



## EARTHWORKS MANAGEMENT PLAN

**ADDRESS**  
765 MUHUNOA WEST ROAD, ŌHAU

**Client** Grenadier Limited  
December 2020

**DOUGLAS LINKS GOLF COURSE**

**PREPARED ON BEHALF OF:**

**GRENADIER LIMITED**

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### APPENDIX 1 EROSION AND SEDIMENT CONTROL PLAN

## 1. INTRODUCTION

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### 1.1. Introduction

This Earthworks Management Plan (**EMP**) has been prepared to detail the measures proposed to manage the bulk earthworks proposed as part of the Douglas Links golf course development proposal on land at 765 Muhunua West Road, Ōhau.

The EMP details the principles, practices and procedures to be implemented by the Applicant to manage, remedy and mitigate potential adverse environmental effects during the bulk earthworks activity.

### 1.2. Purpose and application

The purpose of this EMP is to describe the management and monitoring procedures to be implemented during the project's construction phase.

Overall the EMP will ensure:

- Compliance with any operational conditions of resource consents;
- Compliance with the Resource Management Act 1991 (**RMA**); and
- Environmental risks associated with the project are properly managed.

The EMP sets out the management and mitigation measures to be implemented during the works and specifies when, where, how and by who this will be done. The EMP covers all anticipated construction elements and presents processes for implementing good environmental management.

### 1.3. Scope

The general approach to managing the environmental effects are set out in the main body of this document.

## 2. LOCATION OF WORKS

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The works are to take place at 765 Muhunua West Road, Ōhau.

The site is a 107.2ha rural site with flat to rolling topography and a number of stable coastal dunes over the property. The Applicant proposes to develop an eighteen hole links golf course on the property with associated driving range, clubhouse, accommodation units and ancillary buildings and structures.

## 3. ENVIRONMENTAL OBJECTIVES

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### 3.1. Overall objective

The construction activities are to be progressed in a manner that preserves and enhances the amenity and environmental integrity of the site.

### 3.2. Earthworks

To minimise the effects of earthworks as much as practicably possible by using site specific solutions to earthworks, erosion and sediment control.

### 3.3. Erosion and sediment control

The construction activities will employ the most effective means of erosion and sediment control available. These controls shall be actively managed to ensure the deposition of silt and debris into any watercourse is avoided.

### 3.4. Haulage routes

Internal haulage routes through the site will be kept at the required standard for the vehicles carting material within the site.

No trucks will be allowed to exit the site if they are likely to deposit debris on the public road.

### 3.5. Earthwork material

No earthworked material will be imported or removed from the subject property.

### 3.6. Summary

To achieve these objectives, the following matters are addressed in this draft EMP:

- Statutory and contractual requirements;
- Project structure and responsibilities; and
- Control of construction activities and the sequencing of work.
- General guidelines for erosion and sediment control on the site; and
- Inspection programmes, reporting, review, corrective action and contingency measures.

## 4. REQUIREMENTS

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### 4.1. Statutory requirements (indicative)

- Resource Management Act 1991
- NZS4402 1986 – Methods of Testing Soils for Civil Engineering Purposes
- Greater Wellington Regional Council - Erosion and Sediment Control Guidelines for the Wellington Region (2002)

### 4.2. Consent requirements

#### 4.2.1. Horizons Regional Council Consent Application

Resource consents are sought from Horizons Regional Council for the following (amongst other things):

- Land use consent for land disturbance outside the coastal foredune and any identified at-risk or rare habitats as a **controlled activity** under Rule 13-2 of the Horizons One Plan;
- Land use consent for land disturbance and vegetation clearance within the coastal foredune but outside any identified at-risk or rare habitats as a **discretionary activity** under Rule 13-7 of the Horizons One Plan;
- Land use consent for land disturbance and vegetation clearance within identified at-risk habitats as a **discretionary activity** under Rule 13-8 of the Horizons One Plan;
- Land use consent for land disturbance and vegetation clearance within identified rare habitats as a **non-complying activity** under Rule 13-9 of the Horizons One Plan

#### 4.2.2. Horowhenua District Council Consent Application

Resource consent is sought from Horowhenua District Council for the following (amongst other things):

- Land use consent for earthworks both within and outside the Coastal Outstanding Natural Feature and Landscape as **restricted discretionary activities** under Rule 19.3.1(a).

#### 4.3. Contractual requirements

The contractor will be required to ensure they are familiar with their obligations under this document, any relevant resource consent conditions and the contract documentation.

The requirements may include:

- Site-specific 'Specification for Earthworks'
- Monthly Reports from the Contractor
- Environmental Compliance Meetings
- Feedback Register

## 5. RESPONSIBILITIES

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There are three groups with responsibility for environmental management of the project:

- Grenadier Limited – the project owner and resource consent applicant;
- [TBC] as the designers, planners and supervisors of the project; and
- The contractors undertaking the works.

The main earthworks contractor will be responsible for the environmental management of the whole site. The contractor undertaking these works will be required to read the EMP and sign a declaration that they have read and understood it. Other contractors will be required to read and have input into the approved EMP and any other relevant Management Plan and sign a declaration of understanding. The table below identifies environmental management roles on site:

Name	Company	Position	Responsibilities
[TBC]	Grenadier Limited	Consent Holder	Overall responsibility for the project and the project team
[TBC]	[TBC]	Engineer to the Contract	Responsible for overall site works and for ensuring all activities comply with resource consent conditions
[TBC]	[TBC]	Project Manager	Ensuring Contractor compliance with the contract documents, which will include requirement for carrying out the works in accordance with the relevant resource consents.
[TBC]	[TBC]	Environmental Manager	Compile monitoring results and prepare monthly construction monitoring reports.  Approval of EMP updates.
[TBC]	[TBC]	Contract Supervisor	Reporting to the Project Manager and Engineer to the Contract on construction progress and compliance, undertakes daily site inspections with the Site Manager. Inspection of works to ensure compliance with the EMP.
[TBC]	[TBC]	Site Manager	Overall responsibility for environmental management compliance and contract compliance onsite: <ul style="list-style-type: none"> <li>• Reviewing environmental performance</li> <li>• On-site compliance with consent conditions</li> <li>• Adherence to EMP</li> <li>• Daily inspections and monthly reporting</li> <li>• Receives complaints for inclusion in the public feedback record and responds</li> <li>• Ensure training is undertaken</li> <li>• Ensuring all sub-contractors know the requirements of the EMP</li> </ul>

## 6. PROGRAMME

The programme of works for the project will be as follows:

### 1. Vegetation clearance

- Remove all undesirable trees and shrubs.
- Spray out any undesirable grasses and vegetation eg couch and lupin. This process will be ongoing due to the seed bed in the sandy/soil.
- Harvest any useable timbers.
- Mulch and/or burn remaining vegetative piles. Slash piles to be buried.
- Strip the topsoil, if any, to stockpile for re-use

### 2. Bulk Earthworks

- Undertake the cut to fill earthworks programme in accordance with the golf designers

plans

### 3. Rough Shaping

- Sculpt and shape the material in accordance with the designers plans and site instruction, to create natural patterns and landforms, so that it appears that nothing has actually been done to the landscape at all.
- Ensure that general overland drainage patterns are functioning. Adjust as required to ensure positive drainage.

### 4. Final Shaping

- Create the detail shapes and features that bring the course 'alive' for the designer and golfer.

### 5. Irrigation

- Install pump delivery system.
- Install the irrigation system on a hole by hole basis.
- The irrigation install follows in behind the golf course construction team so that 'sow out' can occur shortly after install, to stabilise the ground.

### 6. Drainage

- Install subsurface drainage, if required. A sandy subgrade will require little drainage due the 'free draining' natural of the land.

### 7. Final Preparation & Sow Out of Golf Hole

- Undertake final preparation of the finished sandy surface after drainage and irrigation has been installed.
- Sow out and hydro-mulch the golf hole.
- Irrigate little and often to ensure an early grass strike.
- Establish for a period of approx. 16 week.

### 8. Grow In

- Grow- In : Post establishment. The process of taking the newly grown turf, from the 16 week timeframe through to maturity, to the point when golf will be playable. A period of approx. 12- 18 months.

## 7. SPECIFIC DESCRIPTION OF WORKS

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### 7.1. Site establishment

During construction, the contractor will have full control of the site. Any visitors to the site will be signed in and escorted around the site, any regular visitors will be inducted.

Earthworks will be undertaken in general accordance with the GWRC guideline document Erosion and Sediment Control Guidelines for the Wellington Region.

Health and Safety requirements will be observed by all truck and machine operators on-site.

## 7.2. Working hours

The following working hours are proposed during the construction activities:

<b>Monday to Friday (excluding public holidays)</b>	7.00am to 6.00pm
<b>Saturdays, Sundays and public holidays</b>	7.00am to 4.00pm

## 7.3. Traffic management

Dedicated areas will be identified within the site for parking of site plant and vehicles. These areas may be progressively moved within the site as the work progresses.

Suitable 'Construction Site Access' signage will be placed at the site access to ensure traffic is aware of speed and safety requirements.

## 7.4. Signage

Suitable 'Construction Site Access' signage is proposed at the site access to ensure traffic is aware of speed and safety requirements.

Other appropriate site signage will be displayed at the site entrance as required under health and safety and other construction regulations.

## 7.5. Archaeological discoveries

If any historical burial sites and/or waahi Tapu or other cultural sites are unearthed during earthworks, the contractor will stop works immediately and follow the agreed protocol set out in the Archaeological Authority [yet to be applied for].

# 8. ENVIRONMENTAL IMPACT AND RISK ASSESSMENT

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This section identifies the main activities associated with the construction of the project, the potential adverse effects and the principles and measures proposed to manage those potential effects to an acceptable level.

## 8.1. Site description

The subject site comprises an approximately 107.2ha rural property to the south of Muhunua West Road, Ōhau. The site is accessed via an existing vehicle crossing and gates from Muhunua West Road.

The property displays a characteristic inland dune topography with areas of rolling dunes and other areas of flatter land that have been used for both plantation forestry and farming. Parts of the property, particularly within the south alongside the Ōhau River around the saltmarsh wetland, are around 2.5m above datum. The highest point in the property is approximately 32.5m above datum at the top of the dune in the centre of the property.

The foredune area rises from approximately 7m above datum at the boundary of the open space reserve to a high point of around 17m above datum. Behind the foredune the land drops to between 3m and 10m above datum over the grassed area before rising up over the inland dune system.

Current vegetation cover varies significantly across the property.

The property is predominantly kept under pasture, although it is not currently grazed and is essentially vacant without a productive use. The property has previously been used for plantation forestry with harvesting understood to have taken place in 2014. Unharvested pines remain in a number of locations on the property, mainly on the inland dunes.

Since the completion of harvesting, the property has mainly been used for grazing bulls but is not being grazed at present.

As stated in the Engineering Report in **Volume 2**:

*The soils are mapped as sandy raw and sandy recent. The geology in this area is mapped as aeolian sand dunes. There is pasture in the majority of the property with stands of mature trees. There is a thin topsoil layer on top of the sand.*

## 8.2. Main construction activities

The main construction activities for the proposed works are:

- Site establishment
- Establishment of erosion and sediment control measures
- Stripping and clearing of vegetation
- Stripping and storage of topsoil
- Cut to fill earthworks to create proposed landform
- Stabilisation through grass-seeding or other appropriate means

## 8.3. Potential adverse effects

If not managed appropriately, the construction activities associated with this project can lead to adverse effects. These effects will be avoided through compliance with this EMP and the associated requirements outlined in Section 4.

The resource consent application and this EMP address the following potential adverse effects:

- Deterioration of water quality in surface water bodies from the effects of sediment discharges from disturbed areas;
- Excessive noise or dust nuisance on neighbouring properties;
- Loss of topsoil due to poor storage and handling.

The site is not known or suspected to have been involved in the use, storage or disposal of hazardous substances. As such, it is not anticipated that contaminated soils will be encountered during the works. However, a procedure has been set out in Section 8.7 below to be followed if contaminated soil is expected during the works.

## 8.4. Erosion and sediment control principles

The minimisation of accelerated erosion and the effective management of sediment runoff from the area of works is the main focus of the erosion and sediment control at the site.

The erosion and sediment controls proposed for this project are therefore aimed at ensuring a high level of protection against sediment discharges into any waterbodies during low to medium intensity rainfall events, and protection against uncontrolled discharges and scour during high intensity rainfall events.

The management procedures proposed for the control of erosion and the treatment of sediment run-off, from earth-worked areas, for this project are based on the following principles:

- Avoid working during inclement weather wherever possible;
- Minimise disturbance;
- Phased construction;
- Protect steep slopes;
- Stabilise and rehabilitate exposed areas rapidly and progressively;
- Install perimeter controls;
- Implement an evolving EMP;
- Inspect the performance of the erosion and sediment control devices;
- Maintain all erosion and sediment control measures to ensure maximum efficiency; and
- Install additional measures prior to medium to high intensity rainfall events, where this is considered necessary and practicable.

The erosion and sediment control measures shown on the attached earthworks plan (at **Appendix 1**) will be implemented and maintained during the construction works.

Placement of these measures has been designed to minimise any potential adverse effect of the works on the receiving environment and on neighbouring sensitive receptors.

These measures will remain in place for the duration of works on site.

Site specific solutions will be implemented as detailed in this EMP, taking into account construction and maintenance requirements. The solutions proposed are used on a number of well managed earthwork projects throughout New Zealand and are based on the methods documented in GWRC's "*Erosion and Sediment Control Guidelines for the Wellington Region*".

### 8.5. 'No go' areas

Areas of the site identified as significant and requiring explicit demarcation and separation from earthworking are shown on the drawing at **Appendix 1**. These areas include the saltmarsh wetland adjoining the Ōhau River, the foredune and areas of existing kanuka on the property.

These areas will be marked on site with bunting a tape and all earthworking will be excluded from these areas.

### 8.6. Dust and odour control

Dust and odour may become a problem during certain weather conditions, causing disturbance to neighbouring properties. Dust and odour may be generated from both works on site and haulage of materials to the works area.

If dust and odour become a problem, the contractor shall employ suitable control measures to avoid, remedy and mitigate adverse effects to appropriate levels. The following measures should be used to minimise effects of excessive dust and odour on adjoining properties:

- Measures, potentially including a water cart with sufficient water resources, shall be available on short notice for the duration of the contract works. Where the water cart is unable to mitigate any hazard to an appropriate level, earthworks shall cease until the hazard is removed by alternative means.
- All storage areas, loading and unloading operations and other activities carried out on site shall be conducted and managed in such a manner as to ensure that all dust and particulate emissions are kept to a practical minimum.
- Where the existing landform or vegetative cover is being disturbed, ground cover is to be established immediately following earthworks and with a minimum of delay to ensure the wind erosion of soil or other material does not become a nuisance.

Site works shall be managed in such a manner to ensure that there shall not be any objectionable odour at or beyond the boundary of the subject property.

### 8.7. Noise control

The earthworking of land has the potential to create noise effects, mainly due to the machinery used. All practicable measures to keep noise to an acceptable level should be implemented. This includes but is not limited to mufflers being used on all earthworking machinery.

Heavy machinery or plant may only operate on the site between 7:00am and 6:00pm Monday to Friday and between 7:00am and 4:00pm Saturday, Sunday and Public Holidays.

### 8.8. Soil contamination procedure

As detailed above, the site is not identified as known or suspected to have been involved in the use, storage or disposal of hazardous substances. As such, contaminated soil is not expected to be encountered.

However, if during works soil contamination is suspected, the following protocol shall be followed:

1. The main potential contaminants on a site of this nature are from sheep dip sites, fertiliser application or pest control. None of these activities is known or suspected to have taken place on the site but contractors are to be made aware of the warning signs of these activities;
2. If evidence of any of these activities is encountered, earthworks in the area surrounding the evidence will cease and that part of the site isolated through physical marking (tape, dazzle paint or similar);
3. The site manager shall engage a suitably qualified and experienced contaminated land professional to attend site and assess whether works can recommence or further site investigation is required.

### 8.9. Important contractor requirements

The consent holder shall ensure that:

- All on-site storage areas for fuels and lubricants are bunded or contained in such a manner so as to prevent the discharge or spillages of such contaminants;
- All machinery is regularly maintained in a manner to minimise the potential for leakage of fuels and lubricants;

- No equipment or machinery is cleaned, stored or refuelled within 20 metres of any watercourse;
- All machinery is thoroughly cleaned of unwanted vegetation (*e.g.* weeds), seeds or contaminants prior to entering the site;
- No contaminants (including but not limited to oil, petrol, diesel, hydraulic fluid) shall be released into water from equipment being used for the works;
- Any excess material from the construction and implementation of the works shall be removed from site and disposed of in an appropriate manner;
- If koiwi, taonga or other archaeological material is discovered in any area during the works, work shall immediately cease and the protocol set out in the Archaeological Authority [yet to be applied for] will be followed.

## 9. EROSION & SEDIMENT CONTROLS

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The following control measures are proposed. These are shown on the drawing at **Appendix 1** to this plan.

### 9.1. Heavy rainfall contingency measures

If heavy rain is forecast or can be reasonable foreseen measures shall be taken on site to inspect all site controls, then review and consider work operations to compact down exposes fill operations to reduce the potential for erosion or discharge of sediment laden water into the sediment control system. These steps shall be especially prudent where the heavy rainfall event is due to be greater than the design event of the control devices.

A final check shall be made to ensure that all sediment control devices will be operating effectively during the rainfall event.

### 9.2. Silt fencing

Silt fences provide control around storage and exposed areas. Silt fencing will be placed at the base of fill areas and will be installed in accordance with the requirements of Clause 5.3 of the Greater Wellington Regional Council Guidelines for Erosion and Sediment Control. The proposed location of silt fencing is shown on the drawing at **Appendix 1**.

Regular returns on the silt fences are to be installed during the installation of the silt fence to ensure the returns trap run off and avoid longitudinal flow through to a possible low point.

### 9.3. Earth bunds

Earth bunds will be placed at the base of work areas and will act as an incorporated erosion and sediment control measure to protect the land outside the work areas from the area of exposed ground. Bunds will be constructed at the base of slopes to intercept any run-off and sediment before it can discharge to any waterbody. The proposed location of the bunds are shown on the drawing at **Appendix 1**.

## 10. SITE STABILISATION

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### 10.1. Stabilisation of works area

The excavated area will be stabilised through grass-seeding or other covering as appropriate. The works will be completed as expediently as is practical and all controls will remain in place until the exposed ground has been stabilised.

## 10.2. Removal of erosion and sediment controls

No sediment control structure will be removed from the site until the earthworks area has been stabilised appropriately. The Engineer is to direct when removal is to occur, once the site has been stabilised appropriately.

## 11. MAINTENANCE

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Daily visual checks of the controls will be undertaken by the site foreman with any repairs noted in a daily diary and completed as required.

## 12. DECOMMISSIONING OF CONTROLS

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Decommissioning of any temporary controls, including the erosion control measures, will not take place until all earthworks within the site has ceased and the site has been stabilised.

## 13. EMERGENCY RESPONSE PROCEDURE

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The Contractor will be responsible for preparing a Site Specific Safety Plan, which will include an Emergency Response Procedure.

## 14. AMENDMENTS TO THE PLAN

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Throughout the course of the project, as monitoring identifies areas where amendments can be made to improve environmental outcomes, these improvements will be made to the relevant plans.

Where changes to this EMP are identified these shall be discussed with the local authorities (HRC and HDC). Any amendment proposed to the approved EMP will be submitted in writing to the HRC and HDC Compliance Officers. Implementation of any amendment shall only occur once the amendment has been approved in writing by the HRC and HDC Compliance Officers.

EROSION AND SEDIMENT CONTROL PLAN

**See Volume 3**