

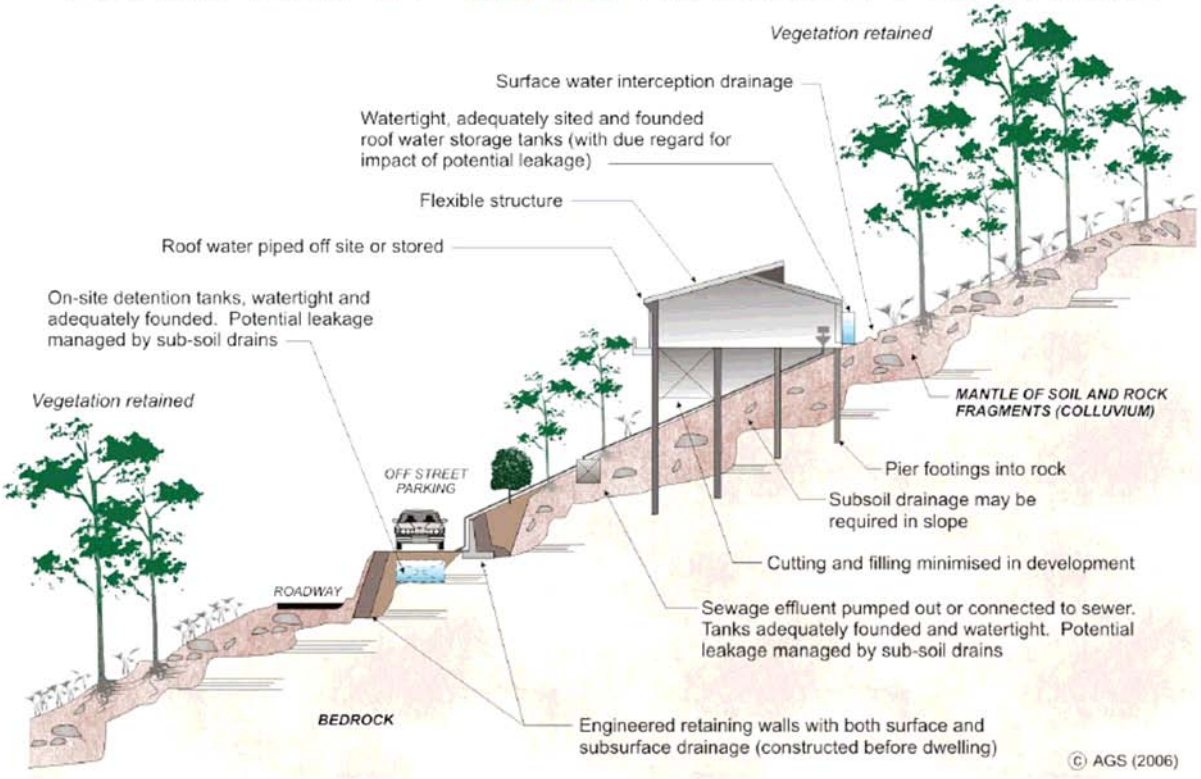
Notes: (5) For Cell A5, may be subdivided such that a consequence of less than 0.1% is Low Risk.
(6) When considering a risk assessment it must be clearly stated whether it is for existing conditions or with risk control measures which may not be implemented at the current time.

RISK LEVEL IMPLICATIONS

Risk Level		**Example Implications** (7)
VH	VERY HIGH RISK	Unacceptable without treatment. Extensive detailed investigation and research, planning and implementation of treatment options essential to reduce risk to Low; may be too expensive and not practical. Work likely to cost more than value of the property.
H	HIGH RISK	Unacceptable without treatment. Detailed investigation, planning and implementation of treatment options required to reduce risk to Low. Work would cost a substantial sum in relation to the value of the property.
M	MODERATE RISK	May be tolerated in certain circumstances (subject to regulator's approval) but requires investigation, planning and implementation of treatment options to reduce the risk to Low. Treatment options to reduce to Low risk should be implemented as soon as practicable.
L	LOW RISK	Usually acceptable to regulators. Where treatment has been required to reduce the risk to this level, ongoing maintenance is required.
VL	VERY LOW RISK	Acceptable. Manage by normal slope maintenance procedures.

Note: (7) The implications for a particular situation are to be determined by all parties to the risk assessment and may depend on the nature of the property at risk; these are only given as a general guide.

EXAMPLES OF GOOD HILLSIDE PRACTICE



EXAMPLES OF POOR HILLSIDE PRACTICE