# Biosecurity Risk Management Framework

## Lord Howe Island Critical Infrastructure Program

PREPARED FOR

NSW National Parks and Wildlife Service (NPWS) (part of the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW)) on behalf of the Lord Howe Island Board

DATE
30 September 2025

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SIGNATURE PAGE

# Biosecurity Risk Management Framework

## Lord Howe Island Critical Infrastructure Program

0741543

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# CONTENTS

## LIST OF FIGURES

# 1. PROJECT OVERVIEW

Lord Howe Island (LHI) is significant for its unique environmental and cultural heritage values and is inscribed as a World Heritage Area. LHI depends almost entirely on marine freight to transport essential supplies to, and remove waste from, the island. Sea freight transport, waste and biosecurity management are critical to protecting the island's unique biodiversity and cultural values and ensure the well-being of its population.

The current marine freight vessel will reach the end of its service life in March 2027. Therefore, there is an urgent need to replace this vessel and provide infrastructure upgrades to facilitate freight transfer from the new vessel. Similarly, the existing waste management facility is in urgent need of upgrade to meet the conditions of the environmental protection licence (EPL) it operates under. New biosecurity facilities are also required to assist with adequate biosecurity management of freight delivered to the island.

The following activities are being delivered under the LHI Critical Infrastructure Program (CIP):

- Marine infrastructure – including a new marine freight vessel and services operating model, mainland logistics service including freight facility and mainland port, and new freight vessel landing facilities and freight staging areas on LHI;
- Waste management facility (WMF), including new storage sheds, new materials recycling facilities, new organics facility and wastewater treatment plant; and
- Biosecurity measures and facilities including an enhanced biosecurity management system with a new biosecurity screening station/facility, dedicated kennel for detection dogs; updated biosecurity program, and capital improvements at the mainland port(s) servicing LHI.

The proponent for the LHI CIP is the NSW National Parks and Wildlife Service (NPWS) (part of the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW)) on behalf of the Lord Howe Island Board

Whilst the LHI Critical Infrastructure Program relates to all activities described above, the Critical Infrastructure Project (Project) (as defined in the Environmental Impact Statement [EIS]) relates to the construction and operation of all marine and land-based infrastructure. The Project itself and its approval does not consider the new marine freight vessel and services operating model nor the mainland facility from which the future service will operate.

Irrespective the Biosecurity Risk Management Framework takes a holistic view of the LHI CIP as biosecurity is required to be integrated throughout all phases, in particular, construction (**Phase 1**) and operation (**Phase 2**).

The company/contractor responsible for design development (as defined in the EIS) and construction of the Project (**Phase 1**) has not yet been selected. A competitive tender process is currently underway with the Main Infrastructure Works (MIW) contractor expected to be engaged in Q4 2025.

There are several locations relevant to the construction and operation of the LHI CIP (as defined in the EIS), namely the:

1. Mainland Australia freight/cargo staging and forwarding port/s and mainland airports;
2. North Zone (**Figure 1-1**) – comprising the marine-based upgrades to the marine infrastructure and land-based upgrades to facilitate marine freight delivery and provide dedicated biosecurity infrastructure; and
3. South Zone (**Figure 1-2**) – comprising upgrades to the existing Waste Management Facility, dedicated kenneling for the Island's biosecurity detection dogs, and a fuel bowser on Lagoon Road.

Construction for the Project (as defined in the EIS) will rely on Port Macquarie and, potentially, other mainland Australian ports for marine freight as well as mainland airports for air freight if required. The ports/airports to be used for staging and subsequent freighting of construction material and equipment will be determined once the MIW contractor has been engaged. At this time, the biosecurity risks associated with freight (marine or air) being delivered to LHI from mainland ports/airports is a significant construction and operational risk and will need to be determined and appropriately managed.

The Project is expected to begin construction in July 2026, and complete construction in late 2027 (**Phase 1**). LHI CIP operations which commence after construction completion (**Phase 1**) are considered to be **Phase 2**. Significant funding for the LHI CIP has been secured from the NSW Government.

It is noted for clarity that LHIB business-as-usual (BAU) biosecurity operations which support the current marine and air freight service will continue to occur throughout the LHI CIP delivery as managed by LHIB and its respective partners and are not considered in this framework.

| No | Design Elements (Indicative) |
|---|---|
| 1 | PUBLIC BOAT RAMP |
| 2 | UPGRADED WILSONS LANDING PICNIC AREA |
| 3 | CONTAINER STUFFING/UNSTUFFING |
| 4 | CARGO LOADING/UNLOADING AREA AND STORAGE |
| 5 | BOAT PARKING FOR TFNSW/MARINE PARKS |
| 6 | OCEAN VIEW BOATSHED ADAPTIVE REUSE |
| 7 | MARINE RESCUE SHED RETAINED |
| 8 | OLD CARGO SHED ADAPTIVE REUSE |
| 9 | INFORMAL VIEWING AREA WITH SEATING |
| 10 | UPGRADED MARINE INFRASTRUCTURE |
| 11 | EXISTING CAR AND/OR TRAILER PARKING RETAINED |
| 12 | BIOSECURITY/QUARANTINE SHED |
| 13 | AUSTRALIA POST AND STORAGE ROOMS |
| 14 | JETTY |





**Legend**

- Cadastre
- Temporarily Secured Area During Vessel Loading/Unloading
- Project Area
- Marine Parks & TFNSW
- New Vessel
- Proposed Piled Vessel Ramp
- Proposed Hardstand
- Proposed Berthing Dolphin
- Proposed Timber Deck
- Proposed Tree
- Proposed Turf Area
- Item to be removed

Coordinate System:
GDA 1994 MGA Zone 57

Date: 01/10/2025

Created By: MB/IS

Drawing Size: A3

0 20 40m

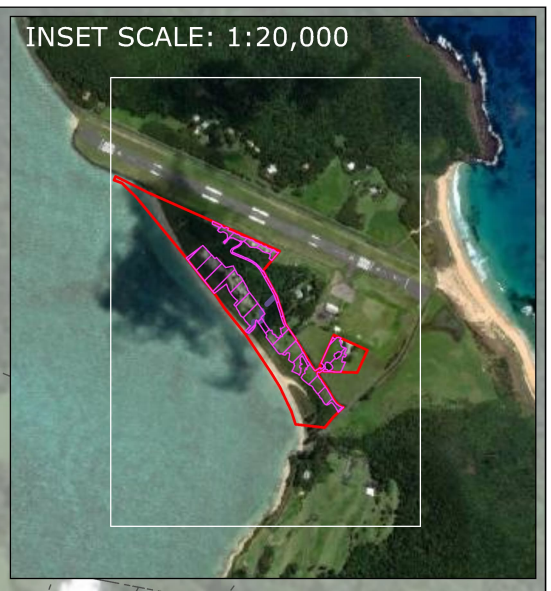
1:1,500

**F1-1 Project Layout (North Zone)**

**LHI CIP**
**Biosecurity Risk Management Framework**
Client: DCCEEW (NSW) on behalf of LHIB c/o APP Group

ERM

| No | Design Elements (Indicative) |
|---|---|
| 1 | STORAGE SHED |
| 2 | OPEN BUNKERS |
| 3 | BULKY GOODS STORAGE |
| 4 | ORGANICS STORAGE |
| 5 | WASTEWATER TREATMENT PLANT |
| 6 | ORGANICS PROCESSING WORKSHOP |
| 7 | MATERIALS RECOVERY FACILITY (MRF) |
| 8 | OFFICE/AMENITIES BUILDING |
| 9 | COMMERCIAL WASTE RECEIVAL |
| 10 | RESIDENTIAL WASTE RECEIVAL |
| 11 | PROPOSED FUEL SERVICING AREA |
| 12 | PROPOSED DETECTION DOG KENNELS |
| 13 | CONSTRUCTION LAYDOWN |




**Legend**

- Existing Walking Track
- Cadastre
- Disturbance Area
- Project Area
- Proposed New/Upgraded Road
- Proposed Tree
- Proposed Turf Area
- Proposed Hardstand

Coordinate System:
GDA 1994 MGA Zone 57

Date: 01/10/2025

Created By: MB/IS

Drawing Size: A3

0 50 100m

1:3,000

# F1-2 Project Layout (South Zone)

**LHI CIP**
**Biosecurity Risk Management Framework**

Client: DCCEEW (NSW) on behalf of LHIB c/o APP Group

ERM

0708120_LordHowe_LHI_CIP_BRMF_R0.aprx

# 2. PURPOSE AND CONTEXT

## 2.1 PURPOSE

The purpose of this Biosecurity Risk Management Framework (BRMF) is to guide the development of two separate comprehensive Biosecurity Risk Management Plans (BRMPs) for the LHI CIP construction (**Phase 1**) and operations (**Phase 2**) phases. The development and implementation of the BRMPs will be the responsibility of:

- The MIW contractor (**Biosecurity Risk Management Plan – Construction (Phase 1)** as a Construction Environmental Management Plan (CEMP) Sub-plan) (**Figure 2-1**);
- The contractor responsible for the new marine freight vessel and services operating model (**Biosecurity Risk Management Plan – Operations (Phase 2)** (**Figure 2-1**);
- The LHIB (Phase 1 and Phase 2); and
- Other relevant contractors (Phase 1 and Phase 2).

This BRMF outlines, at a high-level, the biosecurity strategies that should be considered for the LHI CIP construction and operations, to ensure the effective identification, mitigation, and management of biosecurity risks associated with project activities.

These activities include, but are not limited to, pre-arrival preparations, marine and air freight transportation, construction and operational procedures related to marine infrastructure, cargo handling and biosecurity facilities, and waste management facility upgrades.

During construction (Phase 1), the MIW contractor is required to address key biosecurity measures within this framework, with the aim to minimise biosecurity risk, reduce project delays, and prevent disruptions that could result in additional costs.

During operation (Phase 2), the LHIB and contractor responsible for the new marine freight vessel and services operating model will be responsible for implementing key biosecurity measures to minimise biosecurity risk, ensure continuity of services, and avoid disruptions that could lead to increased operational costs.

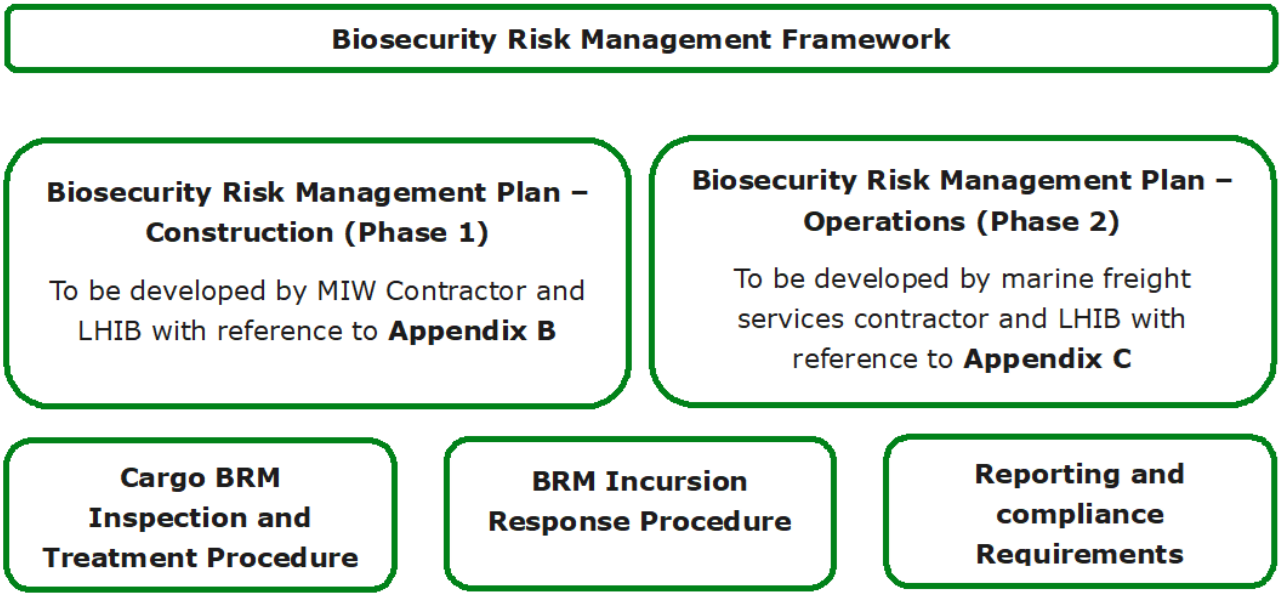
Throughout the LHI CIP, the LHIB, MIW contractor and the contractor responsible for the new marine freight vessel and services operating model will engage with industry partners, stakeholders, and the local community to promote shared responsibility in maintaining biosecurity standards.

All parties must collaborate to ensure LHI's long-term sustainability. In doing so, this will reinforce the CIP's commitment to preserving Lord Howe Island's biosecurity integrity and safeguarding the island's unique ecological values.

## 2.2 CONTEXT

This BRMF is intended to guide the development of the BRMPs and their relevant sub-plans for the construction and operation of the LHI CIP. For example:

FIGURE 2-1 OVERVIEW OF BIOSECURITY RISK MANAGEMENT FRAMEWORK, MANAGEMENT PLANS AND PROCEDURES




The BRMF has referenced the biosecurity risk management template developed by the Department of Agriculture, Fisheries and Forestry. The BRMPs should expand on any areas as required to assess and mitigate the overall biosecurity risk throughout the construction and operations phases.

# 3. SCOPE

This document outlines the framework for the LHI CIP to comply with Lord Howe Island biosecurity requirements by developing and implementing processes and procedures to manage and mitigate biosecurity risks across the entire supply chain.

This BRMF applies to the construction and operation of the Project (as defined in EIS) and aims to address all activities with potential biosecurity impacts. This includes, but is not limited to, the movement of goods and construction materials, site operations, waste and resource recovery handling, and any other construction-related procedures that could pose a biosecurity risk to LHI.

Those responsible for the construction and operation of the LHI CIP must ensure that the BRMPs development and the execution of biosecurity management practices for the LHI CIP are informed by relevant documents and legislation.

The following sections (3-13 including Appendices) provide an overview of relevant aspects of the construction and operation of the Project that may warrant consideration in the BRMPs.

## 3.1 LOCATION

There are several locations relevant to the construction and operation of the LHI CIP (as defined in the EIS), namely the:

1. Mainland freight/cargo staging and forwarding port/s and mainland airports.
2. North Zone (**Figure 1-1**) – comprising the marine-based upgrades to the marine infrastructure and land-based upgrades to facilitate marine freight delivery and provide dedicated biosecurity infrastructure; and
3. South Zone (**Figure 1-2**) – comprising upgrades to the existing Waste Management Facility, dedicated kenneling for the Island's biosecurity detection dogs, and a fuel bowser on Lagoon Road.

Refer to the Site Plans provided in **Section 8.1**.

## 3.2 IMPORTS

LHI is a remote island protected under the World Heritage Convention. The Island cannot sustainably produce the food and general goods required to meet its permanent population and tourist needs. As such, LHI is almost completely reliant on the mainland for essential goods and services.

The Project will involve imports from the mainland including:

- Break bulk cargo and fuel;
- Construction materials (e.g., piles, fender sleeves, headstocks, prefabricated building elements etc.); and
- Equipment and large complex machinery (e.g., cranes, earthmoving equipment).

Further details are provided in **Appendix B**.

The MIW contractor (Phase 1) will be responsible for compiling a detailed list of imports required for construction of the Project, including the type, source location, mainland port of origin and measures to reduce biosecurity risk.

### 3.2.1 EQUIPMENT

The BRMPs must detail the plant and equipment to be used during construction (Phase 1) and operation (Phase 2) of the Project. A biosecurity risk analysis and risk assessment matrix should be conducted for plant and equipment to assess the overall risk of items to be freighted from the mainland to the island. Particularly with respect to large complex machinery.

## 3.3 ACTIVITIES

The following sections specify the activities that will be undertaken during construction and operation of the Project. These activities will need to be revisited, and additional details provided when the MIW contractor and contractor responsible for the new marine freight vessel and services operating model are engaged.

The activities described below align with the EIS and should any changes occur, the changes should be reflected in the below activities and assessed as part of the BRMPs with respect to overall biosecurity risk.

### 3.3.1 TRANSPORTATION ACTIVITIES

Transportation activities for the imports during the Construction (Phase 1) will likely include:

- Transport of goods from suppliers to a mainland warehouse and/or port/airport;
- Marine freight/cargo transport using the MV Island Trader, where available, or other freight vessel/s, as required;
- Tugboats and barges to transport materials and facilitate construction of marine infrastructure;
- Smaller marine craft to facilitate construction of marine infrastructure;
- Air freight services; and
- On-island transport using a variety of vehicles already located on the island.

Transportation activities for construction equipment, plant and materials required for activities within the North Zone would be transported via a barge/vessel that will enter the LHI lagoon through the existing channel via the North Passage and will dock at the existing jetty.

Construction equipment, plant and materials for activities within the South Zone would be transported via a barge/vessel to the North Zone and would then be transported via Lagoon Road. Further details are provided in **Appendix B**.

Construction traffic would be managed through a traffic management CEMP sub-plan which would be prepared and endorsed prior to the commencement of construction.

### 3.3.2 CONSTRUCTION (PHASE 1) ACTIVITIES

Construction activities will be required to comply with Lord Howe Island's current biosecurity procedures. The increased movement of construction materials, equipment and personnel to the island for the CIP, via vessel or aircraft, adds significant biosecurity risks that must be managed. LHIB has prepared a best practice guideline for use by the MIW contractor named *Lord Howe Island Biosecurity Manual – Critical Infrastructure Program, Keith Broome & Araceli Samaniego-Herrara, 08 August 2025 (**Appendix B**).*

All construction activities will require consideration, however, the below activities reflect a summary of the construction works for which planning approval is sought:

- Temporary works to enable the MV Island Trader to continue to operate during construction of the marine infrastructure;
- Enabling works including ground investigations and establishing construction site compounds;
- Earthworks and transport/removal of spoil;
- Establishment of hardstand areas for laydown, where required;
- Construction of marine infrastructure;
- Construction of land-based infrastructure, largely using prefabricated systems;
- Environmental management and pollution control measures; and
- Utilities connections, landscaping and finishing works.

Specific construction activities for the North Zone and South Zone are detailed below.

#### 3.3.2.1 NORTH ZONE ACTIVITIES

Construction activities requiring biosecurity consideration in the North Zone likely include:

- Construction of the new piled vessel ramp including installing precast tubes, precast planks, fender piles and oversleeves;
- Establishment of a mobile concrete batching plant;
- Earthworks to regrade the existing hardstand laydown area and install retaining walls;
- Delivery of civil construction materials, plants and equipment, which would involve vehicle movements coordinated with vessel arrivals;
- Site clearing works and construction of land-based infrastructure including prefabricated buildings for the cargo unstuffing/stuffing shed and biosecurity infrastructure;
- Upgrades to existing Ocean View and Old Cargo sheds; and
- Public access upgrades and landscaping.

Piling equipment would be placed on a barge and towed by a tugboat into the lagoon. The piling barge would include a piling hammer and crawler crane and would remain in place for the duration of the marine infrastructure works.

Construction materials would be stored on a second barge in the lagoon as not all materials would fit on a single barge. The cargo barge would be towed by tugboat back to a mainland port for loading and resupply.

#### 3.3.2.2 SOUTH ZONE ACTIVITIES

Construction activities requiring biosecurity consideration in the South Zone likely include:

- Site clearing works which include removal and disposal of any contaminated material and stockpiles of legacy waste material on the site (e.g., white goods, construction waste, old machinery). Any material that will remain on site for future processing, like organic waste, would be stockpiled in a segregated area that does not affect construction;

- Civil construction and installations - structural and building installations, electrical, water, piping, lighting installation, and processing plant installation for the new waste management facilities in the northern section of the WMF;
- Temporary relocation of existing equipment (e.g., MRF, horizontal baler, hot-rot unit etc.) to enable this equipment to remain operational during the construction of the new facilities; and
- Final relocation of equipment such as the hot-rot unit and balers and installation, testing and commissioning of new equipment.

Prior to construction, the proponent/applicant will coordinate with the local community to minimise the amount of waste that needs to be handled and processed by the WMF during the construction phase. This would include septic tank cleaning, green waste collection, and a coordinated campaign to collect chemicals and hazardous materials on the Island to ensure these wastes can be collected and transported to the mainland before construction commences.

### 3.3.3 OPERATIONAL (PHASE 2) ACTIVITIES

On completion of construction, the new/upgraded marine infrastructure, WMF and biosecurity infrastructure will operate continuously and in tandem to facilitate the broader LHI CIP objectives. The contractor responsible for the new marine freight vessel and services operating model will be required to meet the best practice requirements as detailed in LHIB's *Biosecurity considerations for the operation and maintenance of Lord Howe Island marine cargo, Keith Broome & Araceli Samaniego-Herrara, 12 August 2025 (**Appendix C**).* Operational activities requiring consideration will include:

- mainland marine freight facility and shipping operations;
- berthing of the new marine freight vessel on the new piled vessel ramp;
- biosecurity inspection of cargo with use, as required, of a designated biosecurity screening room and protocols enacted as necessary to contain any identified biosecurity risks;
- cargo unloading and transfer to the cargo unstuffing facility for distribution to the Island; and
- Receival, processing, and storage of waste in a manner that minimises biosecurity, environmental and human health risk and facilitates the efficient movement of waste to the cargo laydown area in the North Zone for removal from the Island.

Mainland operational activities are not considered as part of the scope of the Project, however, the BRMP – Operations (Phase 2) must consider the mainland and the biosecurity continuum holistically. The BRMP should identify responsibilities for operational activities which will require biosecurity risk management.

#### 3.3.3.1 WASTE MANAGEMENT ACTIVITIES

Waste Management activities should be considered as to their overall biosecurity risk and how operations may need to inform the BRMP where relevant. The general operation of the upgraded WMF will include:

- Waste receipt via a dedicated, one-way, drive-through waste drop-off facility to accept commercial and residential waste with clearly demarcated areas to segregate waste types;

- Management of a chemical shed with separate storage zones for the safe containment, handling, and temporary storage of waste such as paint, oils, batteries, domestic gas cylinders, phosphorescent and other lighting tubes and smoke detectors;
- Management and operation of the MRF, which would include a new working platform to provide secure, safe operating conditions. The MRF equipment would consist of two balers, a wrapper, hopper, conveyors, picking station, sorting conveyor/ trommel, capture bins, glass crusher and sorter. The MRF will also house a baler for steel and aluminium cans and other waste;
- Management and operation of open bunkers and dedicated storage areas to hold baled waste material, bulky goods and organics, and waste containers and/or skips awaiting shipment;
- Management and operation of a dedicated organics processing workshop with specialised equipment to mechanically and biologically break down organic materials and include curing and storage areas for final products. The final products will be managed for odours, leachates and quality control in accordance with the EPL;
- Management and operation of a new, dedicated wastewater treatment plant (WWTP), which will include settling and aeration tanks, clarifiers, disinfection equipment and sludge treatment. The WWTP will be constructed within the WMF to service the Island; and
- General duties performed in the office/amenities building.

# 4. MANAGEMENT RESPONSIBILITIES

The roles and responsibilities of key project personnel responsible for the development of the BRMPs and associated sub-plans will need to be defined when the MIW contractor and contractor responsible for the new marine freight vessel and services operating model have been engaged.

Key project personnel identified will be responsible for:

- Ensuring that the BRMPs and associated sub-plans are current and correctly applied throughout the entire supply chain;
- Delivery of biosecurity awareness information and material for project personnel (e.g., induction training, toolbox and pre-start meetings); and
- Development of communications plan to define procedures for recording and reporting biosecurity related issues.

# 5. DEFINITIONS

The BRMPs will need to develop a list of standard definitions, however, below is a list of standard definitions which LHIB currently uses for its BAU operations. Refer to **Appendix B** and **Appendix C** glossaries for additional definitions.

**Antifouling** - A system of specialised coatings applied to a ship's hull to prevent the growth and attachment of marine organisms.

**Backloading** - The process of loading cargo, empty containers, or waste from LHI back onto the ship for return to the mainland.

**Biosecure facility** – A facility designed and operated to exclude and manage the risk of unwanted organisms. Includes sealed areas for inspection, cleaning, and secure storage, with documented procedures and quality assurance.

**Biosecurity** – A set of measures designed to protect an area from the introduction and spread of harmful organisms such as invasive species, pests, or diseases.

**Biosecurity clearance** – Formal approval by LHIB biosecurity staff that cargo, vessels, or aircraft meet the biosecurity requirements for safe departure/entry to LHI.

**Biosecurity risk material** – any plant or animal material, pathogen, fungi, soil or water not specifically authorised to be imported to LHI.

**Biosecurity screening** – The process of isolating and inspecting cargo, vehicles, or personnel to prevent the introduction of pests to LHI. This includes decontamination and prophylactic treatment and secure packaging- whether this is done at the point of supply or at a biosecurity facility prior to shipping.

**Clean-on-arrival** – The required condition that all cargo arrives at the inspection facility free of contamination or biosecurity risk material (BRM).

**Containment** – An action or strategy to prevent the spread of a harmful organism once detected, often involving physical isolation and treatment.

**Detection dog** – A specially trained dog used to detect the presence of invasive species or biosecurity risk materials by scent. Used both on the mainland and on LHI.

**Dunnage** - Timber or other materials used to brace and secure cargo during transport.

**Fumigation** - A method of pest control that involves filling an area, such as a closed compartment or shipping container, with gaseous pesticides to suffocate or poison the pests within.

**High-risk items** – Cargo or materials that pose a greater likelihood of harbouring biosecurity risks – such as used machinery, timber, or aggregate.

**Incursion** – The successful entry of an invasive organism into the island environment.

**ISPM 15** - An international standard for treating wood materials to kill insects or fungi, required for all wooden pallets used for cargo.

**Mainland biosecurity liaison** – An independent resource engaged by the Proponent/applicant to assist suppliers and contractors in meeting biosecurity expectations and ensuring compliance with LHIB standards on the mainland.

**Pathway integrity** – The maintenance of effective biosecurity controls throughout the entire supply chain, from the point of origin to LHI.

**Pest** – Any invasive organism or species (including rodents, insects, reptiles, or pathogens) that poses a risk to LHI's natural environment, economy, or community wellbeing.

**Pest-proof fence** - A specialised fence designed to prevent pests from entering a secure area, such as the mainland cargo facility.

**Rat guard** - A device fitted to a ship's mooring lines to prevent rodents from climbing from the wharf onto the vessel.

**Residual insecticide** - A type of insecticide that remains effective for an extended period after application, used on surfaces to prevent pest establishment.

**Surveillance** – The ongoing monitoring of specific areas to provide early warning of biosecurity threats. Used to detect the presence of unwanted species and guide timely responses.

# 6. REFERENCE DOCUMENTS

Various strategies and plans have been prepared to manage biosecurity risk to LHI. Collectively, these plans aim to manage biosecurity risk from the mainland to LHI and provide mechanisms to respond to a biosecurity emergency. These have been developed in consultation with stakeholders from the island and mainland, focusing on identifying potential and tangible risk pathways. These documents will be useful references in developing the BRMPs.

Policies of relevance can be found on the Lord Howe Island Board website:

- ***Policies | Lord Howe Island Board***;
- ***Plans | Lord Howe Island Board***;
- ***Pre-departure biosecurity forms and information | Lord Howe Island Board***;
- ***Visiting Australian Domestic Vessels | Lord Howe Island Board***; and
- ***Visiting aircraft | Lord Howe Island Board".***

# 7. CARGO TYPES/CONSTRUCTION

The construction methodology will be developed as the design matures, and materials delivery options are refined; however, it will likely comprise:

- Enabling works including ground investigations and establishing construction site compounds;
- Earthworks and removal of spoil from the Project Area (if required);
- Establishment of hardstand areas, where required;
- Construction of infrastructure;
- Environmental management and pollution control measures; and
- Utilities connections, landscaping and finishing works.

The BRMPs will need to provide a description of:

- Cargo including size and complexity (e.g., schematics, images);
- Construction processes/methodology; and
- Biosecurity risks associated with cargo (refer Section **13** and **Appendix A**).

When available, the biosecurity risks associated with the cargo types are to be added (if not already considered) to the Biosecurity Risk Register in **Appendix A** and discussed with the LHIB Biosecurity Team.

# 8. SITE/PREMISE DETAILS

## 8.1 SITE PLAN

The BRMPs should include a site plan of their mainland marine freight facility location (e.g. laydown areas, loading areas, storage facilities, wharves).

If the loading port is a separate location, then a separate port report should be attached.

The BRMP for construction (**Phase 1**) should consider marine freight consolidation at a singular site or loading port prior to shipping to limit and minimise biosecurity risk and to streamline the biosecurity risk management process.

The current site plan (**Phase 1**) for the North Zone is provided in **Figure 8-1.**

The current site plan (**Phase 1**) for the South Zone is provided in **Figure 8-2**.

The future site plan for the North Zone (**Phase 2**) is provided in **Figure 8-3**.

The future site plan for the South Zone (**Phase 2**) is provided in **Figure 8-4**.


**01** **EXISTING SITE PLAN - NORTH ZONE**
1:500

| REV | DESCRIPTION | DATE |
|---|---|---|
| 01 | ISSUE FOR INFORMATION | 23/5/2025 |
| 02 | DRAFT ISSUE | 20/6/2025 |
| 03 | QS BRIEFING PACK | 26/6/2025 |
| 04 | DRAFT 20% CONCEPT DESIGN ISSUE | 6/8/2025 |

AMENDMENTS IN CURRENT REVISION (SHOWN CLOUDED ON DRAWINGS)

| No. | AMENDMENT DESCRIPTION |
|---|---|

TITLE | TITLE | TITLE

TITLE | TITLE | TITLE

LEGEND

NORTH

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CLIENT
**Department of Climate Change, Energy, the Environment and Water (DCCEEW), NSW National Parks and Wildlife (NPWS) Service with Lord Howe Island Board (LHIB)**

NSW GOVERNMENT

PROJECT TITLE
**CRITICAL INFRASTRUCTURE PROGRAM LORD HOWE ISLAND**

SCALE CHECK 5 10

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| REVIEW | DIRECTOR SIGNATURE | DATE |
|---|---|---|
| TENDER | | |
| CONST | | |

LOCATION **NORTH ZONE**

TITLE
# FIGURE 8 1 CURRENT SITE PLAN – NORTH ZONE

| DRAWN | PLOT DATE | SCALE @A1 |
|---|---|---|
| BG | 6/8/2025 | 1:500 |
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**EXISTING SITE PLAN - SOUTH ZONE**
1:500

| REV | DESCRIPTION | DATE |
|---|---|---|
| 01 | ISSUE FOR INFORMATION | 23/5/2025 |
| 02 | DRAFT ISSUE | 20/6/2025 |
| 03 | QS BRIEFING PACK | 26/6/2025 |
| 04 | DRAFT 20% CONCEPT DESIGN ISSUE | 6/8/2025 |

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NSW GOVERNMENT

PROJECT TITLE
**CRITICAL INFRASTRUCTURE PROGRAM LORD HOWE ISLAND**

SCALE CHECK 5 10


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LOCATION: **SOUTH ZONE**

TITLE
# FIGURE 8 2 CURRENT SITE PLAN – SOUTH ZONE

| DRAWN | PLOT DATE | SCALE @A1 |
|---|---|---|
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| CHECKED | PROJECT NO. | DRAWING NO. / REV. NO. |
| BC | 24-05 | A - D A - 1 1 . 1 1 / 04 |


1 **EXISTING SITE PLAN - SOUTH ZONE**
1:500

| REV | DESCRIPTION | DATE |
|---|---|---|
| 01 | ISSUE FOR INFORMATION | 23/5/2025 |
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LOCATION: **SOUTH ZONE**

TITLE
# FIGURE 8 2 CURRENT SITE PLAN – SOUTH ZONE.

| DRAWN | PLOT DATE | SCALE @A1 |
|---|---|---|
| BG | 6/8/2025 | 1:500 |
| CHECKED | PROJECT NO. | DRAWING NO. / REV. NO. |
| BC | 24-05 | A - D A - 1 1 . 1 2 / 04 |


1 **PROPOSED SITE PLAN - NORTH ZONE**
1:500

| REV | DESCRIPTION | DATE |
|---|---|---|
| 01 | ISSUE FOR INFORMATION | 23/5/2025 |
| 02 | DRAFT ISSUE | 20/6/2025 |
| 03 | QS BRIEFING PACK | 26/6/2025 |
| 04 | DRAFT 20% CONCEPT DESIGN ISSUE | 6/8/2025 |

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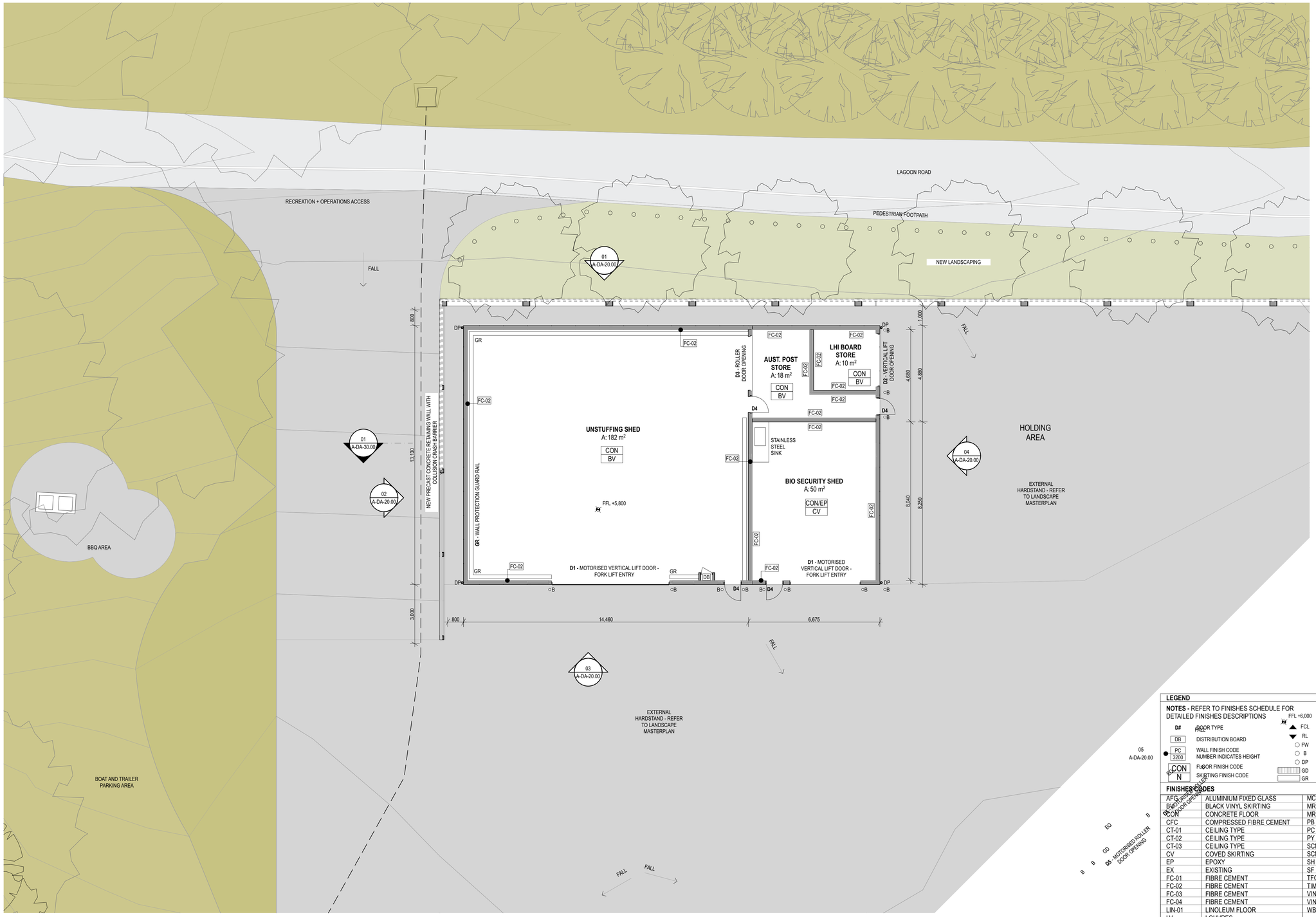
LOCATION **NORTH ZONE**

TITLE
# FIGURE 8 3 FUTURE SITE PLAN – NORTH ZONE

| DRAWN | PLOT DATE | SCALE @A1 |
|---|---|---|
| BG | 6/8/2025 | 1:500 |
| CHECKED | PROJECT NO. | DRAWING NO. | REV. NO |
| BC | 24-05 | A - D A - 1 1 . 0 2 | 04 |




1 **GROUND FLOOR PLAN - NORTH ZONE (UNSTUFFING + BIOSECURITY SHED)**
1:100

**LEGEND**

**NOTES -** REFER TO FINISHES SCHEDULE FOR DETAILED FINISHES DESCRIPTIONS

| | |
|---|---|
| D# | DOOR TYPE |
| DB | DISTRIBUTION BOARD |
| PC 3200 | WALL FINISH CODE<br>NUMBER INDICATES HEIGHT |
| CON N | FLOOR FINISH CODE<br>SKIRTING FINISH CODE |
| FFL +6,000 | FINISH FLOOR LEVEL |
| FCL | FINISHED CEILING LEVEL |
| RL | RELATIVE LEVEL |
| FW | FLOOR WASTE |
| B | BOLLARD |
| DP | DOWN PIPES |
| GD | GRATED DRAIN |
| GR | GUARD RAIL |

**FINISHES CODES**

| | | | |
|---|---|---|---|
| AFG | ALUMINIUM FIXED GLASS | MC-01 | METAL CLADDING |
| BV | BLACK VINYL SKIRTING | MR-01 | METAL ROOF |
| CON | CONCRETE FLOOR | MR-02 | METAL ROOF |
| CFC | COMPRESSED FIBRE CEMENT | PB | PLASTERBOARD |
| CT-01 | CEILING TYPE | PC | PRECAST CONCRETE |
| CT-02 | CEILING TYPE | PY | POLYCARBONATE |
| CT-03 | CEILING TYPE | SCN-01 | SCREEN |
| CV | COVED SKIRTING | SCN-02 | SCREEN |
| EP | EPOXY | SH | SHADE COVER |
| EX | EXISTING | SF | SOFFIT |
| FC-01 | FIBRE CEMENT | TFG | TIMBER FIXED GLASS |
| FC-02 | FIBRE CEMENT | TIM-01 | TIMBER |
| FC-03 | FIBRE CEMENT | VIN-01 | VINYL FLOOR |
| FC-04 | FIBRE CEMENT | VIN-02 | VINYL WALL |
| LIN-01 | LINOLEUM FLOOR | WB-01 | WEATHERBOARDS |
| LV | LOUVRES | | |

| REV | DESCRIPTION | DATE |
|---|---|---|
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LOCATION **NORTH ZONE**

TITLE
# FIGURE 8 3 FUTURE SITE PLAN – NORTH ZONE

| DRAWN | PLOT DATE | SCALE @A1 |
|---|---|---|
| BG | 6/8/2025 | 1:100 |

| CHECKED | PROJECT NO. | DRAWING NO. | REV. NO |
|---|---|---|---|
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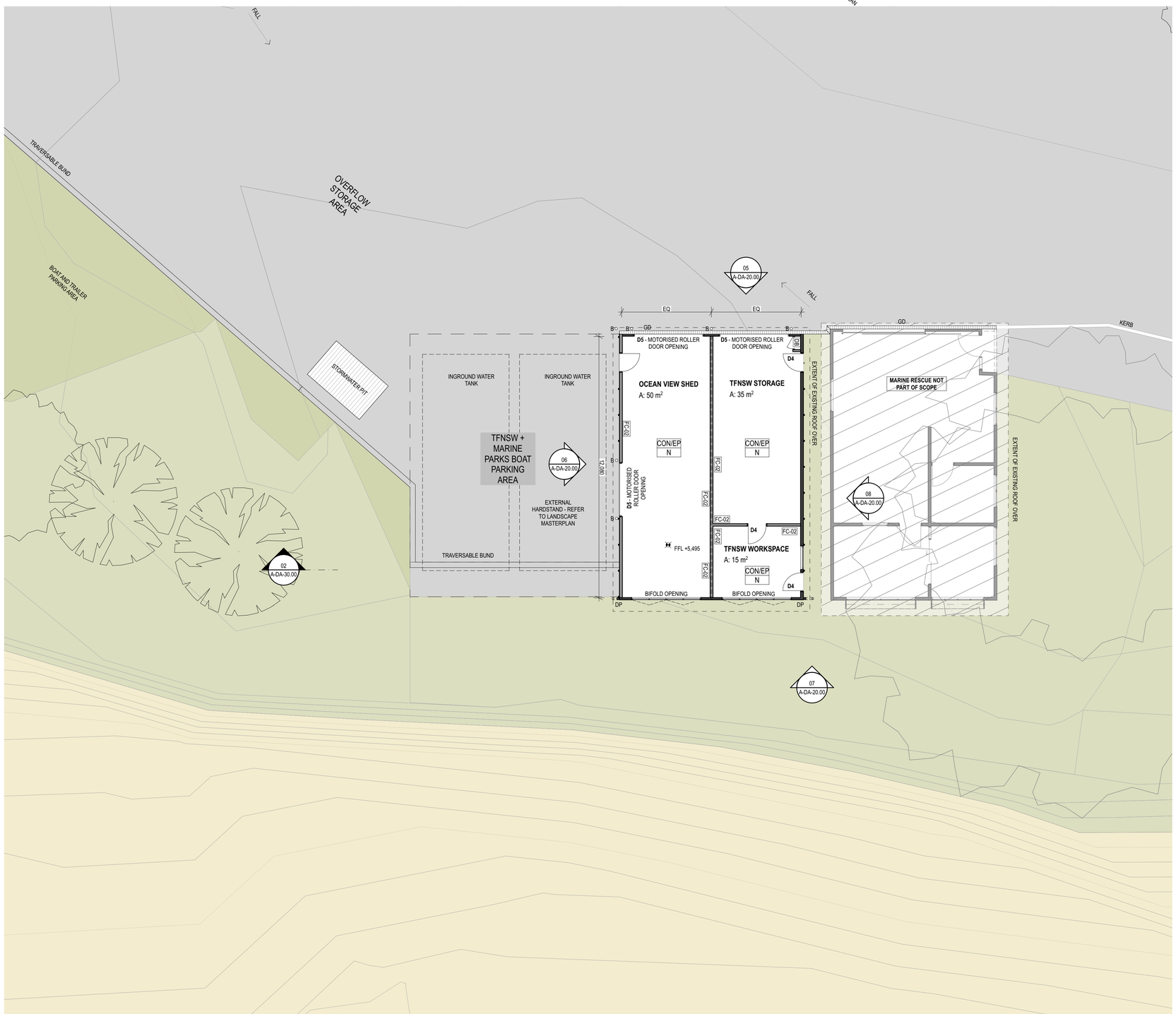


1 **GROUND FLOOR PLAN - NORTH ZONE (OCEAN VIEW SHED)**
1:100

**LEGEND**

**NOTES -** REFER TO FINISHES SCHEDULE FOR DETAILED FINISHES DESCRIPTIONS

| | | | |
|---|---|---|---|
| D# | DOOR TYPE | FFL +6,000 | FINISH FLOOR LEVEL |
| DB | DISTRIBUTION BOARD | FCL | FINISHED CEILING LEVEL |
| PC 3200 | WALL FINISH CODE NUMBER INDICATES HEIGHT | RL | RELATIVE LEVEL |
| | | FW | FLOOR WASTE |
| | | B | BOLLARD |
| | | DP | DOWN PIPES |
| CON N | FLOOR FINISH CODE SKIRTING FINISH CODE | GD | GRATED DRAIN |
| | | GR | GUARD RAIL |

**FINISHES CODES**

| | | | |
|---|---|---|---|
| AFG | ALUMINIUM FIXED GLASS | MC-01 | METAL CLADDING |
| BV | BLACK VINYL SKIRTING | MR-01 | METAL ROOF |
| CON | CONCRETE FLOOR | MR-02 | METAL ROOF |
| CFC | COMPRESSED FIBRE CEMENT | PB | PLASTERBOARD |
| CT-01 | CEILING TYPE | PC | PRECAST CONCRETE |
| CT-02 | CEILING TYPE | PY | POLYCARBONATE |
| CT-03 | CEILING TYPE | SCN-01 | SCREEN |
| CV | COVED SKIRTING | SCN-02 | SCREEN |
| EP | EPOXY | SH | SHADE COVER |
| EX | EXISTING | SF | SOFFIT |
| FC-01 | FIBRE CEMENT | TFG | TIMBER FIXED GLASS |
| FC-02 | FIBRE CEMENT | TIM-01 | TIMBER |
| FC-03 | FIBRE CEMENT | VIN-01 | VINYL FLOOR |
| FC-04 | FIBRE CEMENT | VIN-02 | VINYL WALL |
| LIN-01 | LINOLEUM FLOOR | WB-01 | WEATHERBOARDS |
| LV | LOUVRES | | |

| REV | DESCRIPTION | DATE |
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LOCATION **NORTH ZONE**

TITLE
# FIGURE 8 3 FUTURE SITE PLAN – NORTH ZONE

| DRAWN | PLOT DATE | SCALE @A1 |
|---|---|---|
| BG | 6/8/2025 | 1:100 |

| CHECKED | PROJECT NO. | DRAWING NO. | REV. NO. |
|---|---|---|---|
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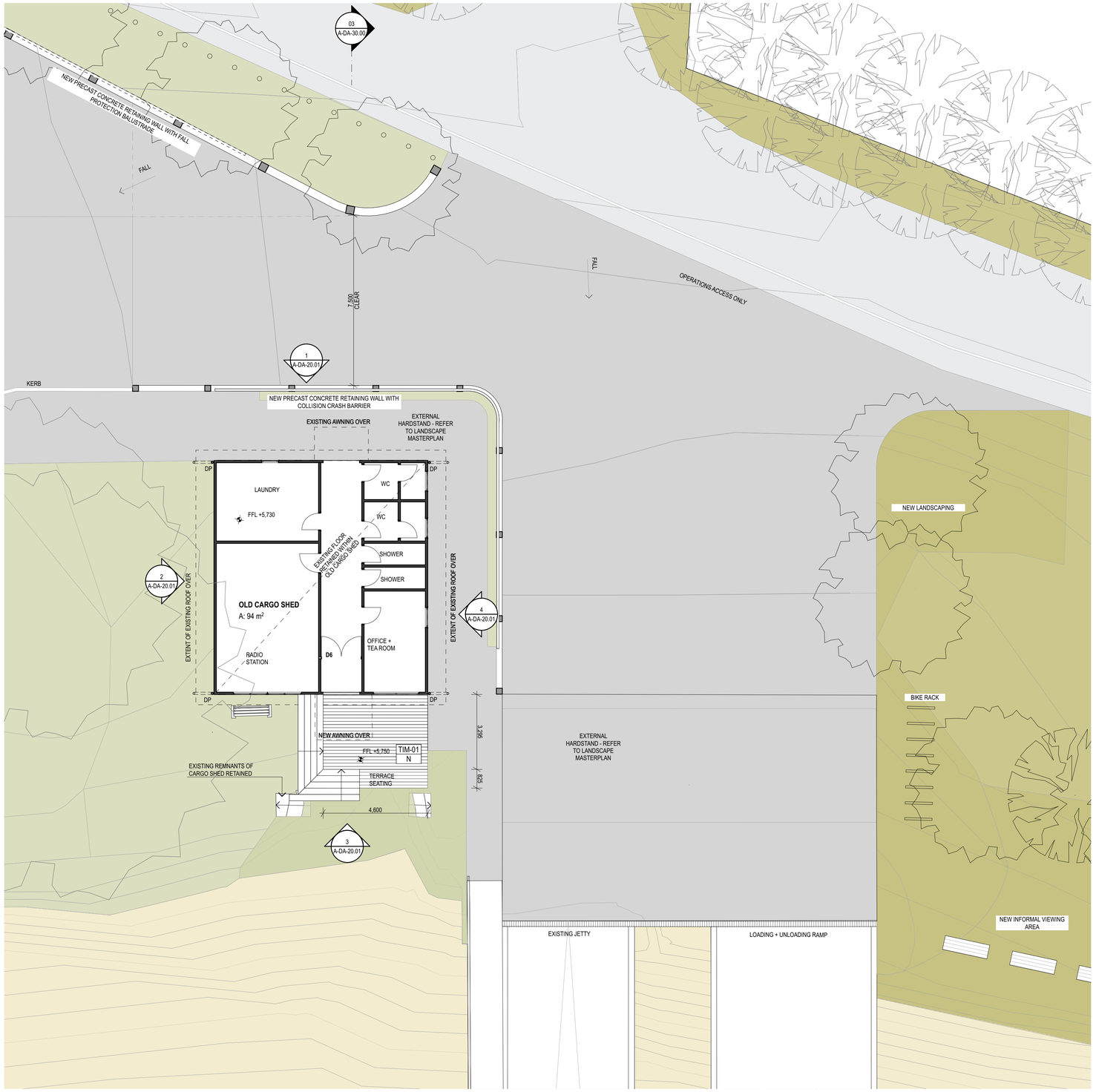


1 **GROUND FLOOR PLAN - NORTH ZONE (OLD CARGO SHED)**
1:100

**LEGEND**

**NOTES -** REFER TO FINISHES SCHEDULE FOR DETAILED FINISHES DESCRIPTIONS

| | | | |
|---|---|---|---|
| D# | DOOR TYPE | FFL +6,000 | FINISH FLOOR LEVEL |
| DB | DISTRIBUTION BOARD | FCL | FINISHED CEILING LEVEL |
| PC 3200 | WALL FINISH CODE NUMBER INDICATES HEIGHT | RL | RELATIVE LEVEL |
| | | FW | FLOOR WASTE |
| | | B | BOLLARD |
| | | DP | DOWN PIPES |
| CON N | FLOOR FINISH CODE / SKIRTING FINISH CODE | GD | GRATED DRAIN |
| | | GR | GUARD RAIL |

**FINISHES CODES**

| | | | |
|---|---|---|---|
| AFG | ALUMINIUM FIXED GLASS | MC-01 | METAL CLADDING |
| BV | BLACK VINYL SKIRTING | MR-01 | METAL ROOF |
| CON | CONCRETE FLOOR | MR-02 | METAL ROOF |
| CFC | COMPRESSED FIBRE CEMENT | PB | PLASTERBOARD |
| CT-01 | CEILING TYPE | PC | PRECAST CONCRETE |
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| CT-03 | CEILING TYPE | SCN-01 | SCREEN |
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| EP | EPOXY | SH | SHADE COVER |
| EX | EXISTING | SF | SOFFIT |
| FC-01 | FIBRE CEMENT | TFG | TIMBER FIXED GLASS |
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| FC-03 | FIBRE CEMENT | VIN-01 | VINYL FLOOR |
| FC-04 | FIBRE CEMENT | VIN-02 | VINYL WALL |
| LIN-01 | LINOLEUM FLOOR | WB-01 | WEATHERBOARDS |
| LV | LOUVRES | | |

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LOCATION **NORTH ZONE**

TITLE
# FIGURE 8 3 FUTURE SITE PLAN – NORTH ZONE

| DRAWN | PLOT DATE | SCALE @A1 |
|---|---|---|
| BG | 6/8/2025 | 1:100 |

| CHECKED | PROJECT NO. | DRAWING NO. | REV. NO |
|---|---|---|---|
| BC | 24-05 | A-DA-14.02 | 04 |


**1 PROPOSED SITE PLAN - SOUTH ZONE**
1:500

| REV | DESCRIPTION | DATE |
|---|---|---|
| 01 | ISSUE FOR INFORMATION | 23/5/2025 |
| 02 | DRAFT ISSUE | 20/6/2025 |
| 03 | QS BRIEFING PACK | 26/6/2025 |
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| CONST | | |

LOCATION: **SOUTH ZONE**

TITLE
# FIGURE 8 4 FUTURE SITE PLAN – SOUTH ZONE

| DRAWN | PLOT DATE | SCALE @A1 |
|---|---|---|
| BG | 6/8/2025 | 1:500 |
| CHECKED | PROJECT NO. | DRAWING NO. | REV. NO. |
| BC | 24-05 | A - D A - 1 1 . 1 4 | 04 |

AIRPORT TERMINAL

WEATHER STATION SATELITE

EXISTING POTABLE WATER TANK

PERIMETER FENCE

EXISTING WEATHER STATION

PROPOSED LANDSCAPING

EMERGENCY VEHICLE ACCESS

IRRIGATION AREA

PROPOSED DOG KENNELS

NEW VEGETATION

PERIMETER FENCE

PERIMETER FENCE

1 A-DA-14.20

1 A-DA-14.30

PROPOSED NEW ACCESS ROAD TO FUEL BOWSERS + LANDSCAPING

FUEL BOWSER TANKS

ENTRY

PERIMETER FENCE

OLD LAGOON ROAD

LAGOON ROAD

TION

BEACH

TO LORD HOWE ISLAND JETTY + NORTH ZONE

1

**PROPOSED SITE PLAN - DOG KENNELS + FUEL BOWSER**

1:500

| REV | DESCRIPTION | DATE |
|---|---|---|
| 01 | ISSUE FOR INFORMATION | 23/5/2025 |
| 02 | DRAFT ISSUE | 20/6/2025 |
| 03 | QS BRIEFING PACK | 26/6/2025 |
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LOCATION **SOUTH ZONE**

TITLE
# FIGURE 8 4 FUTURE SITE PLAN – SOUTH ZONE

| DRAWN | PLOT DATE | SCALE @A1 |
|---|---|---|
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## 8.2 SITE DESCRIPTION

### 8.2.1 MAINLAND FACILITIES

The BRMPs must provide a description of the mainland freight facilities associated with construction (Phase 1) and operation (Phase 2) where relevant, including but not limited to:

- facilities/infrastructure (e.g. impervious hardstand areas, drainage, storage areas, covered areas);
- likelihood of flood, storm surge;
- proximity to other parts of import pathway (e.g., wharves, consolidation sites) and surrounding areas (e.g., adjacent land usage); and
- sea-based discharge points (including co-ordinates).

### 8.2.2 NORTH ZONE

The BRMPs must provide a description of the North including:

- facilities/infrastructure (e.g. impervious hardstand areas, drainage, storage areas, covered areas) and interrelationship with the new marine freight vessel for east and westbound cargo as part of the biosecurity continuum;
- proximity to other parts of import pathway (e.g., new marine freight vessel) and surrounding areas (e.g., adjacent land usage); and
- sea-based discharge points (including co-ordinates).

### 8.2.3 SOUTH ZONE

The BRMPs must provide a description of the South Zone including:

- facilities/infrastructure (e.g. impervious hardstand areas, drainage, storage areas, covered areas) and interrelationship with the North Zone for westbound cargo as part of the biosecurity continuum.

## 8.3 SITE MANAGEMENT AND INSPECTION REGIMES

The BRMPs must detail the site management and inspection regimes to be implemented to manage biosecurity risk to Lord Howe Island during construction and operation of the Project. Please refer to Appendix B for relevant information. This may include:

- Protocols for cargo delivery and storage to manage biosecurity risk;
- Inspection, surveillance, and detection;
- Emergency response, procedures, capability;
- Staff training requirements; and
- Operational protocols.

Given the ever-present biosecurity risk to the Island, all MIW Contractor personnel who work on-Island throughout construction (Phase 1) will play a role in emergency response procedures, such as communication/notification requirements in alerting LHIB to implement any emergency response procedure/s should a risk be identified after cargo has arrived on the Island.

## 8.4 SECURITY

The BRMPs must detail the security procedures to be implemented to ensure that the biosecurity integrity of cargo is maintained, e.g., preventing unauthorised access. Refer **Appendix B** and **Appendix C**.

# 9. OPERATIONAL PROCEDURES

The greatest biosecurity risk to LHI comes from the mainland, and specifically via freight/cargo. Imported cargo will arrive and be stored at a mainland freight facility prior to departure for LHI. The location of the facilities for construction (Phase 1) and operations (Phase 2) are not yet known; however, each facility must act as the primary biosecurity defence for LHI as it is paramount to ensuring 'prevention' and minimising biosecurity risk to the greatest extent possible.

## 9.1 IMPORTED CARGO PATHWAY

The BRMPs must detail the following for the mainland freight facility, the marine freight vessel, and the LHI freight/biosecurity facility:

- The imported cargo pathway and how biosecurity risk management processes will be incorporated and managed throughout the entire supply chain including suppliers, contractors and sub-contractors;
- The types of biosecurity risks present (e.g., animal, plants, food, soil and water)which are to be added to the Biosecurity Risk Register in Appendix A;
- Preventative measures in place to reduce the risk of contamination (e.g., salt rings around cargo, covering potential water collection locations, cleaned cargo to be covered and stored off the ground on a clean and hard surface, transport route management);
- Supplier/contractor compliance with biosecurity management requirements;
- Type of manufacture/construction;
- Type of consolidation/storage;
- Transport plans;
- Loading and vessel cleanliness;
- Management of biosecurity risks which are detected (e.g., during manufacture, during the voyage etc.);
- Preventing cross contamination (e.g., containerisation, tarping, chemical treatments, type of packaging, dunnage used);
- Contingency plans (e.g., cyclones, vessel redirections, contamination);
- Identification and traceability of goods; and
- Unloading procedures.

See **Appendix B** (Construction) and **Appendix C** (Operations) for further details.

## 9.2 INSPECTIONS

The BRMPs must detail the inspection and clearance procedures for cargo including procedure statements/work instructions and records utilised. Refer to **Appendix B** (Construction) and **Appendix C** (Operations) for relevant information on inspection procedures for each phase.

The procedures must outline how LHIB inspection will be incorporated and the communication/notification requirements for requesting an inspection prior to on-Island arrival.

## 9.3 CLEANING/TREATMENT

The BRMPs must detail the cleaning and treatment procedures for cargo identified as a biosecurity risk at mainland facilities including:

- Details of third-party treatment providers;
- Pest control methods (e.g., vermin control - trapping, baiting, insecticidal fogging);
- Methods of cleaning;
- Equipment; and
- Re-inspection and validating compliance.

Responsibility for cleaning/treatment should be assumed as the MIW Contractor throughout construction (**Phase 1**) and an independent resource engaged by the Proponent/applicant for operations (**Phase 2**).

## 9.4 WASTE DISPOSAL

The BRMPs must describe how biosecurity waste (e.g., solids and wastewater) will be segregated, contained and disposed of where relevant. Note that Biosecurity Risk Material (BRM) collected in Australia must be disposed of utilising a method approved by the Department of Agriculture, Fisheries and Forestry (DAFF). Responsibility for waste disposal should generally be assumed as follows:

- Any mainland disposal to be managed by the MIW Contractor; and
- Any on-Island disposal to be managed by the LHIB Biosecurity team.

# 10. TRAINING

The BRMPs must describe the procedures that will be put in place to ensure that all LHI CIP personnel have an understanding of the importance of biosecurity and their role in maintaining biosecurity integrity, including:

- Who will deliver biosecurity awareness training;
- The method of delivery (e.g., inductions, toolbox/start-up meetings);
- The frequency of training;
- On-going initiatives to maintain biosecurity awareness; and
- Delivery of training to address non-conformities and/or BRM detections.

Refer to **Appendix B** and **Appendix C** for relevant information on staff training that is critical to ensuring the effective implementation and maintenance of biosecurity risk management measures.

# 11. AUDITING

The BRMPs must describe the processes in place to ensure that biosecurity risk management practices are being complied with and are effective, including the audit regime and format.

# 12. REPORTING AND RECORDS/ DOCUMENTATION

The BRMPs must outline the records that will be maintained, how they will be recorded and by whom, including:

- Incident reports noting response and remedial action when BRM is detected;
- Off-shore detections – contain, treat/clean, maintain records;
- On-shore detections – e.g., contain, immediately report to LHIB, treat/clean (as directed);
- Supply chain inspection reports;
- Records of disposal of biosecurity waste;
- Records of treatments (e.g., fumigation treatment certificates);
- Training records;
- Audit outcome records;
- Key performance indicators and compliance records;
- Processes implemented to mitigate additional and ongoing contamination events; and
- Processes for managing non-conformities and corrective action.

# 13. BIOSECURITY RISK REGISTER

A Biosecurity Risk Register (**Appendix A**) has been developed with relevant stakeholders. The MIW contractor and the contractor responsible for the new marine freight vessel and services operating model will be required to identify (if not already) all construction and operation related biosecurity risks and associated pathways when preparing the BRMPs and determine all mitigation, controls, monitoring and review to be implemented.

# APPENDIX A BIOSECURITY RISK REGISTER

# Lord Howe Island Biosecurity risk register V6 – 8 August

This Lord Howe Island (LHI) Strategic Biosecurity Risk Register was developed to focus management efforts on the most critical biosecurity threats. The seven strategic risks detailed in this table represent the highest priority risks—those with both high likelihood and high impact—and the list is not intended to be exhaustive.

| | Risk | Hazard and risk pathway | Potential impacts / consequences | Mitigation and controls | Monitoring and review |
|---|---|---|---|---|---|
| 1 | Establishment of a vertebrate pest (e.g., rodent, snake) via a marine or air pathway. | • Inadequate inspection of complex cargo, vessels, or aircraft. • Cargo originating from infested locations.<br>• Non-compliant or undeclared items in passenger baggage.<br>• Pests accessing cargo at mainland staging points.<br>• Contaminated machinery, vehicles, or shipping containers not cleaned to standard.<br>• Non-compliance by mainland suppliers or contractors.<br>• Infestation and contamination of freight during warehousing. | • Irreversible predation on and competition with LHI's unique native fauna.<br>• Significant damage to the island's tourism-based economy and international reputation.<br>• High cost of complex eradication and response programs. | Marine cargo Procurement<br>• Strong procurement and contracting processes, incentivised for compliance<br>• Approved suppliers from low-risk locations.<br>• 'Clean on arrival' campaign. Approved suppliers meeting or exceeding LHIB Biosecurity standards.<br>• Good communication with suppliers at time of purchase/order.<br>• Enforce LHIB import policies.<br>• Restrict timber imports to new (unused) certified timber.<br>• Restrictions on landscape materials permissible.<br><br>Inspection & treatment<br>• Establish and operate a mainland biosecurity inspection facility for all marine cargo.<br>• Inspection facility staffed by authorised biosecurity officers, committed to the LHIB Biosecurity Strategy. | • Database recording of all intercepts of biosecurity risk material.<br>• Documented surveillance effort and results.<br>• Annual reporting on surveillance results for areas aggregate was used on island.<br>• Documented pest management at inspection facility.<br>• Quality assurance of biosecurity inspection service.<br>• Regular contact with suppliers. |
| 2 | Establishment of an invasive invertebrate species (e.g., red imported fire ants) from contaminated cargo, machinery, or freight. | | • Severe negative effects on residents' lifestyle and public health.<br>• Disruption of the island's ecosystems, including impacts on native invertebrates and agriculture.<br>• Harm to the tourism experience. | | |
| 3 | Establishment of a destructive non-native wood-boring insect (e.g., termite) in untreated timber, | • Use of untreated, non-certified, or fraudulent timber/building products.<br>• Failure of inspection to detect subtle signs of insect activity. | • Structural damage to island infrastructure, historic buildings, and homes.<br>• Loss of significant native trees. | | |

| | | | | | |
|---|---|---|---|---|---|
| | building materials, or freight. | • Cross-contamination from other freight. | • Substantial economic cost for treatment, repair, and ongoing management. | • Operating and maintenance of biosecurity inspection facility independent of supplier's consignees and transport operators.<br>• Prophylactic treatment (fumigation, residual insecticide) of high-risk goods and machinery.<br>• Treatment of aggregate (tumbling, heat) followed by tracking of use and surveillance for weeds on island.<br>• Secure post inspection storage pending shipment.<br>• Clean hard stand for all containers at every stage.<br>Shipping<br>• Cargo tracking system integrated with biosecurity inspections and ship manifest.<br>• Continuous on-board surveillance and regular cleaning/ prophylactic treatment of ship<br>• Strict docking and loading procedures during daylight hours.<br>• Detection dog inspection of the ship and landed cargo<br>Air passengers and cargo<br>• Good communication with air passengers at ticketing, check in and boarding.<br>• Disinfect footwear at boarding and on arrival.<br>• Amnesty bins at airports.<br>• Detection dog inspection of landed cargo (luggage and airfreight). | • Annual review of records and procedures at inspection facility.<br>• Debrief of incidents/ intercepts and continuous improvement of standards and procedures.<br>• Annual review of biosecurity budget requirements.<br>• Maintained register of staff and contractor qualifications and training currency.<br>• Periodic independent expert review of all procedures and standards. |
| 4 | Introduction of an aggressive invasive soil-borne pathogen or fungus via contaminated soil on vehicles, equipment, or plants. | • Ineffective cleaning procedures for machinery, tools, or footwear.<br>• Contaminated soil/plant matter arriving with nursery stock.<br>• Failure to enforce "clean on arrival" policies for all imports. | • Widespread dieback of iconic, endemic and native flora, fundamentally altering the island's vulnerable ecosystem.<br>• High cost of management with a very low probability of successful eradication. | | |
| 5 | Establishment of a new, highly invasive weed species from contaminated goods, produce, or personal effects. | • Contamination of stock feed, building materials (sand/gravel), or landscaping supplies.<br>• Seeds attached to clothing, bags, or personal effects.<br>• Incomplete inspection of fresh produce. | • Out-competing and displacement of native plant species.<br>• Increased fire risk and degradation of natural landscapes.<br>• Significant and perpetual costs for ongoing control programs. | | |

| | | | | | |
|---|---|---|---|---|---|
| | | | | On island surveillance and readiness<br>• Routine surveillance at high-risk sites by trained biosecurity team with detection dogs and other tools.<br>• Regular incursion drills and training<br>• Established support relationships for incursion response. | |
| 6 | Translocation and establishment of a new marine pest via vessel biofouling or ballast water. | • Inadequate vessel maintenance and anti-fouling treatment schedules.<br>• Non-compliance with pre-arrival cleaning requirements for niche areas.<br>• Extended vessel inactivity in high-risk ports. | • Disruption of the unique World Heritage marine environment.<br>• Competition with or predation on native marine life.<br>• Potential negative impacts on marine-based tourism and recreational activities. | • Compliance with Marine Parks permit conditions.<br>• Regular inspection and antifouling schedule with independent quality assurance.<br>• Identify risks at all potential ports and avoid highest risk locations.<br>• Monitoring of vessel movements/location.<br>• Monitor ballast water discharges for compliance.<br>• Routine surveillance of high-risk marine sites (e.g. jetty piles, moorings) | |
| 7 | Systemic failure of mainland biosecurity controls due to inadequate resourcing, training, or third-party non-compliance. | • Insufficient funding for key biosecurity programs.<br>• High staff turnover leading to loss of corporate knowledge.<br>• Inadequate training or auditing of third-party contractors.<br>• Influx of cargo from CIP overwhelms existing capacity. | • Increased likelihood of multiple, concurrent incursions across all pathways.<br>• Erosion of the "prevention is better than cure" principle, leading to massive response costs.<br>• Potential for catastrophic and cumulative damage to the LHI environment and economy. | • Prioritise biosecurity budgets over other cost centres.<br>• Increase quarantine and incursion response capacity for duration of CIP.<br>• Clear leadership and accountability at all levels of the system.<br>• Regular training and upskilling with recognised qualifications. | |

# APPENDIX B LORD HOWE ISLAND BIOSECURITY MANUAL FOR THE CRITICAL INFRASTRUCTURE PROGRAM - CONSTRUCTION

# Lord Howe Island Biosecurity Manual Critical Infrastructure Program

## 08 August 2025

Keith Broome & Araceli Samaniego-Herrara



Lord Howe ISLAND BOARD

NSW GOVERNMENT

# Contents

# 1. Version control

| Version | Date | Author | Revision reason |
|---|---|---|---|
| V01 | 08/08/25 | Keith Broome & Araceli Samaniego-Herrara | First draft |
| V02 | 15/08/25 | | LHIB brand formatting |
| | | | |
| | | | |

# 2. Document management

| Name | Title | Role | Actions |
|---|---|---|---|
| Lord Howe Island Board | Elected body/ representatives from NSW Govt. | Final approval | Adopted and delivered. |
| Suzie Christensen | CEO (LHIB) | Oversight/ endorse | Supports and endorses the Biosecurity Plan |
| Kristine Ward | Senior Manager Environment | Manager/ support | Single point of accountability, know the necessary operational approvals and authorisations |
| Darryl Birch | Biosecurity Team Leader | Operations/ review | Understands the plan and informs LHIB biosecurity team and LHIB approved contractors. |

# 3. Purpose and scope

This report provides the biosecurity best practice relevant to contracts associated with the Lord Howe Island (LHI) Critical Infrastructure Program (CIP). The LHI Board (LHIB) and the Principal contractor will refer to the document when drafting their Biosecurity Risk Management Plans which will be subsequently reviewed, approved and costed as part of the contractual arrangements. This document supports implementation, but it operates within the framework of existing biosecurity policy and regulation. Where specific policies or legal requirements exist, those prescriptions take precedence over the recommendations in this report.

Within scope are biosecurity related requirements for:

- Sourcing and preparing cargo, machinery and personnel for transport to LHI
- Ensuring chartered vessels and aircraft are free of biosecurity risk material
- Developing and sustaining a strong biosecurity culture among the workforce
- Monitoring and quality assurance of biosecurity procedures for which the contractor is accountable

Out of scope is:

- Inspection and authorisation of cargo for transport to LHI
- Requirements unrelated to biosecurity such as maritime law, health and safety regulation, security against criminal activity, employment conditions etc

# 4. Context

In this section we describe the context for LHI biosecurity risks and the rationale behind the requirements.

The objective is to highlight the vulnerability of the island to future invasions and the increased risk of invasion correlated with the increased traffic of resources needed to complete the CIP. Lord Howe Island is unlike any other Australian island. Lord Howe is an ancient volcano emerging directly from the sea and colonised by wildlife and plants which have evolved to be vastly different from those found on the mainland. This makes the whole island ecosystem very vulnerable to ecological damage from species arriving from elsewhere. Lord Howe Island residents enjoy an environment lacking some of the mainland household and garden pests and diseases and their economy depends on the protection of this unique environment. To protect this paradise from damage, islanders want strict import controls and sustained vigilance to prevent the accidental transport of future problem species.

## What is LHI vulnerable to?

In short, almost everything! Stowaway rodents and snakes are the highest risk animals due to their likely impact on LHI fauna. Tramp ants (particularly fire ants) and wood boring insects (e.g., termites) would significantly affect residents. Other invertebrates, weeds, pathogens and fungi could impact on natural or lifestyle values (or both) depending on the species.

### So, what do we want to stop?

All vertebrate animals including any life-stage (e.g. the eggs of egg-laying skinks)
All invertebrates including any life-stage (eggs, larvae, pupae, adult).
All soil-borne pathogens (e.g. diseases, fungi, nematodes) or potential disease carriers such as leeches.
All prohibited plant matter, new weed species or propagules of those already under management.

The increased movement of supplies, machinery, and personnel to the island for the CIP, via vessel or aircraft, adds significant biosecurity risks that must be managed. Some organisms have life forms which can survive fumigation or other treatments so visual inspection and trained detection dogs can be the only form of defence.

## 4. Principles of good biosecurity management

In this section we provide underlying principles to good biosecurity management which are reflected in the requirements that follow.

**The objective is to impart a mindset of precautionary actions to avoid future costs and harm to the LHI unique environment.**

These principles underpin a biosecurity mindset applicable to everyone involved, be they LHIB staff or contractors to the CIP.

1. The environment is the economy. Biosecurity work is prioritised over all other work, and is the foundation for maintaining the island's biodiversity value. Other CIP work fits around biosecurity, not vice versa.
2. Preventing incursions is more effective and far less expensive than responding to incursions. Effective quarantine before leaving the mainland is the most cost-effective incursion risk minimisation.
3. Effective biosecurity creates as many lines of defence (layers) against incursion as feasible. The first opportunity is at the very beginning of the supply chain.
4. Even small things that address a particular biosecurity risk are worthwhile, as it lowers the overall risk.
5. Using machinery and materials already on the island completely eliminates the risks associated with transportation. Exploit this option whenever feasible.
6. What people do to manage biosecurity counts most. This is more important than what they say or what is written down. All people connected with the project must understand the significance of the island's pest-free status and vulnerability to

invasion. LHIB staff and contractors at all levels should be committed to biosecurity and lead by example to champion a biosecurity culture which is self-sustaining and dynamic enough to identify and resolve emerging issues before an incursion occurs.

7. Well-trained operators are necessary for biosecurity tools and systems to be effective. Biosecurity operators are not assigned tasks for which they are not trained or competent. New staff receive induction training and good supervision. Stability in team membership is vital to foster mutual trust and enable biosecurity values, standards, and quality control to be internalised.
8. Transparent and independent inspections are key. Avoiding a conflict of interest in biosecurity inspections is an important strength of the system.
9. If during loading, any doubts arise as to the integrity of cargo being pest -free, the cargo should be rejected. Likewise, if doubts arise during transport, it is better to turn the vessel/aircraft back than to assume it can be dealt with on-island or it poses no significant risk.
10. Suppliers and contractors must meet biosecurity hygiene standards to avoid rejection of suspect cargo and the costs associated. Failures in cargo quality assurance will lead to expensive delays and disruption.

## 5. Overview of LHI biosecurity system

There are four 'pillars' to biosecurity for LHI:

1. **Outreach** – focused on improving understanding of the risks and what to do about them.
2. **Biosecurity Screening (including quarantine)**– where goods are cleaned, packaged and stored in a way which ensures no biosecurity risk material enters the transport system (which itself is clean).
3. **Surveillance** – where active monitoring for high risk organisms takes place on the island to provide an early warning of an invasion.
4. **Incursion response** – where removal of invasions detected are attempted.

CIP contractors are expected to play a role in pillars 1 (quarantine) and 4 (understanding of biosecurity) by

- ensuring cargo destined for the island is clean, appropriately packaged and transported
- developing and sustaining a workplace culture among the workforce and suppliers grounded in stringent biosecurity practices.

The CIP will necessitate extra supplies, machinery and personnel being transported to the island which raises the risks of new species arriving unless carefully managed. Biosecurity screening aims to create multiple layers of inspection and treatment to remove unwanted organisms from cargo on the mainland before departure because this part of the biosecurity system is where effort is most cost effective. The cost of just one incursion response on the

island could surpass the annual operating costs of the screening component. Care and vigilance are needed at every stage, beginning at the point of supply for all goods.

The potential modes of transport (pathways) involved are:

- Chartered vessels capable of handling bulk and large items (e.g. motorised barge)
- Chartered aircraft to carry the workforce and small freight
- Use of the regular marine freight service (MV Island Trader) from Port Macquarie
- Use of air passenger and air freight services offering LHI as a destination.

To meet the biosecurity screening standards required for all CIP cargo by any pathway, each consignment must undergo rigorous independent inspection in a 'biosecure' facility on the mainland.

# 6. Responsibilities of contractors

The following are key points for CIP tenders to address in planning and pricing the work to meet the minimum required level of biosecurity. They draw on and expand the principles described above.

## 6.1 Organisational culture

**The objective is to develop and sustain a workplace culture that understands the principles and values the objectives of biosecurity.**

- Plan to train and induct all workers and suppliers on the importance of biosecurity to protect LHI as well as the requirements for biosecurity actions relevant to their work/products. Keep records of biosecurity-specific inductions and the credentials of the providers.
- Champion a biosecurity culture and drive continuous improvement of biosecurity practices through regular communications with those on the work face. Incentivise compliance and ensure awareness of the delays, costs and penalties involved with lack of compliance.
- Appoint a member of the management team with accountability for biosecurity and liaison with LHIB biosecurity staff.

## 6.2 Cargo biosecurity facility

Note: This assumes LHIB decides not to immediately invest in a warehouse themselves and/or separately contract the management of the facility.

**The objective is provide and maintain a facility where all harmful cargo contamination by biosecurity risk material can be intercepted before transport to LHI.**

Maintain a bio-secure warehouse on the mainland where independent inspection of CIP goods can take place and, upon passing inspection, they can be immediately containerised securely prior to transport by vessel or aircraft. The procurement, refitting, maintenance and running of logistics through this facility will be the responsibility of the contractor. The location of the facility will be subject to an assessment by LHIB during the tender process to avoid high risk sites where potential stowaway pests and weed seeds are abundant.

The inspection and authorisation for transport to LHI will be the responsibility of LHIB. A biosecurity facility will follow a LHIB approved management plan which specifies:

- workflow procedures
- staff training, induction and qualifications
- continuous monitoring for pests across the site and within buildings
- pest control in and around buildings and surrounds to maintain targeted species in low to zero abundance (target species will be specified following a location assessment).
- audit, reporting and quality assurance procedures.

Goods transported using the MV Island Trader must follow the same procedures and receive clearance for shipping before arrival at Birdon's yard. Where possible they should be immediately loaded rather than stored at Birdon. Where Birdon storage is unavoidable they will follow Birdon's biosecurity procedures for staging and loading. Airfreight and (CIP workforce) passenger luggage must follow the same procedure of inspection, secure packaging and approval for transport before entering the airline's own biosecurity system.

## 6.3 Communication and reporting

**The objective is to work in partnership with LHIB biosecurity staff to ensure biosecurity standards are sustained and to avoid transport delays.**

- All monitoring results and interceptions of pests are reported to LHIB as soon as practical.
- Movement of materials and machinery from the mainland are planned well in advance and LHIB inspectors notified of the relevant dates, the nature of the cargo and the location.
- Include biosecurity audit results, observations, and continuous improvement as a standing agenda item in contract reviews between LHIB and main contractor.

## 6.4 Supplies and materials

In this section we describe how construction materials should be prepared prior to inspection and clearance for transport to LHI. It also describes what inspections would look like for different types of goods.

**The objective is to meet the 'arrive clean' standard on arrival at the mainland facility to assist inspection and any further prophylactic treatment required, thereby avoiding delays and added costs.**

- Make use of materials already on-island where this can avoid or reduce the quantity of materials needing to be transported.

- CIP workforce should endeavour to leave personal gear on island when returning to the mainland on break to minimise quantities needing reinspection each time. This can be facilitated by the contractor providing secure on island storage and laundry facilities.

- Engage suppliers with procedures in place to ensure quarantine hygiene and secure packaging at source, sufficient to pass independent inspection prior to loading. Regular engagement with suppliers and timely feedback on inspection failures is required by the contractor. This could be facilitated by the contractor having someone with specific supplier liaison duties.

- Avoid supplies from high risk locations. Nominate suppliers and the source of materials in tenders to allow LHIB to undertake biosecurity risk assessments of these locations (e.g. what pest animals and weed species are prevalent).

- Any items found contaminated with biosecurity risk material, will at the inspector's discretion and the contractor's cost, be:
    - rejected and returned to the supplier or another place for cleaning or
    - cleaned on site in a designated area and/or
    - fumigated with a chemical appropriate to the situation or
    - treated with a residual insecticide spray and/or
    - flagged as high risk and subject to further inspection at unpacking on island.

- Where sufficient dismantling for inspection cannot take place due to the nature of the items (not the urgency or time available), they will be fumigated at the contractor's cost and flagged for further inspection at unpacking on island.

### 6.4.1 Aggregate

Aggregate should be sourced from areas of minimal weed infestation and must be tumbled in a rotary drum for at least 5 minutes to ensure any live animals, eggs or larvae are crushed. Alternatively, it can be heated to above 53 degrees for at least 30 minutes. Heat treatment must be monitored at the centre of each load. Note that these treatments will not eliminate weed seeds.

Immediately following treatment it must be securely packaged to deny access to unwanted species. New bulk bags are acceptable if placed into clean solid containers.

Packages of aggregate remaining after completion of the project must be either removed from the island or stored at a location nominated by LHIB. Under no circumstances can these packages be broken open and 'spread' on the island unless under LHIB supervision.

### 6.4.2 Concrete blocks, pavers and pre-cast concrete

Concrete items are high risk due to the spaces they offer invertebrates and reptiles. They should be sourced from preferred suppliers which have a proven track record of secure clean storage. All items must be new/ unused.

Inspectors are likely to require repackaging and fumigation followed by wrapping or containerisation. Pallets must meet packaging requirements.

### 6.4.3 Sawn timber

Sawn timber is high risk due to the spaces it offers to invertebrates and reptiles. It should be sourced from preferred suppliers with a proven track record of secure clean storage that prevents contamination by live organisms.

Untreated timber in packets must be dismantled, inspected and wrapped. Particular attention must be paid to bark encased knots which should be sprayed with a residual insecticide.

Treated timber[1] in packets can be wrapped and fumigated targeting crawling and flying insects. Wooden fillets (spacers) in timber packets must be treated timber.

### 6.4.4 Prefabricated buildings, furniture and appliances

Only new items are acceptable. Appliances in manufacturers packaging can be visually inspected on all sides for gaps or damage to packaging.

Any items with damaged or incomplete packaging will be opened for inspection and repackaged.

### 6.4.5 Plywood sheeting, gyprock, plasterboard

Must be in a generally clean state and free from attached soil, seeds, invertebrates (e.g. slugs, snails, spiders, ants, etc.), invertebrate material (e.g. spider webs, mud wasp nests, etc.), reptiles, rodent chew/damage/droppings, and all other pest damage/chew/sign.

Should be sourced from preferred suppliers which have a proven track record of biosecure clean storage.

Must be fully wrapped/packaged including undersides with packaging free from any holes, rips, or tears. Pallets must meet packaging requirements.

If there is any indication of invertebrate activity the package will be completely dismantled sheet by sheet, inspected/treated and repacked.

### 6.4.6 Roofing steel sheeting

Corrugated sheets are particularly high risk for harbouring lizards and invertebrates between the sheets.  They should be sourced from preferred suppliers which have a proven track record of secure biosecure clean storage.

Only new material is acceptable, used sheeting is prohibited.

If there is any indication of invertebrate activity the package must be completely dismantled sheet by sheet, inspected/treated and repacked.

1Certified chemical treatment against wood boring insects and fungi.

Where wooden fillets (spacers) are used, each group of sheets will be lifted for inspection. Wherever the sheets are not fully in contact along their entire length, they will be separated for inspection. Gaps greater than 1mm are unacceptable.

Ensure pallets meet packaging standards.  Loads will be lifted off pallets for inspection and to treat the top side of pallet solid sheet with residual insecticide.

### 6.4.7 Pipes & hoses

All pipes and hoses must be new/unused, clean and have removable caps on both ends to prevent contamination by spiders and insects and facilitate inspection.

### 6.4.8 Landscaping materials and plants

Most organic landscaping materials (e.g. soil, compost, mulch, potted plants) are prohibited. LHIB has a plant importation policy which requires specific application and approval from the Board prior to shipping.

## 6.5 Packaging

In this section packaging standards are described for all cargo (sea or air), and personal luggage of personnel travelling to LHI.

**The objective is to ensure unwanted biosecurity risk material (e.g. soil, insects, spiders, lizards, snakes, rodents, ants) cannot gain access to infest cargo after it has been inspected and cleared for transport.**

Unless otherwise approved, packaging of all materials and supplies must be resistant to pest entry post inspection. Use secure containers where possible, or shrink wrapping where containers are not practical.

All cargo on wooden pallets must use new pallets meeting ISPM 15 standards. No used wooden pallets are acceptable due to the risk of wood dwelling insects, fungi and spores.
Plastic ‘hygiene’ pallets are preferred as they have minimal spaces and crevices, can be more readily cleaned, inspected and reused.

All pallets must have a solid base layer under the cargo to prevent pest ingress from underneath. Corrugated cardboard, corflute or soft plastic is not acceptable; plywood, sheet steel or rigid (3mm) plastic sheet is preferred.

Reusable pallets and containers should be cleaned and prophylactically treated with a residual surface insecticide prior to use. Never set down on dirt, mud or soil.

Any timber chocks or packing material used inside shipping containers (e.g. to secure the load against movement) must be treated against wood boring insects and fungi.

## 6.6 Machinery, vehicles and equipment

In this section we outline the standard of cleanliness all vehicles, machinery and tools must attain prior to inspection.

**The objective is to minimise the potential for biosecurity risk material to be transported to the island via CIP equipment.**

Make use of machinery and vehicles already on-island where this can reduce the quantity of machinery needing to be cleaned, treated, inspected, wrapped and transported. LHIB has a vehicle importation policy requiring specific application and approval.

Vehicles and machinery must arrive for inspection either new or having already undergone extensive commercial cleaning. The following inspection procedures demonstrate how 'clean' meets the required standard before shipping to LHI.

- Meticulous inspection of all surfaces, including difficult-to-access areas such as crevices, weld breaks, drain holes, undersides, tracks, rollers, tyres, wheel arches, guards, blades, engine bays, grills, footwells, pedals, mats, seats, and the interiors of cabins (e.g., under seats and dashboards). Open all inspection covers and engine covers.
- Underside of vehicle bonnet is clean and free of spiders. Spray all openings with insecticide.
- Use effective cleaning tools such as high-pressure air hosing, vacuuming, pressure washing, steam cleaning, crowbars, stiff brushes, and torches to remove all soil and organic matter.
- Where practical raise vehicles on a hoist to facilitate underside inspection, otherwise use garage creepers.
- Conduct inspections with strong lighting.
- Engine air filters and cabin filters should be new. Pre-cleaners should be clean.
- Ensure radiators are free of vegetation and seeds, spray with a knock-down insecticide.
- Exterior surfaces of machinery should be sprayed with residual insecticide.

Where feasible machinery and tools will be securely containerised immediately after inspection to avoid infestation post-inspection and before departure. Where containerisation is not feasible, consider plastic wrapping.

All inspected, ready to ship cargo must be fully packed and prepared before being placed in a separate secure storage room. This room is strictly for holding cargo awaiting loading—it is not

a space for ongoing packing or additions. Access will be limited, and the room will never be left unattended while unlocked.

# 7. Shipping via chartered vessel

This section is about the operation of a vessel other than the MV Island Trader to transport machinery and cargo to LHI for CIP work.

## 7.1 Bringing the vessel into service

This section describes the procedure to ensure the vessel is clean and free from contamination before it accepts the first load after charter to other destinations or prolonged berthing at the mainland port (more than 5 days) due to breakdown or other delays.

**The objective is to ensure the vessel begins operation to LHI clean.**

- Vessels must 'stand down' with minimal ship-board activity for 5 days prior to loading with all baiting and detection systems operating to allow detection of stowaways.
- Vessels must be baited with brodifacoum and set lethal traps for rodents using approved stations and traps.
- All closed compartments must be fumigated. All open decks must be sprayed with residual insecticide.
- Vessel must be cleared by LHIB biosecurity officer to enter service. They will look for
  - the ships log of where it has been docked
  - evidence of chemical treatment;
  - records from surveillance devices;
  - and inspect the vessel for cleanliness.
  - A biosecurity detection dog[2] may be used.
  - Further biosecurity measures may be prescribed prior to clearance if, in the opinion of the LHIB officer, biosecurity risks warrant it.

## 7.2 Pre-loading procedures

This section covers the routine vessel cleaning procedures undertaken before loading for every journey to LHI. These requirements add to those described above when the vessel is first brought into service.

**The objective is to ensure the ship is clean, free from all contamination and ready to receive clean cargo.**

2 A certified dog & handler trained to detect the scent of specific animals such as rodents and snakes.

- All outer decks and cabin/wheelhouse are pressure washed and sprayed with residual insecticide (Deltamethrin or similar).

- All dunnage timber must be treated against wood boring insects and fungi. Dunnage should be preferably kept on board once inspected. Any material not already onboard will be inspected/treated as for other timber cargo.

- Vessels must be baited and set with lethal traps for rodents 5 days prior to departure using approved stations and traps. Bait/traps must remain active while moored.

- All mooring lines, water and fuel hoses must have approved rat guards set whenever the ship is tied up, except for when tied up to LHI. Common mistakes with rat guards to avoid are:
    - Poor design leaving gaps for rodents to move through.
    - Incorrectly positioned on double lines allowing rodents to bypass guards by jumping across to the other line.
    - Hung from the ship with a separate unguarded retrieval line
    - Not every line is guarded.
    - Tying up to high risk sites.
    - Lack of monitoring to ensure ship movement does not eliminate effectiveness of guard

- The gangways and ramps must be raised at night and at all times when not in use.

- All waste is removed and appropriately disposed of. Interior of all cabins are vacuumed and hard flooring mopped with disinfectant.

- Galley and crew provisions storage is cleaned. Refrigerators and movable appliances are moved to clean under them and the floor area under them is sprayed with a residual insecticide. Evaporation trays are inspected for any sign of rodents or insects.

- Insect sticky traps are set as per an approved schedule.

- All crew and visitors to the vessel must have clean footwear and step onto a disinfectant mat place in the doorway before entering the interior compartments.

- Exterior doors, portholes and hatches must remain closed unless in use while the vessel is in port.

## 7.3 Loading and departure

This section covers the loading and receiving clearance for departure from the mainland port.

**The objective is to reduce the risk of unwanted organisms boarding while the vessel is tied up to the mainland, and to ensure independent verification of clean ship -clean cargo before departure.**

- A permit is required from Marine Parks for each voyage. This permit may have marine biosecurity requirements in addition to those outlined in section 6.7.

- All cargo is to be cleared for loading by Biosecurity Officers

- To minimise opportunities for pests to climb onto the vessel, loading should ideally be undertaken in one operation with the vessel connected to the land for as short a time as possible.

- If a loading ramp is being used it must not remain down unattended for longer than 30 minutes. For any temporary delay in loading for 30 minutes or longer the ramp must be raised at least one metre above ground.

- Rat guards must be placed on all mooring lines when the vessel is tied up. Common mistakes with rat guards to avoid are:
    - Poor design leaving gaps for rodents to move through.
    - Incorrectly positioned on double lines allowing rodents to bypass guards by jumping across to the other line.
    - Hung from the ship with a separate unguarded retrieval line
    - Not every line is guarded.
    - Tying up to high risk sites.
    - Lack of monitoring to ensure ship movement does not eliminate effectiveness of guard.

- Minimise loading during darkness is crucial as rodents and some invertebrates are more active at night.

- The Master of the vessel must receive formal clearance for departure by the Biosecurity manager[3] once full compliance of biosecurity requirements has been established.

3 The Biosecurity Manager resides on LHI and has accountability for the protection of the island. By delegating these decisions to this person and not the biosecurity officer on the mainland it avoids any conflict of interest or undue pressure on the biosecurity officer to make the call.

- During transit, if sign of unwanted organisms is discovered on-board, it must be reported to the LHIB Biosecurity manager immediately. The decision to proceed (not turn back) will be made by the Master and the biosecurity manager according to an agreed plan. This issue should be addressed in the contractor's biosecurity risk management plan and be reflected in any sub-contracts with shipping providers.

## 7.4 Entry into Lord Howe lagoon

This section covers the on-board surveillance reporting requirements and gaining permission to enter the LHI lagoon.

**The objective is to ensure no unwanted organisms remain at large onboard and to double check the vessel did receive clearance before departure. This is the last opportunity to prevent high risk organisms access to the island.**

- All surveillance devices (e.g. traps, insect trays) are set and empty upon inspection.
- Decks are visually inspected.
- The Master of the vessel reports clearance details and surveillance results to the LHIB upon entry into the lagoon.
- The vessel proceeds to the LHI jetty only when authorised.

## 7.5 Unloading and backloading

This section covers the unloading procedures and backloading containers and waste to the mainland.

**The objective is to avoid offloading contaminated cargo and to ensure backloads do not cause 'false alarms' by loading LHI sourced organisms**.

- The vessel and cargo are checked before unloading by a detection dog.
- Cargo found to be suspicious or 'flagged' in the system from previous inspections (refer to section 6.4), should be isolated from other cargo and subjected to further inspection. Any contaminated cargo will not be released or rectified on island. It will be isolated, secured and returned to the mainland for treatment on the next available voyage.
- The time between unloading and backloading is minimised as much as possible.

- Backloaded cargo should be clean or securely packaged to avoid contamination of the vessel.

## 7.6 Crew management and training

This section covers the requirements for crew awareness of biosecurity procedures and purpose.

**The objective is to ensure all crew members understand their responsibilities for biosecurity and to foster a culture of biosecurity awareness and problem solving.**

- All people onboard the vessel (crew, LHIB staff, contractors and passengers) must understand the significance of the island's pest-free status and vulnerability to invasion.

- The crew must be committed to biosecurity and lead by example to champion a biosecurity culture that is self-sustaining and dynamic enough to identify and resolve emerging issues.

- Biosecurity operators should not be assigned tasks for which they are not trained or competent. Well-trained operators are necessary for biosecurity tools and systems to be effective.

- New staff should receive induction training and good supervision.

- Stability in team membership is vital to foster mutual trust and enable biosecurity values, standards, and quality control to be internalised. This helps teams work under duress and ensures horizontal reporting among colleagues, internalising standards and quality control.

## 7.7 Vessel maintenance and anti-fouling

This section covers maintenance as it relates to biosecurity, and outlines the broad requirements for marine biosecurity monitoring and maintenance which are covered in more detail elsewhere.

**The objective is to minimise the opportunity for unwanted terrestrial organisms to board the ship when it is out of the water or tied up at another berth for prolonged maintenance or repair.**

- The special ‘clean status’ of the ship is officially communicated to the staff overseeing and performing the maintenance work.

- The surveillance system should be operating while the ship is under maintenance, as long as it does not interfere with the maintenance work. Any partial or total suspension of the system must be recorded and followed up with a thorough check.

- The ship must have an anti-fouling system applied in accordance with the manufacturer's instructions and within the manufacturer's time frame of effectiveness.

- Evidence of the anti-fouling system and its application date must be recorded.

## 7.8 Biosecurity risk material discovered on-board

**The objective is to eliminate all risk of an organism reaching the island; ensure there is no more yet to be found; and identify what can be learned.**

1. **Contain it**. The immediate priority is to isolate and contain the situation to prevent further spread.
2. **Collect and preserve evidence**. For whole animals or any signs of pests, such as droppings, parts of animals, or seeds, photos (with reference of scale and exact location) and hard evidence must be collected and labelled using water-resistant paper and permanent ink, with labels placed inside the container (including collector, location, date, time, notes). Preferably store in a hard container (to avoid crushing) and in the freezer (for further identification).
3. **Report it**. An incident report must be immediately communicated to the Biosecurity Officer and raised on the reporting system. If during transit to LHI, the Master will contact LHIB.
4. **Decision on turning back**. The decision to proceed (not turn back) will be made by the Master and the biosecurity manager according to an agreed plan in the contractor’s biosecurity risk management plan.
5. **Further mitigation**. Options will be discussed with LHIB biosecurity staff on a case by case basis. Formal identification of the pest, by a taxonomist/geneticist, might be required in some cases.
6. **Build a library**. Samples with complete labels should be preserved long-term; there may be a need of a meta-analysis in the future and can be useful for training.
7. **Debrief**. Discuss with people involved what can be learned/ improved for next time.

# 8. Chartered aircraft

This section is about the operation of aircraft other than the regular air services to transport passengers and cargo to LHI for CIP work.

## 8.1 Bringing the aircraft into service

This section describes the procedure to ensure the aircraft is clean and free from contamination before it accepts the first load after charter to other destinations.

**The objective is to ensure the aircraft begins operation to LHI clean.**

- Aircraft must be baited with brodifacoum and set lethal traps for rodents using approved stations and traps every night for five consecutive nights prior to entering service to LHI.

- All luggage compartments must be sprayed with residual insecticide.

- The aircraft must be cleared by LHIB biosecurity officer to enter service. They will look for
  - a log of where it has been parked overnight;
  - evidence of chemical treatment;
  - records from surveillance devices;
  - and inspect the aircraft for cleanliness.
  - Further biosecurity measures (e.g. inspection by a biosecurity detection dog[4] ) may be prescribed prior to clearance if, in the opinion of the LHIB officer, biosecurity risks warrant it.

## 8.2 Pre-loading procedures

This section covers the routine aircraft cleaning procedures undertaken before loading for every journey to LHI. These requirements add to those described above when the aircraft is first brought into service.

**The objective is to ensure the aircraft is clean, free from all contamination and ready to receive clean cargo.**

- All luggage compartments must be sprayed with residual insecticide (Deltamethrin or similar).

4 A certified dog & handler trained to detect the scent of specific animals such as rodents and snakes.

- Aircraft must be baited and set with lethal traps for rodents two nights prior to departure using approved stations and traps. Alternatively, it can be stored overnight in a closed hangar which has an approved pest management regime operating throughout the building interior and immediate exterior.

- All aircraft doors must be closed when not in use.

- All food items, food waste or other waste is removed and appropriately disposed of each day before storage overnight. Interior of cabin and luggage compartments is vacuumed and hard flooring mopped with disinfectant.

## 8.3 Loading and departure

This section covers the loading and receiving clearance for departure from a mainland airport.

**The objective is to reduce the opportunity for unwanted organisms to come onboard while on the mainland and to ensure independent verification of clean aircraft and clean cargo before departure.**

- To minimise opportunities for animals to climb onto the aircraft, loading should ideally be undertaken in one operation.

- Minimise loading during darkness unless done inside a closed hangar as rodents and some invertebrates are more active at night.

- The pilot of the aircraft must receive formal clearance for departure by the Biosecurity manager once full compliance of biosecurity requirements has been established.

- During transit, if sign of unwanted organisms is discovered on-board it must be reported to the LHIB Biosecurity manager immediately. The decision to proceed (not turn back) will be made between the pilot and the biosecurity manager following an agreed plan.

## 8.4 Landing at Lord Howe airport and unloading

This section covers the unloading procedures.

**The objective is to avoid contaminated cargo leaving the secure area of LHI airport.**

- All luggage and cargo are checked in a secure facility by a detection dog.
- Cargo found to be suspicious or 'flagged' in the system from previous inspections (refer to section 5.4), should be isolated from other cargo and subjected to further inspection. Any contaminated cargo will not be released or rectified on island. It will be isolated, secured and returned to the mainland for treatment on the next available flight.
- The empty luggage compartments and cabin are checked for biosecurity risk material visually and where possible by a detection dog.

# 9. Biosecurity compliance checklist for CIP main contractor

**General principles & organisational commitments**

- Biosecurity is prioritised above all other work activities.
- CIP planning allows for biosecurity to shape schedules and logistics.
- A designated Biosecurity Lead is appointed within the contractor's management team.
- All staff and subcontractors receive biosecurity induction and training.
- A strong, visible biosecurity-first culture is promoted at all levels.
- Biosecurity standards are communicated clearly and regularly.
- Compliance is incentivised; performance bonuses linked to biosecurity are in place.
- Continuous improvement is supported via feedback loops and mentoring.
- Team structure encourages stable, experienced crews and internal quality control.

**Crew responsibilities and training**

- All crew and passengers aware of LHI biosecurity status
- Crew lead by example and promote vigilance
- No task assigned to untrained staff
- New crew receive full induction and supervision
- Team stability prioritised for quality and mutual trust.

**Mainland biosecurity facility requirements**

- Maintain a dedicated bio-secure warehouse with limited, controlled access.
- Independent inspections occur before goods are containerised.
- Warehouse follows an approved management plan covering:
    - Staff training and induction,
    - Defined workflow and cargo movement procedures,
    - Pest surveillance and control in buildings and surroundings,
    - Audit, reporting, and corrective actions.
- Real-time pest interception records are maintained and shared with LHIB.
- LHIB is notified well in advance of cargo movements, including dates, types, and location.

**Cargo preparation & packaging**

- Packaging must prevent post-inspection contamination.
- Secure containers or shrink wrap are used.
- Reusable containers are cleaned and treated with residual insecticide.
- Only new ISPM 15 wooden pallets are used – no reused timber pallets allowed.
- Plastic hygiene pallets preferred where possible.
- Pallets must have a solid base layer under the cargo to prevent pest ingress from underneath. Corrugated cardboard, corflute or soft plastic is not acceptable; plywood, sheet steel or rigid (3mm) plastic sheet is preferred.
- Timber packing inside shipping containers is treated against wood boring insects and fungi.
- All cargo is fully packed and sealed before entering the secure storage room.
- No packing or additions are made once cargo enters secure storage.

**Construction materials**

<u>Aggregates</u>

- Sourced from low-risk areas (minimal weed infestation)
- Treated by:
    - Tumbling in a rotary drum (5+ min), or
    - Heating to >53°C for 30+ minutes (monitored at centre).
- Immediately packaged in clean bulk bags and secure containers.
- Leftover aggregate is:
    - Removed from island, or
    - Stored as directed by LHIB, and
    - Never spread without LHIB approval.

<u>Concrete, blocks, pavers, tiles</u>

- Sourced from preferred low risk suppliers.
- All items must be new and unused.
- Likely to require fumigation and wrapping.

- Pallets must comply with packaging standards.

Sawn timber

- Sourced from preferred low risk suppliers.
- Untreated timber in packets: dismantled, inspected, wrapped.
- Inspect and treat bark-encased knots with residual insecticide.
- Treated timber: wrapped and fumigated against crawling and flying insects.

Roofing steel, gyprock, plywood, plasterboard

- New material only – no used items permitted.
- Thoroughly cleaned and wrapped (including underside).
- Pallets inspected and sprayed.
- Gaps between sheets must be <1mm.
- Suspicious packages must be dismantled, inspected, treated, and repacked.

Prefab buildings, furniture, appliances

- New only, in manufacturer's packaging.
- Damaged packaging → treatment + inspection.
- Repackage as required.

Machinery, vehicles, and tools

- Use island-based equipment wherever feasible.
- Import permit required for vehicles.
- All equipment must arrive new or thoroughly cleaned
- Thorough cleaning includes:
    - Underside, wheel arches, tyres, blades, tracks
    - Engine bays, radiators (cleared and sprayed), air filters
    - Cabins and footwells, seats, floor mats
    - All compartments opened and inspected
- Use strong lighting, creepers or hoists, brushes, vacuums, pressure hoses
- Apply residual insecticide to all external surfaces
- Securely containerise or wrap after inspection to avoid recontamination

**Vessel operations**

Bringing vessel into service

- Vessel stands down with minimal activity for 5 days.
- Rodent baiting (brodifacoum) and lethal traps used.
- Closed compartments fumigated, decks sprayed.
- Clearance by LHIB officer required (including log, evidence, and physical inspection).

Pre-loading (each voyage)

- All decks and compartments cleaned and sprayed.

- Baiting and trapping maintained.
- Rat guards installed on all mooring lines.
- Gangway raised when not in use.
- Galley and storage cleaned thoroughly.
- Disinfectant mats at vessel entries.
- Doors, hatches, portholes closed unless in use.

Loading & departure

- A permit is required from Marine Parks for each voyage.
- Cargo only loaded after LHIB clearance.
- Loading done in one operation if possible; short land contact.
- Ramp not left down >30 mins unattended.
- Avoid loading in the dark.
- Signs of pests during transit must be reported; follow agreed decision making process.

Unloading & backloading

- Detection dog inspects vessel and cargo before unloading.
- Suspicious/flagged cargo isolated for reinspection.
- Minimise time between unloading and backloading.

**Aircraft operations**

- Only charter aircraft cleared by LHIB may operate.
- Pre-service baiting, spraying, and inspection.
- All luggage compartments sprayed before each flight.
- Overnight: baited or stored in pest-managed hangar.
- All food/waste removed; cabins vacuumed and cleaned.
- Doors kept closed when not in use.
- No night loading unless inside secure hangar.
- Cargo checked by detection dog on arrival.

**If contamination is detected**

- Contain the threat immediately.
- Collect evidence: samples, photos, labelled containers.
- Report immediately to LHIB Biosecurity manager.
- Decision to turn back made jointly with LHIB.
- Additional mitigation planned case-by-case.
- Preserve evidence for future training and analysis.
- Conduct post-event debrief and lessons learned.

# 10. Glossary

**Biosecure facility** – A facility designed and operated to exclude and manage the risk of unwanted organisms. Includes sealed areas for inspection, cleaning, and secure storage, with documented procedures and quality assurance.

**Biosecurity** – A set of measures designed to protect an area from the introduction and spread of harmful organisms such as invasive species, pests, or diseases.

**Biosecurity clearance** – Formal approval by LHIB biosecurity staff that cargo, vessels, or aircraft meet the biosecurity requirements for safe departure/entry to LHI.

**Biosecurity risk material** – any plant or animal material, pathogen, fungi, soil or water not specifically authorised to be imported to LHI.

**Biosecurity screening** – The process of isolating and inspecting cargo, vehicles, or personnel to prevent the introduction of pests to LHI. This includes decontamination and prophylactic treatment and secure packaging- whether this is done at the point of supply or at a biosecurity facility prior to shipping.

**Clean-on-arrival** – The required condition that all cargo arrives at the inspection facility free of contamination or biosecurity risk material (BRM).

**Containment** – An action or strategy to prevent the spread of a harmful organism once detected, often involving physical isolation and treatment.

**Detection dog** – A specially trained dog used to detect the presence of invasive species or biosecurity risk materials by scent. Used both on the mainland and on LHI.

**High-risk items** – Cargo or materials that pose a greater likelihood of harbouring biosecurity risks – such as used machinery, timber, or aggregate.

**Incursion** – The successful entry of an invasive organism into the island environment.

**Mainland biosecurity liaison** – A LHIB staff member employed to assist suppliers and contractors in meeting biosecurity expectations and ensuring compliance with LHIB standards on the mainland.

**Pathway integrity** – The maintenance of effective biosecurity controls throughout the entire supply chain, from the point of origin to LHI.

**Pest** – Any invasive organism or species (including rodents, insects, reptiles, or pathogens) that poses a risk to LHI's natural environment, economy, or community wellbeing.

**Surveillance** – The ongoing monitoring of specific areas to provide early warning of biosecurity threats. Used to detect the presence of unwanted species and guide timely responses.

# 11. Authors

**Keith Broome**
Keith has extensive experience in island pest management and island biosecurity during a near 40 year career as technical adviser in NZ Department of Conservation (DOC).

- Supported the development of DOC island biosecurity systems and training including full review of systems in 2013.
- Regular TAG member or leader for pest incursion responses on NZ islands administered by DOC. Auditor of biosecurity practices in DOC regions.
- Supported LHI rodent eradication project since 2009, serving as eradication expert on Steering committee 2012-2018; Technical advice to the project through chairing Island Eradication Advisory Group. Ad hoc advice to LHI Biosecurity officer on island biosecurity.
- Ad hoc advice to Australian Antarctic Division on biosecurity improvements for Macquarie Island. On-island eradication adviser 2011 during Macquarie pest eradication project. Steering committee member for project 2008- 2011.
- Contracted to DOC to write biosecurity plan for NZ Sub-antarctic Islands World Heritage Area.

**Araceli Samaniego-Herrera**
Araceli is a rodent ecologist with over 20 years of international experience in island conservation, leading eradication planning and operations across tropical and sub-tropical regions. She has extensive experience in biosecurity and the development of science-based tools, supporting large-scale projects and producing widely used resources for practitioners.

- Led the Island Rodent Eradication Programme (which includes biosecurity) in Mexico for over a decade.
- Contributed to the rodent eradication project on LHI as team leader for the ground operation in 2019.
- Currently based in Melbourne, supporting large, complex projects with strong biosecurity components: rodent eradications on Pitcairn & Henderson (UK), Aldabra (Seychelles), Auckland (NZ) and Marion (South Africa).

# 12. Acknowledgements

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# APPENDIX C LORD HOWE ISLAND BIOSECURITY MANUAL FOR THE CRITICAL INFRASTRUCTURE PROGRAM - OPERATIONS

# Biosecurity considerations for the operation and maintenance of Lord Howe Island marine cargo.

## 12 August 2025

Keith Broome & Araceli Samaniego-Herrara



Lord Howe ISLAND BOARD

NSW GOVERNMENT

# Contents

# 1. Version control

| Version | Date | Author | Revision reason |
|---|---|---|---|
| V01 | 012/08/25 | Keith Broome & Araceli Samaniego-Herrara | First draft |
| V02 | 19/08/25 | | LHIB brand formatting |
| | | | |
| | | | |

# 2. Document management

| Name | Title | Role | Actions |
|---|---|---|---|
| Lord Howe Island Board | Elected body/ representatives from NSW Govt. | Final approval | Adopted and delivered. |
| Suzie Christensen | CEO (LHIB) | Oversight/ endorse | Supports and endorses the Biosecurity Plan |
| Kristine Ward | Senior Manager Environment | Manager/ support | Single point of accountability, know the necessary operational approvals and authorisations |
| Darryl Birch | Biosecurity Team Leader | Operations/ review | Understands the plan and informs LHIB biosecurity team and LHIB approved contractors. |

# 3. Purpose and scope

This report provides a reference document for the Lord Howe Island Board (LHIB) outlining the best practice requirements for the biosecurity of marine cargo operations between mainland Australia and Lord Howe Island (LHI). Those requirements adopted by LHIB will be reflected in policy prescriptions and contracts to provide the required legal standing.

Within scope are biosecurity related requirements for:

- Operation and maintenance of the ship
- Design features, equipment fit-out and operation of the cargo handling facility
- Inspection and treatment and packing of cargo ready for shipment
- Developing and sustaining a strong biosecurity culture among the workforce

Out of scope is:

- Handling of cargo once landed on Lord Howe Island
- Requirements unrelated to biosecurity such as maritime law, health and safety regulation, security against criminal activity, employment conditions etc.

# 4. Context

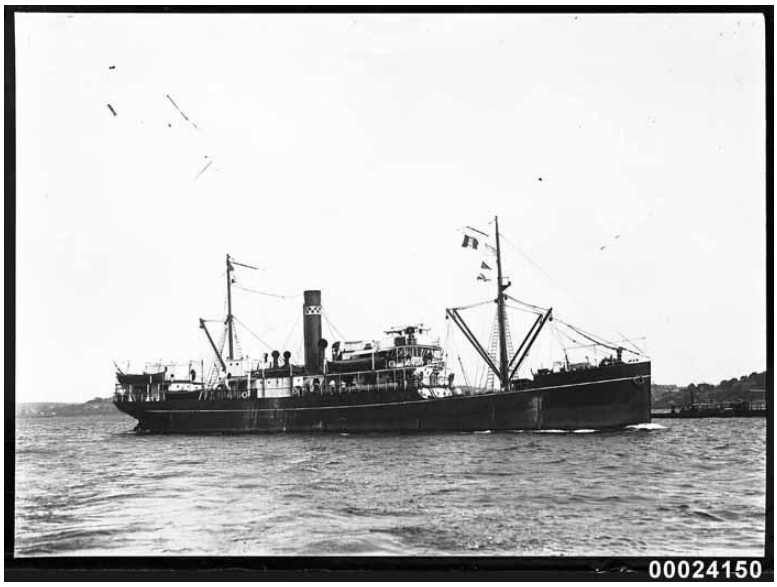
## Lord Howe Island - UNESCO World Heritage Site

Lord Howe Island is unlike any other Australian island. Lord Howe is an ancient volcano emerging directly from the sea and colonised by wildlife and plants which have evolved to be vastly different from those found on the mainland. This makes the whole island ecosystem very vulnerable to ecological damage from species arriving from elsewhere. Lord Howe Island residents enjoy an environment lacking some of the mainland household and garden pests and diseases and their economy depends on the protection of this unique environment. To protect this paradise from damage, islanders want strict import controls and sustained vigilance to prevent the accidental transport of future problem species.

## What is Lord Howe Island most vulnerable to?

In short, almost everything! Stowaway rodents and snakes are the highest risk animals due to their likely impact on LHI fauna. Tramp ants (particularly fire ants) and wood boring insects (e.g., termites) would significantly affect residents. Other invertebrates, weeds, pathogens and fungi could impact on natural or lifestyle values (or both) depending on the species.

## Case study - Rats invade the island




When the SS Makambo grounded off Ned's Beach in 1918 black rats infesting the ship swam ashore and began wreaking havoc among the Lord Howe Island wildlife. Over the following years an ecological catastrophe played out despite the efforts of islanders to control them. Six bird species went extinct, many of them were Lord Howe endemic (not found anywhere else in the world). Two invertebrate species vanished from the main island, but persisted on offshore islets. Of the remaining endemic species, four land birds, two lizards, four invertebrates and five plant species are now listed as threatened species. Rats also devastated populations of nine seabirds, raiding nests and killing chicks.

Rats changed the lives of islanders at the time, infesting their homes, destroying food crops and severely impacting their biggest export, the kentia palm crop. In 2019, after more than a hundred years of rat impacts, an eradication project began. It brought major disruption to the community and cost over $26M, but success was declared in 2021 which was further confirmed in 2023. Since then islanders enjoy living without rodents and have witnessed the remarkable recovery of the native species which managed to survive.

## So, what do we want to stop?

- All vertebrate animals including any life-stage (e.g. the eggs of egg-laying skinks).
- All invertebrates including any life-stage (eggs, larvae, pupae, adult).
- All soil-borne pathogens (e.g. diseases, fungi, nematodes) or potential disease carriers such as leeches.

- All prohibited plant matter, new weed species or propagules of those already under management.

## 5. Principles of good biosecurity management

Biosecurity for LHI requires a multi-layered approach. No single layer is perfect, but multiple layers added together reduce the chances of things making it into the wild on the island where finding and removing them before they establish a population can be impossible or very expensive.

There are four 'pillars' to biosecurity for LHI:

1. Outreach –focussed on improving understanding of the risks and what to do about them.
2. Biosecurity Screening– where goods are cleaned, packaged and stored in a way which ensures no biosecurity risk material enters the transport system (which itself is clean).
3. Surveillance – where active monitoring for high risk organisms takes place on the island to provide an early warning of an invasion.
4. Incursion response – where removal of invasions detected are attempted.

This report addresses the **biosecurity screening** component for marine cargo which is the highest risk pathway for introductions of unwanted organisms. Most of the non-native species now present on LHI came in ships, as did many of the species which have been successfully eradicated from the island over the past few decades at great expense and effort by islanders.

Biosecurity screening aims to create multiple layers of inspection and treatment to remove unwanted organisms from cargo on the mainland before departure because this part of the biosecurity system is where effort is most cost effective. The cost of just one incursion response on the island could surpass the annual operating costs of the screening component. Care and vigilance are needed at every stage, beginning at the point of supply for all goods.

To reach and sustain the goal of successfully preventing the establishment of new invasive species on LHI, the following principles underpin a biosecurity mindset or culture applicable to everyone involved, be they LHIB staff or contractors.

1. The environment is the economy. Biosecurity work is prioritised over all other work, and is the foundation for maintaining the island's biodiversity value. Other work fits around biosecurity, not vice versa.
2. Preventing incursions is more effective and far less expensive than responding to incursions. Effective screening before leaving the mainland is the most cost-effective way of minimising the risk of incursion.
3. Effective biosecurity creates as many lines of defence (layers) against incursion as feasible. The first opportunity is at the very beginning of the supply chain.
4. Even small things that address a particular biosecurity risk are worthwhile, as it lowers the overall risk.
5. What people do to manage biosecurity counts most. This is more important than what they say or what is written down. All people connected with the project must understand the significance of the island's pest-free status and vulnerability to invasion. LHIB staff and contractors at all levels should be committed to biosecurity and lead by example to champion a biosecurity culture which is self-sustaining and dynamic enough to identify and resolve emerging issues before an incursion occurs.
6. Well-trained operators are necessary for biosecurity tools and systems to be effective. Biosecurity operators are not assigned tasks for which they are not trained or competent. New staff receive induction training and good supervision. Stability in team membership is vital to foster mutual trust and enable biosecurity values, standards, and quality control to be internalised.
7. Transparent and independent inspections are key. Avoiding a conflict of interest in biosecurity inspections is an important strength of the system.
8. If during loading, any doubts arise as to the integrity of cargo being pest -free, the cargo should be rejected. Likewise, if doubts arise during transport, it is better to turn the vessel/aircraft back than to assume it can be dealt with on-island or it poses no significant risk.
9. Suppliers and contractors must meet biosecurity hygiene standards to avoid rejection of suspect cargo and the costs associated. Failures in cargo quality assurance will lead to expensive delays and disruption.

## 6. Biosecurity is a social exercise

Sections 6-8 of this report illustrate the systems and actions necessary to achieve effective screening of cargo transported by ship. However simply imposing 'rules' and expecting people to apply them perfectly and consistently in every situation is both unrealistic and disempowering. Instead success depends on developing a workplace culture that understands and values the objectives of biosecurity. In such an environment compliance becomes self- and peer-regulated, and efficiencies are gained through teams finding more practical ways of achieving the goals. While reaching this level of engagement is no small feat, its key components are well understood:

- Clear consistent leadership which unerringly upholds the values.
- Strong communication of objectives and values, and why they are important.
- Efficient and effective feedback loops that empowers staff to identify problems and co-develop solutions.
- A cohesive, well supported workforce fostered through good recruitment and social connection.
- Proactive management to retain a stable, experienced workforce.

Sections 6-8 should be seen as the starting point of a continuous improvement system for screening management. Although they seek to set clear standards, the real focus in each sub-section should be on the ***objectives*** those standards are seeking to achieve. A strong biosecurity culture will not only deliver better outcomes, it will also, crucially uncover smarter, more efficient ways of meeting the objectives.

Liaison with suppliers and customers on LHI is also a vital part of the system. Some will need more guidance and support than others as you take them on the journey of understanding the goals and rationale for them. This requires adequate resourcing for communication and relationship building.

## 7. Investing in technology to enhance biosecurity

Advances in technology with potential application to biosecurity will continue to emerge. When choosing to invest in new hardware the following considerations should be taken into account:

- **Purpose** – will it replace existing equipment/procedures or will it add an extra layer of security to reduce biosecurity risk? Multiple layers with complementary strengths minimises risk.
- **Proven effectiveness** – is there solid evidence it actually works in similar contexts?
- **Reliability** – how does it perform over time and in tropical environments?
- **False positives/negatives** – does the data reflect reality? What are the likely consequences/ costs if false positives or negatives occur?

- **Ease of maintenance** – can they be serviced easily, or require specialised equipment/staff?
- **Operator skill requirements** – what is the required skill level and what training and support are available?
- **Data integrity and accessibility** – who will access and manage the data, and is it useful for decision-making?
- **Integration with existing systems** – do they complement or complicate workflows?
- **Cost vs benefit** – are the added features worth the investment?

In each case, good procurement practices should apply and a 'whole of life' business case should be made, addressing the above criteria.

# 8. Shipping

## 8.1 Bringing the ship into service

This section describes the procedure to ensure the ship is clean and free from contamination before it accepts the first load and before re-entering service after dry-dock maintenance, charter to other destinations or prolonged berthing at the mainland port (more than 5 days) due to breakdown or other delays.

**The objective is to ensure the ship begins operation clean when it has been out of service.**

- Vessels must 'stand down' with minimal ship-board activity for 5 days prior to loading with all baiting and detection systems operating to allow detection of stowaways.
- Vessels must be baited with brodifacoum and set lethal traps for rodents using approved stations and traps.
- All closed compartments must be fumigated. All open decks must be sprayed with residual insecticide.
- Vessel must be cleared by LHIB Biosecurity Officer to enter service. They will look for
    - the ships log of where it has been docked;
    - evidence of chemical treatment;
    - records from surveillance devices;
    - and inspect the vessel for cleanliness.
    - A biosecurity detection dog[1] may be used.
- Further biosecurity measures may be prescribed prior to clearance if, in the opinion of the LHIB officer, biosecurity risks warrant it.

[1] A certified dog & handler trained to detect the scent of specific animals such as rodents and snakes.

### Case study – Red-vented bulbul arrives in Auckland

The red-vented bulbul is native to Asia from Pakistan to China but it has spread through many countries in the Pacific by hitch-hiking on cargo ships. It is a major agricultural and garden pest causing for example $300,000 in orchard damages annually on the Hawaiian island of Oahu. A sighting in Auckland city in 2013 has led to an incursion response by the NZ Government to prevent them establishing. Despite apparent success further sightings were recorded in 2024 suggesting their arrival by ship is an ongoing issue.

New South Wales has the closely related red whiskered bulbul in an expanding wild population.

## 8.2 Pre-loading procedures

This section covers the routine ship cleaning procedures undertaken before loading for every journey to LHI.

**The objective is to ensure the ship is clean, free from all contamination and ready to receive clean cargo.**

- All outer decks and cabin/wheelhouse are pressure washed and sprayed with residual insecticide (Deltamethrin or similar).
- All dunnage timber must be treated against wood boring insects and fungi. Dunnage should be preferably kept on board once inspected. Any material not already onboard will be inspected/treated as for other timber cargo.
- Vessels must be baited and set with lethal traps for rodents 5 days prior to departure using approved stations and traps. Bait/traps must remain active while moored.
- All mooring lines, water and fuel hoses must have approved rat guards set to best practice standard (Appendix 3) whenever the ship is tied up, except for when tied up to LHI.
- All gangways and ramps must be raised at night and at all times when not in use.
- All waste is removed and appropriately disposed of. Interior of all cabins are vacuumed and hard flooring mopped with disinfectant.
- Galley and crew provisions storage is cleaned. Refrigerators and movable appliances are moved to clean under them and the floor area under them is sprayed with a residual insecticide. Evaporation trays are inspected for any sign of rodents or insects.
- Insect sticky traps are set as per an approved schedule.
- All crew and visitors to the ship must have clean footwear and step onto a disinfectant mat place in the doorway before entering the interior compartments.

- Exterior doors, portholes and hatches must remain closed unless in use while the vessel is in port.

## Case study – Mouse caught on the 'Southern Winds'

The NZ Department of Conservation 22m vessel Southern Winds is the critical logistical link in many conservation projects throughout Fiordland National Park. Based in Doubtful Sound, it carries rangers and researchers to many of the pest free islands throughout the Southwest NZ World Heritage Area. The crew are ever-vigilant for stowaway pests because they know the risk of inadvertently introducing a new pest to these precious islands.

In 2008 while on a seven day trip through Dusky Sound someone on board noticed mouse droppings in a gear locker. Traps were set and bait refreshed in the bait stations, everyone on board searched for the culprit. The Southern Winds skipper could not approach the mouse free islands on this trip which limited the goals of the voyage. Traps were left set upon return to the base at Deep Cove and a mouse was caught a couple of days later.

Despite the baiting, trapping and searching this animal eluded the crew for five days even though its presence was known.

## 8.3 Loading and departure

This section covers the loading and receiving clearance for departure from the mainland port.

**The objective is to reduce the risk of unwanted organisms boarding while the vessel is tied up to the mainland and to ensure independent verification of a clean ship and clean cargo before departure.**

- Cargo is to be pre-inspected by Biosecurity Officers inside the mainland cargo facility (See section 8).
- To minimise opportunities for animals to climb onto the ship, loading should ideally be undertaken in one operation with the vessel connected to the land for as short a time as possible.
- Rat guards must be placed on all mooring lines when the vessel is tied up. Common mistakes with rat guards to avoid are:
    - Poor design leaving gaps for rodents to move through.
    - Incorrectly positioned on double lines allowing rodents to bypass guards by jumping across to the other line.
    - Hung from the ship with a separate unguarded retrieval line
    - Not every line is guarded.
    - Tying up to high risk sites.
    - Lack of monitoring to ensure ship movement does not eliminate effectiveness of guard.
- If a loading ramp is being used it must not remain down unattended for longer than 30 minutes. For any temporary delay in loading for 30 minutes or longer the ramp must be raised at least one metre above ground.
- Minimising loading during darkness is crucial as rodents and some invertebrates are more active at night.
- The Master of the vessel must receive formal clearance for departure by the Biosecurity Manager[2] once full compliance of biosecurity requirements has been established.
- During transit, if sign of unwanted organisms is discovered on-board, it must be reported to the LHIB Biosecurity Manager immediately. The decision to proceed (not turn back) will be made by the Master and the Biosecurity Manager according to an agreed plan. This issue should be addressed in the contractor's biosecurity risk management plan.

2 The Biosecurity Manager resides on LHI and has accountability for the protection of the island. By delegating these decisions to this person and not the biosecurity officer on the mainland it avoids any conflict of interest or undue pressure on the biosecurity officer to make the call.

## 8.4 Entry into Lord Howe lagoon

This section covers the on-board surveillance reporting requirements and gaining permission to enter the LHI lagoon.

**The objective is to ensure no unwanted organisms remain at large onboard and to double check the vessel did receive clearance before departure. This is the last opportunity to prevent high risk organisms access to the island.**

- All surveillance devices (e.g. traps, insect trays) are set and empty upon inspection.
- Decks are visually inspected.
- The Master of the vessel reports clearance details and surveillance results to the LHIB upon entry into the lagoon.
- The vessel proceeds to the LHI jetty only when authorised.

### Case study – Skipper makes a poor decision

Rats were eradicated from the popular Moturua Island in 2009 and a conservation trust of volunteers manages fundraising to continue the biosecurity to prevent them returning. In 2017 a group of visitors approached the island in their friend's motor launch. The skipper had found rat droppings in the boat during the journey but decided to continue on to the pest free island. Anchoring in Waiwhapuku bay the visitors took the dingy ashore and had a picnic on the beach. Someone in the group observed a rat swimming ashore from the boat anchored in the bay. It ran under their dingy so they gathered around to ambush the invader when the dinghy was lifted. A video of this effort is available on You-Tube https://www.youtube.com/shorts/p-zVqI6Zqvg

It shows how close the rat came to escaping on the island. If it had been pregnant it could easily have started a new population, all because the skipper failed to make the right decision i.e. not approaching the island before ensuring the rat was caught on-board.

## 8.5 Unloading and backloading

This section covers the unloading procedures and backloading containers and waste to the mainland.

**The objective is to avoid offloading contaminated cargo and to ensure backloads do not cause 'false alarms' by loading LHI sourced organisms.**

- The vessel and cargo are checked before unloading by a detection dog.
- Cargo found to be suspicious or 'flagged' in the system from previous inspections (refer to section 8.4), should be isolated from other cargo and subjected to further inspection. Any contaminated cargo will not be released or rectified on island. It will be isolated, secured and returned to the mainland for treatment on the next available voyage.
- Cargo should remain sealed until unpacked in a secure building on the island. This is the last layer of defence against unwanted organisms that have made it through previous layers. A failure to contain organisms during unpacking could lead to widespread and disruptive incursion response which may not succeed, depending on circumstances.
- The time between unloading and backloading is minimised as much as possible.
- Backloaded cargo should be clean or securely packaged to avoid contamination of the vessel.

## Case study- Asian house gecko reaches Barrow Island

Barrow Island in Western Australia is a Class A nature reserve which also has a major industrial facility operating. The company involved were required to install a world leading biosecurity system to prevent non-native species establishing on this near pristine island. Despite the rigorous biosecurity screening system with multiple layers of inspection and treatment in 2015 an Asian house gecko was detected on the island during routine surveillance.

An incursion response team captured a further seven animals according to ABC news Invasive species Asian house gecko discovered on Barrow Island, posing "significant risk" to the Class A Nature Reserve - ABC News . How and when it got there is unknown. This example demonstrates that even the most robust systems of biosecurity screening are not infallible.

## 8.6 Crew management and training

This section covers the requirements for crew awareness of biosecurity procedures and purpose.

**The objective is to ensure all crew members understand their responsibilities for biosecurity and to foster a culture of biosecurity awareness and problem solving.**

- All people onboard the ship (crew, LHIB staff, contractors and passengers) must understand the significance of the island's pest-free status and vulnerability to invasion.
- The crew must be committed to biosecurity and lead by example to champion a biosecurity culture that is self-sustaining and dynamic enough to identify and resolve emerging issues.
- Biosecurity operators should not be assigned tasks for which they are not trained or competent. Well-trained operators are necessary for biosecurity tools and systems to be effective.
- New staff should receive induction training and good supervision.
- Stability in team membership is vital to foster mutual trust and enable biosecurity values, standards, and quality control to be internalised. This helps teams work under duress and ensures horizontal reporting among colleagues, internalising standards and quality control.

## 8.7 Ship maintenance and antifouling

This section covers ship maintenance as it relates to biosecurity, and outlines the broad requirements for marine biosecurity monitoring and maintenance which are covered in more detail elsewhere.

**The objective is to minimise the opportunity for unwanted terrestrial organisms to board the ship when it is out of the water or tied up at another berth for prolonged maintenance or repair.**

- The special 'clean status' of the ship is officially communicated to the staff overseeing and performing the maintenance work.
- Clean and checked clothing is worn by personnel working on the ship.
- Clean and checked tools are used by personnel working on the ship.
- The surveillance system should be operating while the ship is under maintenance, as long as it does not interfere with the maintenance work. Any partial or total suspension of the system must be recorded and followed up with a thorough check.

- The ship must have an anti-fouling system applied in accordance with the manufacturer's instructions and within the manufacturer's time frame of effectiveness.
- Evidence of the anti-fouling system and its application date must be recorded.

## 8.8 Procedures for dealing with evidence of biosecurity risk material on-board

**The objective is to eliminate all risk of an organism reaching the island; ensure there is no more yet to be found; and identify what can be learned.**

1. **Contain it**. The immediate priority is to isolate and contain the situation to prevent further spread.
2. **Collect and preserve evidence**. For whole animals or any signs of pests, such as droppings, parts of animals, or seeds, photos (with reference of scale and exact location) and hard evidence must be collected and labelled using water-resistant paper and permanent ink, with labels placed inside the container (including collector, location, date, time, notes). Preferably store in a hard container (to avoid crushing) and in the freezer (for further identification).
3. **Report it**. An incident report must be immediately communicated to the Biosecurity Officer and raised on the reporting system. If during transit to LHI, the Master will contact LHIB.
4. **Decision on turning back**. The decision to proceed (not turn back) will be made by the Master and the Biosecurity Manager according to an agreed plan in the contractor's biosecurity risk management plan.
5. **Further mitigation**. Options will be discussed with LHIB biosecurity staff on a case by case basis. Formal identification of the pest, by a taxonomist/geneticist, might be required in some cases.
6. **Build a library**. Samples with complete labels should be preserved long-term; there may be a need of a meta-analysis in the future and can be useful for training.
7. **Debrief**. Discuss with people involved what can be learned/ improved for next time.

# 9. Mainland cargo facility

This section covers the cargo facility requirements and maintenance as they relate to biosecurity. How cargo is actually handled is covered in section 10.

**The objective is to create and sustain a biosecure cargo facility to handle all marine cargo bound for LHI and ensure nothing contaminated with biosecurity risk material gets presented quayside for loading**. See Appendix 1 for suggested contract model.

## 9.1 Location, Location, Location

Where the mainland facility is situated can make a big difference to the pressure from invading species on the whole system. A careful survey and risk assessment should be undertaken for prospective sites before decisions are taken.

The “ideal” location will have the following features:

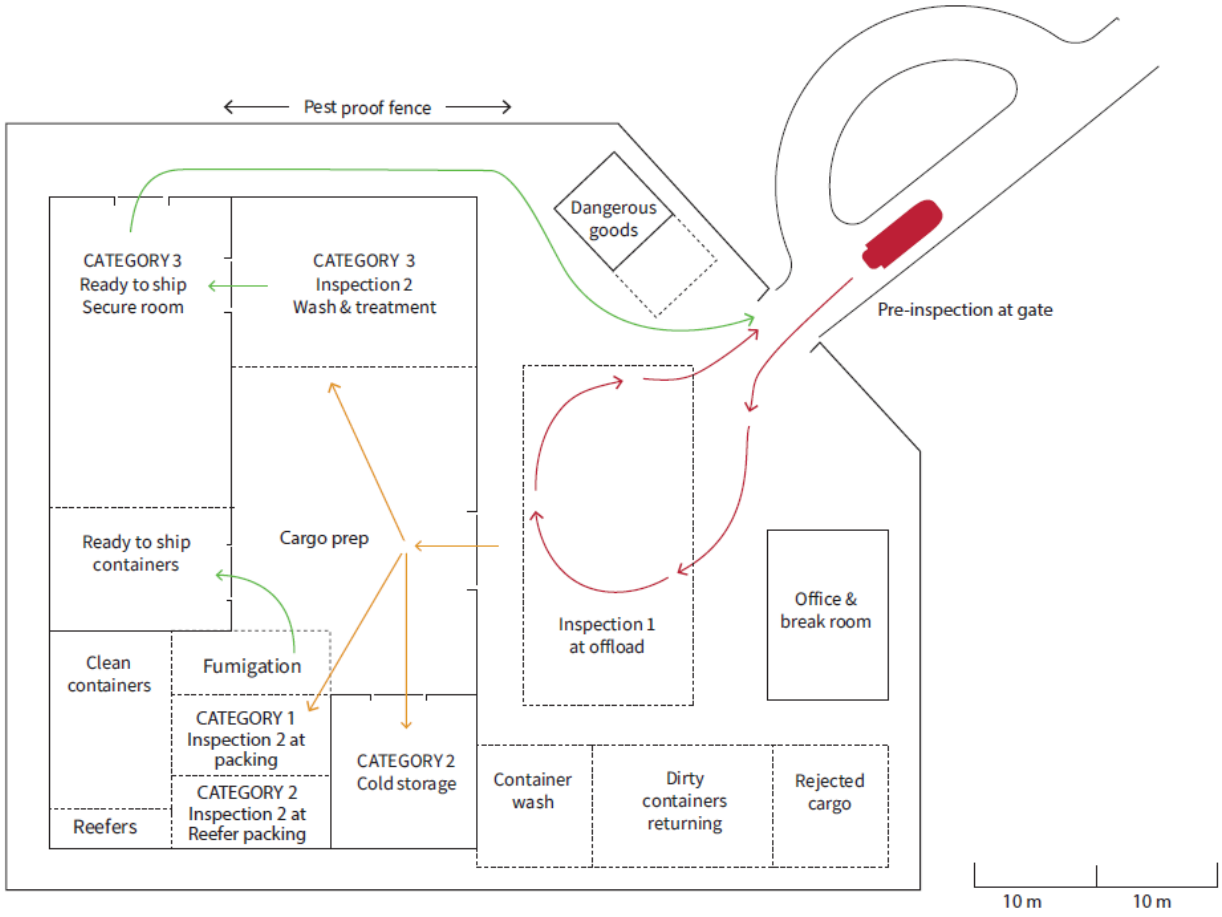
- Far from any vegetation offering habitat.
- Upwind of the nearest sources of windblown seeds most of the time.
- Minimal numbers of potential hitch-hiker species in the surrounding environs.
- A generous size to meet current requirements with potential for expansion during periods of increased cargo (such as infrastructure projects).
- Extensive hard surfaces (e.g. concrete) with good drainage and low flood risk.
- Adequate freshwater supply available with access to wastewater drainage.
- Good all weather road access to the port being used for LHI shipping.
- Long term tenure to justify investments in building infrastructure.
- Reasonable proximity to commercial services such as trades and maintenance.
- Unencumbered by planning constraints likely to inhibit the building and operating of the facility.

## 9.2 Design

This section gives broad design requirements as they relate to biosecurity matters. It does not cover requirements relevant to building code, dangerous goods or health and safety compliance. Any diagrams are not to scale and serve to illustrate features rather than specify their design and exact materials.

**The objective is to identify critical design elements which make the job of inspection, cleaning and treatment of cargo more effective and efficient and which can be incorporated into a new building or a retrofitted existing building.**

Figure 1. Conceptual layout of the mainland biosecurity facility, illustrating the principle of risk segregation. The facility is divided into distinct zones: a 'dirty' receiving area for incoming mainland goods, a processing zone for inspection and treatment, and a 'clean' dispatch area for cleared cargo destined for Lord Howe Island.




Category 1 – all non-perishable packable goods; Category 2 – Perishable and chilled/frozen goods; Category 3 – oversized goods.

Biosecurity features of this design:

- Pre-inspection area before gate is opened into the yard – room for truck turnaround without entering yard if entire load is rejected.
- One way system. Goods are offloaded in the yard and the first inspection is carried out. They enter the building (orange arrows), are further inspected and treated before being stored in a secure room ready for shipping. Ready cargo is unloaded through another door (green arrows) to ensure ‘clean cargo cannot be re-infected by incoming ‘dirty’ cargo.
- Cleaning facilities outside and inside building with appropriate water management. Racks to allow underside of containers to be pressure washed and inspected.
- Good lighting inside the building to facilitate inspection.
- Inside storage for clean containers. The ship should be taking up to 30 ten foot containers per voyage. Ideally three sets of containers would be used – one being packed; one on the water; one being unpacked on island. This would alleviate pressure on island biosecurity staff to allow the unpacking of containers in unsecured situations simply to meet ship departure deadlines.
- If building design allowed for 40 containers to be stored ready for shipping this would require a footprint of 100 square metres if stacked 2 high (12.4m x 8.1m). Refrigerated containers would have to be separate and powered. About 5 or 6 per voyage.
- Secure clean room for ready to ship containers and non-standard items once inspected.
- Fenced yard all hard surfaced with pest proof fence, rapid gate. This is intended to reduce the pressure from invading animals such as rodents and reptiles but will not stop birds, flying insects or wind-blown seeds.
- Durable sealed floor surface inside building coved at walls allowing frequent mechanised cleaning and withstand vehicle traffic. No gaps.
- Staff break room and offices in a separate building to allow easy access; keep food and scraps separate and allow fumigation of main building without putting staff at risk.

## 9.3 Capital Equipment

This section covers the inspection and cleaning equipment required to fit out the facility for biosecurity. It does not cover hand-held trade tools which may be required to perform biosecurity tasks or cargo handling machinery not directly related to biosecurity (e.g. forklifts).

**The objective is to identify biosecurity related machinery and technology required to make the job of inspection, cleaning and treatment of cargo more effective and efficient. The list is expected to change as other strategic decisions are made (e.g. port, location and design of facility, budget, tech assessment).**

- Air curtain e.g.[3] High airflow air curtains - 900 - 1200 - 1500 - 1800- 2000
- Hot/cold pressure washers e.g. Commercial & Petrol Pressure Washers | Kerrick
- Rapid closing doors e.g. YUOU high speed door - YUOU
- High volume air compressor with hard air lines.
- HVAC system with multi filters.
- Inspection hoist e.g. 4-ram lifts
- Container fumigation system.
- High pressure water pump, and tank.
- Overhead crane for containers e.g. Overhead Crane Sales, Overhead Crane Design, Overhead Crane Manufacture, Overhead Crane Installation. James Crane, Melbourne. 1300 780 420
- UV flying insect traps e.g. Insectomatic SE44 Electric Fly Killer - 44W (Stainless) | BUY ONLINE
- Floor cleaning machine e.g. Electric industrial & commercial floor scrubber machines for sale - Chancee
- X-ray machine for small cargo e.g. EX-V10080 Multi-Energy X-Ray Security Inspection Equipment-Imaging Security
- Integrated cargo tracking system which can interface with the biosecurity screening status of packages and record details of inspections (e.g. date, time, operator).

[3]Links are only examples and are not intended to endorse any particular brand or product

## 9.4 Maintenance, monitoring and reporting

This section covers the requirements for routine maintenance, surveillance and reporting relevant to the cargo facility and its immediate surrounds.

**The objective is to ensure the cargo facility itself does not become infested with unwanted organisms which could infect cargo.**

**The property**

- The yard must be consistently kept clean, tidy, and uncluttered, with rubbish removed daily to prevent the accumulation of potential pest habitats.
- A rigorous weed management programme for outdoor areas should be maintained. This includes removing trees outside the fence which have potential to fall on it.
- Rodent trapping/monitoring around yard using both mouse and rat traps.
- A fence breach alarm system should be installed to alert staff to serious breaches in the fence.
- Weekly checking the integrity of the fence for small gaps or maintenance issues is required. Checks should also be made immediately following significant weather events.

**The buildings**

- The buildings must be consistently kept clean, tidy, and uncluttered, with rubbish removed daily to prevent the accumulation of potential pest habitats. This extends to inspecting offices and work areas.
- Regular maintenance of the facility should include an annual "spring clean" to a pathogen level, disinfecting all vertical and horizontal surfaces, furnishings, and equipment. Insect sticky traps should be placed along walls, checked at least monthly for interceptions, and replaced quarterly or more frequently if their tackiness degrades.
- Pest-proof seals on ready to ship secure room must be maintained and checked for gaps at least twice a year.
- Rodent trapping/monitoring throughout all buildings using both mouse and rat traps.

- Residual insecticide sprays should be applied to surfaces, particularly around windows, doors, ventilation points, and wall edges, and should be reapplied after cleaning.
- Rodent poison bait stations should be maintained at regular intervals and in key areas according to a specified plan.
- Biosecurity inspections and monitoring activities should be planned and systematically carried out. This includes ensuring cameras, traps, and all devices are fit for purpose, with images checked frequently by trained operators.

**The system**

- Periodic independent expert reviews of the whole screening system should be a mandatory feature, with suggested frequencies of one year post-implementation and then approximately every five years.
- A performance monitoring framework should be developed, including detection rates relative to effort and trigger thresholds for investigation. Audits can also be triggered by key changes, such as staff, suppliers, or shipping routes.
- Accurate records of all observations, responses, and identification of biosecurity risk material must be collected and preserved, including photos and hard evidence labelled with location information.

## 9.5 Shipping containers

This section covers the cleaning and maintenance of shipping containers required to make them available for packing.

**The objective is to ensure every container ready for packing cargo is clean and free of biosecurity risk material at the start of the packing process.**

To ensure every container meets biosecurity standards, a three-sticker verification system is recommended. This system provides a clear, scanned record of each critical inspection stage, ensuring accountability and preventing contaminated containers from being loaded.

**Step 1**: **Decontamination and inspection** (yellow & blue stickers)

- Upon return, every container is lifted onto racks and undergoes a full six-sided pressure wash and treatment.
- After the wash is complete, a Biosecurity Officer inspects the now-clean container, paying special attention to the underside.
- Once cleared, a unique yellow barcode sticker is applied to the underside and scanned. This logs the inspection, container ID, and officer's credentials, serving as auditable proof of the underside check.
- Contingent on the underside being cleared, a blue sticker is placed on the exterior of the door. This blue sticker signifies the entire container is fully decontaminated and approved to move to the secure packing area.

**Step 2: Final clearance** (green sticker)

- After the container is packed with cleared cargo (see Section 8) and the doors are sealed, a final green sticker is applied to the container door.
- This green sticker is the ultimate clearance, signifying the container and its contents are secure and authorised for loading onto the vessel.

## Case study – Great white butterfly arrives as pupae on shipping containers.

In 2010 the large white cabbage butterfly was found near the port in the city of Nelson. This species is a specialist feeder on plants in the Brassica family and differs from the small white butterfly in that about 100 eggs are all laid together, meaning the larvae can devastate the host plant before moving on to the next. Unfortunately NZ has many species of threatened native plants in the brassica family so this butterfly, once established, has the potential to cause their extinction.

A $5M campaign involving repeated visits to almost every garden in Nelson- a city of 54,000 people managed to eradicate the butterfly after four years, avoiding an ecological and horticultural industry disaster.

A simple inspection and cleaning of the outside of shipping containers would have prevented this invasion at minimal cost and risk.

## Case study – *Sagina procumbens* on Gough Island


Gough Island in the South Atlantic is a World Heritage Site renowned for its unique birdlife. *Sagina* is an invasive weed listed as one of the 100 World's worst invasive species by International Union for the Conservation of Nature (IUCN). It was discovered near the weather station on Gough island in 1998 and is likely to have arrived a few years earlier on the bottom of the steel containers used to ship supplies to the station.

Efforts to eradicate it began in 2000 given the limited area of spread at that time (less than 2ha). Despite more than 20 years of work *Sagina* remains on the island. In 2023 the eradication strategy was changed to one of containment to prevent further spread, acknowledging that failure to clean the underside of containers bound for Gough had led to this invader becoming permanently established on the island.

### 9.6 Staff management and training

This section covers the requirements for staff awareness of biosecurity standards, how to meet them and why they are required. It also covers the standard of staff management expected to uphold a strong biosecurity culture for everyone working at the facility.

**The objective is to develop and sustain a strong biosecurity culture among the total workforce so that workers will correct their peers when they see substandard work and spot issues and contribute to their solution.**

- A strict biosecurity culture is instilled, prioritising biosecurity above all other work and ensuring all staff actively champion a proactive biosecurity mindset. This requires all those in leadership positions to consistently demonstrate these values.
- On-line awareness training developed by LHIB should be mandatory for all staff.
- Promotion of team stability and accountability. Foster stable team membership to build mutual trust, which is vital for internalising biosecurity values, standards, and quality control.
- If specialised technology is incorporated, staff receive adequate training.
- Interception records are shared weekly with the workforce, and any issues raised are documented. LHIB biosecurity staff are present during these meetings.

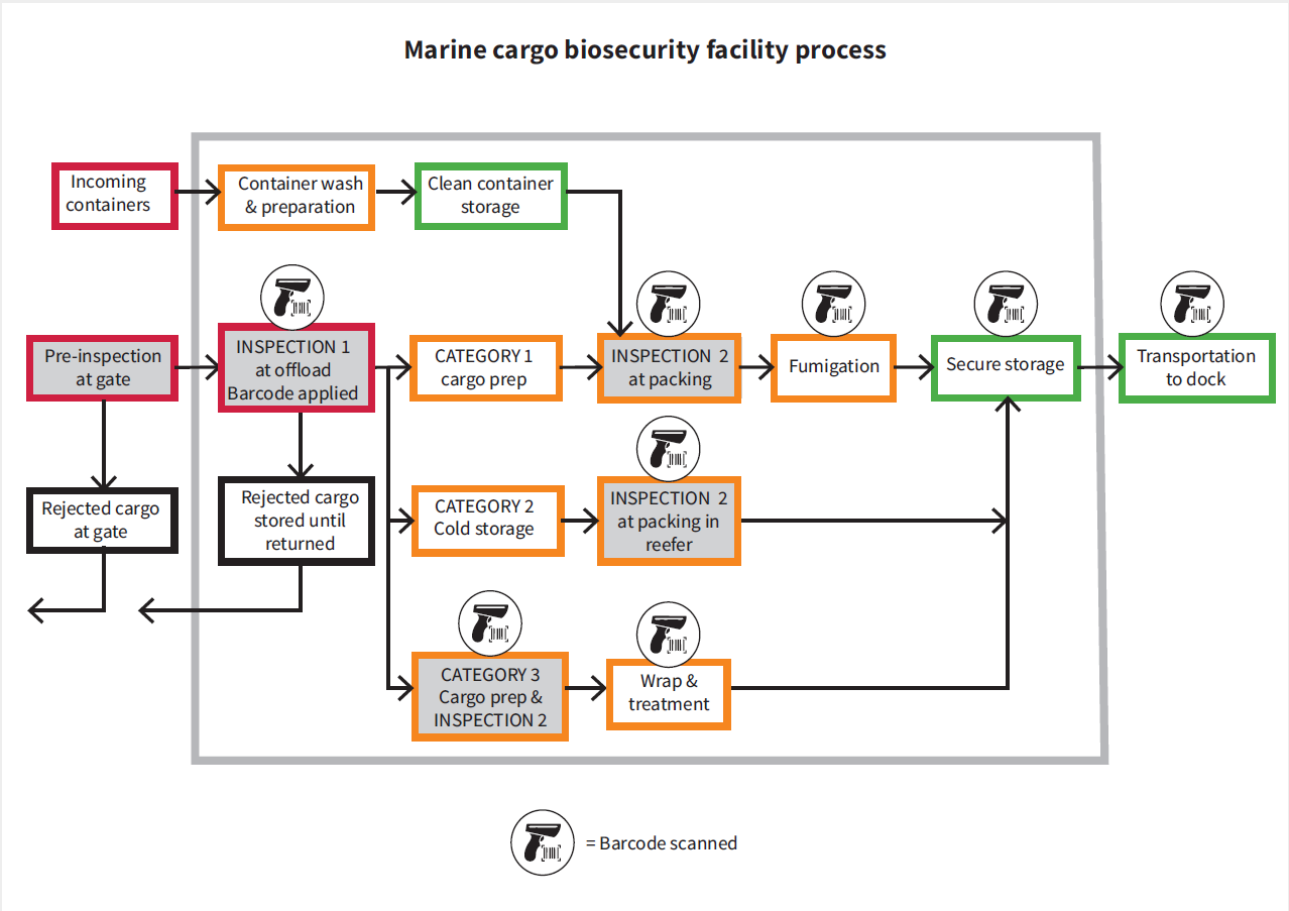
## 10. Inspection and clearance

This section covers the procedures for receiving goods for transport to LHI and preparing them for loading on the ship free from any dirt or unwanted organisms. It does not cover other transport and storage procedures relating to dangerous goods, health and safety or security from criminal behaviour.

**The objective is to establish and sustain a high performing, independent biosecurity screening inspection, and treatment system which enables discovery and elimination of biosecurity risk material before it can reach the ship.**

## 10.1 Overview of process

The section summarises the process of readying cargo for loading clean and free from unwanted organisms. All inspections are conducted by LHIB or their agents. The system of barcoding, scanning and coloured stickers described here are intended to illustrate what is required. The final system will need to be worked out in detail with IT providers. The coloured sticker system is an example of building in redundancy so electronic breakdowns do not necessitate shutdown of the system.




Category 1 – all non-perishable packable goods; Category 2 – Perishable and chilled/frozen goods; Category 3 – oversized goods.

- Obviously non-compliant cargo is refused entry into the yard at pre-inspection.
- External packaging is inspected as it is offloaded (Inspection 1) in the yard and given a blue barcode sticker which is scanned together with an image of the address label.

- Cargo is then segregated for consolidation into shipping containers (except oversized items). A second inspection is undertaken as it is packed into containers.
- Once passing inspection 2 the barcode is scanned and the package receives a green sticker.
- Containers are closed and receive chemical treatment, allowing the container itself to receive a green sticker.
- Green labelled cargo is moved into the secure room ready for shipping.
- All cargo is tracked and linked into biosecurity inspections and treatments, preventing loading without proper authorisation.

## 10.2 Packaging

In this section packaging standards are described for all cargo.

**The objective is to ensure biosecurity risk material (e.g. soil, insects, spiders, lizards, snakes, rodents, ants) cannot gain access to infest cargo after it has been inspected and cleared for transport.**

Unless otherwise approved, packaging of all materials and supplies must be resistant to pest entry post inspection. Use secure containers where possible, or shrink wrapping where containers are not practical.

All cargo on wooden pallets must use new pallets meeting ISPM 15 standards. No used wooden pallets are acceptable due to the risk of wood dwelling insects, fungi and spores.
Plastic ‘hygiene’ or ‘Bio’ pallets are preferred as they have minimal spaces and crevices, can be more readily cleaned, inspected and reused.

All pallets must have a solid base layer under the cargo to prevent pest ingress from underneath. Corrugated cardboard, corflute or soft plastic is not acceptable; plywood, sheet steel or rigid (3mm) plastic sheet is preferred.

Reusable (plastic or steel) pallets and containers should be cleaned and prophylactically treated with a residual surface insecticide prior to use. Never set down on dirt, mud or soil.

Any timber chocks or packing material used inside shipping containers (e.g. to secure the load against movement) must be treated against wood boring insects and fungi.

## 10.3 Acceptance of goods into facility

This section covers minimum standards incoming goods must meet before they can be accepted into the facility for further inspection and treatment. These standards will be further developed in partnership with suppliers by LHIB biosecurity staff.

**The objective is to reject obviously non compliant cargo before it enters the facility to avoid suppliers shifting extra costs and time onto the facility.**

- Only goods known to be allowed (a 'white list') and passing initial visual inspection should be accepted into the yard. This 'white list' should be supported by an application system and underpinned by a risk assessment focused on potential harm, ease of control/eradication.
- Goods known to be prohibited or obviously substandard should be rejected at the gate during pre-inspection.
- Suppliers should have procedures in place to ensure biosecurity hygiene and secure packaging at source, which will pass independent inspection prior to loading. For example, aggregate must be heat-treated ($53^0$ C for at least 30 minutes) or tumbled in a large drum to crush eggs, pupae, or reptiles.
- Goods found to be substandard and rejected during first inspection at off-load are stored in the yard until remediation can be undertaken or the goods picked up and returned to supplier.
- Goods accepted for further inspection and entry into the building receive a blue barcode sticker and are scanned along with an image of the consignment label.

## 10.4 Inspection and cleaning

This section covers the procedures for inspection, cleaning and tracking incoming goods to make them ready for packing.

**The objective is to discover and eliminate biosecurity risk material in cargo before it can reach the ship.**

- Goods arriving at the mainland facility are intensively checked by trained staff, following checklists.
- Inspections include inspection of crevices, weld breaks, and holes.
- High-pressure air hose cleaning can be used as well as vacuuming, pressure washing or steam cleaning.
- All timber products are inspected for bark (not allowed), crevices, and niches upon arrival.
- Any items found contaminated with biosecurity risk material, will at the inspector's discretion be:
    - rejected and returned to the supplier or another place for cleaning or
    - cleaned on site in a designated area and/or
    - fumigated with a chemical appropriate to the situation or
    - treated with a residual insecticide spray and/or
    - flagged as high risk and subject to further inspection at unpacking on island.
- Where sufficient dismantling for inspection cannot take place due to the nature of the items (not the urgency or time available), they will be fumigated at the consignee's cost and flagged for further inspection at unpacking on island.
- Cargo is all barcoded and linked into biosecurity inspections and treatments, meaning it will not proceed without proper authorisation from biosecurity inspectors.

## 10.5 Container packing and treatment

This section covers procedures for packing containers and the treatment of packed containers before sealing ready for loading.

**The objective is to keep biosecurity risk material from entering containers while they are being packed and to add an extra layer of protection by treating each container before it is sealed.**

- Only blue stickered cleaned and treated containers are used.
- Goods able to be fumigated are visually inspected as they are packed into containers.
- Goods unable to be fumigated are visually inspected and packed into containers which are located with an overhead air curtain at the entrance to reduce entry by flying insects.
- Packages are scanned as they pass inspection 2 and are green stickered as they are packed into containers. Barcode scans are digitally connected to the container barcode on the door.
- All containers receive insect sticky traps and rodent bait stations before the doors are closed.
- Treated and correctly packed containers receive a green sticker and are moved into the secure room ready for shipping.

## 10.6 Treatment of cargo unable to fit in containers

This section covers biosecurity procedures for all cargo not being transported in containers. Commonly anticipated cargo is covered here but unusual cargo not covered will require specific advice from LHIB biosecurity staff.

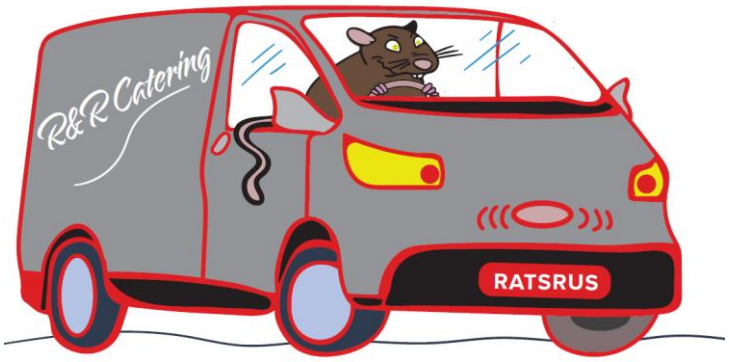
**The objective is to reach the same standard of cleanliness for material unable to fit into the standard container system.**

- Consider the use of detection dogs for an additional layer of biosecurity, as visual checks can miss pests hidden within cargo.

**Vehicles and machinery**

- See Appendix 2 for detail on treatment.
- Machinery and vehicles should arrive at the yard clean inside and out. Obviously contaminated items should be rejected at the gate.

## Case study – Rat-o-Van




In 2011 Fin Buchanan, a biosecurity detection dog handler, found a rat in a van on a barge about to depart for pest free Motuihe Island in the Hauraki Gulf. The van was used by the barge operator to transport food items from a wharf-side container to the barge. Fin usually checks the empty barge before loading gear and vehicles (already checked on the shore).

On this occasion the van was the only thing on deck – and detection dog 'Pai' simply wouldn't let Fin past it. "Pai began straining on his lead as soon as he began checking the van. He knew there was a rodent somewhere on the vehicle," says Fin. The rat appeared to be in the engine area. "I got into the cab of the van and began banging on the area around the firewall. Pai was under the van. The rat dropped out of the engine bay and tried to escape but Pai caught it."

Importantly Fin notes that a simple visual inspection would not have alerted staff to the rat, as there was absolutely no sign of it. Only the scent picked up by Pai made it detectable. Bait stations have long been used at this site. Pai had previously detected rat sign in the area prompting more bait stations to be added. Clearly the presence of bait stations is no guarantee.

**Tanks, pipes, gas bottles**

- All tanks and pipes must be new/unused.
- For hollow or open items like pipework or tanks, require clear internal visibility for inspection, and mandatory capping or taping of all apertures (1 mm diameter or greater) post-inspection to prevent pest entry.
- Underside of gas bottles and valve collars must be clean, free of spiders and other invertebrate eggs.
- After inspection, prophylactically treat items with a residual insecticide.

**Aggregate**

- Aggregate should be sourced from areas of minimal weed infestation and must be tumbled in a rotary drum for at least 5 minutes to ensure any live animals, eggs or larvae are crushed. Alternatively it can be heated to above $53^0$ C for at least 30 minutes. Heat treatment must be monitored at the centre of each load.
- Immediately following treatment it must be securely packaged to deny access to unwanted organisms. Bulk bags are acceptable if the items will be placed into shipping containers and fumigated. Otherwise use plywood crates with fumigation.

**Concrete blocks, pavers and pre-cast concrete**

- All items must be new/ unused.
- Concrete items are high risk due to the spaces they offer invertebrates and reptiles. They should be sourced from preferred suppliers which have a proven track record of secure pest free storage.
- Fumigate all items, and contain securely either by plastic wrapping or plywood crating.

**Sawn timber**

- Sawn timber is high risk due to the spaces they offer invertebrates and reptiles. They should be sourced from preferred suppliers which have a proven track record of secure clean storage.
- Untreated timber in packets must be dismantled, inspected and wrapped. Particular attention must be paid to bark encased knots which should be sprayed with a residual insecticide.

- Treated timber[4] in packets can be wrapped and fumigated targeting crawling and flying insects. Wooden fillets (spacers) in timber packets must be treated timber.

**Prefabricated buildings, furniture and appliances**

- New items are preferable as used items present a higher risk of hidden contamination and need correspondingly more intensive dismantling, inspection and treatment.
- Appliances in manufacturers packaging can be visually inspected on all sides for gaps or damage to packaging.
- Any new items with damaged or incomplete packaging must be opened for inspection and repackaged.

**Plywood sheeting, gyprock, plasterboard.**

- Are in a generally clean state and free from attached soil, seeds, invertebrates (e.g. slugs, snails, spiders, ants, etc.), invertebrate material (e.g. spider webs, mud wasp nests, etc.), reptiles, rodent chew/damage/droppings, and all other pest damage/chew/sign.
- Should be sourced from preferred suppliers which have a proven track record of secure clean storage.
- Are fully wrapped/packaged including undersides.
- Wrapping is free from any holes, rips, or tears
- Should be wrapped or crated and fumigated.
- If there is any indication of invertebrate activity the package must be completely dismantled sheet by sheet, inspected/treated and repacked.

**Roofing steel sheeting**

- Corrugated sheets are particularly high risk for harbouring lizards and invertebrates between the sheets. They should be sourced from preferred suppliers which have a proven track record of secure clean storage.
- New material is preferred, used sheeting must be dismantled sheet by sheet, pressure washed and prophylactically treated with residual insecticide at the consignee's cost.

[4]Certified chemical treatment against wood boring insects and fungi.

- If there is any indication of invertebrate activity the package must be completely dismantled sheet by sheet, inspected/treated and repacked.
- Where wooden fillets (spacers) are used, each group of sheets must be lifted for inspection. Wooden fillets must be treated timber.
- Wherever the sheets are not fully in contact along their entire length, they must be separated for inspection. Gaps greater than 1mm are unacceptable.
- Ensure pallets meet standards, sling and lift load off pallet for inspection. Treat top side of pallet solid sheet with residual insecticide.

**Landscaping materials and plants**

- Most organic landscaping materials (e.g. soil, compost, mulch, potted plants) are prohibited. LHIB has a plant importation policy which requires specific application and prior approval from the Board.

## 10.7 Storage of load-ready cargo

This section covers the staging of inspected cargo which is ready to load.

**The objective is to ensure load ready cargo is not re-infected post inspection before it is loaded.**

- All green stickered cargo and containers ready for shipping are stored in the secure store room.
- Barcodes are scanned as containers and non-standard cargo enter the room.
- All inspected, ready to ship cargo must be fully packed and prepared before being placed in a separate secure storage room. This room is strictly for holding cargo awaiting loading—it is not a space for ongoing packing or additions. Access will be limited, and the room will never be left unattended while unlocked.

## Case study – Bruce's outboard


Bruce stored his fishing boat in his fairly new and very tidy shed. When getting the boat ready for an upcoming trip he noticed a couple of grass straws under the engine cover. When the cover was removed he discovered a rat had built a nest around the engine with dried grass and chewed foam rubber. Just as well he checked! Besides the risk of fire, he might have inadvertently transported a rat to a pest free island near his fishing grounds.

## 10.8 Transport to loading wharf

This section covers procedures to ensure all cargo transported from the facility to dockside for loading retains its integrity as free from unwanted organisms.

**The objective is to ensure load-ready cargo is not re-infected by the transport system taking it from the facility to the quayside for loading.**

- Truck deck washed down before loading.
- Timed to be quayside for minimum time.
- Vehicles destined for LHI are trucked as cargo, not driven to quayside.

# 11. Glossary

**Antifouling** - A system of specialised coatings applied to a ship's hull to prevent the growth and attachment of marine organisms.

**Backloading** - The process of loading cargo, empty containers, or waste from LHI back onto the ship for return to the mainland.

**Biosecure facility** – A facility designed and operated to exclude and manage the risk of unwanted organisms. Includes sealed areas for inspection, cleaning, and secure storage, with documented procedures and quality assurance.

**Biosecurity** - A set of measures designed to protect an area from the introduction and spread of harmful organisms such as invasive species, pests, or diseases.

**Biosecurity clearance** - Formal approval by LHIB biosecurity staff that cargo, vessels, or aircraft meet the biosecurity requirements for safe departure/entry to LHI.

**Biosecurity risk material** - Any plant or animal material, pathogen, fungi, soil or water not specifically authorised to be imported to LHI.

**Biosecurity screening** - The process of isolating and inspecting cargo, vehicles, or personnel to prevent the introduction of pests to LHI. This includes decontamination and prophylactic treatment and secure packaging- whether this is done at the point of supply or at a biosecurity facility prior to shipping.

**Detection dog** - A specially trained dog used to detect the presence of invasive species or biosecurity risk materials by scent. Used both on the mainland and on LHI.

**Dunnage** - Timber or other materials used to brace and secure cargo during transport.

**Fumigation** - A method of pest control that involves filling an area, such as a closed compartment or shipping container, with gaseous pesticides to suffocate or poison the pests within.

**Incursion** - The successful entry of an invasive organism into the island environment.

**ISPM 15** - An international standard for treating wood materials to kill insects or fungi, required for all wooden pallets used for cargo.

**Pest** - Any invasive organism or species (including rodents, insects, reptiles, or pathogens) that poses a risk to LHI's natural environment, economy, or community wellbeing.

**Pest-proof fence**
A specialised fence designed to prevent pests from entering a secure area, such as the mainland cargo facility.

**Rat guard** - A device fitted to a ship's mooring lines to prevent rodents from climbing from the wharf onto the vessel.

**Residual insecticide** - A type of insecticide that remains effective for an extended period after application, used on surfaces to prevent pest establishment.

**Surveillance** - The ongoing monitoring of specific areas to provide early warning of biosecurity threats. Used to detect the presence of unwanted species and guide timely responses.

# 12. Authors

**Keith Broome**

Keith has extensive experience in island pest management and island biosecurity during a near 40 year career as technical adviser in NZ Department of Conservation (DOC).

- Supported the development of DOC island biosecurity systems and training including full review of systems in 2013.
- Regular TAG member or leader for pest incursion responses on NZ islands administered by DOC. Auditor of biosecurity practices in DOC regions.
- Supported LHI rodent eradication project since 2009, serving as eradication expert on Steering committee 2012-2018; Technical advice to the project through chairing Island Eradication Advisory Group. Ad hoc advice to LHI Biosecurity staff on island biosecurity.
- Ad hoc advice to Australian Antarctic Division on biosecurity improvements for Macquarie Island. On-island eradication adviser 2011 during Macquarie pest eradication project. Steering committee member for project 2008- 2011.
- Contracted to DOC to write biosecurity plan for NZ Sub-antarctic Islands World Heritage Area.

**Araceli Samaniego-Herrera**

Araceli is a rodent ecologist with over 20 years of international experience in island conservation, leading eradication planning and operations across tropical and sub-tropical regions. She has extensive experience in biosecurity and the development of science-based tools, supporting large-scale projects and producing widely used resources for practitioners.

- Led the Island Rodent Eradication Programme (which includes biosecurity) in Mexico for over a decade.
- Contributed to the rodent eradication project on LHI as team leader for the ground operation in 2019.
- Currently based in Melbourne, supporting large, complex projects with strong biosecurity components: rodent eradications on Pitcairn & Henderson (UK), Aldabra (Seychelles), Auckland (NZ) and Marion (South Africa).

# 13. Acknowledgements

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# 14. Appendices

## Appendix 1 Suggested contracting model for components of the system

- Cargo facility ownership – ideally owned or long term leased by LHIB to maintain stability. Important not to be controlled by the operating contractor which could change.
- Biosecurity maintenance of facility – can be independently contracted to LHIB or be included in the logistics operators contract or become part of the duties of the inspection staff.
- Cargo logistics (handling of cargo into, through the facility and to the ship) – can be managed by the operations contractor, preferably under a separate contract to the vessel operation.
- Inspection, cleaning and treatment of cargo – staffed by LHIB (or their state government agents). Could be independently contracted to LHIB to maintain oversight and integrity.
- Quality assurance, audits, mentoring, training, clearances for shipping – should be delivered by LHIB biosecurity staff, ensuring continuity and accountability.
- Performance bonuses – to be embedded in all contracts to incentivise strong biosecurity outcomes.

## Appendix 2 Treatment of vehicles and machinery

Although vehicles and machinery must arrive already cleaned, the following procedures ensure 'clean' meets the required standard before shipping to LHI.

- Ensure meticulous inspection of all surfaces, including difficult-to-access areas such as crevices, weld breaks, drain holes, undersides, tracks, rollers, tyres, wheel arches, guards, blades, engine bays, grills, footwells, pedals, mats, seats, and the interiors of cabins (e.g., under seats and dashboards). Open all inspection covers and engine covers.
- Ensure underside of vehicle bonnet is clean and free of spiders. Spray all openings with insecticide.

- Use effective cleaning tools such as high-pressure air hosing, vacuuming, pressure washing, steam cleaning, crowbars, stiff brushes, and torches to remove all soil and organic matter.
- Where practical raise vehicles on a hoist to facilitate underside inspection, otherwise use garage creepers.
- Conduct inspections with strong lighting.
- Engine air filters and cabin filters should be new. Pre-cleaners should be clean.
- Ensure radiators are free of vegetation and seeds, spray with a knock-down insecticide.
- Exterior surfaces of machinery should be sprayed with residual insecticide.
- Allocate adequate time for inspections and avoid rushing the process, as thoroughness is critical to success.
- Document all findings and actions systematically to identify patterns, trace back risk materials, and inform continuous improvement of the system.

## Appendix 3 Rat guard standards

All mooring lines, water and fuel hoses must have approved rat guards set meeting this standard whenever the ship is tied up, except for when tied up to LHI.

**Rat guards**

Design elements:

- large enough to deter a rat from jumping over it; A diameter of at least 80cm. *Rats can jump vertically up to 90cm so while even the largest guard is not impenetrable by a determined rat they will find jumping from a steeply sloping rope much more difficult.*
- present the same level of challenge around the entire circumference of the line. *Mice can cling to rope upside down for short distances.*
- Fit tightly to the line to prevent mice going through – no gaps greater than 6mm including underside of the rope. *Mice can exploit gaps greater than 6mm; rats can exploit gaps greater than 13mm.*
- Conical shaped or readily rotating design such as Rat Guards for ropes | The original since 15 years - SWI-TEC *Cones stop rats with an overhanging surface, making it*

*harder for them to jump; rotating discs will shed rats that jump and cling to the top edge of the guard.*

- Easy to deploy correctly.

Placement

- Placed on every line clear of the vessel and where the line is steeply angled upwards towards the vessel at all tide levels. *If the line is slack so the guard is downslope of the landward end it makes it so much easier for rats to jump.*
- Where double lines are used ensure guards are fixed together to prevent a rodent swapping to the other line once passed the first guard.
- No extra retrieval lines from the guard to the vessel which allow rodents to exploit this as access to the ship. *Rats and mice can climb any rope or cable so retrieval lines tied to the top of the guard to the ship provide another 'highway' to the vessel as well as a point of purchase for a jumping rat*.

Monitoring

- Make mooring guard monitoring a routine part of watch duties to sustain correct placement. Three hourly checks are recommended.

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