



Geotechnical Policy – Kosciuszko Alpine Resorts Form 4 – Minimal Impact Certification

Date received: ___/___/___

DA no: _____

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 Assessments Team in Jindabyne for further information.
Phone 02 6456 1733.

To complete this form, please place a cross in the boxes and fill out the white 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

PAUL D.

Family name
ROBERTS

OF

Company/organisation
JK Geotechnics

certify that I am a geotechnical engineer /engineering geologist as defined by the "Policy" and I have ~~inspected the site~~ reviewed the attached report, Ref: 28265A/Hpt, dated 7 May 2015

PROPOSED ALTERATIONS + ADDITIONS TO SCHUSS LODGE, THREEDOO

As a result of ~~my~~ ^{our} site inspection and review of the following documentation
(List of documentation reviewed)

• Architectural drawings prepared by Lu Balsamo (SK-30^c, SK-31^c, + SK-32^c, dated February 2015 + SK-45, SK-46 + SK-47, dated April 2015.

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.

4. Signatures

Signature

Paul Roberts

Chartered professional status

MIE Aust, CP Eng (2307698)

Name

PAUL D. ROBERTS

Date

7/5/15

5. Contact details

Alpine Resorts Assessments team

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REPORT
TO
SCHUSS SKI CLUB LIMITED
ON
GEOTECHNICAL ASSESSMENT
FOR
PROPOSED ALTERATIONS AND ADDITIONS
AT
SCHUSS LODGE, ALPINE WAY, THREDBO, NSW

7 May 2015
Ref: 28265RHRpt



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Date: 7 May 2015
Report No: 28265RHrpt
Revision No: 0

Report prepared by:

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Paul Roberts
Senior Associate | Engineering Geologist

For and on behalf of
JK GEOTECHNICS
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FIGURE 1: GEOTECHNICAL SITE PLAN

FIGURE 2: GEOTECHNICAL CROSS SECTION – LOOKING EAST

FIGURE 3: GEOTECHNICAL MAPPING SYMBOLS

APPENDIX A: PREVIOUS BOREHOLE LOGS (LM12 AND KTB1)

APPENDIX B: PREVIOUS JK TEST PIT CROSS-SECTIONAL SKETCHS (JK101 AND JK102)



1 INTRODUCTION

This report presents the results of a geotechnical assessment for the proposed alterations and additions at Schuss Lodge (the Lodge), Alpine Way, Thredbo, NSW. The assessment was commissioned by Mr Brad McDonnell of Schuss Ski Club Limited, by signed 'Acceptance of Proposal' form, dated 1 April 2015. The commission was on the basis of our proposal, Ref: P40267ZH, dated 27 March 2015.

Jeffery and Katauskas Pty Ltd (now trading as JK Geotechnics [JK]) carried out a previous geotechnical assessment at the site for a similar proposed development and the results were presented in our report, Ref: 23375WHrpt, dated 8 October 2009. The results of our previous investigations carried out at the site, or by others in close proximity to the site, have been included in this report.

To assist with our assessment, we have been supplied with concept architectural drawings prepared by Mr Lu Balsamo (Master Plan Drawing Nos. SK-30^C, SK-31^C and SK-32^C, dated February 2015 and Stage 1 Drawing Nos. SK-45, SK-46, SK-47, dated April 2015).

From our review of the supplied drawings, an email prepared by Mr Balsamo on 27 March 2015 and our discussions with Mr Balsamo on 30 March 2015, we understand the proposed alterations and additions will include some or all of the following:

1. Construction of a new deck and balcony off the northern side of the Lodge. The proposed deck and balcony will most likely be supported off the existing walls. However, new footings are also being considered to support the proposed structure.
2. At Level 4, construction of a future extension at the south-eastern corner of the Lodge, which will incorporate a ski-bag and deliveries store. We expect new footings will be required for the proposed extension, should this proceed.
3. Replacement of the existing roof with a new roof over the Lounge area.
4. Internal renovations to the kitchen.

We have assumed relatively light structural loads apply to the proposed alterations and additions.

The purpose of the assessment was to carry out a walkover inspection of the site and to refer to the subsurface information obtained from previous investigations, as a basis for comments and recommendations on footings. A secondary purpose of the assessment was to determine whether



the proposed works present minimal or no geotechnical impact on the site, and if so, to prepare a signed Form 4 – Minimal Impact Certification. Based on our assessment, we would determine whether a further geotechnical report, which includes a risk assessment, would be required.

This report has been prepared in accordance with the requirements of the Geotechnical Policy for Kosciuszko Alpine Resorts (2003). It is understood that this report will be submitted as part of the Development Application documentation.

2 ASSESSMENT PROCEDURE

The assessment comprised a walkover inspection of the topographic, surface drainage and geological conditions of the site and its immediate environs by our geotechnical engineer (Adrian Callus) on 1 April 2015. Mapping of the primary geotechnical features identified on site was carried out and is presented on Figure 1. Figure 1 is based on a supplied survey plan (Reference No. 4180, Drawing No. 4180 CD 01, Revision C, dated February 2009).

A summary of our site observations is presented in Section 3.1 below.

Figure 3 presents details of the geotechnical mapping terms and symbols used in Figure 1. Slope angles were measured using a hand held clinometer and the dimensions of features which were accessible were tape measured, otherwise they were estimated. The feature locations shown on Figure 1 are only approximate and, should any of these features be critical to the proposed development, we recommend they be located more accurately using instrument survey techniques.

3 RESULTS OF THE ASSESSMENT

3.1 Site Observations

We recommend that the summary of observations which follow be read in conjunction with the attached Figure 1.

3.1.1 General Location

- The Lodge is located towards the toe of a moderately to steeply sloping north facing hillside, which grades between about 27° and 35°, as shown in the photograph below.



- Figure 1 shows the position of the Lodge relative to the Alpine Way, which ran along the southern boundary. The Alpine Way had been constructed roughly along the hillside contours and is surfaced with asphaltic concrete (AC) which was observed to be in fair condition. Both the uphill and downhill sides of the Alpine Way directly opposite the Lodge were supported by gabion retaining walls, that appeared to be in relatively good condition. The uphill wall was about 4m high, whilst the downhill wall was about 2.4m high. At the time of our walkover inspection, groundwater seepage emanated just above the concrete footpath level along the Alpine Way through the gabion retaining walls directly opposite the Lodge, as well as through the PVC drainage pipe outlets at the base of the gabion walls.
- Our understanding of the reconstruction works carried out along the Alpine Way following the 1997 Thredbo landslide, included filling which contained geo-grid reinforcement.
- The vacant neighbouring property to the east comprises the former Thredbo landslide site.
- The neighbouring three storey concrete block lodge to the west of the subject site (Tyrola – Lot 708) was set back about 3m from the common boundary. Based on a cursory inspection, the neighbouring lodge appeared to be in good external condition.
- Ground surface levels across the eastern and western site boundaries were similar.
- The neighbouring multi-storey weatherboard and concrete block lodge downslope to the north of the subject site (Gunyang – Lot 720) was set back about 3.5m from the common boundary. Based on a cursory inspection, the neighbouring lodge appeared to be in good external condition. There was a low height concrete retaining wall about 1m high, located



just behind the neighbouring lodge, which supported the basal portion of the slope within the subject site.

- The neighbouring multi-storey concrete block lodge to the west of the subject site (Lot 719) was set back about 2m from the common boundary. Based on a cursory inspection, the neighbouring lodge appeared to be in good external condition. Ground surface levels across the common boundary were similar. However, just to the west of the common boundary, the neighbouring lodge had been cut into the hillside slope to a maximum depth of about 3.3m. The area of cut just behind the neighbouring lodge to the west was supported by shotcrete.

3.1.2 Schuss Lodge & Surroundings

- The hillside on which the Lodge is located sloped down to the north between about 27° and 30°. The ground surface on the southern side of the Lodge sloped down to the north at about 40°, possibly due to some previous excavation into the hillside. The majority of the slopes within the site were grass covered and contained several scattered medium to tall trees. Mortared stone and rendered concrete block retaining walls supported the toe of the steeper slope behind the Lodge to the south. The eastern retaining walls appeared to be good condition, however, the western rendered retaining wall, appeared to be in poor condition. The western rendered wall contained several sub-horizontal cracks up to 10mm wide near the top of the wall. We did not observe any obvious bulging or rotation about the base of the wall. A concrete lined dish drain was located behind the crest of the wall.
- A suspended concrete car park was located at the southern end of the site and appeared to be in good condition. The suspended car park was supported by steel columns which were founded on concrete bases. The depth of founding of the concrete bases is unknown. A timber and metal staircase was located between the suspended car park and the Lodge.
- The gabion retaining wall, which supported the downhill side of the Alpine Way, was visible below the aforementioned suspended car park and appeared to be slightly bulging. Groundwater seepage stains were evident within the lined concrete drain which ran along the toe of this gabion wall, however, we did not observe any seepage emanating from the wall at the time of our inspection. Discharge of water within the lined drain appeared to be down to the east.
- The ground surface below the aforementioned suspended concrete car park and southern portion of the entry staircase, was relatively level and covered with grass, geofabric and small shrubs.
- The existing Lodge comprised a three storey concrete block building. Some of the basal portions of the external walls comprised a mortared granite stone facing. A suspended



timber deck was located on the eastern side of the Lodge. Based on a cursory inspection, the Lodge appeared to be in generally good condition. The Lodge did not have any gutters attached to the roof.

- The area on the northern side of the Lodge was terraced. The terraced areas, which were either paved or covered with either grass or mulch, were supported by two low height mortared stone retaining walls, which were up to about 1.3m high. The retaining walls appeared to be in fair condition, based on a cursory inspection. However, the retaining wall at its eastern end contained a vertical and horizontal crack that was up to about 20mm wide.
- The pavers behind the aforementioned northern retaining wall, particularly over its eastern half, was uneven and had subsided in some areas by up to about 150mm. There were several small voids visible behind the wall near to where the subsidence had occurred. We infer that the subsidence and presence of voids are probably due to localised erosion of the backfill.
- The ground surface on the northern side the Lodge below the aforementioned retaining walls graded at about 30° down to the north to the neighbouring 'Gunyang' lodge and was mostly grass covered. Several pine tree stumps were located on the slope. There was also several medium to tall gum trees located at the eastern end of this area i.e. north-eastern corner of site, and some showed evidence of some downhill tilt or basal curvature, which could indicate some localised hillside creep.
- Several concrete lined dish drains were located around the perimeter of the Lodge. From our observations, it appeared that drainage from the 'drip lines' of the Lodge roof, discharged into the lined dish drains. The drains appeared to discharge into stormwater pits, though the outlet locations are unknown. The inlets of some stormwater pits were partially blocked with leaf litter. There was also erosion below the base of the western dish drain.
- Towards the upper south-eastern corner of the site, close to the eastern site boundary, we observed an approximate 300mm diameter open steel pipe which daylighted at the ground surface, as well as a smaller diameter PVC pipe. It is unknown where these pipes connect to or what purpose they serve.
- Apart from the slight basal curvature of some trees located at the northern end of the site and the minor bulging of the gabion wall along the southern boundary, we did not observe any other obvious signs of fill or natural slope instability.
- Based on the relatively good performance of the Lodge, the expected subsurface conditions at depth, we expect that the footings which support the Lodge to be founded in the underlying residual soil profile or possibly in the weathered granite bedrock.



3.2 Subsurface Conditions

The 1:250,000 geological map of Tallangatta (Series SJ 55-3) indicates the site is underlain by granite (or granodiorite) bedrock.

We have included in Appendix A of this report, two previous relevant borehole logs drilled soon after the 1997 landslide. Borehole LM12 was drilled from the former Alpine Way level to a depth of 16m by Longmac Associates, whilst borehole KTB1 was drilled to a depth of 10m by Coffey, downslope of Schuss Lodge in nearby Bobuck Lane. We have shown approximately the location of LM12 on Figure 2, which has been reproduced, but with minor edits, from our previous geotechnical assessment report. In summary, LM12 encountered fill material down to 4.5m depth with extremely weathered granodiorite extending down to the borehole termination depth. The deep fill encountered in LM12 was associated with the previous Alpine Way road embankment. Borehole KTB1 encountered granodiorite at about 0.5m depth which extended down to the borehole termination depth. Groundwater levels at the time of drilling these boreholes (1997) was at about 4m depth.

Due to the reconstruction of the Alpine Way and installation of subsoil drains, we expect that current groundwater levels to be much deeper than 4m below the subject site.

From a previous geotechnical investigation carried out by JK in 2009 at nearby Leatherbarrel Lodge, located about 200m to the east of the Lodge, the subsurface conditions encountered at that site showed fill overlying residual soils with inferred extremely weathered granodiorite at shallow to moderate depth. The residual soils comprised silty clay of low and medium plasticity and assessed stiff and very stiff strength. The weathering process of granodiorite can also result in the residual soils comprising clayey silty sands, clayey sands and silty sands. The previous boreholes at Leatherbarrel Lodge were 'dry' during drilling and on completion of drilling.

The limited subsurface investigations during our previous geotechnical assessment at the site in 2009 comprised two hand excavated test pits (JK101 and JK102) which indicated fill (JK102) and fill overlying residual silty clay of low to medium plasticity (JK101). Both test pits were 'dry' during and on completion of excavation. The previous test pit cross-sectional sketches are presented in Appendix B. The test pit locations are shown on Figure 1.



4 COMMENTS AND RECOMMENDATIONS

Based on our current walkover inspection, with reference to the previously obtained subsurface information at, or near to, the subject site, and with reference to the supplied architectural drawings, we consider that the proposed alterations and additions will constitute 'minimal or no geotechnical impact' on the site. Therefore, we consider that a geotechnical report prepared in accordance with the Geotechnical Policy for Kosciuszko Alpine Resorts (2003) is not required. This report is preceded by the completed Form 4 – Minimal Impact Certification.

In the previous JK test pits, fill was encountered in JK102 down to a depth of at least 0.35m. Furthermore, ground surface levels have been raised along the rear (northern) side of the Lodge by up to about 1.3m where retaining walls were present. We therefore infer that fill is present to a depth of at least 1.3m below some parts of the subject site. We have no records that document the manner of placement, compaction specification and control of the fill. The pavers have also subsided which is indicative of the fill being poorly compacted. Hence, the fill is deemed not to be a 'controlled' fill as defined in Clause 1.8.13 of AS2870-2011 'Residential slabs and footings'. As the site is expected to be underlain by more than 0.4m of 'uncontrolled' fill, the site is Class 'P' in accordance with AS2870-2011.

The standard footing designs in AS2870-2011 are not relevant to this project and therefore design of any new footings will need to be carried out by using engineering principles.

We recommend that the following be taken into account during the design and construction phase:

1. Based on the limited available subsurface information at the subject site, we recommend that where new structures rely on existing footings for support, then those existing footings be designed to support a maximum allowable bearing pressure of 200kPa.
2. If new footings are required, then these should be founded in the underlying weathered granite bedrock and designed for a maximum allowable bearing pressure of 600kPa. We note that the weathered bedrock will be less susceptible to hillside creep movements compared to the overlying soils. If there is any doubt as to the quality of the foundation material, then further geotechnical advice should be sought.
3. All new footings must be founded below an imaginary 45° line drawn up from behind the toe of any adjacent retaining wall or cut slope.
4. A construction joint should be installed between the Lodge and any proposed structure that relies on support from new footings, so as to permit relative movements in case the Lodge is founded within soil.



5. Any existing subsoil drainage or surface drainage measures disturbed as part of the proposed alterations and additions should be reconstructed or diverted around the proposed new structures so that the current site drainage is maintained.
6. Any new unsealed drip lines should be sealed with a concrete lined dish drain which is dispersed in a controlled manner to the stormwater system.
7. All water bearing services be checked for leaks. If leaks are found, then these should be repaired
8. We note that several pine trees have been cut down at the northern end of the site. To reduce surface erosion and potential for higher infiltration of surface water into the ground in the vicinity of the trees stumps, as a result of the tree stumps breaking down over time, we recommend that the pine tree stumps be grubbed out. The section of ground which has been grubbed out should be replaced with clayey soil, which must be nominally compacted using a vibrating plate (sled) compactor or whacker packer and surfaced with grass or similar to reduce erosion. We do not recommend using granular materials as there will be a higher potential for water infiltration through these materials.
9. If we are required to sign a Form 3 '*Final Geotechnical Certificate*' for the proposed alterations and additions, then a geotechnical engineer from JK Geotechnics will need to inspect the foundation materials of any new footings prior to pouring of concrete.

5 GENERAL COMMENTS

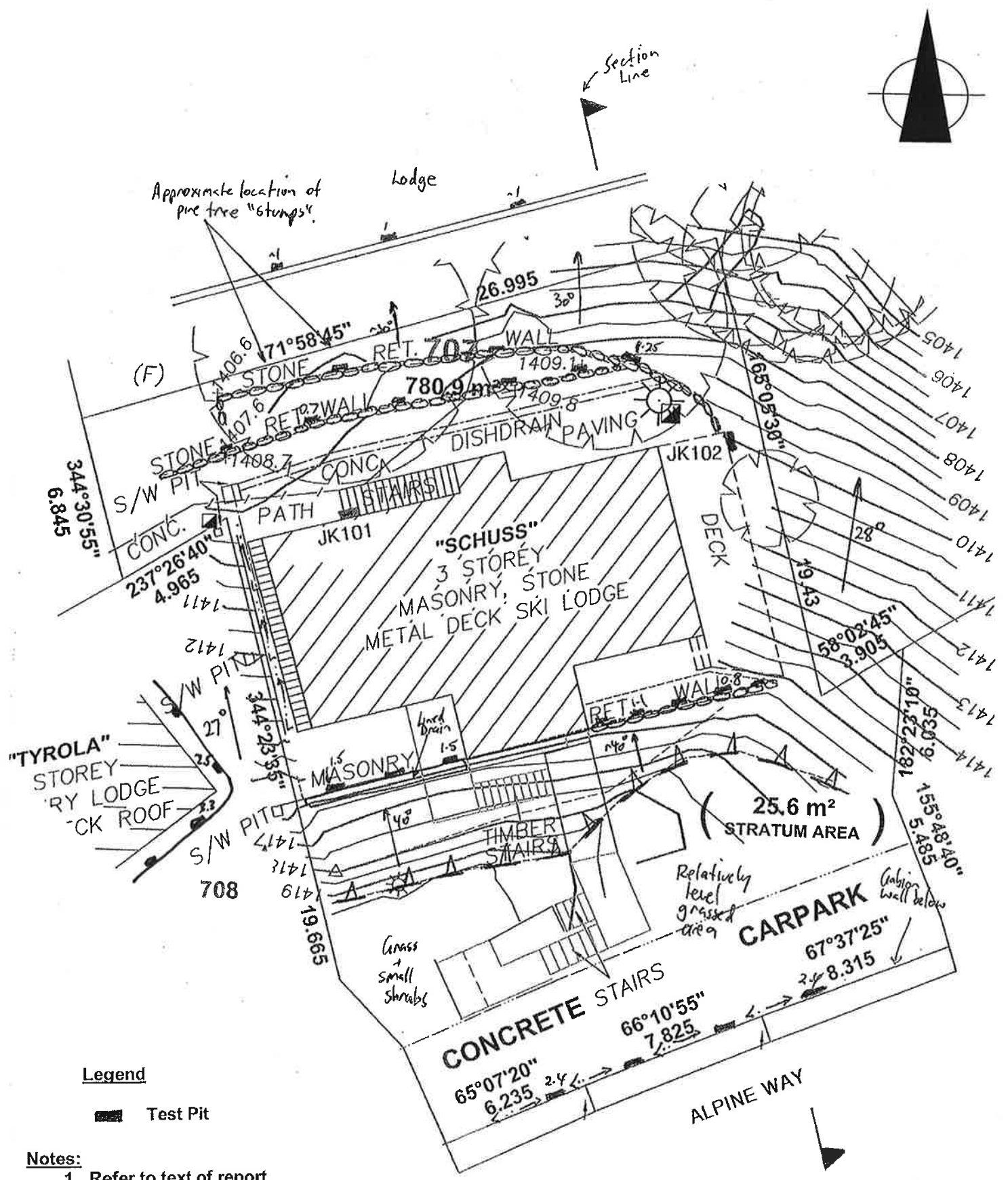
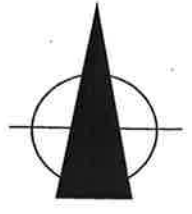
The recommendations presented in this report include specific issues to be addressed during the construction phase of the project. In the event that any of the construction phase recommendations presented in this report are not implemented, the general recommendations may become inapplicable and JK Geotechnics accept no responsibility whatsoever for the performance of the structure where recommendations are not implemented in full and properly tested, inspected and documented.

It is possible that the subsurface soil, rock or groundwater conditions encountered during construction may be found to be different (or may be interpreted to be different) from those inferred from our surface observations in preparing this report. Also, we have not had the opportunity to observe surface run-off patterns during heavy rainfall and cannot comment directly on this aspect. If conditions appear to be at variance or cause concern for any reason, then we recommend that you immediately contact this office.



This report provides advice on geotechnical aspects for the proposed civil and structural design. As part of the documentation stage of this project, Contract Documents and Specifications may be prepared based on our report. However, there may be design features we are not aware of or have not commented on for a variety of reasons. The designers should satisfy themselves that all the necessary advice has been obtained. If required, we could be commissioned to review the geotechnical aspects of contract documents to confirm the intent of our recommendations has been correctly implemented.

This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose. If there is any change in the proposed development described in this report then all recommendations should be reviewed. Copyright in this report is the property of JK Geotechnics. We have used a degree of care, skill and diligence normally exercised by consulting engineers in similar circumstances and locality. No other warranty expressed or implied is made or intended. Subject to payment of all fees due for the investigation, the client alone shall have a licence to use this report. The report shall not be reproduced except in full.



Legend

■ Test Pit

Notes:

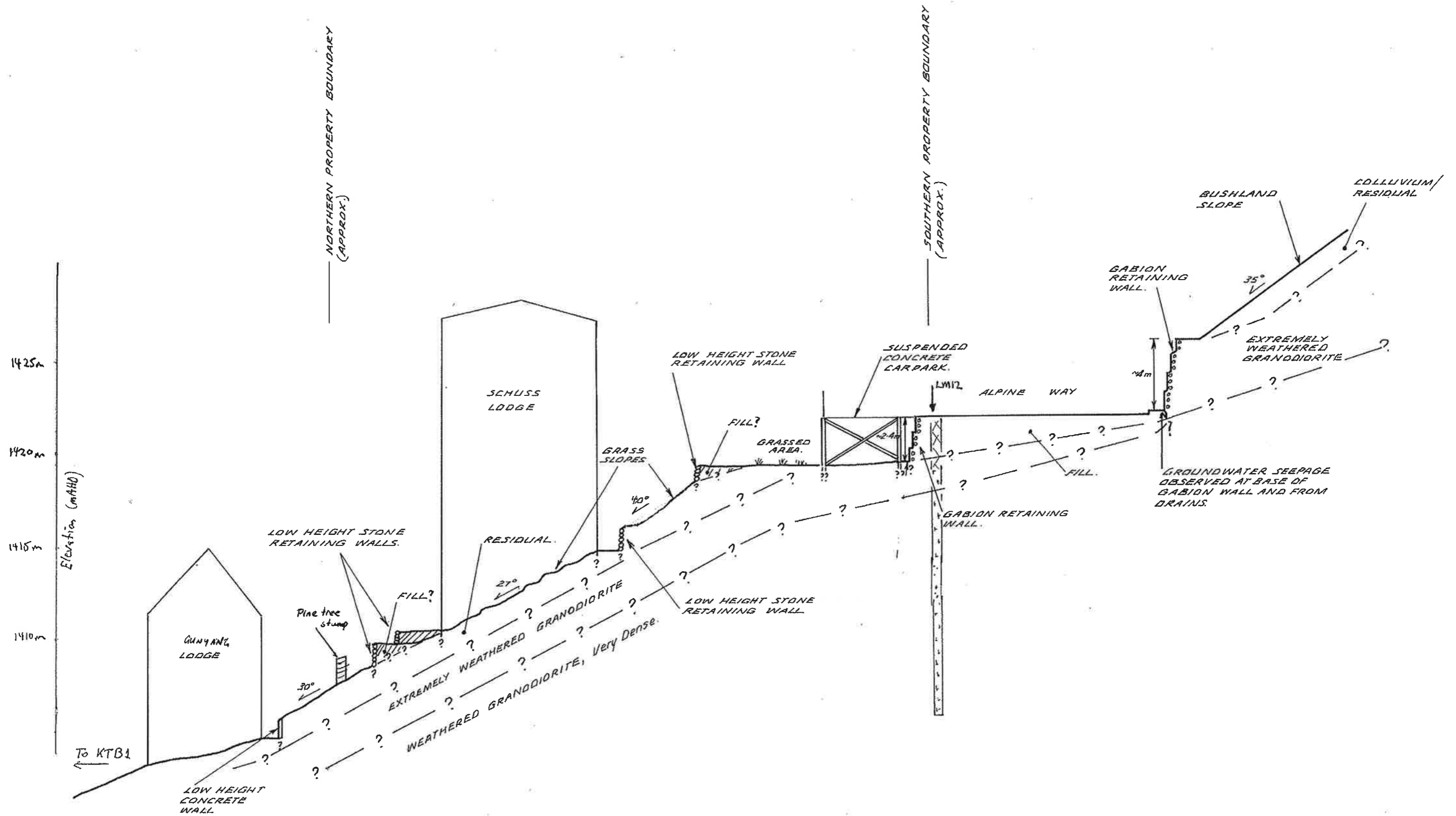
1. Refer to text of report.
2. Refer to Figure 2 for Geotechnical Cross Section.
3. Refer to Figure 3 for Geotechnical Mapping Symbols



GEOTECHNICAL SITE PLAN

JK Geotechnics
 GEOTECHNICAL & ENVIRONMENTAL ENGINEERS

Report No. 28265RH Figure No. 1



Notes:

1. Refer to text of report.
2. Refer to Figure 1 for "Geotechnical Site Plan"



**GEOTECHNICAL CROSS SECTION
LOOKING EAST**

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 Report No. 28265RH Figure No. 2

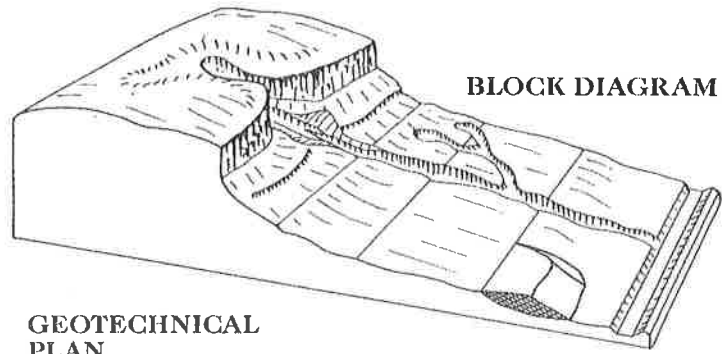
TOPOGRAPHY

Symbol	Ground Profile	
		convex
		concave
		convex
		concave
	breaks of slope	} convex and concave too close together to allow the use of separate symbols
	changes of slope	
	sharp	} ridge crest
	rounded	
	Cliff or escarpment or sharp break 40° or more (estimated height in metres)	
	Uniform Slope	} Slope direction and angle (Degrees)
	Concave Slope	
	Convex Slope	
	Top	} Cut or fill slope, arrows pointing down slope
	Bottom	
	Hummocky or irregular ground	

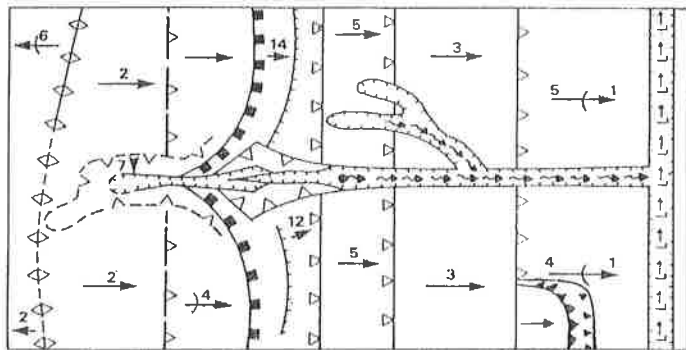
OTHER FEATURES

	Boulder
	Seepage/spring
	Swallow hole for runoff
	Natural water course
	Open drain, unlined
	Open drain, lined
	Fenceline
	Property boundary
	Dry Stone Wall
	Major joint in rock face (opening in millimetres)
	Tension crack (opening in millimetres)
	Masonry or concrete wall
	Ponding water
	Boggy or swampy area

EXAMPLE OF USE OF TOPOGRAPHIC SYMBOLS:



GEOTECHNICAL PLAN



(After Gardiner, V & Dackombe, R.V. (1983), Geomorphological Field Manual; George Allen & Unwin).

GEOTECHNICAL MAPPING SYMBOLS

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Report No. 28265RH

Figure No. 3

APPENDIX A

SLOTTED INCLINOMETER LOG SHEET

STATION No. LM 12

SHEET 1 OF 2

Client : NSW NATIONAL PARKS & WILDLIFE SERVICE
 Project : THREDBO LANDSLIDE
 Location : THREDBO VILLAGE
 Position : 237920.52E 958341.69N Surface Elevation : 1423.13 Angle from Horizontal : 90.0
 Rig Type : PIONEER P160 Mounting : TRUCK Contractor : McDERMOTTS Driller : IAN
 Date Started : 18/8/97 Date Completed : 18/8/97 Logged by : GBM
 Processed : HW
 Checked :
 Date :

DRILLING				BOREHOLE DESCRIPTION				INCLINOMETER			
DRILLING METHOD	HOLE SUPPORT	WATER	SAMPLES & TESTS	DEPTH metres	STRATIGRAPHIC LOG	USC SYMBOL	DESCRIPTION	REMARKS	SLOTTED INCLINOMETER	COMPONENTS	
TC BIT AUGER	NIL	18/8				ML & SM	Moist, brown, stiff, low plasticity, sandy SILT and silty SAND (fill).	Low TC auger resistance		installation not completed	
			SPT 2/2/5 N=7								
			SPT 3/2/3 N=5								
		18/8/97						As above, but wet.			
			SPT 5/4/6 N=10			4.50	SP - SM	Wet, mottled orange and white, medium dense, coarse SAND with silt (residual - completely weathered granodiorite grading to extremely weathered granodiorite).			5.1-6.2, high TC auger resistance
		19/9/97	SPT 4/4/6 N=10			SP - SM	Wet, orange mottled off white, medium dense, SAND with silt (extremely weathered, extremely weak, granodiorite).	Varying between high and moderate TC resistance			
			SPT 7/11/10 N=21								
			SPT 7/8/10 N=18								

DRAFT

See standard sheets for details of abbreviations & basis of descriptions

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 36 Oxley Street, Crows Nest, N.S.W. 2065
 Telephone: (02) 9439 4033 A.C.N. 003 666 966
 CONSULTING GEOTECHNICAL ENGINEERS AND GEOLOGISTS



Job No. **971211**

gINT Template: SINCLINO

SLOTTED INCLINOMETER LOG SHEET

Client : NSW NATIONAL PARKS & WILDLIFE SERVICE
 Project : THREDBO LANDSLIDE
 Location : THREDBO VILLAGE

STATION No. LM 12

SHEET 2 OF 2

Position : 237920.52E 958341.69N Surface Elevation : 1423.13 Angle from Horizontal : 90.0
 Rig Type : PIONEER P160 Mounting : TRUCK Contractor : McDERMOTT'S Driller : IAN Processed : HW
 Date Started : 18/8/97 Date Completed : 18/8/97 Logged by : GBM Checked :
 Date :

DRILLING					BOREHOLE DESCRIPTION			INCLINOMETER			
DRILLING METHOD	HOLE SUPPORT	WATER	SAMPLES & TESTS	DEPTH metres	STRATIGRAPHIC LOG	USC SYMBOL	DESCRIPTION	REMARKS	SLOTTED INCLINOMETER	COMPONENTS	
TC BIT AUGER	LIN		SPT 7/8/11 N=19	10.00	+	SP-SM	SAND with silt (extremely weathered granodiorite) as previous.	High TC auger resistance		70mm dia Inclinometer casing 7mm gravel backfill	
			SPT 11/9/21 N=30	12.30	+	SP					GRANODIORITE, brown, off white and grey, coarse grained, extremely weathered, very weak.
					+						
					+						
					+						
					+						
					+						
					+						
					+						
					+						
		+									
				16.00	+		End of borehole at 16.0 metres.		13.0 to 16.0m Inclinometer casing slotted with drill holes in filter sock		

DRAFT

See standard sheets for details of abbreviations & basis of descriptions

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Job No. **971211**

gINT Template: SINCLINO



borehole no:
KTB1
sheet 1 of 2

engineering log - borehole

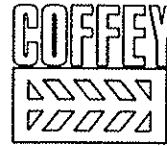
office job no: S10803/2

client: MICHAEL HARMER & ASSOCIATES	hole commenced: 10.10.1997
principal: KOSCIUSKO THREDBO PTY LIMITED	hole completed: 11.10.1997
project: THREDBO VILLAGE INVESTIGATION	logged by: SDW
borehole location: 237925.4m E 958398.2mN 81MBADEEN LODGE, BODUCK LANE	checked by: <i>cl</i>
drill model and mounting: PIONEER 160 TRUCK MOUNTED RIG	slope: -90 DEG
hole diameter: 110m	bearing:
	R.L. Surface: 1391.4 m
	datum: AHD

15 / 12 / 97 8:41:22 U05 COFFEE VERSION B3

method	penetration support water	samples, tests, etc	R.L.	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics colour, secondary and minor components	moisture condition	consistency/density index	hand penetrometer				structure and additional observations
										100	200	300	400	
ADT	1 2 3 4	8 .6 .6 Nk= 14	1391	0		SM	ASPHALT: 70mm with 30mm gravel roadbase SILTY SAND: fine to coarse grained, light brown-brown, traces of fine grained gravel.	MD	VD					PAVEMENT-RESIDUAL
		U50		1	+	SM	GRANODIORITE: Silty gravelly sand, fine to coarse grained, light brown, trace fine grained, relic granitic structure, root fibres.							EXTREMELY WEATHERED BEDROCK
		U50		2	+									
		6 .7 .8 Nk= 15	1390		+									
		U50		3	+	SM	GRANODIORITE: Silty Sand, fine to coarse grained, some fine grained gravel, brown-light brown, relic granitic structure.							
		U50		4	+									
		6 .10 .12 Nk= 22	1389		+									
		U50		5	+	SC	GRANODIORITE: Silty Clayey Sand, medium to coarse grained, some gravel, fine grained, brown.							
		U50		6	+	SM	GRANODIORITE: Silty Sand, fine to coarse grained, some fine grained gravel, mottled light brown to brown-white, relic granitic structure.		MD /					
		13 .19 .25 Nk= 45	1388		+									
		U50		7	+		Some clay below 7.0m							
		U50		8	+									

METHOD AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube xbil shown by suffix B blank bit V V bit T TC bit e.g. ADT	SUPPORT Nil no support M mud C casing PENETRATION 1 2 3 4 little resistance ranging to very slow progress WATER X not measured O none observed water level water outflow water inflow	SAMPLES, TESTS, ETC U undisturbed sample (m) D disturbed sample Bs bulk sample E environmental sample N standard penetration test: Nx SPT + sample recovered Nc SPT with solid cone VS vane shear PM pressuremeter DP dynamic penetrometer WS water sample PZ piezometer	CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION based on unified classification system MOISTURE D dry M moist W wet Mp plastic limit Wl liquid limit	CONSISTENCY/DENSITY INDEX DESCRIPTION VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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borehole no:
KTB1
sheet 2 of 2

engineering log - borehole

office job no: S10803/2

client: MICHAEL HARPER & ASSOCIATES
principal: KOSCIUSKO THREDBO PTY LIMITED
project: THREDBO VILLAGE INVESTIGATION
borehole location: 237925.4m E 958398.2mN BUMBADDEEN LODGE, BOBUCK LANE

hole commenced: 10.10.1997
hole completed: 11.10.1997
logged by: SDW
checked by: *cl*

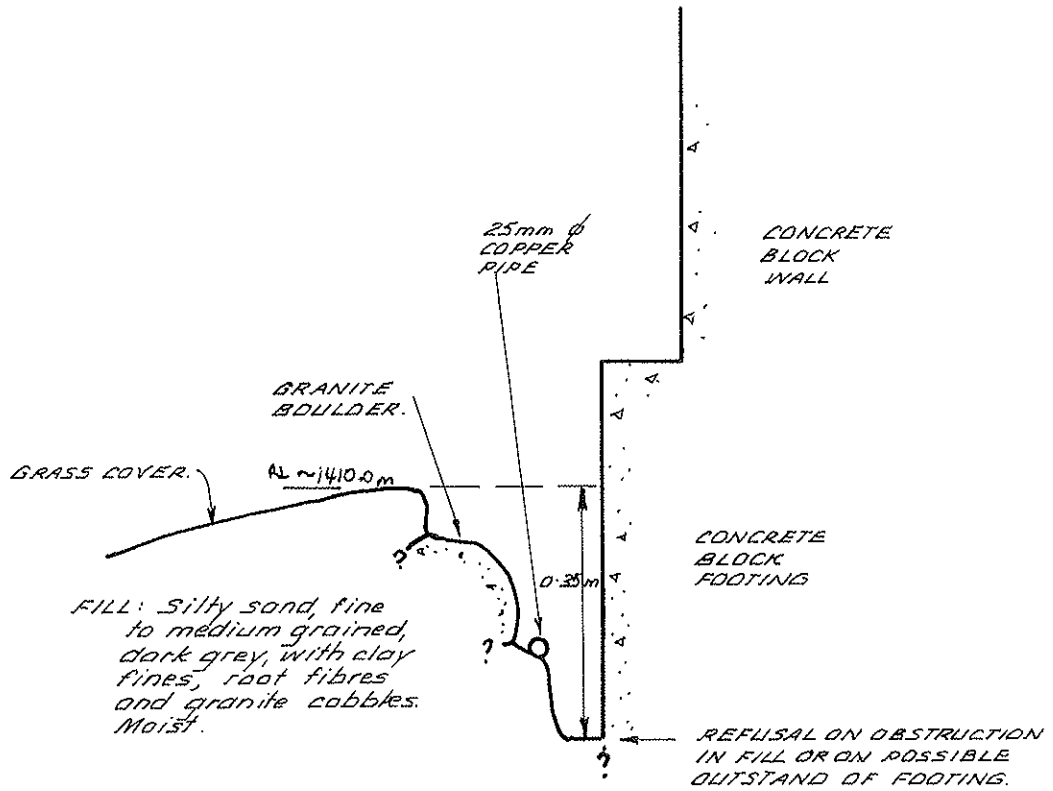
(drill) model and mounting: PIONEER 160 TRUCK MOUNTED RIG slope: -90 DEG R.L. Surface: 1391.4 m
hole diameter: 110mm bearing: datum: AHD

method	penetration	support	water	samples, tests, etc	R.L.	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics colour, secondary and minor components	moisture condition	consistency/density index	hand penetrometer			structure and additional observations
												100	200	300	
ADT				11.10.30 NK=40	1383	9	+	SM	GRANODIORITE: Silty Sand, fine to coarse grained, some fine grained gravel, mottled light brown to brown, white, relic granitic structure.		VD				
				28. - - - NK=R	1382	10	+								
					1381	11			Borehole KTB1 Terminated at 10.00 m PVC standpipe installed to base of hole with concrete seal at surface.						
					1380	12									
					1379	13									
					1378	14									
					1377	15									
					1376	16									

METHOD AS auger screwing* AD auger drilling* RH roller/tricone W washbore CT cable tool HA hand auger OT diatube Xbit shown by suffix B blank bit V V bit I TC bit e.g. ADT	SUPPORT Nil no support M mud C casing PENETRATION 1 2 3 4 little resistance ranging to very slow progress WATER X not measured D none observed water level water outflow water inflow	SAMPLES, TESTS, ETC U undisturbed sample (mm) D disturbed sample Bs bulk sample E environmental sample N standard penetration test: Nx SPI + sample recovered Nc SPI with solid cone VS vane shear PM pressuremeter DP dynamic penetrometer WS water sample PZ piezometer	CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION based on unified classification system MOISTURE D dry M moist W wet Wp plastic limit Wl liquid limit	CONSISTENCY/DENSITY INDEX VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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APPENDIX B



BASE OF TEST PIT AT 0.35m

'DRY' ON COMPLETION.

BASE OF FOOTING NOT REVEALED, BUT IS FOUNDED AT LEAST 0.35m BELOW EXISTING SURFACE.

TEST PIT JK102
CROSS SECTIONAL SKETCH
LOOKING SOUTH

SCALE (M)

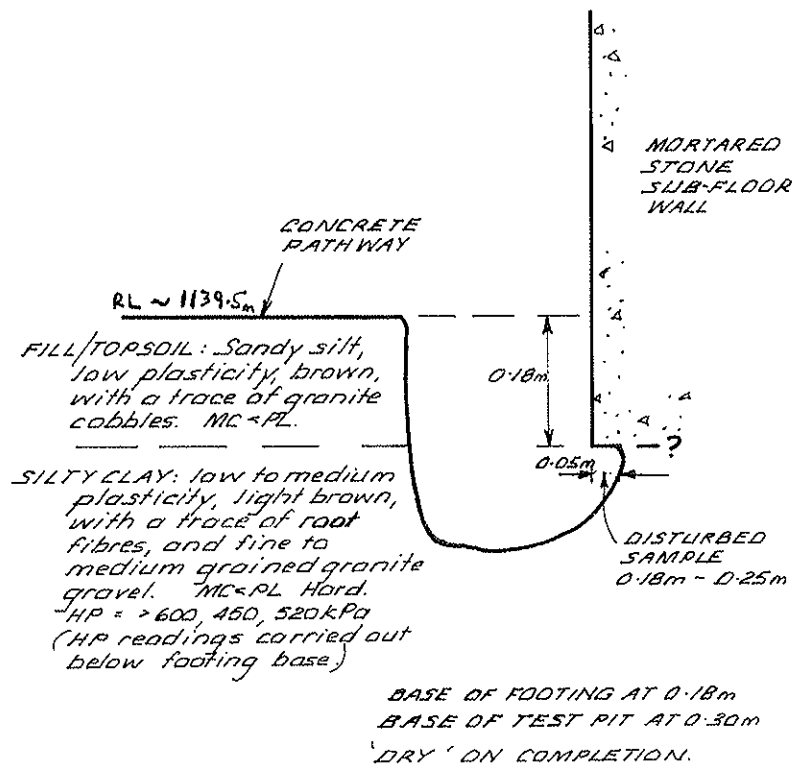


Jeffery and Katauskas Pty Ltd



Report No. 23375WH

Figure No. 5



TEST PIT JK101
CROSS SECTIONAL SKETCH
LOOKING EAST

