Site Environmental Management Plan (SEMP)

Sonnblick Lodge Demolition

Thredbo Alpine Resort
Kosciuszko National Park, NSW

February 2023

Document Control

Revision	Date	Revision Type	Author	Approved by
A	16.08.2023	Draft	C.Hobbs	J.Love
B	30.11.2023	Final	A.Gill	J.Love
C	16.02.2024	Inclusion of NPWS referral comments, Table 4-1 (project timing), Section 6.3 (fauna management measures)		J.Best

Kosciuszko Thredbo Pty Ltd
1 Friday Drive, Thredbo, New South Wales 2625
www.thredbo.com.au

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1 Introduction

This Site Environmental Management Plan (SEMP) has been prepared for implementation by Kosciuszko Thredbo Pty Ltd (KT) (and its contractors) for the Sonnblick Lodge Demolition (the Project).

KT requires a SEMP to support the Development Application (DA) for the Project, situated in Thredbo Alpine Resort (Thredbo), approximately 35 kilometres (km) south-west of Jindabyne, New South Wales. The Project involves demolition of an existing ski lodge identified as Sonnblick Lodge, located at 10 Bobuck Lane, Thredbo.

1.1 Purpose

This SEMP has been developed to outline how construction activities for the Project are to be managed in order to maintain and protect the environmental values of the Project site and surrounds.

1.2 Objective

The objectives of this SEMP are to:

- Provide mitigation measures to minimise the potential for environmental harm and/or environmental nuisance.
- Provide guidance for the development of detailed construction environmental management plans.
- Ensure all Project Personnel understand individual roles and responsibilities.
- Provide corrective actions to be implemented in the event of environmental harm and/or environmental nuisance.
- Ensure Project personnel understand incident and emergency response procedures.

2 Reference Documentation

2.1 Applicable Legislation

The Project will be carried out in accordance with the applicable legislative requirements outlined in the following Acts and subordinate legislation:

- *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)*
- *Biodiversity Conservation Act 2016*
- *Environmental Planning and Assessment Act 1979*
- *Environmentally Hazardous Chemicals Act 1985*
- *Heritage Act 1977*
- *National Parks and Wildlife Act 1974*
- *Protection of the Environment Operations Act 1997*
- *Waste Avoidance and Resource Recovery Act 2001*
- *Water Management Act 2000*
- *Work Health and Safety Act 2011.*

2.2 Supporting Documents

Document	Title	Prepared by	Version
Approval	Development Consent	DPE	-
Report	Statement of Environmental Effects – Sonnblick Lodge Demolition	NGH Consulting	2023
Plan	Demolition Work Plan	ACT Geotechnical Engineers Pty Ltd	2023
Assessment	Geotechnical Investigation and Slope Stability Risk Assessment	ACT Geotechnical Engineers Pty Ltd	2022
Procedure	Construction Site Incident and Emergency Procedures Thredbo Village	Kosciuszko Thredbo Pty Ltd	1.1
Procedure	Emergency Response Spill Procedure	Kosciuszko Thredbo Pty Ltd	1
Procedure	Standard Operating Procedure: Use and Maintenance of Wash Down Bay (KT055)	Kosciuszko Thredbo Pty Ltd	March 2019

2.3 Guidelines

The Project will be carried out in accordance with the applicable guidelines outlined in the following documents:

- Guideline for the Preparation of Environmental Management Plans (DIPNR 2004).
- Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition (Landcom 2004).
- Managing Urban Stormwater: Soils and Construction, Volume 2A, Installation of services (NSW DECC 2008).

3 Project Description

Sonnblick Lodge as shown in Figure 3-1 is located between other lodge accommodation within the Thredbo Village and fronts onto Bobuck Lane. Located on the land is the three-storey Sonnblick lodge, and associated structures including retaining walls, and concrete driveway. The driveway provides direct access onto Bobuck Lane. Bobuck Lane is a one-way road that is accessed via Alpine Way and Banjo Drive and connects onto Friday Drive. Bobuck Lane is a 40km/hr speed limited area and is a narrow road with some parking occurring partially on street at the front of some accommodation lodges.

The Project comprises of the demolition of the Sonnblick lodge, which is a sixteen bed, five apartment, three-storey staff accommodation building in the Eastern precinct of the Thredbo Village. Works will include demolition of the building and associated concrete paths, landings, and stairs. The land is subject to geotechnical plan requirements for site stability during and post demolition. The works will also include site stabilisation and revegetation.

Figure 3-1 Sonnblick Lodge at 10 Bobuck Lane, Thredbo (Source: KT 2023)

4 Construction Management Details

A summary of the construction program and activities is provided in Table 4-1.

Table 4-1 Construction Detail and Activities

Aspect	Details
Site Access	The site is accessed off Bobuck Lane, using an existing concrete driveway. Access along the road must be maintained during the demolition process. A stabilised access would be provided for the demolition (typically a gravel entry point, can be established if the existing entry is deemed not to be appropriate for the demolition. To avoid parked vehicles blocking access along Bobuck Lane, parking for workers would be within/next to the site compound to be established at Friday Flat and workers would be ferried to/from the site in a light vehicle as needed.
Project site	10 Bobuck Lane, Thredbo 2625, legally identified as Lot 876 DP1243112.

Aspect	Details
Construction Program and Activities	**Early works (site preparation)** 1. Receive Handover of Site and sign off services. 2. Site induction. 3. The site would be made safe as per WHS/SafeWork NSW requirements including defining the boundaries of the site (fenced appropriately) prior to any demolition works commencing. 4. Set up works compound/laydown area and facilities **Demolition** The proposed demolition would include removal of the entire building and associated footings, slabs, paths, landings, and stairs. The building is constructed of a mix of materials such as timber panelling, corrugated sheet metal, steel framing, blockwork, and concrete. The four existing rock and masonry retaining walls holding the site cut would be retained and repaired, or replaced to ensure a stable slope as per engineering advice. If required earthworks may include shaping (creating a soil buttress) up against the retaining walls. Demolition works are to be carried out in accordance with the Demolition Work Plan and SafeWork NSW Demolition Works Code of Practice (NSW Govt., 2019). The demolition sequence is set out in the works plan as: 1. Install environmental controls - An Erosion and Sediment Control Plan has been included at Appendix C. 2. Practical removal of hazardous materials. 3. Create drop zones. 4. Soft strip structure. 5. Erect scaffold and protection. 6. Install man and material hoist. 7. Mechanical demolition. 8. Remove rubble and rubbish from site. **Slope stabilisation and rehabilitation** 1. Mitigation measures would be implemented as per the Slope Stability Risk Assessment (ACT Geotechnical Engineers, 2023). To maintain and/or reduce the risk level of slope stability during and after the demolition of the building and associated structures. Measures are outlined below in environmental controls 2. All disturbed areas to be rehabilitated in accordance with the Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park (NGH 2007), or stabilised and revegetated to a state suitable for redevelopment as needed.

Aspect	Details
Machinery, Plant and Equipment	The Development will require (but not limited to) the following vehicles, machinery and equipment: • Hydraulic excavators • Skid steer • Trucks • Mobile crane • Mechanical vacuum type street sweeper Standard hand tools.
Stockpile Sites	Temporary stockpiles may be required within the Project site to effectively manage excavated materials, spoil, soil and vegetation during the works. Soil will be separated so that it can be used during site stabilisation and rehabilitation works. The main stockpile sites are identified in Appendix B. All stockpiles will be managed in accordance with the environmental controls in Section 6 and the Erosion and Sediment Control Plan (Appendix C).
Site Facilities and Compound	A laydown area would be set up at the Friday Flat coach parking area identified in Appendix B. Publicly accessible toilets are provided in Thredbo Village. Proposed reusable and/or recyclable building materials would be managed onsite where available space allows or within the Friday Flat laydown area. No waste storage would occur within the laydown area.
Recycling/waste disposal	Demolished material would be recycled where possible and if not possible would be transported to Jindabyne Landfill. A hazardous material assessment would be carried out to identify any asbestos or other hazardous materials within the building prior to the commencement of any works. Material would be disposed of at an appropriately licenced facility.
Working Hours	Monday to Friday: 7am-6pm, Saturday: 8am-1pm, Sundays or public holidays: No work
Project Timing	Demolition is anticipated to commence in October 2024, and will take approximately 6-8 weeks to complete. Excavation and construction works must cease by 30 April, with rehabilitation and stabilisation works able to continue until 31 May. If extension to this period is required, approval must be sought from DPHI.

4.1 Adverse Weather Contingencies

Adverse weather events (e.g. high winds, thunderstorms, heavy rain, hail, snow, bushfire and high temperatures) have the potential to negatively impact upon construction activities. To ensure appropriate consideration of such events, the Project and Construction Manager will monitor weather conditions throughout the construction period. The Bureau of Meteorology (BoM) Thredbo AWS station provides daily weather observation data for the resort. The NSW Rural Fire Service

website ‘Fires Near Me’ includes information on current bush fires and other incidents, as well as warnings for fires which may affect your location.

If adverse weather events are anticipated and/or occur during construction, contingencies will be implemented and arrangements will be made to postpone construction activities.

The Construction Manager / Site Project Manager will be responsible for notifying construction staff of any impending adverse weather, and to implement appropriate controls onsite, such as:

- Erecting wind breaks or covering stockpiles to prevent materials being blown away.
- Evaluate temporary sediment and erosion controls to ensure they are adequately installed to withstand adverse weather events.
- Discontinue use of plant and machinery.
- Secure materials and equipment.
  Protect open excavations.

5 Environmental Management

5.1 Roles and Responsibilities

The Project team structure is provided in Figure 5-1

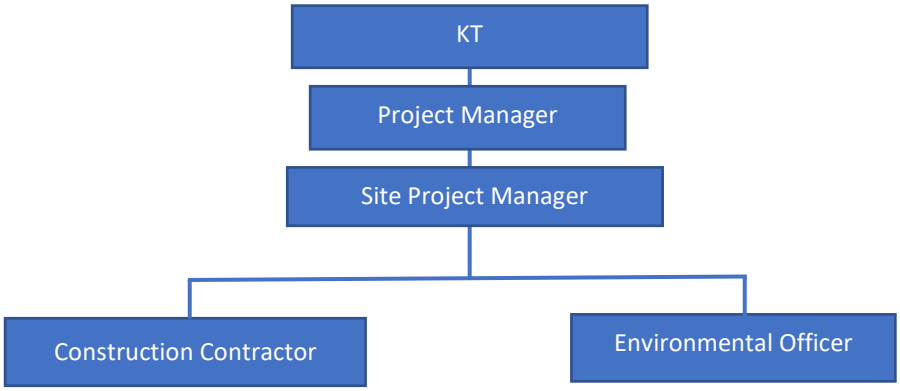

Figure 5-1: Project Team Structure

The roles and responsibilities are outlined in **Table 2**.

Table 2: Roles and Responsibilities

Role	Responsibilities
Project Manager	• Ensure the SEMP is made available, communicated, maintained and understood by all Project staff. • Responsible for the overall management of the construction and operation of the Project. • Ensure the SEMP is updated with applicable conditions of approval following the provision of Development Consent from Department of Planning and Environment (DPE). • Ensure that the requirements of the SEMP and sub-plans have been addressed in all contractor environmental management documentation. • Review of incidents, non-conformances and non-compliance. • Ensuring Project personnel and contractors are adequately trained and qualified to fulfil their roles.

Role	Responsibilities
Site Project Manager	• Implement and maintain the SEMP. • Ensure all Project personnel comply with the requirements of the SEMP. • Report any incidents, non-conformances to the Project Manager.
Environmental Officer	• Oversee all works which are part of the Project on behalf of KT. • Ensure compliance with all environmental protection measures detailed in the SEMP, supporting management plans and conditions of approval. • Ensure all environmental controls are in place and adequately functioning during construction. and • Conduct construction inspections and complete reporting requirements e.g. progress reports, environmental incidents, non-compliance, corrective action and auditing.
All Personnel	• Comply with requirements of this SEMP. • Report any actual or potential environmental incidents to the Construction Manager immediately. • Identify and report non-conforming or potentially hazardous work practices, equipment, machinery or products. • Only perform tasks for which they are trained and competent. • Assist with environmental incident investigations and applying corrective actions. • Ensure all machinery, plant and equipment are in good working order and condition prior to use.
Construction Contractor	• Comply with SEMP and legislative requirements. • Construction contractor to develop and implement management plans in accordance with this SEMP, conditions of approval and contractual obligations.

5.2 Communication and Consultation

5.2.1 Training and Awareness

All Project staff will be made aware of the site-specific environmental controls through a site induction, and pre-start meetings / toolbox talks prior to the commencement of construction.

The site induction will cover the following key aspects:

- Roles and responsibilities.
- Overview of environmental risks and specific locations of environmental and/or cultural heritage significance.
- The scope of legislative requirements and other licences and approvals.
- Communication and notification requirements e.g. procedures for notifying and reporting incidents and complaints.
- Environmental management and controls stipulated in this SEMP.
- Workplace health and safety issues.
- Emergency preparedness and response.
- Procedures for notifying and reporting incidents and complaints.

5.2.2 Key Contacts

Key contacts for the Project are provided in Table 3. Prior to commencement of works, contact details (name and contact number) will be provided for Project personnel.

Table 3: Key Project Personnel Contact Details

Company / Agency	Role / Reason	Name	Contact
Government Agency Contacts			
Department of Planning and Environment (DPE) (Alpine Resorts Team)	Development approval and compliance	-	(02) 6456 1733
National Parks and Wildlife Service (NPWS)	Flora, fauna, archaeology	-	(02) 6450 5600
Environment Protection Agency (EPA)	Water, noise, air pollution and regulation	-	131 555
Thredbo Village Services			
Thredbo Medical Centre	General medical attention	-	(02) 6457 6254
Fire and Rescue Thredbo, NSW	Incident / emergency	-	(02) 6457 6144
Emergency Contacts			
NSW Police	In case of fire, medical or police emergency	-	000
NSW Fire and Rescue		-	
NSW Ambulance		-	

5.2.3 Consultation

KT is committed to ensuring effective communication and consultation is undertaken to inform the development of this SEMP and ensure it is implemented on-site as per the Project roles and responsibilities in **Section 5.1.** Where required, communication with key external stakeholders such as RFS, DPE and NPWS will be undertaken. A summary of the key consultation activities is provided in **Table 4**.

Table 4: Summary of Consultation Activities

Consultation Activity	Communication Method	Frequency
Internal	Site inductions	Prior to commencement of works
	Pre-start meetings and toolbox talks	Daily
	Reports to Project Manager identifying project progress, any environmental incidents, and review of any complaints or enquiries	Weekly
External	Face-to-face meetings, phone and email correspondence with relevant Government Departments / Agencies	As required
	In-writing notifications to Government Departments / Agencies and relevant parties	As required

5.2.4 Notification Protocols

A summary of the key notification protocols is provided in **Table 5.** Notification requirements will be updated as required.

Table 5: Regulatory Agency Notification Protocols

Party to Notify	What to Notify	When to Notify	Responsibility to Notify Regulatory Agency
DPE	Commencement of construction	DPE will be notified in writing at least 48 hours prior to the commencement of construction.	Site Project Manager
Heritage NSW and NPWS	Details of any material suspected of being a European or Aboriginal culturally significant site, relic or artefact.	Immediately upon discovery of any archaeological/culturally significant site or relic that are encountered. NSW Police to also be notified immediately upon discovery of human remains.	Site Project Manager
EPA	Details of pollution incident – who, what, when, where, how, any other supporting information and evidence (e.g. photos)	Immediately upon identification of pollution incident causing or threatening material harm to the environment, in accordance with ***KT's Construction site Incident and Emergency Procedures Thredbo Village, 1.1***.	KT Environmental Manager

5.3 Environmental Incident and Emergency Response

All Project personnel are required to follow KT's ***Construction site Incident and Emergency Procedures Thredbo Village, 1.1***. The procedure will be available on-site and all Project staff will be trained on their implementation through the site induction. The procedure classifies examples of emergencies and incidents and provides specific procedures for response to such events, such as:

- Serious injuries requirement urgent medical help.
- There are threats to property or life.
- Criminal activity e.g. you have witnessed a serious crime or accident.
- Sewer or water service breaks.
- Bushfire, building fire, spot fire on-site.
- Electricity service faults.
- Leaking gas.
- Fires and explosions.
- Release of pollution e.g. release of sediment into watercourse, chemical spill.

The procedure also outlines general site management principles, incident reporting and notification requirements and provides an emergency contacts list.

In the event of an environmental incident, emergency or near-miss, the following steps should be taken:

1) **STOP** works in the area and if safe to do so ensure the safety of personnel within the vicinity.
2) **NOTIFY** relevant persons e.g. emergency services or Construction Manager.
3) **ISOLATE** the risk or hazard e.g. turn off machinery/plant, implement immediate site controls, set up exclusion zone. and
4) **REPORT** and notify relevant persons (e.g. Project Manager, regulatory agencies).

Environmental incident and near-miss reporting requirements are detailed in Section 7.3. Contact details for key Project personnel and emergency services are provided in Table 3.

External contractors are required to prepare and implement an emergency and incident response procedure. The contractor will be responsible for responding to any environmental emergency caused by any action (or inaction) of the contractor's staff, including notification requirements to external parties such as EPA and Fire, Fire and Rescue NSW.

6 Environmental Controls

6.1 General

- Ensure works are conducted by suitably qualified and trained personnel.
- Ensure all site environmental management controls relevant to that stage of work are implemented in accordance with the approved plans and conditions of consent.
- Provide approved plans and relevant documentation in the site office or other suitable location so that they are easily accessible by all construction staff.
- Contractor responsible for carrying out relevant searches (Council, DBYD, etc) as needed to confirm accuracy of plans.
- Work would be carried out in accordance with the Demolition Work Plan, relevant management plans and/or Demolition work Code of Practice (SafeWork NSW, 2019), or as agreed with service providers/in accordance with relevant conditions/approvals.
- Services would be disconnected and made safe for reconnection with any future development. Any work on services would be carried out by a suitably qualified person.

6.1.1 Site Establishment

- Establishment of site boundary with temporary fencing, rope or flagging to clearly delineate the construction corridor and "no-go" areas.
- Erection of site signage and pedestrian/traffic controls.
- Installation of erosion and sediment controls.

6.1.2 Machinery and Storage

- All equipment, machinery and vehicles used during construction of the Project must be cleaned prior to entry into the Park and prior to site mobilisation to ensure they are free of mud and vegetative propagules.
- Equipment, machinery, and vehicles must be regularly maintained and manoeuvred to prevent the spread of exotic vegetation.
- Storage of equipment, machinery, vehicles and material is to be restricted to existing disturbed areas (i.e. at the stockpile, formed roads and within the construction corridors) and avoid undisturbed areas.
- All vehicles and machinery entering Thredbo must adhere to the ***Standard Operating Procedure: Use and Maintenance of Wash Down Bay, March 2019 (KT055).***

6.1.3 Further assessments

- A hazardous material assessment would be completed prior to the commencement of work.

6.2 Soil and Water Quality

Soil and water quality management		
Objective	• Minimise potential impacts to receiving water sources • Reduce the potential for erosion and sediment moving offsite.	
Mitigation Measures		**Timing**
• Implement erosion and sediment control plan provided in Appendix C. • Erosion and sediment controls (ESCs) to be inspected and maintained regularly, particularly immediately following rain events. • All straw bales used for sediment and erosion control or rehabilitation must be weed free. • Construction works should not be undertaken in periods of significant rainfall. • Progressive rehabilitation of disturbed areas should be undertaken in accordance with the Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park (DECC 2007) (Rehabilitation Guidelines). • All stockpiles will be constructed and managed in accordance with *Soil Stockpile Guidelines for the Resort Areas of Kosciuszko National Park* (OEH 2017). • Temporary stockpile sites within the Project site should adhere to the following criteria (Landcom 2004; OEH 2007): – Not exceed 2 m in height, have a slope <50% (26°) – Be at least 2 m from vegetation, concentrated water flows, roads, publicly accessible areas or hazardous areas – Avoid impacts to native vegetation and be located on disturbed areas – Located directly adjacent to the works – Located on relatively flat ground, where possible – In areas with sufficient room to accommodate the volume of material being stockpiled – Be contained by appropriate erosion and sediment controls. • Any excess excavated material will be removed from site and transported to the designated soil stockpiles sites in Appendix B. • Authorisation from NPWS is to be sought where imported gravel or fill material is required, unless the material is sourced from the following NPWS approved locations: – McMahons Earthmoving quarry, located on Alpine Way, Crackenback NSW; or – Kraft Earthmoving / Snowy Mountains Sand and Gravel quarry located on Kosciuszko Road, Jindabyne NSW. • If potentially contaminated material or indications of contamination or any other hazardous substances are discovered, encountered or otherwise noted through visual or olfactory observations, the Unexpected Finds Procedure for contaminated soils (Appendix D) will be implemented. • Mitigation measures would be implemented as per the Slope Stability Risk Assessment (ACT Geotechnical Engineers, 2023), including: – Ensure the existing retaining walls would be properly designed and constructed, and positively drained. Alternatively, the retaining walls stabilisation may include placement of a soil buttress against the walls or by anchoring them back into bedrock. – Form stable permanent batters after the structure demolition.	Pre-construction Construction

Soil and water quality management		
	– Maintain adequate drainage of the site and ensure drains are free flowing. – Where possible, maintain the existing vegetation cover. After demolition works provide erosion protection for exposed soils. – Periodic inspection of the slope uphill for signs of erosion developing and remediate as necessary.	
Performance Criteria	No significant sediment deposition observed leaving the site.	
Corrective Actions	If sediment is observed leaving the site, identify the source and amend the ESCs on-site to ensure appropriate controls are in place. If required, additional ESCs to be installed.	

6.3 Flora and Fauna

Flora and fauna		
Objective	• To ensure compliance with legislative requirements and protect existing native vegetation. • Minimise impacts to native vegetation. • To minimise potential impacts to native fauna, their breeding places and habitat. • To reduce the risk of introducing invasive/pest species.	
Mitigation Measures		**Timing**
• All relevant weed species that occur within the Project site must be treated prior to works commencing to ensure these weeds are not spread further at the site or within KNP.		Prior to construction
• All works must only occur within approved Project site. The Project site is to be clearly identified with flagging tape to mark no-go/no clearing zones prior to construction. • The one tree to be removed (*Eucalyptus pauciflora*), in the rear yard and rocks required to be removed are to be clearly identified. • A pre clearance survey be conducted of the building by a suitably trained, experienced and Rabies vaccinated (with current Titre levels) ecologist the morning of the demolition. The survey will involve careful inspection of internal raked ceilings and other visible nooks that may provide habitat for the Eastern False Pipistrelle. As well as removal of external ceiling panelling near identified entry hole to inspect cavity for signs of microbats. • A Fauna spotter catcher will be present during the roof removal, which is to be undertaken in stages, to intermittently inspect sections of roof and retrieve/relocate any bats found. • If any excavations are left open overnight, structures should be placed at regular intervals to enable fauna to exit. Excavations should be inspected in the morning and late afternoon and any animals that have fallen in removed. Excavations to be checked for animals immediately prior to back-filling. • All disturbance should be kept to the minimum required to achieve the proposal. • All machinery to be used during the construction phase should be limited to the existing disturbed areas and access tracks.		Vegetation clearing Demolition

Flora and fauna	
• Maintain a clean and tidy work area to ensure animals are not attracted to the site, including provision of covered bins during proposed works. • All machinery and equipment used during construction must be cleaned prior to entry into KNP and prior to site mobilisation to ensure the machinery is free of mud, vegetative propagules, and pathogens. This includes machinery that may have been working in an area of the resort that contains weeds and is preparing to be redeployed in the construction corridor and associated stockpile and staging areas. • All vehicles and machinery entering Thredbo must adhere to the Standard Operating Procedure: Use and Maintenance of Wash Down Bay, March 2019 (KT055). The wash down bay is located at the Thredbo Waste Transfer Station for use by KT staff and contractors. • All machinery and equipment must be stored on existing disturbed areas (i.e. at the stockpile and staging areas proposed on the ski slopes) and should not be stored on native vegetation. • All machinery to be regularly maintained and manoeuvred to prevent the spread of weeds and pathogens.	
• A brief (1 page) letter will be prepared and provided to DPE outlining steps taken to prevent harm and any outcomes within 2 weeks following demolition.	Post demolition
Performance Criteria	• No damage to site fencing. • No damage to native vegetation (including vehicle tracks) associated with unauthorised access. • No death or injury to fauna as a result of on-site activities. • No disturbance outside the approval disturbance area. • No introduction of invasive species as a result of construction activities.
Corrective Actions	• Fencing to be repaired / reinstated by appointed contractor. • Entry points for unauthorised access to be identified and access restricted through fencing or other appropriate barriers. • Review and implement suitable strategies to dissuade fauna from coming to site. • Contact NPWS / LAOKO if injured fauna is identified as a result of site activities. • Review existing biosecurity procedures (e.g. clean down procedure) and implement additional controls if required.

6.4 Air Quality

Air Quality Management	
Objective	To minimise potential impacts on sensitive receivers from dust and other air pollution from construction activities.
Mitigation Measures	**Timing**
• Minimise the number and extent of disturbed areas at any given time. When there is a risk of works creating dust nuisance, dust suppression measures are to be implemented i.e. the site is to be watered. • Use of a mechanical vacuum type street sweeper wherever sediment or dust becomes an issue. The sweeper may be used on the external roadways and on the internal hardstand on site. • Water will be maintained at the face of demolition for dust suppression where required. • Plant and equipment to be maintained and operated in an efficient manner to reduce air pollution. • Vehicles are to adhere to speed limits to minimise dust general and potential spill of hauled materials. • All vehicles carrying spoil or rubble to/from site should be covered to prevent the escape of dust or other material. Covers are to be adequately secured. • Mitigation measures would be implemented as per the Demolition Work Plan and ESCP.	During construction
Performance Criteria	No complaints received in relation to air pollution.
Corrective Actions	If complaints are received, the following steps should be taken: • Investigate specific cause of complaint. • Review site activities/processes and identify the source of air emissions. • Implement immediate corrective actions on-site e.g. water site, replace equipment deemed to be poorly maintained. • If required, implement administrative controls e.g. additional staff training, alter construction methods or timing for undertaking dust generating activities.

6.5 Noise and Vibration

Noise and Vibration Management	
Objective	To ensure that noise and vibration from construction activities does not cause environmental nuisance in the locality.
Mitigation Measures	**Timing**
• Awareness training and information will be provided to project personnel in relation to minimising noise pollution as much as practicable when in close proximity of sensitive receivers.	Site induction
• Selection of the most appropriate plant and equipment to minimise noise generation.	Prior to construction

Noise and Vibration Management	
• Construction works will be undertaken during standard work hours. • Noise from the works would be limited by the proposed construction hours. Monday to Friday: 7am-6pm; Saturday: 8am-1pm; Sundays or public holidays: No work • Appropriate noise management strategies will be implemented for construction works and operation of plant in accordance with the Australian Standard AS 2436-2010 *Guide to noise and vibration control on construction, demolition and maintenance sites.* • Regular checks are to be undertaken to ensure all equipment and vehicles are in good working order and are operated correctly. • All plant will be maintained in accordance with the manufacturer's requirements. • Mitigation measures would be implemented as per the Demolition Work Plan which includes measures for limiting noise and vibration to be implemented during the demolition process.	During construction
Performance Criteria	• No construction related noise and vibration complaints received. • No unreasonable noise or vibration.
Corrective Actions	If complaints are received, the following steps should be taken: • Investigate specific cause of complaint. • Review site activities/processes and identify the source of the noise emissions. • Implement immediate corrective actions e.g. swap out noisy equipment. • If required, implement administrative controls e.g. additional staff training or change work hours to minimise noise.

6.6 Fuels and Chemicals

Fuels and Chemicals Management	
Objective	Eliminate the potential for release of fuels, chemicals and hazardous substances to the environment.
Mitigation Measures	**Timing**
• Spill kits will be available onsite and all site personnel will be made aware of their locations in the site induction. • In the event on an on-site spill, construction staff will follow KT's Construction Site Incident and Emergency Procedures Thredbo Village, 1.1. • Hazardous substances, toxic materials or dangerous goods must not be stored or processed on-site at any time without prior approval from the DPE Secretary or nominee. • Fuel and chemicals will be appropriately stored and handled in accordance with relevant Australian Standards. • Appropriate controls will be implemented when refuelling Project vehicles and machinery. • Fuel and chemical management to be managed as per the project Demolition Work Plan.	During construction
Performance Criteria	No fuel, chemical or hazardous substance spills.

Fuels and Chemicals Management	
Corrective Actions	Corrective actions will be taken in accordance with the Construction Site Incident and Emergency Procedures Thredbo Village, 1.1, including: immediate spill response, implementation of any necessary control measures as directed by authorities. Where required, an investigation will be undertaken to determine the root cause.

6.7 Traffic and Access

Traffic and Access Management		
Objective	• Minimise potential impacts to Bobuck Lane access. • Ensure safety of workers, pedestrians, and road users.	
Mitigation Measures		**Timing**
• Traffic and construction vehicles access to be managed as per the project Traffic Management Plan. • Potential temporary traffic and pedestrian closure of Bobuck Lane during demolition works on the southern side of the building. • Access along Bobuck Lane would be maintained during the demolition process, except when there is any need to divert traffic to demolish the front section of the building adjacent to the road. • A stabilised access will be provided for the demolition (typically a gravel entry point, can be established if the existing entry is deemed not to be appropriate for the demolition). • Traffic and construction vehicle access will be managed as per regular daily operation in the resort. • Workers will be required to park within/next to the site compound at Friday Flat. • All Project vehicles and machinery to adhere to speed limits and signage and stay within construction corridor.		During construction
Performance Criteria	• No significant impacts to existing road network or users. • No complaints in relation to traffic or vehicle operators.	
Corrective Actions	If complaints are received, traffic management procedures will be reviewed and amended (if necessary).	

6.8 Waste

The Project will generate the following waste streams:

- General solid waste (putrescible) – waste from litter bins, food waste.
- General solid waste (non-putrescible) –plastic, paper, carboard, demolition and construction waste (e.g. concrete, excess steel).

The following waste receptacles will be provided for the storage and disposal of waste associated with the construction of the Project:

- General litter bins for waste such as food waste and non-recyclable plastic.
- Recycling bins for waste such as carboard packaging, paper, recyclable plastic.

- Skip bins, including wash-out skip bin used for the management of excess concrete.
- KT's waste transfer facility (materials to be segregated for re-use, recycling etc.).

Excess spoil from excavations will be taken off-site and placed within the resort's existing stockpile area located at the carpark adjacent to the Thredbo Waste Transfer Station for re-use within the resort.

Demolished material will be recycled where possible and if not will be transported to Jindabyne Landfill.

Waste Management		
Objective	Minimise construction waste as much as practicable. and Reduce the impact of waste on-site and beyond the site boundary.	
Mitigation Measures		**Timing**
• All waste will be managed and disposed of in accordance with the KT's waste management procedures. • Where possible, construction materials will be salvaged for reuse to divert waste from landfill. • All waste will be separated into waste streams and contained within appropriate receptacles and/or disposed of in accordance with the EPA guidelines. • All receptacles will be in good condition. • All waste transportation vehicles will be covered appropriately to ensure waste cannot spill, leak or escape onto the road or wash into stormwater drains. • Transfer of waste will comply with relevant waste facilities recycling or disposal standards		During construction
Performance Criteria	No litter or waste material to be released from site in an uncontrolled manner.	
Corrective Actions	• Investigate cause of inappropriate waste disposal/management. • Review on-site waste handling facilities and implement corrective actions e.g. change in receptacle size and/or waste management signage. If required, implement administrative controls e.g. additional waste management training for staff.	

6.9 Cultural Heritage

Aboriginal Cultural heritage

The site is within the areas mapped within the Snowy Mountains Special Activation Precinct Master Plan as being disturbed land. A due diligence desktop assessment has been completed for the site to consider potential for impacts.

The assessment considered, AHIMS search results and relevant archaeological reports to develop or refine a model of Aboriginal site prediction based on the type of activity proposed and the level of disturbance of the area. The desktop assessment has indicated that there are no unmodified landscapes present within the proposal area that have the potential to contain Aboriginal objects. The nature of the works being undertaken at the proposal area would involve a high level of ground disturbance and it is unlikely that it would impact on Aboriginal heritage objects.

The recommendations are as follows:

1. The proposed work can proceed with caution without further archaeological assessment.
2. Any activity proposed outside of the current proposal area should also be subject to an Aboriginal heritage assessment.
3. If any items suspected of being Aboriginal in origin are discovered during the work, all work in the immediate vicinity must stop and the NSW Environment Line (1300 361 967) notified. The find would need to be assessed and, if found to be an Aboriginal object, further detailed assessment, and an application for an Aboriginal Heritage Impact Permit (AHIP) may be required.
4. In the unlikely event that human remains are identified during development works, all work must cease in the immediate vicinity and the area must be cordoned off. The proponent must contact the local NSW Police who would make an initial assessment as to whether the remains are part of crime scene or possible Aboriginal remains. If the remains are thought to be Aboriginal, Heritage NSW must be notified by ringing the Enviroline (131 555).

Historic built heritage

Although the Kosciusko National Park and is of heritage significance, Sonnblick Lodge is not specifically heritage listed and no heritage listed sites are adjacent.

6.9.1 Unexpected Finds Procedure

Where unexpected items of potential archaeological, built or Aboriginal cultural heritage significance are discovered, Project personnel will follow the below procedure:

- **STOP:** Stop work and leave the site or item where it is.
- **NOTIFY:** Notify the Project Manager and NPWS to arrange for representatives to inspect the site. If human remains are found, the NSW Police must also be notified.
- **MANAGE:** Management may involve securing the find by erecting a no-go zone.
- **REPORT:** The Project Manager will complete any reporting requirements, as directed by NPWS.

6.10 Bushfire protection

Bushfire protection	
Objective	• Eliminate the potential for fires or bushfires during construction • Ensure safety of workers, visitors to to Thredbo and KNP
Mitigation Measures	**Timing**
• The contractor would be responsible for determining relevant requirements for the site and ensuring staff are aware of bushfire avoidance, evacuation, and management measures.	Site induction
• Water connection at the site would be maintained for the duration of the works. • Debris should be progressively removed to prevent build up that could affect the integrity of a suspended floor of the building or structure; affect workplace entry and exit; become a fire hazard; or cause a health and safety hazard. • Adequate fire prevention equipment should be provided and maintained at all times during the demolition of a structure • Access to the fire protection service, including a booster fitting, should also be maintained.	During construction

Bushfire protection	
• If a sprinkler system is installed in a structure to be demolished, it should be maintained in an operable condition at each storey, so far as is reasonably practicable. • Portable fire extinguishers should be kept in working areas at all times and maintained in an operable condition • In areas where the floor, walls or ground cover are combustible and required to be welded and cut, the area should be protected by spraying it with water, spreading damp sand, laying fireproof blankets or other suitable means of protection.	
Performance Criteria	No fires or bushfires to result due to the works.
Corrective Actions	• Investigate cause of fire. • Review protective measures and implement corrective actions.

7 Monitoring and Reporting

7.1 Environmental Monitoring

The Environmental Officer will conduct monitoring during all project phases (pre-construction, during construction and post-construction) to ensure compliance with this SEMP, associated management plans and conditions of approval.

The Environmental Officer will undertake weekly inspections utilising the ***Site Environmental Management Measures Report***. The report includes a checklist on the following matters:

- Administration (weekly site inspections, sub-contractor environmental management, environmental monitoring, environment incidents, complaints handling, reporting and record keeping).
- Biosecurity management.
- Chemical spills / emergency response.
- Vegetation management and rehabilitation.
- Waste management.
- Native fauna management.
- Material storage and sourcing.
- Water quality.
- Erosion and sediment controls.
- Stockpile management.
- Air quality and noise and vibration.
- Cultural heritage.
- Safety.

7.2 Weekly Environmental Reporting

The Environmental Officer will provide copies of the ***Site Environmental Management Measures Report*** to the Project Manager on a weekly basis. All records will be stored within KT's files and distributed to relevant persons / regulatory authorities as required.

7.3 Environmental Incident Reporting

All incidents and near misses will be managed in accordance with KT's ***Construction site Incident and Emergency Procedures Thredbo Village, 1.1***. The document provides procedures for responding to incidents and emergences, reporting and notification requirements and emergency contacts.

The following information should be recorded:

- Time and date of the incident / near miss.
- A description of the incident / near miss.
- A sequence of events that led to the incident / near miss occurring.
- Person/s involved in the incident / near miss (including witnesses).
- Written statements from person/s involved (as applicable).
- Details of corrective actions.

The ***Environmental Incident Report Form*** should be completed for all environmental incidents (refer to Appendix E). All parts of the form must be completed in accordance with KT's incident procedure and following the instructions within the form. The form must be signed by the person making the report and the Project Manager/person in charge of the site/activity.

7.4 Non-conformance

A non-conformance is the failure to comply with the requirements of this SEMP and supporting management plans. Non-conformances identified via site inspection or during day to day activities will be documented on the ***Site Environmental Management Measures Report*** (or similar contractor's form) and closed out in subsequent inspections. The Environmental Officer is responsible for investigation and managing corrective and preventative actions in the event of non-conformance or a situation likely to cause environmental harm.

7.5 Corrective Actions

Corrective actions should be prioritised on the following hierarchy of controls:

1. **Elimination** – can activities and processes be eliminated to reduce the risk of reoccurrence?
2. **Substitution** – can activities be substituted with another activity of lesser risk?
3. **Isolation** – can you isolate the hazard from any person exposed to it?
4. **Engineering controls** – can you reduce the risk of reoccurrence through engineering changes?
5. **Administrative controls** – can a change in work practices, additional training or additional checks reduce the risk?
6. **Personal Protective Equipment (PPE)** – can PPE be worn to protect personnel from harm?

The Construction Manager will be responsible for managing the implementation of corrective actions on-site.

7.6 Complaints Management

Should complaints be received from the public in relation to the Project they will be recorded using the ***Complaints Form*** (or similar contractor's form). The Project Manager will be responsible for investigating, recording and closing out any complaints received. All records will be stored within KT's files and distributed to relevant persons / regulatory authorities as required.

8 Record Keeping and Review

8.1 Document Control

All Project related documentation will be maintained within KT's Project file. Documents stored within the file include (but not limited to) the following:

- Copies of relevant planning approvals and documents, licences and permits.
- All completed induction forms and visitor sign-on register.
- Records of routine environmental inspections.
- Records of any environmental incidents, complaints, non-conformances and no-compliances.

8.2 SEMP Review

This SEMP is a live document and will undergo reviews and amendments as necessary. Reviews will generally be undertaken –

- If there is a change in the scope of the Project.
- Prior to commencement of construction to ensure any relevant conditions of consent and/or other approval, licence or permit requirements are incorporated.
- If there is a need to improve environmental controls to protect environmental values.
- If there is an increase or introduction of a new environmental risk or impacts.
- At the end of a Project to allow for improvements in subsequent Projects.

9 References

Department of Environment and Climate Change (DECC) 2007, Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park, NSW Government.

Department of Environment and Climate Change (DECC) 2009, Interim Construction Noise Guideline, July 2009, https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/noise/09265cng.pdf?la=en&hash=EF4576FD79DBB25D5AC22DFA1A883A2BADA1F77B

Department of Infrastructure, Planning and Natural Resources (DIPNR) 2004*, Guideline for the Preparation of Environmental Management Plans*, https://www.planning.nsw.gov.au/~/media/Files/DPE/Guidelines/guideline-for-the-preparation-of-environmental-management-plans-2004.ashx?la=en

Department of Planning & Environment (DPE) (2017) *What to include with your development application*, version January 2017, https://www.planning.nsw.gov.au/Policy-and-Legislation/~/media/65E2BA89886F426991525FF25707A9A9.ashx

NSW EPA (EPA) 2014, *Waste Classification Guidelines – Part 1: Classification of Waste*, NSW Environment Protection Authority.

Office of Environment and Heritage (OEH) 2017, *Soil Stockpile Guidelines for the Resort Areas of Kosciuszko National Park, version 1.0, October 2017*, NSW National Parks and Wildlife Service.

Appendix A Site Plans

Geotechnical Engineers ACT

ACT Geotechnical Engineers Pty Ltd
ACN 063 673 530

5/9 Beaconsfield Street, Fyshwick, ACT, 2609
PO Box 9225, Deakin, ACT, 2600
P: (02) 6285 1547 or 0404 064 858
E: Jeremy.murray@actgeoeng.com.au

27 July 2023
Our ref: OB/C14191 v2

Kosciuszko Thredbo Pty Ltd
Via email: Andrew_Harrigan@evt.com

Attention: Mr Andrew Harrigan

Dear Sir

PROPOSED DEMOLITION & REDEVELOPMENT
SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW

DEMOLITION WORK PLAN

We are pleased to forward our demolition Work Plan (DWP) for a proposed demolition and redevelopment of the Sonnblick Lodge in Thredbo, NSW.

The report outlines the methods of demolition to be adopted for proposed works and meet client/contractual/legal and other requirements.

Should you require any further information regarding this report, please do not hesitate to contact our office.

Yours faithfully,
ACT Geotechnical Engineers Pty Ltd

Olga Baruleva
Engineering Geologist
BSc (Geology) MPhil *MIEAust*

Reviewed by:

Jeremy Murray
Senior Geotechnical Engineer | Director
FIEAust CPEng Eng Exec NER RPEQ APEC Engineer IntPE(Aust)
Registered Professional Engineer of Queensland (RPEQ) #19719
NSW Professional Engineer Registration #PRE0001487

KOSCIUSZKO THREDBO PTY LTD

PROPOSED DEMOLITION & REDEVELOPMENT
SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW

DEMOLITION WORK PLAN

APRIL 2023

KOSCIUSZKO THREDBO PTY LTD

PROPOSED DEMOLITION & REDEVELOPMENT
SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW

DEMOLITION WORK PLAN

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KOSCIUSZKO THREDBO PTY LTD

PROPOSED DEMOLITION & REDEVELOPMENT
SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW

DEMOLITION WORK PLAN

1 INTRODUCTION

1.1 Project Description

At the request of the client, ACT Geotechnical Engineers Pty Ltd developed a demolition working plan for the existing Sonnblick Lodge, in Thredbo, NSW. The 340m2 site located on Lot 802 DP1119757, at 10 Bobuck Lane, in Thredbo, NSW.

It is understood the project involves the demolition of the existing lodge, in preparation for selling the vacant land for future redevelopment. The site could potentially be vacant for 12 to 24 months following demolition.

The type of work involved in this project is classified as unrestricted demolition work by SafeWork NSW. As such the company undertaking this demolition is required to carry an Unrestricted Demolition Licence and the Supervisor in charge of the works must carry an Unrestricted Demolitions Certificate.

1.2 Scope of Investigation

This DWP has been developed in accordance with AS 2601:2001 Demolition of Structures. The DWP is to be read in conjunction with the other plans and documents which accompany this application. The DWP will be developed with the SMP and EMP. These developed plans are considered to be the overarching documents to manage and control foreseeable work health and safety risks, environmental risks and meet legislative requirements for the project.

Other supporting documents that may be used during the project include:
- Quality Management Plan (QMP)
- Traffic Control Plan (TCP)
- Traffic Management Plan (TMP)
- Slope Instability Risk Assessment

The following key SWMS will be developed prior to staged works;

- Hand Strip Out and Enabling Works
- Operation of Excavator
- Operation of Skid-Steer Loader
- Operation of EWP
- Oxy Cutting Reo Bar on Live Edge
- Placing beams into building with crane
- Mechanical Strip Out
- Demolish Members Using Oxy LPG Equip
- Control of the Load Out Area

2 SITE INVESTIGATION

An investigation of the structures to be demolished and surrounding environment has been undertaken in accordance with the Code of Practice: Demolition Work (SafeWork, NSW) and AS2601: The demolition of structures. The observation from this investigation is broken up into three (3) sections 'Investigation of Structures', 'Investigation of Site', and 'Investigation of Services' and is recorded below.

2.1 Investigation of Structures

The main structure is the existing lodge (Sonnblick apartments building) is three-storey structure with a basement that will be fully demolished. The structure includes five flats with bathrooms and kitchens, external steel stairs, and masonry retaining walls. The structure is located below Bobuck Lane, ~4m north from the road carriage way, and 5-6m away from two neighbouring buildings, located to the east, west and south. Figure 1 shows the site locality, while Figure 2 is a recent aerial photograph showing the present site layout. Appendix A includes floor plans.

2.2 Investigation of Site

2.2.1 Description of Site

The site dips north at the angle of ~35° to 40° from ~RL1398 to ~RL1390 across the block. It does appear that some excavation spoil may have potentially been placed, assuming from cut-to-fill (~0.5m/1.0m) platform construction.

No heritage listed structures have been identified on site.

All neighbouring buildings are to remain operational throughout the demolition process. MDG works must not in any way hinder the operation of these surrounding buildings.

2.2.2 Underground Structures

The concrete pad and strip footings of the main structure`s and retaining walls` founded on colluvial soils at ~0.5/2m depth.

2.2.3 Adjoining Structures

The external basement walls to the building are retaining walls. There are also four retaining walls external to the building that support driveway and Bobuck Lane carriageway. The walls are from 0.5 to 2.5m heigh and comprise boulders and mortar.

2.2.4 Hazardous Chemicals / Dangerous Goods Storage or Dumps

No major hazardous chemicals or dangerous goods (e.g. munitions, chemical storage systems, underground storage tanks, compressed gas cylinders, fire retardant cylinders, medical gases, dumps of noxious or toxic or hazardous substances, etc.) have been identified on site or have been communicated by the Client.

Work involving removal of hazardous chemicals / dangerous goods is not in MDGs scope of works and is the responsibility of the Principal Contractor to remove unexpected findings of hazardous chemicals / dangerous goods on site. In the event of encountering any unexpected findings of

hazardous chemicals / dangerous goods, the following is to apply before work commences in the immediate area:

1. Work in the immediate area will stop
2. The Site Supervisor will be notified of the find
3. The Site Supervisor will notify the Project Manager
4. The Project Manager will notify the Principal Contractor
5. The Principal Contractor will organise the safe removal of the substance (which may necessitate the engagement of specialist contractors), work will not recommence in the area until the Principal Contractor has given approval.

2.2.5 Hazardous Chemicals / Dangerous Goods Storage or Dumps

The buildings, paths, roadways, and other items surrounding the site shows signs of deterioration and unsoundness of the main structure, such as external cracking. Retaining wall had cracking through the mortar. Site erosion removed the material below the basement rock façade.

A full Dilapidation Survey is to be undertaken by the Principal Contractor prior to demolition starting. MDG do not anticipate any physical impacts on the surrounding structures. Care will be taken to minimise impacts on adjoining sites and structures. Various methods will be employed to minimise the disruption to the surrounding buildings or adjoin sites and structures.

2.3 Investigation of Services

2.3.1 Services to be disconnected

All services shall be disconnected / made safe prior to commencement of demolition work. A sign-off on services will be received by the contractor prior to the commencement of any demolition works.

For early works prior to full disconnection of power, areas will be isolated and a sign off on the power in those areas received. For some minor demolition in localised areas where it is clearly evident that there is no power services going to be disturbed (e.g. removal or demolition of ceiling grids, furniture and fixings that do not contain power) the demolition may occur without a signoff.

For complex structures that involve many operational 'live' Client critical services (pressurised piping systems, other water/chemical/steam/air systems, electrical, communication, gas, etc.) requiring identification, relocation and decommissioning or isolation by the Client (and where MDG is the Principal Contractor). The following form may be used to assist MDG in obtaining required signoffs Request to Client for Service Id, Decommission & Approval to Remove form.

Where fire sprinkler systems are unable to be isolated due to Client operational needs, care shall be taken during works to prevent disruption to this service. Refer Service Disconnection Signoffs

2.3.2 Services to be maintained

Water and temporary power will be used during the course of demolition works. Some emergency access lighting will be installed and temporary power boards will be used to provide task lighting in the darker areas of the structures. Water will be used for dust suppression.

2.4 Hazard Investigation

The following key hazards associated with demolition work have been identified:

- Unplanned structural collapse

- Falls from one level to another
- Falling objects
- The location above and underground essential services, including the supply of gas, water,
- sewerage, telecommunications, electricity, chemicals, fuel and refrigerant in pipes or lines
- Exposure to hazardous chemicals – these may be present in demolished material or in the
- ground where demolition work is to be carried out (contaminated sites)
- Hazardous noise from plant
- The proximity of the building or structure being demolished to other buildings or structures

Each of the above risks has been investigated and control measures will be outlined in the Safe Work Method Statement (SWMS) developed for demolition and associated works.

2.5 Suspended Slabs and No-Go Areas for Machine's

The following areas are no-go areas for machinery unless an engineer's approval is sought first:

1. All suspended slabs
2. The high side of any retaining walls from the edge of the wall, back a distance equal to the height of the wall
3. On top of any underground structures including fuel tanks and the like. Note: where the walls of underground structures are retaining walls, they should be treated in accordance with the above point

All levels of the structures to be demolished with the exception of the basement slabs are suspended. No machines are to be placed on these slabs without first getting engineers approval. Certification will be sought as to the heaviest Skidsteer, EWP, truck and excavator types that can be places on area of the building prior to bringing any machines on site. Prior to heavier machines being brought onto site, temporary propping will be designed by a structural engineer, installed and finally certified by the design engineer for the areas the machine will be working in. A third party engineer will also check all temporary works including back propping and bracing.

Prior to installation of back propping a SWMS will be developed for the installation of the props. See Metropolitan Demolitions SWMS – Installation of Back Propping.

3 DEMOLITION EXCLUSION ZONE

The demolition Exclusion Zone will encompass the entire site with the exception of the site amenity areas (and access ways to and from), which will be deemed construction zones.

All personnel on the Principals contractor site have to be inducted into their system. In addition, all personnel not inducted by MDG will be required to visit the site office and not enter the demolition site until they have been inducted and signed on the Site Sign-In Register or brought on site with the permission of the MDG Site Supervisor under the supervision of an inducted person and have signed in the Site Visitors Register.

As well as the whole demolition site being a demolition zone, various area inside site will be demarcated with chain wire fencing and signs 'Warning Drop Zone, Do Not Enter', Jersey curbs, steel plates and other engineering barricades will also be used in the Drop Zones. The locations of these Drop Zones are also marked up on an Exclusion Zone Plan. The location of smaller temporary localised Drop Zones will be tool box talked daily and detailed in the demolition site sign on location.

All Exclusion Zones and Drop Zones will be properly demarcated. No unauthorised persons shall be permitted into the demolition work area. All personnel and visitors will follow Site Personnel and Visitor Registration Procedure.

5 DETAILS OF DEMOLITION

5.1 Sequence

Demolition

Work will follow the sequence below. Amended to this sequence may occur to suit. For more detail see separate Demolition Program.

1. Receive Handover of Site and sign off services
2. Site induction
3. Demarcate site and define Exclusion Zones
4. Install Environmental Controls
5. Practical Removal of Hazardous Materials
6. Create Drop Zones
7. Soft strip structure
8. Erect scaffold and protection
9. Mechanical Demolition
10. Install Man and Material Hoist
11. Mechanical Demolition
12. Remove rubble and rubbish from site
13. Handover
14. Demobilisation

More details on the sequence and flow of the work including durations will be provided in a separate Demolition Program and updated monthly programs.

Note: Where temporary works are necessary (propping, scaffolding needles and the like) the following sequence MUST be adhered to prior to the use of the temporary works item:

1. Design
2. Specialist Engineer Sign Off on Design
3. Tall Sign off on Design
4. Installation
5. Inspection and Certification (engaged specialist Engineer)
6. Use

Temporary Works

Note: Where temporary works are necessary (propping, scaffolding needles and the like) the following sequence MUST be adhered to prior to the use of the temporary works item:

1. Design
2. Specialist Engineer Sign Off on Design
3. Second engineer to check design
4. Installation
5. Inspection and Certification (engaged specialist Engineer)
6. Use of temporary works structure/item

5.2 Detailed Work Methodology

5.2.1 Receive Handover of Site and Sign-off on Services

Demolition will begin only when the site has been officially handed over and a sign off on services

- has been received by the appropriate service providers for appropriate areas.

5.2.2 Site Induction

A site induction is to be held before any work commences on site. The site induction includes the following:

- Induction into this DWP, other plans and SWMS
- Induction into the Principal Contractors Work Health and Safety Management Plan/system
- Induction into the Clients Work Health and Safety Management Plan/system (where
- required)

5.2.3 Demarcate Site and Define Exclusion Zones

The entire site will be fenced with 1.8m chain wire fencing. Other areas of site may be demarcated as hazard removal areas, exclusion or Drop Zones. The access gate will be closed during demolition works and manned during load out.

Site notices to be displayed in a prominent position are:

- Unauthorised entry prohibited
- Warning Demolition in Progress
- Mandatory PPE information signage
- MDG Site Supervisor in charge of works
- 24 hour site emergency contact number

5.2.4 Install Environmental Controls

A responsible demolition contractor should endeavour to ensure the unimpeded operation of the surrounding sites throughout our works. Importance will be placed on sensitive receivers and close proximity to adjacent buildings. The contractor should endeavour to do everything reasonably practicable to make what is by nature a noisy and disruptive process as quiet and dust free as possible.
A summary of the key environmental methods that will be used on site include:

Sediment Control

- Leaving all hardstands in place until the very end of the project. All truck movements will be on hardstand
- Installing sediment settling and filtration system in the sumps of building to collect and filter sediment prior to it being released into the storm water system. Prior to releasing any water into the storm water a testing system will be put in place
- A mechanical vacuum type street sweeper is to be employed wherever sediment or dust becomes an issue on the external roadways and on the internal hardstand on site. It is expected that initially there will be not much need for the sweeper however towards the peak load out period of the project the sweeper may need to return to site daily. The need for the sweeper will be assessed on a daily basis with input from interested parties and stakeholders.
- All drains will be covered in a Geotech material, with Geotech lined hay bales placed up stream of the flow to these drains. All fencing to the perimeter of site will be lined with shade cloth

Noise Management

Demolition is a noisy process; however many measures can be taken to minimise this noise.
The following noise reduction measures when implemented will minimise
noise disruption to the surrounding buildings:

- Demolition will be undertaken by as large as possible machines as they are far less obtrusive than the rapid crescendo of smaller machines.

- External walls of each floor will be left in place until the very last stage of each floors demolition. The walls act as a sound barrier shielding the neighbourhood buildings from much of the noise generated by machines on that floor.
- At least two decks of scaffolding will be lined with Metro Mesh to the full height of the perimeter of building providing a noise dampening measure.
- Drop Zones will be located to ensure minimum noise from their operation
- Material that generates a lot of noise when removed via Drop Zone (large steel members, etc.) will be craned off the structure)
- The base of drop zones will be covered with 500mm of rubble prior to their use
- A 3m high 'A Class' hoarding that will be erected to the perimeter of the demolition site will greatly reduce ground level noise from escaping the confines of site.

Dust Control

Demolition of brick and concrete can generate excessive amounts of dust however through the following dust suppression measures MDG anticipate the dust leaving the confines of the building being demolished will be kept below a level that adversely affects the surrounding billings and site:
Installing a minimum of 2 water points (with 3 outlets on each point) or as needed on every level of the building with booster pumps used to achieve sufficient water pressure at the top levels of the building (as required).

- Each machine used in the demolition process will be accompanied by a labourer with a water hose to ensure water is available on each separate demolition face and provide adequate dust suppression. Water runoff will be minimised.
- All scaffolding will be lined with Metro Mesh which reduces the wind over the active demolition faces and the possibility of dust permeating through the scaffolding screen
- Material will be saturated prior to being removed via the Drop Zone
- During load out of material, material will be wet down to minimise dust being generated
- The 3m high 'A Class' hoarding will be erected reducing ground level dust from escaping the confines of the site

Vibration Management

Vibration on this site will emanate from the excavator mounted hydraulic hammers used in the process of breaking down the concrete and brick structure into rubble and also from items reaching the base of the Drop Zone. The following measures will ensure that disruptive vibration will not travel beyond or site:

- Physical links from structure being demolished to adjoining buildings and structures will be demolished (e.g. overhead walkway etc.)
- Physical separation will be done by saw cutting a slice of the slab
- Breakup of slabs, beams and columns into smaller pieces of rubble to reduce vibrations being felt from Drop Zone operation
- Structural steel and large heavy objects will be craned off site
- Covering of the base of Drop Zone with 500mm of rubble prior to use.

Truck Movements

- Providing traffic controllers to control pedestrian and vehicular traffic
- Ensure trucks are covered prior to leaving site
- Providing drivers information on access, routes and site conditions and sensitive
- receivers
- Space allocated for trucks within hoardings

5.2.5 Soft Strip Structures

The structures will be stripped-out by hand and appropriate hand tolls where required, prior to mechanical stripping in appropriate areas. No heavy machines will be placed in the areas highlighted in the Demolition Exclusion Zones.

Bounded material such as non-loading bearing walls, partitions, and doors that may not be removed by machines will be removed by a combination of hand, picks, crow bars, and other associated tools, and stockpiled in the building or a secure area of site for load out by machines.

5.2.6 Asbestos & Hazardous Removal Methodology

A hazardous material assessment must be carried out to identify any asbestos or other hazardous materials within the building. An Asbestos Removal Control Plan must then be developed to outline the removal methodologies and management practices to allow for the safe removal. A SWMS must also be developed for the removal of asbestos material.

5.2.7 Slope Stability Risk Assessment

A slope stability risk assessment has been conducted by ACT Geotechnical Engineers 9Report C14191 of 26 April 2023). The risk mitigation measures advised in that report must be followed so that the risk of slope instability is not increased by demolition activities, as well as ensuring the site remains stable both during and after demolition works.

5.2.8 Excavation Works

Only minor excavation works are anticipated – primarily for removal of the footings of the existing building. All excavations will be immediately backfilled using on-site soils.

5.2.9 Quantity of Waste Removal & Disposal Site

All waste from the demolition activities will be taken to the Jindabyne Landfill. Based on a floor area of 200m^2 of the existing building, it is estimated that the total quantity of waste will be about 300 tonnes.

5.2.10 Mechanical Demolition

Mechanical demolition will be by hydraulic excavator. 5, 12 and 20 tonne hydraulic excavators with shear, pulveriser, hammer and bucket attachments. These machines will be on suspended slabs and transported from one level to the next via ramps. An engineer's approval will be sought regarding the size of machine that can be put on any particular slab.

Hydraulic excavators with shear attachments will cut down steel elements of structure in sections. Hydraulic excavators with hammer / pulveriser attachments will break up brick walls and concrete slabs of the structures in sections and removed via the Drop Zone. Only material of a suitable size will be placed into the Drop Zone to avoid blockages.

A watcher will work with plant and equipment operators at all times.

Water will be maintained at the face of demolition for dust suppression where required.

During demolition the floor area under the excavators and the bay area's being demolished will be closed off with warnings signs, ATF fence panels and existing wall's. No plant or personnel will be allowed in these areas.

Shear wall that is on the perimeter of the building will be demolished in the following sequence:

1. Excavator will punch a vertical line in the wall, leaving steel reinforcement intact
2. The excavator will then make a horizontal line at the base of the wall keeping the steel reinforcement intact. Leaving 300mm concrete between the vertical cut and the start of the horizontal cut
3. A worker will then cut the back steel reinforcement in the horizontal line and all the steel reinforcement in the vertical line
4. The machine will then fold the wall inside the building

The pulling in of perimeter beams will be done in the following sequence:

1. An excavator will hammer both ends of the beam leaving steel reinforcing intact
2. Chains will be attached to the beam at one end
3. All steel reinforcement will be oxy cut at the chained end and the only top reinforcement will be cut on the other end
4. The chained end will be towed in and placed on the slab
5. The remaining bottom steel will be oxy cut
6. The remaining end will fall onto some rubble or steel to cushion the impact on the slab
7. The beam can then be safely dragged in by the excavator

Mechanical demolition of lower structure from ground level will be by hydraulic excavator. 20, 30 and 40 tonne hydraulic excavators with shear, pulveriser hammer and bucket attachments. All buildings and structure can be reached from the ground.

5.2.11 Remove Rubbish and Rubble from Site

Demolished material will be separated and stock piled ready for load out. A combination of hydraulic excavator with grapple attachments or bucket and/or Skidsteer with grapple attachments will load out demolished material into appropriate bins for transportation to an EPA approved tipping or recycling facility.

Care shall be taken to watch for pedestrians when entering and leaving site.

Approved Traffic Control Plan will be adhered to at all times. All trucks will follow the truck route and guidelines on entering and exiting the site. A MDG RTA tickets traffic controller will assist trucks for site access and egress when required.

5.2.12 Handover Site to Client Representative

Demolished material will be separated and stock piled ready for load out. A combination of hydraulic excavator with grapple attachments or bucket and/or Skidsteer with grapple attachments will load out demolished material into appropriate bins for transportation to an EPA approved tipping or recycling facility.

5.2.13 Demobilise from Site

The site demobilisation will take place following the site handover to Clients representative. Truck floats will take plat off site, the mobile amenities (where used) will be towed off site and the site fencing dismantled and carted off site.

6 PERMITS BY AUTHORITIES

All relevant permits required by authorities will be sought and displayed on-site at all times. These permits include but are not limited to:

- SafeWork NSW Permit for demolition
- Council approval for temporary footpath closures (if necessary)

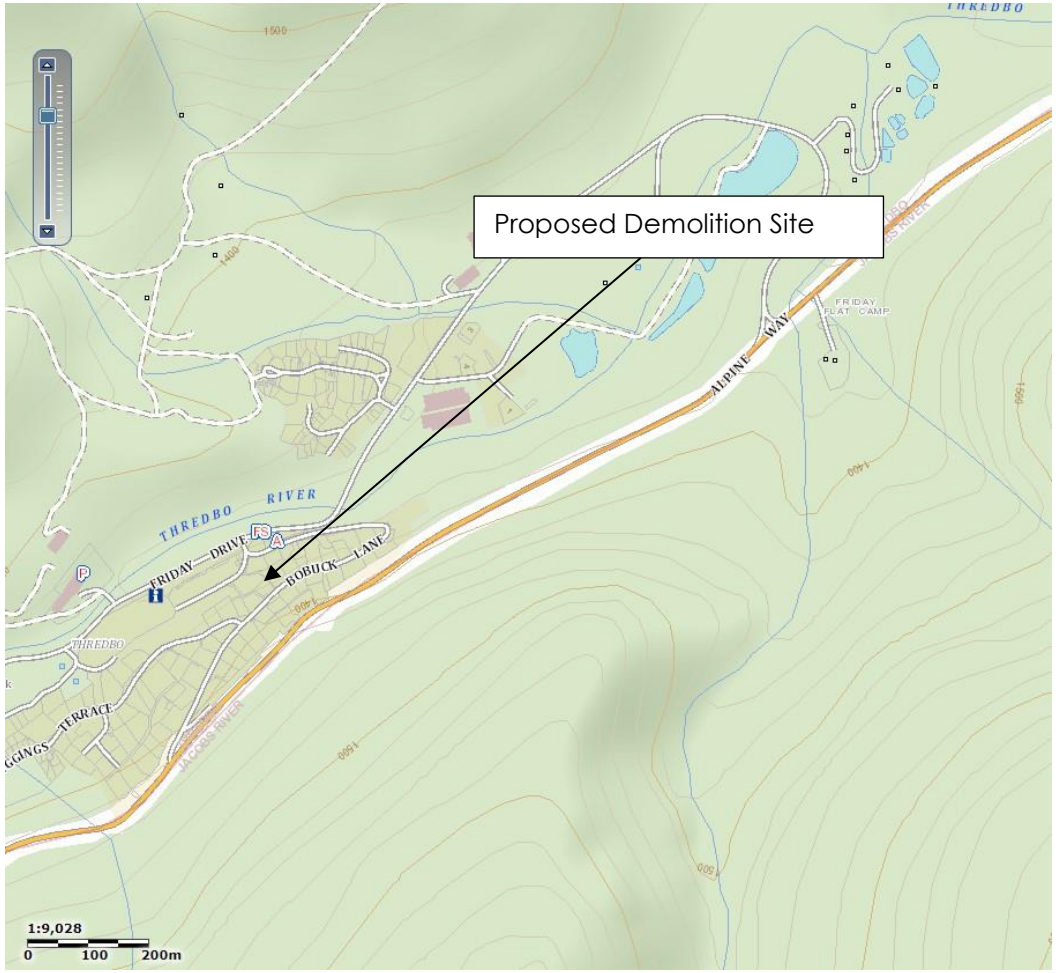
- Council approval for Hoardings and laybacks (if necessary)

6 PERSONNEL QUALIFICATIIONS

All personnel onsite shall hold a General Construction Induction Card (White Card).

The Site Supervisor shall be a SafeWork NSW recognised Demolition Class A (unrestricted) Competent Person with considerable expertise in the demolition of similar structures.
All plant will be operated by SafeWork NSW ticketed and experienced personnel.

N



KOSCIUSZKO THREDBO PTY LTD
PROPOSED DEMOLITION & REDEVELOPMENT - SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW
SITE LOCALITY

ACT Geotechnical Engineers Pty Ltd	**C14191**	**FIGURE 1**

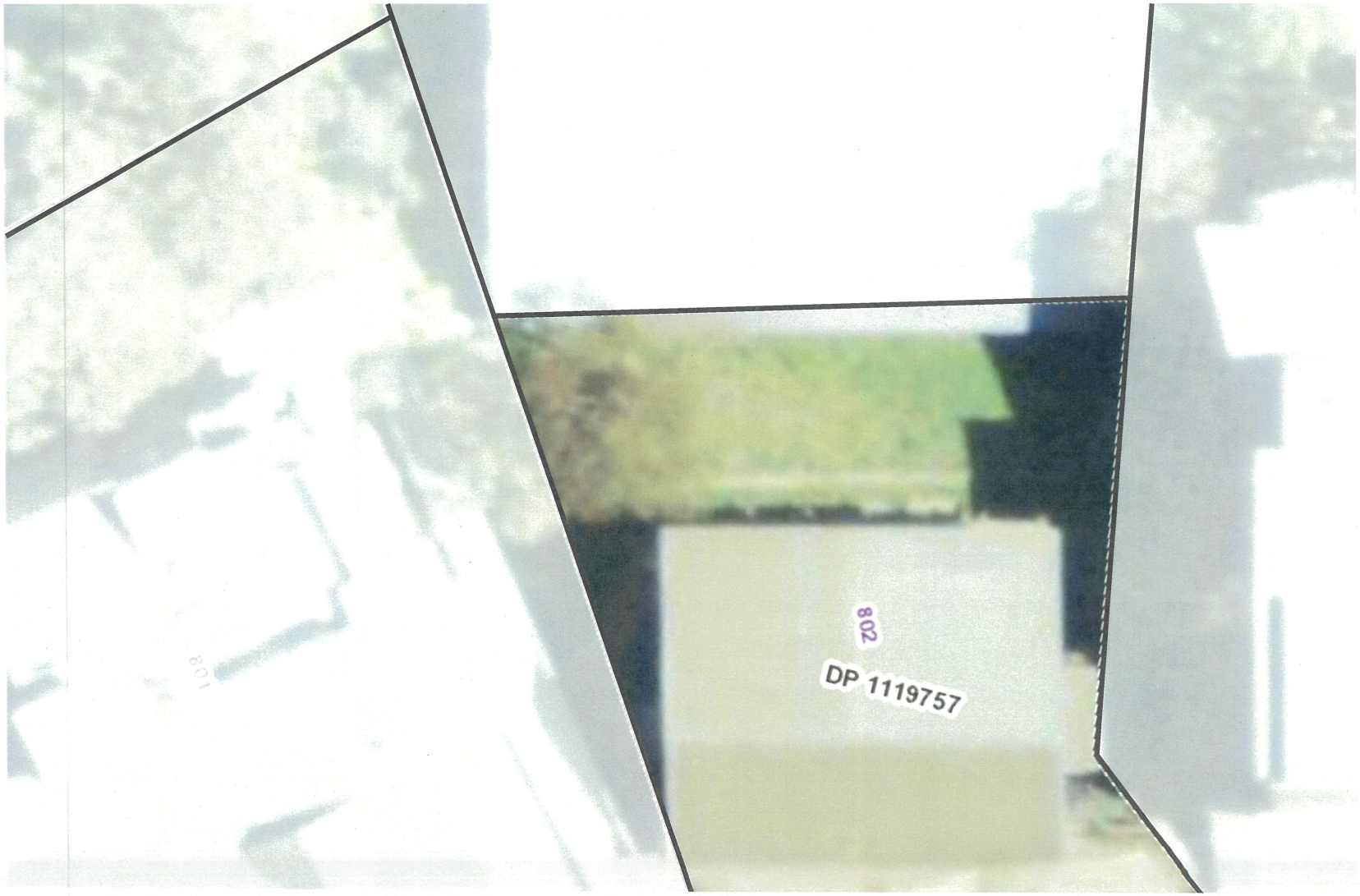
KOSCIUSZKO THREDBO PTY LTD
PROPOSED DEMOLITION & REDEVELOPMENT - SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW
RECENT AERIAL PHOTOGRAPH

ACT Geotechnical Engineers Pty Ltd	**C14191**	**FIGURE 2**

APPENDIX A
SONNBLICK LODGE FLOOR PLANS

Sonnblick Lodge

Date: November 7, 2019

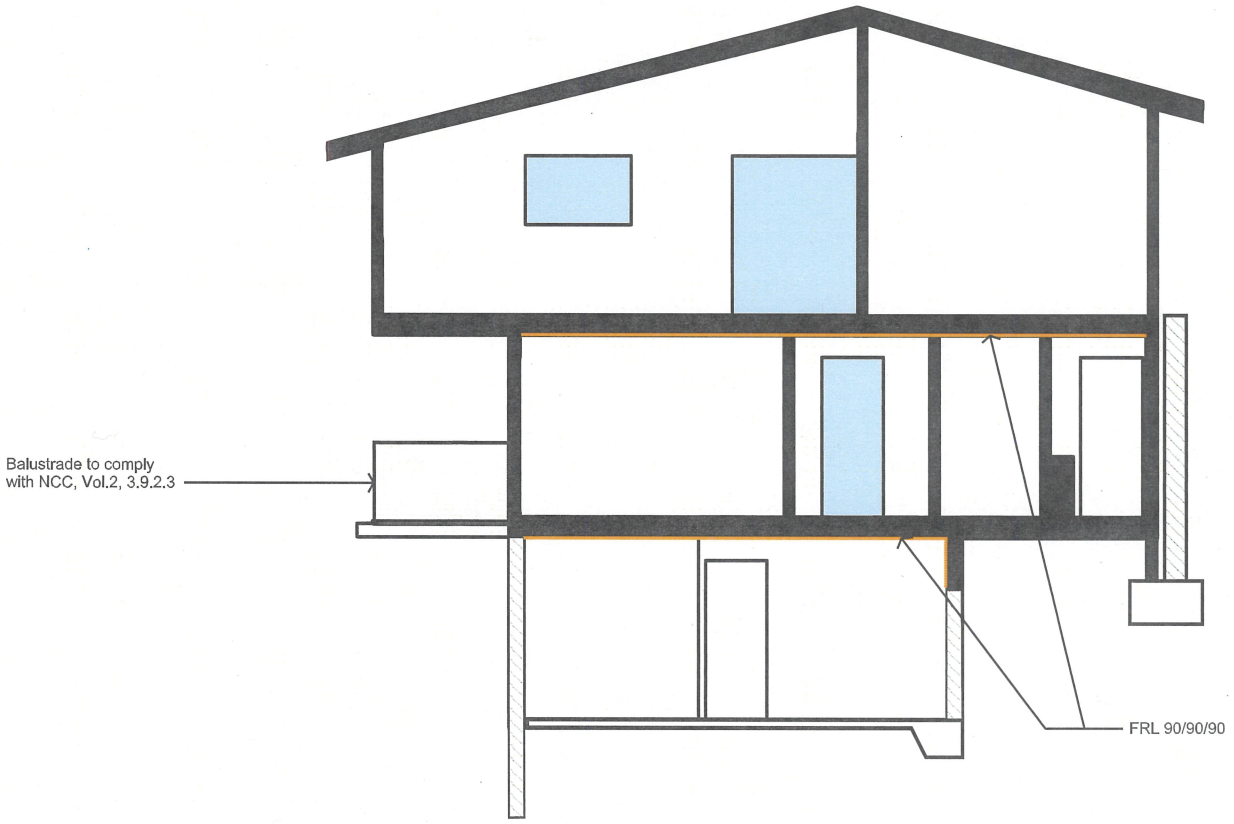


CONTENTS

TYPE LEGEND

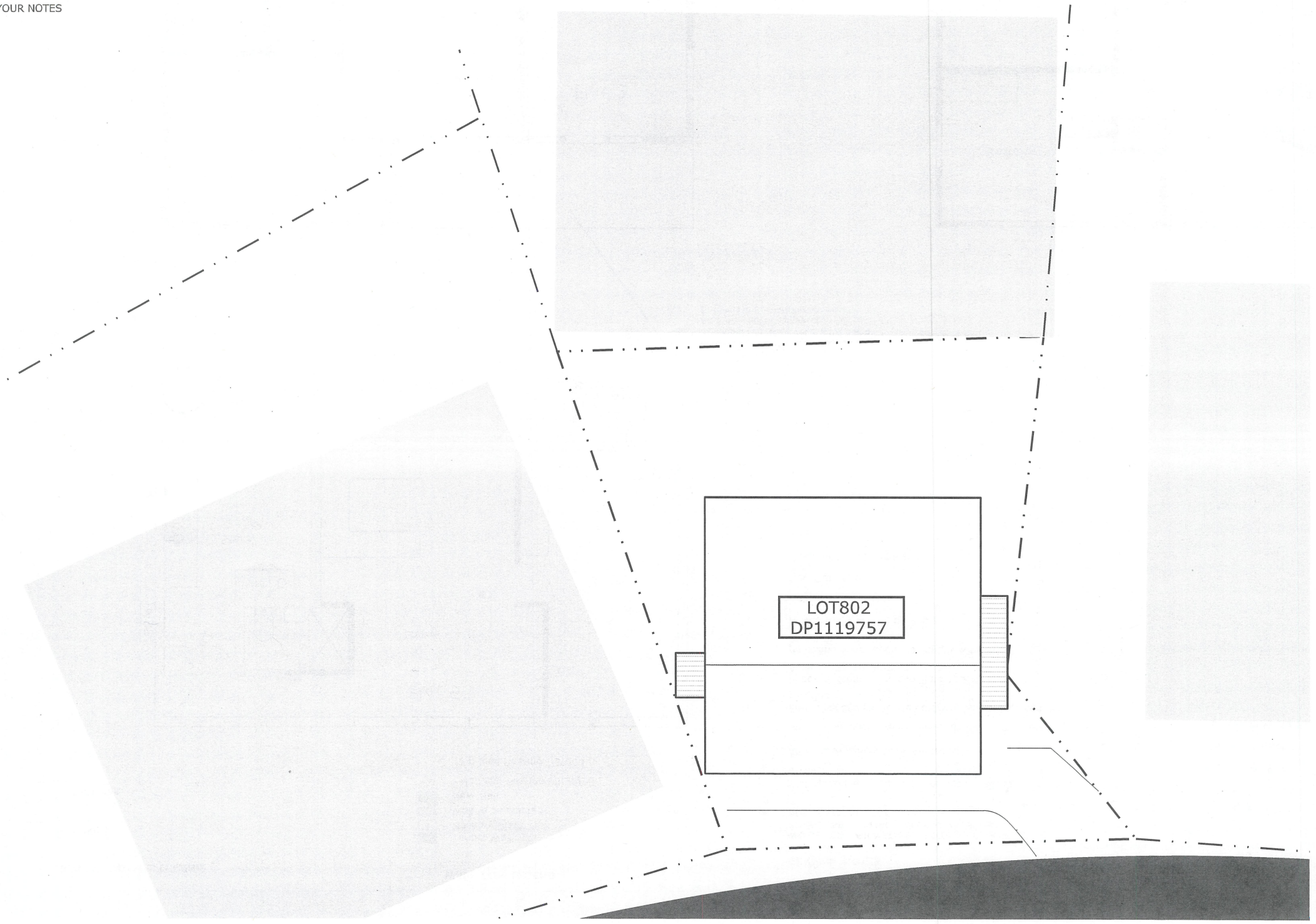
- Timber
- Masonry Block
- Concrete
- FRL: Load Bearing 90/90/90

  Non-load Bearing -/60/60



GENERAL NOTES

ADD YOUR NOTES



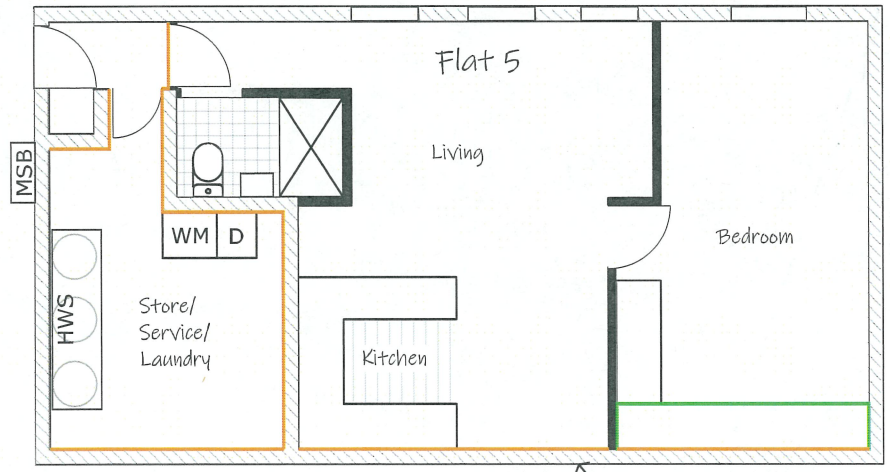
FLOOR FINISHES LEGEND

- Decking
- Wet areas

WALL TYPE LEGEND

- Timber Wall
- Masonry Block Wall
- Wall to be deleted
- New Wall
- FRL: Load Bearing 90/90/90

Non-load Bearing -/60/60



1 / A102 Level 1

Scale: 1 : 100

GENERAL NOTES

WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS. CONTRACTORS SHALL VERIFY ALL DIMENSIONS ON SITE

Waterproofing needs to be replaced in all Wet areas

All Kitchen joinery to be Replaced

All existing joinery to be replaced

Fire Panel and smoke detectors to be serviced and certified

Exposed Beam ceilings in Flats 2, 3, 4, 5, to Achieve FRL 90/90/90

All ceiling penetrations to comply with FRL 90/90/90

All Internal Doors to be Replaced

New Floor Coverings

New Light Fittings

Site may contain Asbestos

ABBREVIATIONS

WM - Washing Machir

D - Dryer

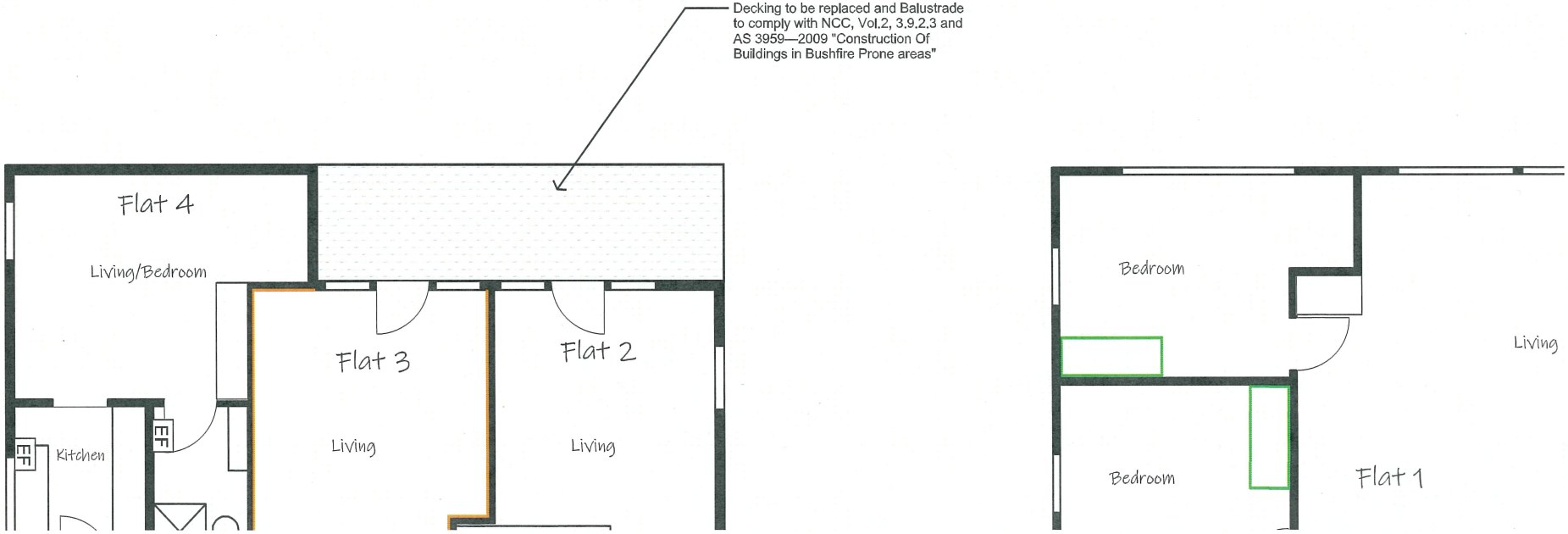
EF - Exhaust Fan

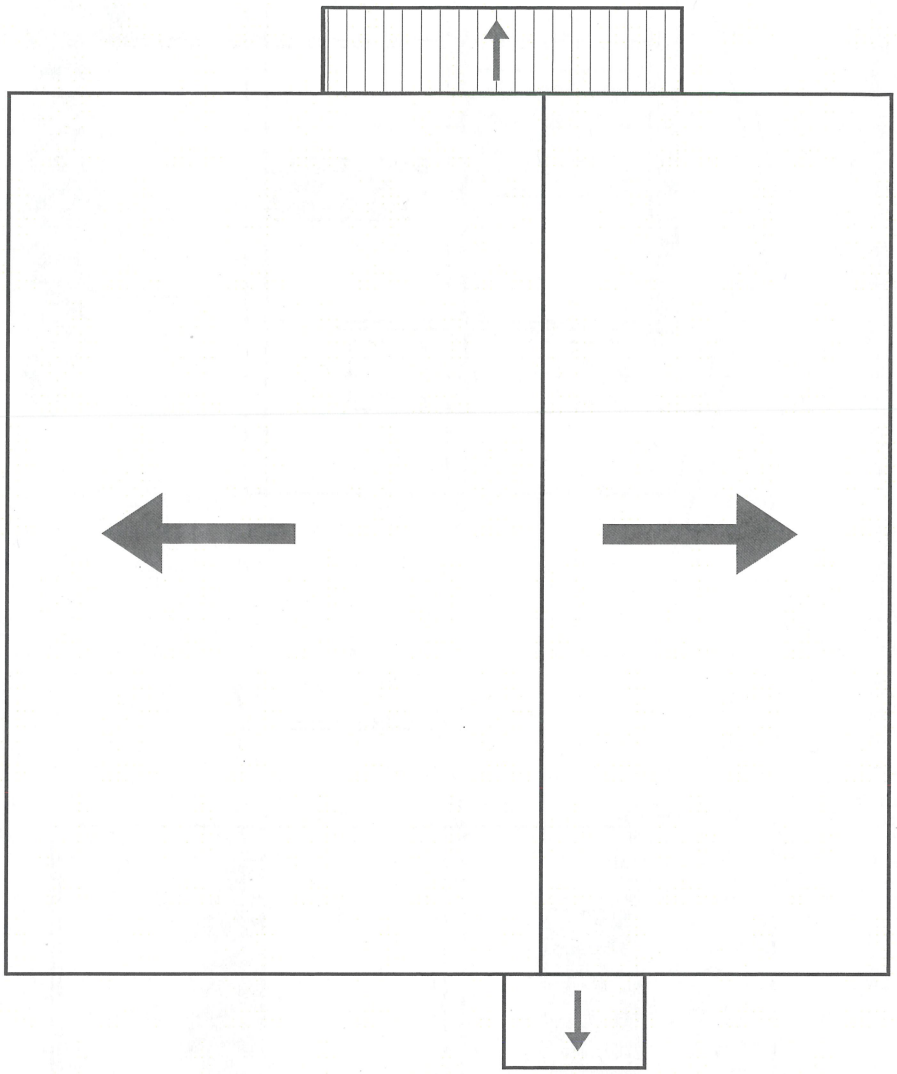
SB - Switch Board

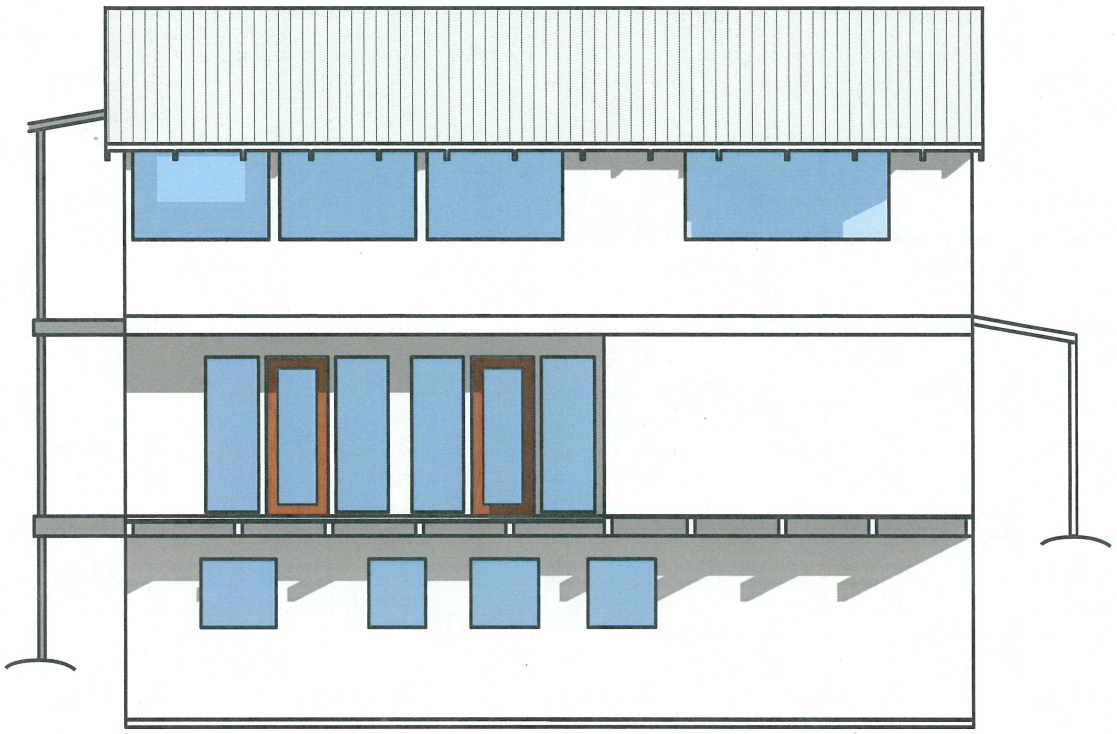
MSB - Main Switch Bc

FHR - Fire Hose Reel

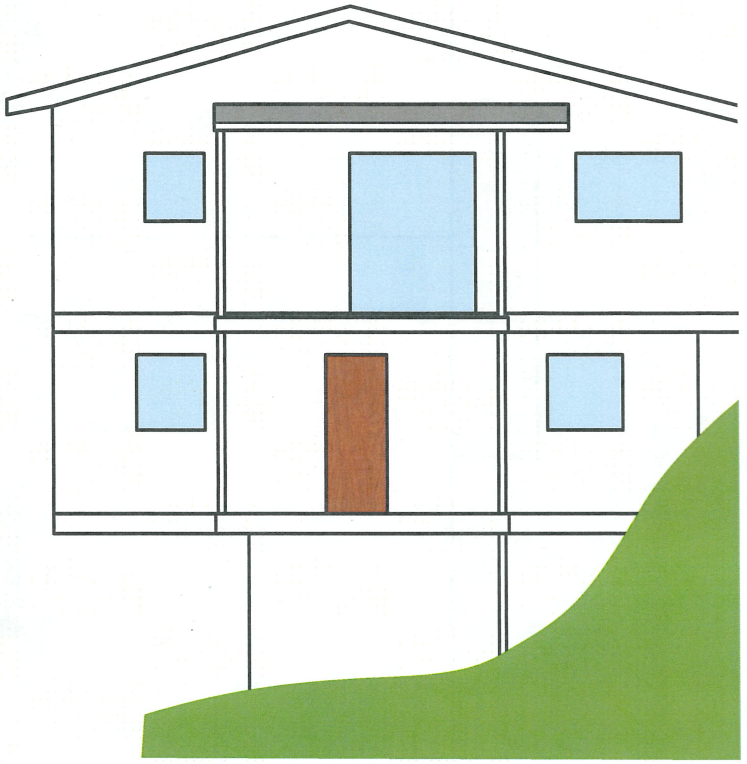
HWS - Hot Water Sys



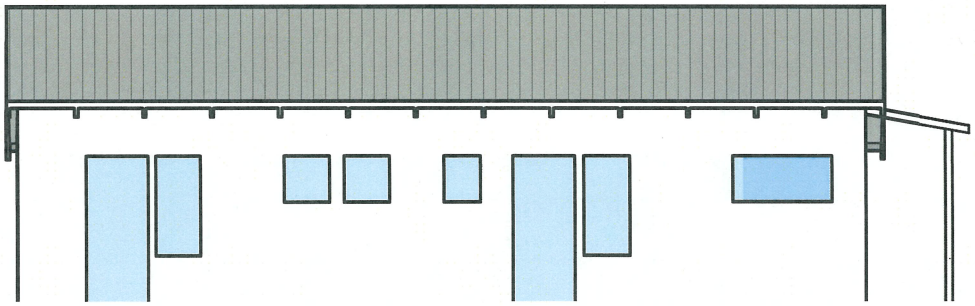


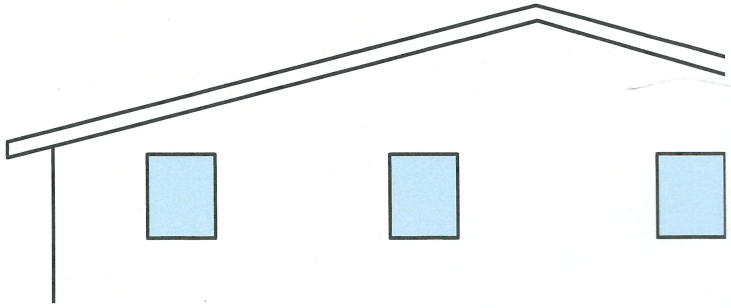


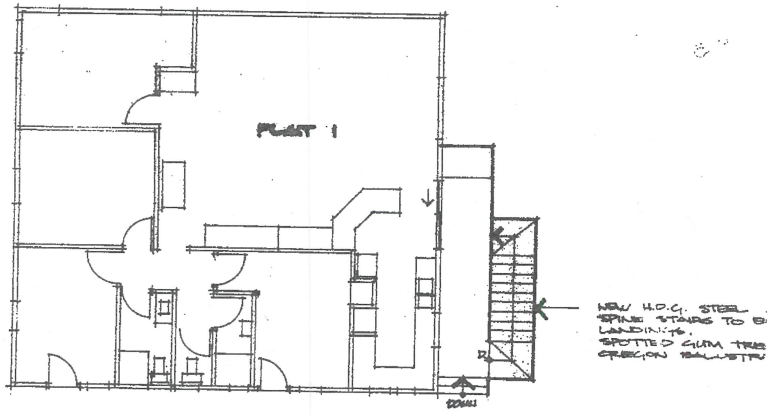
EN / A201 North Elevation
Scale: 1 : 100



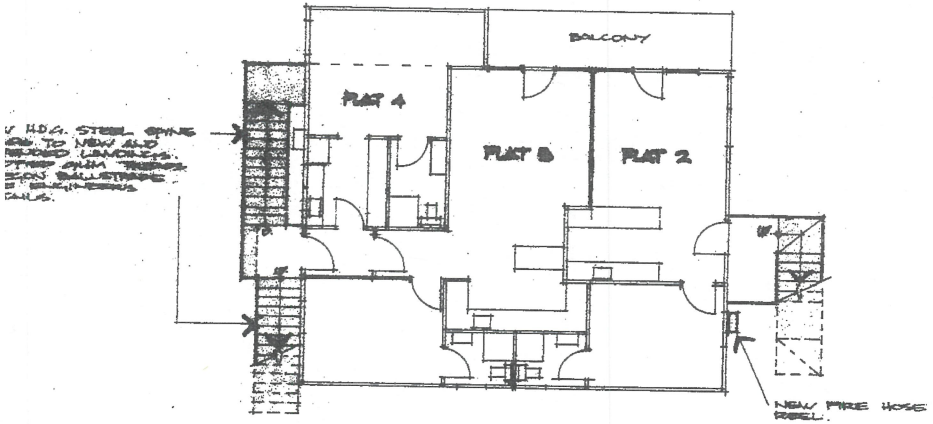
EN / A201 East Elevation
Scale: 1 : 100



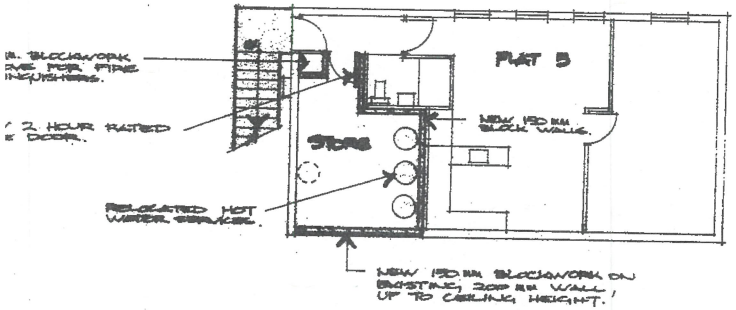




LEVEL 3 1:100



LEVEL 2 1:100



LEVEL 1 1:100

NOTES:

- PROVIDE FIRE ALARM SYSTEM IN ACCORDANCE WITH AS 1670 TO FLATS 1,2,3,4,5, PLANT ROOM AND STORE.
'AS EXECUTED' DWG. WILL BE SUBMITTED.
PROVISION HAS BEEN MADE FOR CONNECTION TO FIRE STATION.

Geotechnical Engineers ACT

ACT Geotechnical Engineers Pty Ltd
ACN 063 673 530

5/9 Beaconsfield Street, Fyshwick, ACT, 2609
PO Box 9225, Deakin, ACT, 2600
P: (02) 6285 1547 or 0404 064 858
E: Jeremy.murray@actgeoeng.com.au

26 April 2022
Our ref: OB/C14191

Kosciuszko Thredbo Pty Ltd
Via email: Andrew_Harrigan@evt.com

Attention: Mr Andrew Harrigan

Dear Sir

PROPOSED DEMOLITION & REDEVELOPMENT
SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW

GEOTECHNICAL INVESTIGATION & SLOPE STABILITY RISK ASSESSMENT

We are pleased to forward our geotechnical investigation and slope stability risk assessment for the proposed demolition and redevelopment of the Sonnblick Lodge in Thredbo, NSW.

The report outlines the methods and results of field investigations and results of a qualitative slope instability risk assessment.

The slope instability risk assessment is based on the landslide risk management concepts and guidelines issued by the Australian Geomechanics Journal Vol 35 March 2007 "Practice Note Guidelines for Landslide Risk Management 2007". By these criteria, it was established that the level of risk to be proposed and neighbouring dwellings and to people is "Very Low to Very High" and is no higher than normally acceptable for residential development.

Should you require any further information regarding this report, please do not hesitate to contact our office.

Yours faithfully,
ACT Geotechnical Engineers Pty Ltd

Olga Baruleva
Engineering Geologist
BSc (Geology) MPhil *MIEAust*

Reviewed by:

Jeremy Murray
Senior Geotechnical Engineer | Director
FIEAust CPEng Eng Exec NER RPEQ APEC Engineer IntPE(Aust)
Registered Professional Engineer of Queensland (RPEQ) #19719
NSW Professional Engineer Registration #PRE0001487

KOSCIUSZKO THREDBO PTY LTD

PROPOSED DEMOLITION & REDEVELOPMENT
SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW

GEOTECHNICAL INVESTIGATION & SLOPE STABILITY RISK ASSESSMENT

APRIL 2023

KOSCIUSZKO THREDBO PTY LTD

PROPOSED DEMOLITION & REDEVELOPMENT
SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW

GEOTECHNICAL INVESTIGATION & SLOPE STABILITY RISK ASSESSMENT

TABLE OF CONTENTS

KOSCIUSZKO THREDBO PTY LTD

PROPOSED DEMOLITION & REDEVELOPMENT
SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW

GEOTECHNICAL INVESTIGATION & SLOPE STABILITY RISK ASSESSMENT

1 INTRODUCTION

1.1 Project Description

At the request of the client, ACT Geotechnical Engineers Pty Ltd carried out a geotechnical investigation and a qualitative slope instability risk assessment for the proposed demolition and redevelopment of Sonnblick Lodge, in Thredbo, NSW.

It is understood the project involves the demolition of the existing lodge, in preparation for selling the vacant land for future redevelopment. The site could potentially be vacant for 12 to 24 months following demolition. The site is within "Zone G" of the Kosciusko National Parks Alpine Resorts, so under the NSW Department of Planning Geotechnical policy, a geotechnical investigation and slope instability risk assessment is required.

1.2 Scope of Investigation

The slope stability risk assessment required the development of a qualitative matrix risk assessment to people and property, in accordance with the guidelines of "Landslide Risk Management Concepts and Guidelines", Australian Geomechanics Journal, 2007. In this instance, the present residents of the lodge and workers on the site during and after demolition are considered as "people" and the existing structure, as well as the surrounding houses were considered as "property".

The slope stability assessment is qualitative, based on the guidelines on landslide risk management published by the Australian Geomechanics Society. Risk assessment involves the following components: (i) Hazard identification, (ii) Likelihood of Hazards Occurring, (iii) Consequences of Hazards, and (iv) Significance of Risks. This uses a matrix approach to determine the risk level of each hazard based on the likelihood and consequences of each hazard occurrence.

1.3 Geotechnical Policy – Kosciuszko Alpine Resorts

Section 4 of "Geotechnical Policy – Kosciuszko Alpine Resorts" by the NSW Department of Infrastructure, Planning and National Resources details the requirements that must be included in a geotechnical report for developments within the designated "G" areas of the Kosciuszko Alpine Resorts. The table below summarises the requirements and the sections within this report that covers those requirements.

Table 1 - Summary of "Geotechnical Policy – Kosciuszko Alpine Resorts" requirements.

Policy Section	Policy Requirement for Inclusion in Geotechnical Report	Section in This Report Covering the Requirement
4.1 (a)	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, Volume 35 No. 1 of March 2000.	See Section 5 "Slope Instability Risk Assessment".
4.1 (b)	Plans and sections of the site and related land form from survey and field measurements with contours and key features identified, including the locations of the proposed development, buildings/structures on both the subject site and adjoining site, stormwater drainage, sub-surface drainage, water supply and sewerage pipelines, trees, and other identifiable geotechnical hazards.	See Figure 2 "Aerial Photograph" and Figure 3 "Contour Plan".
4.1 (c)	Details of all site inspections and site investigations and any other information used in preparation of the geotechnical report. A site inspection is required in all cases. Site investigation may require sub-surface investigation; appropriate investigation may involve boreholes and/or test pit excavations or other methods to adequately assess the geotechnical/geological model for the site.	See Section 2 "Site Description & Geology" and Section 3 "Investigation Methods".
4.1 (d)	Photographs and/or drawings of the site and related land adequately illustrating all geotechnical features referred to in the geotechnical report, as well as the locations of the proposed development.	See Figures 5 - 6 "Site Photograph", Figure 2 "Arial Photograph" and Figure 3 "Contour Plan".
4.1 (e)	Presentation of the geological model of the site and related land showing the proposed development, including an analysis of sub-surface conditions, taking into account thickness of the topsoil, colluvium and residual soil layers, depth to underlying bedrock, and the location and depth of groundwater.	See Section 4.1 "Subsurface Conditions", Section 4.2 "Groundwater", and Figure 4 "Subsurface Section"
4.1 (f)	A conclusion as to whether the site is suitable for the development proposed to be carried out either conditionally or unconditionally. This must be in the form of a specific statement that the site is suitable for the development to be carried out, subject to the following conditions: (i) Conditions to be provided to establish the design parameters, including, but not limited to; footing levels and supporting rock quality, degree of earth and rock cut and fill, recommendations for excavation batters, bearing capacities for use in the design of all structural works including footings, retaining walls, and drainage, signing of Form 2 as the mechanism to check that these parameters have been used and interpreted correctly.	See Section 5.8 "Suitability of the Proposed Development". See Section 6 "Discussion & Recommendations".

	(ii) Conditions applying to the detailed design to be undertaken for the construction certificate, including, but not limited to; any structural design relating to the geotechnical aspects of the proposal is to be checked and certified by a suitably qualified and experienced geotechnical engineer, any other design conditions the geotechnical engineer preparing the geotechnical report believes are required in the design phase in order to ensure the design will achieve the "acceptable risk management" level as defined in the policy for potential loss of both property and life, signing of Form 2 as the mechanism to check that these parameters have been used and interpreted correctly.	See Section 6 "Discussion & Recommendations".
	(iii) Conditions applying to the construction phase, including but not limited to; constructed works which require inspection and/or sign off by a suitably qualified and experienced geotechnical engineer. The report must highlight and detail the inspection regime to provide the builder with adequate notification of all necessary inspections, any other construction conditions including works methodology and temporary works that the geotechnical engineer preparing the geotechnical reportbelieves are required in the construction phase to ensure the design will achieve "acceptable risk management" level as defined by the policy for potential loss of both property and life, and signing of Form 3 as the mechanism to check that these parameters have been used and interpreted correctly.	See Section 6.9 "Hold Points for Geotechnical Inspections".
	(iv) Conditions regarding ongoing management of the site/structure, including but not limited to; any conditions that may be required for the ongoing mitigation and maintenance of the site and the proposal, from a geotechnical viewpoint. (v)	See Section 6.5 "Stable Cut/Fill Battered Slopes" and Section 6.8 "Drainage".
4.1 (g)	A copy of Form 1 bearing the original signature of the geotechnical engineer as defined by this policy, who has either prepared or technically verified the geotechnical report.	See Appendix F "Form 1 – Declaration by geotechnical engineer".

2 SITE DESCRIPTION & GEOLOGY

The 340m^2 site located on Lot 802 DP1119757, at 10 Bobuck Lane, in Thredbo, NSW. The site is currently occupied by the Sonnblick Lodge on the southern two-thirds of the lot, with a grassed area on the northern third. The existing lodge is three-storey structure, partly cut into the steeply sloping site on the low side of Bobuck Lane.

The site dips north at the angle of ~35° to 40° from ~RL1398 to ~RL1390 across the block. It does appear that some excavation spoil may have potentially been placed on the downslope portion of the site, assuming from cut-to-fill (~0.5m/1.0m) platform construction. Figure 1 shows the site locality, while Figure 2 is a recent aerial photograph showing the present site layout and the location of the proposed development. Figure 3 is a survey plan of the site, showing the surface

contours and topographical features. Figures 5 to 8 are the site photographs, taken at the time of investigation.

The Minview Geology map indicate the site to be underlain by Silurian age Bullenbalong Supersuite bedrock, part of the Mowambah Granodiorite, which includes granodiorite and granite. Striking north-easts, the Crackenback Fault is located on the northern edge of the site. The Crackenback Fault is a major fault that developed in the granitic rock which became areas of weakness that were more easily eroded than the stronger unaltered rock.

3 INVESTIGATION METHODS

3.1 Previous Investigations

Arup Geotechnics previously conducted a geotechnical landslide risk management assessment of the Sonnblick Lodge in May 1998 (Reference 10664/04). That investigation identified the possible hazards with significant assessed risks for the site, as follows:

- Deep seated slip beneath existing retaining walls at cut face and fill below Bobuck Lane.
- Erosion and undermining of the slope at the rear of the site.

Coffey Partners International previously conducted a geotechnical investigation of the site in November-March 1999 (Reference S10803/15-AE). That investigation comprised three boreholes and two test pits with excavation depths up to 4.6m. SPT testing was also performed.

Geotechnical investigation data of previous report has been considered in the analysis of the present investigation and all the previous information was compiled in the current report.

3.2 Current Investigation

The field investigation was carried out on 12 April 2023. The investigation comprised one (1) borehole, designated BH1, using 50mm push-tube equipment. The borehole location is shown on Figure 2, and the borehole log is presented in Appendix A.

The borehole was excavated to 1.5m depth, terminating at refusal in granitic gravel/cobbles/bedrock. The soil profiles were visually logged in accordance with the Unified Soil Classification System (USCS). Definitions of terms used on the logs and in this report, including a copy of the USCS chart, are provided in Appendix B. The stability assessment is a qualitative slope instability assessment, in line with the requirements of the NSW DIPNR, and is based on the guidelines on the AGS "Landslide Risk Management Concepts and Guidelines 2007". (Reference 2).

4 INVESTIGATION RESULTS

4.1 Subsurface Conditions

Bore holes BH1 found the following subsurface profile:

Geological Profile	Depth Interval	Description
FILL	0m to 0.2m	Sandy Silty CLAY; fine to coarse sand, low plasticity, some fine angular gravel, pale brown, some brick/ceramic pipes fragments, moist, soft.
TOPSOIL	0.2m to 0.5m	Silty SAND with clay; fine to coarse sand, low platicity, dark grey, black, moist, loose.
COLLUVIAL SOIL	Below 0.5m/>1.5m	Silty Clayey SAND; fine to coarse sand, low plasticity, brown. grey, some fine to moderate angular granite gravel, moist, loose to medium dense.

Borehole BH1 refused on likely a cobble/gravel material. Based on the previous investigations mentioned in Section 3.1, granite bedrock is expected at 2m/4m depth. It appears that the footings of the existing lodge and retaining wall are founded on colluvial soils, rather than weathered granite bedrock.

Figure 4 is a subsurface section through the site, showing the geotechnical model of the site as found by the investigation borehole and basing on the previous studies.

4.2 Groundwater

Permanent groundwater is not expected within at least 3m of the surface, however, temporary, perched seepages could occur at shallower depth following rainfall, particularly within pervious colluvial soils and sections of fractured bedrock.

The general surface and subsurface drainage of the Thredbo Village hillside has been upgraded since the 1997 Thredbo Landslide with major drainage being installed along the Alpine Way. Noted drainage includes a subsoil drain ~2m deep, with slotted agricultural pipe and backfilled with gravel.

5 SLOPE INSTABILITY RISK ASSESSMENT

5.1 Method of Risk Assessment

The following sections of the report outline the slope instability risk assessment carried out for the site. The assessment is qualitative, based on the guidelines provided in the Australian Geomechanics Journal Vol 42 March 2007, and has been adopted by the NSW Department of Infrastructure, Planning and Natural Resources. This uses a matrix approach to determine the risk level of each hazard based on the likelihood and consequences of each hazard occurring.

Risk assessment involves the following components:

(i) Identification on the potential site slope hazards that may damage property and/or cause loss of life (Hazard Identification).

(ii) Estimation of the likelihood of each hazard occurring (Likelihood of Hazards Occurring).

(iii) Assessment of the potential consequences to property and people of these hazards occurring (Consequences of Hazards).

(iv) Evaluation of the significance of the assessed risks against criteria of acceptability (Significance of Risks).

Following the risk assessment, options for the treatment of the risk are provided as a guide to the owner, administrator and regulatory authorities who will need to decide whether to avoid or accept the risk, or to treat the site to reduce the likelihood and/or consequences of the hazards.

A flowchart, included in the Australian Geomechanics Journal, Vol 42, March 2007, paper on "Landslide Risk Management Concept & Guidelines" 2007 (Reference 3), which shows the processes of risk assessment/risk management is copied here in Appendix D. Appendix E provides guidelines for hillside construction.

5.2 Hazard Identification

The potential hazards to slope stability at this site were considered, and include:

- Large Scale Transitional Slide
- Shallow Soil Creep in the Soil Profile
- Failure of a Retaining Wall
- Surface Erosion
- Failure of Cut Batters
- Large Rockfall from Upslope

5.3 Likelihood of Hazards Occurring

5.3.1 Large Scale Translational Slide

The Thredbo Alpine Resort is located in an area where landslips have occurred. There is a history of severe embankment instability, rock fall, debris slide and debris flow problems in the Thredbo valley.

There are several landslides recorded in the immediate vicinity to the site. A catastrophic landslide occurred just ~50m away from the site in July 1997. This landslide occurred below Alpine Way and resulted in major damage. The remediation works has been completed along the Alpine Way to reduced the risk of a major landslide.

The Arup Geotechnics report states the presence of another large landslide located above the Bobuck Lane. The report map shows a ~2m high and ~30m long concave scarp approximately 25m south the Sonnblick Lodge. This can indicate a past major landslide and a possible deep seated slip surface beneath existing road fill embankment, retaining wall and possibly the Sonnblick Lodge.

The slope above Bobuck Lane is currently supported by retaining walls and covered with mature Snow Gum Trees. There are signs of soil movements below Bobuck Lane, including:

- Multiple tension crack on the asphalt road pavement on the outer lane of Bobuck Lane. The cracks are to 10mm wide and running to 6m long. One tension crack in front of the driveway to 2.5m long.
- Cracking of the concrete pavement of the driveway.
- Signs of the distress of the masonry retaining wall below the Bobuck Lane.
- Moist soils behind the masonry driveway retaining wall and at the toe of level 1 retaining wall.
- Multiple cracks on the existing structure, indicating foundation settlement.

Figures 5-6 show the features of this hazard.

The landslides that have previously occurred in the Thredbo area have generally been triggered by changes in the slope (cut or fill) or changes in the drainage, combined with heavy rainfall. The combination of a soil mantle, a relatively shallow soil profile (2m/4m) and good surface drainage, reduces the possibility of a major landslip occurring.

For such a large-scale slide to happen there would need to be an extreme combination of unfavourable triggering conditions such as earthquakes, extreme rainfall, saturated soils, mass clearance of vegetation, unsupported excavations etc. The site is located in an area designated as having a Landslide Susceptibility rating of "Possible". In accordance with the AGS ratings (Appendix C), such an event is considered to be "Possible".

5.3.2 Shallow Soil Creep

The rear of the site slopes at the relatively steep angle of ~35°. The site is grass-covered and there was a mature tree cut recently. The existing ground surface exposed small-cale soil heaving and rupturing. The soil horizontal movements was estimated to be 0.05 to 0.1m and assessed by exposed soil (Figure 5).

Under adverse site conditions, such as when site soils are saturated, small slumping failures of the soils could conceivably occur. The existing ground surface is 'lumpy', indicating that slumps may have occurred in the past, so such an event is "Possible".

5.3.3 Failure of Retaining Walls

The site has been cut into a slope and four masonry retaining walls support the cut batters. The retaining walls comprises stone and mortar, and are possibly not properly engineered. It is also not known if they have proper footings and drainage. The four walls are:

(1) RW1 is located at the rear of the building and is up to 0.5m height. The soil has been washed out beneath the retaining wall rock facade. Cracking through mortar are to 0.5cm wide.

(2) RW2 supports the basement and was not inspected during the site visit.

(3) RW3 supports Level 1 cut, driveway part of the upper slope. Some cracking through mortar and soft soils were noted. Ceramic stormwater pipes outlets are located at the toe of the retaining wall.

(4) RW4 is from 1m to 1.4m high and is located below Bobuck Lane, but above the driveway and entrance to the Sonnblick Lodge. The retaining wall comprises angular granite boulders boded by mortar. This retaining wall shows signs of deterioration, including cracks through masonry to 1-2cm wide, fallen out boulder. In the gap between the fallen boulders, its possible to see that some material behind the wall has been washed out. There is also a steel stormwater pipe outlet beneath the road.

The existing retaining walls, especially adjacent to Bobuck Lane RW4, have defects that may indicate failure onset. If left in the current state, the deterioration may progress further until the retaining wall failure occurs. Generally, the cuts to be constructed on the block should be supported by well-drained, properly designed and constructed engineered retaining walls.

Considering signs of retaining wall failure observed, the likelihood of retaining wall failure is judged to be "Likely".

5.3.4 Surface Erosion

There are presently minor signs of surface scouring and erosion on the block, particularly along the paths and the along the rear of the building. Adjacent to the building erosion has resulted in undermining retaining walls and a slope. Most of the area is grass-covered with no signs of erosion. However, when the building is demolished, uncovered exposed soils would be prone for erosion. In addition, the upper soils are quite silty, so if the vegetation is removed and surface water flow-paths were allowed to develop, surface erosion is "Likely".

5.3.5 Large Rockfall from Upslope

Large rockfalls from up the slope occurred in the past in the area, as evidence by debris deposits on the lower slopes of the valley. Provided the existing structures, retaining walls and mature vegetation uphill of the site, the risk is reduced. Therefore, this event is "Rare".

5.3.6 Failure of a Cut Batter

The proposed demolition may require excavations to ~1-3m depth. Since the cuts may stay exposed for an extended time, from 12 to 24 months, the cuts should be permanently supported by properly designed and constructed engineered retaining walls, however, temporary site cuts will be

exposed during construction until the retaining walls can be constructed. The likelihood of failure of a temporary site cut during construction is judged to be "Possible".

5.4 Consequences of Hazards Occurring

5.4.1 Large-Scale Translational Slide

Theoretically, a large-scale slide would occur with little or no warning, and the consequences to property and people would depend on the volume of the slide material, its velocity, and whether or not people are present, or in the downslope dwelling at the time. Using the AGS table of qualitative measures of vulnerability and consequences in Appendix C, we consider the consequences of such a rare event to be "Major", i.e Theoretically, there is the possibility of a fatality in the dwelling and/or the imposition of major damage to some of the structure in the rare even of this occurring.

5.4.2 Shallow Soil Creep

The existing structure will be demolished, therefore the consequence to its damage is not applicable. The consequence to the dwelling and associated structures of a small-scale slump occurring in the soil if case the new footings have been founded in bedrock is believed to be "Minor". The soil creep is a very slow process; therefore, the risk to people's health or loss of life is very low and the consequences for persons can be rated as "Insignificant".

5.4.3 Failure of a Retaining Wall

If a retaining wall failed, damage may well result to the neighboring dwellings and Bobuck Lane, depending on many factors. Stabilization works would require in case RW4 below Bobuck Lane is failed. if In general, the consequences can be rated as "Medium" to "Major". The chance of persons being injured or of loss of life is low and the consequences to persons are therefore also rated as "Minor".

5.4.4 Surface Erosion

If such an event develops and occurs, small cobbles/boulders may wash out of erosion gully slides and rolled downhill. The consequential damage to a structure would be "Insignificant".

5.4.5 Large Rockfall from Upslope

The top of the escarpment is approximately >1.5km north of the property, with at least 330m of tree-dense bushland within the immediate vacinity of the property. Therefore, any large rockfalls that do occur will have slowed in velocity and magnitude by the time it reaches the property, or be protected by the properties immediately uphill. Therefore, the consequences to people and property are considered as "Minor" to "Insignificant".

5.4.5 Failure of Cut Batter

The chance of persons being injured or of loss of life is low and the consequences to persons and property are therefore also rated as "Minor".

5.5 Risk Estimation

A summary of estimated risk to property and life for each of the potential hazards identified in the previous sections is provided in Table 1a. This risk assessment in Table 1a is based on the present conditions, prior to any mitigation measures being implemented. The resulting risk level was derived using the AGS risk analysis matrix presented in Appendix C.

TABLE 2a - Risk Analysis Summary – Prior to Any Mitigation Measures Being Implemented

Potential Hazard	Assessed Likelihood	Assessed Consequences	Risk Level
Large-Scale Translational Slide	Possible	To Dwelling - Major	High
		To People in/adjacent to dwelling - Medium	High
Shallow Soil Creep	Possible	To Dwelling - Minor	Moderate
		To People in/adjacent to dwelling - Insignificant	Very Low
Failure of Retaining Wall	Rare	To Dwelling – Minor	Moderate
		To People in/adjacent to dwelling – Major to Medium	Very High to High
Surface Erosion	Possible	To Dwelling - Insignificant	Very Low
		To People in/adjacent to dwelling - Insignificant	Very Low
Rockfalls	Possible	Minor/Insignificant	Very Low to Medium
Failure of Cut Batter	Possible	Minor	Moderate

5.6 Risk Treatment

To maintain and/or reduce the risk level of slope stability during and after the demolition of the dwelling and associated structures, the following measures are recommended to be implemented:

- Ensure the existing retaining walls should be properly designed and constructed, and positively drained. Alternatively, the retaining walls stabilisation may include placing a soil buttress against the walls or by anchoring them back into bedrock.

- Form stable permanent batters after the structure demolition. Section 6.3 provides further details on temporary and permanent batters. Section 6.2 provides instructions on construction controlled fill platform if that required.
- Maintain adequate drainage of the site and ensure drains are free flowing.
- Where possible, maintain the existing vegetation cover. After demolition works provide erosion protection for exposed soils.
- Periodic inspection of the slope uphill for signs of erosion developing and remediate as necessary.

Some useful guidelines on hillside construction, prepared by the Australian Geomechanics Society (Reference 3), are presented in Appendix E.

A summary of estimated risk to property and life for each of the potential hazards identified in the previous sections is provided in Table 2b. This risk assessment in Table 2b is based on the proposed future conditions, assuming that all recommended mitigation measures are implemented. For this risk assessment to be valid, a suitably qualified geotechnical engineer must sign Form 2 and Form 3 as the mechanism to check that these mitigation measures have been correctly incorporated into the design and constructed correctly. The resulting risk level was derived using the AGS risk analysis matrix presented in Appendix C.

TABLE 2b - Risk Analysis Summary – After Recommended Mitigation Measures Are Implemented

Potential Hazard	Assessed Likelihood	Assessed Consequences	Risk Level
Large-Scale Translational Slide	Unlikely	To Dwelling - Medium	Low
		To People in/adjacent to dwelling - Minor	Low
Shallow Soil Creep	Rare	To Dwelling - Minor	Very Low
		To People in/adjacent to dwelling - Insignificant	Low
Failure of Retaining Wall	Rare	To Dwelling – Minor to Medium	Low
		To People in/adjacent to dwelling - Minor	Very Low
Surface Erosion	Rare	To Dwelling - Insignificant	Very Low
		To People in/adjacent to dwelling - Insignificant	Low
Rockfalls	Unlikely	Minor/Insignificant	Very Low to Low
Failure of Cut Batter	Rare	Minor	Very Low

Note: This risk assessment in Table 1b is based on the assumed future conditions, assuming that all recommended mitigation measures are implemented. For this risk assessment to be valid, a suitably qualified geotechnical engineer must sign Form 2 and Form 3 as the mechanism to check that these mitigation measures have been correctly incorporated into the design and constructed correctly.

5.7 Significance of Risks (Risk Evaluation)

Risk evaluation is the process by which owners, administrators and relevant regulatory authorities can decide whether the potential risks (See Table 1a and Table 1b) are acceptable, and/or whether these can be feasibly eliminated or reduced by remedial treatment. Implications of each level of risk are described in Appendix C.

In the present conditions, the overall risk to property and people is assessed to be "Very Low" to "Very High" (See Table 1a). Provided the demolition and earthworks are undertaken in accordance with accepted procedures for hillside construction, and treatments and mitigation measures are carried out to reduce the potential hazards (as recommended in Section 5.6 and Section 6), the risk is assessed to be "Very Low" to "Low" (See Table 1b).

5.8 Suitability of the Proposed Demolition

Provided that the demolition and earthworks are undertaken in accordance with accepted procedures for hillside construction, and treatments and mitigation measures are carried out to

reduce the potential hazards (as recommended in Section 5.6 and Section 6), the risk is assessed to be "Very Low" to "Low" (See Table 2b). Therefore, it is assessed that the site is suitable for the proposed demolition (provided all the recommendations in our report are followed).

6 DISCUSSION & RECOMMENDATIONS

Geotechnical recommendations for the works that can associate with the proposed demolition are provided in the following sections. After the demolition works are complete, a suitably qualified geotechnical engineer must inspect the site and sign Form 2 as the mechanism to check that these design recommendations and slope stability mitigation measures have been correctly incorporated.

6.1 Excavation Conditions & Use of Excavated Material

Proposed excavation depths have not been indicated but excavations to ~1.5m depth would be through topsoil and colluvial/residual soils. The soils and any weak rock (EW/HW) are readily diggable by backhoe and medium sized excavator.

The low and medium plasticity colluvial/residual soils can be used in controlled fill construction of building platforms. The weathered granodiorite bedrock is also suitable for fill material, although rock particles should be broken down to <75mm size. The silty topsoil and slopewash material and any high plasticity clay should not be used in controlled fill construction, but could be used in non-structural applications such as landscaping.

If imported fill is required, a suitable select fill material would include a low or medium plasticity soil such as clayey sand or gravelly clayey sand, containing between 25% and 50% fines less than 0.075mm size (silt and clay), and no particles greater than 75mm size.

6.2 Controlled Fill Construction

For construction of any new controlled fill platforms and road subgrades, it is recommended that:

- Areas be fully stripped of all silty topsoil and any uncontrolled fill. A stripping depth of up to ~0.5m/1m may be required. Stripped foundations should be proof-rolled by a vibratory pad-foot roller of not less than 9 tonne static mass to check for any weak or wet areas that would require replacement. No fill should be placed until a geotechnical engineer has confirmed the suitability of the foundation.

- Controlled fill comprising suitable site excavated or imported materials of not greater than 75mm maximum particle size (Section 6.1), be compacted in not greater than 150mm layers to not less than 95%ModMDD at about OMC.

- Fill placement and control testing be overviewed and certified by a geotechnical engineer at Level 1 or 2 involvement of AS3798 – 1996 "Guidelines on Earthworks for Commercial & Residential Developments" (Reference 3).

6.3 Stable Cut/Fill Batter Slopes

6.3.1 Temporary Batters (During Demolition)

Temporary site excavations to 1.5m depth should be cut back at no steeper than 1(H):1(V). If required and space allows, deeper temporary cuts can be formed at 1(H):1(V) in soils and at 0.5(H):1(V) in weathered granite bedrock. Where there are existing cuts steeper than 1(H):1(V), it is recommended that they are stabilized using reinforced shotcrete, or with soil buttress. A geotechnical engineer should inspect all cut batters during construction to confirm stability. Exposed temporary batters should be protected from the weather by black plastic pinned to the face with link-wire mesh, or similar.

During construction, the following recommendations must be followed to maintain stability of all temporary unsupported excavations:

- All equipment/machinery/stockpiles/site sheds and containers are located 1(H):1(V) from the toe of the batters. Trucks and heavy construction plant/equipment and large soil stockpiles must not be located close to the top edge of the batters, especially with the motor idling. Trucks and heavy construction plant/equipment must be located outside the zone of influence (1(H):1(V)) of the excavation batter.

- A bund or dish drain must be constructed along the top edge of all cuts to intercept and divert surface water away from the batters.

- All batter faces must be trimmed when erosion occurs, and loose material cleaned from the face regularly. Therefore, it is recommended that the batter faces are monitored on a daily basis and cleaned of loose material when present.

- Regular inspections by a geotechnical engineer of the batters would be required. As a guide, these inspections by a geotechnical engineer must be conducted on a monthly basis, while a competent person representing the contractor should do daily checks.

- No work must be conducted close to the toe of the batters during rain and 24 hours after. The batters must be re-inspected by a geotechnical engineer following rainfall (about 20mm of rain, or enough rain that the batter faces become wet).

- If deterioration or significant weathering of the batter face occurs, stabilisation/remediation of the batter must be applied. A geotechnical engineer will confirm this recommendation.

6.3.2 Permanent Batters (Post-Construction)

Permanent cut and fill soil batters should be formed at no steeper than 2(H): 1(V). All soil cut and fill surfaces should be protected against erosion by topsoiling and grassing, or other suitable means. Steeper permanent cuts should be supported by structural retaining walls. It is advisable that permanent batters are inspected during excavation by an experienced geotechnical engineer to confirm stability. To reduce the risk of future slope instability, all surface slopes around the development must be maintained to prevent erosion, and regular maintenance and inspections will be required to ensure on-going stability.

6.4 Low Retaining Walls

Retaining walls constructed in open excavation, with the gap between the excavation face and the wall backfilled later, can be designed for an earth pressure distribution given by:

$$\sigma_h = (K\gamma' h) + Kq$$

where,

σ_h is the horizontal earth pressure acting on the back of the wall, in kPa

K is the dimensionless coefficient of earth pressure; this can be assumed to be 0.4 when the top of the wall is unrestrained horizontally, and 0.6 when the top of the wall is restrained (i.e. by building slabs etc.)

γ' is the effective unit weight of the backfill, and can be assumed to be 20kN/m^3 for a lightly compacted soil backfill

h is the height of the backfill, in metres

q is any uniform distributed vertical surcharge acting on the top of the backfill, in kPa

Apart from structural restraints such as floor slabs, resistance to overturning and sliding of retaining walls is provided by frictional and adhesive resistance on the base, and by passive resistance at the toe of the wall. For a natural soil or controlled fill foundation, an ultimate base friction factor (tanδ) of 0.4, base adhesion (c) of 30kPa, and allowable passive earth pressure coefficient Kp=2.5 can be used for calculation of sliding resistance. For a weathered bedrock foundation an ultimate base friction factor (tanδ) of 0.55, base adhesion (c) of 100kPa, and an allowable passive earth pressure coefficient Kp=3.5 can be used for calculation of sliding resistance.

Free-draining granular backfill or synthetic fabric drains should be installed behind all walls. These should connect to weep holes and/or a collector drain, and ultimately to the stormwater system. Granular backfill should be wrapped in a suitable filter fabric to minimise infiltration of silt/clay fines.

6.4 Earthquake Site Factor

Table 2.3 of AS1170.4 "Minimum Design Loads on Structures - Part 4: Earthquake Loads" (Reference 5) lists the earthquake acceleration coefficients for major centres to be considered in structural design. The Thredbo area has an acceleration coefficient of 0.08.

Section 4 of AS1170.4 summarises the Site Subsoil Class which depends on the subsurface conditions at the site in question. A Site Subsoil Class C_e is applicable for this development.

6.5 Drainage

Suitable surface drainage should be provided to ensure rainfall run-off or other surface water cannot pond against buildings or pavements. Suitable drainage must be provided behind retaining walls.

It may be advisable to install a subsoil drain along the upslope side of the property to intercept any subsoil seepages. The drain should extend to at least 1m depth and should be directed past the building and into the stormwater system. If overland flow is an issue, a swale or bund drain could be constructed upslope to divert water away.

6.6 Hold Points for Geotechnical Inspections

Upon demolition completion, a suitably qualified geotechnical engineer must inspect the site and certain structural and civil elements, and sign Form 3 as the mechanism to check that these design recommendations and slope stability mitigation measures have been correctly constructed. The following is a list of hold points that require geotechnical inspection and sign off:

1) Inspect all temporary and permanent cut and fill batters to check stability and advise on remediation/treatment measures.

2) Inspection and certification of all controlled fill construction (where it is specified to be controlled fill in accordance with AS3798).

3) Inspect all surface and subsurface drainage measures to check that they are adequate, and to advise for additional measures if required.

ACT Geotechnical Engineers Pty Ltd

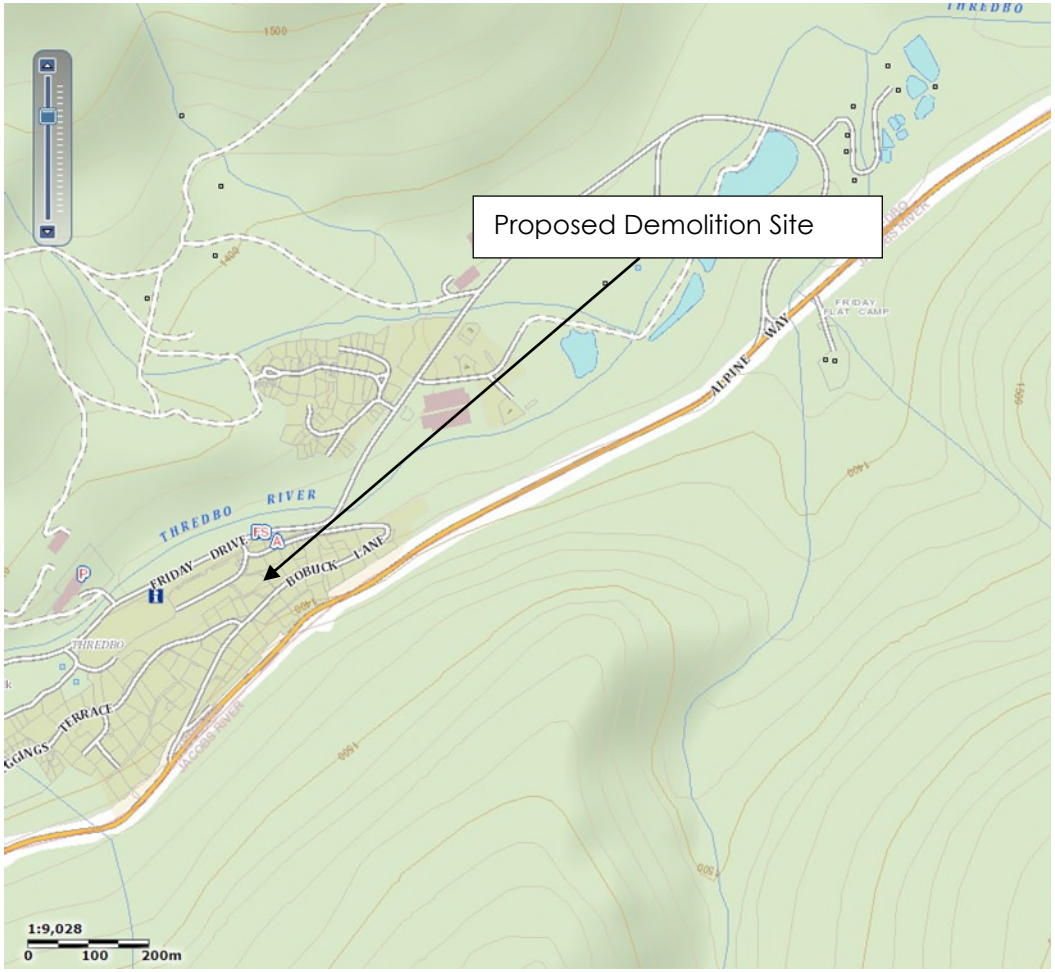
REFERENCES

1 Bureau of Mineral Resources, Commonwealth of Australia, "Wollongong 1:250 000 Engineering Geology Series", 1985.

2 Standards Australia, "AS2870 - 1996 - Residential Slabs & Footings - Construction".

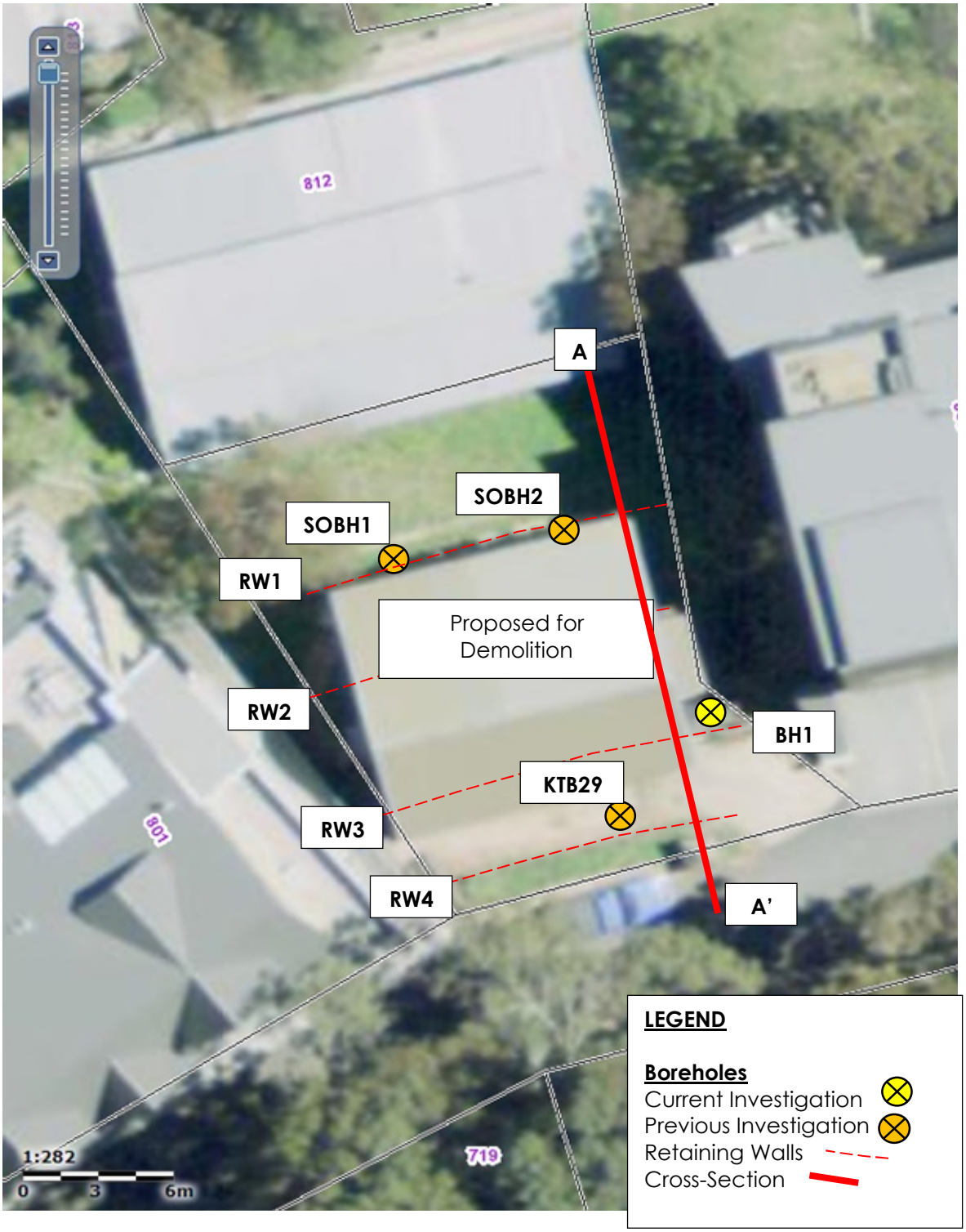
3 Standards Australia, "AS1170.4 - 1993 - Minimum Design Loads on Structures - Part 4: Earthquake Loads".

N



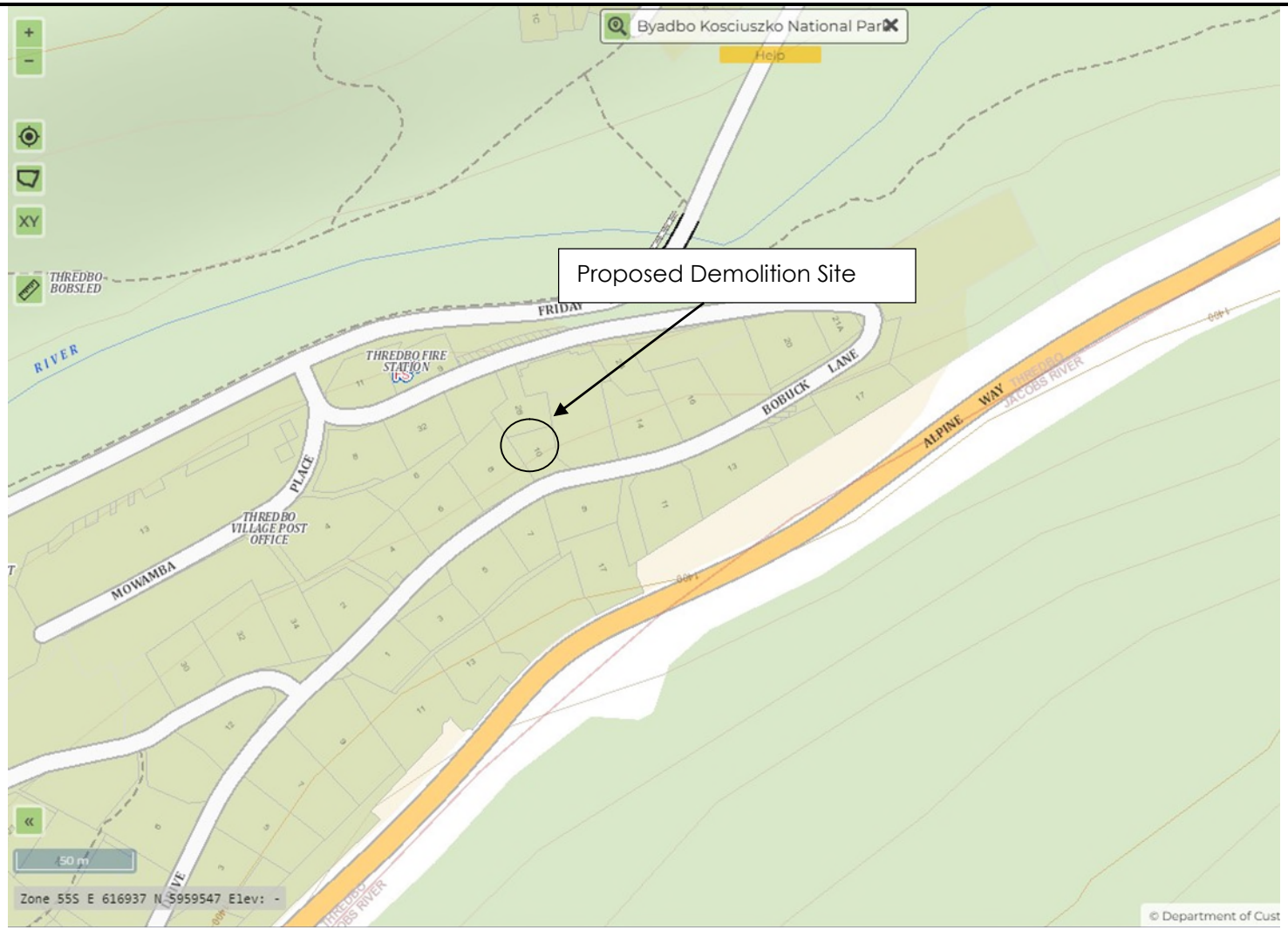
KOSCIUSZKO THREDBO PTY LTD
PROPOSED DEMOLITION & REDEVELOPMENT - SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW
SITE LOCALITY

ACT Geotechnical Engineers Pty Ltd	**C14191**	**FIGURE 1**



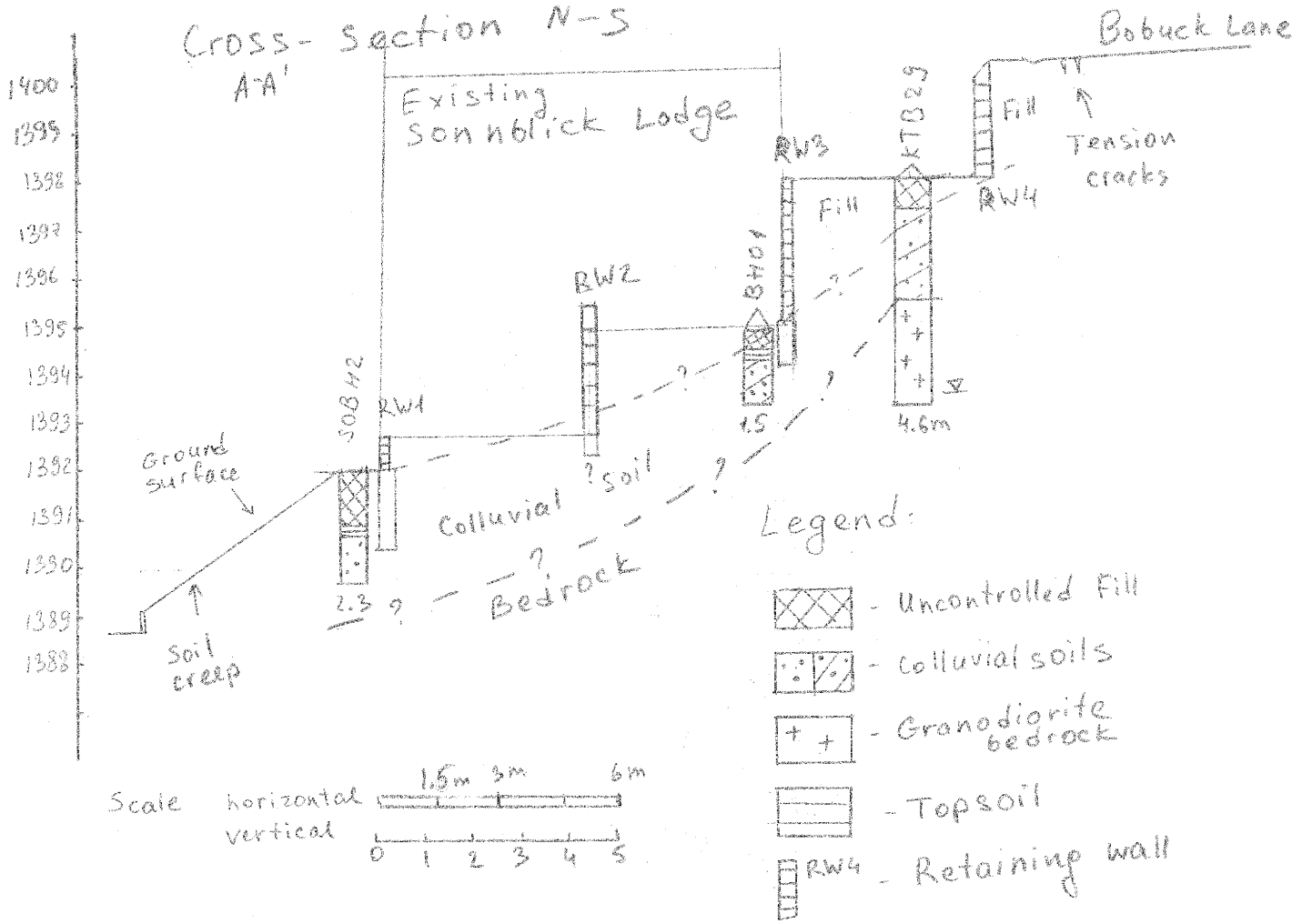
KOSCIUSZKO THREDBO PTY LTD
PROPOSED DEMOLITION & REDEVELOPMENT - SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW
AERIAL PHOTOGRAPH & BOREHOLES LOCATIONS

ACT Geotechnical Engineers Pty Ltd	**C14191**	**FIGURE 2**



KOSCIUSZKO THREDBO PTY LTD
PROPOSED DEMOLITION & REDEVELOPMENT - SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW
CONTOUR PLAN

ACT Geotechnical Engineers Pty Ltd	**C14191**	**FIGURE 3**



KOSCIUSZKO THREDBO PTY LTD
PROPOSED DEMOLITION & REDEVELOPMENT - SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW
SUBSURFACE SECTION

ACT Geotechnical Engineers Pty Ltd	**C14191**	**FIGURE 4**

KOSCIUSZKO THREDBO PTY LTD
PROPOSED DEMOLITION & REDEVELOPMENT - SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW
SITE PHOTOGRAPHS – TENSION CRACKS ON THE ROAD PAVEMENT

ACT Geotechnical Engineers Pty Ltd	**C14191**	**FIGURE 5**

KOSCIUSZKO THREDBO PTY LTD
PROPOSED DEMOLITION & REDEVELOPMENT - SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW
SITE PHOTOGRAPHS – RW4 (BELOW BOBUCK LANE)

ACT Geotechnical Engineers Pty Ltd	**C14191**	**FIGURE 6**

KOSCIUSZKO THREDBO PTY LTD
PROPOSED DEMOLITION & REDEVELOPMENT - SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW
SITE PHOTOGRAPH – RW3

ACT Geotechnical Engineers Pty Ltd	**C14191**	**FIGURE 7**

KOSCIUSZKO THREDBO PTY LTD
PROPOSED DEMOLITION & REDEVELOPMENT - SONNBLICK LODGE – 10 BOBUCK LANE, THREDBO, NSW
SITE PHOTOGRAPHS

ACT Geotechnical Engineers Pty Ltd	**C14191**	**FIGURE 8**

Appendix A
Borehole Log BH1

Borehole Log

Borehole No.	**BH1**
Sheet	1 of 1
Job No.	C14191

CLIENT: Kosciuszko Thredbo Pty Ltd

PROJECT: PROPOSED DEMOLITION AND REDEVELOPMENT - SONNBLICK LODGE -10 BOBUCK 10 BOBUCK LANE, THREDBO, NSW

Location : See Figure 1

Equipment Type : Pushtube
Hole Diameter : 50mm

Collar Level : Not Known
Angle From Vertical : 0°
Bearing : N.A.

Samples	Casing	Depth (Metres)	Graphic Log	U.S.C.S.	Material Description, Structure Soil Type: Plasticity or Particle Characteristics, Colour, Secondary and Minor Components, Moisture, Structure	Consistency or Relative Density	Field Test Results	Geological Profile
				CL	Sandy Silty CLAY; fine to coarse sand, low plasticity, some fine angular gravel, pale brown, some brick/ceramic pipes fragments, moist.	SOFT		FILL
		0.2		SM	Silty SAND with clay; fine to coarse sand, low platicity, dark grey, black, moist.	LOOSE		TOPSOIL
		0.5		SC-SM	Silty Clayey SAND; fine to coarse sand, low plasticity, brown. grey, some fine to moderate angular granite gravel, moist.	LOOSE TO MEDIUM DENSITY		COLLUVIAL SOIL
		1.0						
		1.5			BOREHOLE TERMINATED AT 1.5m			
		2.0						

Logged By : OB Date : 6/4/22 | Checked By : JM Date : 30/4/22

ACT Geotechnical Engineers

aaaaa

BOREHOLE/EXCAVATION LOG THREDBO.GPJ ACT GEO.GDT 17/4/23

APPENDIX B
Definitions of Geotechnical Engineering Terms

DESCRIPTION AND CLASSIFICATION OF SOILS

The methods of description and classification of soils used in this report are based on the Australian Standard 1726 – 1993, Geotechnical site investigations. In general, descriptions cover the following properties – soil type, colour, secondary grain size, structure, inclusions, strength or density and geological description.

Soil types are described according to the predominating particle size, qualified by the grading of other particles present (e.g. sandy clay) on the following basis:

Classification	**Particle Size**
Clay	Less than 0.002mm
Silt	0.002mm to 0.06mm
Sand	0.06mm to 2.00mm
Gravel	2.00mm to 60.00mm
Cobbles	60mm (63mm) to 200mm
Boulders	>200mm

Soils are also classified according to the Unified Soil Classifications System which is included in this Appendix. Rock types are classified by their geological names.

Cohesive soils are classified on the basis of strength either by laboratory testing or engineering examination. The terms are defined as follows:

Consistency	**Shear Strength su(kPa) (Representative Undrained Shear)**	
Very soft	< 12	<2 (~SPT "N")
Soft	12 - 25	2-4
Firm	25 - 50	4-8
Stiff	50 – 100	8-15
Very Stiff	100 – 200	15-30
Hard	> 200	>30

Non-cohesive soils are classified on the basis of relative density, generally from the results of in-situ standard penetration tests as below:

Term	**Relative Density (%)**	**SPT Blows/300mm 'N'**
Very loose	< 15	<4
Loose	15-35	4-10
Medium dense	35-65	10-30
Dense	65-85	30-50
Very Dense	>85	>50

SAMPLING

Sampling is carried out during drilling to allow engineering examination (and laboratory testing where required) of soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are generally taken by one of two methods:

1. Driving or pushing a thin walled sample tube into the soil and withdrawing with a sample of soil in a relatively undisturbed state.

2. Core drilling using a retractable inner tube (R.I.T.) core barrel.

Such samples yield information on structure and strength in additions to that obtained from disturbed samples and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Details of the type and method of sampling are given in the report.

PENETRATION TESTING

The relative density of non-cohesive soils is generally assessed by in-situ penetration tests, the most common of which is the standard penetration test. The test procedure is described in Australian Standard 1289 “Testing Soils for Engineering Purposes” Testing Soils for Engineering Purposes” – Test No. F3.1.

The standard penetration test is carried out by driving a 50mm diameter split tube penetrometer of standard dimensions under the impact of a 63 kg hammer having a free fall of 750mm.

The “N” value is determined as the number of blows to achieve 300mm of penetration (generally after disregarding the first 150mm penetration through possibly disturbed material). The results of these tests can be related empirically to the engineering properties of the soil.

The test is also used to provide useful information in cohesive soils under certain conditions, a good quality disturbed sample being recovered with each test. Other forms of in situ testing are used under certain conditions and where this occurs, details are given in the report.

DEFINITIONS OF ROCK, SOIL, AND DEGREES OF CHEMICAL WEATHERING

GENERAL DEFINITIONS – ROCK AND SOIL

ROCK In engineering usage, rock is a natural aggregate of minerals connected by strong and permanent cohesive forces.

Note: Since "strong" and "permanent" are subject to different interpretations, the boundary between rock and soil is necessarily an arbitrary one.

SOIL In engineering usage, soil is a natural aggregate of mineral grains which can be separated by such gentle mechanical means as agitation in water, can be remoulded and can be classified according to the Unified Soil Classification System. Three principal classes of soil recognized are:

Residual soils: soils which have been formed in-situ by the chemical weathering of parent rock. Residual soil may retain evidence of the original rock texture or fabric or, when mature, the original rock texture may be destroyed.

Transported soils: soils which have been moved from their places of origin and deposited elsewhere. The principal agents of erosion, transport and deposition are water, wind and gravity. Two important types of transported soil in engineering geology and materials investigations are:

Colluvium – a soil, often including angular rock fragments and boulders, which has been transported downslope predominantly under the action of gravity assisted by water. The principle forming process is that of soil creep in which the soil moves after it has been weakened by saturation. It may be water borne for short distances.

Alluvium – a soil which has been transported and deposited by running water. The larger particles (sand and gravel size) are water worn.

Lateritic soils: soils which have formed in situ under the effects of tropical weathering include all reddish residual and non residual soils which genetically form a chain of material ranging from decomposed rock through clay to sesqui-oxide rich crusts. The term does not necessarily imply any compositional, textural or morphological definition; all distinctions useful for engineering purposes are based on the differences in geotechnical characteristics.

ROCK WEATHERING DEFINITIONS

Extremely Weathered (EW)	Rock substance affected by weathering to the extent that the rock exhibits soil properties, i.e. it can be remoulded and can be classified according to the Unified Classification System, but the texture of the original rock is still evident.
Highly Weathered (HW)	Rock substance affected by weathering to the extent that limonite staining or bleaching affects the whole of the rock substance and other signs of the chemical or physical decomposition are evident. Porosity and strength may be increased or decreased compared to the fresh rock usually as a result of iron leaching or deposition. The colour and strength of the original fresh rock substance is no longer recognisable.
Moderately Weathered (MW)	Rock substance affected by weathering to the extent that staining extends throughout the whole of the rock substance and the original colour of the fresh rock is no longer recognisable.
Slightly Weathered (SW)	Rock substance affected by weathering to the extent that partial staining or discolouration of the rock substance, usually by limonite, has taken place. The colour and texture of the fresh rock is recognisable.
Fresh (Fr)	Rock substance unaffected by weathering.

The degrees of rock weathering may be gradational. Intermediate stages are described by dual symbols with the prominent degree of weathering first (e.g. EW-HW).

The various degrees of weathering do not necessarily define strength parameters as some rocks are weak, even when fresh, to the extent that they can be broken by hand across the fabric, and some rocks may increase in strength during the weathering process.

Fresh drill cores of some rock types, such as basalt and shale may disintegrate after exposure to the atmosphere due to slaking, desiccation, expansion or contraction, stress relief or a combination of any of these factors.

AN ENGINEERING CLASSIFICATION OF SEDIMENTARY ROCKS

This classification system provides a standardised terminology for the engineering description of the sandstone and shales in the Sydney area, but the terms and definitions may be used elsewhere when applicable. Where other rock types are encountered, such as in dykes, standard geological descriptions are used for rock types and the same descriptions as below are used for strength, fracturing and weathering.

Under this system rocks are classified by Rock Type, Strength, Stratification Spacing, Degree of Fracturing and Degree of Weathering. These terms do not cover the full range of engineering properties. Descriptions of rock may also need to refer to other properties (e.g. durability, abrasiveness, etc) where these are relevant.

ROCK TYPE DEFINITIONS

ROCK TYPE	DEFINITION
Conglomerate:	More than 50% of the rock consists of gravel sized (greater than 2mm) fragments.
Sandstone:	More than 50% of the rock consists of sand sized (0.06 to 2mm) grains.
Siltstone:	More than 50% of the rock consists of silt-sized (less than 0.06mm) granular particles and the rock is not laminated.
Claystone:	More than 50% of the rock consists of silt or clay sized particles and the rock is not laminated.
Shale:	More than 50% of the rock consists of silt or clay sized particles and the rock is laminated.

Rocks possessing characteristics of two groups are described by their predominant particle size with reference also to the minor constituents, e.g. clayey sandstone, sandy shale.

STRATIFICATION SPACING

Term	Separation of Stratification Planes
Thinly Laminated	< 6mm
Laminated	6mm to 20mm
Very thinly bedded	20mm to 60mm
Thinly bedded	60mm to 0.2m
Medium bedded	0.2m to 0.6m
Thickly bedded	0.6m to 2m
Very thickly bedded	> 2m

DEGREE OF FRACTURING

This classification applies to diamond drill cores and refers to the spacing of all types of natural fractures along which the core is discontinuous. These include bedding plane partings, joints and other rock defects, but exclude known artificial fractures such as drilling breaks.

Term	Description
Fragmented:	The core is comprised primarily of fragments of length less than 20mm, and mostly of width less than the core diameter
Highly Fractured:	Core lengths are generally less than 20mm – 40mm with occasional fragments.
Fractured:	Core lengths are mainly 30mm – 100mm with occasional shorter and longer section.
Slightly Fractured:	Core lengths are generally 300mm – 1000mm with occasional longer sections and occasional sections of 100mm – 300mm.
Unbroken:	The core does not contain any fracture.

ROCK STRENGTH

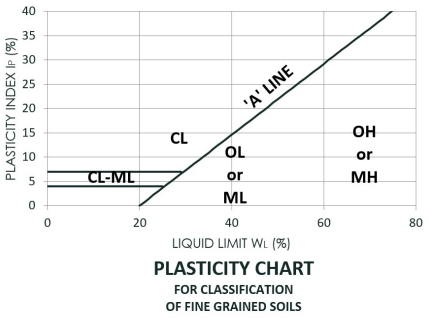
Rock strength is defined by the Point Load Strength Index (Is 50) and refers to the strength of the rock substance in the direction normal to the bedding. The test procedure is described by the International Society of Rock Mechanics.

Term	Point Load Index Is(50) MPa	Field Guide	Approx qu MPa*
Extremely Weak:	0.03	Easily remoulded by hand to a material with soil properties.	0.7
Very Weak:	0.1	May be crumbled in the hand. Sandstone is “sugary” and friable.	2.4
Weak:	0.3	A piece of core 150mm long x 50mm dia. May be broken by hand and easily scored with a knife. Sharp edges of core may be friable and break during handling.	7
Medium Strong:	1	A piece of core 150mm long x 50mm dia. can be broken by hand with considerable difficulty. Readily scored with knife.	24
Strong: (SW)	3	A piece of core 150mm long x 50mm dia. core cannot be broken by unaided hands, can be slightly scratched or scored with knife.	70
Very Strong (SW)	10	A piece of core 150mm long x 50mm dia. may be broken readily with hand held hammer. Cannot be scratched with pen knife.	240
Extremely Strong (Fr)	>10	A piece of core 150mm long x 50mm dia. is difficult to break with hand held hammer. Rings when struck with a hammer.	>240

The approximate unconfined compressive strength (qu) shown in the table is based on an assumed ration to the point load index of 24:1. This ratio may vary widely.

Unified Soil Classification System (Metricated)
Data for Description Indentification and Classification of Soils

MAJOR DIVISIONS				DESCRIPTION				FIELD IDENTIFICATION					LABORATORY CLASSIFICATION				
				Group Symbol	Graphic Symbol	TYPICAL NAME	DESCRIPTIVE DATA						% [2] < 0.06mm	PLASTICITY OF FINE FRACTION			NOTES
COARSE GRAINED SOILS	More than 50% by dry mass, less than 60mm is greater than 0.06mm.	GRAVELS	More than 50% of coarse grains are greater than 2.0mm	GW		Well graded gravels and gravel-sand mixtures, little or no fines	Give typical name, indicate approximate percentages of sand and gravel, maximum size, angularity, surface condition and hardness of the coarse grains, local or geological name and other pertinent descriptive information, symbols in parenthesis. For undisturbed soils add information on stratification, degree of compactness, cementation, moisture conditions and drainage characteristics. EXAMPLE: Silty Sand, gravelly, about 20% hard, angular gravel particles, 10mm maximum size, rounded and sub angular sand grains coarse to fine, about 15% non-plastic fines with low dry strength, well compacted and moist in place, light brown alluvial sand, (SM)	Determine approximate percentages of material over 60mm size, maximum size, shape, surface texture, hardness of material, geological description. Identify on estimated percentage mass of the various fractions.	COARSE GRAINED SOILS	More than half of the material less than 60mm is larger than 0.06mm	0.06mm is about the smallest particle visible to the naked eye	GRAVELS AND SANDS	GRADATIONS	NATURE OF FINES	DRY STRENGTH	Group Symbol	Use the gradation curve of material passing 60mm for classification of fractions according to criteria given under 'Major Division'.	0-5	-	>4	Between 1 and 3	1. Identify Fines by the method given for fine grained soils. 2. Borderline classifications occur when the percentage of fines (fraction smaller than 0.06mm size) is greater than 5% and less than 12%. Borderline classifications require the use of dual symbols eg SP-SM GW-GC
				GP		Poorly graded gravels and gravel-sand mixtures, little or no fines						GOOD	Wide range in grain size	"Clean" materials (not enough fines to band coarse grains)	None	GW		0-5	-	Fails to comply with above		
		GRAVELLY SOILS		GM		Silty gravels, gravel-sand-silt mixtures						POOR	Predominantly one size or range of sizes			GP		12-50	Below 'A' line and Ip >7	-	-	
				GC		Clayey gravels gravel-sand-clay mixtures						GOOD TO FAIR	"Dirty" materials (Excess of fines)	Fines are non-plastic (1)	None to medium	GM		12-50	Above 'A' line and Ip > 7	-	-	
		SANDS	More than 50% of coarse grains are greater than 2.0mm	SW		Well graded sands and gravelly sands, little or no fines								Fines are plastic (1)		GC		0-5	-	>6	between 1 and 3	
				SP		Poorly graded sands and gravelly sands, little or no fines						GOOD	Wide range in grain size	"Clean" materials (not enough fines to band coarse grains)	None	SW		0-5	-	Fails to comply with above		
		SANDY SOILS		SM		Silty sand, sand-silt mixtures						POOR	Predominantly one size or range of sizes			SP		12-50	Below 'A' line or Ip < 4	-	-	
				SC		Clayey sands, sand-clay mixtures						GOOD TO FAIR	"Dirty" materials (Excess of fines)	Fines are non-plastic (1)	None to medium	SM		12-50	Above 'A' line and Ip > 7	-	-	
														Fines are plastic (1)		SC						
FINE GRAINED SOILS	More than 50% by dry mass, less than 60mm is less than 0.06mm	Liquid Limit less than 50%		ML		Inorganic silts, very fine sands, rock flour, silty or clayey fine sands.	Give typical name, indicate degree and character of plasticity, amount and maximum size of coarse grains, colour in wet condition, odour if any, local or geological name and r pertinent descriptive information, symbols in parenthesis. For undisturbed soil add information on structure, stratification, consistency in undisturbed and remolded states, moisture and drainage conditions. EXAMPLE Clayey Silt, brown, low plasticity, small percentage of fine sand, numerous vertical root-holes, firm and dry in place, fill, (ML).		FINE GRAINED SOILS	More than half of the material less than 50mm is less than 0.06mm		SILT AND CLAY FRACTION									
				CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.						Fraction smaller than 0 20mm AS sieve size										
				OL		Organic silts and organic silty clays of low plasticity						DRY STRENGTH	DILATANCY	TOUGHNESS								
		Liquid Limit more than 50%		MH		Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts.						None to low	Quick to slow	None		ML		Below 'A' line				
				CH		Inorganic clays of high plasticity, fat clays.						Medium to high	None to very slow	Medium		CL		Above 'A' line				
				OH		Organic clays of medium to high plasticity.						Low to medium	Slow	Low		OL		Below 'A' line				
												Low to medium	Slow to none	Low to medium		MH		Below 'A' line				
												High to very high	None	High		CH		Above 'A' line				
												Medium to high	None to very slow	Low to medium		OH		Below 'A' line				
				Pt		Peat muck and other highly organic soils.		Readily identified by colour, odour, spongy feel and generally by fibrous texture								Pt*	*Effervescence with H2O2					



PLASTICITY CHART
FOR CLASSIFICATION OF FINE GRAINED SOILS

ACT Geotechnical Engineers

ACT Geotechnical Engineers Pty Lt
ACN 063 673 530

5/9 Beaconsfield Street, Fyshwick ACT 2609
PO Box 9225, Deakin ACT 2600
Ph: (02) 6285 1547

Limitations in the Use and Interpretation of this Geotechnical Report

Our Professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally accepted engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied.

The geotechnical report was prepared for the use of the Owner in the design of the subject development and should be made available to potential contractors and/or the Contractor for information on factual data only. This report should not be used for contractual purposes as a warranty of interpreted subsurface conditions such as those indicated by the interpretive borehole and test pit logs, cross- sections, or discussion of subsurface conditions contained herein.

The analyses, conclusions and recommendations contained in the report are based on site conditions as they presently exist and assume that the exploratory bore holes, test pits, and/or probes are representative of the subsurface conditions of the site. If, during construction, subsurface conditions are found which are significantly different from those observed in the exploratory bore holes and test pits, or assumed to exist in the excavations, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary. If there is a substantial lapse of time between conducting this investigation and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, this report should be reviewed to determine the applicability of the conclusions and the recommendations considering the changed conditions and time lapse.

The summary bore hole and test pit logs are our opinion of the subsurface conditions revealed by periodic sampling of the ground as the test holes progressed. The soil descriptions and interfaces between strata are interpretive and actual changes may be gradual.

The bore hole and test pit logs and related information depict subsurface conditions only at the specific locations and at the particular time designated on the logs. Soil conditions at the other locations may differ from conditions occurring at these bore hole and test pit locations. Also, the passage of time may result in a change in the soil conditions at these test locations.

Groundwater levels often vary seasonally. Groundwater levels reported on the boring logs or in the body of the report are factual data only for the dates shown.

Unanticipated soil conditions are commonly encountered on construction sites and cannot be fully anticipated by merely taking soil samples, bore holes or test pits. Such unexpected conditions frequently require that additional expenditures be made to attain a properly constructed project. It is recommended that the Owner consider providing a contingency fund to accommodate such potential extra costs.

This firm cannot be responsible for any deviation from the intent of this report including, but not restricted to, any changes to the scheduled time of construction, the nature of the project or the specific construction methods or means indicated in this report: nor can our company be responsible for any construction activity on sites other than the specific site referred to in this report.

APPENDIX C
Qualitative Terminology & Risk Matrix

Attachment 1 – Risk Assessment Matrix

E – Extreme risk – detailed action plan required
H - High risk – needs senior management attention
M – Medium risk – specify management responsibility
L – Low risk – manage by routine procedures

High or **Extreme** risks must be reported to Senior Management and require detailed treatment plans to reduce the risk to **Low** or **Medium**.

	Consequence →				
People	Injuries or ailments not requiring medical treatment.	Minor injury or First Aid Treatment Case.	Serious injury causing hospitalisation or multiple medical treatment cases.	Life threatening injury or multiple serious injuries causing hospitalisation.	Death or multiple life threatening injuries.
Reputation	Internal Review	Scrutiny required by internal committees or internal audit to prevent escalation.	Scrutiny required by external committees or ACT Auditor General's Office, or inquest, etc.	Intense public, political and media scrutiny. Eg: front page headlines, TV, etc.	Assembly inquiry or Commission of inquiry or adverse national media.
Business Process & Systems	Minor errors in systems or processes requiring corrective action, or minor delay without impact on overall schedule.	Policy procedural rule occasionally not met or services do not fully meet needs.	One or more key accountability requirements not met. Inconvenient but not client welfare threatening.	Strategies not consistent with Government's agenda. Trends show service is degraded.	Critical system failure, bad policy advice or ongoing non-compliance. Business severely affected.
Financial	1% of Budget or <$5K	2.5% of Budget or <$50K	> 5% of Budget or <$500K	> 10% of Budget or <$5M	>25% of Budget or >$5M
	Insignificant	**Minor**	**Moderate**	**Major**	**Catastrophic**
	1	2	3	4	5

Likelihood	**Probability:**	**Historical:**							
	>1 in 10	Is expected to occur in most circumstances	5	**Almost Certain**	**M**	**H**	**H**	**E**	**E**
	1 in 10 - 100	Will probably occur	4	**Likely**	**M**	**M**	**H**	**H**	**E**
	1 in 100 – 1,000	Might occur at some time in the future	3	**Possible**	**L**	**M**	**M**	**H**	**E**
	1 in 1,000 – 10,000	Could occur but doubtful	2	**Unlikely**	**L**	**M**	**M**	**H**	**H**
	1 in 10,000 – 100,000	May occur but only in exceptional circumstances	1	**Rare**	**L**	**L**	**M**	**M**	**H**

Adapted from Standards Australia Risk Management AS/NZS 4360: 2004

APPENDIX D
Flowchart of Landslide Risk Management

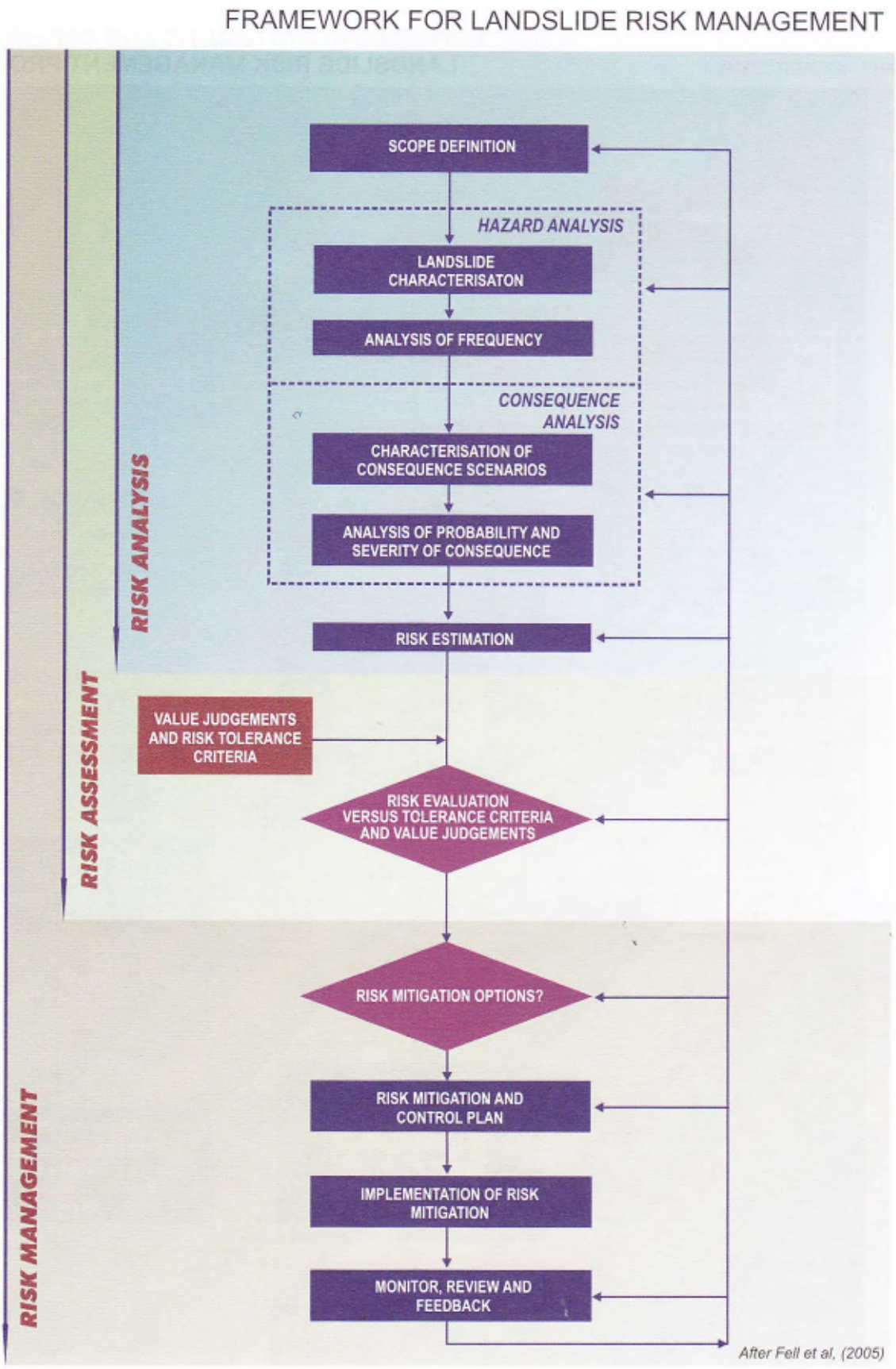
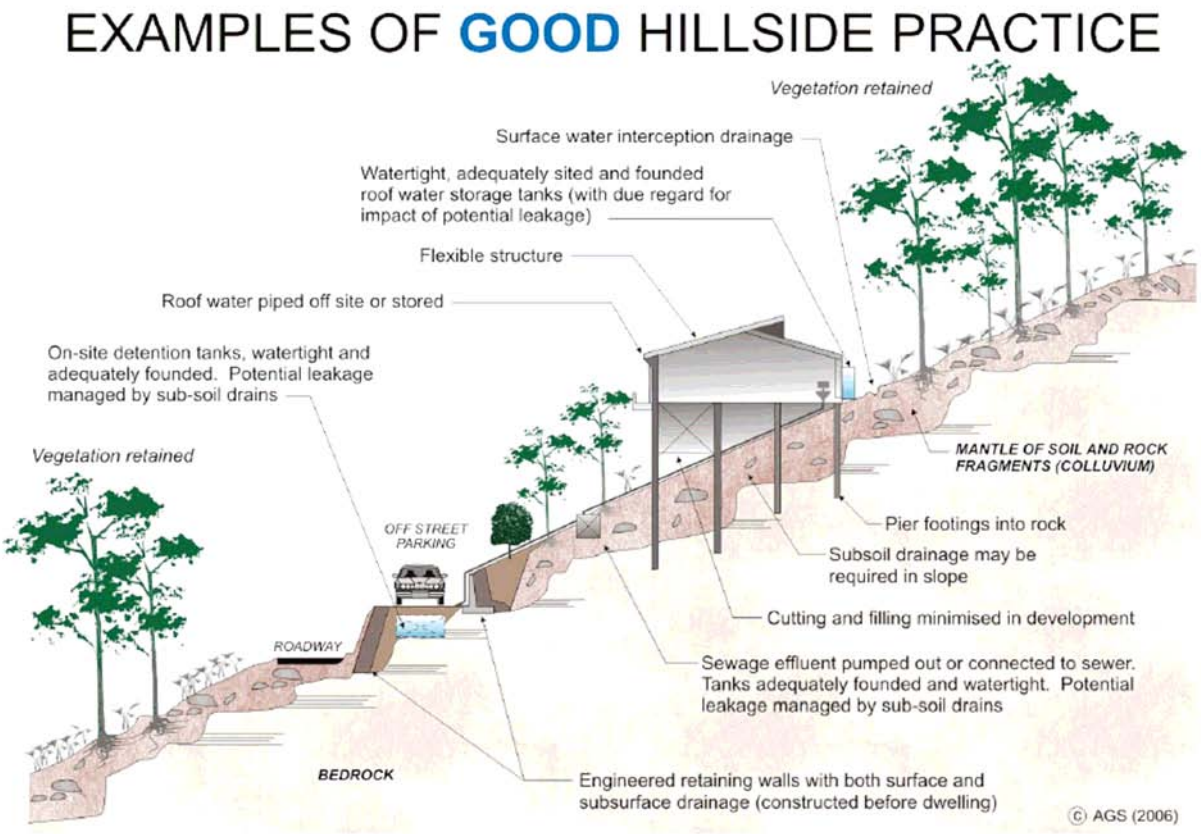


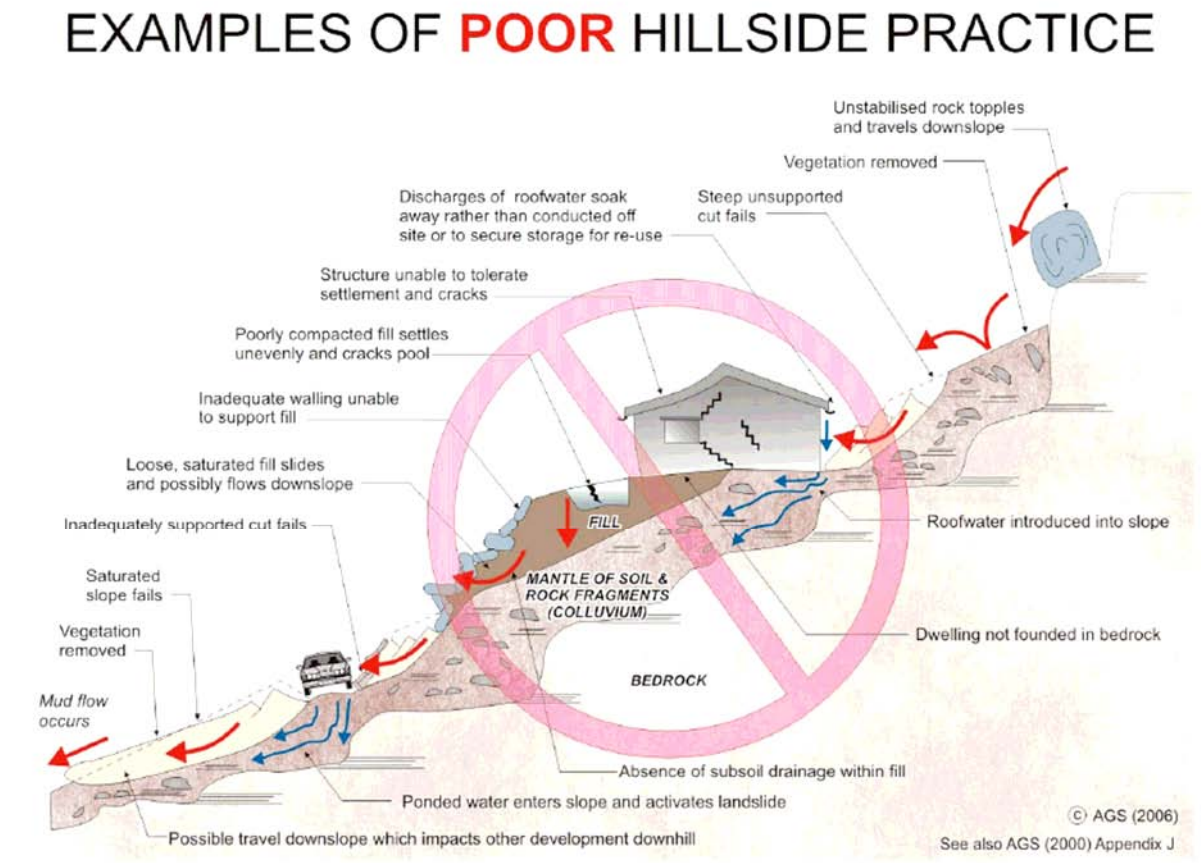
Figure 2: Abbreviated flowchart for Landslide Risk Management.
Ref: AGS (2007a, 2007c)

APPENDIX E
Hillside Construction Guideline

APPENDIX G - SOME GUIDELINES FOR HILLSIDE CONSTRUCTION

	GOOD ENGINEERING PRACTICE	*POOR ENGINEERING PRACTICE*
ADVICE		
GEOTECHNICAL ASSESSMENT	Obtain advice from a qualified, experienced geotechnical practitioner at early stage of planning and before site works.	Prepare detailed plan and start site works before geotechnical advice.
PLANNING		
SITE PLANNING	Having obtained geotechnical advice, plan the development with the risk arising from the identified hazards and consequences in mind.	Plan development without regard for the Risk.
DESIGN AND CONSTRUCTION		
HOUSE DESIGN	Use flexible structures which incorporate properly designed brickwork, timber or steel frames, timber or panel cladding. Consider use of split levels. Use decks for recreational areas where appropriate.	Floor plans which require extensive cutting and filling. Movement intolerant structures.
SITE CLEARING	Retain natural vegetation wherever practicable.	Indiscriminately clear the site.
ACCESS & DRIVEWAYS	Satisfy requirements below for cuts, fills, retaining walls and drainage. Council specifications for grades may need to be modified. Driveways and parking areas may need to be fully supported on piers.	Excavate and fill for site access before geotechnical advice.
EARTHWORKS	Retain natural contours wherever possible.	Indiscriminatory bulk earthworks.
CUTS	Minimise depth. Support with engineered retaining walls or batter to appropriate slope. Provide drainage measures and erosion control.	Large scale cuts and benching. Unsupported cuts. Ignore drainage requirements
FILLS	Minimise height. Strip vegetation and topsoil and key into natural slopes prior to filling. Use clean fill materials and compact to engineering standards. Batter to appropriate slope or support with engineered retaining wall. Provide surface drainage and appropriate subsurface drainage.	Loose or poorly compacted fill, which if it fails, may flow a considerable distance including onto property below. Block natural drainage lines. Fill over existing vegetation and topsoil. Include stumps, trees, vegetation, topsoil, boulders, building rubble etc in fill.
ROCK OUTCROPS & BOULDERS	Remove or stabilise boulders which may have unacceptable risk. Support rock faces where necessary.	Disturb or undercut detached blocks or boulders.
RETAINING WALLS	Engineer design to resist applied soil and water forces. Found on rock where practicable. Provide subsurface drainage within wall backfill and surface drainage on slope above. Construct wall as soon as possible after cut/fill operation.	Construct a structurally inadequate wall such as sandstone flagging, brick or unreinforced blockwork. Lack of subsurface drains and weepholes.
FOOTINGS	Found within rock where practicable. Use rows of piers or strip footings oriented up and down slope. Design for lateral creep pressures if necessary. Backfill footing excavations to exclude ingress of surface water.	Found on topsoil, loose fill, detached boulders or undercut cliffs.
SWIMMING POOLS	Engineer designed. Support on piers to rock where practicable. Provide with under-drainage and gravity drain outlet where practicable. Design for high soil pressures which may develop on uphill side whilst there may be little or no lateral support on downhill side.	
DRAINAGE		
SURFACE	Provide at tops of cut and fill slopes. Discharge to street drainage or natural water courses. Provide general falls to prevent blockage by siltation and incorporate silt traps. Line to minimise infiltration and make flexible where possible. Special structures to dissipate energy at changes of slope and/or direction.	Discharge at top of fills and cuts. Allow water to pond on bench areas.
SUBSURFACE	Provide filter around subsurface drain. Provide drain behind retaining walls. Use flexible pipelines with access for maintenance. Prevent inflow of surface water.	Discharge roof runoff into absorption trenches.
SEPTIC & SULLAGE	Usually requires pump-out or mains sewer systems; absorption trenches may be possible in some areas if risk is acceptable. Storage tanks should be water-tight and adequately founded.	Discharge sullage directly onto and into slopes. Use absorption trenches without consideration of landslide risk.
EROSION CONTROL & LANDSCAPING	Control erosion as this may lead to instability. Revegetate cleared area.	Failure to observe earthworks and drainage recommendations when landscaping.
DRAWINGS AND SITE VISITS DURING CONSTRUCTION		
DRAWINGS	Building Application drawings should be viewed by geotechnical consultant	
SITE VISITS	Site Visits by consultant may be appropriate during construction/	
INSPECTION AND MAINTENANCE BY OWNER		
OWNER'S RESPONSIBILITY	Clean drainage systems; repair broken joints in drains and leaks in supply pipes. Where structural distress is evident see advice. If seepage observed, determine causes or seek advice on consequences.	


EXAMPLES OF GOOD HILLSIDE PRACTICE
Vegetation retained
Surface water interception drainage
Watertight, adequately sited and founded roof water storage tanks (with due regard for impact of potential leakage)
Flexible structure
Roof water piped off site or stored
On-site detention tanks, watertight and adequately founded. Potential leakage managed by sub-soil drains
Vegetation retained
MANTLE OF SOIL AND ROCK FRAGMENTS (COLLUVIUM)
OFF STREET PARKING
Pier footings into rock
Subsoil drainage may be required in slope
Cutting and filling minimised in development
ROADWAY
Sewage effluent pumped out or connected to sewer. Tanks adequately founded and watertight. Potential leakage managed by sub-soil drains
BEDROCK
Engineered retaining walls with both surface and subsurface drainage (constructed before dwelling)
© AGS (2006)


EXAMPLES OF POOR HILLSIDE PRACTICE
Unstabilised rock topples and travels downslope
Vegetation removed
Discharges of roofwater soak away rather than conducted off site or to secure storage for re-use
Steep unsupported cut fails
Structure unable to tolerate settlement and cracks
Poorly compacted fill settles unevenly and cracks pool
Inadequate walling unable to support fill
Loose, saturated fill slides and possibly flows downslope
Inadequately supported cut fails
FILL
Roofwater introduced into slope
Saturated slope fails
MANTLE OF SOIL & ROCK FRAGMENTS (COLLUVIUM)
Vegetation removed
Dwelling not founded in bedrock
BEDROCK
Mud flow occurs
Absence of subsoil drainage within fill
Ponded water enters slope and activates landslide
© AGS (2006)
Possible travel downslope which impacts other development downhill
See also AGS (2000) Appendix J

Appendix F
Kosciuszko Alpine Resorts – Geotechnical Policy – Form 1

NSW GOVERNMENT Planning & Environment

Geotechnical Policy
Kosciuszko Alpine Resorts

Form 1 – Declaration and certification made by geotechnical engineer or engineering geologist in a geotechnical report.

DA Number: _____

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 the Department of Planning & Environment (DP&E) Geotechnical Policy. Alternatively, where a geotechnical report has been prepared by a professional person not recognised by DP&E 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 DP&E Geotechnical Policy.

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

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

1. Declaration made by geotechnical engineer or engineering geologist as part of a geotechnical report

I,

Mr ☑ Ms ☐ Mrs ☐ Dr ☐ Other ☐

First Name: Jeremy

Family Name: Murray

OF

Company/organisation: ACT Geotechnical Engineers

on this the 2nd day of May 2023

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 DP&E Geotechnical Policy – Kosciuszko Alpine Resorts.

☑ am willing to technically verify that the Geotechnical Report referenced below has been prepared in accordance the AGS 2000 and DP&E Geotechnical Policy – Kosciuszko Alpine Resorts.

2. Geotechnical Report Details

Report Title: Proposed Demolition & Redevelopment - Sawblick Lodge - 10 Bobuck Lane, Thredbo

Author: Jeremy Murray

Dated: 26/4/2023

DA Site Address: 10 Bobuck Lane, Thredbo, 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

Chartered professional status

CP Eng # 2122247

Name

Jeremy Murray

Date

2/5/23

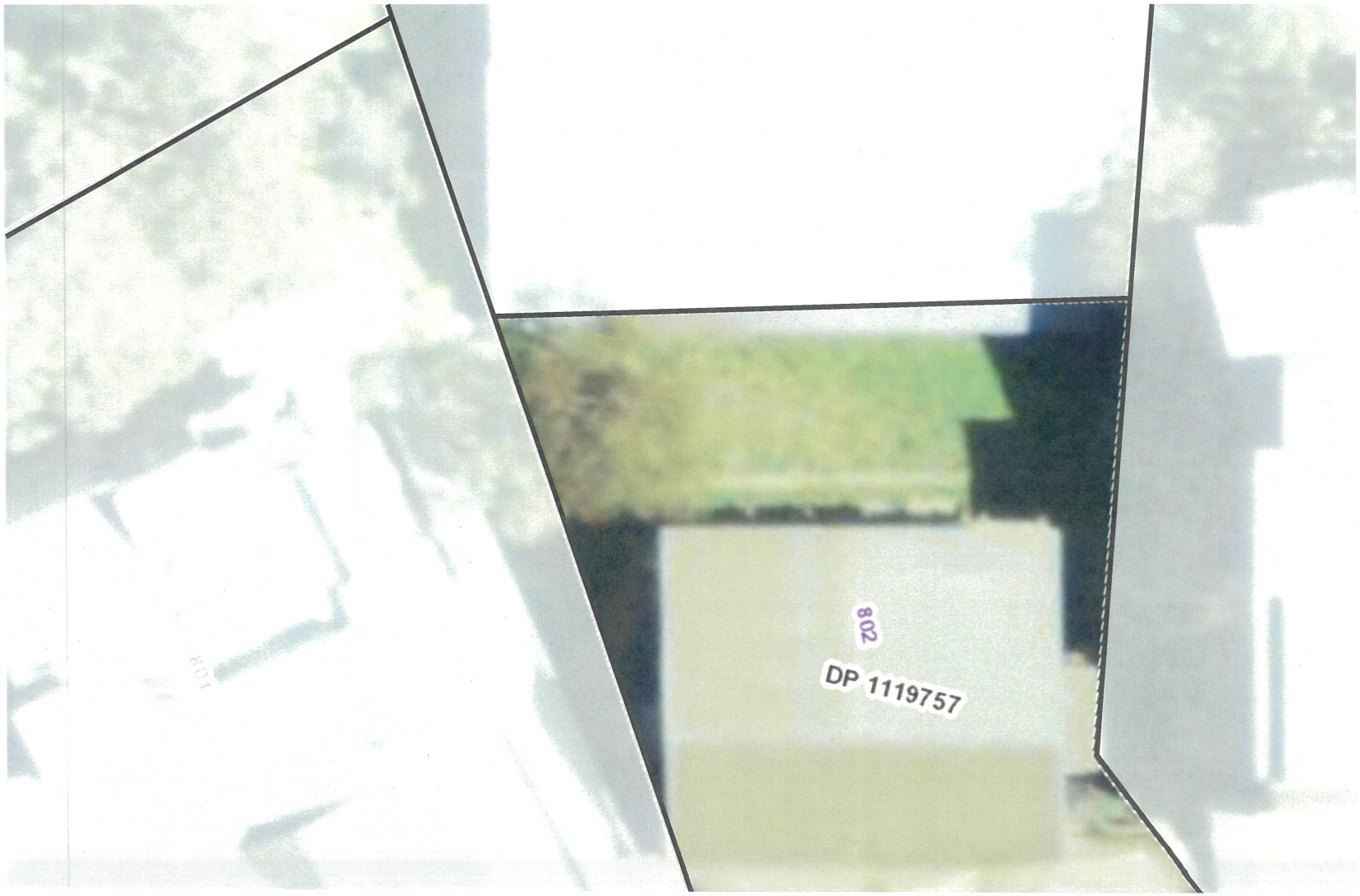
5. Contact details

Department of Planning & Environment
Alpine Resorts Team
Shop 5A, 19 Snowy River Avenue
PO Box 36, JINDABYNE 2627
Telephone: 02 6456 1733
Facsimile: 02 6456 1736
Email: alpineresorts@planning.nsw.gov.au

Appendix G
Architectural Plans

Sonnblick Lodge

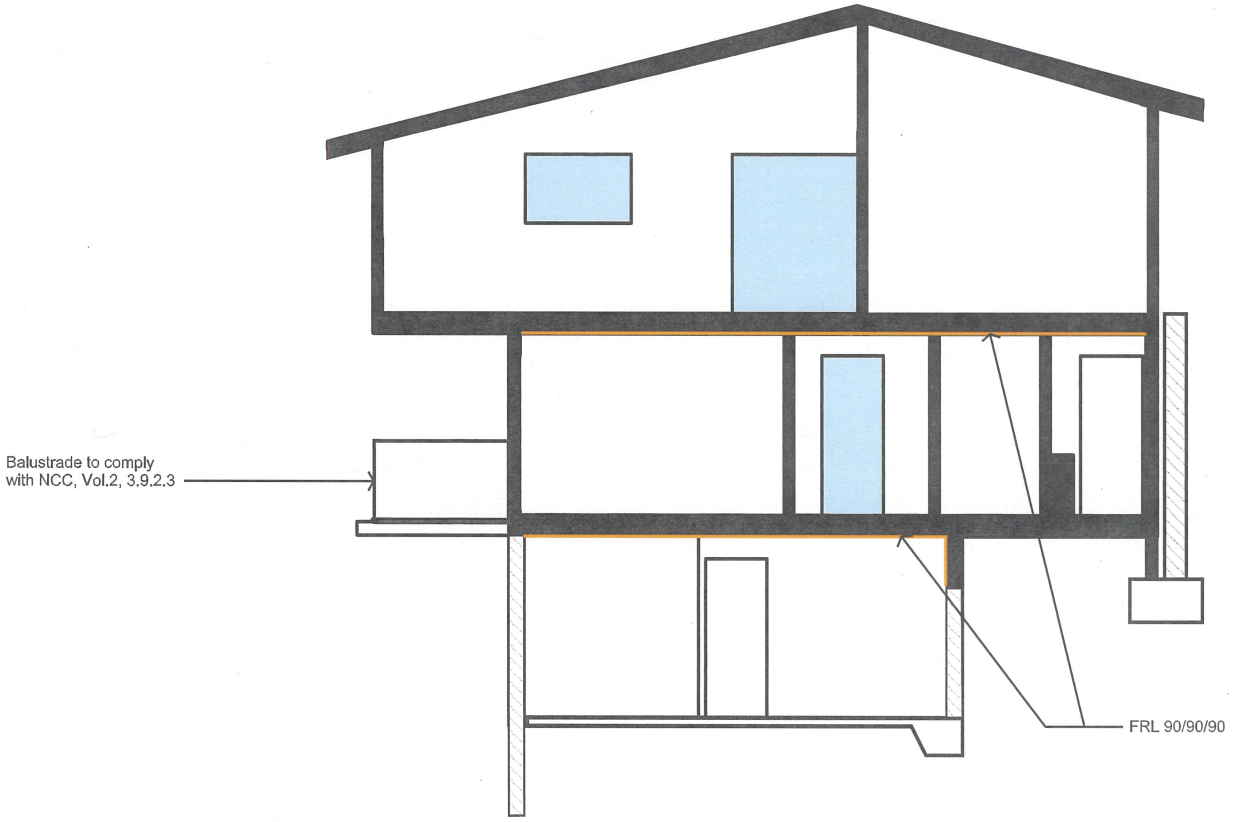
Date: November 7, 2019



CONTENTS

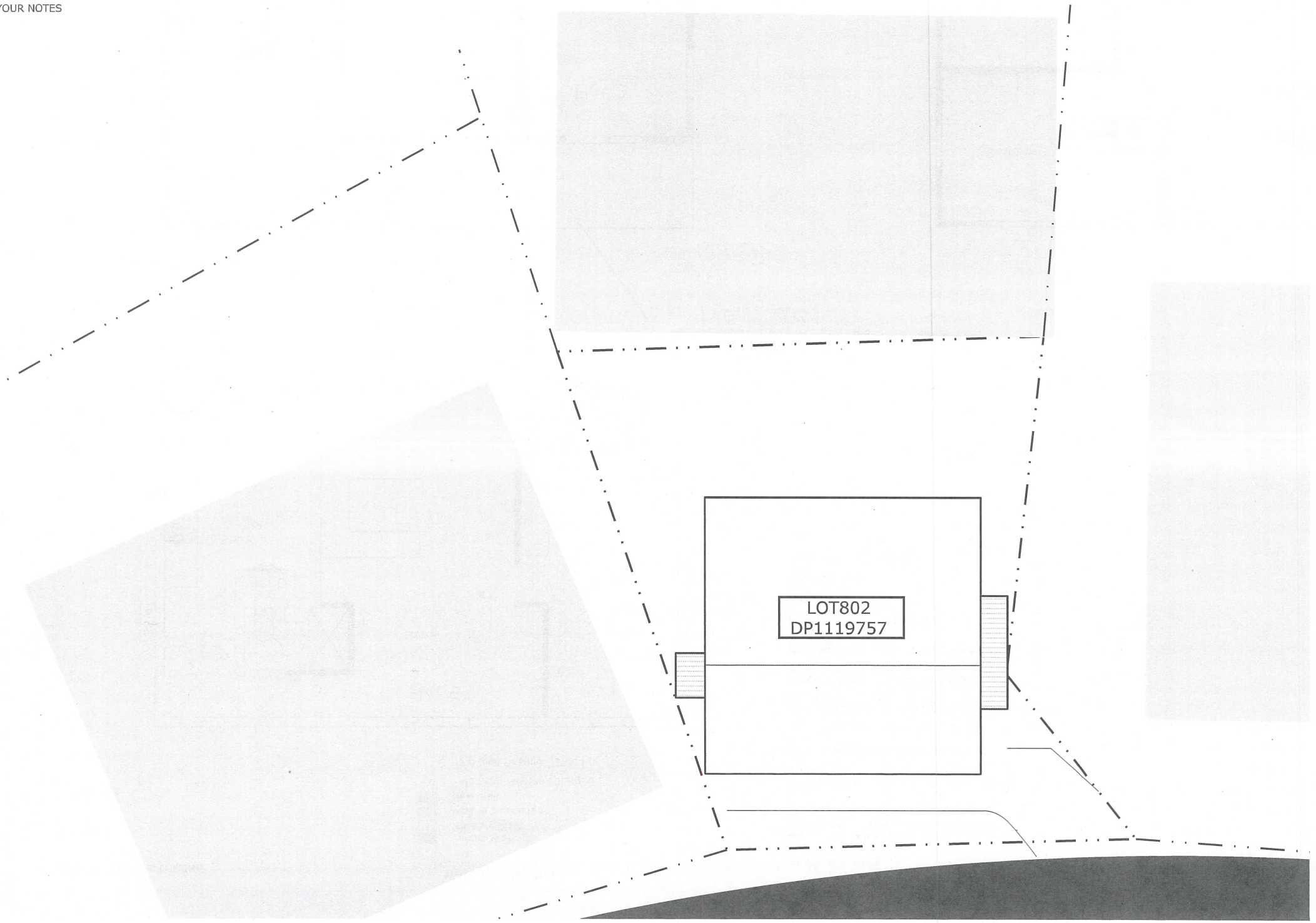
TYPE LEGEND

- Timber
- Masonry Block
- Concrete
- FRL: Load Bearing 90/90/90
  Non-load Bearing -/60/60



GENERAL NOTES

ADD YOUR NOTES



FLOOR FINISHES LEGEND

- Decking
- Wet areas

WALL TYPE LEGEND

- Timber Wall
- Masonry Block Wall
- Wall to be deleted
- New Wall
- FRL: Load Bearing 90/90/90

Non-load Bearing -/60/60

GENERAL NOTES

WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS. CONTRACTORS SHALL VERIFY ALL DIMENSIONS ON SITE

Waterproofing needs to be replaced in all Wet areas

All Kitchen joinery to be Replaced

All existing joinery to be replaced

Fire Panel and smoke detectors to be serviced and certified

Exposed Beam ceilings in Flats 2, 3, 4, 5, to Achieve FRL 90/90/90

All ceiling penetrations to comply with FRL 90/90/90

All Internal Doors to be Replaced

New Floor Coverings

New Light Fittings

Site may contain Asbestos

ABBREVIATIONS

WM - Washing Machir

D - Dryer

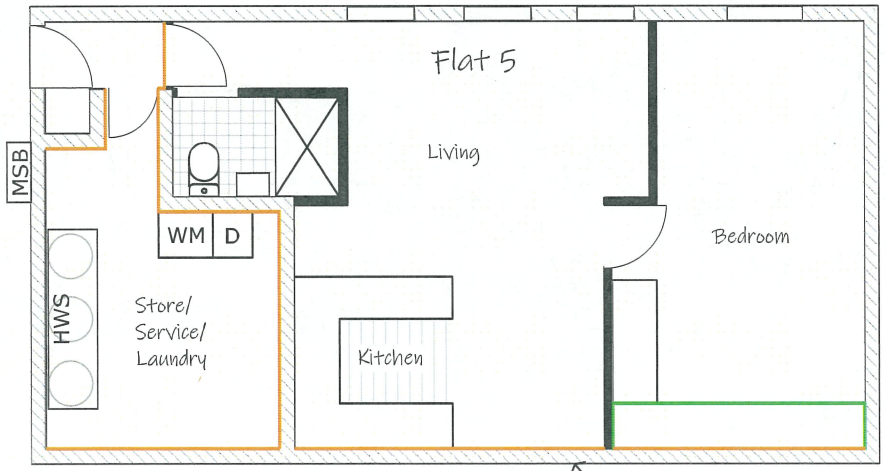
EF - Exhaust Fan

SB - Switch Board

MSB - Main Switch Bc

FHR - Fire Hose Reel

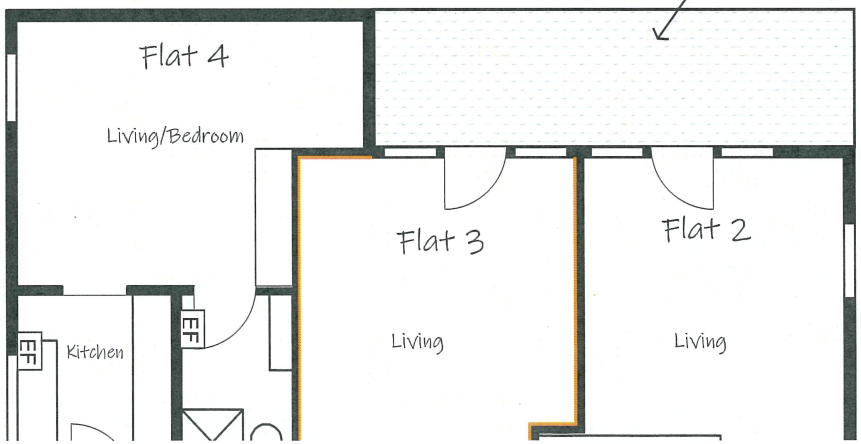
HWS - Hot Water Sys

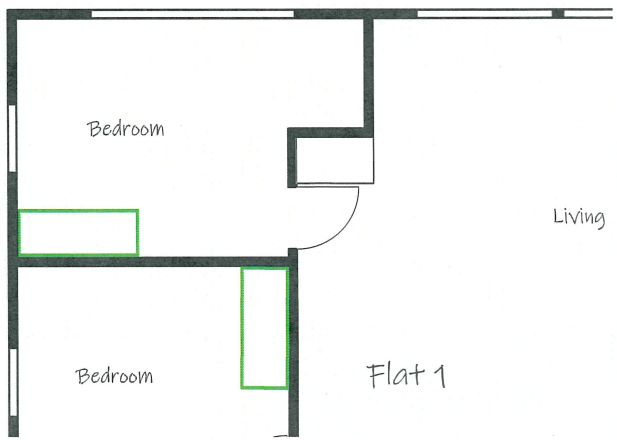


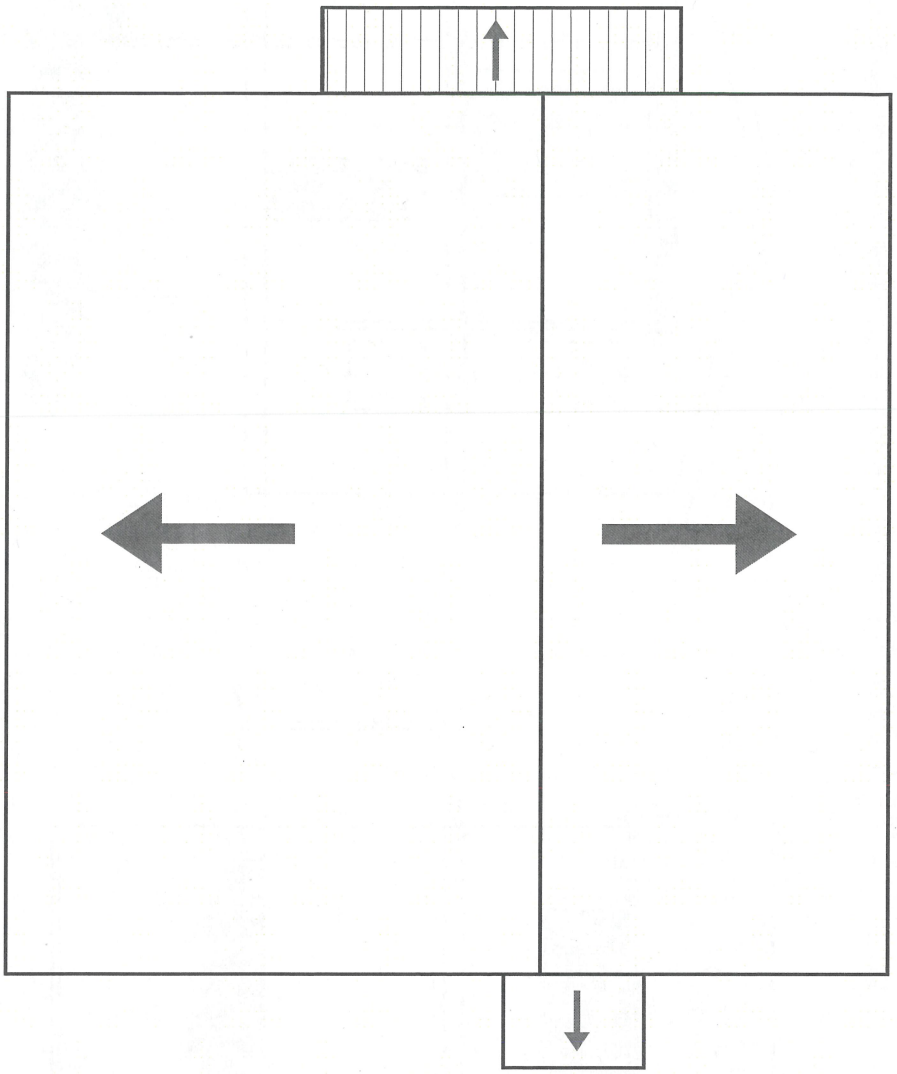
1 / A102 Level 1

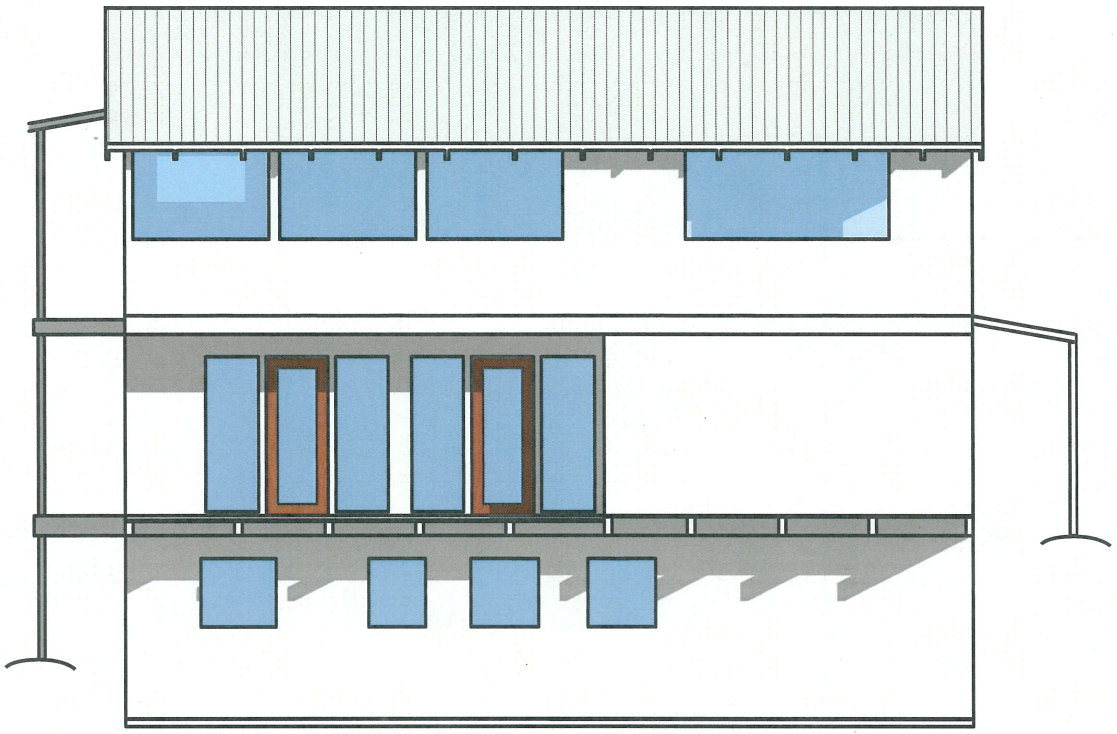
Scale: 1 : 100

Decking to be replaced and Balustrade to comply with NCC, Vol.2, 3.9.2.3 and AS 3959—2009 "Construction Of Buildings in Bushfire Prone areas"

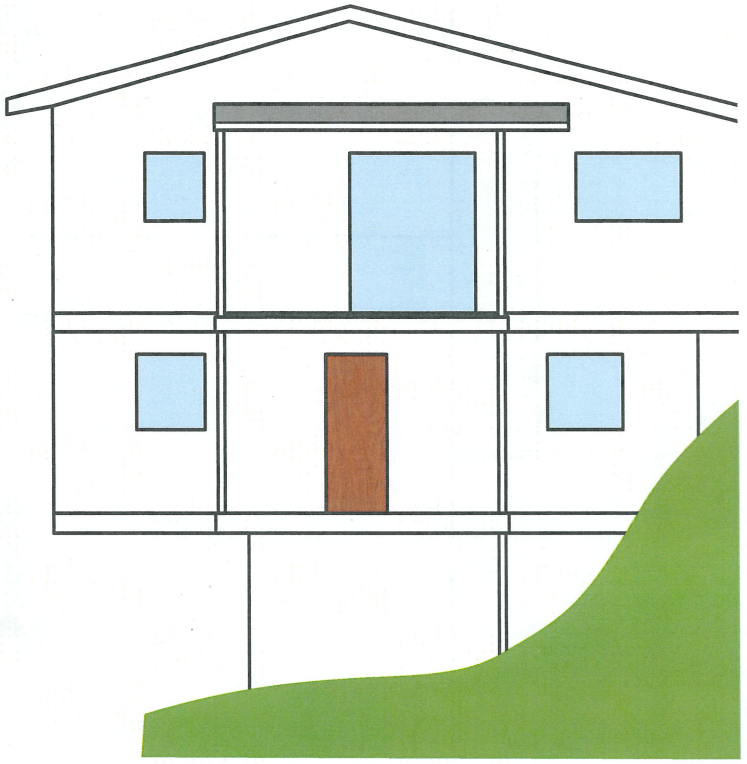








EN / A201 North Elevation
Scale: 1 : 100



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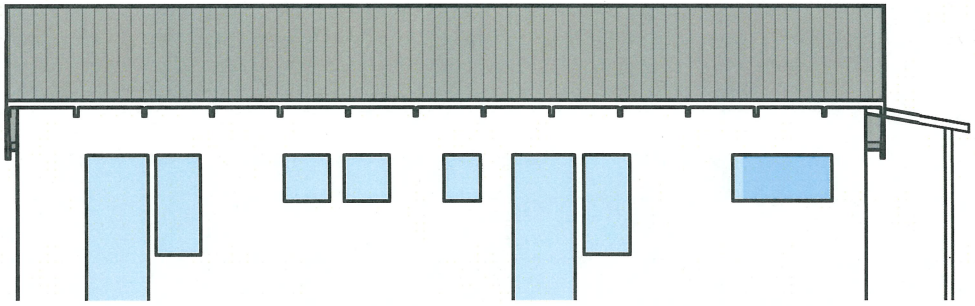

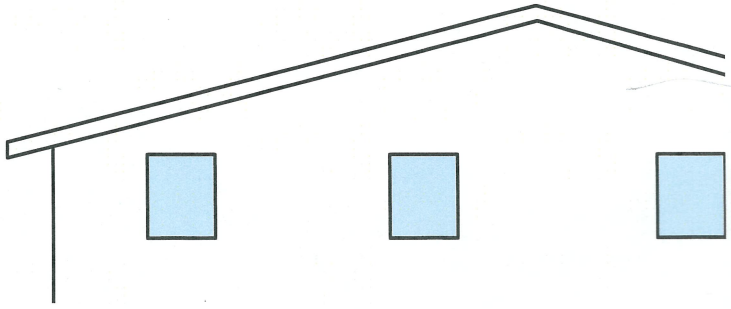

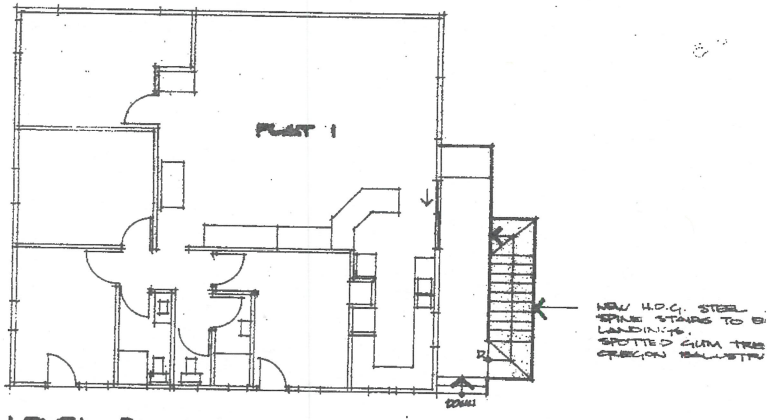

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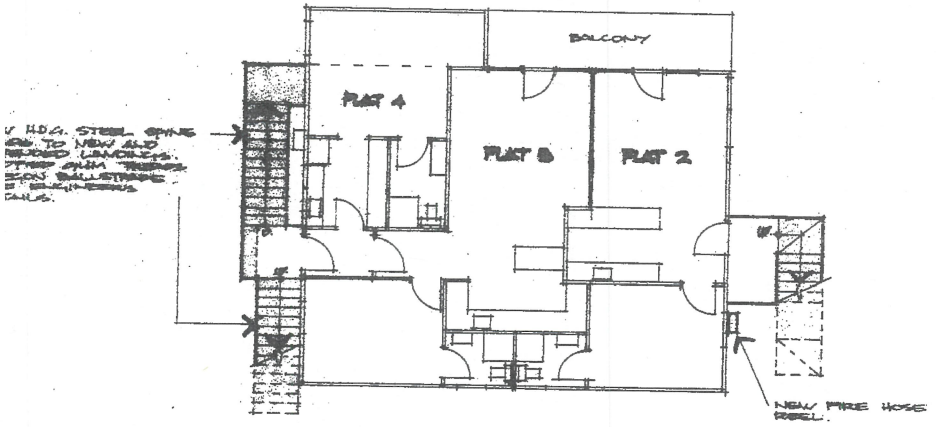

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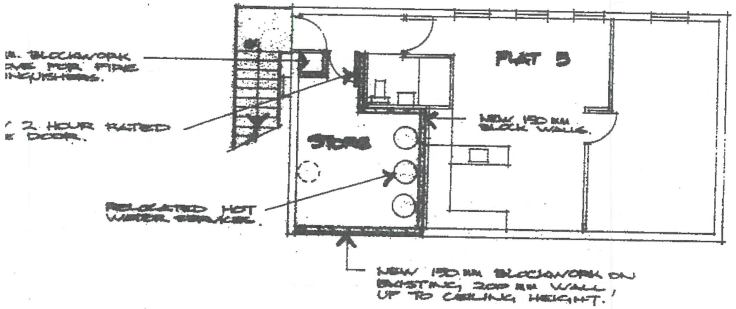


LEVEL 1 1:100

NOTES:

- PROVIDE FIRE ALARM SYSTEM IN ACCORDANCE WITH AS 1670 TO FLATS 1,2,3,4,5, PLANT ROOM AND STORE.
'AS EXECUTED' DWG. WILL BE SUBMITTED.
PROVISION HAS BEEN MADE FOR CONNECTION TO FIRE'S STATION.

Appendix B Stockpile and Material Storage Areas

Legend

Staging Area

0 4.5 9 18 27 36

Meters

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 2020
Grid: GDA 2020 MGA Zone 55

N

THREDBO

SITE COMPOUND / STAGING AREA

FRIDAY FLAT CAR PARK

Revision: A

Date: 14/09/2023

Produced By: KOS

0 4.5 9 18 27 36 Meters

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 2020
Grid: GDA 2020 MGA Zone 55

N

THREDBO

STOCKPILE AND MATERIAL STORAGE LOCATION WASTE TRASFER FACILITY

Revision: A

Date: 14/09/2023

Produced By: KOS

Appendix C Erosion and Sediment Control Plan

Erosion and Sediment Control Plan

Sonnblick Lodge Demolition

PURPOSE

The purpose of this Erosion and Sediment Control Plan is to outline the intentions and fundamental principles that will be followed in the planning and implementation of erosion and sediment control (ESC) measures for the duration of the project.

OBJECTIVES

To minimise potential impacts from construction works to receiving waters.

To reduce the potential for erosion and sediment moving offsite.

SCOPE OF THIS PLAN

This document identifies appropriate controls specific to project activities to prevent sedimentation and pollution of receiving waters, and minimise potential impacts on vegetation communities with and adjacent to the site.

GUIDELINES

- Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition (Landcom 2004)
- Best Practice Erosion and Sediment Control Guidelines (IECA, 2008)
- Erosion and Sediment Control: A field Guide for Construction Site Managers (Catchments & Creeks Pty Ltd, 2012)

EROSION AND SEDIMENT CONTROLS

Implementation of appropriate controls and locations will be the responsibility of the construction contractor. Controls to be installed prior to any construction work (where required) and retained in place until exposed areas of soil or vegetation are stabilised/rehabilitated.

SITE ESTABLISHMENT

- Implement sediment control measures prior to any construction work and retain in place until exposed areas of soil or vegetation are stabilised/rehabilitated.

STOCKPILES AND STORAGE OF MATERIALS

- Soil stockpiles to be managed in accordance with the Soil Stockpile Guidelines.
- Refer **Attachment A** for recommended controls, including installation notes and examples.
- Refer to **Figure 1** and **Figure 2** for the location of the nominated stockpile and compound sites.

GENERAL

- Additional erosion and sediment control measures must be implemented and a revised ESCP must be prepared in the event that site conditions or project design change significantly from those considered within this plan.
- In the event that serious or material environmental harm may occur as a result of sediment leaving site, appropriate additional erosion and sediment control measures must be implemented such that all reasonable and practicable measures are being taken to prevent or minimise such harm.
- The construction schedule must aim to minimise the duration that all areas of soil are exposed to the erosive effects of wind, rain and surface water. Where possible, works will be undertaken during periods of no rainfall.
- Land-disturbing activities must not cause unnecessary soil disturbance if an alternative construction process is available that achieves the same or equivalent outcomes at an equivalent cost.
- Refer **Attachment A** for recommended controls, including installation notes and examples.

SITE ACCESS

- The site entry / exit point along Bobuck Lane will be monitored for sedimentation, particularly after rainfall. Any sedimentation on sealed, public roads must be removed in a timely manner via sweeping or washing back into the project site.
- Refer **Attachment A** for recommended controls, including installation notes and examples.

VEGETATION REMOVAL

- Vegetation removal will be limited to the smallest extent possible to complete the works
- Any clearing required is to be delayed as long as possible prior to the commencement of works, particularly within proximity to watercourses.
- All reasonable and practicable efforts must be taken to delay the removal of, or disturbance to, existing groundcover (organic or inorganic) prior to the commencement of works.
- Sedimentation controls must be installed prior to the commencement of works.

EROSION CONTROL

- Prevention of erosion will be prioritised above sediment control wherever practicable during the work.
- Dust suppression will occur when visible dust is sighted. Sediment-laden runoff from dust suppression must not run off site, cause a traffic hazard or environmental issues.
- All temporary earth bunds and flow diversion systems must be machine-compacted and stabilised with polymer or landscaping techniques (seeding, hydromulch etc.).

REHABILITATION AND STABILISATION

- All exposed areas shall be progressively stabilised/rehabilitated as soon as possible.
- As soon as demolition works are completed, a sterile cover crop will be applied using a hydroseed / hydromulching mix.
- Only weed-free or natural thatch/litter should be used in sediment control activities.
- All ESCs will remain in place until all exposed areas of soil are stabilised and/or revegetated.
- All landscaping and rehabilitation should be undertaken in accordance with the *Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park* (NGH 2007).

MONITORING

During construction, all ESCs are to be checked regularly to ensure they remain in good working order at all times (e.g. prior to forecast rain, daily during extended periods of rainfall and after significant rainfall events). Regular monitoring and maintenance will be the responsibility of construction personnel. The Environmental Officer will undertake weekly inspections of controls for the duration of the works.

PERFORMANCE INDICATOR

No sediment deposition observed leaving the site.

CORRECTIVE ACTIONS

If sediment is observed leaving the site, identify the source and amend the ESCs on-site to ensure appropriate controls are in place. If required, additional ESCs to be installed.

ATTACHMENT A – CONTROL INSTALLATION AND CONSTRUCTION NOTES

Control	Project Activity	Location	Purpose	Timing	Standard Drawing Reference[1]
Stabilised site access	Demolition	At the site entry / exit point (driveway).	To prevent mud tracking onto Bobuck Lane.	Prior to commencement of works. Retain in place until exposed areas of soil are stabilised.	Stabilised Site Access (SD 6-14)
Flow control berms (earthen bunds)	Demolition of Sonnblick Lodge	Along the northern boundary (downgradient) of the development footprint.	To prevent dirty water from leaving the site and entering the adjacent, downgradient property.	Prior to commencement of works. Retain in place until exposed areas of soil are stabilised.	Flow Control Berms (CB-01)
Coir logs (fibre rolls) and/or sediment fencing	Demolition of Sonnblick Lodge	Upgradient of the development footprint. These measures should also be applied to the driveway areas.	To divert clean water from the works area.	Prior to commencement of works. Must be installed prior to periods of forecast rainfall, as well as on weekends and during site closures.	Coir logs (FR-01) or sediment fencing (SD 6-8)
Rock check	Following demolition of Sonnblick Lodge	Offset throughout the development footprint, targeting steeply sloping areas.	To slow dirty water movement within the development footprint.	Following completion of demolition works.	Rock Check Dam (SD 5-4)

[1]Landcom 2004; NSW DECC 2008 & IECA Best Practice Erosion and Sediment Control (BPESC) document

Erosion and Sediment Control Plan
Map 1 of 2

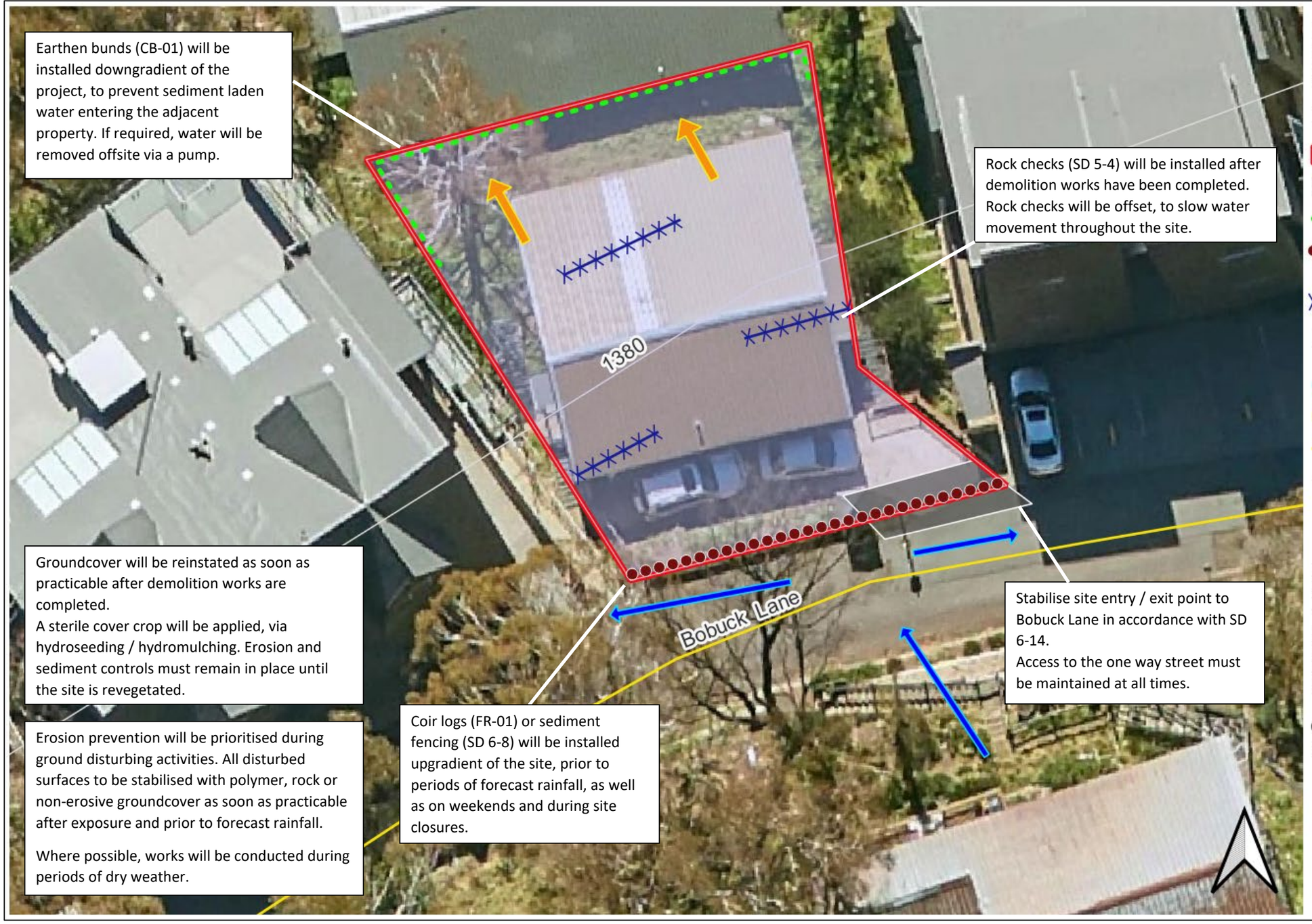
Legend

- Subject land
- Roads
- Contours (AHD, 20 m interval)

Ref: 230203 Sonnblick Demolition ESCP 20230628 \ Erosion and Sediment Control Plan
Author: alyce.g
Date created: 05.07.2023
Datum: GDA94 / MGA zone 55

0 10 20 30 m

NGH



Erosion and Sediment Control Plan
Map 2 of 2

Legend

- Subject land
- Development footprint
- Earthen bund (CB-01)
- Coir logs (FR-01) or sediment fencing (SD 6-8)
- Rock check dam (SD 5-4)
- Stabilised site access (SD 6-14)
- Clean water flow
- Dirty water flow
- Roads
- Contours (AHD, 20 m interval)

Ref: 230203 Sonnblick Demolition ESCP 20230628 \ ESCP Map 2
Author: alyce.g
Date created: 05.07.2023
Datum: GDA94 / MGA zone 55

0 5 10 m

NGH

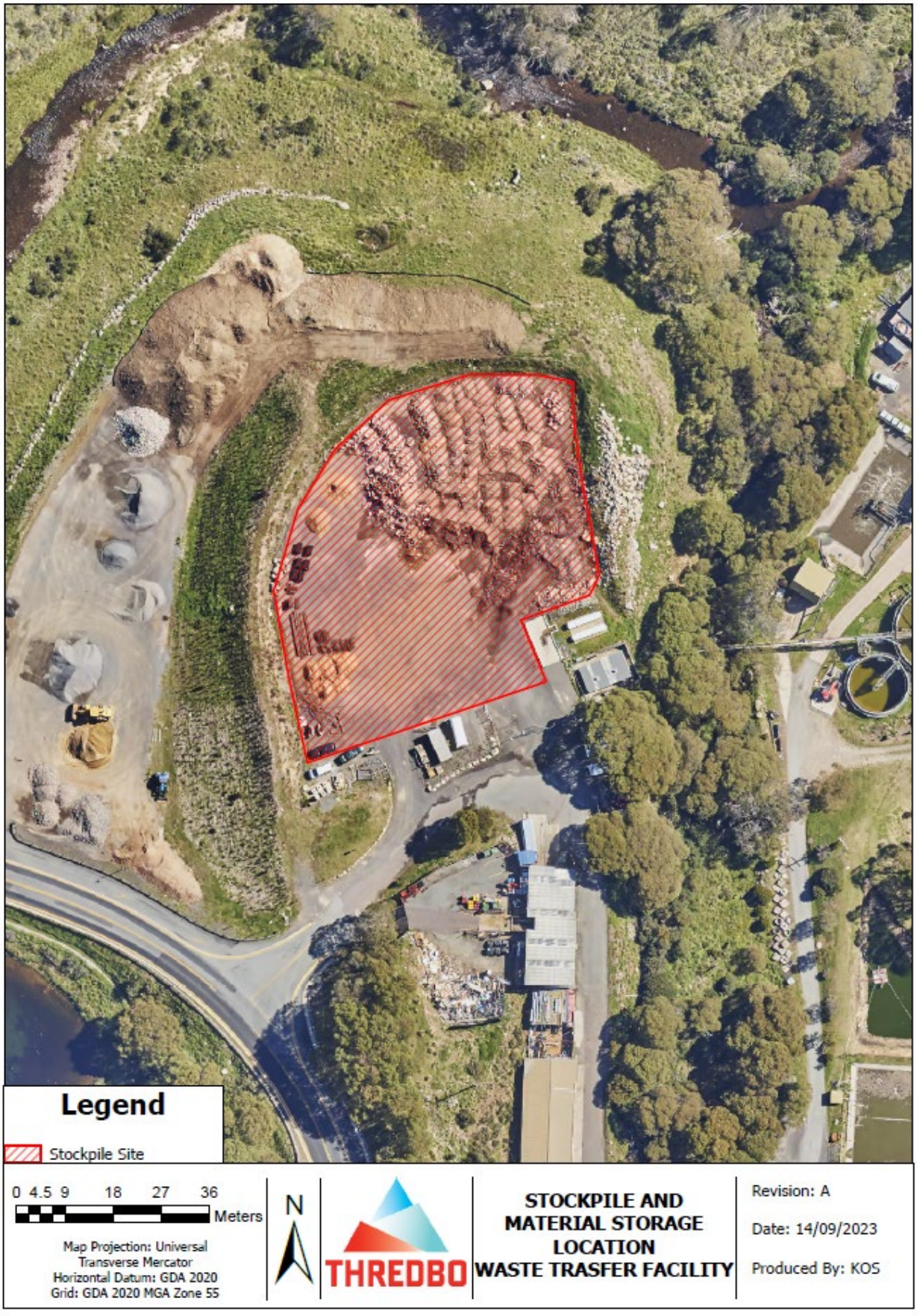


Figure 1 Stockpile location

Figure 2 Compound location

Sediment fence

Flow diversion bank

Rock check dam

Figure 3 Erosion and sediment controls (Source: Catchments & Creeks Pty Ltd, 2012)

CONTROL INSTALLATION NOTES

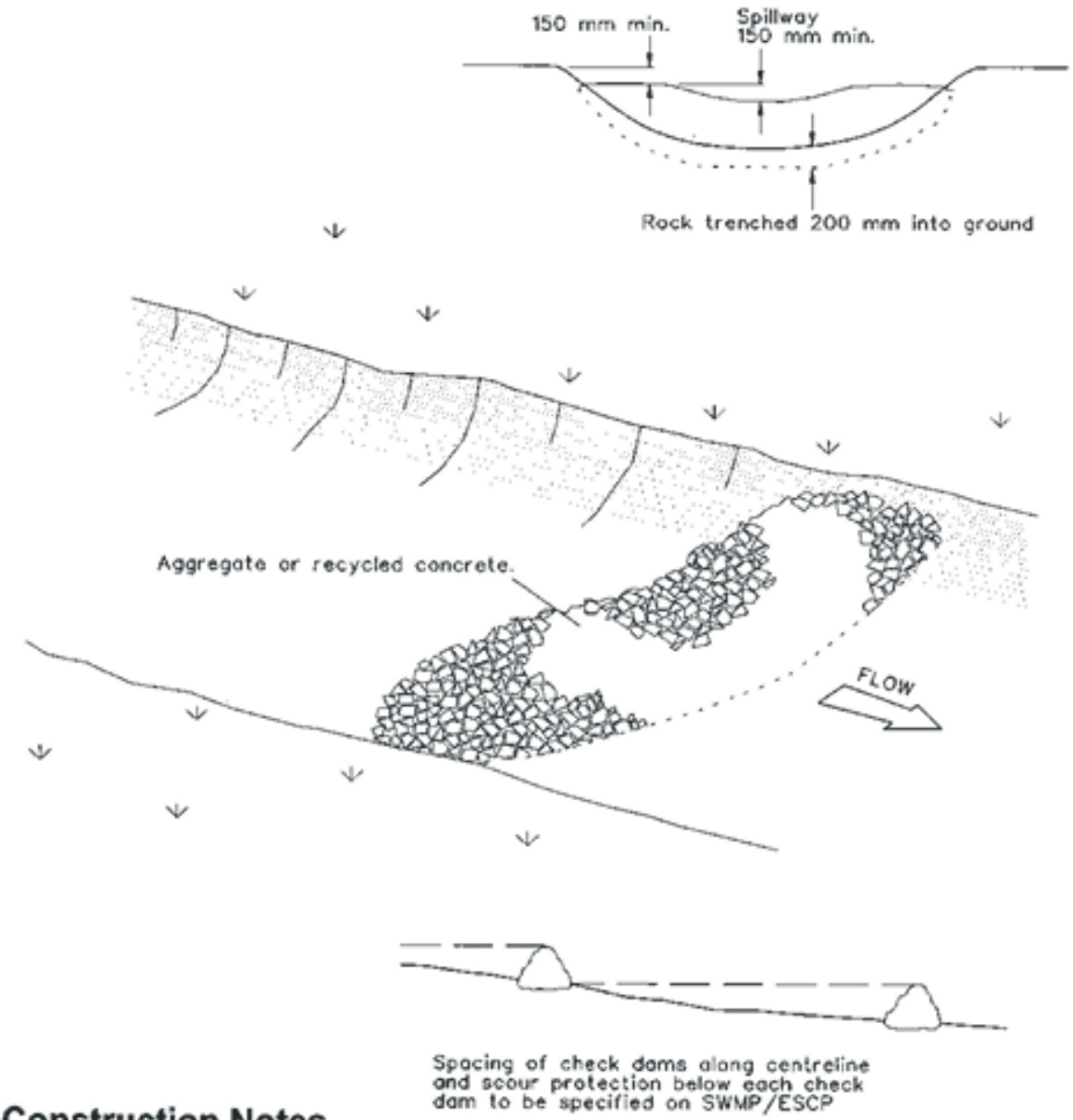
Cross Drainage and Sediment Barriers

The recommended spacing for cross drainage and sediment barriers is provided below:

Slope Grade (%)	Cross Drain / Sediment Barrier (m)
5-10	15-20
10-15	10-15
15-25	8-10
>25	5-8

Source: NPWS 2007; Parr-Smith and Polley (1998)

Note: To calculate the grade of a slope: (rise/run) x 100 = slope grade

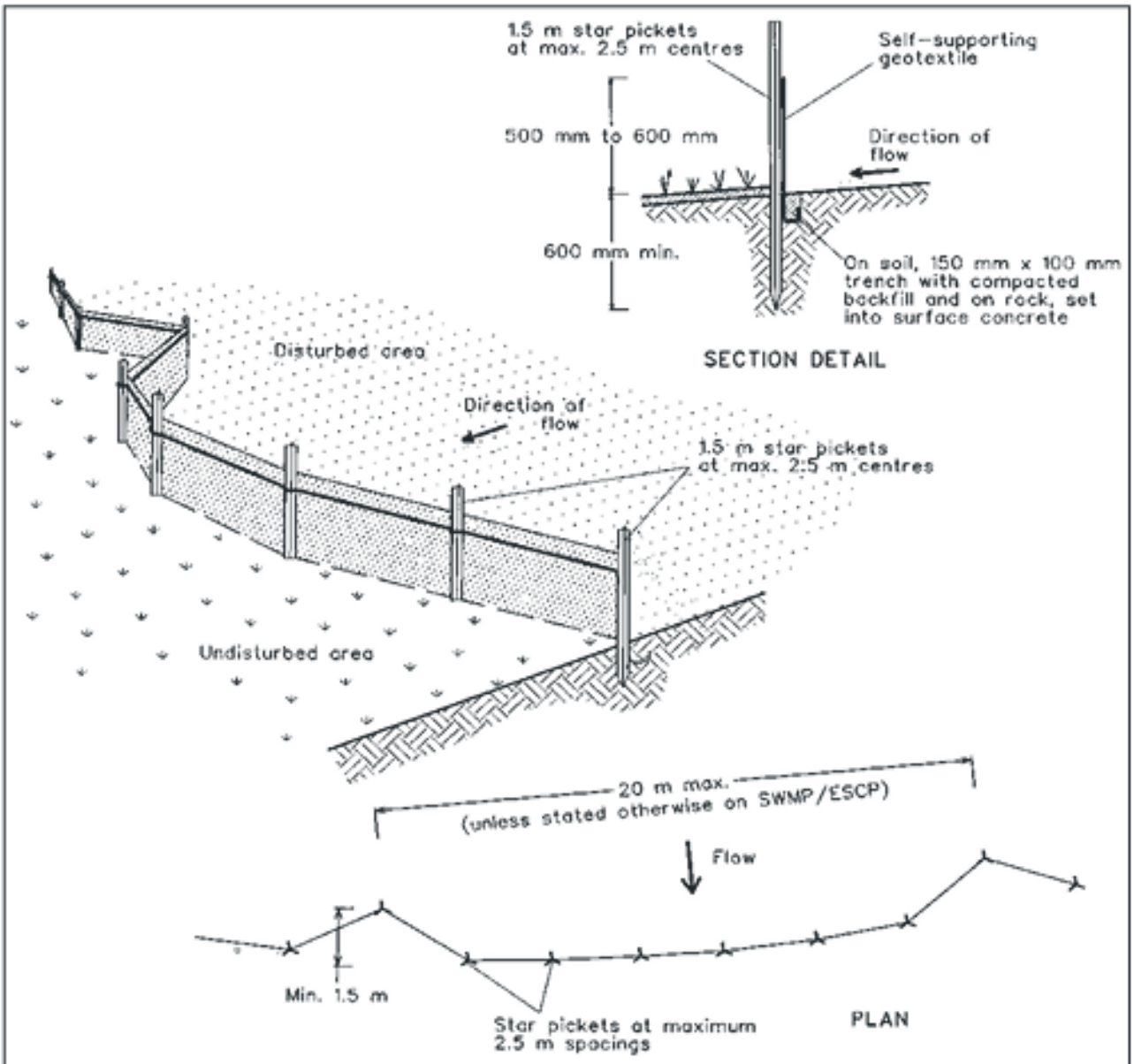


Construction Notes

1. Check dams can be built with various materials, including rocks, logs, sandbags and straw bales. The maintenance program should ensure their integrity is retained, especially where constructed with straw bales. In the case of bales, this might require their replacement each two to four months.
2. Trench the check dam 200 mm into the ground across its whole width. Where rock is used, fill the trenches to at least 100 mm above the ground surface to reduce the risk of undercutting.
3. Normally, their maximum height should not exceed 600 mm above the gully floor. The centre should act as a spillway, being at least 150 mm lower than the outer edges.
4. Space the dams so the toe of the upstream dam is level with the spillway of the next downstream dam.

ROCK CHECK DAM

SD 5-4



Construction Notes

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. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
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.

SEDIMENT FENCE **SD 6-8**

MATERIALS

FIBRE ROLLS: TYPICALLY 200 TO 250mm JUTE, COIR OR STRAW ROLL TIED WITH SYNTHETIC OR BIODEGRADABLE MESH.

STAKES: MINIMUM 25 x 25mm TIMBER STAKES.

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION AND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. WHEN PLACED ACROSS NON-VEGETATED OR NEWLY SEEDED SLOPES, THE ROLLS MUST BE PLACED ALONG THE CONTOUR.

3. IF PLACED ON OPEN OR LOOSE SOIL, ENSURE THE FIBRE ROLLS ARE TRENCHED 75 TO 125mm IN SANDY SOILS AND 50 TO 75mm IN CLAYEY SOILS.

4. ENSURE THE OUTER MOST ENDS OF THE FIBRE ROLL ARE TURNED UP THE SLOPE TO ALLOW WATER TO ADEQUATELY POND UP-SLOPE OF THE ROLL, AND TO MINIMISE FLOW BYPASSING.

5. WHEN PLACED ACROSS THE INVERT OF MINOR DRAINS, ENSURE THE SOCKS ARE PLACED SUCH THAT:

(i) THE CREST OF THE DOWNSTREAM ROLL IS LEVEL WITH THE CHANNEL INVERT AT THE IMMEDIATE UPSTREAM SOCK (IF ANY);

(ii) EACH ROLL EXTENDS UP THE CHANNEL BANKS SUCH THAT THE CREST OF THE FIBRE ROLL AT ITS LOWEST POINT IS LOWER THAN THE GROUND LEVEL AT EITHER END OF THE ROLL.

6. ENSURE THE ANCHORING STAKES ARE DRIVEN INTO THE END OF EACH ROLL AND ALONG THE LENGTH OF EACH ROLL AT A SPACING NOT EXCEEDING 1.2m OR SIX TIMES THE ROLL DIAMETER, WHICHEVER IS THE LESSER. A MAXIMUM STAKE SPACING OF 0.3m APPLIES WHEN USED TO FORM CHECK DAMS.

7. ADJOINING ROLL MUST BE OVERLAP AT LEAST 450mm, NOT ABUTTED.

MAINTENANCE

1. INSPECT ALL FIBRE ROLLS PRIOR TO FORECAST RAIN, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER SIGNIFICANT RUNOFF PRODUCING STORMS OR OTHERWISE AT WEEKLY INTERVALS.

2. REPAIR OR REPLACE DAMAGED FIBRE ROLLS.

3. REMOVE COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

REMOVAL

1. ALL EXCESSIVE SEDIMENT TRAPPED BY THE ROLLS MUST BE REMOVED FROM THE DRAIN OR SLOPE IF SUCH SEDIMENT IS LIKELY TO BE WASHED AWAY BY EXPECTED FLOWS.

2. DISPOSE OF COLLECTED SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. THE BIODEGRADABLE CONTENT OF THE STRAW ROLLS MAY NOT NECESSARILY NEED TO BE REMOVED FROM THE SITE.

4. ALL SYNTHETIC (PLASTIC) MESH OR OTHER NON READILY BIODEGRADABLE MATERIAL MUST BE REMOVED FROM THE SITE ONCE THE SLOPE OR DRAIN IS STABILISED, OR THE ROLLS HAVE DETERIORATED TO A POINT WHERE THEY ARE NO LONGER PROVIDING THEIR INTENDED DRAINAGE OR SEDIMENT CONTROL FUNCTION.

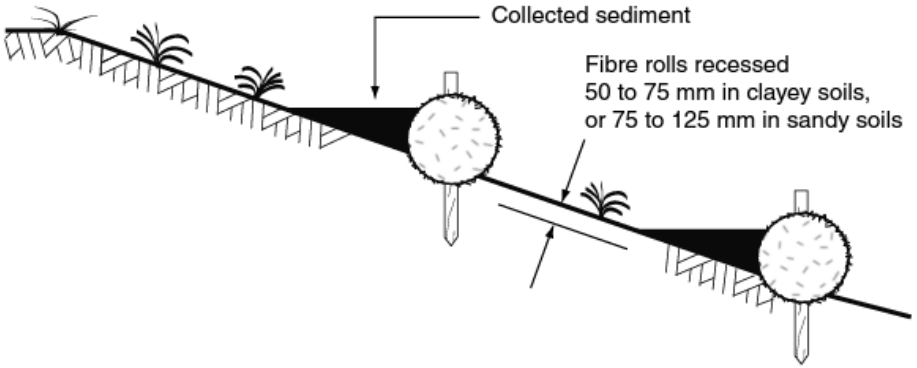


Figure 1 - Typical installation of fibre rolls

Drawn:	Date:		
GMW	Apr-10	Fibre Rolls	FR-01

Catchments & Creeks Pty Ltd

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. CLEAR THE LOCATION FOR THE BERM, CLEARING ONLY THE AREA THAT IS NEEDED TO PROVIDE ACCESS FOR PERSONNEL AND EQUIPMENT.

3. REMOVE ROOTS, STUMPS, AND OTHER DEBRIS AND DISPOSE OF THEM PROPERLY.

4. FORM THE BERM FROM THE MATERIAL, AND TO THE DIMENSION SPECIFIED IN THE APPROVED PLANS.

5. IF FORMED FROM SANDBAGS, THEN ENSURE THE BAGS ARE TIGHTLY PACKED SUCH THAT WATER LEAKAGE THROUGH THE BAGS IS MINIMISED.

6. CHECK THE ALIGNMENT OF THE BERM TO ENSURE POSITIVE DRAINAGE IN THE DESIRED DIRECTION.

7. ENSURE THE BERM DISCHARGES TO A STABLE OUTLET.

8. ENSURE THE BERM DOES NOT DISCHARGE TO AN UNSTABLE FILL SLOPE.

MAINTENANCE

1. INSPECT FLOW CONTROL BERMS AT LEAST WEEKLY AND AFTER RUNOFF-PRODUCING RAINFALL.

2. INSPECT THE BERM FOR ANY SLUMPS, WHEEL TRACK DAMAGE OR LOSS OF FREEBOARD. MAKE REPAIRS AS NECESSARY.

3. CHECK THAT FILL MATERIAL OR SEDIMENT HAS NOT PARTIALLY BLOCKED THE DRAINAGE PATH UP-SLOPE OF THE EMBANKMENT. WHERE NECESSARY, REMOVE ANY DEPOSITED MATERIAL TO ALLOW FREE DRAINAGE.

4. DISPOSE OF ANY COLLECTED SEDIMENT OR FILL IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

5. REPAIR ANY PLACES IN THE BERM THAT ARE WEAKENED OR IN RISK OF FAILURE.

REMOVAL

1. WHEN THE SOIL DISTURBANCE ABOVE THE BANK IS FINISHED AND THE AREA IS STABILISED, THE FLOW CONTROL BERM SHOULD BE REMOVED, UNLESS IT IS TO REMAIN AS A PERMANENT DRAINAGE FEATURE.

2. DISPOSE OF ANY SEDIMENT OR EARTH IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

3. GRADE THE AREA AND SMOOTH IT OUT IN PREPARATION FOR STABILISATION.

4. STABILISE THE AREA BY GRASSING OR AS SPECIFIED IN THE APPROVED PLAN.

Table 1 - Recommended dimensions of flow control berms

Parameter	Earth banks	Vegetated banks	Compost berms	Sandbag berms
Height (min)	500 mm	500 mm	300 mm	N/A
Top width (min)	500 mm	500 mm	100 mm	N/A
Base width (min)	2500 mm	2500 mm	600 mm	N/A
Side slope (max)	2:1 (H:V)	2:1 (H:V)	1:1 (H:V)	N/A
Freeboard	300 mm	150 mm	100 mm	50 mm

Drawn:	Date:		
GMW	Dec-09	Flow Control Berms	CB-01

Catchments & Creeks Pty Ltd

Appendix D Unexpected Finds Procedure for contaminated soils

To prevent further disturbance, follow these measures:

- Stop works in the potentially hazardous area immediately, including excavations or drilling
- Isolate material or spill from further movement, where practicable
- Move to a designated meeting point or safe area
- Notify the Environmental Officer OR Construction Foreman OR Person in control of the workplace
- Make the area temporarily “safe”
- Use dust suppression to dampen the area for any suspected asbestos impacted soil
- Cover the unexpected finds if safe to do so (wearing PPE) and covering using geofabric or plastic
- Delineate an exclusion zone around the area using fencing and appropriate barriers and signage. The exclusion zone should be at least a 10-metre buffer from the unexpected find.

Examples of signage include:

Inspection and investigation

- Assess the potential risk to human health and the environment posed by the unexpected find and assess if evacuation or emergency services need to be contacted.
- A suitably experienced environmental consultant should undertake an assessment of any unexpected finds and determine any further actions required e.g., sampling and/or validation of material, potential for remediation and/or management.
- Construction Foreman to arrange inspection by the Environmental Officer and external environmental consultant to assess the unexpected find and provide advice as follows:
  - Preliminary assessment of the find and need for immediate management controls (if any)
  - What further assessment and / or remediation works are required and how such works are to be undertaken in accordance with contaminated site regulations and guidelines and management procedures
  - Preparation of a Remedial Action Plan for large scale contamination or specification for smaller or minor volumes of material (if necessary)
  - Remediation works required (where applicable)
  - Validation works required following remediation works (if applicable).

Remediation Action Plan

- If the Environmental Officer and external environmental consultant determine there is a risk to human and environmental health, remediation and validation is required. The site validation report must be forwarded to the EPA for review and endorsement prior to occupancy of the site.

- If required by the Environmental Officer / external environmental consultant, a Remedial Action Plan (RAP) will be prepared and implemented in accordance with the following endorsed guidelines as a minimum:
  - National Environmental Protection Measure, Assessment of Contaminated Sites, 2013 (NEPM 2013)
  - NSW EPA Consultants Reporting on Contaminated Land – Contaminated Land Guidelines 2020 (NSW EPA 2020)
  - NSW EPA Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme 2017 (3rd Edition) (NSW EPA 2017)
  - NSW EPA Duty to Report Contamination under the Contaminated Land Management Act 1997 (CLM Act 1997).
- Works are not to recommence in the affected area until appropriate advice has been obtained from the environmental consultant or suitably qualified person and they have provided clearance.
- Intrusive works (excavation and drilling) will not recommence until the extent of the contamination has been assessed and, if necessary, a RAP has been prepared and the site has been validated.

Validation

- Recommencement of development activities in an area requiring remediation and validation cannot take place until the EPA has reviewed and endorsed the consultant's validation report into the suitability if the area for its permitted uses.
- If it is deemed safe to do so, the environmental consultant will provide clearance for works to proceed in the affected area. If it is not considered to be safe, works must remain on hold until appropriate assessment, remediation and / or validation measures have been actioned.
- The material will be separated from other materials and stockpiled for assessment. Sampling of the materials will be undertaken in accordance with the relevant guidelines or professional judgement where justification is applied. Samples will be analysed for a range of analytes as required.
- Laboratory results will be assessed to determine the appropriate waste classification of the material in accordance with the NSW EPA Waste Classification Guidelines – Part 1: Classification of Waste (NSW EPA 2014).
- Depending on the classification, material already excavated and stockpiled will be transported to an appropriate waste facility that is licensed to accept waste of the relevant classification or beneficially reused if appropriate.
- A waste tracking system recording the volume of material, waste classification status, removal documentation and truck and receiving landfill facility details must be recorded to ensure all waste is accounted for and disposed of appropriately in accordance with NSW EPA requirements.
- Any unexpected finds must be documented in the validation report to be prepared at the completion of construction, if required. For 'ad-hoc' and minor volumes of materials identified (i.e., <10m3) records must be kept on file.
- Keep a record of the unexpected find. Any validation reports or remedial works will also act as a record of works undertaken to minimise risks to human health and the environment. The record must include exact location / GPS coordinates of the find.

Appendix E Environmental Schedules

Kosciuszko Thredbo Pty Ltd

Environmental Incident Reporting Form

Confidential document after first entry

The purpose of this form is to report any incident that may have resulted in Environmental harm on Kosciuszko Thredbo Pty Ltd premises. Remember to be succinct, stick to the facts and do not make assumptions. Only record information you know to be correct.

The only persons authorised to contact external agencies eg EPA in relation to environmental incidents are the Kosciuszko Thredbo General Manager and Environmental Services Manager or their approved delegates.

Return completed form to the Environmental Services Manager as soon as practicle, on completion of the Environmental incident.

Date of Incident:	**Time of incident:**
Reported by:	**Department:**

Location of Incident

EXACT location of the incident (include landmarks and features, nearest cross street etc to make it easier to identify later)		
Site:	Building:	Room:

Description of incident

Provide description and extent of incident: …… …… …… …… ……
Have relevant photos been taken and attached? Yes ☐ No ☐
If 'No', provide sketch and attach to the rear of this document.
What was the estimated duration of the incident?

Type of incident

☐ Spill (including fuel,oil,waste material or other polluting substance)	☐ Erosion and sedimentation incident	☐ Contaminated water discharge
☐ Noise emission/complaint	☐ Unauthorised/accidental damage to heritage item	☐ Unauthorised/accidental vegetation removal or harm
☐ Air Emission	☐ Wildlife habitat/nesting area disturbed	☐ Other (specify)

Environmental Incident Reporting Form

Level of incident

Level	Example
☐ Minor	eg. No material has escaped the site or caused material harm to the environment – it is easy to clean up without additional assistance.
☐ Major	eg. Material has escaped the site causing pollution downhill/downstream areas, which will require clean up involving other agencies and/or additional resources not available to local site management. Damage has occurred or is likely to occur to the environment.

Hazardous Material Spilt

☐ Petroleum based products/ Hydrocarbons	☐ Chemicals domestic or industrial grade
☐ Biological waste / Clinical and related waste	☐ PCB insulating liquids
☐ CFC containing equipment	☐ Paints or paint products
☐ Radioactive waste	☐ Other (specify)
Detail type/ingredient spilt: (UN, MSDS details)	
Detail concentration of material spilt:	
Detail quantity of material spilt:	

Type of Spill

☐ Spilt onto ground	☐ Spilt into stormwater drain
☐ Spilt into waterway	☐ Poured down sink
☐ Poured down sewer	☐ Released into atmosphere
☐ Caused odour	☐ Caused fire/explosion
☐ Caused infectious contamination	☐ Other (specify)

Immediate Actions

Was spill contained? Yes ☐ No ☐
Detail immediate actions/controls measures taken to rectify or contain the incident …… …… …… …… …… …… …… ……

Environmental Incident Reporting Form

Corrective Actions

Detail corrective clean up action taken

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Disposal

Detail disposal method/plans and location

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Recommended follow up and preventative actions

Detail recommendations

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……

Persons present at Incident

Were there any witnesses to the accident? Yes ☐ No ☐ If 'Yes', please provide names

……

……

Declaration

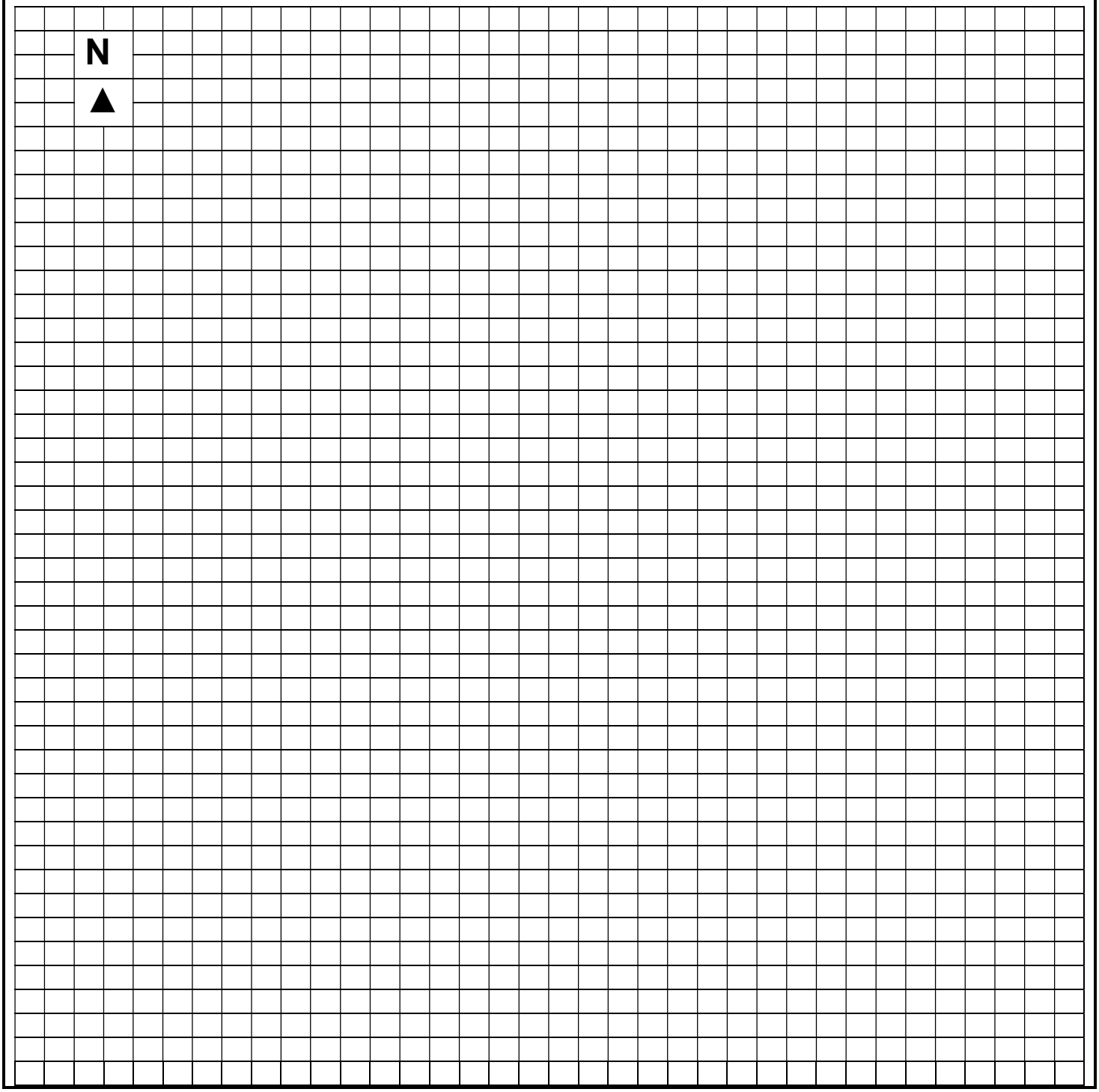
The information and answers given above are true in every detail and no information has been withheld.

Departmental Supervisors Name	
Departmental Supervisors signature	*Date*

Departmental Managers Name	
Departmental Managers signature	*Date*

Environmental Incident Reporting Form

Diagram: (do not scale)



Created By: Paul Corcoran
Created Date: 24 Mar 2009
Review Date: 24 Mar 2017
Reviewed Date: 7th January 2020, by E Diver

THREDBO ENVIRONMENTAL SERVICES

Record of complaint

Sheet _____of_____

Project: _____ Date / Time: _____

Received by: _____ Reference Number: _____

Complainant details:	Witness details:

Nature of complaint:

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..... Complainant sign:

Action taken:

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