

**CONSTRUCTION  
ENVIRONMENTAL  
MANAGEMENT PLAN  
(CEMP)  
DRAFT**

MURIWAI DOWNS GOLF COURSE DEVELOPMENT  
Project No: 1976

PREPARED FOR

THE BEARS HOME PROJECT

MANAGEMENT COMPANY

LIMITED

DECEMBER 2021



**MCKENZIE & CO.**

## DOCUMENT CONTROL RECORD

**PROJECT:** Muriwai Downs Golf Course Resort  
**CLIENT:** The Bears Home Project Limited  
**PROJECT LOCATION:** 451, 610, 614, 670 & 697 Muriwai Road, Muriwai Valley  
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Muriwai Downs Golf Course*

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## Table of contents

<b>1.0</b>	<b>INTRODUCTION</b> .....	<b>7</b>
<b>2.0</b>	<b>PURPOSE &amp; OBJECTIVE OF THE PLAN</b> .....	<b>8</b>
<b>2.1</b>	<b>Purpose &amp; Scope</b> .....	<b>8</b>
<b>2.2</b>	<b>Objective</b> .....	<b>8</b>
<b>2.3</b>	<b>Implementation of the CEMP</b> .....	<b>8</b>
<b>2.4</b>	<b>Health &amp; Safety</b> .....	<b>9</b>
<b>2.5</b>	<b>Updating the CEMP “Live Document”</b> .....	<b>9</b>
<b>3.0</b>	<b>ROLES AND RESPONSIBILITIES</b> .....	<b>10</b>
<b>3.1</b>	<b>Principal and Consent Holder</b> .....	<b>10</b>
<b>3.2</b>	<b>Engineer to the Contract</b> .....	<b>10</b>
<b>3.3</b>	<b>Contractor</b> .....	<b>10</b>
<b>3.4</b>	<b>Site Construction Manager</b> .....	<b>10</b>
<b>4.0</b>	<b>SITE INFORMATION</b> .....	<b>12</b>
<b>4.1</b>	<b>Site Summary</b> .....	<b>12</b>
<b>4.2</b>	<b>Affected Parties</b> .....	<b>13</b>
<b>5.0</b>	<b>PROJECT DEVELOPMENT OVERVIEW</b> .....	<b>14</b>
<b>6.0</b>	<b>PRINCIPLES TO MINIMISE ENVIRONMENTAL EFFECTS</b> .....	<b>15</b>
<b>6.1</b>	<b>Potential Adverse Environmental Effects</b> .....	<b>15</b>
<b>6.2</b>	<b>Register for Environmental Effects</b> .....	<b>15</b>
<b>7.0</b>	<b>SITE CONSTRUCTION PROCEDURES &amp; PROVISIONS</b> .....	<b>18</b>



7.1	Site Establishment .....	18
7.2	Construction Area .....	18
7.3	Temporary Storage of Fuels, Lubricants and Hazardous Materials .....	19
7.4	Waste Management .....	20
7.5	Wastewater Sewage from Site .....	20
7.6	Site Access and Construction Traffic .....	20
7.7	Operating Hours of Work .....	20
8.0	EARTHWORKS .....	21
8.1	Establishment of Earthworks .....	21
8.1.1	Notify neighbours .....	21
8.1.2	Site clearance and tree protection .....	21
8.1.3	Contaminated Kauri dieback disturbance area .....	22
8.1.4	Archaeological .....	22
8.1.5	Land contamination .....	22
8.1.6	Civil and geotechnical works .....	22
8.3	Health & Safety .....	23
8.4	Completion – Land Stabilisation .....	24
9.0	GOLF COURSE CONSTRUCTION .....	25
9.1	Site Clearing and Vegetation Removal .....	25
9.2	Earthwork Contour Plans .....	25
9.3	Earthwork Cut & Fill Plans .....	26
9.4	Sediment & Erosion Control Plans .....	27
9.5	Earthwork Activities .....	27

9.5.1	Establish sediment controls.....	27
9.5.2	Establish kauri dieback management controls .....	27
9.5.3	Topsoil removal, stockpiling and re-spreading .....	27
9.5.4	Bulk cut and fill .....	27
9.5.5	Golf course contour shaping.....	28
9.5.6	Fairway and primary rough construction .....	28
9.5.7	Transition area treatments .....	28
9.5.8	Trenching.....	28
9.5.9	Golf Course Tee Construction .....	28
9.5.10	Golf Course Green Construction.....	28
9.5.11	Golf Course Bunker Construction .....	29
9.5.12	Grow in or Turf Establishment .....	29
10.0	CONSTRUCTION OF BRIDGES .....	30
11.0	WATER RESERVOIR.....	31
12.0	CONSTRUCTION OF CULVERTS .....	32
13.0	PROTECTION OF WATER COURSES.....	32
14.0	TRENCH DEWATERING .....	33
15.0	DUST.....	33
16.0	CONSTRUCTION NOISE .....	33
16.1	Performance Standards .....	33
16.2	Noise Mitigation .....	34
16.3	Noise Complaints .....	34
17.0	INSPECTIONS, REPORTING AND RECORDING .....	34

<b>17.1</b>	<b>Inspections.....</b>	<b>34</b>
<b>17.2</b>	<b>Reporting.....</b>	<b>35</b>
<b>17.3</b>	<b>Incident Register .....</b>	<b>35</b>
<b>17.4</b>	<b>Monitoring .....</b>	<b>35</b>
<b>17.5</b>	<b>Recording and Documentation .....</b>	<b>35</b>
<b>18.0</b>	<b>CONTINGENCIES .....</b>	<b>36</b>
<b>18.1</b>	<b>Discharge of Sediment .....</b>	<b>36</b>
<b>18.2</b>	<b>Discharge of Fuels, Lubricants, and Hazardous Materials .....</b>	<b>36</b>
<b>18.3</b>	<b>Discharges into the Air .....</b>	<b>37</b>
<b>18.4</b>	<b>Fire .....</b>	<b>37</b>
<b>19.0</b>	<b>COMPLETION OF CONSTRUCTION .....</b>	<b>38</b>
<b>19.1</b>	<b>As Constructed Document – As Built .....</b>	<b>38</b>
<b>19.2</b>	<b>As Constructed Document - Earthworks Completion Report .....</b>	<b>38</b>

**Appendices**

APPENDIX A	MCCL ENGINEER DRAWING FOR RESOURCE CONSET (attached separately)
APPENDIX B	KAURI DIEBACK TREE REMOVAL AND EARTHWORKS PROCEDURES (attached separately and prepared by Peers Brown Miller)
APPENDIX C	DRAFT DUST MANAGEMENT PLAN (DMP) – (Prepared by MCCL)
APPENDIX D	GOLF COURSE OPERATIONS AND MAINTENANCE – (attached separately and prepared by NZ Turf Institute & Steve Marsden Turf Services Ltd)

Figure 1 – Site Location Aerial Photograph .....	12
Figure 2 - Site Layout with Preliminary Earthworks Staging concept .....	19
Figure 3 – Clearing Plan for Holes 4, 5 & 6 (prepared by MCCL) .....	25
Figure 4 – Golf course final contour plan for Holes 4,5 & 6 (prepared by MCCL) .....	26
Figure 5 – Golf course Cut and Fill Plan (prepared by MCCL) .....	26
Figure 6 – Erosion & Sediment Control Plan for Holes 4, 5 & 6 (prepared by MCCL) .....	27

## 1.0 INTRODUCTION

McKenzie and Co Consultants have been engaged by The Bears Home Project Management Ltd (the Consent Holder) to prepare a preliminary Construction Environmental Management Plan (CEMP) for the proposed Muriwai Downs Golf Resort (the Project). This Draft CEMP has been prepared to support the Resource Consent application for bulk earthworks and construction activities for “the Project”. This Draft CEMP has been prepared to set out a pathway for the appointed Contractor to prepare a Final CEMP prior to the commencement of the proposed contract works.

## 2.0 PURPOSE & OBJECTIVE OF THE PLAN

### 2.1 Purpose & Scope

This Draft CEMP has been prepared to set out a pathway to ensure all statutory requirements and standards will be adopted by all Contractor organisations, their employees, and sub-contractors during the construction phase of the Project so to mitigate adverse impacts resulting from construction activities on the receiving environment.

The Draft CEMP is to be used as a guide for the 'Contractor' when preparing the Final CEMP for approval. Any appropriate resource consent conditions will also be included in the Final CEMP.

The extent of the project works (i.e., construction phase) comprises of:

- Site clearance of vegetation
- Working within or adjacent to natural features with high ecological value (e.g., wetlands and native vegetation)
- Importation of materials
- Bulk earthworks (i.e., cut and fill operations)
- Civil infrastructure construction
- Geotechnical remediation
- Restoration of vegetation and planting

### 2.2 Objective

The CEMP for the Project sets out the following objectives:

- To ensure that all requirements of the CEMP and statutory requirements of the Resource Consent are complied with and implemented by all stakeholders throughout the duration of the works.
- To ensure all steps are taken to care for and protect the environment.
- To carry out the works taking all necessary steps and processes to ensure the Health and Safety of all staff, sub-contractors, and the public.
- To ensure no adverse effects to neighbouring properties, community and sensitive receiving environments resulting from any activities onsite throughout the duration of the works.

### 2.3 Implementation of the CEMP

This CEMP will be included with the tender documents. Following award of the contract to the successful contractor, the Contractor shall be required to prepare a detailed CEMP and submit for review and provisional approval to the Engineer prior to issue to Auckland Council Manager, Resource Consents for final review and approval.

- The Contractor must ensure the CEMP is a comprehensive single document that demonstrates all statutory requirements and Resource Consent conditions can be satisfied and complied with.
- The Contractor shall identify and set out specific procedures and measures that will implement the provisions of this Draft CEMP. The Contractor CEMP shall nominate staff who will be responsible for implementing and ensuring compliance with the provisions of the approved CEMP.
- The Contractor shall take the necessary steps to adopt a pro-active approach to the management of the site by the following means:
  - Considering the potential for adverse effects resulting from the various and specific construction activities during their planning stage of the Project,
  - Planning all activities to ensure compliance is achieved with all Resource Consent conditions.
- The Contractor shall ensure that everyone on site is familiar with the CEMP and that these staff member know



who is responsible for the implementation of the procedures/monitoring of the works. The Contractor shall also ensure that all sub-contractors and site logistics organisations dealing with the project are familiar with the site CEMP.

- The Contractor shall ensure that a copy of the approved final CEMP is kept onsite for reference by all onsite staff, external regulatory monitors, and the Engineer to the Contract.

#### 2.4 Health & Safety

The Contractor shall be in total control of the site and take all responsibility for all staff, sub-contractors, authorised visitors, and the public to ensure their Health & Safety. The Contractor shall prepare a site-specific Health and Safety Plan and submit to the Engineer for review and approval.

#### 2.5 Updating the CEMP “Live Document”

This Draft CEMP is considered a ‘live’ document and as such will be reviewed on a regular basis. Updates to this CEMP may be necessary due to any changes in environmental management practices, works activities and/or contractors.

As detailed in the later sections, the procedures agreed in this CEMP will be audited throughout the project roll-out phase to ensure compliance.

Following granting of the Resource Consent, a final CEMP will be prepared by the Contractor and submitted to the Engineer to the Contract for review prior to issuing to the regulatory authority for approval. This will ensure all Resource Consent condition requirements are incorporated with further detail on the Contractors proposed works methodology also set out to demonstrate how the works will be achieved.

## 3.0 ROLES AND RESPONSIBILITIES

### 3.1 Principal and Consent Holder

The Principal as the Consent Holder shall be responsible for ensuring that the site works are undertaken in accordance with this CEMP and Resource Consent conditions. This also includes ensuring that all site staff and subcontractors are aware of and comply with the procedures and the Health & Safety requirements contained within this document. The Consent Holder shall also appoint the Engineer to the Contract and the Contractor.

### 3.2 Engineer to the Contract

Appointed by the Consent Holder, the Engineer to the Contract shall carry out the required inspections to ensure the site work activities are undertaken in accordance with the finalised CEMP (and any other Management Plans) and the Resource Consent conditions including any statutory requirement and standards required.

### 3.3 Contractor

Appointed by the Consent Holder, the Contractor will be responsible for implementing site management controls during the works, daily inspections, record keeping and reporting to Engineer to the Contract.

The Contractor shall also update and finalise the CEMP to reflect their proposed construction methodologies and sequences. The final updated CEMP will then be provided to the Engineer.

The Contractor shall ensure that all construction activities required to be undertaken throughout the Project are carried out in accordance with the contract and specifications, CEMP, Resource Consent, and statutory requirements. The Contractor shall also ensure that the appropriate training to all staff onsite and sub-contractors are provided to ensure compliance with the CEMP and statutory requirement are achieved.

To facilitate compliance with the CEMP and Resource Consent the Contractor will appoint a Site Construction Manager (SCM) prior to the commencement of works on the site.

### 3.4 Site Construction Manager

The appointed Site Construction Manager (SCM) will take the responsibility for all activities on the site. The name, qualifications and contact details shall be provided in the CEMP.

The SCM will be responsible to put measures in place to ensure the site in its entirety is secure to deter unauthorised persons access onto the site. The SCM will also be responsible to provide and maintain provisions for internal traffic management and control in accordance with provisions set out in the contract and the Health & Safety Plan. To assist with the day-to-day implementation of the CEMP the Contractor and SCM can appoint site supervisory roles who will be responsible for Environmental Management and Health & Safety matters onsite and shall report directly to the SCM.

The SCM shall maintain daily records that will include:

- Records of plant and equipment operating onsite including the daily safety and maintenance checks of the plant or equipment used.
- Records of weather monitoring.
- Record site visitors and inductions.
- Records of routine and monitoring of Health and Safety measures.
- Records of routine and monitoring of Environmental Controls
- Records of routine and monitoring of Sediment Erosion Controls.
- Records of any complaints received, and the mitigation measures taken to attend to the complaint.

The SCM will be the designated point of communication between the Contractor and the Auckland Council designated regulatory staff. The SCM will communicate and meet as is required with the Auckland Council regulatory

staff to ensure compliance with the Resource Consent conditions and required regulatory standards and requirements.

Prior to the works commencing onsite, the Consent Holder shall convene an onsite pre-construction meeting with the SCM, the Engineer to the contract and the Auckland Council nominated Environmental Monitoring staff member. A minimum of one weeks' notice by the Consent Holder will be provided to all parties to ensure their attendance the pre-construction meeting.

## 4.0 SITE INFORMATION

The site consists of several separate titles which are outlined in summary below. The site is irregular in shape and combine to a total area of 507Ha. Muriwai Road traverses the central portion of the site with the main conglomerate of properties located to the north and second smaller parcel to the south of Muriwai Road.

The site is zoned Rural Production which is the current land use.

There are several intermittent streams/open watercourses that traverse across the site within natural gully features and tribute into a main permanent stream (Auckland Council Id# 32176) which defines the sites northern boundary. The permanent stream ultimately discharges to Muriwai Beach approximately 2.0km west of the site.

There are several wetland areas associated with these intermittent streams which hold intrinsic ecological value. Information available on the Auckland Councils AUP GeoMaps indicates these wetland areas to hold significant ecological value and are designated as protected Significant Ecological Areas (SEA).

Lake Ōkaihou is located within the site, adjacent to the western boundary, which will remain as a protected water body.

There are also various locations across the site that host exotic and indigenous vegetated areas (e.g., Kauri) which have been identified to hold significant value and must remain protected. Consultation with the sites ecologist and arborists must be carried out for works within proximity of these areas.

Auckland Council information also indicates several areas of archaeological interest on site.

The site is located adjacent to Muriwai Road as shown in Figure 1 below.

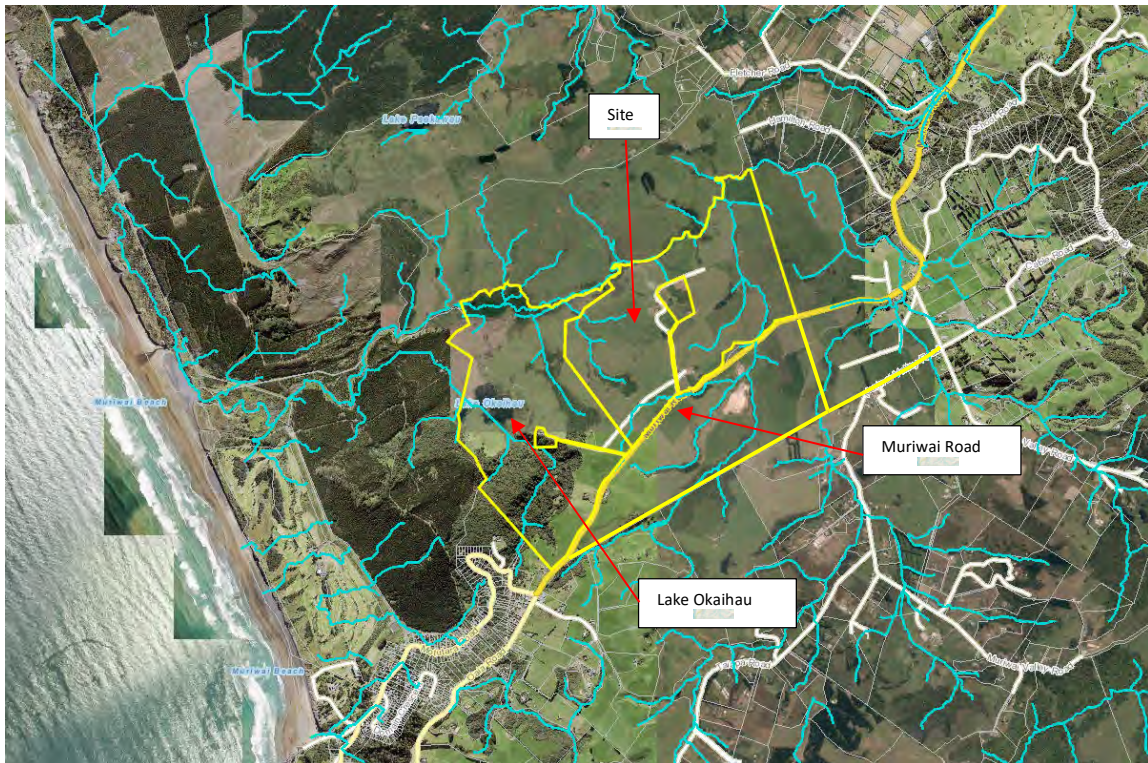


Figure 1 – Site Location Aerial Photograph  
(Courtesy of Auckland Council GeoMaps - dated 30/09/2021)

### 4.1 Site Summary

Site Address: 451, 610, 614, 670, 697 Muriwai Road, Muriwai Valley

Legal Site Description: Lot 4 DP 187060, Lot 3 DP 196479, Sec 3 SO 41485, Lot 1 & 2 DP 196478, Lot 1 &

	5 DP 187057, Lot 5 DP 187061
Site Area:	504.3115 Ha (combined).
Current Land Use:	Rural
Zoning (AUP):	Rural – Rural Production Zone. Water – Encompasses Lake Okaihua
Overlays:	Natural Resources: Significant Ecological Area Quality-Sensitive Aquifer Management Areas – Kaipara Sand Aquifer (rp) Natural Heritage: Outstanding Natural Features – Toroanui & Okintoto Falls (within 610 Muriwai Road)

#### 4.2 Affected Parties

Notable immediate neighbouring properties and their occupants (i.e., rural residential) with the potential to be affected by the proposed construction activities for the Project:

- 171 Fletcher Road.
- 1, 17, 25, 33, 37, 45, 53, 63, 71, 89, 93, 117, 127, 129 & 133 Hamilton Road.
- 378, 380, 388, 394, 433, 434, 451 & 774 Muriwai Road.
- 27 & 41 Valley Road.
- 5, 51, 67, 68, 102 & 104 Muriwai Valley Road
- 43 & 47 Coster Road.
- 75 Motutara Road.
- 417 Rimmer Road (Woodhill Forest block).
- Public road users on Muriwai Road (i.e., road widening activities).

## 5.0 PROJECT DEVELOPMENT OVERVIEW

The Project will develop the site as a recreational resort style 19-hole golf course with associated site facilities, lodging, amenities (e.g., buildings, internal roads, carparking, walkways) and water storage (reservoir).

Bulk earthworks over an area of approximately 99ha involving approximately 590,000m<sup>3</sup> (solid measure) total quantity of combined cut to fill will be required to form, shape, and construct the development of the golf course and associated amenities (e.g., internal roads, road widening and building platforms etc.) and inclusive of an irrigation reservoir.

The irrigation reservoir that will be dedicated for water storage to facilitate the on-course water irrigation. This water reservoir is to be located across the south-eastern portion of the site (451 & 670 Muriwai Road) immediately adjacent to Muriwai Road. The expected bulk earthworks will involve a balanced combined cut to fill operation.

The Project will also require the construction of an internal private roading network with associated car parking facilities. Stormwater disposal and treatment swales will also form part of these works. The internal private roading network will ultimately connect to Muriwai Road via two separate access locations. These two locations will require some upgrade to provide appropriate connection to the existing public arterial road (i.e., road widening).

The earthworks and construction of amenities have been designed to minimise impacts on wetlands, streams, and significant vegetation areas.

The construction of 13 accessway bridges are proposed to cross various SEAs, wetlands and streams to minimise works within/near these existing features. These bridge crossings will have their foundations/abutments designed so to avoid any works within natural wetland areas and minimise land disturbance and/or vegetation clearance.

The Contractor will need to prepare and implement a stringent management approach to these works and earthworks near streams and wetlands to minimise adverse construction effects.

Without a selected Contractor currently, there is no clear and precise construction programme available. However, we would envisage that with the extent and scale of the works required for the Project a broadly estimated programme would likely extend across 3-4 seasons (i.e., 2-3 years).

When finalising the CEMP and contract programme, the Contractor will need to coordinate closely with the golf course design team and their golf course construction specialists and shapers as well as the farmer.

For further details pertaining to the Bulk Earthworks, associated Civil works and Environmental Management concepts for the development refer to the attached Earthwork and Civil Engineering Drawings prepared by McKenzie & Co Consultants Ltd (Appendix A). These plans include:

- Existing Topography Plans
- Clearing Plans
- Contaminated Kauri Dieback Disturbance Plans
- Final Contour Plans
- Cut and Fill Plans
- Erosion Sediment Control Plans
- Bridge Crossing Detail Plans
- Water Reservoir Plans
- Roading Plans
- Stormwater, Wastewater, Water Supply and Utility Plans



## 6.0 PRINCIPLES TO MINIMISE ENVIRONMENTAL EFFECTS

### 6.1 Potential Adverse Environmental Effects

The Project will involve various activities that can potentially lead to the following adverse environmental effects:

- Noise.
- Discharge of contaminants to air (e.g., dust).
- Discharge of sediment from disturbed/exposed land.
- Erosion of soil.
- Contamination of water, soil, ground, and stormwater from construction activities.
- Litter and waste materials.
- Damage to archaeological features.
- Traffic effects.
- Effects on fish, birds, lizards, and other fauna
- Effects to neighbouring landowners and livestock.
- Effects on native and exotic vegetation and flora.

### 6.2 Register for Environmental Effects

An Environmental Effects Register for the potential effects listed in section 6.1 above has been prepared (refer Table 1 below). This register is to highlight and bring awareness to the potential adverse effects and methods to eliminate, mitigate and minimise throughout the duration of the Project. This register will be updated on a regular basis (i.e., monthly) by the Contractor's Environment Manager. Please note prior to works the effects register will be updated based on appropriate Resource Consent conditions.

Table 1: Environmental Effects Register

Adverse Effect	Activity causing effect	Avoidance or minimise	Potential Mitigation Measures	Monitor and Report	Contingency
Noise	Plant & Equipment in poor condition. Use of unsuitable equipment.	Secure attachments, chains, tail gates and fixtures. Good/courteous practices around vehicles. Keep equipment in good condition. Training of operators. Selection of appropriate equipment.	Install noise suppression equipment where required. Ensure regular maintenance. Restrictions on allowable hours of work.	Daily inspection and report	Cease work until appropriate time and conditions to carry out activity. Cease work until plant or equipment is repaired
Air Contaminant discharge	Dust discharges from earthworks or transport of materials.	Minimise the areas of disturbance. control vehicle speeds. cover loads and train staff /operators, wind conditions	Water carts or sprinklers to dampen and suppress dust sources.	Follow Dust Management Plan. Daily inspection and report	When activity triggers dust emission halt work to until conditions improve and or measures implemented

Nuisance effect to neighbouring properties	Restriction to property access	Programme works during convenient times for neighbours	Adequate warning and communication with effected neighbours	Regular communications with neighbouring residents	
Sediment discharge to receiving environment (e.g. land, waterways)	Runoff from exposed and disturbed areas	Minimise the area of disturbance. Compact and cover all stockpiles. Avoid direct discharge of runoff into waterways.	Treatment using Clean water diversion, cut off drains, silt fences, DEBs, filter socks, hard site access routes and settlement tanks.	Daily inspection and weekly/monthly reports. Rigours Inspections to occur prior to any known high rainfall events	Increase and implement extra sediment measures as required.
	Discharge of sediment laded water from works in proximity to streams.	Divert stream away from works area e.g. over pumping from upstream to downstream. Plan works for when weather forecast is dry	Silt fences installed downstream, of works area	Daily inspection. Follow Stormwater Management Plan	Halt works until conditions improve
	Discharge of sediment laden water from dewatering process.	Prevent and intercept water from entering excavations. Avoid scour/erosion when discharging dewatering across stabilised area (e.g geotextile)	Treatment using sediment holding tanks for appropriate discharge into settling devices.	Daily inspection	Halt works until conditions improve
Soil Erosion	Concentrated runoff from adjacent areas onto exposed areas	Prevent water from entering the excavations. Limit areas of open excavation.	Don't open new trench when poor weather forecast. Fill / repair erosion damage.	Daily inspection. Follow Sediment & Erosion Plan	Halt works until conditions improve
Onsite waste and litter	Waste materials and bins not cleared or emptied	Ensure Bins are readily available. Staff training	Regular collection service regime put in place	Daily inspection	Clean up
Harm to aquatic life	Works in or near streams and wetlands	Prepare separation barriers to stream and wetland	Silt fences, provide passage for relocation if required	Monitor daily	Ensure barriers 100% effective, include new and repair maintain existing controls
Damage or loss to native vegetation	Removal of vegetation to construct golf course and amenities	Liaison with Development Arborist. To set restriction zones for works in proximity	Minimise removal of natives – agree with arborist and regulator	Monitor daily and report	

		of vegetation	monitoring		
Harm to bird life	Clearance of vegetation in proximity to nesting birds	Cordon off area of nesting until breeding season is complete	Carry out inspections prior to clearing to identify any bird life	Monitor inspections and report	
Harm to lizards	Clearance of vegetation in proximity to lizards	Identify any lizards prior to clearing and relocate	Carry out inspections prior to clearing to identify any lizards	Monitor inspections and report	
Disturbance and / or accidental discovery of Archaeological sites	Excavation of earth and fill placement	Areas identified to be restricted. Any new area identified to be communicated to Project archaeologist	Accidental discovery protocols to be put in place. Ongoing liaison with Project archaeologist and iwi monitors. Any archaeological site to be clearly fenced off and appropriate warning signage to be erected	Regular ongoing monitoring	Cease work until archaeologist approves further work.
Nuisance to Neighbours	Working within proximity to private property close to dwellings.	Programme works for when neighbouring occupiers are not on site.	Provide advanced warning and communications to all neighbours	Regular communications with neighbours	
Traffic impacts – Muriwai Road	Construction within road corridor	Restrict works during weekend and holiday season. Work one lane	Traffic Management Plan implemented, advanced consultation with local residents	Comply with Traffic Management Plan. Daily monitoring and assessment with reporting	Night works for lane closures if required (e.g., pipeline installations)

## 7.0 SITE CONSTRUCTION PROCEDURES & PROVISIONS

This section of the CEMP identifies a series of procedures and provisions that will be adopted to implement measures to avoid, minimise or mitigate adverse environmental effects during the various construction activities for the Project. These procedures cover the following:

- Site Establishment
- Site Access and Construction Traffic
- Construction Area
- Waste Management
- Operating Hours of Work
- Site Clearance and Tree Removal

### 7.1 Site Establishment

Once the Contractor is awarded possession of site, the Contractor can commence with site establishment. The Contractor must check that all consent approvals are in place and obtain copies if not already provided by the Consent Holder before any site works can commence.

The Contractor will be responsible to ensure that all affected neighbours are notified of the works commencing. The Contractor shall respect their rights and advise any such neighbours which may be affected by any activity of works on the site (e.g. access restrictions etc). The Contractor must also consider the needs of livestock or animals that may be affected by the works onsite.

Site establishment will include but not be limited to the following activities:

- Erecting appropriate site fencing to secure the work site.
- Site compound area for site office and amenities (e.g staff lunchroom, toilets and washing facilities)
- Stabilised site access and material laydown areas (Note: to be constructed with guidance from Auckland Council GD05/2016).

No part of the works shall commence until the Contractor has prepared a final CEMP which will include their construction method statement to be approved by the Engineer. The Contractor shall also submit for approval by the Engineer (and ultimately Auckland Council), copies of the Health & Safety Plan (H&S Plan), Environment Management Plan (EMP), Traffic Management Plan (TMP) and Dust Management Plan (DMP).

The Contractor shall ensure that copies of the relevant regulatory consents, the approved CEMP, any documentation required to satisfy Resource Consent conditions and records of all monitoring of environmental protection works are held and maintained at the Site office. These documents shall always be readily available for reference by the Engineer to the contract and or appointed representatives of Auckland Council.

The Contractor shall include an area as part of the site office that can easily be distinguished as a visitor reception area. All visitors shall sign in and receive briefings and or site inductions on site safety and environmental activities before entering the site. Sufficient signed carparking for visitors located adjacent to the site office and reception area is advisable.

The Contractor shall ensure the site office hosts an area to allow for clear and visible signage and notice boards which will provide all visitors, staff and sub-contractors relevant information pertaining to Site Management, contact details, Health & Safety, Environmental Management, and current construction activities.

### 7.2 Construction Area

Due to nature and extent of the Project, construction will occur at number of differing locations across the site. These can be split into separate stages or phases to make construction more manageable and efficient.

The likely approach of breaking the site into 4 main phased zones of works could be adopted similar as depicted in Figure 2 below:

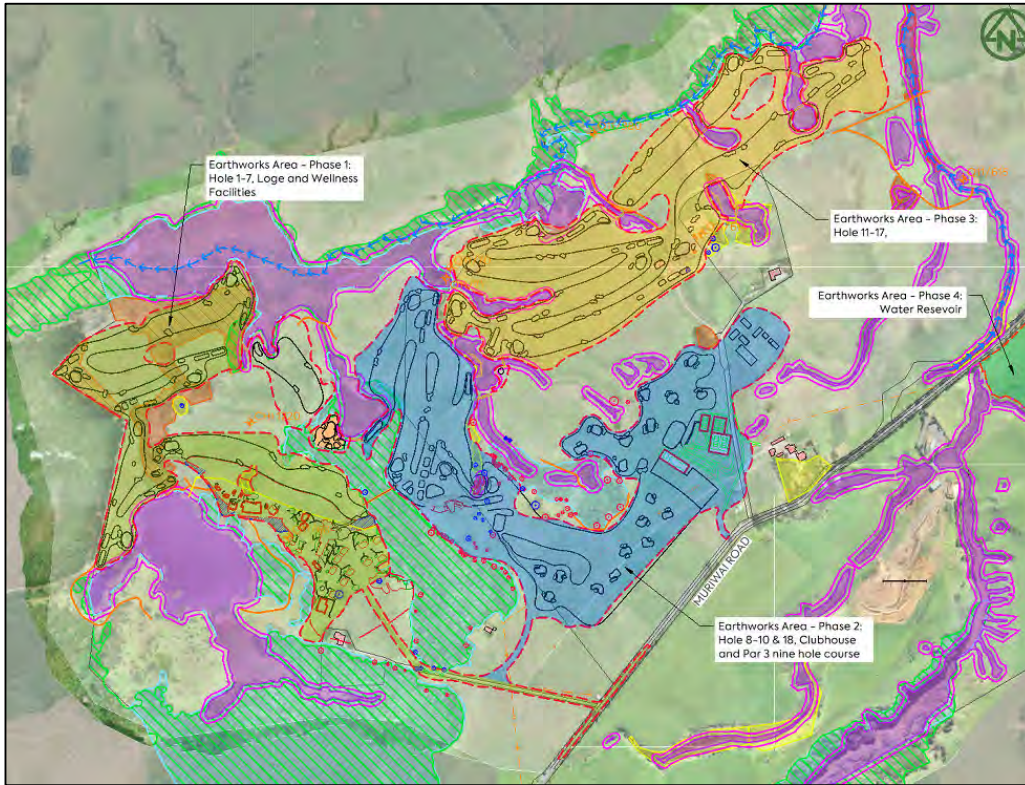


Figure 2 - Site Layout with Preliminary Earthworks Staging concept

In terms of the earthworks and civil works, the site broken into 4 possible phases would see Phase 1 consisting of Holes 1-7 and Lodge and wellness facilities, Phase 2: Holes 8-10, 18 Clubhouse and Phase 3: Holes 11-17 and Phase 4: Water Reservoir works. We note that this proposed methodology is indicative only and may vary depending on the appointed Contractor.

The Contractor will need to coordinate with the golf course design team and the construction specialist to understand the specific construction details required to facilitate the desired finished outcome for the golf course and amenities. This will aid the Contractor to formulate a specific methodology to phasing the works. The proposed methodology will be presented and agreed between the Contractor, Engineer, and the Consent Holder. This final methodology will be confirmed in the final CEMP.

Suitable signage, fencing, barriers or any other measures shall define the works areas once agreed and approved as a "Construction Zone" and ensure the prevention of unauthorised public access. The Contractor shall adhere to the strict 10m buffer zone provided around all wetland (SEA) areas.

### 7.3 Temporary Storage of Fuels, Lubricants and Hazardous Materials

It is envisaged that mobile tankers or trailers will be used to dispense fuel to plant, vehicles and equipment on site. All fuel tankers will carry a suitable spill kit. Should the Contractor plan to hold temporary bulk storage of fuel on site, then appropriate bunding and containment measures to prevent spillage of fuel should be put in place.

A dedicated hazardous substances container will be used on site to store all hazardous materials. These hazardous substances to be stored will likely include fuels for hand-held equipment, lubricants and oils and construction chemicals. The storage container will have an internal bund to capture and contain any spillages. Spill kits will be provided to tend to any spillage. Gas/LPG bottles will be stored in external racks with large vents to minimise the risk of any gas build up.

An inventory of fuel, lubricants and hazardous materials will be maintained and checked monthly to ensure there is no loss to these materials through leakage. All storage facilities will be inspected on a weekly basis to ensure that there is no leakage of materials. Material Safety Data sheets for all substances will be kept in the storage container and site office.

A sign identifying the spills protocol will be placed on the wall of the container.

The Contractor shall comply with Hazardous Substances and Noxious Organisms (HSNO) and Work Safe regulations for appropriate storage, handling and application practices.

#### 7.4 Waste Management

The construction site will have a variety of waste streams. Waste management will be the responsibility of the Contractor to which they must always ensure and maintain clean and tidy site conditions with regular removal of rubbish and waste materials. The Contractor shall also where practical implement re-use and or recycling of waste materials so to minimise waste to landfill.

No significant amounts of hazardous material should be held onsite. Any small quantities held on site shall be stored and disposed of in a manner appropriate to the HSNO classification.

#### 7.5 Wastewater Sewage from Site

Only toilet and wash facilities with holding tanks will be permitted onsite.

#### 7.6 Site Access and Construction Traffic

Site access will be off Muriwai Road which is classified as a public Arterial Road. The Contractor will need to prepare for approval a Traffic Management Plan (TMP) which will be a requirement of the consent. The Contractor shall be responsible for obtaining the appropriate Corridor Access Request (CAR) in line with the TMP and ensuring these documents are always in place and valid. This CAR shall be made with Auckland Transport a minimum of 10 working days prior to commencement of the works. Confirmation (i.e. copies) of these Works Approval Permits must be provided to the Engineer to the contract for review and record prior to any works onsite.

The Contractor shall ensure access to site is limited to people who have been inducted. Short term visitors shall always be escorted by an inducted member of staff. Appropriate signage shall be put in place to direct construction traffic to the approved designated access points.

Parking for all visitors to site will be at the designated compound area and no parking should be permitted on Muriwai Road at any time. The Contractor shall ensure adequate provisions are provided with the appropriate traffic management measures for parking onsite.

Plant and equipment storage and services areas must be confined to the site compound area. Onsite servicing of plant and or equipment shall be carried out on concrete floors which drain to a sump for regular emptying by vacuum service vehicles for disposal to a suitable disposal site.

The Contractor must provide an appropriate area to wash down site construction vehicles prior to exiting the site via the stabilised access points. The wash down area shall be constructed as per the guidance of GD05/2016 document and located as close as practical to the stabilised access point/s to avoid any further tracking of sediments off site. Wash down areas shall be regularly maintained to ensure effective control of sediment from the site.

Throughout the duration of the works, the Contractor will keep records of movement and monitor the condition of the vehicles leaving the site. Precautionary measures will need to be arranged so that at short notice the public road if deemed to be laden with sediment and or spoil should be cleaned up (e.g., road sweeper). This activity will need to be included in the TMP.

#### 7.7 Operating Hours of Work

Generally, hours of work on the site will be specified under the resource consent (typically 7am to 7pm, 6 days a week). This will be subject to suitable weather and work conditions. Note the Resource Consent conditions will overarch should conditions vary for working hours. No work is permitted on Sunday or Public Holidays.



## 8.0 EARTHWORKS

*Note: Please refer to the Erosion and Sediment Control Plan set (Drawings 1976-1-230 to 242) prepared by MCCL for details of proposed sediment controls in accordance with Auckland Council Guideline document 2016/GD005 – “Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region” – GD005*

Prior to commencement of the earthworks, the Contractor shall review the approved Resource Consent conditions and prepare a final Environmental Erosion and Sediment Control Plan (ESCP) for review and approval by the Engineer and the Auckland Council representative.

Once approved, a pre-construction meeting will be held between the Contractor, the Engineer and the Auckland Council Monitoring representative. The Contractor shall provide copies of all documentation as required by the Resource Consent conditions which generally are as follows:

- A final CEMP including Construction Programme
- Health & Safety Plan
- Copies of Insurances put in place for the contract
- Erosion and Sediment Control Plan
- Chemical Treatment plan for Ponds and Decanting Earth Bunds
- Adaptive Management Plan if required for SEA management
- Dust Management Plan

Following site establishment of site compound, security measures, amenities and environmental controls, site clearance can commence in accordance with the approved clearance plans. On completion of the site clearance Bulk Earthworks can be initiated.

### 8.1 Establishment of Earthworks

The combined earthworks area will cover approximately 99 ha which will involve cut to fill operations with an approximate combined volume expected to be in the order of 590,000 m<sup>3</sup> (includes topsoil). These proposed earthworks will be carried out not only for the construction of the golf course, practice facilities and amenities (i.e., building platforms, private roads & carparking etc.) but also the proposed water reservoir located on the south-eastern portion of the site.

The Contractor will be responsible for preparing their works methodology and associated programme to carry out these works. As a broad time-guide, we would estimate the earthworks/construction program to extend across approximately 2-4 seasons (2-3 years).

Due to the size and nature of the project, it would be beneficial to stage or phase the works so to minimise and confine exposed works area to smaller manageable portions. Doing this will minimise risk of adverse effects to the receiving environment and would also be advantageous in allowing progressive stabilisation and turf establishment on the completed parcels of golf course.

Prior to earthworks and critical work phases throughout the construction the following items shall be addressed.

#### 8.1.1 Notify neighbours

Firstly, neighbours and affected parties shall be notified a minimum of 5 working days in advance of the earthwork operations commencing.

#### 8.1.2 Site clearance and tree protection

The Project proposes to remove some existing vegetation as shown on the site clearance plans (Refer to MCCL Site Clearance Drawings 1976-1-180 to 192-Appendix A).

Prior to earthworks commencing in a designated earthworks and construction area, the removal of selected

vegetation is to be undertaken. A pre-construction meeting shall be undertaken with the SCM, the Project's arborist and ecologist to establish the areas of specific trees to be retained and identify what is permitted to be removed. The Contractor will then put measures in place to cordon off and clearly mark out the areas to be retained to ensure no works activities within those areas. Once the Contractor has put in place these barriers and established the required approved sediment controls, site clearing can commence.

On completion of the vegetation removal, the Contractor will establish sediment controls which will consist of super silt fences adjacent to SEA area (and around abutment areas), then sediment diversion bunds followed by sediment management devices such as sediment ponds or decanting earth bunds. Upon completion of all sediment control measures, the area is to be reviewed by the engineer and council environmental compliance representative and if agreed ground disturbing activities can commence. Sediment control measures are to be inspected daily and immediately prior to periods of forecast rain and any defects remedied. Once earthworks are completed and exposed areas are stabilised sediment controls can be removed and immediately stabilised.

#### 8.1.3 Contaminated Kauri dieback disturbance area

It should be noted that there are significant kauri tree specimens located across the site which must be retained and protected. Throughout a large part of New Zealand there is a current issue with Kauri Dieback Disease. This disease is susceptible to kauri trees of all ages and size. It is generally spread through both water and soil with soil movement on equipment such as footwear and machinery.

There are several kauri tree specimens that have been identified for removal following assessment by the Project's ecologist – (Refer to MCCL Site Clearance Drawings 1976-1-190 to 192-Appendix A). The plans indicate kauri dieback containment areas which will require specific protocols for any proposed work activities.

We attach with this CEMP, a Tree Removal and Earthworks Procedure Plan (Appendix B) which has been prepared by Peers Brown Miller Ltd (Arborist). This plan gives specific guidelines for managing kauri dieback outlining safe and appropriate removal and earthworks activities within proximity to any kauri tree specimens. It is important that the Contractor implements this plan and consults with the project's arborist and ecologist before any works activities are to take place in proximity to these trees. The exact same approach for the establishment of erosion and sediment controls as discussed in section 8.1.2 shall be adopted by the Contractor.

#### 8.1.4 Archaeological

Areas identified as archaeological sites shall be protected and appropriate setbacks established. If kōiwi, taonga or other archaeological material is discovered in any area during the works, work shall immediately cease and the Contractor must notify the Consent Holder who shall in turn contact the local iwi, Heritage New Zealand Pouhere Taonga and Auckland Council within 24 hours of the find.

Note: Evidence of archaeological material may include burnt stones, charcoal, rubbish heaps, shell, bone, old building foundations, artefacts, and human burials.

#### 8.1.5 Land contamination

A Preliminary Site Investigation (PSI) and a Detailed Site Investigation (DSI) has been prepared by Pattle Delamore Partners Ltd. A Contaminated Soil Management Plan (CSMP) will be required prior to undertaking any earthworks within the discrete areas of the site where HAIL activities have occurred and contaminants have been detected in soil samples at concentrations above the published background concentrations of non-volcanic soils in the Auckland region (i.e., the Former Boarding House, Sheep Spray Shower & Woolshed, and Treated Timber Storage areas). The CSMP will detail the appropriate soils handling and disposal measures that must be implemented, commensurate with the concentrations of contaminants observed at these areas of the site as well as to manage any unexpected discovery of previously unidentified contamination at the site.

All works will be undertaken in accordance with the CSMP as relevant.

#### 8.1.6 Civil and geotechnical works

Construction of any geotechnical stabilisation works such as palisade, earth or gravity retaining walls, underfill

counterfort drainage and stormwater culverts should be constructed where possible prior to bulk earthworks commencing. These items can generally be undertaken without exposing large areas of unconfined material and can generally be controlled with silt fencing.

Stormwater and or subsoil drain outlets into the streams and wetland areas should have specific super silt fencing as sediment barriers and where practical produce as little disturbance as possible for example hand works rather than heavy tracked machinery. These areas should be stabilised as soon as possible following completion of construction. The location of the geotechnical works and outlets should be made in consultation with the Project's Arborist and Geotechnical Engineer.

The formation and construction of any building platforms, roading, pedestrian paths and bridges in proximity to (SEA) wetland areas or streams shall have specific super silt fencing as sediment barriers where practical. Generally, the foundations for the proposed bridges will be designed with locations as best practical outside these SEA areas but there will be some localised areas that may require works within. Regardless, due to proximity either nearby or within the SEA stringent sediment controls at minimum. These works and any temporary works required for the bridge construction should be consulted with the project arborist, ecologist, and geotechnical engineer.

## 8.2 Control and Management of Sediment Discharge

Sediment Control measures will be constructed onsite prior to stripping topsoil and or removal of vegetation in accordance with the Contractors ESCP (Note, to be approved by Auckland Council). The major controls will include Sediment Retention Ponds (SRP), Decanting Earth Bunds (DEB), flocculation equipment, contour drains, clean water and dirty water diversion bunds, silt fences and stabilised haul roads, laydown, and access points. All control measures shall be in accordance with Auckland Council Guideline Document GD005

Given the extent and complexity of the Project and the controls proposed, the earthworks and sediment controls need to take a systematic approach which will be established by the Engineer, the Contractor, and the Auckland Council Monitoring Representative. This shall be in line with the earthworks programme which is yet to be finalised by the appointed Contractor.

Council approved flocculation will be proposed on this development for optimal efficiency to the SRP and DEB's. Flocculation will require specific management and the Contractor will be responsible in preparing for approval a Chemical Treatment and Management Plan (CTMP).

The CTMP should at minimum include the following details:

- Material Safety Data sheets for the chemicals
- Provisions and management for storing chemicals used for treatment and appropriate disposal of empty chemical vessels/containers and spill response
- Sample testing regime to set and adjust dosage rates to effectively remove sediments
- Management and monitoring procedures
- Logging the use of treatment chemicals

Sediment laden water within the site will be directed to the SRP using diversion bunds. DEB and silt fences will be employed during the earthwork's operations. Additional "cut off drains" will be installed as required.

Existing or new stormwater reticulation can be used as appropriate to discharge treated/clean water from the site. Any dewatering required during construction will be managed to industry standards and sediment laden or concrete affected water will be directed to the sediment controls on site prior to treatment and discharge from the site.

At completion of the construction for the sediment controls, the Contractor will be responsible for providing as-built information of the devices and controls for review to the Engineer and Regulatory Monitoring representative to confirm volumes and locations of devices installed to ensure in accordance with approved plan.

## 8.3 Health & Safety

The Contractor shall comply with all relevant health and safety regulations and adopt best practice guidelines for activities occurring on and off site which are directly related to the nature of works required.

These measures as previously mentioned shall include the provision of appropriate signage and fencing where necessary to ensure public safety during the period of works.

#### 8.4 Completion – Land Stabilisation

As areas of bulk earthworks and golf course formations are progressively completed and tested to confirm compliance to the required specification these areas will be covered with the specified topsoil and sown with specified grass seed and mulched.

Any areas to be used as roading, carparking and building platforms shall be stabilised with placement hard-fill aggregate.

As the finished worked areas achieve stabilisation the sediment controls can be disestablished.

## 9.0 GOLF COURSE CONSTRUCTION

### 9.1 Site Clearing and Vegetation Removal

Based on the current golf course design, specific site clearing and vegetation removal plans have been prepared. These are presented in Appendix A. Figure 3 provides an example of a clearing plan showing areas of the golf course construction footprint where exotic and indigenous vegetation will need to be removed, cleared, or trimmed.

These plans also show the extents of natural wetlands and SEA areas in relation to clearing areas. It should be noted that the construction of the golf course (and all other elements of the site) does not require any earthworks or vegetation clearance to be undertaken in a natural wetland or directly impact any known archaeological or cultural sites.

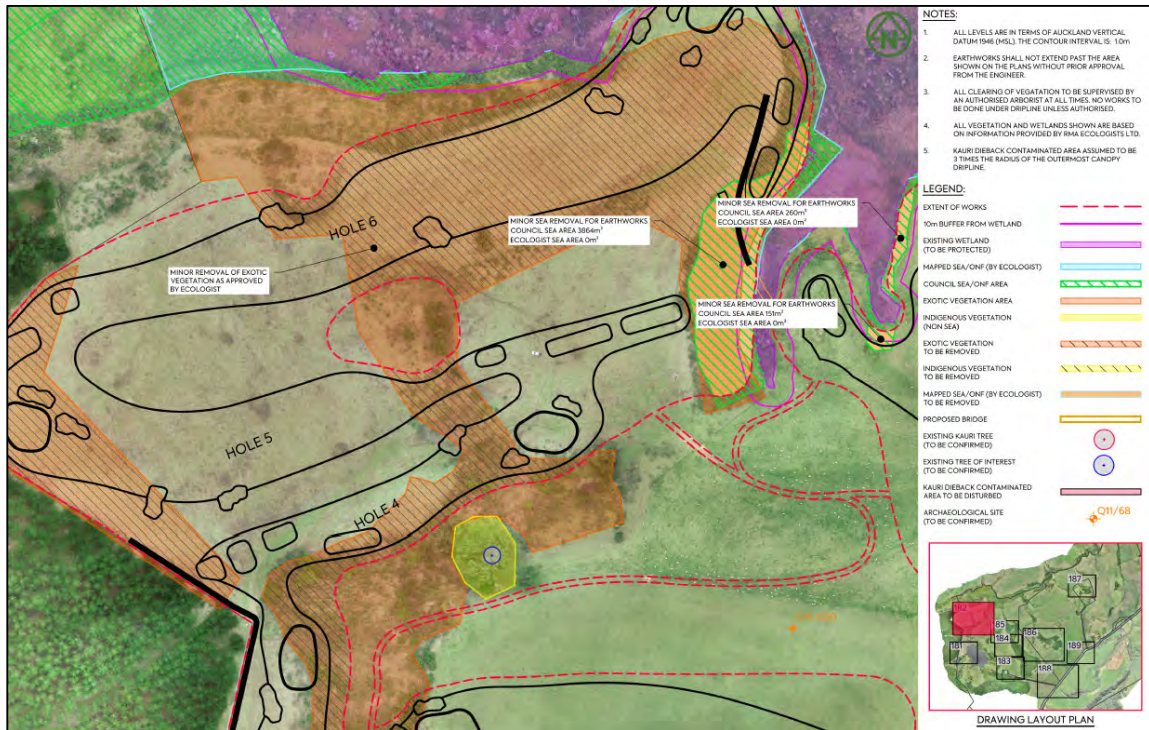


Figure 3 – Clearing Plan for Holes 4, 5 & 6 (prepared by MCCL)

Detailed methodology statements for site clearing are provided below. Methodology details for vegetation removal and initial tree trimming are provided in the Peers Brown Miller Report.

### 9.2 Earthwork Contour Plans

To determine the scale and extent of earthworks required to construct the golf course, contour plans for the designed course are compared to the existing ground contours. An example of a contour comparison plan is provided in Figure 4.



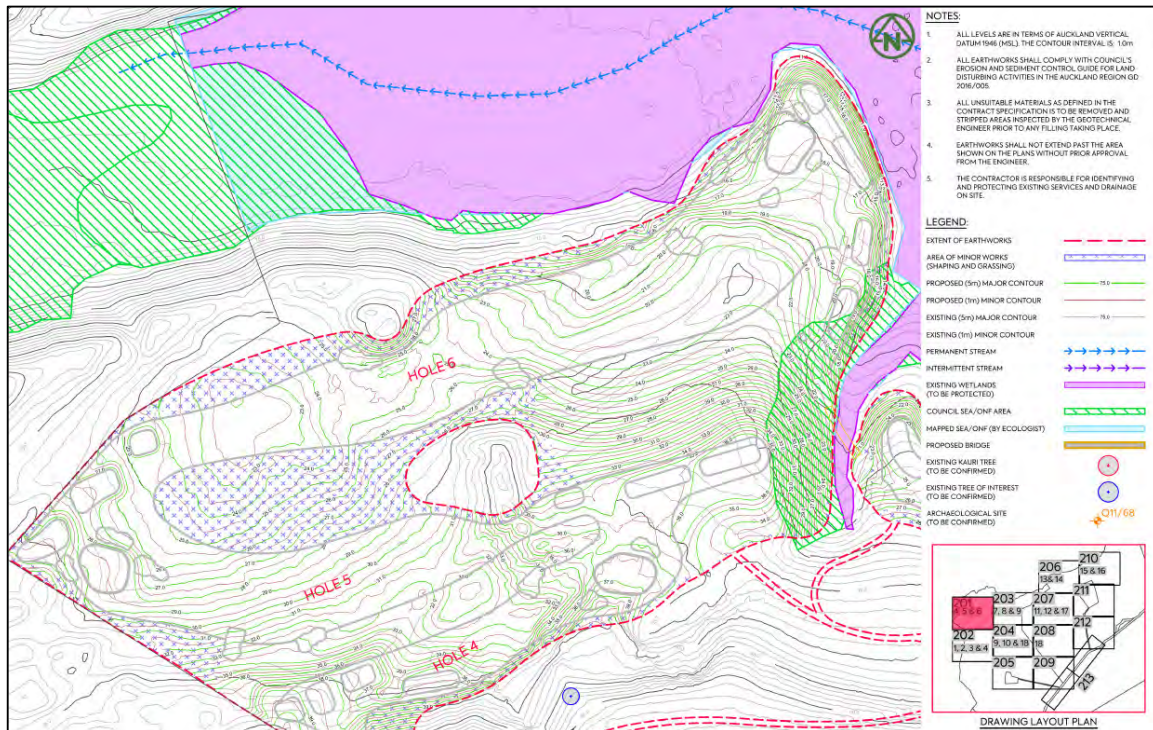


Figure 4 – Golf course final contour plan for Holes 4,5 & 6 (prepared by MCCL)

### 9.3 Earthwork Cut & Fill Plans

The contour comparison plans have then been used to produce preliminary cut and fill plans that denote areas of earthworks resulting in a net lowering of existing land contour (cut) and areas resulting in a net increase in land surface elevation (fill). An example of a cut and fill plan is shown in Figure 5.

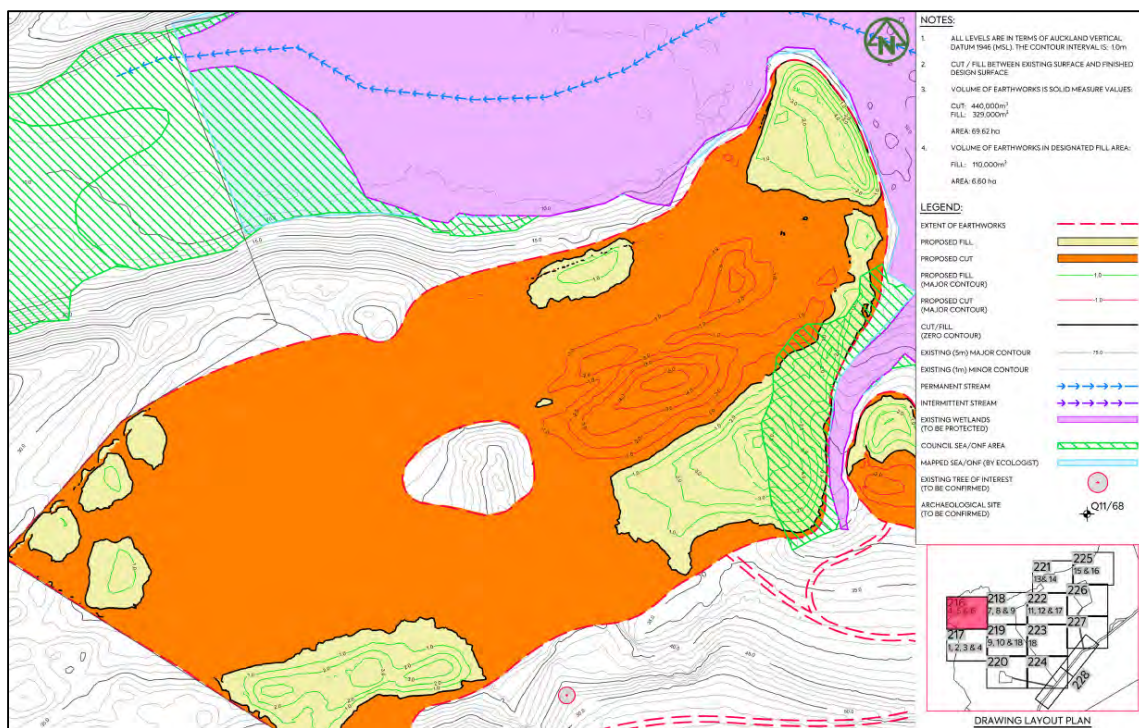


Figure 5 – Golf course Cut and Fill Plan (prepared by MCCL)

Figure 5 shows large areas of cut (i.e., refer orange coloured isopach areas). It should be noted that most of these cut areas relates to only very shallow soil disturbances associated with golf course topsoil removal, minor shaping,



and topsoil replacement. Areas of bulk cut are focussed in much smaller areas - limited to those areas where red depth contour lines are shown.

#### 9.4 Sediment & Erosion Control Plans

The preliminary earthworks plans depicting the cut and fill operations have been used to develop preliminary construction ESCPs. These show how stormwater runoff will be managed and treated while earthwork activities are occurring in each catchment. An example of a preliminary ESCP is shown in Figure 6.

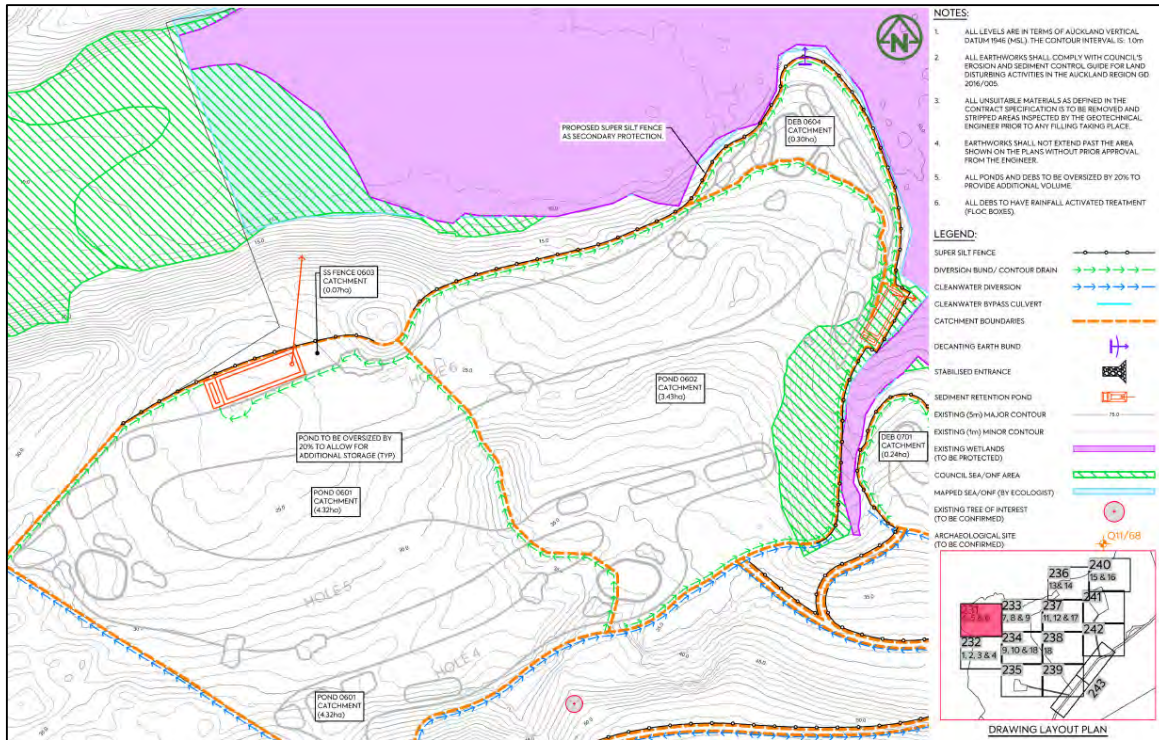


Figure 6 – ESCP for Holes 4, 5 & 6 (prepared by MCCL)

#### 9.5 Earthwork Activities

Earthworks will involve disturbances of soils during several different construction activities. These are described briefly below.

##### 9.5.1 Establish sediment controls

The Contractor will be required to establish and maintain erosion and sediment controls in accordance with the approved ESCP and GD005 to ensure compliance of the Resource Consent conditions.

##### 9.5.2 Establish kauri dieback management controls

The Contractor will be required to establish kauri die-back management infrastructure and buffer zones to ensure compliance of the Resource Consent conditions and the Kauri Dieback Management Plan (refer to Peers Brown Miller Plan – Kauri Dieback Disease: Tree Removal and Earthwork Procedures).

##### 9.5.3 Topsoil removal, stockpiling and re-spreading

Strip topsoil from the proposed earthwork areas in manageable phases and stockpile in areas outside the earthworks extent whilst ensuring these temporary stockpile locations have appropriate erosion and sediment controls established. The Contractor will confirm these locations in their ESCP and CEMP.

##### 9.5.4 Bulk cut and fill

The Contractor will undertake the cut and fill operation in sequence as per the approved methodology set out in their CEMP to achieve finished bulk formation levels as shown on the approved Earthwork plans (Appendix A). The Contractor shall ensure all required inspection and testing regimes are carried out by suitably qualified professional

(e.g., geotechnical engineer) to ensure the earthworks complies with the contract specifications and regulatory requirements.

#### 9.5.5 Golf course contour shaping

Once the main cut and fill earthworks are completed, subsoil material is then shaped into new contours by a specialist shaping contractor. Once the shaping is completed, the re-spreading of topsoil can begin.

#### 9.5.6 Fairway and primary rough construction

Following the shaping phase, all fairways and primary rough areas will be constructed using a shallow layer of sand overlying a drained soil profile. This is known as the sand carpet concept.

#### 9.5.7 Transition area treatments

Transition areas include areas between the outside perimeter of the golf course and the edges of the farm or environmentally sensitive areas such as wetlands, stream beds and SEAs. Since some of these transition areas are close to, or immediately adjacent to, sensitive and highly valued habitat, to create the desired course aesthetic, where areas of fairway or primary or secondary rough seamlessly merge with these parts of the site, requires particularly careful management. To minimise risk in these locations, the following specific construction method will be adopted:

- Farm pasture within transition areas of the golf course located immediately adjacent to wetlands or streams, will be replaced with mature Fescue Turf (i.e., ready turf).
- This will be done by first manually removing, or “opening up” in small sections, the existing pasture within a buffer zone of approximately two metres from the wetland or stream bed.
- Pasture removal in these areas would not be undertaken in wet weather or on days where rain is expected.
- The Fescue Turf would then be installed and secured with biodegradable stakes.
- All areas “opened up” would be turfed before the end of that same day.
- The Fescue Turf would not be mown for a period of at least 6 months.
- Seeding up-gradient of the Fescue Turf would be hydroseeded (including a tackifier) to secure the seed/seed bed in situ.

This manual turfing method in sensitive transition areas can either be undertaken ahead of or following other construction earthworks phases.

#### 9.5.8 Trenching

Following the main earthworks phases, in accordance with final drainage and irrigation design plans, trenches will be constructed throughout the golf course to house drainage, irrigation, communications and power infrastructure. These should be installed starting from the downstream ends. The Contractor shall ensure that appropriate erosion and sediment controls are established for any trench works at all times.

All materials including backfill material must meet the required specifications as per the contract specification and is compliant with the relevant NZ Building Code standards. The Contractor shall ensure that all the required inspection and testing regimes are carried out on these by suitably qualified professional to ensure compliance.

#### 9.5.9 Golf Course Tee Construction

Tees will be constructed using the sand carpet methodology with topsoil spread over. This is described in more detail within Appendix D (*Golf Course Operations and Management Report: NZ Turf Institute & Steve Marsden Turf Services*).

#### 9.5.10 Golf Course Green Construction

The construction of the greens will adopt the United States Golf Association (USGA) construction methodology. This is described in more detail within Appendix D (*Golf Course Operations and Management Report: NZ Turf Institute & Steve Marsden Turf Services*).

#### 9.5.11 Golf Course Bunker Construction

The sub-grade of each bunker will have drainage trenches installed to a depth of approximately 250mm, with 110mm perforated drainage pipe located within the trench and surround by a washed drainage chip.

Bunker construction will accommodate a bunker liner that sits between the soil profile below and the sand layer above. This liner helps to hold sand on the sloping bunker face during periods of heavy rain and keeps the sand from becoming contaminated with silts from the sub-grade profile within the bunker. This is described in more detail within Appendix D (Golf Course Operations and Management Report: NZ Turf Institute & Steve Marsden Turf Services).

#### 9.5.12 Grow in or Turf Establishment

Once the irrigation systems have been installed and commissioned and the greens, tees and fairways have all been constructed and shaped to reflect the design intentions of the golf course, they will then be grassed then managed (fertiliser, water, topdressing) to establish a mature, dense turf cover.

The commencement of the grassing helps to secure any open ground and start the establishment, or grow-in, period for each of the new playing surfaces. Typically, the grow-in process takes around 16 weeks.

## 10.0 CONSTRUCTION OF BRIDGES

To provide easy flowing connectivity for the golf course patron and maintenance staff on course, a series of all-weather pedestrian/cart paths have been designed across the golf course. All bridge foundations will be located outside any wetland extents. These paths will generally consist of formed concrete paths which will include connection to fourteen bridge crossings over the existing streams and wetlands located within SEAs.

As shown on MCCL Drawings 1976-1-280–294 (Appendix A), these proposed bridges have been designed as best with locations to avoid where possible construction works within the SEA areas. However, there will be a requirement to carry some very localised earthworks within small areas of SEA to construct bridge foundations (i.e., abutments). As previously mentioned, the extents of the SEA have been further revised by the Project Ecologist (RMA Ecology) and the revised extents are shown in their report and on the MCCL Site Clearance Drawings 1976-1-180-189 (Appendix A).

The general principles adopted by the Contractor during the earthwork's activities within the small areas of very localised works to construct the bridge abutments, will be as follows.

- Prior to works commencing near or within the SEA the Contractor will meet with Project ecologist on site to agree extent of works and review consent conditions.
- Clearly mark extent of works and brief all staff involved with works on process and importance of protection of SEA.
- Commence removal of vegetation prior to earthworks starting, note potential additional management processes for Kauri Dieback. Ecologist to be actively involved in this process. Note no stump removal or grinding to occur prior to sediment controls being put in place.
- Any topsoil removed within Kauri Dieback areas will be stockpiled separately and fenced off. Topsoil from any other earthwork activities areas not affected should not be placed with or nearby these specific contained stockpiles.
- Once vegetation is removed, sediment controls will need to be established which will consist of super silt fences adjacent to SEA area (and around abutment areas), then sediment diversion bunds followed by sediment management devices such as sediment ponds or decanting earth bunds.
- Once all sediment control measures are in place the area is to be reviewed by the Project engineer and council environmental compliance officer and if agreed, ground disturbing activities and bridge construction to commence. Ecologist to brief all bridge staff prior to works commencement adjacent to or over SEA.
- Once primary sediment controls are established and approved, establishment of materials and equipment for the bridge abutment construction can be undertaken. All materials and machinery are to be stored upstream of the primary sediment controls. Plant and machinery should always be well maintained and kept clean.
- Materials and machinery are to be in an area bunded off from any potential sediment laden runoff flows.
- Supersilt fence to remain in place until bridge construction completed.
- Sediment control measures are to be inspected daily and immediately prior to periods of forecast rain and any defects remedied.
- Once bridge works are completed and exposed areas are stabilised sediment controls (e.g., supersilt fence) can be removed.

## 11.0 WATER RESERVOIR

The proposed golf course and practice facilities will require significant water supply for on course irrigation purposes. To meet this demand a large water reservoir will be constructed on the south-eastern portion of the site adjacent to Muriwai Road. The proposed water reservoir will have a storage containment volume of 140,000m<sup>3</sup>. Water supply to the reservoir will be via a high flow water intake from the Raurataua Stream and a production bore located on the northern side of Muriwai Road approximately 400m away. The water take locations will require a pump and piped network to be constructed to deliver supply to the reservoir.

As shown on earthworks drawings 1976-R1-150, 200, 210, 230 & 260 a large earthworks operation will be required to form this water reservoir. The earthworks operation will include a balanced cut-fill operation (i.e., 150,000 m<sup>3</sup> cut & 150,000 m<sup>3</sup> fill) over an area of 8.3ha. Cut material from the reservoir site will be placed as engineered fill to the land formation immediately to the south.

There is no significant vegetation removal required. However, the reservoir is located on elevated land in proximity to a couple of existing wetlands/streams. There will also be some localised works near the Raurataua Stream to the east of the reservoir site to construct the water intake and pump inlet facility.

It is anticipated that conventional earthmoving plant and equipment will be used for the construction of the water reservoir and associated pipe networks. The Contractor will need to pay particular attention given the risk of sediment contamination and the spread of dust emission from the earthworks and construction activities. The earthworks operation will be separated into two separate catchments which will include a combination of sediment controls such as clean and dirty water diversion bunding, silt fencing, SRP and DEB devices.

The general principles adopted during the earthwork's activities for the reservoir and water intake construction, will be incorporated in the ESCP, are as follows:

- Minimise the disturbance area due to earthwork activities as much as practically possible by staging earthworks and progressively stabilising exposed areas following completion.
- Where possible, divert all clean water runoff away from the works affected areas (e.g. exposed/unconsolidated), thus reducing the contributing catchment to the exposed earthwork areas.
- Intercept and divert sediment-laden runoff (i.e., dirty water) from exposed areas to specifically designed treatment devices (SRP's & DEB's) prior to discharging into the downstream environment.
- Where conventional containment devices are not practical the use of super silt fences will be incorporated.
- Implement measures to prevent construction traffic tracking sediment and other materials attached to the undercarriage and tyres onto Tavern Road and Forge Road.
- Regularly monitor and inspect the erosion and sediment control devices and undertake any maintenance necessary to maximise their efficiency and effectiveness.
- In the event of forecast inclement weather conditions, stabilise the site as far as practicably possible and if required close operations that may be impacted. Inspect the control measures following the passing of the inclement weather conditions and repair as required.
- Ensure site staff and sub-contractors have adequate training and are aware of the requirements of the ESECP and the relevant Resource Consent conditions prior to the works commencing.

The Contractor will be required to establish and maintain erosion and sediment controls in accordance with the approved ESEC plan and Auckland Councils Guideline GD005 to ensure compliance of the Resource Consent conditions.



## 12.0 CONSTRUCTION OF CULVERTS

There are two proposed stormwater culverts to be constructed across the golf course formation to maintain natural conveyance of stormwater flows for discharge into the receiving wetland/streams along the northern boundary. As show on the MCCL proposed drainage plans 1976-1-430-432 & 435 (Appendix A) these culverts will generally follow the existing gully feature alignments across the proposed fairways to holes 11, 17 and 14 & 16. These culverts will consist of 450mmØ and 900mmØ RCRRJ pipes for installation and have been sized to convey up to the 1% AEP storm events.

It is anticipated that conventional earthmoving and construction plant will be used for the installation of these culverts. The installation of these culverts will generally be in fill areas within the extent of the golf course earthworks areas. These pipes will be installed in accordance to AS/NZS 3725:2007 *Design for installation of buried concrete pipes*.

The Contractor will be required to maintain the natural flow path of the existing gully features during the installation of these culverts and will need to incorporate temporary diversion practices in accordance with Auckland Councils GD005.

Whilst these culverts are predominately located within the earthwork's extents for the golf course, the inlet and outlets to each culvert will be within close proximity to protected wetland SEA areas. The Contractor will need to pay particular attention given the risk of sediment contamination and the spread of dust emission from the drainage installation activities. The use of silt fencing, SRP and DEB devices in accordance with Auckland Council Guideline GD005 will be utilised for these works and emphasis on the protection of the inlet and outlet locations will be adopted.

The Contractor will be required to established and maintain erosion and sediment controls in accordance with the approved ESCP and the Auckland Council Guideline GD005 to ensure compliance of the resource consent conditions. Adopting the same approach to the main earthwork operations for the golf course and amenities should significantly reduce the risk of sediment leaving the site, thus protecting receiving environments from sedimentation and water quality degradation.

## 13.0 PROTECTION OF WATER COURSES

There is anticipated works to be undertaken near the various intermittent streams (i.e., wetlands) and the permanent streams along the northern boundary and south-east portion of the site. Works should be approved and take place where practical between October to April during low flow conditions. Where possible, when constructing the new bridges, culverts, and water intake facilities in proximity to the protected stream areas the flows in the streams will be maintained, away from the work area, where not possible over pumping may be required. Silt fences should be installed downstream of any excavations which will catch any falling debris.

The vegetation within these SEA shall be protected and maintained and only removed under the direction of the project arborist and ecologist in accordance with the approved plans. Pre-construction meeting with the Project arborist, ecologist and regulatory monitoring representative shall be undertaken to identify most appropriate locations and levels of activities within these areas.

Stream works methodologies are to be prepared by the Contractor for each works location / type and be approved by the Engineer prior to the submission to the Auckland Council monitoring representative for approval prior to commencement of and earthworks and construction.

## 14.0 TRENCH DEWATERING

Although unlikely, some of the excavations may intersect the water table or have surface water infiltration, requiring dewatering of trenches and other excavation sites. Dewatering could result in sediment laden discharges to land or water.

The Contractor will be required to minimise the effects of the sediment load on the receiving environment. Treatment will need to include sediment tanks or other settlement device (e.g., SRP or DEBs) prior to discharge of clean water into the receiving environment.

## 15.0 DUST

Dust emissions could potentially be an issue due to the makeup of the existing soil conditions expected to be encountered on site. As prescribed in the General Conditions of the Contract it will be the Contractor responsibility to manage this potential issue and take all practical steps to avoid the generation of dust emission into the air.

The most practical approach to mitigating the effects of dust and dirt on roads is to minimise the generation at source. The SCM shall be responsible for ensuring the implementation of mitigation measures, which will include:

- Minimising areas of exposed earthworks and by stabilising completed areas as soon as practicable
- Maintaining stabilised entrance and exit points
- Reducing the speed of plant and vehicles in localised areas
- Stabilised egress points (incorporating wheel wash facilities as required)
- Enforcing site vehicles to use where possible stabilised surfaces such as haul roads
- Restricting access to un-stabilised and exposed areas
- Regular road sweeper
- Grassing or covering of stockpiles
- Halting of works during winds
- Retain existing vegetation as shelter belts
- Watering of haul roads and exposed works areas during dry periods.

Effective monitoring must be implemented with regular audits of work activities and areas susceptible to emitting dust to ensure that the mitigation measures are working effectively.

Prior to the commencement of works the Contractor will be responsible for preparing a Site-specific Dust Management Plan (DMP) for review and approval by the Engineer and the Regulatory Monitoring representative.

Attached with this CEMP, a Preliminary DMP has been prepared by MCCL (Appendix C) which sets out a pathway for the Contractor to implement.

## 16.0 CONSTRUCTION NOISE

### 16.1 Performance Standards

The Contractor shall carry out works and operations onsite in accordance with Table (below), NZS 6803:1999 “New Zealand Standard for Acoustics – Construction Noise – Table 2” unless otherwise approved in writing by local authority or consent conditions variations stipulating such.

*Table 2 – NZS 6803:1999 - “New Zealand Standard for Acoustics – Construction Noise: Table 2”*

Time of Week	Time Period	Duration of Work						
		Typical Duration (dBA)		Short-term Duration (dBA)		Long-term Duration (dBA)		
		Leq	L <sub>max</sub>	Leq	L <sub>max</sub>	Leq	L <sub>max</sub>	
Weekdays	0700 - 0730	60	75	65	75	55	75	
	0730 - 1800	75	90	80	95	70	85	
	1800 - 1900	70	85	75	90	60	80	
Saturdays	0700 - 0730	45	75	45	75	45	75	
	0730 - 1800	75	90	80	95	70	85	
	1800 - 1900	45	75	45	75	45	75	
Sundays & Public Holidays	No Work							

### 16.2 Noise Mitigation

The contractor shall ensure that any plant and equipment to be used on the site must be well maintained and equipped with appropriate sound attenuating devices as is recommended by the manufacture of that specific item of plant or equipment.

Plant or equipment that is considered or deemed to be in poor operating condition or otherwise emitting excessive noise may be removed from site at the direction of the Engineer if deemed necessary.

### 16.3 Noise Complaints

Any complaints regarding noise emissions shall be addressed and managed by the Contractors Construction Manager. The Contractors Construction Manager must follow up with the complainant as soon as is practical to discuss the source and timing of the noise activity. Once identified the Construction Manager shall investigate and put in place appropriate mitigation measures and report this back to the complainant once completed.

## 17.0 INSPECTIONS, REPORTING AND RECORDING

The Contractor will undertake regular inspections and audits of the construction activities and will report and maintain records of the outcome of these. In addition, records, and responses to incidents to public inquiries or complaints will be maintained.

### 17.1 Inspections

Various inspections will be required to ensure compliance with the CEMP.

The Contractor will undertake the following inspections:

- Daily site inspection by the site supervisors; and
- Weekly audit by the site based environmental and compliance managers.

The inspections/monitoring will cover the following:

- The site security.
- Entrances ways for tracking of mud onto Muriwai Road.
- Public road access to the works area condition.
- Stormwater treatment measures.
- Plant and equipment condition.
- Waste management and litter.

- Noise, vibration, and dust prevention measures; and
- Hazardous substance storage facilities and use of substances.

To assist in undertaking these inspections and audits a check sheet will be used. The inspections will record non-compliances or improvements.

#### 17.2 Reporting

The SCM will be responsible for preparing a monthly report which will include all reporting on compliance with the CEMP.

#### 17.3 Incident Register

An incident register will be maintained to record any incidents onsite that may be considered to have potential for adverse environmental effects. Such incidents include:

- Discharges from exposed and un-stabilised areas not treated by erosion and sediment control measures.
- Failure of any erosion and sediment control measures.
- Any spillage of fuel, lubricants, wastewater, or hazardous substances; and
- Any other incident which either directly or indirectly causes, or is likely to cause, adverse environmental effects.

#### 17.4 Monitoring

In addition to the environmental inspections, ongoing monitoring of noise and vibration, air quality and stormwater quality will be undertaken. The results of the monitoring will be used to assist in reviewing the effectiveness of the environmental management and the individual construction method statements.

#### 17.5 Recording and Documentation

The following records will be maintained in the Site Office:

- Daily Inspections.
- Weekly Reports.
- Monthly Reports.
- Incident and complaints records.
- Site induction register; and
- Training and induction records.

The following documentation will be kept in the site office as reference material:

- Resource Consent conditions.
- TMP - Traffic Management Plan
- CEMP – and any subsequent updates.
- CTMP – Chemical Treatment Plan
- DMP – Dust Management Plan
- Construction, commissioning, and decommissioning method statements; and
- Health & Safety Plan.

## 18.0 CONTINGENCIES

There is always the potential threat for unforeseen events to occur resulting in emergency action being required. Unforeseen events may include:

- Natural Hazards:
  - Earthquakes.
  - Flooding.
  - Extreme rainfall events.
  - Extreme wind events; and
  - Tsunamis (unlikely to impact site).
- Operational Errors:
  - Failure of Equipment.
  - Ecological events; and
  - Vandalism.

The potential outcome of these emergency events is:

- Discharges of sediment to storm water.
- Discharges of fuels, lubricants, or hazardous materials into stormwater and / or ground water; and
- Discharges to air of nuisance dust emissions or contaminants.

### 18.1 Discharge of Sediment

The most likely reason for the discharge of sediment from site would be an extreme rainfall event or poor performance of a treatment device.

When this occurs, all practical steps will be taken to remove any sediment discharged from the site and or deposited on the road. These actions will include:

- Clearing of affected area.
- Cleaning out of shoulder drains and sumps downstream of the site; and
- Advise the Engineer and Regulatory Monitoring Representative of the event.

Following the discharge event, a review will be undertaken of the reasons for the discharge and what improvements or added mitigation measures are required to prevent a reoccurrence.

### 18.2 Discharge of Fuels, Lubricants, and Hazardous Materials

The nature of the risk of discharges of fuel, lubricants and hazardous materials varies depending upon the volume of materials involved and location. Section 7.3 identifies the actions to be taken to minimise the potential for a discharge of fuel lubricants or hazardous substances. In the event of a spill the following procedure will be followed:

- Evaluate the material being spilled to determine nature of risk and volume of material.
- Report spillage to the SCM and Environmental and Compliance Manager. Notify the Engineer.
- Stop all operations in the immediate area of concern and remove or shut down any ignition sources.
- Wear appropriate PPE and protective clothing.
- Isolate the source of spillage by closing off valves, rotating punctured drums, plugging leaks.
- Contain and control the spill by using an appropriate spill kit and dispersants and if necessary, use earth moving equipment to create an earth bund to contain the spill.
- Start cleaning up and request assistance if necessary.



- Dispose of material used in clean-up to an appropriately consented landfill.
- Clean-up site and remove all contaminated soil to an appropriate consented landfill.
- Replace and replenish used material in spill kits.
- Review contingency plan and procedures by determining the cause and the actions taken to contain and clean up the spill; and
- Amend site operational procedures and oil spill response as necessary.

#### 18.3 Discharges into the Air

In the event of dust or contaminants being discharged into the air, the first action will be to stop the discharge. This will be achieved by wet-down or covering the source of dust or shutting-off the source of contaminant.

Once the discharge is stopped, action will be taken to avoid, mitigate or eliminate the risk of reoccurrence. Daily monitoring and reporting will be implemented to ensure management is effective.

#### 18.4 Fire

The risk of fire in dryer months (October-April) must be considered as a potential hazard. No fires should be permitted onsite and in particularly during regional fire restrictions and or fire bans. This is [particularly important around dense vegetation (grasses, bush, and forests) within the site or adjacent to the site boundaries on neighbouring properties.

Fire extinguishers will be carried on all vehicles including plant and available at the site office. In the event of a fire being identified the first action will be to extinguish the fire if possible. If it is not possible to extinguish the fire, the Fire Service will be contacted (DIAL 111).

## 19.0 COMPLETION OF CONSTRUCTION

### 19.1 As Constructed Document – As Built

Within 2 months of completion of the earthworks phase, as constructed documentation (i.e., As-built plans) shall be prepared to identify finished contours, subsoil drainage, public and private drainage and roads shall be submitted to Auckland Council – Resource Consents Manager. Should the earthworks be staged, as constructed documentation shall be submitted for each successive stage.

### 19.2 As Constructed Document - Earthworks Completion Report

An Earthworks Geotechnical Completion Report shall be prepared by a suitably qualified professional and submitted to the Regional Authority at the completion of the earthworks stage. Should the earthworks be staged a separated Completion Report shall be submitted for each successive stage.

The Completion Report shall include a Statement of Professional Opinion as to the suitability of the land formed for building construction and must include foundation conditions and any restrictions for future buildings, and any particular geotechnical matters for design parameters for foundations and any construction works such as stormwater.

## APPENDIX A – EARTHWORKS & CIVIL ENGINEERING DRAWINGS

(Attached Separately)

(Prepared By MCCL - Bound Separately)