2016

# Proposed Alterations to Lampada Ski Lodge, Perisher Valley

## *Statement of Environmental Effects*

**August 2016**

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## ATTACHMENTS

# 1 INTRODUCTION

This Statement of Environmental Effects (SEE) has been prepared for proposed works at Lampada Ski Lodge, Lot 107, DP 756697, Perisher. The works proposed include removal of extisting first floor bedroom and build bathroom ensuites to remaining 5 bedrooms. Ground floor will have an additional disabled bedroom and ensuite excavated from the extising storage area located at the southern end of the building *(refer Geotech report)* below existing rooms. New disabled entrance and double glazed windows to be included.

Owned by the Lampada Ski Club Cooperative Ltd., the lodge operates as a club lodge, providing accommodation to club members and other visitors. The existing lodge is licensed to provide accommodation for up to 14 guests. The proposed extensions will improve the existing facilities available to the lodge users. The location of the Lampada Ski Lodge is shown on Figure 1.1.

This SEE assesses the environmental impact of the proposed development. Recommendations provided to mitigate any adverse environmental impact have been included in the *Site Environmental Management Plan* (SEMP), Attachment 2. A *Storm Water Management Plan* (SWMP) has also been prepared to supplement these documents providing details on how the stormwater will be managed at the site (refer to Attachment 3).

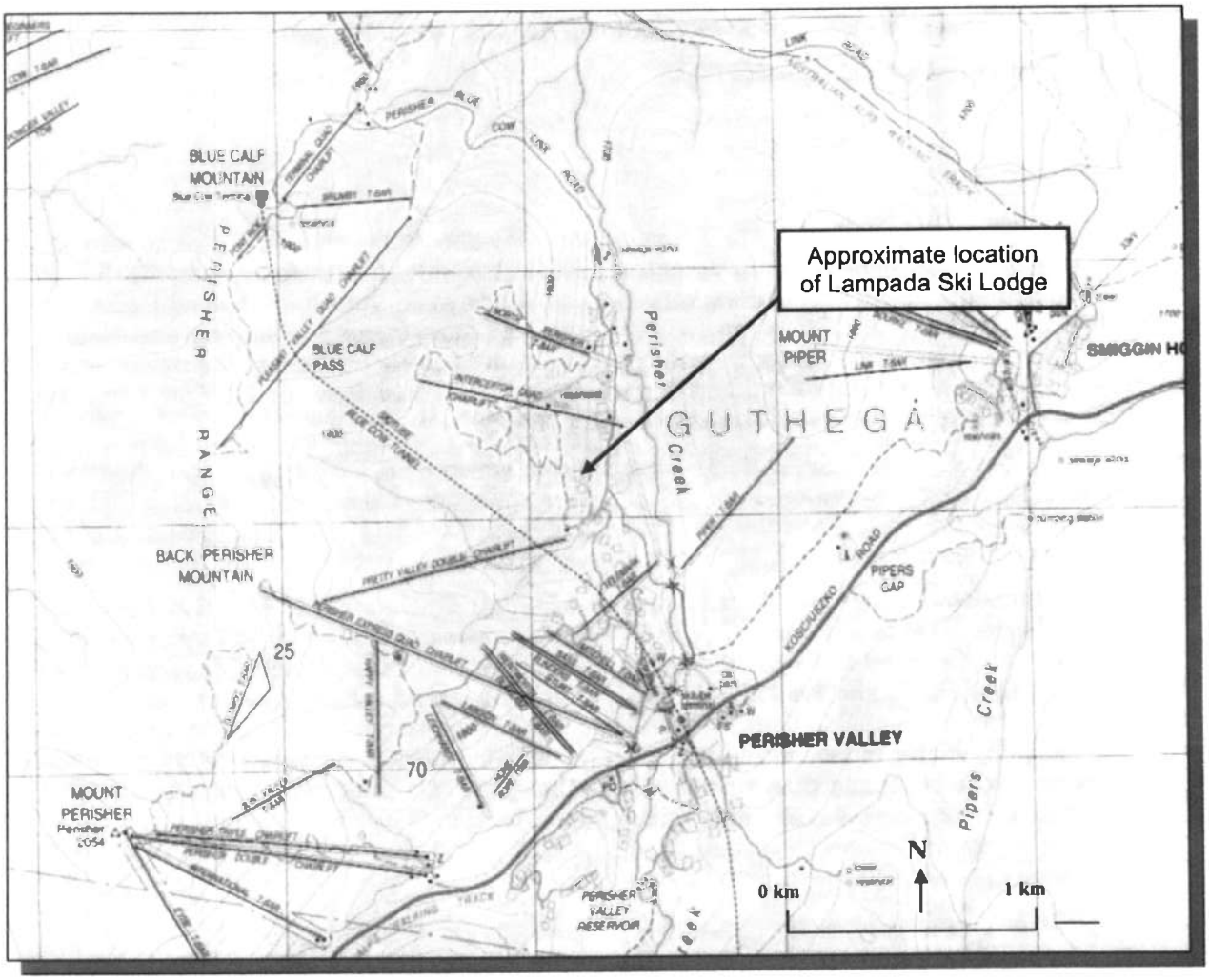


**Figure 1.1** Location Map, Perisher Range (Perisher Range 1:25,000 Map Sheet).

# 2 PLANNING REQUIREMENTS

## 2.1 Integrated Development

The proposed works at Lampada Ski Lodge is not an integrated development. The works will not require approval from any other government agency in relation to the;

i) *Fisheries Management Act 1994* (sec. 201 and 205),

ii) *Heritage Act 1977* (sec. 58),

*iii) Threatened Species Conservation Act 1995*

*iv) Native Vegetation Conservation Act 1997*

v) *Mine Subsidence Compensation Act 1961* (Sec. 15),

vi) *National Parks and Wildlife Act 1974* (Sec. 90),

vii) *Protection of Environment Operations Act 1997*,

viii) *Roads Act 1993* (sec. 138- see Appendix 1),

ix) *Soil Conservation Act 1938* (Sec 21D),

x) *Waste Minimisation and Management Act 1995* (Sec 44), and

xi) *Water Management Act 2000.*

## 2.2 SEPP's

***State Environmental Planning Policy (Kosciuszko National Park - Alpine Resorts) 2007***
***The Alpine Resorts Team of the NSW Department of Planning & Environment manages the the development and building assessment process for Kosciuszko National Park under Part IV of the Environmental Planning and Assessment Act of 1979.***

The proposal site has been identified as land to which ***this*** SEPP applies and, therefore, this SEE sets out to address all the relevant requirements within the Policy so that any impacts of the proposal may be properly assessed. The proposed works are not described under the SEPP and are not an advertised development.

## 2.3 Kosciuszko National Park Plan of Management

The development area falls within the "Perisher Valley-Smiggin Holes Management Unit" J3 of the Kosciuszko National Park Plan of Management, Consolidated Version (2000). Development of facilities within this management unit is generally regulated by sections 7.3 and 8.1 of the plan. The main objectives of management stipulated within the plan and relating to works and developments within the alpine skiing management unit J3 include;

- *"to encourage the provision of facilities and services in alpine skiing management units for alpine skiing;*
- *to ensure that resort area planning and services are of a high standard appropriate to winter visitors and to a park of Kosciuszko's environmental quality and international stature;*
- *to ensure that facilities are provided for non-skiing visitors to prescribed levels;*
- *to ensure that ski resort function well;*
- *to ensure visitor safety in the operation of services and facilities;*
- *to ensure satisfactory design standards for all new structures and works;*
- *to ensure community services are provided to meet visitor growth and statutory standards; and*
- *to protect important features including landscape and environmentally sensitive areas."*

No new beds are proposed for Lampada Ski Lodge. The proposed works conform to the objectives of Kosciuszko National Park Plan of Management (PoM, 2000).

## 2.4 Kosciuszko National Park Environment Code of Practice

All works will be completed in accordance with the Kosciuszko National Park Environmental Safeguards Code of Practice for Construction Works, dated August 2002.

## 2.5 Threatened Species Conservation Act 1995

**Joint Management Agreement**

No joint management agreement under the *Threatened Species Conservation Act 1995* (TSC Act) currently exists for the development site. An assessment of the potential impact that the works will have on threatened species has been completed in section 4.20 of this document.

**Any Affect on Critical Habitat**

Critical habitat is defined within the TSC Act, and refers to habitat declared to be critical under Part 3 of the Act. These are listed on Schedule 1 of the TSC Act. The development proposal will not affect critical habitat as defined within this Act.

**Effect on Threatened Species Populations or Ecological Communities and Their Habitats**

An assessment of the effect on threatened species populations or ecological communities and their habitats has been completed in section 4.20. This assessment has identified that the development will be unlikely to significantly impact on threatened species populations or ecological communities and their habitats.

## 2.6 Effect on Protected Fauna or Protected Native Plants

An assessment of the likely impact on protected fauna or protected native plants has been completed in section 4.20 below.

## 2.7 Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* introduces an assessment and approvals system for;

- actions that have a significant impact on matters of national environmental significance,
- actions that have a significant impact on the environment of Commonwealth land, and
- actions carried out by the Commonwealth Government.

A matter requires the approval of the Federal Environment Minister if an action is likely to have a significant impact on a matter of national environmental significance or listed as a matter of national significance which includes:

i) World Heritage Properties,

ii) Wetlands of International Importance,

iii) Commonwealth Listed Threatened Species and Ecological Communities,

iv) Commonwealth Listed Migratory Species,

v) Nuclear action,

vi) Commonwealth Marine areas, or

vii) Commonwealth land

While category iii) is relevant to the Perisher area (due to the local occurrence of the Alpine Tree Frog - *Littoria verreauxii alpina*, a species listed as threatened) the development proposal will not impact on any matters of national significance. An assessment of the likely impact of the proposed works on threatened species has been included in section 4.20.

## 2.8 Other Relevant Legislation and Policies

### 2.8.1 Wilderness Act 1987

The development site is not located within any listed or identified wilderness areas as defined within the *Wilderness Act 1987*.

### 2.8.2 Principals of ecologically sustainable development

An objective of the development is to conform to the principles of ecologically sustainable development.

The "principles of ecologically sustainable development" are listed below;

- the precautionary principle - namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- inter-generational equity - namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;

- conservation of biological diversity and ecological integrity - namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration; and
- improved valuation, pricing and incentive mechanisms - namely, that environmental factors should be included in the valuation of assets and services

The assessment process has incorporated these principles.

### *2.8.3 Perisher Range Resorts Master Plan*

Lampada Ski Lodge is located within the Northern precinct of the Perisher Valley under the Perisher Range Resorts Master Plan (2001). The Master Plan applies to the ski resort villages of Guthega, Smiggin Holes and Perisher Valley. It presents a broad development strategy for resort areas on Perisher Range, together with a set of Master Plans and development controls and guidelines for individual resorts. These plans are intended to provide a clear framework and direction for new development in this part of the Kosciuszko National Park over the next 10 to 15 years.

This document has the primary objective to assist the resorts in providing international class facilities "*based on ecologically sustainable principles*". It also has an objective of creating a village with a range of accommodation improved services that will enhance visitor experience. The document discusses environmental management principles that avoid or ameliorate adverse impacts associated with the continued development of the Perisher Range Resort village areas.

The proposed extensions comply with the objectives of the Master Plan, by improving existing substandard accommodation facilities, and ensuring that the lodge is an "*international class facility*". The works will comply with the environmental management principles identified within the Master Plan. This SEE has incorporated the Perisher Range Resorts Master Plan (2001) broad development strategies and guidelines.

# 3 THE PROPOSAL

## 3.1 Background

Lampada Ski Lodge is utilised by club members and guests for accommodation. The lodge is used during both the winter and summer months, although the majority of visitation occurs during the winter ski season. In an effort to provide higher quality accommodation and greater comfort to members and guests, it is considered necessary to provide ensuite bathrooms to most rooms plus disabled facilites including entry, bedroom and bathroom ensuite that comply to the Building Code of Australia (see DDA Report). New double glassed windows and improved thermal and noise insulation will be installed.
This would have obvious benefits to people visiting the lodge, that not only is expected but demanded by most members and their guests.

Since it was built in the mid-1960's, the lodge has undergone a number of renovations and refurbishments which have been described in section 4.2. This new proposal would improve the living and recreational values of Lampada Ski Lodge for members and guests, and help to ensure that future accommodation services within the Perisher Valley are of a high standard.

Lampada Ski Lodge is located in the northern extents of the main Perisher Valley resort area (Figure 3.1).

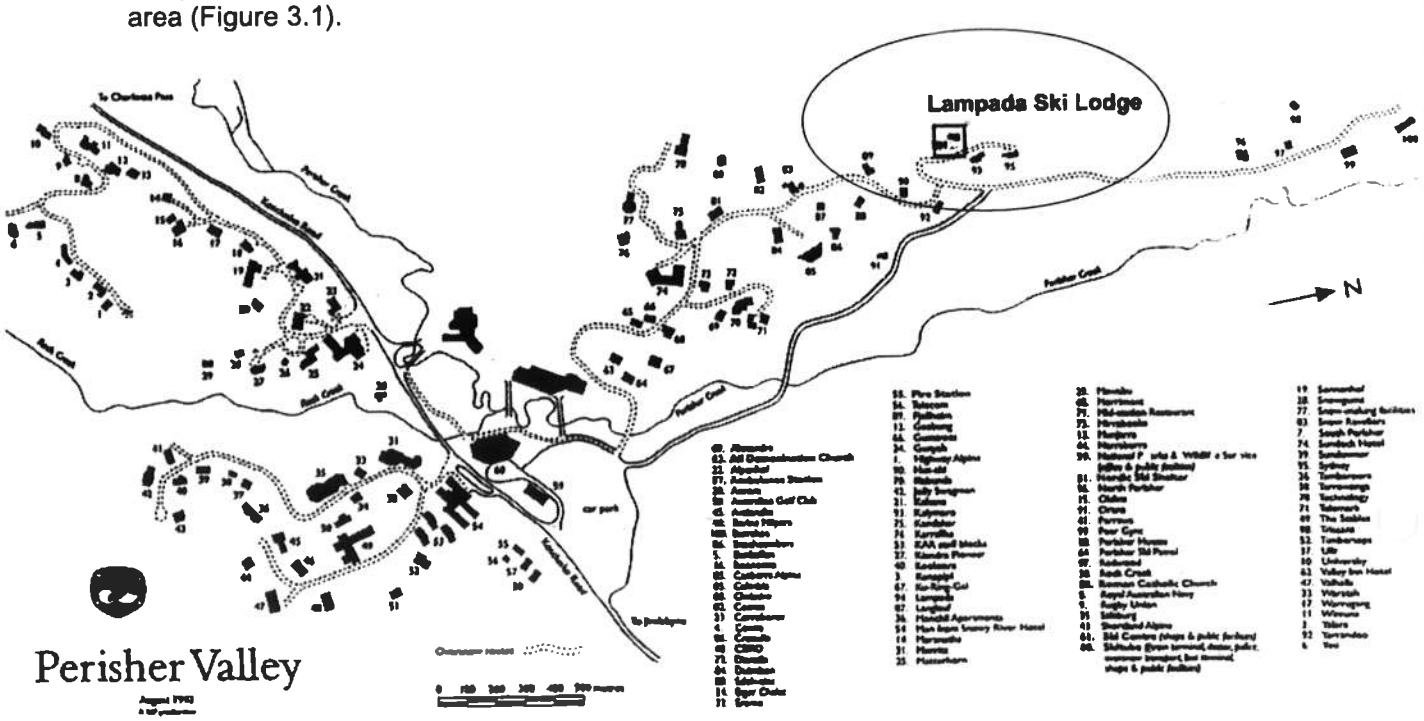


**Figure 3.1** The location of Lampada Ski Lodge with respect to other lodges within Perisher Valley

## 3.2 Existing Facilities

Lampada Ski Lodge currently exists as a two storey club lodge utilised by members and guests principally for accommodation. The lodge itself is licensed to provide a bedding limit of 14.

The existing lodge basement currently provides a large games room, a locker room, ski room, laundry and drying rooms, airlock/lobby and bathroom. The first storey contains six bedrooms, kitchen, dining and lounge room, and a large deck located on the eastern side side of the building. By providing bathroom ensuites and disabled facilites there should be increase the comfort and of the lodge, hence providing a more pleasant accommodation experience for people staying at the lodge.

The lodge is located in a semi-natural subalpine setting with a low to moderate risk of being affected by a bushfire.

## 3.3 Project Description

The proposed alterations and additions comprise the construction of a new bedroom and ensuite at ground level, beneath current bedrooms 3 and 4 located at the southern end of the building. This bedroom and ensuite will comply to the Building Code of Australia, the Disability Discrimination Act and Disabilty Access to Premises Standards (attached DDA Report) The works require excavation of the existing under floor area and are relatively minor from a geotechnical perpective and they interact with the ground surface that require the construction of a 4.8m long retaining wall to support the new cutting behind the proposed ensuite (attached Geotechical AssessmentReport)
A smaller storage room will replace the existing large storage area near the new disability bedroom and ensuite.
The first floor level will reduce the current six bedrooms to five with additional ensuites to be constructed for each room. All existing wooden frame single glazed windows to be replaced with double glazed aluminium versions for improved heating efficiency.

All materials have been selected in order to match the buildings existing materials. These include:

- vertical grey lining boards,
- galvanised trimdeck iron roof sheeting,
- new double glazed aluminium windows.

Excavation work will be carried out with an excavator (eg. bob cat or backhoe). Construction machinery access to the site will be via existing village roads and an informal track (Figure 3.1). Refer to SEMP for safeguards concerning excavation, storage of earth, waste and building materials.

The underlying objective of the proposal is to upgrade the existing services and conditions for members and guests of the lodge.

### *3.3.1 Rehabilitation*

If any soils are disturbed to such a level that they may be considered unstable or at risk of erosion during a possible rainfall event, they would be revegetated and rehabilitated. Areas where vegetation has been removed would also be rehabilitated. Rehabilitation methodology has been outlined in section 1.2.6 of the SEMP.

## *3.4 Colour and Material Samples*

***Renovated paint work, window frame colours and stone work will match the existing building.***

***Photo 3.1*** ***Shows existing building colours and materials to be matched***

# 4 ENVIRONMENTAL ASSESSMENT

## 4.1 Character of the Locality

The proposed work is located within Kosciuszko National Park. The park was first reserved in 1944, being declared a State Park. In 1977, it was designated as a Biosphere Reserve by UNESCO. The park is of National and State conservation significance as it:

- *provides significant water catchments,*
- *contains all of the states NSW alpine areas, and a large portion of its sub-alpine areas,*
- *contains a large area (697,000 hectares) of land that contains a variety of habitats and threatened flora and fauna communities,*
- *contains a range of significant topographical and geomorphological features, that contain a large diversity of environments (these vary from semi-arid areas to alpine areas),*
- *contains six declared wilderness areas, totalling 304,031 hectares,*
- *provides an important recreational resource, receiving up to 3,000,000 visitors a year. The majority of visitation occurs in winter when the park is utilised by downhill and cross country skiers and snowboarders,*
- *provides an important educational and scientific resource (of national and international importance),*
- *contains archaeological resources, including Aboriginal campsites, stone arrangements, quarries, burial places and ceremonial grounds, and*
- *contains a rich non-indigenous history, relating to previous activities including grazing, gold mining, skiing and the Snowy Mountains Scheme.*

On a local scale, the Lampada Ski Lodge lease area is located within the Perisher-Smiggins Franchise area. The lodge is also located within the sub-alpine environment. The sub-alpine is of significance as it provides an important recreation resource and contains a variety of significant natural features.

An assessment of cultural significance of the building has been completed. The report is attached within Attachment 4. Refer to section 4.14 for further detail on the cultural significance of Lampada Ski Lodge.

### 4.1.1 Geology

The development site occurs in the sub-alpine environment at an approximate elevation of 1,750 metres above sea level. The underlying geology of the Perisher area is the Mowamba Granodiorite. This is an "S" type granitic rock, probably Silurian in age derived from sedimentary rocks (Mallen et al. 1985). Soils in the undisturbed areas are principally alpine humus. Once decomposed granite is exposed, areas that are not stabilised and revegetated are extremely susceptible to frost heave and erosion.

The proposed development area and materials storage area contain soils that are both disturbed and undisturbed. Disturbed areas have been subject to previous excavation associated with the construction and use of the existing access track, ski room, deck and supports. Soils in these areas consist largely of gravel or introduced grasses and herbs and do not contain a humic layer.

**Photo 4.1** Nature of ground around the proposal area. Note the disturbed grasses.

### *4.1.2 Climate*

Alpine and sub-alpine environments experience extremes of climate. The weather is dominated by a westerly air stream and the prevailing winds are from the north-west. Wind velocities of up to 200 km/hr have been recorded in exposed areas. Annual precipitation falls between 2,400 and 2,500 mm a year (Hooy & Matthews, 1981 from NPWS 1985). Approximately half of the annual precipitation occurs during the winter months from June to September, refer to Figure 4.1. Snowfalls account for most of the precipitation during this period.

The prevailing winds at the lodge are from the west however as the lodge is located on the eastern flanks of Perisher Back Mountain it is relatively sheltered. Accumulation of snow at the site occurs mainly on the southern side of the lodge.

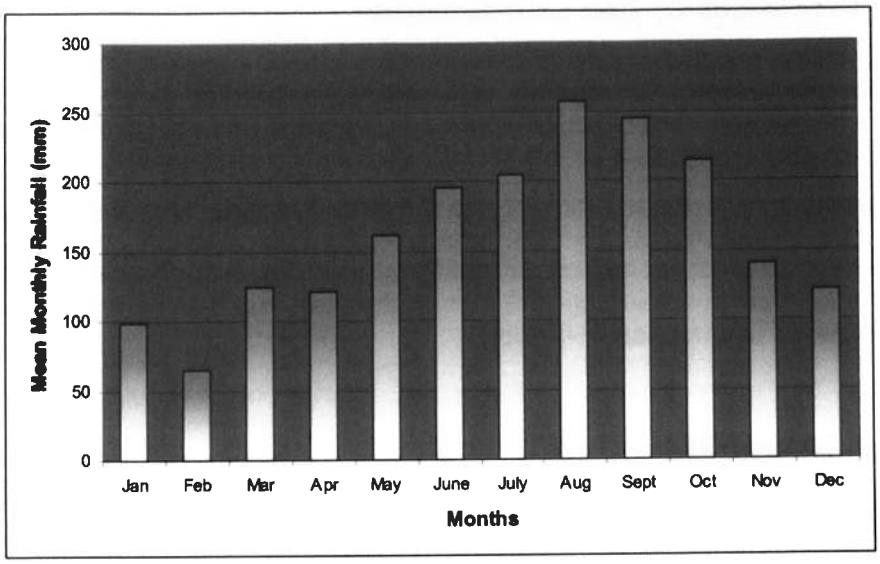


**Figure 4.1** Mean Monthly Rainfall/Precipitation at Perisher Ski Centre from 1976 – 2004 (from the Bureau of Meteorology)

## 4.2 History of the site

Originally known as Kooroora, the site has been utilised as a club ski lodge since it was built in the 1965-66 summer. The Kooroora Lodge was bought and renamed to "Lampada" in 1968 by a cooperative group consisting of the old Shore Boys (an extension of the Torch Bearers Ski Club which formed during the early 1950's). Since it was built, Lampada Ski Lodge has had a number of renovations/refurbishments including;

- The basement level concrete block wall clad with stone (1970);
- Modification of one of the bedrooms and extension of the front verandah to allow a more effective fire escapes (1990);
- Renovation of the kitchen (1991/92);
- Refurbishment of the bathroom (1996);
- Verandah railing replaced (1997);
- Renovation of the bedrooms (1997/8).
- Renovation of the lounge, dinning and kitchen area, veranda replacement, new bathroom and ski room (2005/6).

For further information on the history of the Lampada Ski Lodge refer to the Cultural Heritage Statement (Attachment 4).

## 4.3 Relationship to Adjoining Land Uses

The proposed extension will be located within the club lodge's existing lease area, where the land use is dedicated to the operation of Lampada Ski Lodge. Land use in the lease area is restricted to accommodation, and, possibly, for passive recreation (the area included within the lease area is likely to be utilised for activities such as picnics and walking). The proposed works would not prevent such activities occurring within the lease area.

The "Interceptor Quad Chairlift" is located approximately 250m north of the lodge, with the area upslope containing the "Discovery Trails" ski runs. Neither this nor any other adjoining land uses in area would be impacted on by the proposal.

## 4.4 Relationship to the Landscape

The works will be undertaken within current Lampada Ski Lodge footprint with minimal changes. An outline of the proposal is included in section 3.3.
The existing landscape would not be significantly altered as a result of the works.

The proposed works would not change the present land use, nor would any significant environmental impact occur on the current landscape features at the site. Once completed, the new bedrooms, ensuites and improvements with disabled access would increase the comfort of the lodge. It is also suspected that the works may improve the visual qualities of the Lampada Ski Lodge.

## 4.5 Site Suitability

The proposed site has been utilised as a club Ski Lodge since the mid 1960's. Since then the Lampada Ski Lodge has been upgraded several times to cater for increased demands in terms of accommodation and other services. Impacts on the existing and future amenity of the area will be minimal.

Biological and ecological impacts will not be significantly impacted as a consequence of this proposal and these issues have been further addressed in Section 4.21.

## 4.6 Present and previous uses

Lampada Ski Lodge is owned by Lampada Ski Club Coop. Ltd., and has been utilised by club members and guests for accommodation since the mid 1960's when it was built. The lodge is used during both the winter and summer months, though the majority of visitation occurs during the winter ski season. The development site is located within the Lampada Ski Lodge lease area. The site is not utilised for any formalised purpose than accommodation and related facilties, and is not located on any ski slopes, walking trails, roads or oversnow routes.

## 4.7 Visual Impact

The visual quality of the Perisher-Smiggins ski resort areas, which have been highly modified by the construction of ski resort facilities, have been discussed by Hodges (1988). This paper describes the area as having a number of visually obtrusive, as well as attractive features during both the summer and winter seasons. The assessment describes the resort as having a number of features with poor visual amenity during summer; negative features identified include introduced grasses that dominate disturbed areas (such as road batters and municipal service lines), large paved areas, and large unscreened buildings.

The development site which occurs within the sub-alpine environment is located on an east-facing slope overlooking Perisher Creek, and a ski slope serviced by Pipers T-bar. The site is visible from these areas and surrounding village roads. The lodge currently appears as a relatively unobtrusive structure surrounded by snowgum woodland and heath vegetation (Photo 4.2). The proposed extensions/alterations would also be visible from surrounding areas, particularly those downslope.

The lodge itself is an example of State Park Alpine design. This is a rustic style derived originally from the United States Park Service design philosophy. The lodge is representative of 1960's ski accommodation design in Australia. Lampada Ski Lodge has a moderate degree of aesthetic significance in the Perisher Valley, being a good example of a vernacular style ski lodge. Extensions/alterations would be restricted to the existing

footprint, and as the nature of these changes will conform to the style of the existing building, the proposal is unlikely to produce a negative impact. Building materials and colour scheme would match the existing building. It is suspected that the new design will actually improve the appearance of the building.

**Photo 4.2** The existing visual nature of the Lampada Ski Lodge can be partly seen in the photo above.

## 4.8 Potential Overshadowing and Impacts on Privacy

The proposed development will not have any significant impact on privacy; nor would it cause any overshadowing.

## 4.9 Availability of Electricity, Water and Sewer

Water and sewer services are currently provided by the lodge. The proposed extensions/alterations will not require any additional facilities. As such they will not be incorporated into the proposal.

## 4.10 Building Classification and Building Code of Australia (BCA)

The proposed installation is a Class *3* building as specified in the Building Code of Australia, Class 2 to 9 Buildings, Australian Building Codes Board, Volume 1.

- A Class *3* building is classified as:

  "a boarding house, guest house, hostel or the like-

- in which 14 persons ***or more*** would ordinarily be resident;

Proposed fire safety measures have been addressed according to Class 10 of the BCA.

## *4.11 Wind classification and Snow Loading*

Wind velocity and snow loading has been considered for the proposed development with proposal designed appropriately in accordance to the relevant Australian/New Zealand Standards (Joint Australian/New Zealand Standards AS/NZS 1170). This information has been provided within the Engineer's drawing package that will be submitted separately to this SEE.

## *4.12 Engineering details*

Detailed engineering plans to be lodged separately to this SEE. A site classification has been prepared by a qualified geotechnical consultant (**GHD** Pty Ltd.). A full geotechnical report has also been prepared and will also be lodged separately to this SEE.

A Stormwater Management Plan (SWMP), including erosion and sedimentation control measures has been prepared along with a Site Environmental Management Plan (SEMP) (Attachments 2 & 3 respectively).

## *4.13 Access and Traffic*

Traffic levels may increase slightly during construction. These will be of a minor level; the majority of it will be confined to village roads. The lodge can be accessed by an informal access track. The movement of vehicles along this track will be restricted, as it is susceptible to erosion. Safeguards are discussed in the SEMP. The development will not result in increased car park requirements (following construction) nor will it generate a significant increase in traffic in the long term. The club do not propose to construct a formalised carpark, as the local topography would require extensive earthworks, and would likely impact on potential Broad-toothed Rat habitat.

The following are to be provided for access according to DIPNR guidelines:

- Pedestrian amenity – not applicable in this instance
- Access for people with disabilities – not applicable in this instance
- Proposed bicycle facilities – not applicable in this instance
- Existing bus services and over snow services – not applicable in this instance
- Vehicle access to a road – the existing informal track access is suitable for the entry of vehicles and machinery to the site
- Resident, staff, customer and visitor parking arrangements – not applicable in this instance,
- Parking calculations – not applicable in this instance
- Potential conflict between vehicles, pedestrians and cyclists – not applicable in this instance

## 4.14 Effect on items of heritage and conservation significance

On a local level, the Lampada lease area is located within a sub-alpine area, within the Perisher-Smiggins Franchise area. The local area is of significance as it provides an important recreation resource and contains a variety of significant natural features, however these would not be impacted on by the proposal.

A search of the non-statutory Ski Resorts Heritage Study Database found that an inspection on the Lampada Ski Lodge (on 18th June 1997) and associated Ski Resorts Heritage Study was carried out and produced by Peter Freeman Pty. Ltd.

The report recognises the Lampada Ski Lodge's importance at a local level as it represents an example of a vernacular design style lodge of a typical form erected to the former Kosciusko State Park Trust guidelines. The proposed works continue to conform to the original theme of the building, i.e. private ski lodge/accommodation.

An assessment of cultural significance of the building has also been completed for previous works associated with Lampada Lodge (**ngh**environmental 1997). The following information has been obtained from this statement (prepared by Victoria Design and Management, 1997):

> 'Lampada has a *low to moderate degree of historic significance* owing the fact that there are more than 50 lodges already built at Perisher in 1966, however the lodge does represent the skiing era of the 1960's. The lodge is a good example of a vernacular style ski lodge. The lodge is considered to be of historic significance at a local level because of its contribution to an identifiable period in Australian architecture and lifestyles. It is not considered to be significant from a regional, state or national level.'

This assessment identified the following;

- Lampada has a moderate degree of aesthetic significance in Perisher Valley because it is a good example of a vernacular style ski lodge, and
- Lampada has a low degree of technical/research significance.

The cultural assessment gave the building a low to moderate rating for historic significance at a local level.

**Statement of Cultural Significance**

The following statement of cultural significance is from the cultural assessment (see Attachment 4);

*"A **low to moderate rating of historic significance at a local level** is attributed to Lampada Ski Lodge as it is one of about 53 extant lodges dating from the 1950's and 60's.*

*Lampada Ski Lodge is ascribed a **moderate degree of aesthetic significance at a local level** as it is a good example of a 1960's vernacular style ski lodge and is representative of the design philosophies of that era and locality.*

*Lampada has a **low degree of technical/research significance** because it is representative of ski lodge construction in both material use and design but there are probably examples of greater interest available for any research activities.*

*Lampada has a **moderate degree of Cultural Significance in the Kosciuszko National Park** as it is*

- *representative of the Kosciusko State Park Trust philosophies for development*
- *it is one of 53 surviving lodges dating from the 1950's and 1960's*

- *representative of Australian ski lodge accommodation*
- *is a good example of 1960's vernacular style ski lodge*".

## 4.15 Effect on items of Aboriginal heritage significance

Only one archaeological site, has been recorded within Perisher-Smiggins Management Unit, it is located at Perisher Gap, the site is an open campsite. The most likely places to be of an archaeologically sensitive nature within alpine and sub-alpine areas are those located below the tree line or alternatively close to Bogong Moth aestivation sites (NPWS 1985). Kinhill (1997) included an assessment for archaeological sites in Perisher-Smiggins area, and state that "*localities likely to have archaeological potential are flat, well-drained, wooded areas on ridges or spurs overlooking the valley. The chances of archaeological sites being present would be higher where there are massive granite outcrops (tors) that would have made suitable moth aestivation sites*". No Bogong Moth aestivation sites have been found within the Perisher Smiggins Franchise Area (Mallen et al. 1985).

Along with the undisturbed parts of the development site being located on sloping terrain, there is a lack of Bogong Moth aestivation sites nearby. As such the likelihood of the development site providing archaeological potential is low. A desktop archaeological survey was completed by Julie Dibden of NSW Archaeology Pty Ltd. Refer to Attachment 4.

## 4.16 Changes in stormwater runoff quality or quantity

The proposal area has been partially disturbed however a relatively large area of groundcover vegetation remains. The proposal requires only minor excavation work in relation to extensions, including the installation of associated footings. The proposed works would not alter the current runoff quality or quantity in the long term.

Refer to the accompanying Site Environmental Management Plan (SEMP) and the Storm Water Management Plan (SWMP) for further clarification of stormwater runoff and quality and remediation techniques to be adopted for this proposed installation.

## 4.17 Potential for soil erosion and pollution or sedimentation of water bodies

The site falls within Perisher Creek catchment. The Lampada Ski Lodge is located on the lower eastern slopes of the Back Perisher Mountain, approximately 150m north of a tributary of Perisher Creek and approximately 300m west of Perisher Creek itself. This water course is not expected to be impacted on by the proposed works. The hydrology of parts of the proposed extension site and surrounding areas where stabilisation works are proposed have been modified as a result of previous earthworks within and adjacent to the site. The majority of surface runoff from the site currently flows into surrounding vegetated areas.

Potential for erosion and loss of topsoils from the site through turbid runoff is likely to be at its highest during the construction period. Localised disturbance to soils and hydrology will result from the excavation of footings required for the proposed southern renovation Given the controls outlined in the SEMP and SWMP (Attachments 2 & 3), this disturbance is unlikely to have impact on local soils and water quality.

The existing retaining wall and associated drainage features would be extended around the proposed northern section of the building. This would have the objective of reducing the moisture content of soils at the building site. Impact on local hydrology is likely to be low, drains will be stable, and will discharge runoff into stabilised vegetated areas.

## 4.18 Flood hazards to the development

The existing lodge is at a high elevation and is not at risk of flood. The proposed renovations would not alter the existing flood risk affecting the site.

## 4.19 Noise, dust, vibration or smoke generation

The generally low number of vehicles within the Perisher area and the site's distance from cities and industry, that emit large amounts of atmospheric pollutants, ensures that air quality at the site is high. Dust may emanate from the site during construction, however, impact will be short term and of and acceptable level. The development will **not** result in the generation of smoke.

Noise and vibration from construction activities will emanate from the building site during the construction phase. Summer visitation at Perisher Valley is generally higher during weekends and public holidays. Noise emanating from construction works occurs regularly within all NSW ski resorts during the building season. To reduce impact on park visitors it is recommended that works do not take place during public holidays, and should, only take place between 7.30 am and 5.30 pm. Refer to the SEMP, Attachment 2 for additional safeguards.

## 4.20 Flora and fauna

A number of species of flora and fauna, considered to be of high conservation significance occur within the Perisher-Smiggins Franchise Area.

### 4.20.1 Flora

The site was assessed on 7 June 2005. The timing was poor for detecting grasses and forbs but it is considered unlikely that any significant species were overlooked.

The disturbed areas at Lampada Lodge are dominated by introduced 'alpine mix' grasses and other introduced herbs (eg. Cats Ear). The site also contains intact dry heath, which is relatively abundant within the local area (Perisher Smiggins Management Unit, Nicholas Graham-Higgs & Associates 1996 & Mallen et al 1985). The heath is dominated by mint bush (*Prostanthera cuneata*). Vegetation on the site's eastern side, where the existing retaining wall has been installed, is highly disturbed, though due to its moist nature, this area contains wet heath species including *Richea continentis* and *Grevillea australis*. A plant list for the site is included as Attachment 1.

**Significant Flora**

No species of any conservation significance occur on the site. No species of flora listed as vulnerable on Schedules 1 and 2 of the *Threatened Species Conservation Act 1996* (TSC Act) where recorded as occurring within the development area. The shrub *Nematolepis ovatifolius* is listed (as *Phebalium ovatifolium*) as being of significance within Kosciuszko National Park, but only because it is endemic to the park. It is a common and often dominant species in subalpine and alpine dry heath and subalpine woodland.

### 4.20.2 Fauna

A range of fauna species occur in the Kosciuszko alpine and high sub-alpine zones, although a number of these do not persist over winter. In the Perisher Range area, the most common small mammals are the Bush Rat, Broad-toothed Rat, and the Dusky

Antechinus. A number of migratory birds are found in the alpine areas, most of these spend the warmer summer months in the alps and migrate to lower elevations during the winter period.

Reptiles and amphibians are less well represented in the alpine zone; 7 frogs, 2 snakes and 11 lizards (including 10 skinks, 3 of which are threatened) have been recorded in the Snowy Mountains and Victorian Alps. In comparison with temperate montane environments in other continents, the Australian Alps are, however, significant for the number of reptile species above the snowline (Green and Osborne 1994). Both native (Mountain Galaxias), and introduced fish (trout) occur within local streams.

Invertebrates play an important role in alpine ecosystems. Most insects at higher elevations are typically found in montane zone rather than subalpine and alpine zones, however, they do have an ability to traverse these areas easily. Mountains form a natural trap for insects which may have been blown considerable distances. The alpine zone supports high numbers of springtails, mites and earthworms, but few phasmids and snails. Numerous aquatic macroinvertebrates are found in small alpine streams, these invertebrates are useful tools in assessing water quality and stream health, as aquatic invertebrates are sensitive to distrubance (pollutants, sedimentation, temperature etc.). Many invertebrates are endemic to the snow country, including 4 stoneflies known only from the Mount Kosciuszko area, metallic cockroaches, net-veined midges and genus *Kosciuscola* grasshoppers (Green and Osborne 1994).

A diverse range of fauna may utilise the dry heath habitat located within or adjacent to the development site. The disturbed sections of the site are unlikely to provide important habitat to protected or threatened fauna.

**Significant Fauna**

Table 2 lists significant species of fauna known to occur within the Perisher Valley area. It summarises each species' habitat requirements, and identifies if the development site provides potential habitat for them. A precautionary approach has been adopted, particularly where distributions and ecological relationships are poorly known.

**Table 2:** Significant species known to occur within the Perisher Valley area (from Nicholas Graham-Higgs & Associates 1997), and the likelihood of their utilising habitat located within the development site.

| Species | Significance* | Broad habitat requirements | Potentially present? |
|---|---|---|---|
| **MAMMALS** | | | |
| **Broad-toothed Rat** *Mastacomys fuscus* | Schedule 2 Category 2 | Tall, dense wet /dry heath and tussock grassland >1000 metres. Sign of this species occurs within the development site. | yes |
| **Mountain Pygmy Possum** *Burramys parvus* | Schedule 1 Category 1 EPBC (e) | Scrubby heathland and snow gum woodland with boulders above 1400m ASL. This species especially prefers rocky areas, particularly boulder deposits. The shrubby heathland associated with Mountain Pygmy-possum habitat is characterised by the presence of Mountain Plum Pine *Podocarpus Lawrencei* which is often found in boulder fields (NPWS 2001a). Mt Blue Cow located nearby has a small population of possums. Dispersing juvenile may utilise this area as a movement corridor, animals have been tracked moving through this slope (pers. comm. Linda Broome, NPWS). | yes, primarily as a movement corridoor. |

| Species | Significance* | Broad habitat requirements | Potentially present? |
|---|---|---|---|
| **Greater Long-eared Bat** *Nyctophilus timoriensis* | Schedule 2 | Dry open woodlands, roosts in hollows, feeds above understorey and watercourses. | no |
| **Great Pipistrelle** *Falsistrellus tasmaniensis* | Schedule 2 Category 2 | They are found in a range of habitats including dry and wet sclerophyll forest but appear to prefer wet sclerophyll forest (Hall and Richards 1979). Proposed works unlikely to disturb forage habitat. | no |
| **Common Bent-wing Bat** *Miniopterus schreibersii* | Schedule 2 Category 2 | Various; roosts in caves. | no |
| **BIRDS** | | | |
| **Latham's Snipe** *Gallinago hardwickii* | Category 2 JAMBA, CAMBA | The species utilises flat and gently sloping sites where a high water table is maintained throughout the year. Dominant species at these sites include *Carex gaudichudiana*. | no |
| **Olive Whistler** *Pachycephala olivacea* | Schedule 2 Category 2 | Dense closed habitats, especially riparian tea-tree thickets. | no |
| **Pink Robin** *Petroica rodinogaster* | Schedule 2 Category 2 | Moist forest with dense understorey. | no |
| **Regent Honeyeater** *Xanthomyza phrygia* | Schedule 1 | Forest and woodland with feed species. | no |
| **REPTILES** | | | |
| **Rosenbergs Monitor** *Varanus rosenbergi* | Schedule 2 | Woodland, wet/dry forest, uses burrows, logs, crevices. | no |
| **Alpine Water Skink** *Eulamprus kosciuszkoi* | Category 3 | The species has a very specific habitat, being restricted to wet heath and bog areas (Osborne 1983; Green and Osborne 1985) in particular sphagnum (Osborne 1983, Green and Osborne 1994), and may shelter in crustacean burrows. | no |
| **Alpine Oak Skink** *Cyclodomorphus praeltus* | alpine/sub-alpine endemic | It appears to shelter in grass tussocks and is considered to be exceptionally rare (Green and Osborne 1994). | no |
| **AMPHIBIANS** | | | |
| **Alpine Tree Frog** *Litoria verreauxii alpina* | Schedule 1 EPBC (e) Category 1 | Open sub-alpine valleys, especially with large shallow pools. Apparently declining. | no |
| **Spotted Tree Frog** *Litoria spenceri* | Schedule 1 Category 1 | Naturally vegetated, rocky, fast-flowing upland streams 280-1110m ASL. | no |
| **Southern Corroboree Frog** *Pseudophryne corroboree* | Schedule 1 Category 1 EPBC (e) | Pools and seepages; bog, wet heath, herbfield, grassland, 1240-1710 m ASL. Targeted searches for the species over recent years have failed to detect its presence in the resorts area (Connell Wagner 2000). | no |
| **FISH** | | | |
| **Mountain Galaxias** *Galaxias olidus* | Category 2 | Restricted to headwaters inaccessible to trout. | no |

* Schedule 1, 2 — *Threatened Species Conservation Act 1995*, endangered, vulnerable
Category 1-3 — KNP Schedule of Significant Natural Features; Very Highly Significant, Highly Significant, Significant
EPBC (e), (v) — *Environment Protection and Biodiversity Conservation Act 1999*, endangered, vulnerable

The dry heath located within and adjacent to the development site provides potential Broad-toothed Rat (*Mastacomys fuscus*) habitat. Broad-tooth Rat sign was located within the heath to the west and northwest of the site.

The *Threatened Species Conservation Act 1995* (TSC Act) introduces a set of eight factors which must be considered by decision-makers regarding the effect of a proposed development or activity on threatened species, populations or ecological communities, or their habitats. These factors form part of the threatened species assessment process under the *Environmental Planning and Assessment Act 1979* (EP&A Act) and are collectively referred to as the '8 Part Test'. As the dry heath located at the site provides known habitat to the Broad-toothed Rat an "8 Part Test", which sets out factors that need to be considered in deciding whether there is likely to be a significant effect on threatened species, as required by the TSC Act, has been completed. An 8 Part Test has been included in Attachment 5.

## 4.21 Biological Impacts

### 4.21.1 Flora

Impacts on the flora and fauna within the development site will be of a reduced level. A significant proportion of the proposed construction site has been subject to previous disturbance, and is dominated by 'Alpine Mix' grasses, clovers and other introduced herbs.

The works will require the removal of a limited amount of partially disturbed dry heath vegetation. Three small snowgums would also be removed to improve bushfire protection. Ongoing bushfire management would involve the removal of dead material and plant debris within a 20 metre APZ surrounding the lodge. No significant vegetation species where observed at the development site.

Given the abundance of similar dry heath vegetation within the Perisher area, the removal of a restricted amount of this vegetation community will not impact on its abundance within the local area. Impact on adjacent vegetation would be minimised by through the application of the safeguards recommended in the SEMP. Site fencing will be installed around the site, in order to minimise the risk of damage to the peripheral native vegetation due to construction activities.

The installation of appropriate site and erosion controls will minimise the risk of damage to the surrounding vegetation as a result of disturbance from the movement of construction machinery, vehicles and workers, the crushing of vegetation from the storage of building materials, or siltation from sediment loaded runoff. Refer to SEMP for further details.

Following the completion of works all disturbed areas will be revegetated. Revegetation and rehabilitation techniques should be completed in accordance with the recommendations in the SEMP. In areas where a grass cover will be retained (eg. the informal access track) Alpine Mix should be substituted with 100% non invasive Chewings Fescue. Other areas would be stabilised by sowing initially with 100% sterile black winter rye corn (or a similar species which grows rapidly and is non-invasive). This would be overplanted with *Poa fawcettiae* seed or tubestock to encourage recolonisation by native species. Straw mulch utilised during revegetation, would be certified weed and seed free hay. Refer to section 3.3.1 and SEMP for rehabilitation methodology.

A number of introduced weed species occur within and adjacent to the development site (alpine grasses, clovers, Yarrow). A number of these (especially Yarrow) are able to rapidly colonise disturbed sites. The likelihood of disturbed sites becoming dominated by weed species can be minimised via,

- weed control of the construction site prior to works taking place,
- ensuring that earth moving equipment is cleaned before entering the park,
- rapid revegetation of the site once construction is completed, and
- on-going weed control at the development site.

### *4.21.2 Fauna*

Potential impact on fauna as a result of the proposal is likely to be low. Dry heath is known to provide habitat to a variety of species, however, given the abundance of similar habitat within the local area, and surrounding sub-alpine areas conserved within Kosciuszko National Park, the disturbance to the magnitude proposed is unlikely to have a notable impact on native species dependent on this vegetation type. The impact that the development is likely to have on significant species is discussed in section 4.20.

The impact that the works are likely to have on the Broad-toothed Rat, (listed as vulnerable in the *Threatened Species Conservation Act 1995),* is assessed in the 8 Part Test, Attachment 5.

## *4.22 Soil, water and waste-water management*

Alpine areas play an important hydrological role. Runoff from precipitation and snow melt does not usually flow over the surface; rather it enters soils (alpine humus) and flows downwards. Where the water table reaches the surface, it usually manifests as bog and wet heath areas where water 'oozes' down slope, rather than flowing freely. Their ability to retain water and release it slowly, combined with the seasonal thaw (that typically occurs up until the summer months), ensures that local streams and rivers flow annually.

The important hydrological values of the alpine area are recognised. Safeguards have been recommended to minimise potential impact the works will have on the hydrological values of the development site. Refer to the SEMP for additional information on soil management and the SWMP for stormwater controls.

The proposal will not increase waste water or sewerage production. Existing services are located onsite. During the construction stage, any waste generated by the works will be stored in secured, appropriate receptacles and/or transported from the site to an approved depot. Ablution and water facilities will be available for contractors during the construction period (refer to SEMP).

## *4.23 Bushfire hazards and potential fire hazard arising from the development*

In terms of the Rural Fires Act (1997) the proposed works are unlikely to adversely impact on the existing fire regime affecting the area. The risk of a high intensity bushfire affecting the site is considered to be low, even though a major bushfire swept through Kosciuszko National Park during the summer of 02/2003.

The following text is from the Perisher Range Resorts Village Master Plan Environmental Impact Statement (p.C1-77) "*The bushfire potential within the resort area is assessed to be low. The low risk is associated with the climate of the area and the moisture loadings of the vegetation, as well as the slope and aspect. There have been very few ignitions of vegetation within the resort area and these have not travelled far due to the factors mentioned above. Life and property are more at risk from fires emanating from buildings rather than from a fire in vegetation*".

## 4.24 Social impact in the locality

The proposed extension will offer advantages to members and guests of the Lampada Ski Club community, by improving living conditions at the lodge. The proposal should not result in disadvantages to any other local community members.

The development will be of benefit to those employed in its construction. Construction works can create a public safety hazard. Refer to the SEMP for further safeguards to minimise risks to people, property and the environment.

The proposal will increase the number of people on site only temporarily but during this time it will increase employment opportunities for local contractors. The proposal will not adversely impact on the local community and will not create areas of insecurity or risk to occupants or pedestrians in or adjacent to the development.

During the construction period, there will be a slight increase in traffic along access the village track, however this would be of a low level (refer to section 4.13). The construction arrangements, including timing and duration of works, will be carried out in consultation with the National Parks and Wildlife Service and DIPNR to minimise any inconveniences.

Refer to the SEMP further additional safeguards.

## 4.25 Economic benefits to the locality

The development will not result in a cost to the community, nor will it effect the local community's economic stability. The proposed extension will provide employment (during construction) to builders. This is likely to be of advantage to the local economy. Lampada Ski Lodge's income is primarily received from tourism. The proposed extensions will improve living conditions to members of the Lampada Ski Club and is likely to increase the cliental in the future.

## 4.26 Environmental effects of construction processes

The construction period may result in minimal negative impacts of short duration, including localised modifications to the visual environment. These will be of a relatively low impact and due to the location of the development, will be partially hidden from the main slopes. Any impact caused during the construction/demolition phases should be outweighed by the benefits of the renovations. Any effects relating to runoff, erosion or landscape are considered low. These matters (including environmental other safeguards and remediation strategies) have been outlined in the SEMP.

### *4.26.1 Environmental Objectives and Performance Targets*

**Table 5.1** Environmental objectives and performance targets (refer to SEMP and SWMP for safeguards and recommendations outlined to achieve the targets below).

| Key environmental objectives | Risk of significant impact[1] | Performance target |
|---|---|---|
| **Hydrology and water quality**<br>• Avoid pollution of watercourses from sediment-laden runoff or chemical pollutants.<br>• Minimise pollution of adjacent waterways and drainage lines.<br>• Avoid disruption to groundwater flows and soil moisture status in areas surrounding work site. | Negligible-Low | 1. No visible discoloration of watercourses following rainfall events due to runoff from works site.<br>2. No measurable sediment deposition in drainage lines following a rainfall event (observed at pools downslope of runoff accession points).<br>3. No hydrocarbon impacts to vegetation or hydrological features. Hydrocarbon spill kits present and accessible at all times.<br>4. High level of awareness among field staff of emergency procedures and the use of clean up equipment.<br>5. Compliance to the SWMP as a minimum |
| **Soils**<br>• Minimise soil erosion.<br>• Minimise soil compaction in undisturbed areas<br>Minimise disturbance to soil profiles in disturbed areas.<br>Maintain vitality of stored and respread topsoil. | Low | 1. No measurable downslope movement of soil at the discharge point below the construction site or from work site runoff zones, during construction.<br>2. No major concentration of runoff following rainfall event, evidenced by rilling or gullying.<br>3. Respond to unanticipated runoff flows or erosion within 24 hours of commencement of rainfall event.<br>4. No noticeable dieback of vegetation caused by soil compaction or excavation other than that described by this SEE or SEMP. |
| **Flora**<br>• Minimise impacts to native vegetation. | Low-moderate | 1. No disturbance to, or loss of, native vegetation other than that documented in this SEE or SEMP.<br>2. No increase in distribution or abundance of weed populations in or around disturbed areas. |
| **Fauna**<br>• Minimise direct impacts to native fauna and habitat<br>• Restore habitat values as quickly as possible following the works. | Low | 1. Works are tightly contained within the disturbed area and as close as possible to the proposed development site<br>2. Achieve a high level of awareness in field staff of key fauna habitat values.<br>3. No observed fauna mortality due to construction. |
| **Social and economic impacts**<br>• Obtain community and visitor understanding of, and support for, the project to maximise tolerance. | Low | 1. No complaints received in relation to the works.<br>2. Any complaint received is responded to within 24 hours. |
| **Archaeology/Cultural Heritage**<br>• To minimise impacts on places and artefacts of archaeological and Aboriginal cultural significance | Negligible-Low | 1. No impact on Aboriginal or European heritage.<br>2. Work ceased and the relevant Local Aboriginal Land Council notified within 24 hours of the discovery of any suspected artefact. |
| **Visual and scenic**<br>• Minimise visual impact of works during and following construction. | Low | 1. No permanent damage to vegetation surrounding the proposal site.<br>2. High public awareness of the nature of the proposed works. |

[1] based on probability of occurrence and significance of consequences; assuming the effective implementation of the safeguards identified in this SEE

# 5 CONCLUSION

***We believe this Statement of Environmental Effects for alterations to Lampada clearly demonstrates that the enviromental impact resulting from the proposal will be of a reduced and acceptable level***

# 6 AUTHORS

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***Kent Mears - (Director) Lampada Ski Lodge***

***with reference to :***

***Environmental Effects Additions to Lampada Lodge NGH Enviromental - August 2007 NGH Enviromental***

***Heritage Impact Statement Victoria Design & Managemnt Pty Ltd - August 2005***

***Geotechnical Assessment Report GDH Pty Ltd - July 2016***

***The Disability (Access of Premises-buildings) Stanards 2010 Hendry Report - May 2015***

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# Attachment 1

Plant Species List

## SPECIES LIST FOR THE SITE

Relative abundance is given by a cover abundance scale (modified Braun-Blanquet):

1 1 to a few individuals present, less than 5% cover
2 many individuals present, but still less than 5% cover
3 5 - < 20% cover
4 20 - < 50% cover
5 50 - < 75% cover
6 75 - 100% cover

Cover/abundance scores relate to general abundance over the entire site, not to representative quadrats.

*Introduced species are preceded by an asterisk.

| **Scientific name** | **Common name** | **Family** | **Abundance** |
|---|---|---|---|
| TREES | | | |
| *Eucalyptus niphophila* | snow gum | Myrtaceae | 1 |
| | | | |
| SHRUBS | | | |
| *Cassinia uncata* | dogwood | Asteraceae | 1 |
| *Grevillea australis* | | Proteaceae | 1 |
| *Hovea montana* | | Fabaceae | 0-2 |
| *Hymenanthera dentata* | tree violet | Violaceae | 1 |
| *Nematolepis ovatifolia* | | Rutaceae | 0-3 |
| *Olearia phlogopappa* var. *flavescens* | | Asteraceae | 0-2 |
| *Orites lancifolia* | alpine orites | Proteaceae | 1 |
| *Ozothamnus secundiflorus* | cascade everlasting | Asteraceae | 1-4 |
| *Pimelea axiflora* ssp. *alpina* | | Thymeleaceae | 1 |
| *Pimelea ligustrina* ssp. *ciliata* | alpine rose | Thymeleaceae | 1 |
| *Prostanthera cuneata* | mint bush | Lamiaceae | 4 |
| *Richea continentis* | candle heath | Epacridaceae | 1 |
| | | | |
| FORBS | | | |
| *Acaena* sp. A | | Rosaceae | 1 |
| **Acetosella vulgaris* | sheep sorrel | Polygonaceae | 1 |
| *Dianella tasmanica* | blue flax lily | Phormiaceae | x |
| **Trifolium repens* | white clover | Fabaceae | 0-2 |
| | | | |
| GRASSES | | | |
| **Agrostis capillaris* | browntop bent | Poaceae | 2-4 |
| *Poa fawcettiae* | smooth blue snowgrass | Poaceae | 0-4 |
| | | | |
| GRAMINOIDS | | | |
| *Carex breviculmis* | | Cyperaceae | 1 |

# Attachment 2

Site Environmental Management Plan (SEMP)

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## Appendices

# 1 INTRODUCTION

## 1.1 Background

This Site Environmental Management Plan (SEMP) has been prepared to document the construction processes associated with proposed renovation works at Lampada Ski Lodge, Perisher.

The purpose of this SEMP is to:

- to document specific environmental objectives, issues and performance targets for the proposal;
- provide a framework for the development of appropriate environmental safeguards and the adoption of environmentally sound work practices to be implemented prior to, during and following the completion of the project (including guidelines for incidents and emergencies);
- outline an organisational profile, providing the relevant management arrangements and communication protocols to be implemented during the works. This aims to ensure that contractors are aware of the environmental management guidelines and procedures outlined in this SEMP, and who is responsible for implementing and maintaining the required safeguards; and
- provide a basis for the auditing, monitoring and reporting of environmental performance.

This SEMP has been designed to supplement and be read in conjunction with the *Statement of Environmental Effects* document which has also been prepared for the proposal The SEE contains further details of site values such as detailed environmental background, proposed works, likely impacts of the proposal and legislative requirements for environmen -tal protection.

## 1.2 Environmental Setting

### 1.2.1 Geology and soils

The proposed development site and materials storage area contain soils that are both disturbed and undisturbed. Disturbed areas have been subject to previous excavation associated with the construction and use of the existing access track, ski room, deck and supports. Soils in these areas consist largely of gravel or introduced grasses and herbs and do not contain a humic layer. Refer to section 4.1.1 of the SEE for additional background on the geology of the site.

Several rocks would have required displacement during the original works associated with the construction of the Lodge and the original deck. Further excavation may result in the disturbance of more rock, however, it would be of a small scale and limited to the construction site. Waste material such as rock and earth would be removed from the site. Any rocks disturbed on the perimeter of the work site would be moved back to their original position to minimise impact on habitat.

If construction activities (such vehicle or machinery movement) result in the disturbance of groundcover or the soil profile to such a degree that the soil may be destabilised, the area should be revegetated. Refer to SEE, *Section 4.5 - Rehabilitation & Section 2.3.1 - Rehabilitation* for further details.

### 1.2.2 Erosion

Rain splash and concentrated runoff are likely to generate erosion at the site. Due to the position of the site and the surrounding topography, however, the likelihood of severe erosion occurring with appropriately managed construction is low. Timing (eg. avoiding works during expected rain periods) and adequate controls (such as the installation of sediment fencing) are the most important factors in minimising the potential for erosion to occur.

All areas are to be stabilised to reduce impact from frost, wind and raindrop action and this should take place immediately after the completion of construction. Stabilisation would include both short and long term prescriptions outlined in the *Stormwater Management Plan* (SWMP – Attachment 3 of the SEE), and seeding. Given the small scale and nature of the propose works a separate Erosion and Sediment Control Plan (ESCP) was not considered necessary. Instead the necessary erosion and sediment controls that will be applied during construction have been included in the SWMP and this SEMP.

### 1.2.3 Water

The Lampada Ski Lodge is located on the lower eastern slopes of the Back Perisher Mountain, approximately 200m north of a tributary of Perisher Creek and approximately 300m west of Perisher Creek itself. This water course is not expected to be impacted on by the proposed works. At the time of the proposed construction, after the winter melt, the area is expected to be relatively dry compared to other times of the year (approximately half of the areas annual rainfall falls in the winter months).

### 1.2.4 Vegetation

Several trees, shrubs and an area of dry heath are located adjacent to the site. One of the requirements of the SEE is that disturbance to vegetation would be minimal and should be treated as a priority during construction. To ensure that the works will not impact on vegetation other than that outlined by the SEE, the requirements of the root systems should also be noted. Protection of trees and other vegetation, including their root systems, would be achieved by fencing off areas of intact native vegetation around the construction site. If root zones are to be impacted upon, a temporary layer of woodchip overlaying a base of geo-fabric could be used for protection against desiccation.

### 1.2.5 Fauna

The vegetation adjacent to the site is known to provide habitat for the Broad-toothed Rat. Broad-toothed Rat habitat should be protected where possible, and only vegetation outlined in the SEE would be removed. The potential impact of the works on this and other fauna species has been considered in section 4.20.2 of the SEE.

### 1.2.6 Rehabilitation

*General specifications for rehabilitation:*

The specifications below are applicable to all areas where vegetation has been disturbed to such a level that rehabilitation may be warranted, eg. bare earth areas.

*Pre-construction*

- Tree Removal: **no** trees will require removal.
- Significant Species: **no** significant species will be affected by the proposal.

*Preparation*

Excavated soils, rocks and vegetation should be removed from the site and temporarily stockpiled in designated areas if they are to be reused (refer to SWMP - Attachment 3 of SEE, for stockpile site) or disposed of in an appropriate landfill site. The stockpile sites will be away from any natural drainage paths. They should also be located in a cleared area and have erosion and sediment controls implemented, such as sediment fencing installed down-slope or around the perimeter.

Where weeds exist on the work site they must be sprayed with an approved herbicide three to six weeks before works begin to reduce risk of the spread of weeds.

*Planting/seeding*

1. If disturbance of groundcover or the soil profile has occurred to such a degree that the soil may be destabilised (eg. through vehicle movement), the area should be revegetated. Initially the site would be sown with 100% sterile black winter rye corn (or similar species which grows rapidly and is non-invasive). Black winter rye corn should be spread at the rate of 120kg per hectare. To encourage the re-establishment of native species, the site should then be over seeded with indigenous grasses such as *Poa fawcettiae,* sown at a rate of 5-7 per square metre. In areas where a grass cover will be retained (eg. the informal access track) 100% non invasive Chewings Fescue could be used.
2. Seeded areas will be watered directly after planting and every day for the following week. If the season remains dry, the site will need to be watered regularly.

*Stabilisation*

1. All areas are to be stabilised to reduce impact from frost, wind and raindrop action and this should take place immediately after the completion of construction.
2. Stabilisation would include short-term prescriptions outlined in the SWMP and seeding (outlined above). Large areas, or those on steep slopes that are considered to be highly disturbed would be seeded (as described) and then covered with organic jute mesh matting that is anchored or pinned down to the ground. This would help to encourage native groundcover encouraging moisture retention, suppression of weed growth and soil stabilisation. Tubestock should also be considered along with locally sourced native shrubs if larger areas of vegetation are removed.

*Maintenance*

1. This includes the achievement of at least 80% vegetative cover on areas stabilised with black winter rye corn / native ground cover.
2. Spraying (if necessary to control weeds) should be completed on a still day to reduce the possibility of spray drift onto native vegetation. A rate of 3 litres/hectare of Glyphosphate (active ingredient) and a wetting agent is recommended.

# 2 SITE ENVIRONMENTAL MANAGEMENT

## 2.1 Management & Communication Structure

Contractors will be responsible for management of their works crew and implementation of this SEMP. The project organisational structure is illustrated in Figure 3.1.

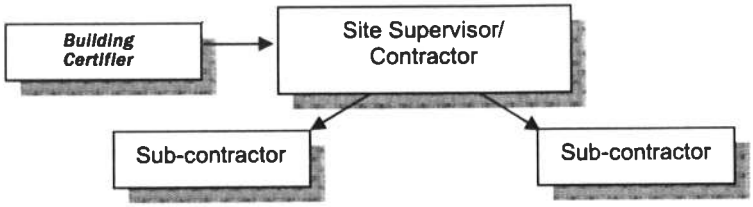



**Figure 2.1:** Project Organisation & Communication Structure

## 2.2 Roles and Responsibilities

### 2.2.1 Site Supervisor/Contractors

- defines environmental responsibilities within the project;
- is familiar with contents of this SEMP;
- supervises and ensures the requirements of the SEMP are implemented;
- supervises implementation of training/induction;
- ensures records are kept;
- ensures that all personnel including contractors/sub-contractors (if required) comply with the SEMP requirements relevant to their scope of work; and
- ensures environmental requirements are incorporated into contract documents.

### 2.2.2 Sub- contractors (if required)

- implement and maintain SEMP relevant to work being undertaken; and
- report on compliance as required.

## 2.3 Training

All staff involved with works would be made aware of the relevant requirements of the SEE and this SEMP (and Attachments). Training would be initiated by site induction.

The contractors are responsible for site induction and training of their immediate staff.

Site induction of all staff would include;

- training in the principle of due diligence,
- training in relevant codes of practice relating to construction activities,
- training in specific environmental issues including;
    - those identified in the SEE,
    - relevant legislation/licences/approvals,
    - emergency preparedness/procedures,
    - incident reporting,
    - community consultation, and
    - site environmental procedures;
- ensuring awareness of emergency response plans, incident reporting and how to respond to potential chemical spills.

Site induction of supervisory staff would include;

- the need to induct all persons involved in the project on site, and
- regular briefings in relation to requirements of the SEMP.

## 2.4 Emergency/Incident Reporting

Contractors would be responsible for monitoring any emergency/incident, and subsequent action taken by the Site Supervisor, Works Manager or relevant authority. This would be recorded in an Incident Report Form (refer to Appendix 1).

If sub-contractors are involved with an incident their plan would include a requirement to contact Site Supervisor/Works Manager.

The emergency/incident procedure plan would include the following as a minimum:

- The safety of any persons either workers or others involved in the event is to be the first priority.
- Any environmental damage is to be contained and quickly minimised. All emergency actions should take place as soon as possible after the event. Note: it is a requirement that each work crew keeps hydrocarbon and spill containment kits on site at all times.
- The appropriate departmental representative should be contacted immediately after an incident.
- The requirement to contact other organisations if necessary (eg. NPWS, DIPNR, EPA, Police).
- Following rectification of the incident, a full report would be prepared by the Site Supervisor/Works Manager for review by the relevant authority.

- During any incident the EPA, and/or Contractor Works Manager would be supplied with the names and telephone numbers of the Site Supervisor, who will be available on a 24 hour basis.
- The site representative would have the authority to take immediate action to shut down any activity, or to affect any pollution control measure, as directed by an authorised officer of the EPA.

It would be a requirement that contractors have an emergency/incident procedure plan, which includes an oil spill response plan. The contractors are responsible for responding to any environmental emergency, including contacting appropriate authorities (NPWS, DIPNR, EPA etc).

## *2.5 Environmental Control Plans*

A Storm Water Management Plan (SWMP) incorporating erosion and sediment controls has been prepared for the works (Attachment 3 of the SEE).

# *3 ENVIRONMENTAL SAFEGUARDS*

Environmental safeguards to be employed during construction are detailed in the following tables. They are to be implemented to meet the objectives outlined in Table 5.1 – Environmental Objectives in the SEE.

## 3.1 Community Impact Management

| Key Performance Indicators (KPIs) | | | |
|---|---|---|---|
| ***PARAMETER*** | ***THRESHOLD*** | ***MEASUREMENT LOCATION*** | ***AUDITOR'S COMMENT*** |
| ***Minimise community impacts associated with the works.*** | Community understanding of the proposal achieved. | Incident report records. Records of consultation. | |
| | All complaints and incidents appropriately dealt with. | | |

| Management Plan | | | |
|---|---|---|---|
| ***MANAGEMENT PRACTICES*** | ***MONITORING*** | ***RESPONSIBILITY*** | ***CHECKED/COMMENTS*** |
| 1. Consultation shall be undertaken with DIPNR and in regards to the nature of the proposal. | *Prior to construction* | *Proponent* | |
| 2. Records shall be kept of all incidents and complaints. | *Continuous* | *Contractor* | |

## 3.2 Soils, Geology, Geomorphology, Hydrology and Water Quality

| Key Performance Indicators (KPIs) | | | |
|---|---|---|---|
| ***PARAMETER*** | ***THRESHOLD*** | ***MEASUREMENT LOCATION*** | ***AUDITOR'S COMMENT*** |
| ***Minimise the potential for soil erosion*** | No major concentration of runoff following rainfall event, evidenced by rilling or gullying, particularly at drainage discharge points. | Areas surrounding construction site. | |
| ***Minimise soil compaction*** | No noticeable dieback of vegetation caused by soil compaction bordering area outlined for disturbance. | Areas surrounding construction site. | |
| ***Avoid pollution of water-courses by sediment-laden runoff or chemical pollutants*** | No visible discoloration or sedimentation in watercourses following rainfall events due to runoff from works site. | Areas surrounding construction site. | |
| | Appropriate spill kits present and accessible at all times. | With contractors. | |
| | High level of awareness among field staff of emergency procedures and the use of clean up equipment. | Contractors. | |

| | | | |
|---|---|---|---|
| 10. Vegetative sods/topsoil and subsoil excavated from the site shall be treated as described in the Vegetation Management section of this SEMP. | *Continuous* | *Contractor* | |
| 11. Scheduling of ground disturbance works will avoid predicted periods of heavy rainfall and would commence only during stable weather conditions. Should a rainfall event occur, the site would have appropriate erosion/runoff mitigation measures applied. | *Continuous* | *Contractor* | |
| 12. Sediment fences and other sediment and water quality control devices will be inspected daily and maintained so that they remain effective at all times. | *Continuous* | *Contractor* | |
| 13. No stockpiles of earth (or construction materials) would be placed within any channel or runoff point, to ensure that natural water courses are not disrupted. | *Continuous* | *Contractor* | |
| **Post Construction** | | | |
| 14. Revegetation will be undertaken, as described in Section 1.2.6, where disturbance to soil has occurred. Revegetation will take place as soon as possible following the completion of works. | *Following completion of construction* | *Contractor* | |

## *3.3 Transport, Storage and Handling of Hazardous Materials*

| Key Performance Indicators (KPIs) | | | |
|---|---|---|---|
| ***PARAMETER*** | ***THRESHOLD*** | ***MEASUREMENT LOCATION*** | ***AUDITOR'S COMMENT*** |
| ***Minimise risk of chemical spills.*** | No fuel or chemical spills occur. | On site, wherever hazardous materials are used. | |
| | Fuel and chemicals are handled in a manner which would not increase the likelihood of a spill occurring. | | |

| Management Plan | | | |
|---|---|---|---|
| ***MANAGEMENT PRACTICES*** | ***MONITORING*** | ***RESPONSIBILITY*** | ***CHECKED/COMMENTS*** |
| **During Construction** | | | |
| 1. Cement and additives shall be stored in a manner in which they are protected from the weather and stormwater. | *Continuous* | *Contractor* | |

| | | | |
|---|---|---|---|
| 2. The use and storage of chemicals classified as a Dangerous Goods Class 6 Poison shall be strictly in accordance with the manufacturer's instruction and the relevant Materials Safety Data Sheets (MSDS). | *Continuous* | *Contractor* | |
| 3. Check machinery daily to ensure there is no oil, fuel or other liquids leaking from the machinery. If leaks are detected, stand machinery down until the leak is repaired. | *Continuous* | *Contractor* | |
| 4. Care will be taken when refuelling or servicing plant to ensure containment of any spilled fuels or oils. | *Continuous* | *Contractor* | |
| 5. Refuelling shall not occur in the vicinity of waterways or environmentally sensitive areas. Operators' to remain nearby while refuelling and ensure refuelling is performed responsibly and with respect to due diligence. | *Continuous* | *Contractor* | |
| 6. Any oil/fuel/chemical spills or accidents on site that are likely to cause pollution, shall be reported through the management in accordance with the relevant legislation and the contractor's EMP. | *Continuous* | *Contractor* | |
| 7. Any on-site spillage of fuels or chemicals shall be contained immediately and the incident shall be notified to the Site Supervisor and Project Manager. Removal and disposal of contaminated material shall be undertaken in consultation with the DEC/EPA, and the contractor's EMP. | *Continuous* | *Contractor* | |
| 8. Contractors shall have an emergency/incident procedure that includes an oil spill response plan. Contractors shall be responsible for responding to any environmental emergency, including contacting appropriate authorities. | *At site induction* | *Construction Manager* | |
| 9. Emergency procedures shall be displayed in a prominent position. | *Continuous* | *Construction Manager* | |
| 10. Any contaminated material (empty drums, rag, contaminated soil, etc.) shall be removed from the site and disposed of in accordance with the appropriate regulations. | *Continuous* | *Contractor* | |
| 11. Fuels and other chemicals would be stored appropriately within impermeable bunded structures capable of holding 110% of the total volume stored. | *Continuous* | *Contractor* | |

| | | | |
|---|---|---|---|
| 12. A 20 litre container of spill absorbent shall be kept within the site working area to be used for emergency fuel/oil spills. | *Continuous* | *Contractor* | |

## 3.4 Waste Management

| Key Performance Indicators (KPIs) | | | |
|---|---|---|---|
| ***PARAMETER*** | ***THRESHOLD*** | ***MEASUREMENT LOCATION*** | ***AUDITOR'S COMMENT*** |
| ***Remove all waste from the construction site and recycle waste where possible.*** | No waste remains at the construction sites. | At construction sites. | |
| | Waste is appropriately disposed of. | Waste disposal locations. | |

| Management Plan | | | |
|---|---|---|---|
| ***MANAGEMENT PRACTICES*** | ***MONITORING*** | ***RESPONSIBILITY*** | ***CHECKED/COMMENTS*** |
| **Prior to Construction** | | | |
| 1. All workers shall be informed of the need to maintain a clean and secure site. | *Site Induction* | *Construction Overseer/Contractors* | |
| **During Construction** | | | |
| 2. Waste which is unsuitable for re-use or recycling will be disposed of at a licensed landfill site. Non-putrescible waste will be disposed of at a designated tip. | *Continuous* | *Contractor* | |
| 3. Littering or dumping of waste or disposal of surplus construction materials including concrete, or permitting such activities on any land on or around the site is not permitted. Rubbish will not be burnt or buried at the site. | *Continuous* | *Contractor* | |
| 4. Construction litter will be contained within nominated sites. Secure rubbish bins would be provided at the site and emptied as required. Smaller objects that can be windblown will be disposed of in hoppers. | *Continuous* | *Contractor* | |
| 5. All loads of rubbish or any other material being transported shall be securely covered to ensure no spillage. | *Continuous* | *Contractor* | |

| | | | |
|---|---|---|---|
| 6. Concrete washings are to be undertaken outside the National Park or within designated disposal areas if practicable. Where this is not practical, concrete wash and excess concrete will be contained and stored in sealed drums for offsite disposal. | *Continuous* | *Contractor* | |
| 7. Maximise resource reuse including recycling of construction waste where practical. | *Continuous* | *Contractor* | |
| 8. Ablution and water facilities will be available for contractors during the construction period (mobile-sealed toilet, eg. Portaloo). Human waste from such facilities would be disposed of off-site at an appropriate facility by a licensed contractor in accordance with relevant regulations. | *Continuous* | *Construction Overseer/Contractors* | |
| **Post Construction** | | | |
| 9. Construction site to be left clean and free of weeds, rubbish and other waste on completion of the works. | *Continuous* | *Construction Overseer/Contractors* | |

## 3.5 Vegetation Management (Including Weed, Pest and Hygiene Management)

| Key Performance Indicators (KPIs) | | | |
|---|---|---|---|
| ***PARAMETER*** | ***THRESHOLD*** | ***MEASUREMENT LOCATION*** | ***AUDITOR'S COMMENT*** |
| ***Minimise potential impacts to native vegetation.*** | Impact on vegetation is restricted to that detailed in the SEE. | Access track and area adjacent to construction site. | |
| ***Revegetation achieved.*** | Minimum 80% success rate of revegetation cover two years after the completion of the works. | Revegetation areas. | |
| ***Avoid the spread of weeds.*** | No increase in distribution or abundance of weed populations in or around disturbed areas. | In the vicinity of disturbed areas/ construction areas. | |

| Management Plan | | | |
|---|---|---|---|
| ***MANAGEMENT PRACTICES*** | ***MONITORING*** | ***RESPONSIBILITY*** | ***CHECKED/COMMENTS*** |

| | | | |
|---|---|---|---|
| **Prior to Construction** | | | |
| 1. All construction staff will be made aware of the need to preserve native vegetation and control weeds. | *Prior to construction* | *Construction Overseer/Contractor* | |
| 2. All sites shall be clearly marked prior to construction commencing. Clearing and land disturbance shall be limited, where possible, to the footprint of the works. | *Prior to and during construction* | *Construction Overseer/Contractor* | |
| 3. Trees that are adjacent to construction sites shall be protected using fencing that encloses the likely area of their root system. | *Prior to construction* | *Construction Overseer* | |
| 4. If root zones are to be impacted upon, a temporary protection layer of wood chip on a base of geo-fabric will be used. The fabric is to be laid over the area of concern and topped with a 150mm thick layer of woodchips, this can be removed immediately following the disturbance. | *Prior to construction* | *Construction Overseer* | |
| 5. Where weeds exist, they shall be sprayed with an approved herbicide three to six weeks before work begins to reduce risk of their spread. Spraying (if necessary) should be completed on a still day to reduce the possibility of spray drift onto native vegetation. A rate of 3 litres/hectare of Glyphosate and wetting agent is recommended. A DEC representative is required to be on site at the time of spraying. | *2 weeks prior to works commencing* | *Contractor* | |
| 6. All machinery is to be clean of dirt prior to mobilisation to the site to minimise potential for the transfer of weeds or disease. | *Prior to mobilisation* | *Contractor* | |
| **During Construction** | | | |
| 7. Machinery and vehicular access will not occur outside the identified areas described in 1 above. | *Continuous* | *Contractor* | |
| 8. Impact on vegetation outside of the areas described in the SEE for this project will be avoided. | *Continuous* | *Contractor* | |
| 9. Straw bales used for sediment control (if required) shall be certified "weed free". | *Continuous* | *Contractor* | |

| | | | |
|---|---|---|---|
| 10. Soil shall not be imported to the site, ***or*** exported from the site. Soil will be used as close as practicable to its site of origin to minimise the transfer of weeds across the site. | *Continuous* | *Contractor* | |
| 11. Cleared native shrubs should be mulched and re-used for landscaping on-site. Mulch should be applied as close to its original location as possible. Weeds shall be separated from native species and they shall not be reused for mulch. | *Continuous* | *Contractor* | |
| 12. Proposed stock pile areas (if required) would be inspected prior to works occurring for weed species. If weeds are detected they would be treated as outlined in point 5 above. | *Continuous* | *Contractor* | |
| **Post Construction** | | | |
| 13. All revegetated areas shall be stabilised immediately after the completion of construction by the methods described in Section 1.2.6. | *Stabilisation/rehabilitation to be carried out immediately following completion of works according to Section 1.2.6 of this SEMP* | *Construction Overseer/ Contractor* | |
| 14. For long term stabilisation, seeding with native species is recommended (eg. locally sourced *Poa fawcettiae* from a certified local distributor), however, 100% Chewings Fescue spread at the rate of 120 kg per hectare may be used if local seed or tubestock cannot be obtained. | *Post construction* | *Construction Overseer/Contractor* | |
| 15. Revegetated areas shall be watered directly after planting and daily for the following week unless there is rainfall. If the season remains dry, the site will require regular watering. | *Post revegetation* | *Construction Overseer/Contractor* | |
| 16. Mulch (if required) will be replaced when it breaks down, until there is sufficient groundcover to retain moisture, suppress weed growth and stabilise the soil. | *Review condition bi-annually* | *Construction Overseer/Contractor* | |
| 17. The condition of rehabilitated areas shall be monitored seasonally (Summer, Autumn, Winter and Spring) until permanent vegetation cover is achieved. Where necessary, follow-up planting shall be carried out along with appropriate weed control. | *Seasonally* | *Construction Overseer/Contractor* | |

| | | | |
|---|---|---|---|
| 18. Follow up weed control will take place at least bi-annually for a minimum of two years following construction. | *Bi-annually* | *Construction Overseer/Contractor* | |

## 3.6 Fauna Management

| Key Performance Indicators (KPIs) | | | |
|---|---|---|---|
| ***PARAMETER*** | ***THRESHOLD*** | ***MEASUREMENT LOCATION*** | ***AUDITOR'S COMMENT*** |
| ***Minimise direct impacts to native fauna and habitat.*** | Works and impacts are tightly contained in sensitive areas. | *Work site, access track and surrounding areas.* | |
| | Field staff have a high level of awareness of key fauna habitat values. | | |
| ***Avoid the spread of disease, weeds and vermin.*** | No weeds, vermin or diseases are introduced to the site as a result of the works. | *Work site, access track surrounding areas.* | |
| ***Restore habitat values as quickly as possible following the works.*** | Priority is given to site rehabilitation/revegetation following completion of works. | *Rehabilitation areas.* | |

| Management Plan | | | |
|---|---|---|---|
| ***MANAGEMENT PRACTICES*** | ***MONITORING*** | ***RESPONSIBILITY*** | ***CHECKED/COMMENTS*** |
| **Prior to Construction** | | | |
| 1. Works will not impact on important habitat. | *Prior to construction* | ***ngh**environmental* | |
| 2. Field staff will be informed of the importance of maintaining habitat values and avoiding impact on fauna. | *Prior to construction* | *Construction overseer/contractor* | |
| **During Construction** | | | |
| 3. Habitat values shall be protected through:<br>• Limiting the extent and duration of the works; and<br>• Effective weed control and hygiene. | *Continuous* | *Contractor* | |
| 4. Sub-surface rocks shall be redistributed as closely as possible to their original distribution. | *Continuous* | *Contractor* | |
| 5. If any wildlife is injured during the works a DEC representative | *Continuous* | *Contractor* | |

| | | | |
|---|---|---|---|
| would be notified. | | | |
| **Post Construction** | | | |
| 6. Site rehabilitation will be carried out as detailed in Section 1.2.6 of this SEMP. | *Bi-annually* | *Construction Overseer* | |

## 3.7 Fire Hazard Management

| Key Performance Indicators (KPIs) | | | |
|---|---|---|---|
| ***PARAMETER*** | ***THRESHOLD*** | ***MEASUREMENT LOCATION*** | ***AUDITOR'S COMMENT*** |
| ***Does not increase the likelihood of a wildfire occurring.*** | Potential sources of ignition are controlled. | *On site.* | |
| | No fires occur on site. | | |

| Management Plan | | | |
|---|---|---|---|
| ***MANAGEMENT PRACTICES*** | ***MONITORING*** | ***RESPONSIBILITY*** | ***CHECKED/COMMENTS*** |
| **During Construction** | | | |
| 1. No fires will be permitted on site, including burning-off of materials. | *Continuous* | *Contractor* | |
| 2. Cigarette butts are to be discarded appropriately, for example, in a bin containing sand and dedicated to 'butts only'. | *Continuous* | *Contractor* | |
| 3. All equipment using internal combustion engines shall be inspected to ensure that the muffler and exhaust pipes are in good repair and contain spark arresters. | *Continuous* | *Contractor* | |
| 4. No cutting, welding, grinding or other activities likely to generate fires shall be undertaken in the open on "total fire ban" days. | *Continuous* | *Contractor* | |
| 5. Two general-purpose fire extinguishers and two fire extinguishers suitable for control of oil or petrol fires shall be available on site at all times and shall be in useable condition. | *Continuous* | *Contractor* | |
| 6. A minimum of one person on site shall be familiar with or trained | *Continuous* | *Contractor* | |

| | | | |
|---|---|---|---|
| in the use of fire-fighting equipment. | | | |
| 7. All flammable materials shall be kept in a locked bunded area within the site. | *Continuous* | *Contractor* | |

## 3.8 Air Quality, Noise & Vibration Management

| Key Performance Indicators (KPIs) | | | |
|---|---|---|---|
| ***PARAMETER*** | ***THRESHOLD*** | ***MEASUREMENT LOCATION*** | ***AUDITOR'S COMMENT*** |
| ***Ensure that works conform with the Environment Protection Authority's construction noise criteria.*** | No infringements. | *At work site. Incident reports.* | |
| ***Ensure that airborne emissions are limited.*** | No illegal emissions occur. | *At work site. Incident reports.* | |
| | No complaints about air-borne emissions are received. | | |

| Management Plan | | | |
|---|---|---|---|
| ***MANAGEMENT PRACTICES*** | ***MONITORING*** | ***RESPONSIBILITY*** | ***CHECKED/COMMENTS*** |
| **Prior to Construction** | | | |
| 1. Management of adjacent lodges to be advised about the construction activities. | *N/A* | *Proponent* | |
| **During Construction** | | | |
| 2. Excavation shall be avoided when soil moisture levels are low, and high levels of dust are likely to be generated. Dust levels on site will be visually monitored. Dust suppression (eg. water sprays) will be implemented if required. | *Continuous* | *Contractor* | |
| 3. Dry loads and stockpiles, such as cement, shall be covered and protected from prevailing weather conditions. | *Continuous* | *Contractor* | |
| 4. All equipment shall be regularly maintained, and operated | *Continuous* | *Contractor* | |

## 3.10 Cultural Heritage Management

| Key Performance Indicators (KPIs) | | | |
|---|---|---|---|
| ***PARAMETER*** | ***THRESHOLD*** | ***MEASUREMENT LOCATION*** | ***AUDITOR'S COMMENT*** |
| ***To minimise impacts on places and artefacts of archaeological and Aboriginal cultural significance, consistent with obligations under section 90 of the NPW Act.*** | No impact on Aboriginal or non-indigenous heritage. | *At construction sites. Incident reports.* | |

| Management Plan | | | |
|---|---|---|---|
| ***MANAGEMENT PRACTICES*** | ***MONITORING*** | ***RESPONSIBILITY*** | ***CHECKED/COMMENTS*** |
| **During Construction** | | | |
| 1. If any material suspected of being Aboriginal in origin is found during the proposed works, ground disturbing works must cease and a DEC representative and the relevant Local Aboriginal Land Council will be notified within 24 hours of the discovery. This will ensure that identified archaeological sites can be recorded. | *Continuous* | *Contractor* | |

# Appendix 1

Record of Incident/Complaint

# Incident Record,

# Lampada Ski Lodge extension works,

# Perisher

**For the recording of a complaint or incident (both verbal and written complaints).**

| | |
|---|---|
| **Time and date of incident/complaint:** | |
| **Reference number:** | |
| **Name of representative who witnessed incident/complaint:** | **Name and contact details of complainant:** |
| **Nature of incident/complaint:** | |
| **Action taken in response to incident/complaint:** | |
| Overseer's signature:_____ (or appropriate delegate) | Date:_____ |

# Attachment 3

Storm Water Management Plan (SWMP)

## Table of contents

## Introduction

This Stormwater Management Plan (SWMP) (including erosion and sediment controls) been prepared to outline procedures to control stormwater and the impact of erosion and turbid runoff/runon associated with the proposed Lampada Ski Lodge extension works. Due to the scale and nature of the proposed works it was considered unnecessary to produce a separate Erosion and Sediment Control Plan (ESCP). As such the temporary erosion and sediment controls have been included in this SWMP. This document should be read in conjunction with the accompanying Site Environmental Management Plan (SEMP) and the Statement of Environmental Effects.

The purpose of this SWMP is to:

- Identify specific environmental objectives, issues and performance measures specifically related to erosion and sediment control (short term) and stormwater management (long term) for the proposal;
- Outline management prescriptions to address the
  - methods and timing of vegetation clearing, and
  - management of cleared vegetation and topsoil;
- Provide guidelines for the installation of temporary methods of erosion and sediment control;
- Provide recommendations for the installation of ongoing controls to manage stormwater;
- Document environmental management safeguards associated with erosion and sediment control and stormwater to be implemented prior to, during and following the completion of the project (including construction details of the works associated with implementing these safeguards); and
- Provide a framework for monitoring the effectiveness of the erosion and sediment controls that have been implemented, outlining routine maintenance requirements and remedial action in the case of failure events.

## Background

This SWMP has been prepared for the stabilization and prevention of sediment loss and ongoing management of stormwater related to the proposed Lampada Ski Lodge extension works.

The site itself requiring excavation or direct disturbance **(for new bedroom, ensuite and storeroom)** only measures approximately 4.8m x 5.18m for the **southern** alterations. **Approximate total of area of** 9.98m$^2$. Although a significant part of this area has been previously disturbed, it is likely that soils of an area in excess of these dimensions will be disturbed also.

### *Soils*

The topsoils are typically shallow consisting of humus (approximately the top 200mm), overlaying rocky granitic soils. Processes likely to generate erosion at the site are rain splash and concentrated runoff. However, due to the position of the site and the surrounding topography, the likelihood of severe erosion occurring with appropriately managed construction is low. Timing (e.g. avoiding works during expected rain periods) and adequate controls (such as the installation of sediment fencing) are the most important factors in minimising the potential for erosion to occur.

### *Slopes*

The site itself is located mid-slope with a moderate gradient ranging from relatively flat (around the immediate area of the Lodge) to slopes of approximately 23 degrees uphill and 13 degrees downhill of the Lodge. A number of granite outcrops are located immediately adjacent to the proposed work site,

## References

Bureau MRGG, 1988, *Geology of Kosciusko National Park*, Bureau of Mineral Resources, Geology and Geophysics, 1:250 000 mapsheet.

Department of Land & Water Conservation, 1996, Urban Erosion & Sediment Control: Field Guide

Landcom, 2004, "Blue Book" Soils & Construction: Managing Urban Stormwater, Volume 1 4th Ed.

# General Prescriptions & Constraints

Sediment control measures will be routinely inspected and replaced or upgraded if required.

Soil stockpiles will be located on existing disturbed hard stand areas, which are protected from runoff and run-on of water with sediment fencing, diversion banks or straw bales.

Site access will be restricted to the defined access route.

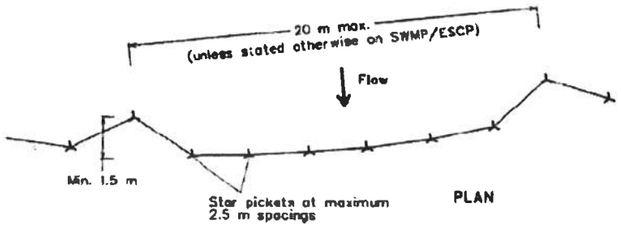
No stock piles would be placed within any channel or runoff point.

Disturbed areas of vegetation will be rehabilitated according to Section 1.2.6 of the SEMP.

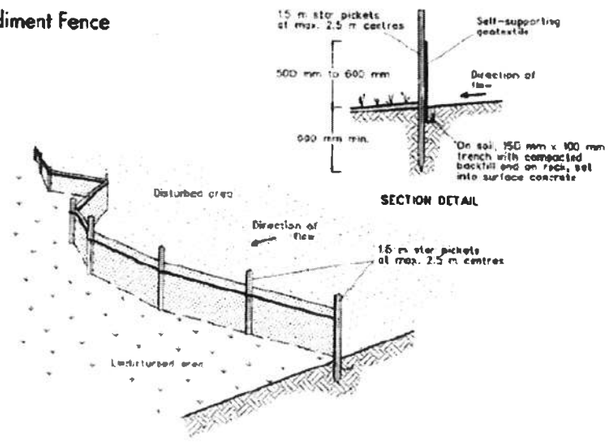
Ground cover vegetation would be retained where possible. The vegetated areas downhill from the site will play an important role as an additional sediment filter for turbid runoff. As such impact on this area should be minimsed.

Runon derived from the western slope would be controlled using the existing retaining wall and associated drainage. This wall (and assocaited drainage features such as agricultural pipe) would be extended around the proposed extensions on their completion. This would divert runon around the lodge, downslope into adjacent vegetation.

## Sediment Fence




## Sediment Fence

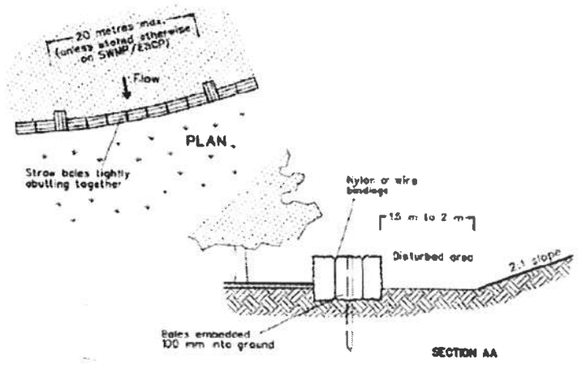



### Sediment Fences

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

**Figure 1. Sediment Fence**

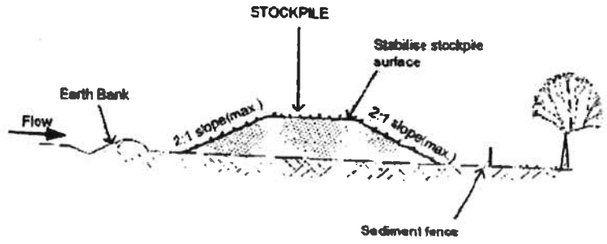
## Straw Bale Filter




### Straw Bale Filters

1. Construct the straw bale filter as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section.
2. Place bales lengthwise in a row with ends tightly abutting. Use straw to fill any gaps between bales. The straws in each bale are to be aligned parallel to ground.
3. Ensure that the maximum height of the filter is one bale.
4. Embed each bale in the ground 75 mm to 100 mm and anchor with two 1.2 metre star pickets or stakes. Angle the first star picket or stake in each bale towards the previously laid bale. Drive them 600 mm into the ground and, if possible, flush with the top of the bales. Where star pickers are used and they protrude above the bales, ensure they are fitted with safety caps.
5. Where a straw bale filter is constructed downslope from a disturbed batter, ensure the bales are placed 1 to 2 metres downslope from the toe.
6. Establish a maintenance program that ensures the integrity of the bales is retained – they could require replacement each two to four months.

**Figure 2. Straw Bale Diversion Banks**




### Construction Notes

1. Locate stockpile at least 4m from any trees. Do not remove any exisiting vegetation.
2. Stockpile should be piled on geotextile matting.
3. Seperate stockpiles should be used for vegetation sods, topsoils and subsoils where possible, to aid in rehabilitation.
4. Stockpiles will not exceed 2m in height. Where material requires removal from site, it would be removed as soon as possible.
5. Straw bales (upslope, or sediment fencing) and sediment fencing (downslope) would be installed to divert runon and capture runoff.
6. Ground under the geotextile matting would be rehabilitated if required under the guidelines outlined in the SEMP/SEE

**Figure 3. Soil Stockpiles**

General Notes

| No. | Revision/Issue | Date |
|---|---|---|
| | Final | 12.08.16 |

Firm Name and Address

Project Name and Address

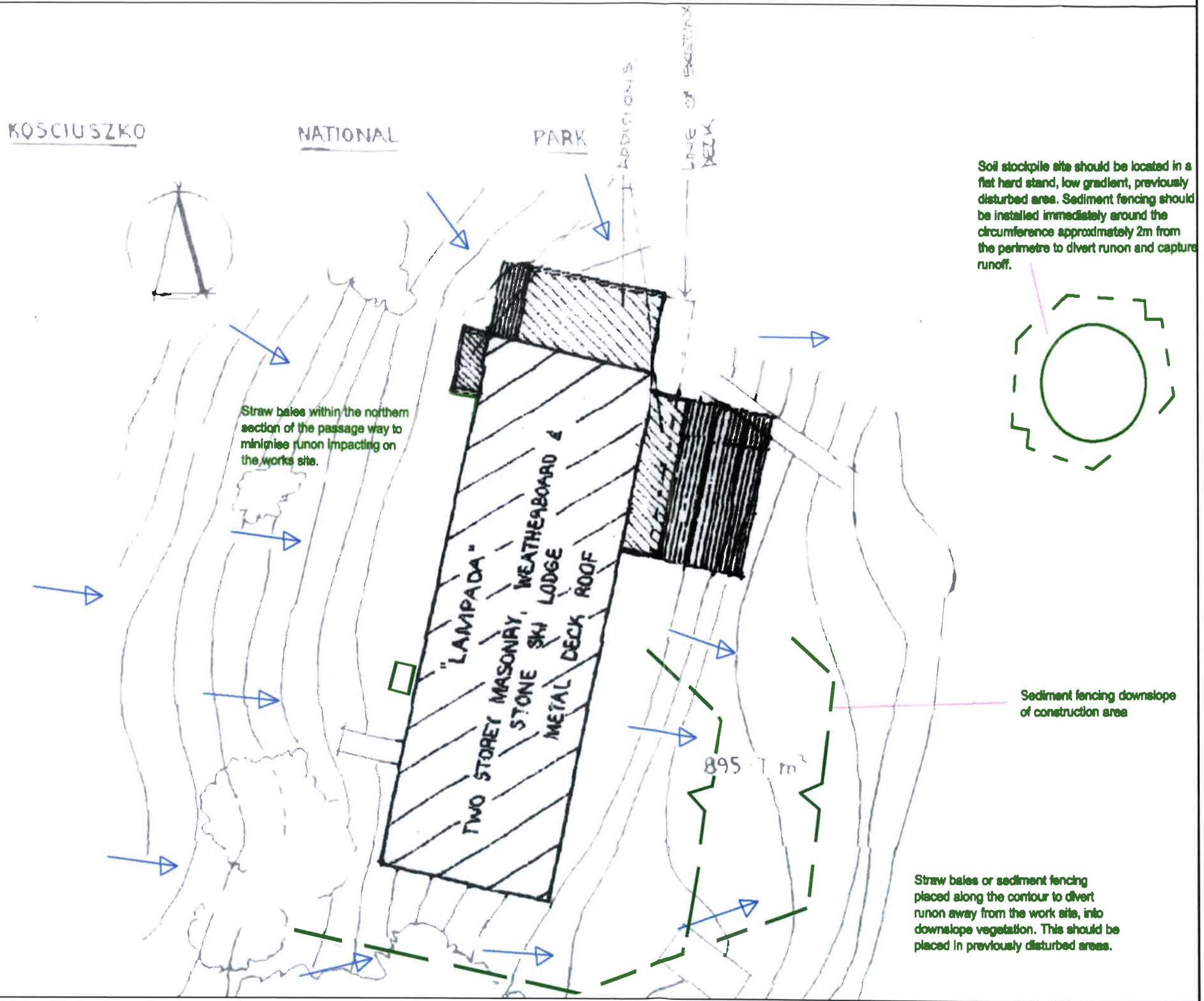
**Lampada Lodge, Perisher**

Project

Date

Scale
NOT TO SCALE

Sheet
1 of 2




General Notes

Arrows refer to stormwater flow direction

| No. | Revision/Issue | Date |
|---|---|---|
| | Final | 12.08.16 |

Firm Name and Address

Project Name and Address

**Lampada Lodge, Perisher**

| Project | Sheet |
|---|---|
| Site | 1 of 1 |
| Scale: NOT TO SCALE | |

# Attachment 4

Archaeological Assessment

Lampada Ski Lodge Extensions
Archaeological Assessment: Julie Dibden July 2005

This assessment is based on a desktop review and provides an assessment of the archaeological potential of the Lampada Ski Lodge proposal area.

The proposed work site at Lampada Ski Lodge is situated on an east facing slope which is of moderate to steep gradient. The proposed work area adjacent to the site has previously suffered disturbance.

The proposal site is located within an area which does not possess any previously defined archaeological potential. Recourse to Navin Officer Heritage Consultants (2000) mapping of areas of archaeological sensitivity in the Perisher Range area indicates that the area has not been defined as possessing archaeological potential.

Given the environmental context the proposal site it is predicted to be of low archaeological potential. The proposed works are highly unlikely to cause impacts to Aboriginal objects or archaeological deposits.

# Attachment 5

Eight-part Test for threatened and significant fauna

# *8-Part Test for Threatened Species*

The *Threatened Species Conservation Act 1995* (TSC Act) introduced the need to complete a Species Impact Statement (SIS) in certain circumstances. Under Section 5 of the *TSC Act* an SIS is required to accompany development applications if there is likely to be a "significant effect on threatened species, populations or ecological communities, or their habitats". The *TSC Act 1995* sets out factors that need to be considered in deciding whether there is likely to be a significant effect on threatened species etc. These factors are listed in an 'eight-part test'.

Section 4.20 of the Statement of Environmental Effects identified that the development site contains habitat that is known to be utilised by the Broad-toothed Rat, a threatened species listed within the *Threatened Species Conservation Act* 1995 (TSC Act).

In order to assess the impact that the development will have on these threatened and significant species, the following "8 part test" that sets out factors that need to be considered in deciding whether there is likely to be a significant effect on threatened species as required by the TSC Act, has been completed.

a) *in the case of a threatened species, whether the life cycle of the species is likely to be disrupted, such that a viable local population of the species is likely to be placed at risk of extinction,*

*Mastacomys fuscus* is found between elevations of 1,000 metres and 2,200 metres (Good 1992: Green & Osborne 1994: Strahan et al. 1983). The species are most abundant within patches of optimum habitat, which include tall, diverse, wet heaths, "*along gullies or in watercourses, which are cold, provide protective cover and an abundance of soft palatable grasses*". The species also commonly utilises a variety of heath and woodland habitat (Green & Osborne 1994). The optimum habitat of wet heath communities occur in small but "*...locally common patches*" forming approximately 5% of the Kosciuszko Alpine Zone (Good 1992)

Reproduction of this species is seasonal, mating occurs in mid-late October, with the first litters being born in November to December, a second and possibly third litter can be born in Late December to early January and late February to early March (Bubela et al. 1991). The use of optimum habitat by *M. fuscus* is likely to an adaptation enabling them to maximise reproduction (Bubela et al. 1991).

*M. fuscus* diet is strictly herbivorous (Carron et al. 1990), the majority of its diet is monocotyledon and dicotyledon leaf, with small amounts of bark, seed and fungi (Carron et. al 1990). Radio tracking has revealed that the species is territorial and that males have home ranges of up to three females (Bubela & Happold 1993). Studies at Smiggin Holes revealed that the mean range for males was approximately 2,700m$^2$ in January to 1,000m$^2$ in autumn, and females, 1,600m$^2$ in January and 1,100m$^2$ in autumn (Bubela & Happold 1991). It has been suggested that females seek out optimum habitat during their breeding season, with the males utilising more marginal habitat at this time (Belcher 1988).

Holloway & Osborne (1997) completed a study on the distribution of this species in the Perisher Blue Ski Resort. This assessment identified a continuous distribution across the resort area. The report suggested that this may reflect the availability of optimal microclimates and habitat types in this part of the Snowy Mountains. The species have been observed to occur in highly modified environments (N. Graham-Higgs pers. obs.).

Habitat critical to the life cycle of the Broad-toothed Rat is likely to include areas of optimum habitat that allows for the seasonal mating of the species, in addition to an abundance of marginal habitat for the survival of males.

Signs of this species were observed within and surrounding the development site, within vegetation to the west and north-west of the site. Scats were also observed in dry heath immediately adjacent to the development site. It is unlikely to be optimum habitat, as the heath is not a "tall, diverse, wet heath".

The work will require the removal of small amount of poor quality habitat to the north of the site. Higher quality habitat however exists to the west of the lodge and would not be significantly impacted on as a result of the proposed works. The removal of only a small area of low quality Broad-toothed Rat habitat, which is abundant in the local area, will ensure that the impact resulting from the development will be of a minor level (Holloway & Osborne 1997). Therefore it is considered unlikely that the development will influence the viability of any local populations of this species.

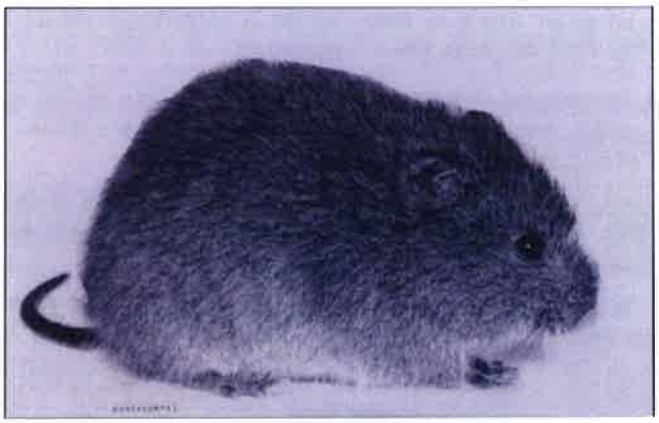


**Photo 1.2** Broad-toothed rat *(Mastacomys fuscus),* photo by Ederic Slater

**Photo 1.3** Section of the site in which the Broad-toothed Rat passage, scat and evidence of feeding was found with respect to proposed development area.

Optimum habitat (tall, diverse wet heath) is not located within the study site. Given the species large home range and the disturbance of only a small area of potential habitat, works will not affect the viability of the local population of this species.

b) *in the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised,*

No populations within the Snowy Mountains are listed under schedule 1, part 2 of the TSC Act.

c) *in relation to the regional distribution of the habitat of a threatened species, population or ecological community, whether a significant area of known habitat is to be modified or removed,*

The Broad-toothed Rat is relatively abundant in the montane, subalpine and alpine environments of the local area. A small area of habitat utilised by the Broad-toothed Rat will be removed as a result of the proposed extension. However, given the abundance of similar habitat on a local level (Holloway & Osborne 1997), the disturbance of a small area of low quality habitat as proposed will not constitute a "*significant area of known habitat*".

d) *whether an area of known habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for a threatened species, population or ecological community,*

The proposed works will not fragment habitat of threatened species, nor result in the creation of a barrier to the movement of any threatened species, populations or ecological communities.

e) *whether critical habitat will be affected,*

No areas of critical habitat have been identified or declared for the local area.

f) *whether a threatened species, population or ecological community, or their habitats, are adequately represented in conservation reserves (or other similar protected areas) in the region,*

In general terms, it can be assumed that the majority of species listed as being threatened are not adequately reserved in conservation reserves on a state level, however as a large proportion of the Snowy Mountains is conserved, within Kosciuszko National Park, it can be assumed that a large proportion of the local populations of the Broad-toothed Rat are represented in conservation reserves on a local and regional level.

g) *whether the development or activity proposed is of a class of development or activity that is recognised as a threatening process,*

A number of threatening processes have been listed in Schedule 3 of the TSC Act. None of them are relevant to this proposal.

h) *whether any threatened species, population or ecological community is at the limit of its known distribution*

The Broad-toothed Rat restricted distributions. However, none are at the limit their range within the development site.

This 8-part test demonstrates that, whilst the works will impact on a threatened and significant species, this impact will be of a minor level and will be unlikely to impact on the abundance of these species on a local or regional level.

# Attachment 6

**The Disability (Access to Premises - buildings) Standards 2010**

***Hendry DDA Report***

HENDRY

HENDRY GROUP PTY LTD
*Building Surveying Consultants*
ABN: 13 006 693 232

Level 4, 32 York Street
Sydney NSW 2000
*Tel:* (02) 8245 2300 *Fax:* (02) 8245 2399
hendrynsw@hendry.com.au www.hendrygroup.net.au
Ref: N:\NETDATA\13PP\Latrobe Uni Union Disabled Report.doc

27 May 2015

Mr Peter Terry
Lampada Ski Lodge
Pretty Valley Road
Perisher Valley NSW 2624

Dear Peter

**Re: Lampada Ski Lodge- DDA Report**

**Introduction**

This disability access report has been prepared for Lampada Ski Lodge, a two storey timber frame and clad building located on Pretty Valley Road, Perisher Valley.

The Lampada Ski Lodge is owned by the Lampada Ski Club Cooperative Ltd and provides accommodation to club members and their guests only.

The Cooperative wish to extend the lodge to provide additional rooms and beds and it is intended, as part of the extension, to provide accessible amenities and rooms as part of the renovations.

The renovations trigger compliance with the Building Code of Australia, Australian Standard 1428.1-2009, the Disability Discrimination Act (DDA) and Disability (Access to Premises) Standards 2010 (the Premises Standards).

The Cooperative has considered a number of design options for the renovations, with each option providing accessible toilets and accommodation as required. The Cooperative are keen to provide accessible facilities where possible, however options to provide access from the property boundary and into the building are limited.

The Lampada Ski Lodge is located within the sub-alpine environment at an elevation of approximately 1,750 metres above sea level. The site slopes steeply from all aspects of the building. Due to the slope of the site, amongst other site restrictions including lack of parking. suitable access, the location of the building in a National Park and environmental impacts, the Cooperative have sought advice from Hendry Group on the current accessible facilities within the building and how compliance with the relevant statutes may or may not be achieved to provide the best possible outcome for the Cooperative and its many members and guests.

Accordingly, the purpose of this report is to carry out a general overview of the current status of DDA compliance of the Lampada Lodge with the requirements of the BCA, The Premises Standards and AS 1428.1-2009. The following are our comments and recommendations.

## 1. Access to Lampada Lodge

In order to comply with the requirements of the Premises Standards, access from the building's Principal Pedestrian Entrance to the new 'affected' parts of the building will be required as part of any proposed renovations.

The Cooperative have taken many design options into consideration in order to accommodate compliance within and to the building.

There is currently no disability access to the Lampada Ski lodge from the property boundary to the building due to the severe slope of the site. At present there is no driveway to the site and carparking must occur at the base of the site which is a reasonably flat area capable of fitting perhaps 2-3 parked cars. This carparking site is also shared with a building located opposite the Lampada Ski Lodge. I refer to the attached photos on page 5 showing the access to the property and access to the entrance of the building.

From the car parking site to the principal pedestrian entrance of the Lampada Ski Lodge, access is via steep, uneven grounds and there is no constructed path for use. There is at present enough room for approximately 2-3 cars for car parking at the base of the building site. According to the requirements of the BCA where 3 car parking spaces or less are provided or required accessible car parking spaces are not required. It is understood the Cooperative has ownership only of the building and the remainder of the site, including areas used to gain access to the building is owned by Kosciuszko National Park.

In order to provide compliant disabled access from the property boundary to the entrance of the building, a compliant accessible ramp that complies with the AS 1428.1-2009 is required to be constructed.

It is considered that compliance with the Australian standard will be extremely limited due to the slope of the site and the limited car parking area available. The construction of a compliant ramp would require the ramp to be constructed over a considerable length, and including rest areas every 9m, would result in a ramp of 60m or more in length. This option would include limited cut and fill to the site. A shorter ramp length could be achieved only with considerable cut and fill which would have an environmental and heritage impact on the site and would not be in accordance with the Koscuiszko National Park Plan of Management.

## 2. Access within Lampada Lodge

Currently access into the building is via a single leaf swinging front entry door. There are currently no ramps or landings providing access to the front door and access to the front door is via a number of steep steps and then onto a small concrete landing.

Once inside the building, access to the store rooms, bedrooms, and games room is via a single hall. Access to the 1st floor of the building is via a single internal staircase which leads to a general living area, kitchen and a number of bedrooms and bathrooms.

The current widths of existing doorways varies, however a number of doors are less than the minimum width permitted under AS 1428.1-2009 which is 850mm clear. There is some consideration made for circulation spaces however due to limited space compliance is generally not achieved. Door hardware is a mix of old knob style hardware and single action lever hardware throughout the building.

Tactile ground surface indicators (TGSIs) and luminance contrasting stair nosing strips have not been installed to the stairways.

Handrails are provided on one side of the stairway; however it does not comply with AS 1428.1 as the handrails do not extend a minimum of 300mm past the top riser and 550mm past the bottom stair and handrails are not continuous or of the appropriate construction. The stairway should therefore be upgraded to fully comply with AS 1428, i.e. handrails to both sides of the stairway with a 30-50mm diameter etc.

In order provide accessibility to the first floor of the building in the event that proposed works are carried out on this level, access from the principal pedestrian access to the new affected areas will be required. Due to site restraints, this would be achievable only via a lift installed to the building.

It is understood the Cooperative are keen to provide facilities where possible, especially the provision of accessible toilets and accommodation, however as disabled access cannot be gained to the site due to restraints of the site itself, the Cooperative consider that the installation of a lift may be ineffective and as such, would affect the existing use of the building and would trigger major renovations and a restructure of a major portion of the building to accommodate the installation.

Hendry Group considers that, due to the limited access to the site, the potential costs of compliance in this aspect as well as the impacts to the existing building and site would greatly outweigh the benefits of the installation of a lift.

Due to the relatively small building site and again, the severe slope of the site, the installation of an external ramp to access the first floor via a new entrance would also trigger major construction works.

## 3. Sanitary facilities for People with Disabilities

A toilet for persons with a disability and for persons with an ambulant disability are currently not provided within the Lampada Lodge.

It is understood that accessible toilets are proposed to be installed as part of the renovations to the building.

Consideration must be given to the installation of new DDA toilet facilities in the Building in the event of any future major refurbishment works to the building.

## 4. Recommendations

We have categorised our comments and recommendations into two categories, short term DDA items that should be addressed and DDA items that should be considered for any future major refurbishments to the building.

### Short Term Items

- Install 30% luminance contrasting non slip strips to the stair nosings to the internal stairway.
- Install handrails to both sides of the stairway complying with Clause 11 and 12 of AS 1428.1-2009.
- Provide door hardware to all doors complying with Clause D2.21 of the BCA and13.5 of AS 1428.1-2009.

- Toilets for people with an ambulant disability should be installed as per the requirements of Clause 15 of AS 1428.1-2009.

Long Term/Future Refurbishment Works

- Consider applying an Alternative Solution to the provision of the access to and into the building where possible to achieve compliance with the Deemed to Satisfy Provisions of the BCA and to achieve compliance with the Kosciusko National Park Plan of Management.
- Where an Alternative Solution in accordance with the BCA cannot be achieved, consider making an application to under the DDA for Unjustifiable hardship.

If you have any queries please do not hesitate to contact the undersigned.

Yours faithfully

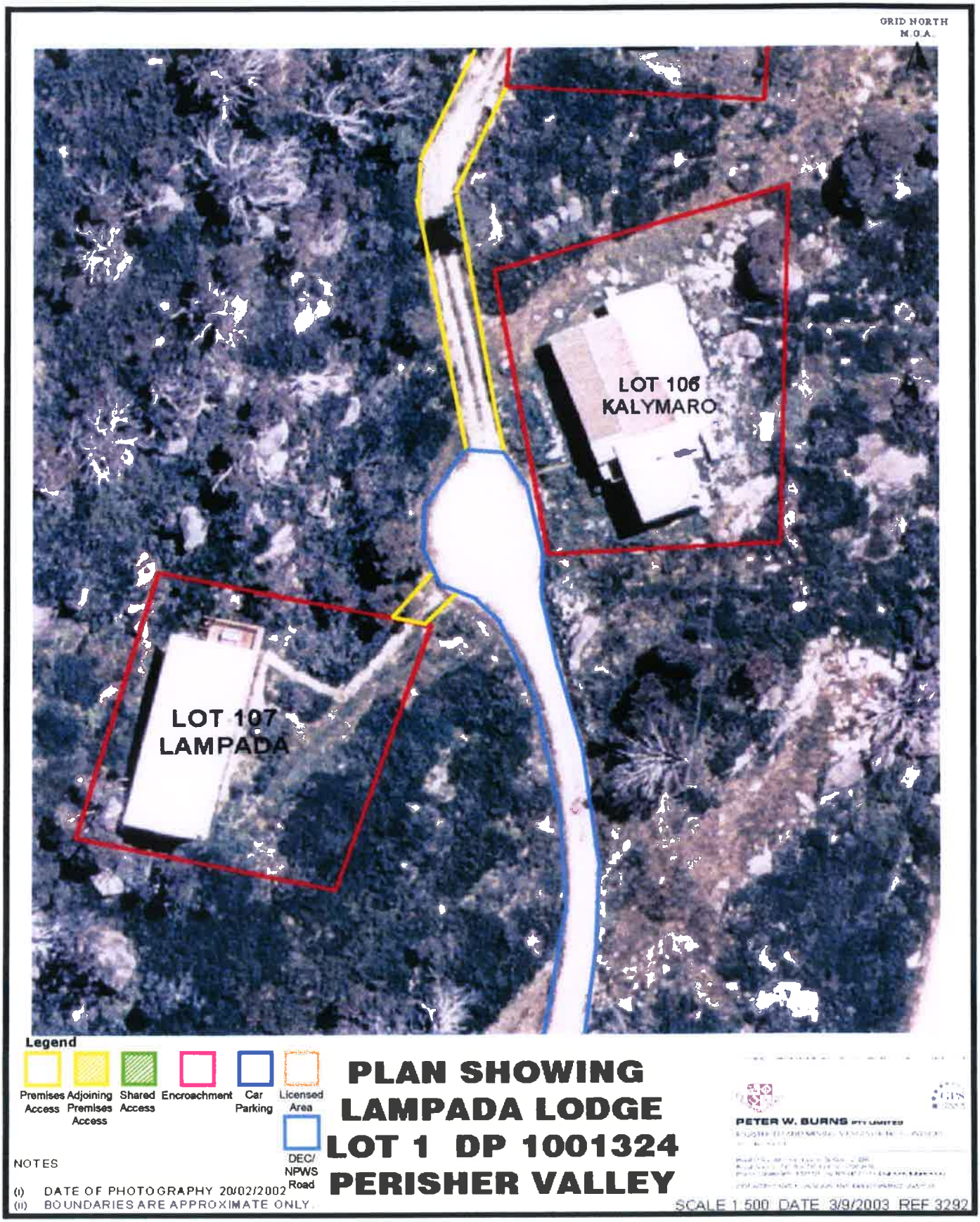
Jessica McDonald
Hendry Group Pty Ltd
Building Surveyor

Access from base of the site up to the Lodge

Stairs to front porch

# Attachment 7

**Lease Survey Plan and Lease Copy**




Legend

Premises Access | Adjoining Premises Access | Shared Access | Encroachment | Car Parking | Licensed Area | DEC/ NPWS Road

# PLAN SHOWING LAMPADA LODGE LOT 1 DP 1001324 PERISHER VALLEY

PETER W. BURNS PTY LIMITED

NOTES

(i) DATE OF PHOTOGRAPHY 20/02/2002
(ii) BOUNDARIES ARE APPROXIMATE ONLY

SCALE 1:500 DATE 3/9/2003 REF 3292

Form: 07L
Release: 2.6
www.lands.nsw.gov.au

# LEASE

New South Wales
Real Property Act 1900

AF344839P

**PRIVACY NOTE:** Section 31B of the Real Property Act 1900 (RP Act) authorises the R( by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

**STAMP DUTY** Office of State Revenue use only

(A) **FOLIO OF THE REGISTER**

Property leased
Folio Identifier 1/1001324
and known as Lampada Ski Club, Perisher Valley

(B) **LODGED BY**

| Document Collection Box | Name, Address or DX, Telephone, and LLPN if any | CODE |
|---|---|---|
| 813E | Crown Solicitor's Office<br>DX 19, Sydney<br>9224 - 5079<br>Reference: CEA 1235890 200801715 | L |

(C) **LESSOR**

MINISTER ADMINISTERING THE NATIONAL PARKS AND WILDLIFE ACT 1974

The lessor leases to the lessee the property referred to above.

(D) Encumbrances (if applicable):

(E) **LESSEE**

LAMPADA SKI CLUB CO-OPERATIVE LIMITED
ABN 57 976 259 245

(F) ~~TENANCY~~:

(G)
1. **TERM** 20 years
2. **COMMENCING DATE** 1 July 2008
3. **TERMINATING DATE** 30 June 2028
4. With ~~an~~ 2 **OPTIONS TO RENEW** for a period of 10 + 10 + 10 years set out in clause 16 of Annexure "A"
5. With an **OPTION TO PURCHASE** set out in clause N.A. of N.A.
6. Together with and reserving the **RIGHTS** set out inclause N.A. of N.A.
7. Incorporates the provisions or additional material set out in **ANNEXURE(S)** "A" hereto.
8. Incorporates the provisions set out in N.A. in the Department of Lands, Land and Property Information Division as No. N.A.
9. The **RENT** is set out in clause No. 2 of Schedule 2

DATE 8 SEPTEMBER 2009

(H) I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Signature of witness: Claire Armour

Name of witness: Claire Editha Armour

Address of witness: CROWN SOLICITOR'S OFFICE
LEVEL 6
60-70 ELIZABETH STREET, SYDNEY 2000
GPO BOX 25 SYDNEY, DX 19 SYDNEY

Certified correct for the purposes of the Real Property Act 1900 by the lessor.

Signature of lessor:

EXECUTED by me, Vince Rago, Manager, Business Operations Unit, Department of Environment and Climate Change for and on behalf of the MINISTER ADMINISTERING THE NATIONAL PARKS AND WILDLIFE ACT, 1974 as duly authorised delegate.

I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

EXECUTED BY LAMPARA SAT CLUB CO-OPERATIVE LIMITED PURSUANT TO SECTION 47 OF THE CO-OPERATIVES ACT ~~pursuant to s127 Corporations Act~~ in the presence of:

Signature of witness:

Name of witness: SIMON MUNRO GATES
DIRECTOR

Address of witness: 96 Raglan Street
Mosman.

Certified correct for the purposes of the Real Property Act 1900 by the lessee.

Signature of lessee:

ROBERT WILLIAM HIPSLEY
SECRETARY

(I) **STATUTORY DECLARATION** *

I _____

solemnly and sincerely declare that—

1. The time for the exercise of option to _____ in expired lease No. _____ has ended; and
2. The lessee under that lease has not exercised the option.

I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Oaths Act 1900.

Made and subscribed at _____ in the State of New South Wales

on _____ in the presence of—

Signature of witness: _____ Signature of lessor: _____

Full name of witness: _____

Address of witness: _____

Qualification of witness: *[tick one]*

- ☐ Justice of the Peace
- ☐ Practising Solicitor
- ☐ Other qualified witness *[specify]* _____

* As the Department of Lands may not be able to provide the services of a justice of the peace or other qualified witness, the statutory declaration should be signed and witnessed prior to lodgment of the form at Land and Property Information Division.

# Attachment 8

## Geotechnical Assessment Report

***GDH Pty Ltd***

# Lampada Ski Club

## North Perisher Valley, NSW

## Geotechnical Assessment Report

July 2016

Department of
Infrastructure, Planning and Natural Resources

# Geotechnical Policy – Kosciuszko Alpine Resorts
# Form 1 – Declaration and certification made by geotechnical engineer or engineering geologist in a geotechnical report.

Date received: ____/____/____ DA no: _____

To be submitted with a development application

You can use Form 1 to verify that the author of a geotechnical report is a geotechnical engineer or engineering geologist as defined by DIPNR Geotechnical Policy. Alternatively, where a geotechnical report has been prepared by a professional person not recognised by DIPNR Geotechnical Policy, then form 1 may be used as technical verification of the geotechnical report if signed by a geotechnical engineer or engineering geologist as defined by the DIPNR Geotechnical Policy.

**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 as part of a geotechnical report

I,

Mr ☒ Ms ☐ Mrs ☐ Dr ☐ Other ☐

GREGORY

Family name
KOTZE

OF

Company/organisation
GHD Pty Ltd

on this the 3rd day of AUGUST 2016,

certify that I am a geotechnical engineer or engineering geologist as defined by the "Policy" and I; (tick appropriate box)

☑ prepared the geotechnical report referenced below in accordance with the AGS 2000 and DIPNR Geotechnical Policy – Kosciuszko Alpine Resorts.

☐ am wiling to technically verify that the Geotechnical Report referenced below has been prepared in accordance the AGS 2000 and the Geotechnical Policy – Kosciuszko Alpine Resorts.

## 2. Geotechnical Report Details

Report Title
LAMPADA SKI CLUB, GEOTECHNICAL ASSESSMENT REPORT

Author
GREGORY P. KOTZE

Dated
03/08/2016

DA Site Address
LAMPADA LODGE, NORTH PERISHER VALLEY, NSW

DA Applicant

I am aware that the Geotechnical Report I have either prepared or am technically verifying, (referenced above) is to be submitted in support of a development application for the proposed development site (referenced above), and it's findings will be relied upon by the Consent Authority in determining the development application.

## 3. Checklist of essential requirements to be contained in a geotechnical risk assessment report to be submitted with a development application

The following checklist covers the minimum requirements to be addressed in a Geotechnical Risk Management Report. This checklist is to accompany the report.

Please tick appropriate box

- ☑ Risk assessment of all identifiable geotechnical hazards in accordance with AGS 2000, as per 6.1 (a) of the policy.
- ☑ Site plans with key hazards identified and other information as per 6.1 (b)
- ☑ Details of site investigation and inspections as per 6.1 (c)
- ☑ Photographs and/or drawings of the site as per 6.1 (d)
- ☑ Presentation of geotechnical model as per 6.1 (e)
- ☑ A specific conclusion as to whether the site is suitable for the development proposed on the above site, if applicable, subject to the following conditions;
  - ☐ Conditions to be provided to establish design parameters,
  - ☑ Conditions to be incorporated into the detailed design to be submitted for the construction certificate,
  - ☑ Conditions applying to the construction phase,
  - ☑ Conditions relating to ongoing management of the site/structure.

## 4. Signatures

Signature: G.P. Kotze.

Name: GREGORY P. KOTZE

Chartered professional status: CP Eng, CP Geo, RP Geo

Date: 03/08/2016

## 5. Contact details

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# Table of contents



# Figure index



# Table

# Photographic plates



# Appendices

# 1. Introduction

This geotechnical assessment report has been compiled to accompany a Development Application (DA) by Lampada Ski Club to the NSW Department of Planning and Environment, (DoP), for the construction of relatively minor alterations and additions at the southern and of the Lampada Lodge at north Perisher Valley in New South Wales. The location of Lampada Lodge is shown on Figure 1.

Regional geotechnical hazard mapping in Kosciuszko National Park (KNP) has identified this area of north Perisher Valley as being potentially at risk from slope instability and rockfall/boulder hazards. As such, a geotechnical report is required to be submitted with the DA for proposed building works.

This report should be read in conjunction with the General Notes and Standard Sheets attached in Appendix A.

# 2. Objectives and scope of this report

The objectives and scope of this report are as follows:

- Review the proposed alterations and additions to the existing lodge and determine their suitability and compatibility with the existing lodge location.
- Develop a geotechnical model of the site.
- Identify any geotechnical hazards that could impact the lodge.
- Carry out risk assessments for identified hazards in accordance with DoP and Australian Geomechanics Society (AGS) 2007 Guidelines.
- Develop as appropriate conditions to be imposed on the proposed works to ensure that "Acceptable" levels of geotechnical risk are achieved and maintained.
- Provide geotechnical recommendations to appropriately address design and construction requirements of the proposed works.

# 3. Geotechnical History and previous investigations of the site

It is understood (pers. Comms. Mr T. Proud) that Lampada Lodge was initially constructed in 1967 (under the previous name of "Kooroora"). The lodge was constructed on a "cut to fill" building platform above and to the west of Perisher Creek Road and adjacent to the northern end of Burramys Road.

In October 1997 the site was subject to a geotechnical investigation and assessment by Van Leeuwen and Associates Pty Ltd (Reference 1), for an extension to the southern end of the Lodge building (first floor bedrooms 3 and 4). That investigation included the excavation and logging of two (2) test pits. A site location plan and the logs of those test pits 1 and 2 are presented herein as Appendix B.

In 2003/3004, GHD Longmac (GHD Pty Ltd) was engaged by NSW National Parks and Wildlife Service (NPWS) to carry out geotechnical hazard mapping and hazard zoning in resort and ski slope areas of KNP (Reference 2). That mapping, which was carried out by the author of this document, included the identification and delineation of geotechnical hazards consisting of potential slope instability and rockfalls/boulder impacts on the slopes around Lampada Lodge. Hazard mapping extracts encompassing the Lampada site are presented herein as Appendix C.

In June 2005 the site was subject to a geotechnical investigation and assessment by URS Australia Pty Ltd (URS) (Reference 3), for an extension to the northern end and north-eastern corner of the Lodge building (first floor living and deck areas respectively). That investigation included the excavation and logging of two (2) test pits and a Dynamic Cone Penetrometer (DCP) probe. A site location plan and the logs of those test pits TP1 and TP2 and, the DCP probe results, are presented herein as Appendix D.

# 4. Geotechnical model of the site

The information contained in Appendices B, C and D has been assimilated and a set of current site photographs (taken in June and July 2016) has been viewed to confirm that site conditions at Lampada are consistent with those last viewed by the author of this document.

The broad geotechnical setting of Lampada Lodge is shown on attached Plates 1 and 2 and is also shown on the mapping extract presented as Appendix C. That is, Lampada is located in a sparsely developed area in north Perisher, near the toe of an easterly facing slope above and to the west of Perisher Creek Road. Behind the lodge the slope rises to an intermediate ridge and access road and ultimately to Back Perisher Mountain (with an elevation of 2014m) as can be seen on Plate 1. The upper slopes are rocky and strewn with granodiorite blocks and boulders.

A localised boulder field exists above and to the north of Lampada as shown on the mapping extract presented as Appendix C and as can be seen on Plate 2. Significantly, as can also be seen on Plate 2, the slope immediately above the rear or western wall of the lodge is relatively clear of boulders. One exception exists however, in the form of a single boulder located at the immediate south-western corner of the lodge as shown on Plates 4, 5, 6 and 7.

As mentioned above, Appendices B and D present the results of the two previous geotechnical investigations at Lampada for prior episodes of building alteration and extension. Those investigations have included a total of four (4) test pit excavations and a DCP probe. The four test pit locations approximate the four corners of the lodge site.

The test pit excavations confirmed that the site is characterised by a surficial topsoil layer with a typical depth or thickness in the order of 400mm. The topsoil comprises dark brown, loose, moist, clayey sand, with root matter and some granodiorite gravel. The topsoil is underlain by a colluvial soil sequence that typically comprises red-brown clayey sand, with granodiorite gravel and cobbles to 100mm diameter. The colluvium is generally moist and the clay component is of low to medium plasticity. It is noted that the (locally disturbed) colluvial soil materials can be seen beneath the existing southern end of the lodge on Plate 8.

The colluvial soil sequence is underlain by a residual, brown to grey clayey sand, with fragments and corestones of granodiorite, that in turn is underlain by granodiorite bedrock. The previous test pit excavations were unable to confirm the depth to granodiorite bedrock in the lodge foundation area due to depth limitations and the presence of boulders/corestones. Previous geological mapping in north Perisher however, has revealed depths to weathered granodiorite bedrock that range from 1.5m to 3m below the ground surface. This depth range is interpreted to be representative of subsurface conditions at Lampada.

Soil moisture contents vary with rainfall infiltration and snow melt impacts and localised seepage can be encountered on top of the weathered granodiorite bedrock surface. Deeper groundwater however, occurs in rock mass defects within the granodiorite bedrock.

The conditions documented in References 1, 2 and 3 and the authors personal knowledge of geotechnical conditions at north Perisher Valley have been assimilated to compile a geotechnical model of the Lampada Lodge site, as shown on Figure 2. The geotechnical profile shown on Figure 2 is presented on cross section A-A upon which the currently proposed ground floor alterations to the lodge building are shown, as further described below.

# 5. Proposed Alterations and Additions

We have been provided with architectural drawings (by Allan McFarland Designs) of the currently proposed alterations and additions to Lampada by Mr T. Proud. Those drawings are presented over as Figures 3, 4, and 5. The proposed alterations and additions are relatively minor from a geotechnical perspective and they interact with the ground surface beneath existing bedrooms 3 and 4 at the southern end of the building. These works comprise the construction of a new bedroom (7) and ensuite at ground floor level, beneath bedrooms 3 and 4, as shown on Figures 3, 4 and 5. The works will require excavation of the existing under floor area and the construction of a 4.8m long retaining wall to support the new cutting behind the proposed ensuite. Five additional ensuites are also to be constructed on the existing first floor level.

# 6. Identification of Geotechnical Hazards

We have assessed the geotechnical model of the site and the broader setting within which Lampada Lodge is located. We have identified a total of five (5) geotechnical hazards that could impact Lampada, both during the construction of the proposed alterations and additions and, into the future. The five geotechnical hazards are shown diagrammatically on Figure 6 and described below.

**Hazard H1 – boulders from upslope**

By reference to Plates 1 and 2 and Appendix C it can be seen that there are boulder sources on the slopes above and around Lampada. Boulders on overlying slopes constitute hazards that could impact Lampada.

**Hazard H2 – Landslide or Debris Flow**

The slopes to the immediate rear or west of Lampada are characterised by ground slope angles that typically range from 25° to 30° from horizontal, with a colluvial and residual soil sequence that ranges in depth and thickness from 1.5m to 3m below surface (see Plate 2 and Figure 2). During rainfall and snow melt periods these soil slopes could be susceptible to landsliding and/or debris flow events that could be hazardous to Lampada.

**Hazard H3 – Slope Creep**

The above-described soil slopes behind Lampada are locally "hummocky" and display localised evidence of slope creep that is likely to continue into the future, particularly during and immediately following heavy of prolonged rainfall periods and snow melt. Ongoing and cumulative impacts of slope creep could be hazardous to Lampada.

**Hazard H4 – Cutting or Wall Failure**

The existing underfloor area beneath bedrooms 3 and 4 is to be excavated to create the proposed new bedroom and ensuite. It is understood by reference to Plates 7 and 8 that at its southern end the new excavation could be in the order of 2m high and located in close proximity to the front of the existing boulder at the south-western corner of the building. The potential failure of the proposed excavation during construction could be hazardous, as could be the failure of the proposed new retaining wall in the future.

**Hazard H5 – Fill/soil scour**

By reference to Plate 3, Figure 2 and Appendix D, it can be seen that a sloping wedge of fill exists on the down side of the lodge building platform. Ground slope angles are typically in the order of 25° from horizontal in this area and the fill is underlain by topsoil. Potential scouring or erosion of the fill and soil sequence could be hazardous to Lampada.

# 7. Geotechnical Risk Assessment

In accordance with the requirements of the DoP's Geotechnical Policy we have carried out an assessment of the risk posed by all reasonably identifiable geotechnical hazards which have the potential to either individually or cumulatively impact upon people or property upon the site or related land to the proposed development in accordance with the guidelines set out in 'Landslide Risk Management Concepts and Guidelines' published in the Australian Geomechanics Journal, Vol.42 No.1, March 2007" (AGS 2007).

AGS 2007 requires that risk of loss of life be determined by quantitative risk estimation.

For loss of life, the individual risk can be calculated from:

$$R_{(LoL)} = P_{(H)} \times P_{(S:H)} \times P_{(T:S)} \times V_{(D:T)}$$

Where:

$R_{(LoL)}$ is the risk (annual probability of loss of life (death) of an individual).

$P_{(H)}$ is the annual probability of the landslide.

$P_{(S:H)}$ is the probability of spatial impact of the landslide impacting a building (location) taking into account the travel distance and travel direction given the event.

$P_{(T:S)}$ is the temporal spatial probability (e.g. of the building or location being occupied by the individual) given the spatial impact and allowing for the possibility of evacuation given there is a warning of the landslide occurrence.

$V_{(D:T)}$ is the vulnerability of the individual (probability of loss of life of the individual given the impact).

Risk to property however, can be determined using qualitative terms, as defined over in Appendix E.

## 7.1 Risk to Property

The risks to property damage at Lampada from geotechnical hazards H1 to H5 described above, are assessed as summarised in Table 1. As well as the risk assessment outcomes, Table 1 lists the consideration of items relevant to the assessment of the various hazards. The assessed risk levels are **low** or **very low**, which is considered to be consistent with the satisfactory performance of the Lampada Lodge site since initial construction some 50 years ago.

## 7.2 Risk of Loss of Life

The risks of loss of life to lodge occupants from the identified geotechnical hazards are presented in Table 2. The calculated risk levels to lodge occupants range from $5.75 \times 10^{-9}$ to $5.18 \times 10^{-6}$. In accordance with AGS 2007 guidelines the risk level outcomes are considered to be "**Acceptable**" for an existing lodge structure.

The risk associated with Hazard H4a was determined to be $4.2 \times 10^{-5}$ for the person most at risk which is an excavation worker, in a "base case" situation without specific construction management recommendations in place. This risk level is generally regarded to be "Tolerable". However, with the specific construction recommendations presented below adhered to, the probability of failure can be reduced, as can be the temporal spatial probability of workforce individuals, thereby lowering the risk of cutting failure during excavation to:

$R = 2 \times 10^{-2} \times (5 \times 10^{-1}) \times (0.0063) \times 0.1 = 6.3 \times 10^{-6}$

That risk level is regarded as "**Acceptable**", for an informed workforce.

**Table 1 Summary of Risk Assessments for Risk To Property**

| Hazard Number | Hazard Type | Likelihood (of Lampada impact) | Consequence | Risk Level | Considerations |
|---|---|---|---|---|---|
| H1 | Boulders from upslope | Unlikely | Medium | Low | Source locations, slope angles, trajectory characteristics. |
| H2 | Landslide or debris flow | Possible | Insignificant | Very Low | Slope angles, small volumes, run-out characteristics, absence of services above. |
| H3 | Slope Creep | Possible | Insignificant | Very Low | Slow moving, retaining wall visible and repairable. |
| H4a | Cutting Failure (during excavation) | Unlikely | Minor | Low | Boulder surcharge, load distribution, short exposure time. |
| H4b | Wall Failure (after excavation) | Rare | Minor | Very Low | Engineer designed wall is visible and repairable. |
| H5 | Fill/soil scour | Unlikely | Minor | Low | Limited fill at southern end, slope angles. |

Notes to accompany Table 1.

i. Due to its sparce development setting (Refer to Plate 1 and Appendix C) risks to property are confined to the Lampada Lodge structure.

ii. Refer to Figure 6 and text section 6 for location and description of geotechnical hazards.

iii. Refer to Appendix E for Likelihood, Consequence and Risk Level explanations.

**Table 2 Summary of Risk Assessments for Loss of Life**

| | | $R_{(LoL)}$ | $= P_{(H)}$ | $X P_{(S:H)}$ | $X P_{(T:S)}$ | $X V_{(D:T)}$ | |
|---|---|---|---|---|---|---|---|
| Hazard Number | Hazard Type | Risk (Loss of Life) | = Annual Probability | X Probability of spatial impact | X Temporal Spatial Probability of Individuals (Annualised) | X Vulnerability of loss of life given impact | = R |
| H1 | Boulders from upslope | R | $5 \times 10^{-3}$ | $10^{-1}$ | 0.052 x 0.67 x 0.33 | 0.9 | $5.18 \times 10^{-6}$ |
| H2 | Landslide or debris flow | R | $5 \times 10^{-3}$ | $3 \times 10^{-1}$ | 0.052 x 0.67 x 0.33 | 0.1 | $1.73 \times 10^{-6}$ |
| H3 | Slope Creep | R | $5 \times 10^{-2}$ | $10^{-1}$ | 0.052 x 0.67 x 0.33 | 0.001 | $1.15 \times 10^{-8}$ |
| H4a | Cutting Failure (during excavation) | R | $10^{-1}$ | $5 \times 10^{-1}$ | 0.25 x 0.42 x 0.08 | 0.1 | $4.2 \times 10^{-5}$ |
| H4b | Wall Failure (after construction) | R | $10^{-4}$ | $5 \times 10^{-1}$ | 0.052 x 0.67 x 0.33 | 0.01 | $5.75 \times 10^{-9}$ |
| H5 | Fill/soil scour | R | $10^{-3}$ | $5 \times 10^{-1}$ | 0.052 x 0.67 x 0.33 | 0.01 | $5.75 \times 10^{-8}$ |

Notes to accompany Table 2

i. Due to the sparce development setting (Refer to Plate 1 and Appendix C) risks of loss of life are confined to lodge occupants, with the exception of Hazard H4a which includes excavation workers.

ii. Temporal probabilities are based on lodge occupancy rates (Mr T. Proud) peaking from 1 July to 5 October.

# 8. Conclusions and Recommendations

Subject to compliance with the recommendations presented below, the site is considered suitable for the construction of the proposed additions and alterations.

## 8.1 Design and Construction

a. All footings, wall, and support elements of the proposed alterations and additions must be designed by a suitably qualified and experienced Structural Engineer.

b. Footings for the new retaining wall must extend down at least 500mm into in-situ residual (decomposed granodiorite) soil and/or onto weathered granodiorite bedrock.

c. For foundation design purposes the site may be classified as Class S in accordance with AS2870.

d. The allowable vertical bearing pressure of the in-situ residual soil is 200kPa. The allowable vertical bearing pressure of weathered granodiorite bedrock in 500kPa.

e. The new retaining wall should be free – draining and designed to cater for lateral loads to be applied by the materials that overly granodiorite bedrock.

f. Excavations for the new retaining wall should not be commenced during or shortly after wet weather.

g. Prior to the commencement of excavation for the new retaining wall, the existing boulder at the south-western corner of the building should be installed with a tensioned monitoring device (wire/cable/timber or equivalent) secured uphill to enable the detection of any boulder movement during the excavation period. Should movement occur the excavation site should be evacuated and the boulder movement monitored. Should movement occur it is expected to be slow at initiation. By reference to Plates 4, 7 and 8, it is expected that continued movement would result in the boulder coming to rest against the southern (masonry) wall of the building, at which time the excavation and the new retaining wall construction can be completed. The boulder could be subsequently secured or broken up for removal or re-location.

h. Following the commencement of excavation for the new retaining wall, the excavation should be completed and the wall constructed as soon as possible.

i. The footings excavations for the new retaining wall should be inspected and approved by a suitably qualified and experienced geotechnical engineer or engineering geologist.

## 8.2 Risk Management

Recommendations f, g, and h above should be undertaken to manage the risk of the above-described Hazard H4a during the (assumed maximum 3 weeks) excavation and wall construction period.

All other assessed risk levels at the site are considered to be “Acceptable” in accordance with current industry standards and AGS 2007 guidelines.

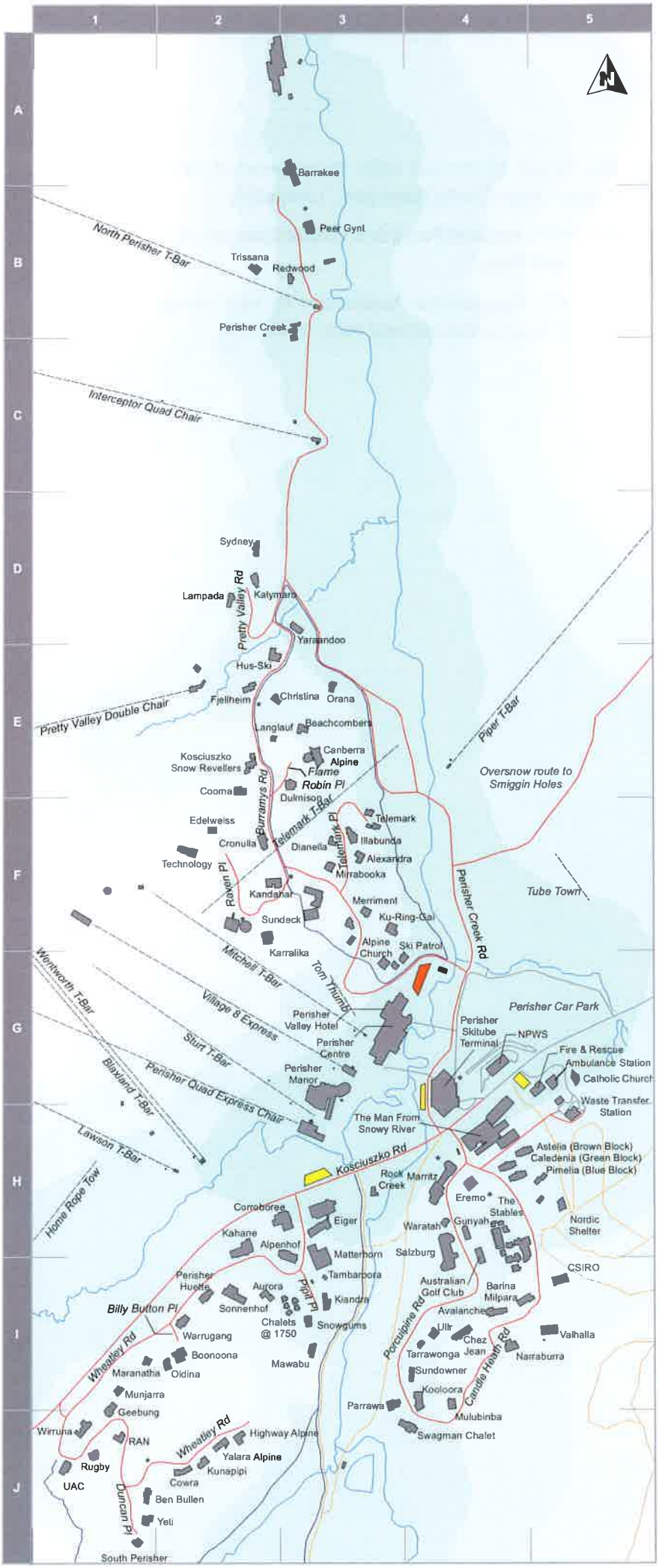
To maintain existing acceptable risk levels, it is recommended, that with the exception of the currently proposed alterations and additions addressed herein, the site should not be subject to any excavation, construction or disturbance without written geotechnical approval. It is also recommended that all existing drainage installations and facilities in and around Lampada should be cleaned and maintained in functional working order.

# 9. References


1. Van Leeuwen and Associates Pty Ltd, 14 October 1997, "Assessment of Geotechnical Conditions Report, For Proposed Lodge/Cholet Extension, "Lampada".
2. GHD Longmac, 19 May 2004, "NSW National Parks and Wildlife Services, Kosciuszko National Park, Geotechnical Hazard Maps".
3. URS Australia Pty Ltd, 7 July 2005, "Geotechnical Assessment for an Extension to Lampada Lodge, Perisher Valley, Kosciuszko National Park, NSW".

# Perisher Valley

## Village Map




## Accommodation

| | |
|---|---|
| Alexandra | F3 |
| Alpenhof | H3 |
| Astelia (Brown Block) | H4 |
| Aurora | I2 |
| Australian Golf Club | H4 |
| Avalanche | I4 |
| Barina Milpara | I4 |
| Barrakee | A3 |
| Beachcombers | E3 |
| Ben Bullen | J1 |
| Boonoona | I2 |
| Caledenia (Green Block) | H4 |
| Canberra Alpine | E3 |
| Chalets @ 1750 | I3 |
| Chez Jean | I4 |
| Christina | E2 |
| Cooma | E2 |
| Corroboree | H3 |
| Cowra | J2 |
| Cronulla | F2 |
| CSIRO | I5 |
| Dianella | F3 |
| Dulmison | E3 |
| Edelweiss | F2 |
| The Eiger | H3 |
| Eremo | H4 |
| Fjellheim | E2 |
| Geebung | J1 |
| Gunyah | H4 |
| Highway Alpine | J2 |
| Hus-Ski | E2 |
| Illabunda | F3 |
| Kahane | H2 |
| Kalymaro | D2 |
| Kandahar | F2 |
| Karralika | F2 |
| Kiandra | I3 |
| Kooloora | I4 |
| Kosciuszko Snow Revellers | E2 |
| Kunapipi | J2 |
| Ku-Ring-Gai | F3 |
| Lampada | D2 |
| Langlauf | E2 |
| The Man from Snowy River | H4 |
| Maranatha | I1 |
| Marritz | H4 |
| Matterhorn | H3 |
| Mawabu | I3 |
| Merriment | F3 |
| Mirrabooka | F3 |
| Mulubinba | I4 |
| Munjarra | I1 |
| Narraburra | I4 |
| Oldina | I2 |
| Orana | E3 |
| Parrawa | I3 |
| Peer Gynt | B3 |
| Perisher Centre | G3 |
| Perisher Creek | B3 |
| Perisher Huette | I2 |
| Perisher Manor | G3 |
| Perisher Skitube Terminal | G3 |
| Perisher Valley Hotel | G3 |
| Pimelia (Blue Block) | H5 |
| Redwood | B3 |
| Rock Creek | H3 |
| Royal Australian Navy (RAN) | J1 |
| Rugby | J1 |
| Ski Patrol | G4 |
| Snowgums | I3 |
| Sonnenhof | I2 |
| South Perisher | J1 |
| The Stables | H4 |
| Sundeck | F3 |
| Sundowner | I4 |
| Swagman Chalet | J4 |
| Sydney | D2 |
| Tambaroora | I3 |
| Tarrawonga | I4 |
| Technology | F2 |
| Telemark | F3 |
| Trissana | B2 |
| University Alpine Club (UAC) | J1 |
| Ulir | I4 |
| Valhalla | I5 |
| Waratah | H4 |
| Warrugang | I2 |
| Wirruna | J1 |
| Yalara Alpine | J2 |
| Yaraandoo | |
| Yeti | J1 |

## Resort Services, Restaurants & Bars

| | |
|---|---|
| Alpine Church | G3 |
| Ambulance Station | G5 |
| Catholic Church | G5 |
| The Eiger - *The White Spider Restaurant* | H3 |
| Fire and Rescue | G5 |
| The Man from Snowy River - *Restaurant, Lounge, Bar* | H4 |
| Marritz - *Marritz Bar and Restaurant* | H4 |
| Nordic Shelter | H5 |
| NPWS - *Information, cross country ski lessons and hire, snowshoe hire* | G4 |
| Perisher Centre - *Ticket Sales, Lessons, Snowy Day Care, Restaurants, Bars, Equipment Sales and Hire, Tuning, Food Court, Cafes, Gifts* | G3 |
| Perisher Manor - *Base 1720m Restaurant & Bar, The Pub Family Food Court* | G3 |
| Perisher Skitube Terminal - *Ticket Sales, Police, Doctor, Pharmacy, Supermarket, Post Office, Cafes, Gifts, Oversnow Services, Charlotte Pass Transfer* | |
| The Stables - *The Loft Bar, Stables Restaurant* | H4 |
| Sundeck Hotel - *Restaurant, Bar* | F3 |
| Waste Transfer Station | H5 |

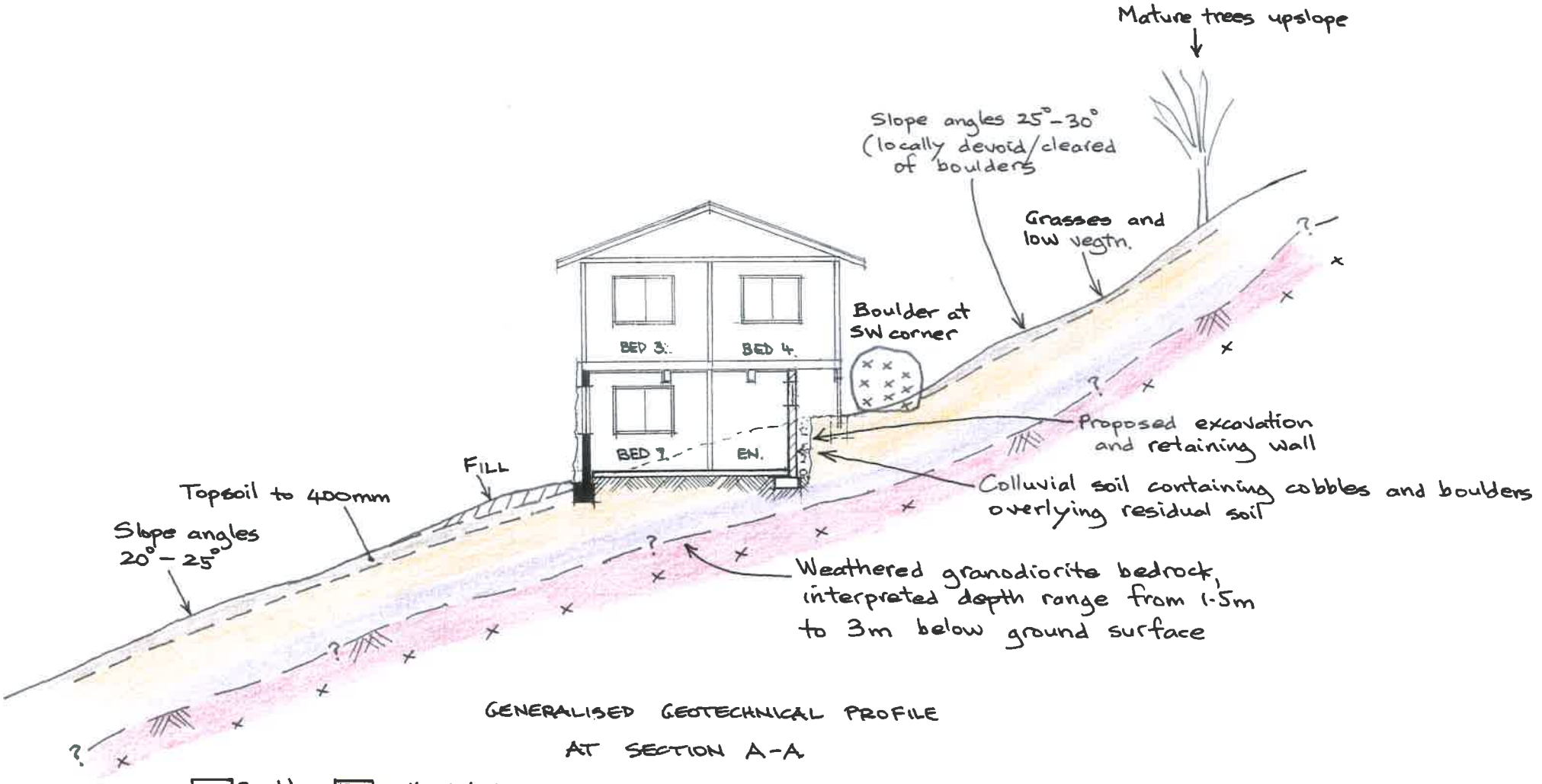
Cleared Road
Oversnow Route
Resorts Lifts
Snowshoe Trail
Cross Country Ski Trail
Oversnow Vehicle Day Parking
Oversnow Vehicle Overnight Parking

*Oversnow routes subject to snow conditions*

NSW Office of Environment & Heritage
NSW National Parks & Wildlife Service

August 2015

Figure 1




GENERALISED GEOTECHNICAL PROFILE
AT SECTION A-A

Figure 2



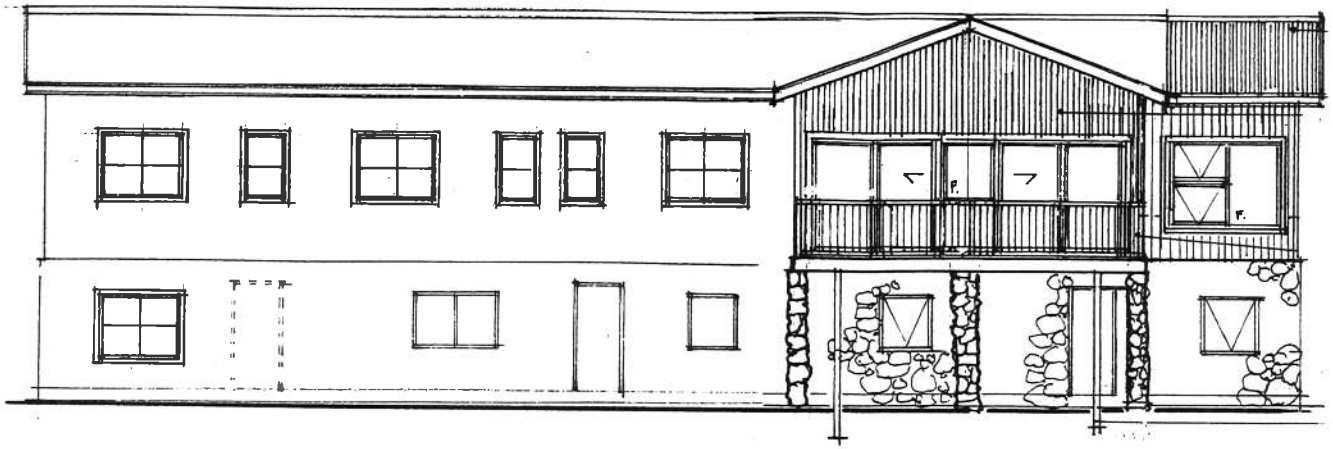
| No. | Revisions | Approved | Date |
|---|---|---|---|

| | | |
|---|---|---|
| Drawn | | |
| Designed | G.P.K. | 28/7/16 |
| Draft check | | |
| Design check | | |
| Approved | | |

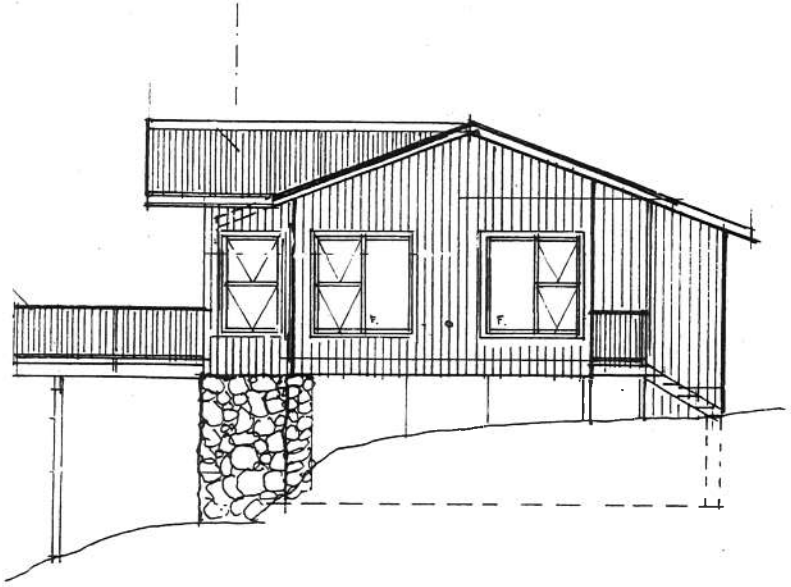
Client and project MR T. PROUD
LAMPADA SKI LODGE
NORTH PERISHER

Title GENERALISED GEOTECHNICAL PROFILE AT SECTION A-A

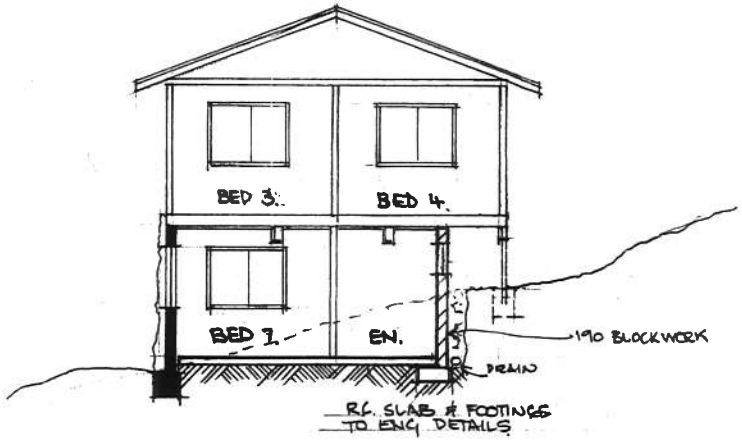
A3 Drawing no. Scale 1:100



EAST ELEVATION
SCALE 1:100.



NORTH ELEVATION




SECTION A-A

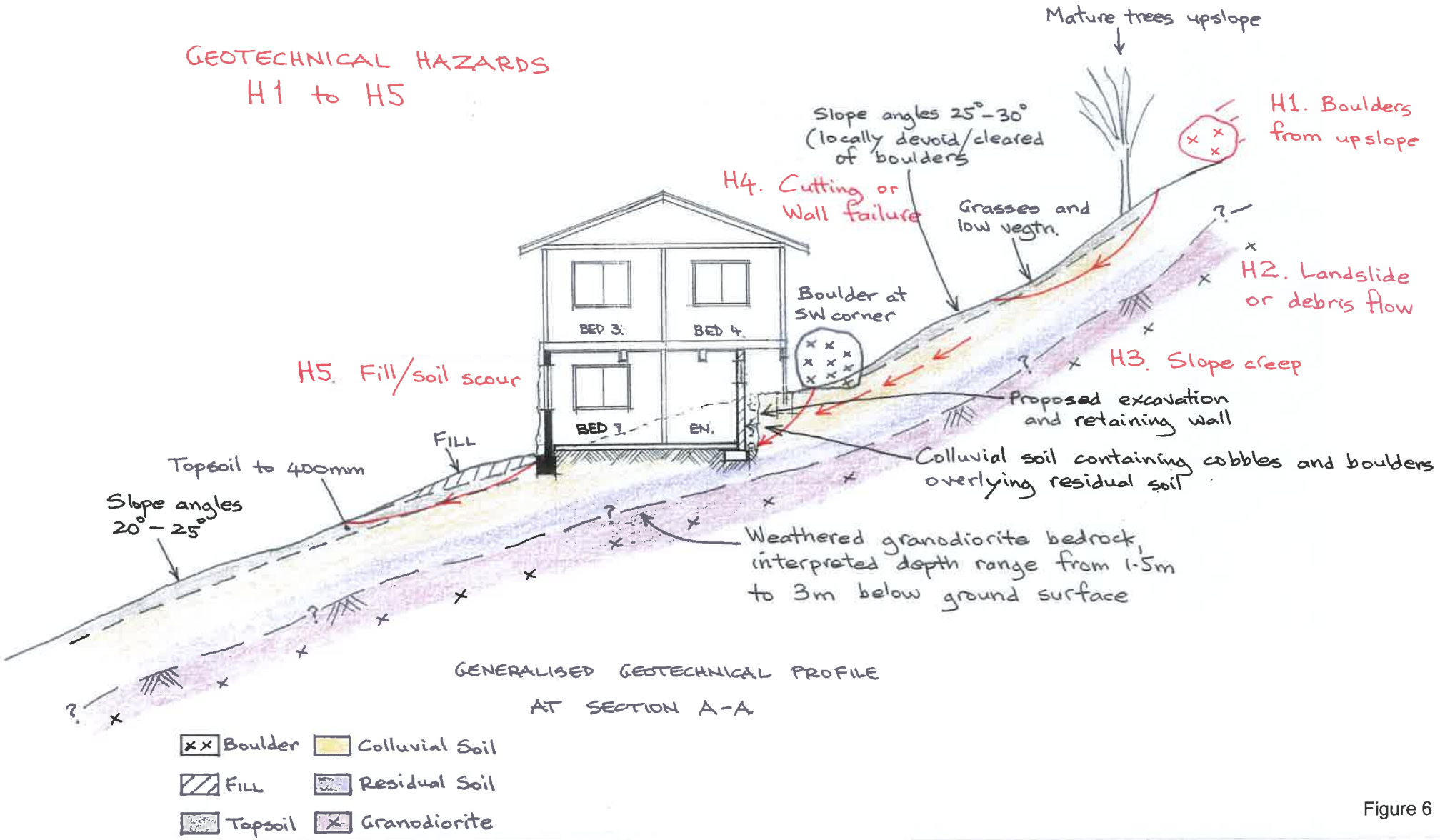
Figure 5

PROPOSED ALTERTIONS & ADDITIONS TO LAMPADA SKI CLUB, PERISHER

ALLAN McFARLAND DESIGNS 02 64563411

SCALE 1:100 1: DATE 04/16 SHEET /

# GEOTECHNICAL HAZARDS
## H1 to H5




GENERALISED GEOTECHNICAL PROFILE AT SECTION A-A

Figure 6



| No. | Revisions | Approved | Date |
|---|---|---|---|

| | | |
|---|---|---|
| Drawn | | |
| Designed | G.P.K. | 28/7/16 |
| Draft check | | |
| Design check | | |
| Approved | | |

Client and project MR T. PROUD
LAMPADA SKI LODGE
NORTH PERISHER

Title GENERALISED GEOTECHNICAL PROFILE AT SECTION A-A

A3 Drawing no. Scale 1:100

**Plate 1**

**Plate 2**

**Plate 3**

Plate 4

Plate 5

**Plate 6**

**Plate 7**

**Plate 8**

# Appendices

# **Appendix A** – General Notes and Standard Sheets

- General Notes
- Rock Description
- Sol Description

# GENERAL NOTES

**GHD GEOTECHNICS**
Specialist Services in Geotechnical Engineering, Geology, Field/Laboratory Testing and Hydrogeology
www.ghd.com

The report contains the results of a geotechnical investigation or study conducted for a specific purpose and client. The results may not be used or relied on by other parties, or used for other purposes, as they may contain neither adequate nor appropriate information. In particular, the investigation does not cover contamination issues unless specifically required to do so by the client.

To the maximum extent permitted by law, all implied warranties and conditions in relation to the services provided by GHD and the report are excluded unless they are expressly stated to apply in the report.

## TEST HOLE LOGGING

The information on the test hole logs (boreholes, test pits, exposures etc.) is based on a visual and tactile assessment, except at the discrete locations where test information is available (field and/or laboratory results). The test hole logs include both factual data and inferred information. Moreover, the location of test holes should be considered approximate, unless noted otherwise (refer report). Reference should also be made to the relevant standard sheets for the explanation of logging procedures (Soil and Rock Descriptions, Core Log Sheet Notes etc.).

## GROUNDWATER

Unless otherwise indicated, the water levels presented on the test hole logs are the levels of free water or seepage in the test hole recorded at the given time of measuring. The actual groundwater level may differ from this recorded level depending on material permeabilities (i.e. depending on response time of the measuring instrument). Further, variatic of this level could occur with time due to such effects as seasonal, environmental and tidal fluctuations or construction activities. Confirmation of groundwater levels, phreatic surfaces or piezometric pressures can only be made by appropriate instrumentation techniques and monitoring programmes.

## INTERPRETATION OF RESULTS

The discussion or recommendations contained within this report normally are based on a site evaluation from discrete test hole data, often with only approximate locations (e.g. GPS). Generalised, idealised or inferred subsurface conditions (including any geotechnical cross-sections) have been assumed or prepared by interpolation and/or extrapolation of these data. As such these conditions are an interpretation and must be considered as a guide only.

## CHANGE IN CONDITIONS

Local variations or anomalies in ground conditions do occur in the natural environment, particularly between discrete test hole locations or available observation sites. Additionally, certain design or construction procedures may have been assumed in assessing the soil-structure interaction behaviour of the site. Furthermore, conditions may change at the site from those encountered at the time of the geotechnical investigation through construction activities and constantly changing natural processes.

Any change in design, in construction methods, or in ground conditions as noted during construction, from those assumed or reported should be referred to this firm for appropriate assessment and comment.

## GEOTECHNICAL VERIFICATION

Verification of the geotechnical assumptions and/or model is an integral part of the design process - investigation, construction verification, and performance monitoring. Variability is a feature of the natural environment and, in many instances, verification of soil or rock quality, or foundation levels, is required. There may be a requirement to extend foundation depths, to modify a foundation system and/or to conduct monitoring as a result of this natural variability. Allowance for verification by appropriate geotechnical personnel must be recognised and programmed for construction.

## FOUNDATIONS

Where referred to in the report, the soil or rock quality, or the recommended depth of any foundation (piles, caissons, footings etc.) is an engineering estimate. The estimate is influenced, and perhaps limited, by the fieldwork method and testing carried out in connection with the site investigation, and other pertinent information as has been made available. The material quality and/or foundation depth remains, however, an estimate and therefore liable to variation. Foundation drawings, designs and specifications should provide for variations in the final depth, depending upon the ground conditions at each point of support, and allow for geotechnical verification.

## REPRODUCTION OF REPORTS

Where it is desired to reproduce the information contained in our geotechnical report, or other technical information, for the inclusion in contract documents or engineering specification of the subject development, such reproductions must include at least all of the relevant test hole and test data, together with the appropriate Standard Description sheets and remarks made in the written report of a factual or descriptive nature.



Ref: DS5.5.1 Issue 1.8 Date: 5/10/2012

# GLOSSARY OF SYMBOLS

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www.ghd.com/global/services/geotechnical/

This standard sheet should be read in conjunction with all test hole log sheets and any idealised geological sections prepared for the investigation report.

## GENERAL

| Symbol | Description | Symbol | Description |
|---|---|---|---|
| D | Disturbed Sample | PZ | Piezometer Installation |
| U | Undisturbed Sampled (suffixed by sample size or tube diameter in mm if applicable) | R | Rising Head Permeability Test |
| | | F | Falling Head Permeability Test |
| C | Core Sample (suffixed by diameter in mm) | PBT | Plate Bearing Test |
| SV | Shear Vane Test (suffixed by value in kPa) | ▸— | Water Inflow (make) |
| SPT | Standard Penetration Test (with blows per 0.15m) | —◂ | Water Outflow (loss) |
| N | SPT Value | ▽ | Temporary Water Level |
| HB | SPT hammer bouncing | ▼ | Final Water Level |
| PM | Pressuremeter Test | ● | Point Load Test (axial) |
| PP | Pocket Penetrometer (suffixed by value in kPa) | ○ | Point Load Test (diametric) |
| PK | Packer Test | IMP | Impression Device Test |

## SOIL SYMBOLS

### Main Components

SAND | CLAY | SILT

GRAVEL | FILL | TOPSOIL

### Minor Components

sandy | clayey | silty

gravelly | vegetation, roots

*Note:* Natural soils are generally a combination of constituents, e.g. sandy CLAY

## ROCK SYMBOLS

### Sedimentary

SANDSTONE | SHALE

CLAYSTONE | CONGLOMERATE

SILTSTONE | COAL

### Igneous

GRANITIC ROCK

IGNEOUS DYKE

BASALTIC ROCK

*Note*: Additional rock symbols may be allocated for a particular project.

## NATURAL FRACTURES (Coding)

### Fracture Type

| | |
|---|---|
| JT | Joint |
| BP | Bedding Plane |
| Cb | Cross Bed |
| SS | Sheared Surface |
| SM | Seam |
| CS | Crushed Seam |
| FZ | Fragmented Zone |
| SZ | Shear Zone |
| VN | Vein |
| ~~CV~~ | ~~Cleavage~~ |
| WSM | Weathered Seam |
| ISM | Infilled Seam |
| SSm | Sheared Seam |

### Orientation

For vertical non-oriented core ... "Dip" angle (eg. 5°) measured relative to horizontal
For inclined non-oriented core ... "Angle" measured relative to core axis.
For inclined oriented core ... "Alpha" angle and "Beta" angle (eg. 45°/225° mag.)

| | |
|---|---|
| VT | Vertical |
| HZ or 0° | Horizontal |
| d | degrees |

### Infilling or Coating

| | |
|---|---|
| CN | Clean |
| X | Carbonaceous |
| CLAY | Clay |
| KT | Chlorite |
| CA | Calcite |
| FE | Iron Oxide |
| MI | Micaceous |
| Mn | Manganese |
| Py | Pyrite |
| QZ | Quartz |
| VE | Veneer |

### Shape

| | |
|---|---|
| PLN | Planar |
| CU | Curved |
| UN | Undulating |
| ST | Stepped |
| IR | Irregular |

### Roughness

| | |
|---|---|
| POL | Polished |
| SLK | Slickensided |
| SO | Smooth |
| RF | Rough |
| VR | Very Rough |

### Others

| | |
|---|---|
| DIS | Discontinuous |
| OP | Open |
| CL | Closed |
| TI | Tight |

Ref: DS6.5.1_31296802 Issue 1.0 Date: 07/02/2014

# SOIL DESCRIPTION

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This procedure involves the description of a soil in terms of its visual and tactile properties, and relates to both laboratory samples and field exposures as applicable. A detailed soil profile description, in association with local geology and experience, will facilitate the initial (and often complete) site assessment for engineering purposes.

The method involves an evaluation of each of the items listed below and is in general agreement with both Australian Standard AS 1726 (the Site Investigation Code) and ASTM D2487 and D2488.

## MOISTURE

The moisture condition of the soil is most applicable for cohesive soils as a precursor to the assessment of consistency and workability. The moisture condition is described as:-

***Dry*** (dusty, dry to the touch) ***Slightly Moist*** ***Moist*** (damp, no visible water) ***Very Moist*** or ***Wet*** (visible free water, saturated condition)

In addition, the presence of any seepage or free water is noted on the testhole logs.

## COLOUR

Colour is important for correlation of data between testholes and during subsequent excavation operations. The prominent colour is noted, followed by (spotted, mottled, streaked etc.) then secondary colours as applicable. Colour is usually described at as-received moisture condition, though both wet and dry colours may also be appropriate.

## CONSISTENCY / DENSITY INDEX

This assessment is based on the effort required to penetrate and/or mould the soil, and is an indicator of shear strength.

Granular soils are generally described in terms of density index as listed in AS 1726. These soils are inherently difficult to assess and normally a penetration test procedure (SPT, DCP or CPT) is used in conjunction with published correlations. Alternatively, in-situ density tests can be conducted in association with minimum and maximum densities performed in the laboratory.

| Term | Symbol | Density Index (%) |
|---|---|---|
| Very Loose | VL | < 15 |
| Loose | L | 15 - 35 |
| Medium Dense | MD | 35 - 65 |
| Dense | D | 65 - 85 |
| Very Dense | VD | >85 |

Cohesive soils can be assessed by direct measurement (shear vane, CPT etc), or estimated approximately by tactile means and/or the aid of a geological pick as given on the following table. It is emphasised that a "design shear strength" must take cognisance of the mode of testing and the in-situ moisture content with the possible variations of moisture with time.

| Term | Symbol | Tactile Properties | Undrained Strength $S_u$ (kPa) |
|---|---|---|---|
| Very Soft | VS | Extrudes between fingers when squeezed in hand | <12 |
| Soft | S | Easily penetrated by thumb about 30-40 mm. Pick head can be pushed in up to shaft. | 12-25 |
| Firm | F | Penetrated by thumb 20-30mm with moderate effort. Sharp end of pick pushed in 30-40mm. | 25-50 |
| Stiff | St | Indented by thumb about 5mm with moderate effort. Pick pushed in up to 10mm. | 50-100 |
| Very Stiff | VSt | Readily indented by thumb nail. Slight indentation produced by pushing pick into soil. | 100-200 |
| Hard | H | Difficult to indent with thumb nail. Requires power tools for excavation. | >200 |

## STRUCTURE/OTHER FEATURES

The soil structure is generally applicable to cohesive soils and mainly refers to the presence or absence of joints and layering. Typical terms used are intact (no joints), fissured (closed joints), shattered (open joints), slickensided (polished joints indicative of movement), and stratified/laminated. In addition, the presence of other features (ferricrete nodules, timber inclusions) should also be noted as applicable.

For granular soils, an assessment of grading (well, uniform or poor), particle size (fine, medium etc.) and angularity and shape may also be given.

## SOIL TYPE

The soil is described in terms of its estimated grain size composition and the tactile behaviour (plasticity of any fines (less than *0.06 mm)). This system does not differentiate on grading below 0.06 mm, in accordance with the Unified Soil Classification (USC) procedure.

However, in some situations a soil can exhibit different characteristics between the undisturbed and disturbed/remolded condition (eg. 'sand' sized particles which break down a clay). The Soil Type generally relates to the latter state but the former condition should be noted where applicable.

Furthermore, as most natural soils frequently are combinations of various constituents, the primary soil is described and modifed by minor components. In brief, the system is as follows:-

| Coarse Grained Soils | | Fine Grained Soils | |
|---|---|---|---|
| % Fines | Modifier | % Coarse | Modifier |
| <5 | omit, or use "trace" | <15 | omit, or use "trace" |
| 5-12 | describe as "with clay/silt" as applicable | 15-30 | described as "with sand/gravel" as applicable |
| >12 | prefix soil as "silty/clayey" as applicable | >30 | prefix soil as "sandy/gravelly" as applicable |

(*The 200# sieve (0.075 mm) is commonly used in practice to differentiate between fine and coarse grained soils).

Note: For soils containing both sand and gravel the minor coarse fraction is omitted if less than 15%, or described as "with sand/gravel" as applicable when greater than 15%.

The appropriate USC symbol may also be given after the soil type description in accordance with ASTM D2487 and D2488.

## ORIGIN

An attempt is made, where possible, to assess origin (transported, residual, pedogenic, or fill etc.) since this assists in the judgement of probable engineering behaviour. This assessment is generally restricted to field logging activities. An interpretation of landform is a useful guide to the origin of transported soils (e.g. colluvium, talus, slide debris, slope wash, alluvium, lacustrine, estuarine, aeolian and littoral deposits) while local geology and remnant fabric will assist identification of residual soils.

# ROCK DESCRIPTION

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This method is based on Australian Standard AS 1726 and is orientated to the field logging of diamond drill core, but may be used for the profiling of natural exposures and cuttings, as applicable. The procedure involves a visual and tactile assessment of the rock mass and the nature of defects within it in order to facilitate a prediction of engineering behaviour.

*DESCRIPTION:* Rock Type is described on the basis of origin (sedimentary, metamorphic and igneous) with the common types listed below:-

| Sedimentary | | | | Metamorphic | Igneous | | | |
|---|---|---|---|---|---|---|---|---|
| Clastic | Non clastic (chemical) | Non clastic (organic) | Pyroclastic | | | Acid | Intermediate | Basic |
| Conglomerate<br>Sandstone<br>Siltstone<br>Shale<br>Claystone | Limestone<br>Chert<br>Gypsum<br>Salt | Coal<br>Some<br>Limestone | Tuff<br>Agglomerate<br>Volcanic<br>Breccia | Slate<br>Phyllite<br>Schist<br>Quartzite<br>Gneiss | Extrusive | Rhyolite | Trachyte / Andesite | Basalt |
| | | | | | Intrusive (medium grained) | Quartz Porphyry | Porphyry / Porphyrite | Dolerite |
| | | | | | (coarse grained) | Granite | Syenite / Diorite | Gabbro |

Colour is given to assist in rock identification and the interpolation of field data. Colour is usually described at as-received moisture condition, though both wet and dry colours may also be appropriate.

Texture refers to the degree of crystallinity and granularity (grain size) and the fabric relationship between the constituents of a rock. Often only grain size is given for simplified descriptions of certain sedimentary rocks.

Structure and texture are commonly used synonymously in describing rocks since there is no clear delineation between terms. In general, structure refers to large-scale features recognisable in the field (banding, lineation, massive, porphyritic, schistose etc.). For sedimentary rocks in particular, the thickness of sedimentary layering (bedding) is described as:-

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Thinly laminated | <6mm | very thinly bedded | 20-60mm | medium bedded | 0.2-0.6m | very thickly bedded | >2m |
| Laminated | 6-20mm | thinly bedded | 60-200mm | thickly bedded | 0.6-2m | | |

In addition, mineral composition, hardness, alteration, cementation is given as applicable.

*WEATHERING*: The assignment of weathering is some what subjective. Weathering assists identification and does not imply engineering behaviour. No distinction is drawn between chemical weathering and alteration for most engineering purposes. These procedures are collectively described as "weathering" using the following terms which do not describe the related strength change. This system is general, and in this format may not apply to all rock types. Carbonate rocks generally do not conform to this classification.

| Term | Symbol | Definition |
|---|---|---|
| Completely Weathered | CW | Residual soil with rock fabric not visible. |
| Extremely Weathered | EW | The rock exhibits soil-like properties though the texture of the original rock is still evident. |
| Highly Weathered | HW | Limonite staining or colour change affects the whole of the rock mass and oth er signs of chemical or physical decomposition are evident. |
| Moderately Weathered | MW | Staining extends throughout the whole of the rock mass and the original colour is no longer recognisable. |
| Slightly Weathered | SW | Partial staining or discolouration of the rock mass, usually by limonite, has taken place. |
| Fresh | Fr | Rock mass unaffected by weathering. |

*ESTIMATED STRENGTH*: This refers to the strength of the rock substance and not that of the rock mass. The strength of the rock substance is estimated by the Point Load Strength Index $I_S(50)$ and refers to the strength measured in the direction normal to the bedding for sedimentary rocks. A field guide is given below:-

| Term | Symbol | $I_S(50)$ MPa | Field Guide (The core refers to a 150mm long x 50mm dia. sample) |
|---|---|---|---|
| Extremely Low | EL | <0.03 | Remoulded by hand to a material with soil properties. |
| Very Low | VL | 0.03-0.1 | May be crumbled in the hand. Sandstone is "sugary" and friable. |
| Low | L | 0.1-0.3 | The core may be broken by hand and easily scored with a knife. Sharp edges of core may be friable and break during handling. |
| Medium | M | 0.3-1.0 | The core may be broken by hand with considerable difficulty. Readily scored with knife. |
| High | H | 1-3 | The core cannot be broken by unaided hands, can be slightly scratched or scored with knife. |
| Very High | VH | 3-10 | The core may be broken readily with hand held hammer. Cannot be scratched with knife. |
| Extremely High | EH | >10 | The core is difficult to break with hand held hammer. Rings when struck with a hammer. |

*DEFECTS*: This important feature can control the overall engineering behaviour of a rock mass. All types of natural fractures across which the core is discontinuous are noted. These fractures include bedding plane partings, joints and other defects but exclude artificial fractures such as drilling breaks. The nature of the defects (joints, bedding partings, seams, zones and veins) is also noted with description, orientation, infilling or coating, shape, roughness, thickness, etc. given generally in accordance with AS 1726. The spacing of natural fractures excludes bedding partings unless there is evidence that they were separated prior to drilling. This notwithstanding, bedding partings maybe considered as planes of weakness in an engineering assessment.

Ref: Doc 5.2.1 Issue 1.0 Date: 24/06/2008

# CORE LOG SHEET NOTES

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The intention of Core log Sheets is to present factual information measured from the core or as recorded in the field. Some interpretative information is inevitable in the location of core loss, description of weathering and identification of drilling induced fractures. This should be noted in the use of Core Log Sheets and remembered in their utilisation.

**DRILLING AND CASING**

The types of drilling used to advance the drill hole are recorded for relevant intervals. The types of drilling may include: NMLC coring, NQTT (NQ triple tube wire line), HW, HX, NW and NX casing, wash boring (tri-cone roller bit, TC drag bit, TC blade bit), or auger drilling (V-bit, TC drag bit).

The relevant progress is shown by abbreviated dates in the column.

**WATER**

Water lost or water made during drilling is recorded and subsequent readings of water levels in the borehole or piezometers are recorded here with dates of observation.

**DRILL DEPTH AND CORE LOSS**

Drilling intervals are shown by depth increments and horizontal marker lines. Core loss is measured as a percentage of the drill run. If the location of the core loss is known or strongly suspected, it is shown in a region of the column bounded by dashed horizontal lines. If unknown, core loss is assigned to the bottom of a coring run.

**SAMPLES AND FIELD TESTS**

The location of samples taken for testing or the location of field tests are indicated by the appropriate symbol from the GLOSSARY OF SYMBOLS Standard Sheet (or as applicable for the project) and are shown at the relevant location or over the relevant depth interval.

**DEPTH (RL)**

Changes in rock types or the locations of piezometer tips, samples, test intervals or other depths are shown as appropriate in terms of depth from the hole collar or in terms of RL.

For inclined holes the depths shown on the log refer to the drilled length along the borehole. The RL, where used, is the only transformed reference to true vertical depth.

**STRATA**

Rock types are presented graphically using the symbols shown on the GLOSSARY OF SYMBOLS Standard Sheet or as assigned for the project.

**DESCRIPTION**

The rock type is described in accordance with the ROCK DESCRIPTION Standard Sheet.

**WEATHERING**

Weathering is described, by code letters, in accordance with the ROCK DESCRIPTION Standard Sheet. A weathering term or range of terms is usually assigned to various strata.

It is noted, however, that the assignment of a term of weathering is subjective and is normally used for identification and does not imply engineering behaviour (such behaviour being controlled principally by rock substances strength and defect frequency - collectively, rock mass strength). Consequently, boundaries are often not shown and weathering may even not be reported where potentially misleading.

**ESTIMATED STRENGTH**

The strength of the rock substance is estimated by a combination of Point Load testing and tactile appraisal in accordance with the ROCK DESCRIPTION Standard Sheet. The estimated strength is presented in a histogram form. Both axial and diametric point load test results can be presented using the symbols on the GLOSSARY OF SYMBOLS Standard Sheet and the variation between axial and diametric values is indicative of anisotropy or fissility of the rock unit.

**NATURAL FRACTURES**

The identification of natural fractures requires an endeavour to exclude drilling induced breaks in the core and, as such, can be somewhat subjective. Natural fractures exist prior to coring the rock, whereas artificial fractures occur either during coring, during placing core in the core boxes, or during examination or transportation, or core after being boxed.

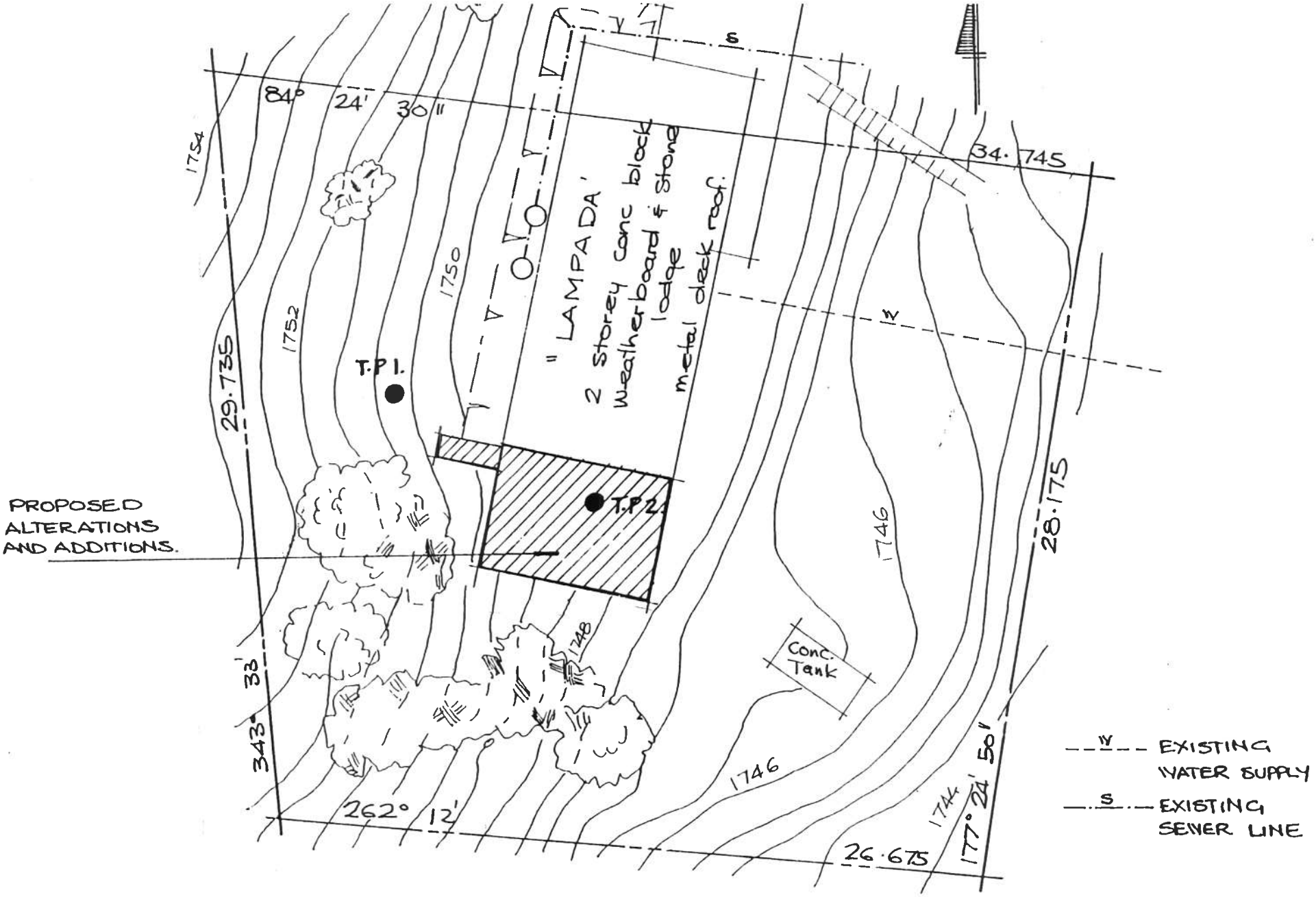
The log of Natural Fractures is presented as a combination of Fracture Spacing, Visual and Description columns. Coding is presented on the GLOSSARY OF SYMBOLS Standard Sheet.

**ROCK QUALITY DESIGNATION (RQD) INDEX OPTION**

The Core Log Sheet has an optional field column to record the RQD index. For certain projects, such as tunnelling or underground mining investigations, rock mass ratings or classifications can be required as part of the design process. The Rock Quality Designation (RQD) Index forms a component of these rock mass ratings and provides a quantitative estimate of rock mass quality from rock core logs. The core must be a minimum of 54.7mm diameter (although NMLC-sized core is probably OK) for derivation of an RQD index.

The RQD index is expressed as a percentage of intact rock core (excludes extremely weathered rock/residual soil) greater than 100 mm in length over the total selected core length. The total selected core length should be based on identifiable engineering geological domain characteristics. Should this not be practicable, RQD can be measured on a per run basis.

# **Appendix B** – Previous Investigation Results – Van Leeuwen and Associates




SITE PLAN APPENDIX 'B' **SITE PLAN SHOWING TEST PIT POSITIONS**

Scale 1:200

# EXCAVATION LOG TEST PIT/BORE No. 1 APPENDIX 'C'

CLIENT : LAMPADA LODGE
PROJECT : EXTENSION
LOCATION : PERISHER VALLEY

DATE : OCT. 1997.
PROJECT No. : 1
AHD LEVEL : 1750 m

| SAMPLES | WATER | RL DEPTH | U.S.C.S | MATERIAL DESCRIPTION, STRUCTURE<br>Soil type: Plasticity; Colour: Moisture<br>Particle Characteristics; Structure<br>Secondary or minor components | CONSISTENCY RELATIVE | TEST RESULTS | GEOLOGICAL PROFILE |
|---|---|---|---|---|---|---|---|
| | MOIST<br>SUBSURFACE<br>WET<br>SURFACE | 400 | SC | SILTY SANDY LOAMY LOW PLASTICITY<br>DARK BROWN SOIL FRIABLE<br>SOME CLAY | LOOSE. | PP <1 | LATE<br>SILURIAN<br>GRANODIORITE |
| | MOIST | 900 | SW<br>SP<br>SM | SILTY SANDY COARSE GRAIN SOIL<br>LITTLE CLAY LIGHT BROWN | FIRM TO<br>DENSE | PP >1-2 | |
| | | >900<br>Varies<br>Considerably<br>to possibly<br>3000 | | COARSE GRAINED GRANITE<br>ROCK | HARD. | | |


**VAN LEEUWEN and Associates pty ltd**

**STRUCTURAL, CIVIL and GEOTECHNICAL ENGINEERS** ACN 007 387 180

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civil — Roads Drainage Water Supply Sewerage Subdivisions
geotechnical — Site Assessment Soil Testing and Stability
construction — Project Managers Inspections Supervision Plans

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## EXCAVATION LOG TEST PIT/BORE no. 2 APPENDIX 'C'

CLIENT : LAMPADA LODGE
PROJECT : EXTENSION
LOCATION : PERISHER VALLEY.

DATE : OCT. 1997.
PROJECT No. :
AHD LEVEL : 1750

| SAMPLES | WATER | RL DEPTH | U.S.C.S | MATERIAL DESCRIPTION, STRUCTURE<br>Soil type : Plasticity ; Colour ; Moisture<br>Particle Characteristics ; Structure<br>Secondary or minor components | CONSISTENCY RELATIVE | TEST RESULTS | GEOLOGICAL PROFILE |
|---|---|---|---|---|---|---|---|
| | Wet Surface<br>Moist Subsurface | 400 | SC | Silty Sandy Loamy Low Plasticity Dark Brown Friable Soils Some Clay. | Loose | - | Late Silurian Granodiorite |
| | Moist. | 900 | SW. SP. SM. | Silty Sandy Coarse Grained Light Brown Soils with Little Clay | Firm to Dense | | |
| | | | | Underlying Coarse Grained Granite Rock of varying depths below surface. | Hard. | | |


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# **Appendix C** – Previous Hazard Mapping Results – GHD Longmac

H2
(B,S)

H1

H3

H2
(B,S)

H1

H1

SEE ACCOMPANYING LEGEND AND NOTES



GHD
57 HERBERT STREET, ARTARMON N.S.W. 2064
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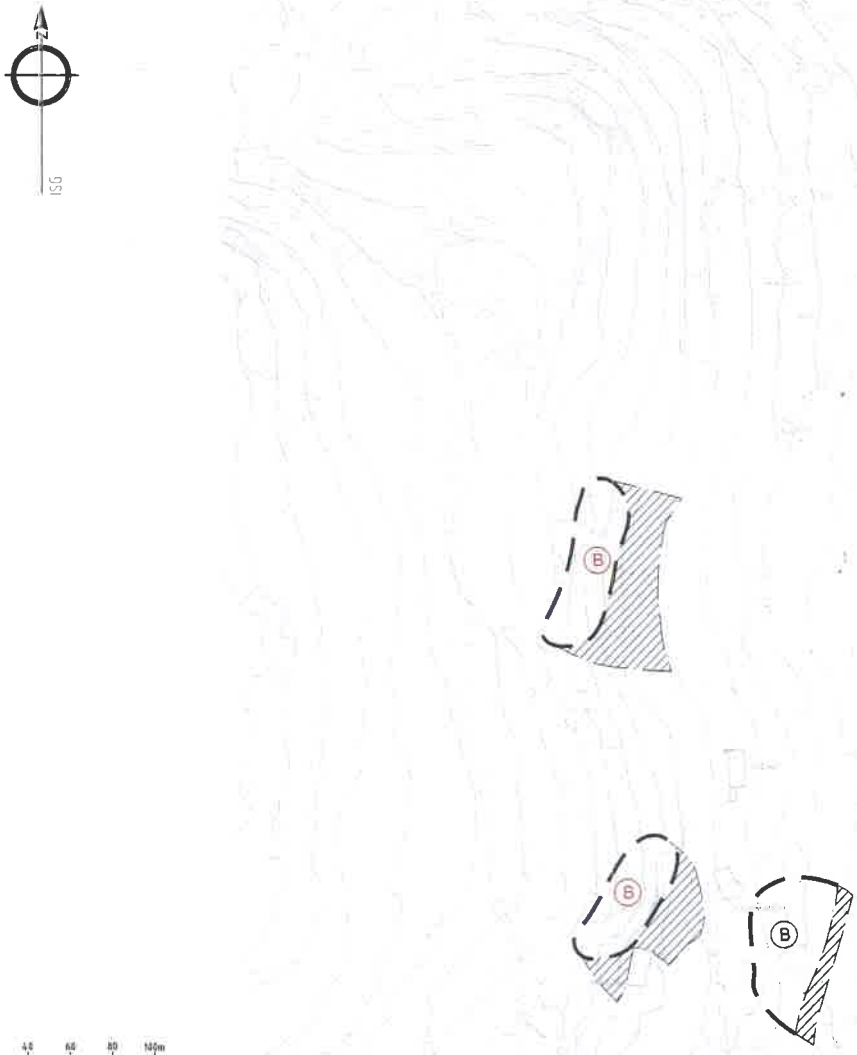
EMail:longmac@ghd.com.au
GHD LONGMAC

# KOSCIUSZKO NATIONAL PARK
# PERISHER VALLEY
# GEOTECHNICAL HAZARD ZONES

| | |
|---|---|
| Designed: | GPK |
| Drawn: | HW |
| Checked: | Date: 19/5/04 |
| File name: | 190030_H1-2a.DWG |

| | |
|---|---|
| Figure No: | H1.2a |
| Job No: | 190030/00 |
| Scale: | AS SHOWN |




SEE ACCOMPANYING LEGEND AND NOTES



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GHD LONGMAC

# KOSCIUSZKO NATIONAL PARK
# PERISHER VALLEY
# GEOTECHNICAL HAZARD MAP

| | |
|---|---|
| Designed: | GPK |
| Drawn: | HW |
| Checked: | G.P.K. Date: 19/5/04 |
| File name: | 190030_H1-2.DWG |

| | |
|---|---|
| Figure No: | H1.2 |
| Job No: | 190030/00 |
| Scale: | AS SHOWN |

# **Appendix D** – Previous Investigation Results - URS

# URS

BOREHOLE LOG

Borehole No:

Sheet 1 of

CLIENT: ALLAN McFARLAND
PROJECT: LAMPADA LODGE GEOTEC
LOCATION: TP1
DRILL CONTRACTOR: NA

JOB NUMBER: 43197173.00102
DATE COMMENCED: 8 JUN 05
DATE COMPLETED: 8 JUN 05
LOGGED BY: TED McDONNELL

Drill Model: Hole Angle: deg. Rock Size: RL:
Drilling Fluid: Orientation: deg. Co-ordinates:

| Method / Casing | Depth (m) | Graphic Log | USCS Classification | Material Description (type, colour/mottling, plasticity/grain size, secondary/minor components, soil origin) | Moisture | Consistency / Density | Field Records/Comments |
|---|---|---|---|---|---|---|---|
| | 0.2 | | | BLACK - DARK BROWN ROOT & VEGETABLE MATTER EVIDENT | | | |
| | 0.4 | | SC-SM | CLAYEY SAND MOIST LOW - MEDIUM PLASTICITY APPEARS TO BE A MIXTURE OF NATURAL TOP SOIL AND FILL MATERIAL | | | |
| | 0.6 | | | | | | |
| | 0.8 | | | | | | |
| | 1.0 | | | | | | |
| | | | SC-CP | SAME SOIL TYPE AS ABOVE BUT ROCKS Ø = 50-100mm IN SOIL MATRIX | | | |
| | 1.2 | | SC | RED-BROWN - SANDY SOIL LOW - MEDIUM PLASTICITY, PARTICLES TO 5mm Ø | | | RESIDUAL/COLLUVIAL DECO GRANITE SOIL |
| | 1.4 | | | HOLE TERMINATED AT 1.3m (EXTENT OF AUGER) | | | |
| | | | | WEAK EW GRANITE ROCK EXPECTED AT 2-4m | | | |

| CLIENT: Allan McFarland | PROJECT: Geotechnical Investigation For Extension To Lampada Lodge, Perisher Valley, Kosciuszko National Park | TITLE: Test Pit Log For TP1 | |
|---|---|---|---|
| NOT TO SCALE | DESIGNED: TMD<br>DRAWN: TMD<br>DATE: 10 Jun 05 | APPROVED:<br>DATE:<br>STATUS: | PROJECT NUMBER: 43197173 URS |

# URS

Borehole No:

Sheet 1 of

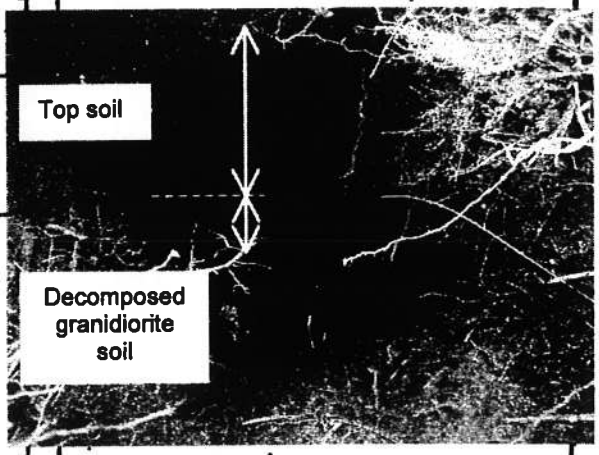
## BOREHOLE LOG

CLIENT: ALLAN McFARLAND
PROJECT: LAMPADA LODGE GEOTECH
LOCATION: PERISHER VALLEY - TP2
DRILL CONTRACTOR: NA

JOB NUMBER: 43197173.00102
DATE COMMENCED: 8 JUN 05
DATE COMPLETED: 8 JUN 05
LOGGED BY: TED McDOWELL

Drill Model: Hole Angle: deg. Rock Size: RL:
Drilling Fluid: Orientation: deg. Coordinates:

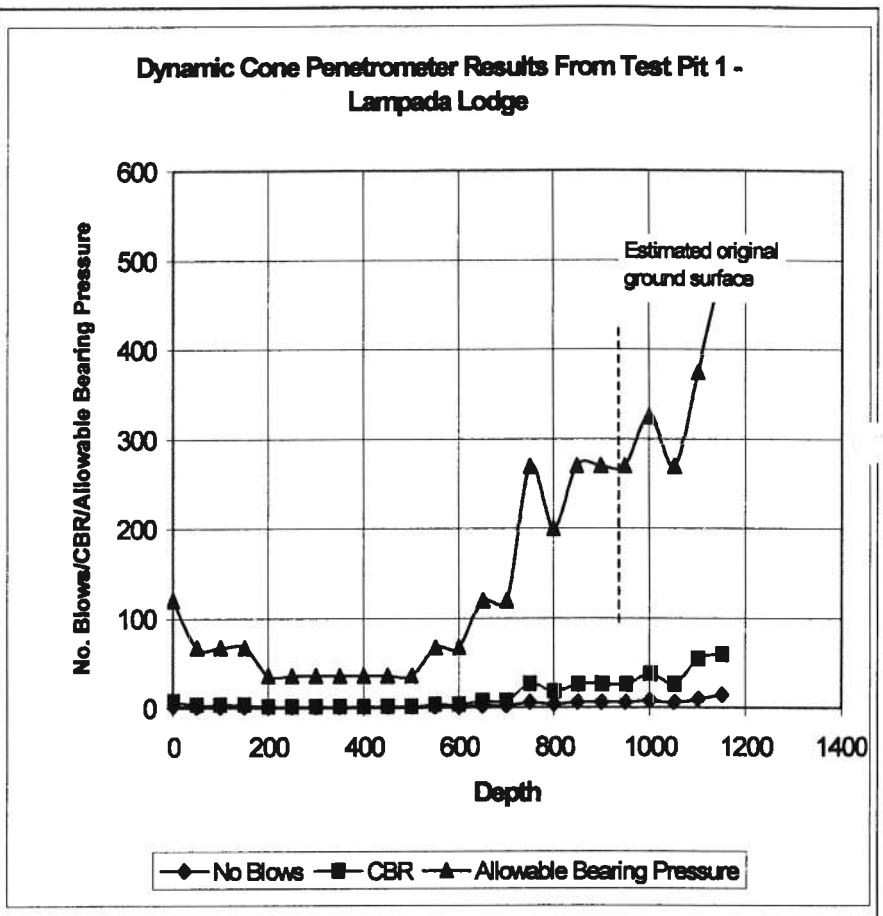
| Method / Casing | Depth (m) | Graphic Log | USCS Classification | Material Description (type, colour/mottling, plasticity/grain size, secondary/minor components, soil origin) | Moisture | Consistency | PID / Photoionizer | Sampling | Field Records/Comments (Initial testing, groundwater observations/regime, well construction details, additional information) |
|---|---|---|---|---|---|---|---|---|---|
| | 0.2 | | SC<br>SM | DARK BROWN-BLACK COLOUR CLAYEY SAND; SOME ROOT & VEGETATIVE MATTER MOIST LOW PLASTICITY<br>→TOP SOIL | | | | | |
| | 0.4 | | | RED-BROWN CLAYEY SAND. GRANITE ROCKS 50-100mm Ø. RESIDUAL/COLLUVIAL DECO GRANITE SOIL | | | | | |
| | 0.6 | | | HOLE TERMINATED AT 0.6m DUE TO PRESENCE OF GRANITE ROCK Ø ≥ 0.5m | | | | | |




| CLIENT: Allan McFarland | PROJECT: Geotechnical Investigation For Extension To Lampada Lodge, Perisher Valley, Kosciuszko National Park | TITLE: Test Pit Log For TP2 | |
|---|---|---|---|
| NOT TO SCALE | DESIGNED: TMD<br>DRAWN: TMD<br>DATE: 10 Jun 05 | APPROVED:<br>DATE:<br>STATUS: | PROJECT NO.: 43197173 URS |

# Appendix 3 – Results Of DCP Test

| Depth | No. Blows | CBR | Inferred Bearing Pressure |
|---|---|---|---|
| 0 | 2 | 7.8 | 120 |
| 50 | 1 | 3.6 | 68 |
| 100 | 1 | 3.6 | 68 |
| 150 | 1 | 3.6 | 68 |
| 200 | 0.5 | 1.5 | 36 |
| 250 | 0.5 | 1.5 | 36 |
| 300 | 0.5 | 1.5 | 36 |
| 350 | 0.5 | 1.5 | 36 |
| 400 | 0.5 | 1.5 | 36 |
| 450 | 0.5 | 1.5 | 36 |
| 500 | 0.5 | 1.5 | 36 |
| 550 | 1 | 3.6 | 68 |
| 600 | 1 | 3.6 | 68 |
| 650 | 2 | 7.8 | 120 |
| 700 | 2 | 7.8 | 120 |
| 750 | 6 | 27 | 270 |
| 800 | 4 | 18 | 200 |
| 850 | 6 | 27 | 270 |
| 900 | 6 | 27 | 270 |
| 950 | 6 | 27 | 270 |
| 1000 | 8 | 38 | 325 |
| 1050 | 6 | 27 | 270 |
| 1100 | 10 | 55 | 375 |
| 1150 | 15 | 60 | 490 |




*Conversion from No. blows to CBR based on AS1289.6.3.2-1997*

*Conversion from CBR to estimated allowable bearing pressure base on M.J. Stockwell, "Determination of Allowable Bearing Pressure Under Small Structures", New Zealand Engineering, (32, 6) 15 June 1977*

# **Appendix E** – Qualitative Terminology for use in Assessing Risk to Property

# 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 | | The event is conceivable but only under exceptional circumstances over the design life. | RARE | E |
| $10^{-6}$ | | 1,000,000 years | 200,000 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.

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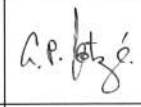
Document Status

| Revision | Author | Reviewer | | Approved for Issue | | |
|---|---|---|---|---|---|---|
| | | Name | Signature | Name | Signature | Date |
| 0 | Greg Kotze | Tony Colenbrander |  | Greg Kotze |  | 3/08/16 |
| | | | | | | |
| | | | | | | |

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SIGNATURES AND SEALS ONLY

# DP1001324

Registered: dated 14-5-1999

C.A.

Title System: CROWN LAND

Purpose: LEASE PURPOSES *

Ref. Map: PARISH

Last Plan: 6034.1604 5020.3040

PLAN: OF SUBDIVISION OF LOT 107 D.P.756697 AND Ms.5020-3040 Gbn.

Lengths are in metres. Reduction Ratio 1: 200

L.G.A.: SNOWY RIVER

Locality: PERISHER VALLEY

Parish: GUTHEGA

County: WALLACE (31)

This is sheet 1 of my plan in ... sheets. (Delete if inapplicable)

Surveyors (Practice) Regulation 1996

I, PETER WILLIAM BURNS of P.O. BOX 737 COOMA.. 2630 a surveyor registered under the Surveyor's Act 1929, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Surveyors (Practice) Regulation 1996 and was completed on 15.2.99

The survey relates to LOT 1

(Here specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey)

Datum Line: "A-B" (I.S.G. COORDINATES)

Zone: Subdivision/County

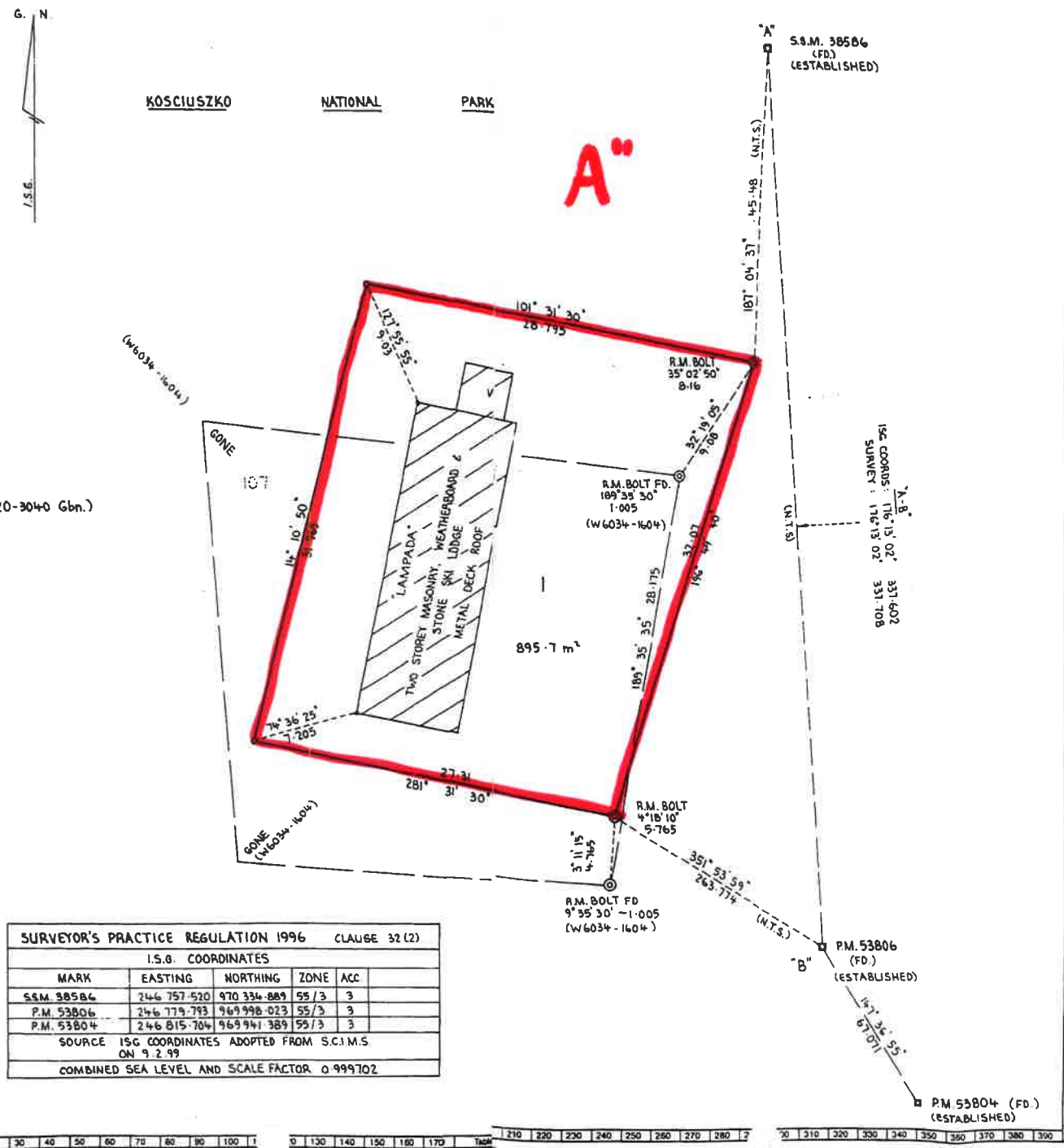
(Signature) Peter Burns

Surveyor registered under the Surveyors Act 1929

Plans used in preparation of survey/compilation

W 6034 - 1604

PANEL FOR USE ONLY for statements of intension to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants




| SURVEYOR'S PRACTICE REGULATION 1996 CLAUSE 32 (2) | | | | | |
|---|---|---|---|---|---|
| I.S.G. COORDINATES | | | | | |
| MARK | EASTING | NORTHING | ZONE | ACC | |
| S.S.M. 38586 | 246 757·520 | 970 334·889 | 55/3 | 3 | |
| P.M. 53806 | 246 779·793 | 969 998·023 | 55/3 | 3 | |
| P.M. 53804 | 246 815·704 | 969 941·389 | 55/3 | 3 | |
| SOURCE ISG COORDINATES ADOPTED FROM S.C.I.M.S ON 9.2.99 | | | | | |
| COMBINED SEA LEVEL AND SCALE FACTOR 0.999702 | | | | | |

Crown Lands Office Approval

PLAN APPROVED

Authorised Officer

Land District

Paper No

Field Book pages

Subdivision Certificate

I certify that the provisions of s. 109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to the proposed set out herein (insert subdivision or new road)

*Authorised Person/General Manager/Accredited Certifier

Consent Authority

Date of endorsement

Accreditation No

Subdivision Certificate No

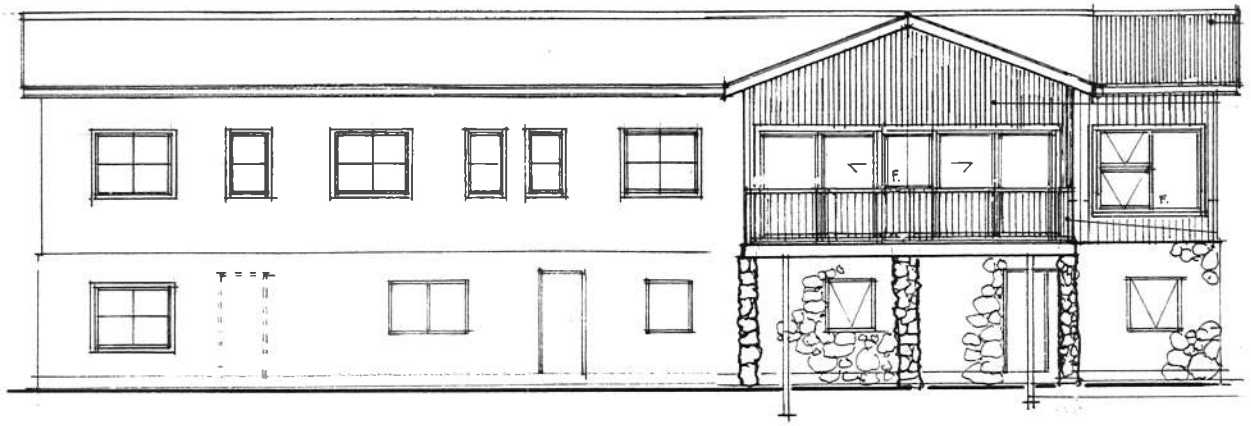
File No

When the plan is to be lodged electronically in the Land Titles Office, it should include a signature in an electronic or digital format approved by the Registrar-General

*Delete whichever is inapplicable

SURVEYOR'S REFERENCE 2983 CHECKLIST

WARNING: CREASING OR FI... WILL LEAD TO REJECTION



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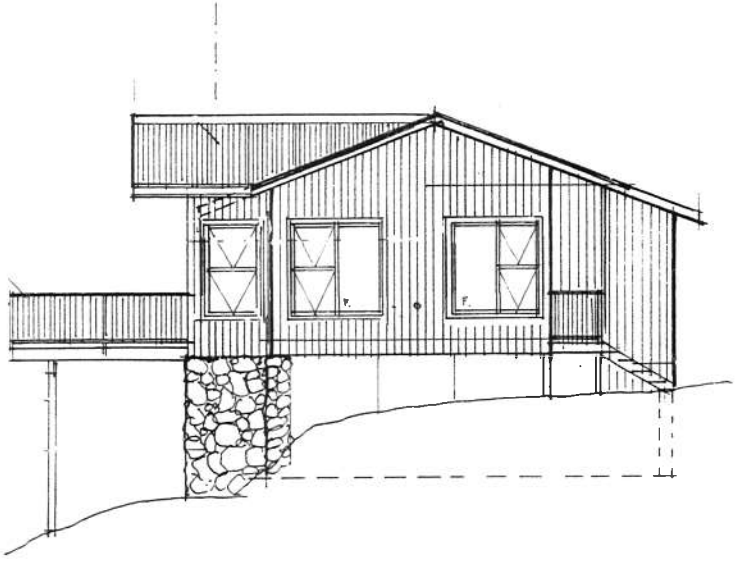
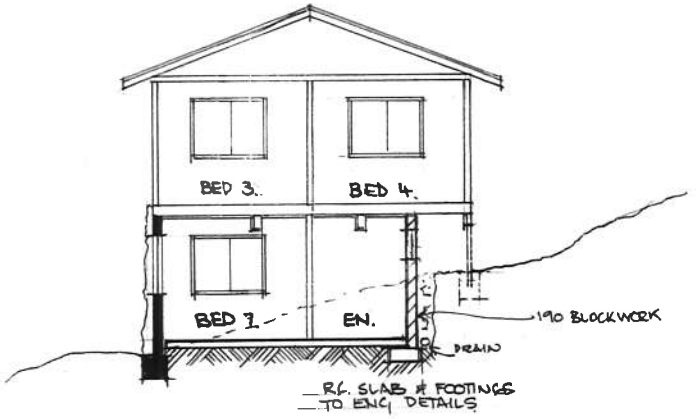


NORTH ELEVATION




SECTION A-A

PROPOSED ALTERTIONS & ADDITIONS TO LAMPADA SKI CLUB, PERISHER

*ALLAN McFARLAND DESIGNS 02 64563411*

SCALE 1:100 1 : DATE 04/16 SHEET /