

# **APPENDIX D**

## Draft Construction Management Plan

**WELLINGTON INTERNATIONAL AIRPORT**

**RUNWAY EXTENSION PROJECT**

**Draft Construction Management Plan**

DRAFT

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# **1 BACKGROUND**

## **1.1 Introduction**

This Construction Management Plan (CMP) details the principles, practices and procedures to be implemented by Wellington International Airport Limited (WIAL)<sup>1</sup> to manage and/or mitigate potential adverse environmental effects during construction of the runway extension at Wellington Airport (the Airport) (the Project). These principles, practices and procedures are intended to assist WIAL in meeting resource consent conditions and relevant legislation.

## **1.2 Purpose and Application**

The purpose of the CMP is to describe the environmental management and monitoring procedures to be implemented during the construction phase of the Project. The CMP will ensure that appropriate environmental management practices are followed at all times during construction.

The CMP will enable WIAL to construct the runway extension with the least adverse environmental effects and/or implement best management practices to minimise/mitigate those adverse environmental effects. Overall, implementation of this CMP will also ensure:

- Compliance with the conditions of resource consent
- Compliance with environmental legislation
- Environmental risks associated with the construction of the Project are properly managed.

The CMP defines details of who, what, where and when environmental management and mitigation measures are to be implemented. The CMP covers all anticipated construction elements and presents a framework of principles, environmental policy, objectives and performance standards as well as processes for implementing good environmental management.

The CMP sits alongside the Stakeholder and Communication Management Plan (SCMP). The SCMP identifies the key stakeholder groups and methods for engaging with them as well as individual members of the public throughout the construction phase of the Project.

## **1.3 Scope**

The principles and general approach to managing the environmental effects as a result of the construction of the Project are set out in the main body of this document. The management of specific effects (e.g. construction noise, air quality, traffic) are detailed more particularly within a specific management plan.

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<sup>1</sup> While this Plan refers to WIAL, who is the requiring authority and the consent holder, it is noted that the works will be carried out on its behalf by a contractor(s).

Matters that are addressed in more specific management plans are identified in the subsequent sections of this CMP.

This CMP may require review and amendment during the construction to reflect changes to activities, risks, mitigation measures, responsibilities and management processes. The ability to make changes to the CMP is an important aspect of continually improving the effectiveness of the CMP. For example, modification of this CMP will be required if and when the necessary statutory approvals have been obtained, with finalisation after a contractor is selected and detailed design and construction methods are settled.

WIAL and its project team will be required to undertake all construction activities on site in accordance with the provisions of the relevant management plans and resource consent conditions.

A copy of the CMP shall be held at each construction site/compounds at all times. The CMP shall be implemented and maintained throughout the duration of the project.

## 2 RUNWAY EXTENSION PROJECT OVERVIEW

### 2.1 Project Overview

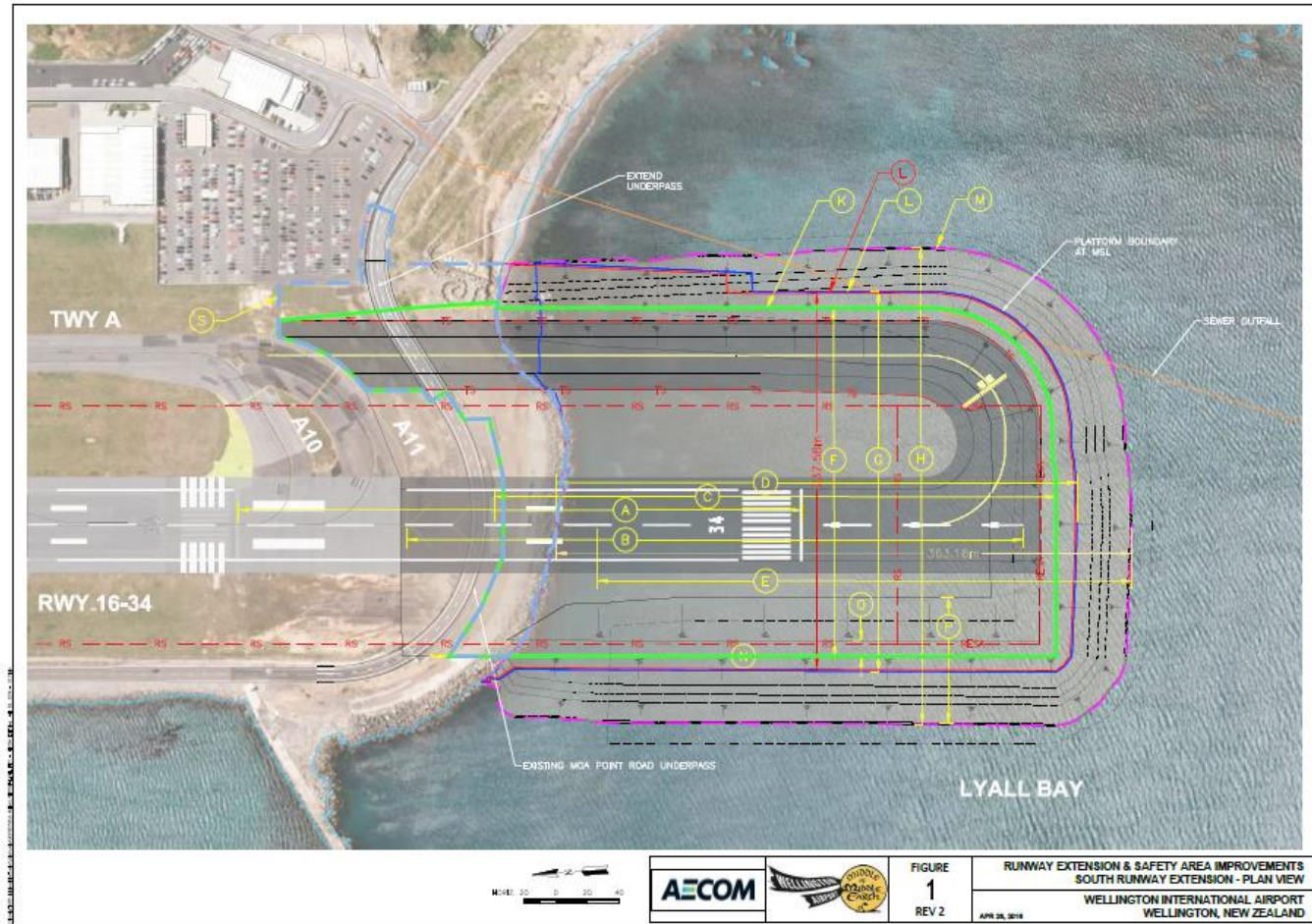
WIAL is extending the existing runway at Wellington Airport to provide a minimum Take Off Runway Available (TORA) of 2,300m with a 150m Runway End Protection Area (REPA). The runway geometry will enable Wellington Airport to handle most Code E aircraft types with sufficient load capacity to and from east Asian and western north American destinations. The primary design criteria adopted for the project are set out in **Table 1**.

**Table 1: Summary of Key Design Criteria**

KEY DESIGN PARAMETER	DESIGN CRITERIA
Runway Specifications	Minimum 2300m TORA Minimum 2150m Landing Distance Available
REPA Specifications	90m RESA 60m runway strip
Aircraft Requirements	Code E Aircraft Occasional passage of Code F Aircraft
Taxiway Specifications	107.5m from runway, centre-line to centre-line
Seismic Performance	500-year earthquake; 0.60g peak ground acceleration (PGA); less than 2m lateral displacement and 1m vertical settlement

KEY DESIGN PARAMETER	DESIGN CRITERIA
	2,500-year earthquake; 0.98g PGA; no catastrophic failure
Wave Height	100-year wave; height 10% of waves ( $H1/10=10.5\text{m}$ ; deep water significant wave height = 12.5m

Based on the aforementioned design criteria and other influential feasibility and design parameters an extension to the south of the existing runway configuration is the preferred option for achieving a 2300m TORA.



**Figure 1: Plan View of the Proposed Runway Extension**

**Table 2: Design Parameters of the Proposed Runway Extension**

Item	Project Parameter	Approximate Dimension or Quantity
A	Length of runway extension, from threshold to threshold	361m
B	Length of runway extension, from runway end to runway end	393m
C	Length of platform extension, at crest of platform	354m
D	Length of platform extension, at mean sea level (MSL) Length of platform extension, at mean high water springs (MHWS)	331m 331m
E	Length of platform extension, at toe of platform	337m
F	Width of platform, at crest of platform	220m



Item	Project Parameter	Approximate Dimension or Quantity
G	Width of platform, at MSL	239m
	Width of platform, at MHWS	238m
H	Width of platform, at toe of platform	301m
I	Height of platform, from toe to highest point	21.8m
J	Height of platform, from MSL to highest point	9.0m
	Height of platform, from MHWS to highest point	8.1m
K	Area of platform, at crest	8.3ha
L	Area of platform, at MSL	8.1ha
	Area of platform, at MHWS	8.1ha
M	Area of platform, at toe (within CMA)	10.82ha
N	Length of perimeter rock dyke, along wave wall	986m
O	Width of rock dyke at crest	10m
P	Width of rock dyke, from toe to toe at widest point	80m
Q	Volume of rock dyke materials (including armour layers)	583,600 m <sup>3</sup>
R	Volume of reclamation fill materials	857,380 m <sup>3</sup>
S	Area of platform above MHWS	1.7ha

Detailed design and corresponding construction will set out the specific methodologies to be employed in order to achieve the design parameters set out in Table 2. These will be further developed by the selected contractor.

## 2.2 Construction Overview

A preliminary construction methodology has been developed based on the conceptual engineering design work completed to date, the available site and geotechnical information following preliminary investigations, and the project objectives and constraints.

The following provides an overview of the anticipated construction methodology. The final methodology will be confirmed following completion of the detailed design and awarding of the construction contract.

In order to provide a longer runway at the Airport that achieves the design criteria set out in Table 1, a runway platform over mostly reclaimed land into Lyall Bay will be constructed.

To construct the runway platform, a full section rock dyke will be built around the perimeter of the runway extension which may include the installation of stone columns and a rock blanket. Once the rock dyke is in place, filling of the reclamation will commence. The indicative construction programme suggests that it may take around three to four years to complete the reclamation depending upon the source of the bulk fill material.

It is estimated that up to 1.5 million cubic metres of material would be required to complete the reclamation. The reclamation bulk fill is likely to be sourced from existing quarries in the greater Wellington area, or if available, made up of material dredged from the harbour channel. Rock dyke materials are likely to be sourced from quarries from both within and outside the Wellington region.

Improvement of fill material may be required for reduction of both static and liquefaction (seismic)-induced settlements. Where practicable, different methods used to build the rock dyke and fill the reclamation, such as marine based platform barges and land based equipment, are anticipated for different areas of the reclamation due to constraints imposed by the Airport's obstacle limitation surfaces (OLS) and the associated height restrictions for structures and machinery near the runway.

Associated works include removal of a hillock at the south western end of the Airport between Stewart Duff Drive and Freight Drive. It is likely that the material removed will be used as fill in the reclamation. Once this area has been levelled, it will be used initially as a construction staging area and then in the long term for airport purposes.

The existing Moa Point Sewage Treatment Plant ocean outfall passes through the area of the proposed reclamation. Engineered protection of the outfall pipe to avoid damage due to placement of the dyke and reclamation fill is also required.

The reclamation platform will require consolidation, likely involving an extended period of surcharging by the placement of additional fill material to expedite the rate of consolidation and/or using ground improvement methods such as vibro-compaction. Once any surcharging is complete, the additional fill material would then be trimmed off the top, transported off site prior to the construction of the sealed runway and the installation of other associated runway infrastructure.

The proposed runway works also involve the extension of the runway taxiway, requiring the extension of the Moa Point Road tunnel or the construction of a new bridge structure to accommodate the taxiway. This is proposed to be constructed at the outset of the Project and thus it is anticipated that Moa Point Road can remain fully accessible to the public and also construction traffic (as

part of the daytime haulage window) throughout the proposed construction period.

It is estimated that the construction works will require around 50 staff on the site at any one time to fulfil all of the daily construction tasks.

There would be a significant amount of fill material required for the construction of the reclamation. These materials would be conveyed to the construction site via land or sea based transport methods, or a combination of the two (for example, bulk fill from quarry source by road, rock armour by barge).

If land based fill material is utilised, it is likely that the majority of construction fill materials will be transported to the airport construction site from existing quarries located at Kiwi Point (Ngauranga Gorge) and Horokiwi (south of Petone), with transportation routes centred principally on State Highways 1 and 2, or potentially a barge option from a location within the harbour and near the rock source quarry.

Upgrades to the airfield infrastructure, including grading, paving and utilities will be required in association with the project, as well as changes to the ground lighting and navigational aid configuration. Subsequent upgrades to the taxiway markings will follow from the completion of the works.

In addition to these works, a series of amenity improvements have also been proposed and will need to be constructed. This includes:

- A submerged wave focussing structure
- Moa Point Road improvements
- Moa Point Beach enhancements

### 3 RESOURCE MANAGEMENT ACT COMPLIANCE

The Contractor will, at all times, comply with the provisions of the Resource Management Act 1991 (RMA). In particular, the Contractor shall comply with the specific requirements and conditions of the resource consents obtained for the work, as described in the following sections.

#### 3.1 Greater Wellington Regional Council Consents

The Contractor shall comply with the following regional council consents:

**Table 3: Consents issued by Greater Wellington Regional Council (GWRC) under the operative Greater Wellington Regional Coastal Plan.**

Consent	Activity

*[These consents are yet to be issued by Greater Wellington Regional Council. When issued, they will be included in as **Appendix A** to the CMP.]*

**Table 4: Consents issued by Greater Wellington Regional Council under the Proposed Natural Resources Plan.**

Consent	Activity

*[These consents are yet to be issued by Greater Wellington Regional Council. When issued, they will be included in as **Appendix A** to the CMP.]*

### 3.2 Wellington City Council Consents

The Contractor shall comply with the following city council consents:

**Table 5: Consents issued by Wellington City Council (WCC) under the operative Wellington City District Plan.**

Consent	Activity

*[These consents are yet to be issued by Wellington City Council. When issued, they will be included in as **Appendix A** to the CMP.]*

## 4 CONSULTATION AND COMMUNICATION

WIAL, the contractor and its professional advisors will consult with consent authorities and affected parties through the development phases of this CMP.

### 4.1 Roles and Responsibilities

There are four groups with an overarching environmental and construction management role associated with the runway extension project. These include:

- 1) WIAL as the owner of the Project and the holder of the resource consents;
- 2) The Project Manager, including owner's engineer(s), who will be responsible for completing site investigations, preliminary design and the construction bid documents, as well as performing construction supervision;
- 3) The Contractor undertaking the works, which includes the final design team for the Project and subcontractors; and,
- 4) The Greater Wellington Regional Council who audits the works and ensure compliance with resource consent conditions and the CMP.
- 5) Wellington City Council who audits the works and ensure compliance with resource consent conditions and the CMP.

The main Contractor will be responsible for the whole construction site and compounds. The table below identifies the environmental and construction management roles on site.

**Table 6: Environmental and Construction Management Roles Onsite**

Name	Company	Position	Contact Details	Responsibilities
	WIAL			<ul style="list-style-type: none"> <li>– Key contact at WIAL</li> <li>– Ensuring CMP meets WIAL operational requirements</li> <li>– Communicating and liaising with WIAL operations and management</li> </ul>
	[Yet to be awarded]	Project Manager		<ul style="list-style-type: none"> <li>– Ensuring compliance with consent conditions</li> <li>– Approval of CMP updates</li> <li>– Inspections of works to ensure compliance with CMP</li> </ul>
	Main Contractor [Yet to be awarded]	Environmental Compliance Manager (or similar)		<ul style="list-style-type: none"> <li>– Overall responsibility for environmental management</li> <li>– Reviewing environmental performance</li> <li>– Inspections and reporting</li> <li>– Liaison with Stakeholders</li> <li>– Receives complaints and addresses these</li> </ul>
	Main Contractor [Yet to be awarded]	Site Manager		<ul style="list-style-type: none"> <li>– Onsite compliance with any conditions</li> <li>– Adherence to CMP</li> <li>– Ensuring all sub contractors understand requirements of CMP</li> </ul>

Name	Company	Position	Contact Details	Responsibilities
	Sub Contractors			– Adherence to CMP including specific management plans.
	WCC	Compliance Manager		– Review of CMP – Auditing to ensure conditions are being met
	GWRC	Compliance Manager		– Review of CMP – Auditing to ensure conditions are being met

## 4.2 Key Stakeholders and Affected Parties

The Stakeholder and Communications Plan (SCMP) sets out procedures detailing how the public and stakeholders will be communicated with throughout the construction of the Project.

## 4.3 Consent Authorities

WIAL's advisors will consult with WCC and GWRC as the CMP is developed similar to the above.

The Contractor shall take responsibility for communications with consent authorities once construction commences, notwithstanding that this is on behalf of WIAL. WIAL and its advisors will communicate directly with consent authorities as necessary.

## 4.4 Key Personnel

The Contractor shall provide a list of key personnel including responsibilities and contact details. This shall be appended to this CMP as **Appendix B**. Included shall be the Environmental Compliance Manager and other persons with delegated responsibility for health and safety and implementation of the various elements of the CMP and other relevant management plans.

## 4.5 Training

### 4.5.1 Employees and Sub-contractors

The Contractor shall ensure that all personnel responsible for supervising contractor site staff (e.g. foremen, supervisors, and managers) shall undergo environmental awareness training and training about their responsibilities under the CMP and associated management plans.

Training will be designed to ensure all personnel understand their obligations to exercise due diligence for environmental matters.

A comprehensive environmental induction will be provided to all staff and subcontractors prior to starting work on site. The induction will include, as a minimum:

- The significance of the actual or potential environmental effects and the importance of mitigation;
- An overview of the mitigation measures required for the Project;
- Any cultural ceremonies required before or during the construction;
- Location of sensitive receptors;
- Importance and relevance of the CMP and associated management plans;
- Consent requirements and conditions;
- Roles and responsibilities in relation to compliance with consents.
- Spill response and emergency procedures
- Hazard and risk management;
- Accident, incident, spill reporting and methods for environmental protection;
- Complaints management procedures
- Environmental monitoring and reporting requirements.

All employees and sub-contractors involved with the construction works will be required to read the CMP and sign a declaration that they have read and understood its requirements. This includes the details of the specific management plans that may influence their work.

#### **4.5.2 Visitors**

All visitors must undergo a visitor's induction. Shortened inductions may be provided for visitors to the construction site where there is only minimal potential environmental harm.

Sub-contractors will be responsible for the actions and conduct of their visitors and will ensure that visitor obey all environmental requirements of the site. Visitors will be accompanied at all times.

### **4.6 Complaints Procedure**

At all times during the construction phase of the Project, the Contractor shall maintain a register of any complaints or any other feedback received alleging adverse effects from, or related to, the construction of the runway project.

Complaints from the public will be dealt with in the first instance by the Site Manager. A 24 hour/seven day complaints line will be established for the local

community to call if there are any concerns regarding construction. The complaints number will be advertised at regular intervals in the local newspaper, on the Project website as well as being displayed on signs in the area.

A log will be kept of all complaints which will include the following details:

- Date and time of the complaint;
- The nature of the complaint;
- Complainant name, address and contact details
- weather conditions at the time of the complaint (as far as practicable), including wind direction and approximate wind speed if the complaint relates to air discharges;
- the outcome of the investigation into the complaint (i.e. the cause and effect);
- measures taken to respond to the complaint; and
- any other activities in the area, unrelated to the Project that may have contributed to the complaint, such as unusually noisy or dusty conditions generally.

A general objective of the Environmental Compliance Manager will be to initially respond to the complaint within 48 hours, ideally with a solution, or if not a programme for solution. All communications in relation to the complaint will be logged. A written response to the complaint shall be provided within 10 working days.

The log of complaints and actions will be made available to the Consent Authorities on request. A copy of any the complaints register shall be provided to the local and regional council every two months.

The Contractor shall provide detail of the proposed complaints procedure and append to this CMP as **Appendix C**. Included shall be a template log.

## 5 DESIGN

### 5.1 Design Overview

The works will be undertaken generally in accordance with the engineering plans and construction documents attached as **Appendix D**.

*[Section to be completed with reference engineering plans required by condition x].*



## **6 CONSTRUCTION ACTIVITY**

### **6.1 Establishment**

The Contractor shall detail their proposed establishment activities and methodologies and attach them to the CMP.

The following sections set out requirements and guidelines.

#### **6.1.1 Construction Offices and Compounds**

##### **6.1.1.1 Location, Access**

The proposed general location and access locations for the construction offices and compounds shown in the Site Layout Plan [that will be attached as **Appendix E**].

The Contractor will detail the number, type, size, characteristics, location and purpose of temporary buildings proposed to be located in these areas prior to the CMP receiving final approval.

Temporary buildings will be for the sole use of this Project and will be removed following the completion of works.

##### **6.1.1.2 Utilities**

The Contractor will detail the provision for temporary power, water and telecommunications supply to the construction offices and compounds and append to this CMP. The Contractor will also address handling of sewerage and solid waste.

##### **6.1.1.3 Drainage Control**

The Contractor will provide appropriate site grading and control measures for handling of storm water runoff, including collection and treatment systems as necessary.

##### **6.1.1.4 Car Parking**

The Contractor shall provide sufficient car parking on the Contractor's facilities area for the number of staff expected to be on site at any time, including subcontractors plus expected visitors to the site.

The Contractor shall detail provisions and append to this CMP.

##### **6.1.1.5 Machinery Parking**

The Contractor shall provide secure parking for all land based mobile machinery when outside hours of operation. The Contractor shall provide details of machinery parking and shall append to this CMP.

##### **6.1.1.6 Security**

The Contractor shall secure the Contractor's office and compound areas. This will be achieved with security fencing and gates. A second security perimeter

will be established around fuel storage areas and hazardous goods storage areas.

The Contractor shall ensure that security fencing and gates are of sufficient height and robustness and shall append details to this CMP. Note special requirements for aircraft security fencing described in Section 11 **Error! Reference source not found..**

Airport operational areas shall be kept secure at all times as set out in Section 11 **Error! Reference source not found..**

Haulage routes close to and onto the construction site should be secured by fences to ensure public safety is maintained at all times.

Security lighting may be used at the discretion of the Contractor. If used lighting shall comply with the provisions of Section 11 Aircraft Operations and Section 12 Lighting.

#### **6.1.1.7 Hazardous Substances**

Bulk fuel for land based machinery and vehicles will be stored within the contractors' facilities area shown on the Site Layout Plan.

The staff responsible for fuelling will ensure fuelling is undertaken in the most efficient and effective manner. The fuel tanks operator will observe the fuelling procedure and ensure that in the event of pipe failure or spillage, refuelling is stopped immediately, the spillage contained and cleaned up. The Contractor shall maintain spill kits on site for use in the event of spills.

The spill kits will contain absorbent pads, booms, pillows, socks, pegs and such other equipment usually contained in a spill kit. The Contractor shall be responsible for ensuring the kit is correctly sized to meet potential spillages.

Fuels for hand held equipment, lubricants and hazardous material will be stored in a suitable shed or container at the Contractor's fuel and hazardous goods storage area.

The Contractor shall detail provision for fuel storage, refuelling, machinery servicing and hazardous goods storage and shall append to this CMP.

## **6.2 Fill Source Material**

The Contractor shall list and describe the volume of fill material required for the construction of the Project and their relevant sources. Due to the significant volume of fill material required, this may be populated as each stage progresses.

The Contractor shall maintain a log recording the source of imported fill material. This shall be made available to the Compliance Manager, GWRC, on request.

All fill material shall be in accordance with the Ministry for the Environment 'cleanfill' definition, as detailed in Publication ME418 "A Guide to the Management of Cleanfill, 2002" or subsequent updates.

### 6.3 Fill Haulage Routes

Construction and fill material will likely be conveyed to the site via a combination of land-based and marine-based transportation equipment. The final means will be determined by the selected Contractor.

The CMP will list and describe how the material will be transported to the construction site and will include identification of:

#### *Marine Based Haulage Routes*

- The marine based equipment required.
- Navigation and notification requirements;
- Mooring system proposed and where it will be established;
- The frequency of marine vessel movements;
- Adverse weather procedures;
- Staff transfer, material loading/unloading and refuelling procedures; and
- Emergency and spill response procedures.

#### *Land Based Transportation*

- The land based equipment required.
- The haulage route proposed, noting the requirements and limitations inherent in the conditions of consent.
- Emergency and spill response procedures.

The Construction Traffic Management Plan (CTMP) will detail the measures related to cleanliness of vehicles, keeping public roads available and minimising risks to the safety of vehicular and pedestrian movements.

### 6.4 Establishment of Construction Plant and Equipment

A combination of marine and land based construction plant and equipment will be required to construct the Project. This could include, but is not limited to:

*[List to be updated by the successful contractor]:*

Marine Based Construction and Plant	Land Based Construction Plant and Equipment
<ul style="list-style-type: none"> <li>• Jack up barges;</li> <li>• Floating barges;</li> </ul>	<ul style="list-style-type: none"> <li>• Tipper Truck and Trailer Units;</li> </ul>

<ul style="list-style-type: none"> <li>• Hopper barges;</li> <li>• Long Arm Diggers (mounted on a barge);</li> <li>• Trailing Suction Hopper Dredge;</li> <li>• Clam Shell Dredge;</li> <li>• Cutter Suction Dredge;</li> <li>• Floating and Land Based Pumps and Discharge points;</li> <li>• Pile Driving rigs (mounted on a barge);</li> <li>• Stone Column rigs (mounted on a barge);</li> <li>• 150 to 400 tonne crawler cranes (mounted on a barge);</li> <li>• Ancillary/support plant such as deck barges, tender tugs and crew boats; and,</li> <li>• Survey vessels (for quality control and inspection, quantity calculation for payment, and identification of fill problems).</li> </ul>	<ul style="list-style-type: none"> <li>• Long Arm Excavators;</li> <li>• Stone Column rigs;</li> <li>• Vibrocompaction rigs;</li> <li>• 15 to 50 tonne excavators;</li> <li>• Bulldozers – e.g. D6, D8 and D9;</li> <li>• Medium Wheel Loader e.g. CAT 980;</li> <li>• 150 to 400 tonne crawler cranes;</li> <li>• 25 ton articulated dump trucks;</li> <li>• Compressors (including compressed air tools); and,</li> <li>• Rollers.</li> </ul>
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## 6.5 Stockpiles

The Contractor shall detail their proposals for stockpiling and shall append to this CMP.

Detail should include:

- Location
- Purpose of stockpile
- Volume and dimensions
- Duration
- Methodology and machinery proposed to form and draw from stockpiles
- Drainage, erosion and fugitive dust control measures.

The general management of the stockpiles and the mitigation measures to ensure the dispersal of dust arising from the establishment, storing or use of stockpiles is set out the Construction Air Quality Management Plan (CAQMP) which is to be appended to the CMP. The measures proposed to manage sediment run off and erosion of the stockpiles is described in the Erosion and Sediment Control Plan (ESCP).

## 6.6 Hours of Construction

Due to the constraints of the OLS and the need to maintain scheduled airside operations for the duration of the Project construction, night work will be required between the hours of 1:00am to 6:00am when the airport is non-operational.

Night work will be required to perform parts, if not all, of the following construction activities:

- Construction of the extended underpass;
- Construction of temporary marine support and berthing/mooring structures;
- Protection and/or relocation of the outfall;
- Construction and implementation of the ground improvements under the rock dyke (if necessary);
- Construction of the rock dykes;
- Construction of the reclamation;
- Implementation of surcharge fill and/or ground improvement of the reclamation fills, and,
- Construction of the airside works, including but not limited to pavement works, the installation of all lighting, electrical, drainage, pavement marking, navigational aids, fencing, topsoiling, grassing works and all finished ground level based associated tasks.

Based on a 10 hour working day, 6 days per week, the majority of night work for these phases is estimated to occur over:

- 3 calendar months for the extended underpass and temporary marine structures;
- Intermittent periods over 18 calendar months for construction of the rock dyke;
- 5 to 18 calendar months for installing the reclamation fill depending on the sources of the fill materials.
- 2 to 3 calendar months for ground improvement of the reclamation fills.
- 10 calendar months for the airside works and removal of any surcharge on the reclamation fill.

These periods could be independent of each other or concurrent depending on the Contractor's programme.

The effects of night time construction noise on surrounding sensitive receivers is managed via the Construction Noise and Vibration Management Plan (CNVMP).

## 6.7 Contingency Planning

The characteristics of the Project site, including its location directly adjacent to an operational Airport and its exposure to strong northerly and southerly weather conditions present some not insignificant construction challenges that will ultimately influence the construction methodologies adopted for the Project.

The Project is exposed to the open sea, which will result in construction impacts from waves, currents, wind and storm events. Sufficiently adverse weather conditions may bring a halt to construction activities on occasion and will likely require the demobilisation of marine equipment from Lyall Bay to a safe refuge (such as Evans Bay). Provision for construction activities in less than ideal weather conditions will therefore need to form a consideration of the final construction methodologies adopted.

The contractor will be required to prepare and append an adverse weather policy that sets out the procedures to be implemented prior to, during and following an adverse weather event.

## 6.8 Emergency and Incident Response

There is the potential for unforeseen events to occur that may impact on the environment and will require emergency response. The following sections provide an outline of how environmental incidents or emergencies are to be managed. This may be amended to reflect the selected contractor's equipment, construction methodologies and response procedures, however the following sets out the minimum response required.

An environmental incident is an occurrence which has (or potentially could have had) a negative or 'adverse' effect on the environment. An adverse effect is something that causes (or could have caused) environmental harm.

Environmental incidents include but are not restricted to:

- Spills;
- Unforeseen impact on areas of high sensitivity or environmental value;
- Consent condition non-compliances.

An environmental emergency is an event which has a detrimental effect on the surrounding environment. A detrimental environmental effect is something that causes significant harm to the environment, which is not legally allowed and requires immediate response. An examples of environmental emergency includes a significant (large volume) chemical / oil spill to the coastal marine area or land.

The Contractor will establish a set of environmental incident/emergency procedures and append them to this CMP. This will include an environmental incident register that will be made available to the Greater Wellington Regional Council on request.

## 6.9 Site Demobilisation and Rehabilitation

The Contractor's construction offices, compounds and staging areas, and the construction site shall be rehabilitated as follows:

- Removal of all buildings, fences and other temporary structures
- Removal of all temporary services
- Removal of all refuse and debris
- Removal of contaminated material for disposal (if any)
- Where necessary, removal of any concrete or seal surfacing
- Removal of temporary erosion and fugitive dust control measures.

The Contractor shall provide detail of rehabilitation methodologies and append to this CMP. Note where detail is covered under other aspects of this CMP repetition is not required.

## 6.10 Construction Quality Assurance

The Contractor's construction quality assurance (QA) obligations will be set out in their tender specifications and will be further developed and established through the detailed design phase of the project.

As a minimum, it shall include:

- Quality control (QC) criteria
- Required and guideline measurement and testing criteria
- Obligations for independent QC and QA
- Contractor quality assurance systems (that is assurance of QC performance)
- Engineer directed independent quality audits
- Reporting and documentation requirements.

The Contractor shall detail their proposed QC and QA methodologies and append to this CMP.

## 7 PROGRAMME

The anticipated general sequencing and duration of construction of the runway extension project is set out in Table 7. The actual staging and duration will be finalised on completion of detailed engineering design and from input of the selected construction contractor.

It should be noted that many of the stages identified below can and will be performed concurrently, with staggered starting dates. The overall construction

timeframe is anticipated to be in the order of three to four years. This timeframe also takes into consideration the likely delays that will arise due to adverse weather conditions.

The contractor will prepare a detailed programme that will provide sufficient detail in respect of the construction sequences and will represent programme constraints. The final programme will be appended to this CMP.

**Table 7: Construction Sequence**

Stage	Duration	Description
Stage 0	3 months	General site establishment works, including site compounds, staging areas and temporary marine support and berthing/mooring structures.
Stage A	14 months	Installation of stone columns beneath the rock dyke, if required.
Stage B	14 months	Once stone columns are sufficiently advanced, commence installation of stone blanket over stone columns, adjacent filter layer on seabed and secondary armour layer over seabed filter layer. Trim all rock to final profile.
Stage C	14 months	Once stone blanket, seabed filter layer and secondary armour over seabed filter are sufficiently advanced, commence installation of core rock section of the rock dyke. Remove existing Akmon armour units in the immediate vicinity where land-based operations have commenced.
Stage D	14 months	Progressively place filter layer to outside of core batter and trim to profile. Trim top of core material to obtain filter profile to complete placement of filter material.
Stage E	15 months	Once the core section and filter layer are sufficiently advanced, place primary armour to toe; secondary armour over batter filter layer; followed by outer primary armour to batter. Progressively recover existing Akmon armour units to place on outside of new eastern rock dyke.
Stage F	13 months	Complete core and filter to top surface, and then complete placement of secondary armour and primary armour top (horizontal) layers. Leave out accropods immediately adjacent to precast concrete wall location.
Stage G	1 month	Fabricate geotextile into large panels and roll onto mandrel. Fix geotextile to top of rock dyke and roll



Stage	Duration	Description
		down the batter.
Stage H	5 months	Construct reclamation using locally dredged material with marine-based equipment and/or land-based (and possibly marine based) equipment for land-based fill material. For the marine-based method, establish pumping connections and locations for off-load of the dredged material from marine-based equipment, as well as flow discharge points from reclamation. Place fill material to finished surface level.
Stage I	3 months	Once reclamation is sufficiently complete, place precast concrete wave wall units (3-metre-long precast units ~30 tonnes each) using crawler crane. Place final (primary armour) accropodes in position adjacent to the precast structure. Place precast drain and graded gravel surface to top surface of precast units.
Stage J	1 month for wick drains, and if performed, 10 months for surcharge, including 8 months consolidation	Perform ground improvement (such as vibro compaction) of reclamation fill materials. Alternatively, where applicable, install wick drains within area of reclamation to be surcharged then construct surcharge fill.
Stage K	10 months	If surcharge fill placed, remove surcharge. Construct airfield drainage, pavements, and install navigation lighting, etc. Construct amenity improvements to Moa Point Road and Beach area.

## 8 SEDIMENT AND EROSION CONTROL

There is potential for the infilling and construction activities to give rise to sediment discharges in the coastal marine area (CMA) and into the stormwater management network.

Management of sediment discharges throughout the construction phase will be implemented via an Erosion and Sediment Control Plan (ESCP). The Plan will specify the erosion and sediment control measures that will be implemented during the construction phase of the Project, including within the CMA and on land.

## **9 DUST**

There is the potential for dust to be generated from a number of construction activities. These include:

- Initial site establishment including compounds;
- Stockpiling of rock dyke and fill materials;
- Placement of rock dyke material;
- Placement and compaction of fill material;
- Operation of vehicles on access/site roads;
- Wind erosion of working areas; and,
- Rehabilitation of completed areas.

The Construction Air Quality Management Plan (CAQMP) sets out procedures for monitoring the discharge of particulates into the air during construction, as well as methods to be used to limit dust and any odour nuisance effects.

## **10 CONSTRUCTION NOISE**

The Construction Noise and Vibration Management Plan (CNVMP) provides the framework to manage construction noise and vibration arising from the construction of the Project. This plan will be particularly important in managing the potential for night time construction noise to mitigate annoyance and sleep disturbance.

## **11 AIRCRAFT OPERATIONS**

Special attention is required to ensure that there are no adverse effects on aircraft or aerodrome operation and that air traffic can continue to operate safely.

### **11.1 Obstacle Limitation Surface**

The Contractor shall ensure that no object penetrates the “airspace designation” including the take off and approach fans and flyover areas at any time during aerodrome operations.

### **11.2 Security**

Wellington International Airport is an international aerodrome and as such has specific and strict security provisions. As the construction work progresses, existing security fencing may require removal. Temporary security provisions complying with CAA rules shall be provided.

### **11.3 Debris**

It is critical that no loose material or debris is present on the runway or runway strip during aircraft operations. Controls are required to prevent debris occurring, prevent debris blowing onto the secure area, and to inspect for and remove any occurrence of debris.

### **11.4 Dust**

Dust has the potential to adversely affect aircraft operations through impaired visibility and induction into engines. Control of dust is critical to safe aircraft operation and is described in the CAQMP and the Method of Works Plan attached as Appendix X and X respectively.

### **11.5 Navigation and Communication Systems**

Although unlikely, it is possible that Contractor's construction machinery and systems could affect aircraft and aerodrome navigation and communication systems, for example:

- Unsuppressed electrical systems
- Radio communications
- Construction and marine navigation lighting
- GPS operation.

These systems will be monitored and controlled throughout construction to ensure that there is no potential for the Contractor's systems to interfere with aircraft navigation systems.

### **11.6 Communication**

It is necessary for the Contractor working in and around the aerodrome to maintain open communication channels at all times with the Aerodrome Operator (WIAL) and Air Traffic Control (Airways Corporation).

### **11.7 Emergencies**

In the event of an aircraft emergency contingent plans are required to ensure Contractor activities do not adversely affect the emergency or present avoidable hazards.

Similarly, in the event that Contractor operations breach provisions for aircraft or aerodrome operations, contingent plans are necessary to prevent an aircraft emergency.

## 11.8 Method of Works Plan

CAA regulations require that, when work is on or affecting the secure area of an aerodrome a Method of Works Plan (MOWP) is submitted and approved by the Aerodrome Operator (WIAL).

The MOWP shall describe the works proposed, methodologies, duration, hours of work and provisions for control of effects on the aerodrome and aircraft.

The MOWP shall be a standalone document covering all aspects of construction likely to affect aircraft or aerodrome operations. It is not sufficient for the MOWP to refer to this CMP or other documentation. This will create repetition of some aspects of this CMP into the MOWP and is unavoidable.

## 12 MARINE OPERATIONS

The plan and programme for the marine based operations will be developed by the Contractor to establish the specific operational requirements for all marine construction activities, including marine traffic travelling to and from the proposed construction site, and within the site construction zones. The Plan will require consultation with and acceptance by the relevant authorities with jurisdiction over the CMA.

The marine operations to be developed by the Contractor will include the procedures, requirements, standards, equipment, and safety measures for the marine works construction activities. Special attention is required to ensure that there are no significant adverse effects to the CMA, the aircraft or aerodrome operations, and recreational uses within Lyall Bay.

The marine operations will address the following:

- Methodologies and equipment to be used for each element of the marine construction works, including work hours,
- Positioning, anchoring and mooring systems to be used for marine equipment during working and non-working hours,
- Procedures for anchoring and/or demobilisation of marine equipment due to adverse weather conditions,
- Procedures for spill control and spill response for protection of the CMA,
- Procedures for fuelling of marine equipment,
- Emergency response procedures,
- Debris management procedures,
- Monitoring procedures and equipment for protection of the CMA,
- Procedures and equipment for discharge of decant water from the reclamation construction area into the CMA,
- Navigational and safety lighting requirements,

- Procedures and equipment to perform surveys for quantity measurements and confirmation of coordinates and elevations,
- Procedures for protection of existing infrastructure within the construction zone, including the Moa Point outfall sewer, and
- Security procedures for marine equipment.

## **13 LIGHTING**

The Contractor shall develop a lighting plan for the Project. The purpose of this plan is to ensure that lighting overspill and illumination to airside activities, adjoining land uses, local communities, and marine species is appropriately managed. The Contractor shall detail their proposals for lighting management and append to this CMP.

The Contractor shall ensure that lighting will not generate greater than a 3 lux light spill (horizontal or vertical) at the boundary of any residential site or the boundary of roads.

The Contractor shall ensure that fixed lighting systems, including temporary installations on the runway extension, is directed downwards onto the work site and away from roads and residences.

The Contractor shall ensure that machinery mounted lighting is directed downward (excluding safety/hazard lighting), and that operating headlights in 'dipped' position as necessary. The Contractor should consider the erection of screens (if necessary) to ensure light spill is within the above criteria.

The Plan shall identify the methods in which to manage light spill on adjacent land uses as far as is practicable and to minimise the risk of bird attraction and strikes.

## **14 TRAFFIC**

The Construction Traffic Management Plan (CTMP) sets out the specific operational requirements of all construction related traffic travelling to and from the proposed construction site, and within the site. The Plan will require consultation with and acceptance by the relevant road controlling authorities.

The plan confirms the procedures, requirements and standards necessary for managing the traffic effects during construction so that safe, adequate and convenient transportation facilities are maintained throughout the construction of the Project.

The CTMP will also identify where changes are required to the existing landside operations (e.g. car parking) to facilitate the construction activity.

## **15 ECOLOGICAL MANAGEMENT**

Ecological enhancement and habitat recreation is proposed as part of the management of effects arising from the construction of the Project on coastal aquatic ecosystems and existing reef habitats. This shall be implemented via the Ecological Mitigation and Management Plan (EMMP).

## **16 ARCHAEOLOGICAL DISCOVERY PROTOCOL**

The objective of this protocol shall be to manage any potential or actual effects arising from construction activities on any cultural, archaeological or heritage sites.

The Contractor shall be responsible for implementing the Accidental Discovery Protocol prepared by WIAL in consultation with Iwi representatives and Heritage New Zealand.

The protocol shall be adhered to at all times during the construction of the Project.

A copy of the protocol will be appended to the CMP.

## **17 NETWORK UTILITIES**

Construction could potentially impact on a number of network utilities and services. Utilities and services will either be protected in place or relocated in conjunction with the project's construction. Contractors will be required to work closely with the relevant service providers to undertake the necessary protection and/or relocation works. It will be the Contractor's responsibility to maintain utility services throughout construction.

The Network Utilities Management Plan shall be attached to this CMP and shall set out the measures proposed to ensure the integrity of the networks utilities and services is maintained throughout the duration of construction of the Project.

## **18 HEALTH AND SAFETY**

Construction activity will be required to comply with all relevant and applicable legislation, regulation and procedures, with the intended outcome being the avoidance of harm to workforce and visitors to the site.

The Contractor will be required to identify the interfaces of the construction works with the public and management to ensure the safety of all. The contractor will also be required to establish hazard identification, management and mitigation, emergency protocols and incident reporting.

The methods to ensure this is achieved are set out below:

- Adhere to the provisions and requirements of the Health and Safety in Employment Act at all times
- Outline protocols to ensure the safety of staff working on the construction site and including in the CMA.
- Outline protocols to ensure the safety of the public using the CMA within proximity to the construction zone.
- Establish zones where public access to the coast will be temporarily excluded in the interests of health and safety in accordance with any conditions of consent.
- Establish in-water zones where public access to marine areas will be temporarily excluded from recreational activities in accordance with any conditions of consent.
- Provisions and protocols to address public safety during construction activities.

## **19 MONITORING AND REVIEW**

### **19.1 Environmental Monitoring and Compliance**

Monitoring of environmental performance and compliance with resource consents is required throughout the construction phase of the Project. This enables the overall effectiveness of the environmental controls to be determined and allows areas of non-compliance to be identified so corrective actions can be taken.

Environmental monitoring will take place prior to construction to assess the baseline, during construction to assess the impact of the construction on the environment, and after construction to assess the impact of the completed Project. Environmental monitoring is required at various stages of construction for various aspects of the Project, as specified in the detailed management plans attached to the CMP.

Monitoring will be conducted in accordance with the approved methods stated in the resource consent conditions or otherwise agreed by the relevant stakeholders (GWRC, WCC).

Where monitoring results exceed the relevant standards and/or resource consent conditions, corrective actions will be taken. A non-compliance report will be prepared and reported to the Greater Wellington Regional Council, Wellington City Council, and other key stakeholders as required.

### **19.2 Environmental Auditing**

Periodic environment auditing will be undertaken throughout the construction of the Project to determine the extent to which the resource consent conditions and management plans have been met.

Audits will include:

- Regular internal audits of site and task specific activities (such as refuelling procedures and stockpile management).
- External audits by regulatory authorities to confirm compliance with resource consent conditions.

The project manager will be responsible for ensuring that any non-conformances identified in the audit are closed out in a timely fashion as per the auditors' recommendations.

## 20 REVIEW

This document will be reviewed after confirmation of the resource consent conditions and will be revised in accordance with those conditions. The CMP and the other management plans will be updated, with the necessary approval, throughout the course of the Project to reflect material changes associated with changes to design, construction approach and methodologies and/or the natural environment.

Approval from GWRC and WCC will be required for any relevant revisions of a material nature to the CMP or other plans, for which these authorities have jurisdiction.

A management review of the CMP will be undertaken every three months by the Project Manager.

The review will take into consideration:

- Site personnel comments;
- Audit findings and recommendations;
- Environmental monitoring records;
- Environmental complaints, incidents and emergencies;
- Details of corrective and preventative actions;
- Any environmental non-compliances;
- Ongoing compliance with objectives, conditions and targets; and
- Possible changes in legislation and standards.

The review process will include looking at the environmental controls and procedures to make sure they are still applicable to the activities being carried out. Reasons for making changes to the CMP will be documented. A copy of the original CMP document and subsequent versions will be kept for the Project records, and marked as obsolete.

Each new/updated version of the CMP documentation will be issued with a version number and date to eliminate obsolete CMP documentation being used.



## **APPENDICES**

**[to be developed]**

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