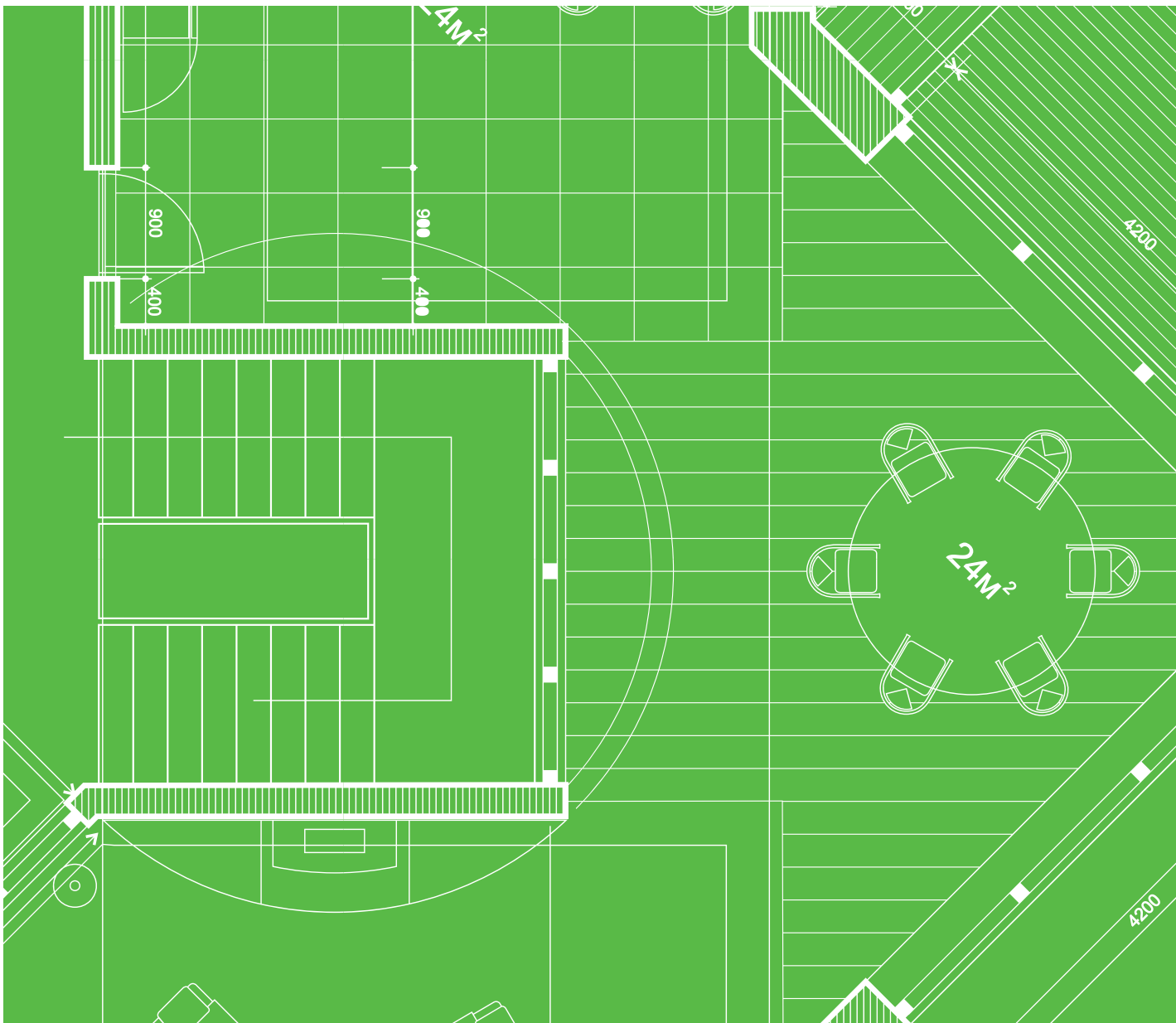
1.0
General



General Design Guidelines

The design guidelines have been developed to provide a greater level of certainty for all stakeholders when CIAL embark on developing a new commercial asset. The focus is to deliver on the three core pillars of our mission: enhancing people's lives, fuelling economic prosperity and being great Kaitiaki of our planet.

The overarching objectives of the design guidelines are to:

- Generate consistency and quality within our commercial development environment
- Give certainty to CIAL as to the new asset performance and ongoing operating costs
- Ensure our external suppliers (consultants/contractors) have certainty of CIAL expectations
- Ensure our clients (tenants) have certainty of their outcomes
- Be clear about CIAL's Health, Safety and Environmental expectations when generating new assets.

PURPOSE

CHAMPIONING TE WAIPOUNAMU THE SOUTH ISLAND AND AOTEAROA NEW ZEALAND FOR TODAY AND TOMORROW

MISSION

CHRISTCHURCH AIRPORT IS RECOGNISED FOR

ENHANCING PEOPLE'S LIVES
Our team, customers, partners, communities

+

FUELLING ECONOMIC PROSPERITY
of the South Island and New Zealand

+

GREAT KAITIAKI OF OUR PLANET
Safety, security and sustainability

CHRISTCHURCH AIRPORT

CONTENTS

1.1 INTRODUCTION

The Design Guidelines have been prepared to provide project teams with a concise list of expectations that Christchurch International Airport Limited (CIAL) has for the development of commercial and industrial projects outside of the terminal itself. The guidelines contain mandatory compliant items and general guidance to help design teams to produce high-quality building stock in accordance with CIAL policies and planning documentation.

The Design Guidelines are to be used by project teams throughout the design process to facilitate coordination and development of integrated building solutions and offer clear direction as to the expectations of CIAL. Each section of the Design Guidelines contains lists of products and equipment approved by CIAL in order to condense the client approval process and improve project design efficiency.

CIAL is a long-term owner of buildings on its campus. As such, it has an interest in not just the capital cost to construct the buildings but also the ongoing cost to operate, maintain and ultimately demolish them. CIAL has prepared these Design Guidelines in order to have new developments produce robust buildings to a consistent high quality and provide tenants with spaces that are efficient, comfortable and healthy for their employees.

The guidelines should be distributed to the design team at the initial project set-up phase in order for items to be incorporated during early concept design. The compliance checklists provided within each section of the Design Guidelines is reviewed by CIAL at specific design milestones to ensure that the design team and CIAL are both aware of how the project is tracking against these items, and any deviation from the guidelines is picked up and discussed.

The guidelines are not intended to restrict designers from making recommendations in the interest of the project but rather to encourage the incorporation of features and systems that will provide flexibility for change of use, new technologies or expansion in the future.

1.1.1 THE AIRPORT

Christchurch is the main gateway to New Zealand's South Island and exists in an area of unique, spectacular and beautiful geology. The CIAL team believes that, as citizens of the South Island, it's our responsibility and privilege to be one of many kaitiaki to this very special place, and we take that role seriously.

CIAL is passionate about protecting the environment, minimising the use of natural resources and improving the quality of life for our community. The team's approach to sustainability is centred in the Māori concept of kaitiakitanga (responsibility, care and guardianship). We continually challenge ourselves to seek out, develop and implement new processes that make our business more sustainable.

1.1.2 HOW TO USE THE DESIGN GUIDELINES

The Design Guidelines are comprised of nine sections, which cover the various design disciplines and considerations required for a development project. The guidelines contain a combination of mandatory compliance items and general guidance for acceptable design practices for CIAL.

1.1.2.1 Specific nomenclature

The following specific nomenclature is used throughout the Design Guidelines for consistency:

- CIAL – Christchurch International Airport Limited.
- Design Guidelines or guidelines – the full suite of CIAL Design Guidelines referenced within these General Design Guidelines.
- Lead consultant – the project manager or lead discipline for the consultant team for the project. May also be referred to as the lead designer or project manager.
- NZBC – New Zealand Building Code.
- Project Hub – the document management system established by CIAL to assist initiating, planning, executing and controlling each project. It provides one-source document management and ensures the right people and key stakeholders are engaged throughout the project life cycle and follow the CIAL project management framework.

1.1.2.2
Compliance checklist

Each section of the Design Guidelines contains a compliance checklist, which should be used by the design team to track progress and list any proposed deviation from specific items listed within the guidelines.

Each compliance checklist should be completed at the each stage of design and provided by the lead consultant to CIAL for review and discussion alongside:

- concept design documentation
- developed design documentation
- detailed design documentation.
- CIAL will review the compliance checklists provided and provide feedback on deviations from the Design Guidelines within 2 weeks of issue of documentation.

1.1.3
DESIGN EXPECTATIONS

1.1.3.1
Regulatory and reference documents

The Design Guidelines suite of documents is to be used as a backbone to the project design only. In no situation does any Design Guidelines document reduce the responsibility or supersede the requirement of all design consultants in the project team to design in compliance with minimum codes and standards relevant to their field.

Items listed in the Design Guidelines typically provide a minimum performance standard for items as required by CIAL for its developments. Where the Design Guidelines contain reference to a higher performance than the relevant code or standard, the Design Guidelines shall take precedence.

1.1.3.2
Planning controls

Key planning documents for the development of buildings and infrastructure for CIAL are discussed in the CIAL Environmental & Planning booklet. This document is available on request from CIAL. A high-level summary of key planning items are listed below for quick reference.

Developments on CIAL-owned land must be conducted in accordance with applicable environmental regulations. The main regulatory requirements are summarised below.

District planning matters

CIAL operates under a designation – all airport-purpose land use activities can occur as of right and need to be formally established through an outline plan process.

CIAL also operates under the Special Purpose Airport Zone (SPAZ) in the Christchurch District Plan. Development of the CIAL campus must be undertaken in accordance with the SPAZ or by resource consent.

Regional planning matters
CIAL must develop and operate in accordance with the regional planning framework, which generally applies to how land is used for earthworks, storage of hazardous substances, discharges to land, air and water as well as water takes. CIAL operates under several global consents under the regional planning framework. All CIAL development must occur in accordance with conditions of these consents or where project-specific resource consents are also required.

Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations (NES Soil)
Airports and several activities associated with airports have been identified as sites where Hazardous Activities and Industries List (HAIL) activities have either occurred in the past or are currently occurring. This means that, under the NES Soil, the airport campus is a HAIL site and a resource consent is required when any soil disturbance is undertaken.

CIAL holds a global resource consent **(RMA/2016/844)** under the NES Soil, providing for the disturbance of contaminated soil and potentially contaminated soil across the airport campus. Designers must refer to the contaminated soil risk category map to understand what risk category the earthworks are in and design accordingly.

1.1.3.3
Design stages

All projects shall be prepared and submitted to CIAL for the following design stages, in accordance with those presented in the New Zealand Construction Industry Council Guidelines:

- Concept
- Preliminary
- Developed
- Detailed
- Construction.

Specific coordination should be carried out between consultants within the design team appropriate to each design stage to ensure that the submitted documentation has considered all those involved.

1.1.3.4
Operation and maintenance (O&M) manuals

The design team must stipulate in their documentation that O&M manuals are required for the following disciplines, to be structured in accordance with both the CIAL As-Built Technical Specification for Building Projects (Appendix A) and the IPENZ BSG 80 O&M Compliance Checklist. Where items are referenced in both documents, the CIAL specification shall take precedence:

- Mechanical
- Electrical, communications and security
- Hydraulic services.

O&M manuals should be uploaded to the Project Hub in both PDF and Microsoft Word (.docx) formats to allow for post-completion alterations to any services within the building.

1.1.3.5
Post-completion requirements

CIAL has prepared the Project Closure and Handover Process form attached to these guidelines as Appendix B. CIAL requires the following key considerations for post-completion items provided by building contractors and subcontractors:

- 12 months defects liability period.
- Product and installer guarantees and warranties.

Electrical/hydraulic/mechanical

- There shall be no specific 12-month maintenance period to be included in tender pricing. CIAL will complete its own maintenance following practical completion.
- 3-month post-commissioning building tuning period to ensure equipment is operating as designed/specified.

1.1.4
VALUE/RISK MANAGEMENT

Risk management is a key consideration of CIAL for each project. Specific processes should be established by the project team to ensure management and mitigation of the following risk categories.

1.1.4.1
Project scale

In assessing project risk, the project team must review the size and complexity of the development and advise on specific risks relevant to the scale of the project.

1.1.4.2
Value management

Prior to issue of detailed design, it is important that value management components have been considered in the design for each consultant. Specific items should be identified where value can be managed, along with any change to project risk associated with that item.

The project team must be aware of CIAL's budget position and manage scope creep as the project progresses.

1.1.5
WHOLE-OF-LIFE COST CONSIDERATIONS

Due to the business model of CIAL, buildings produced under the influence of these Design Guidelines will be owned and managed by CIAL for a significant length of time. For this reason, CIAL is interested in optimising the balance between capital and operating costs for each project, given a consistent level of quality and service.

Each consultant's concept design package should contain reference to capital and operating costs and compare alternative options with high0level cost estimates. Cost comparisons should list any key assumptions made and allow CIAL to approve the appropriate concept design for each consultant with confidence that other options have been considered and ruled out.

1.1.6
HEALTH AND SAFETY BY DESIGN

Each consultant is required to consider health and safety by design for their aspects of the project. This section should be read as an introduction to the dedicated Health and Safety Design Guidelines.

Each member of the design team is specially placed to reduce or remove risk in an efficient and cost-effective manner for each of their fields. Consultants must consider safety in design items within the building for all stages following building design, including:

- construction
- occupation
- maintenance
- modification
- demolition.

A project-wide safety in design register must be prepared and submitted along with concept design documentation to CIAL for initial review. A final issue is also required alongside detailed design documentation. This register must be kept current and is to be managed by the lead consultant and made available to CIAL upon request. It is suggested that the project team should undertake a specific safety in design workshop within the team during the production of this document to ensure clarity and coordination within the team.

The project team shall arrange and attend one focused health and safety by design workshop with the CIAL team to outline and discuss specific items in the safety in design register. This should be undertaken during the developed design phase to ensure that items are integrated into the design at an early stage.

1.1.7 ENVIRONMENTALLY SUSTAINABLE DESIGN PRACTICES

Environmentally sustainable design is a key consideration for CIAL. It is important that the project team considers sustainability within their relevant fields, with key sustainability objectives described in the subsections below.

As a company, CIAL accepts the role carbon dioxide and other greenhouse gases play in climate change. CIAL believes in the science behind climate change and has committed to eliminating all non-emergency-related scope 1 emissions, reducing its scope 2 emissions from electricity and managing its scope 3 emissions by working with suppliers, customers and the wider economy to reduce or eliminate reliance on fossil fuels.

CIAL is a founding signatory of the Climate Leaders Coalition and is mindful of the Climate Change Response (Zero Carbon) Amendment Act and as such is committed to action to reduce its direct emissions and to offset emissions where they cannot practically be eliminated. It is important that all building stock being developed follows these same lines in order to achieve these goals and increase awareness around these issues.

1.1.7.1 Energy

Project teams should incorporate energy-efficient solutions where practical, utilising technologies available to each discipline (i.e. efficient conditioning systems, LED lighting etc.). Where there is a significant capital cost increase to incorporate an applicable energy-efficient solution, a simple payback calculation should be undertaken to assess the suitability for the specific project.

Below is a brief list of energy efficiency items that should be considered for each project. These should form part of the concept design report for each relevant discipline, along with project-specific recommendations.

Architect

- Building position and orientation on site to optimise for heating and cooling energy and peak load, as well as daylighting.
- Increased insulation levels above minimum New Zealand Building Code (NZBC) levels. Overall insulation levels shall be 30% above code.
- Consider insulated wall panels for warehouses/storage to maintain a more consistent temperature without the requirement of space conditioning (where required). Reduces likelihood of overheating in summer where space is unconditioned.
- Consider a warm roof design to provide an unbridged roof to the thermal envelope.
- High-performing double glazing with a high insulating R-value and low solar heat gain G-value.
- Façade shading to reduce solar load, particularly on north and west façades. Consider fixed shading (i.e. fins or eaves) or external venetian blinds.

Electrical

- EV charging to prioritise the use of electric vehicles by tenants and their guests.
- LED lighting installed to office spaces is becoming standard practice.
- Occupant and daylight sensing/harvesting to activate and dim lighting when possible in office spaces.
- Solar PV panels to offset grid electricity and charge EVs during office hours.

Hydraulic

- Solar domestic hot water, using either flat plate collectors or evacuated tubes, to reduce domestic hot water energy consumption. Specific assessment of the expected domestic hot water use should be undertaken.

Mechanical

- High-efficiency equipment, such as heat pumps, should be considered for space conditioning.
- Ventilation heat recovery utilises outgoing exhaust air to pre-heat incoming fresh air, reducing electrical heating required in winter.
- Demand-based ventilation utilises carbon dioxide sensing with variable fresh air fans to provide ventilation only when required. This reduces fan energy consumption.
- Increased ventilation rates have been shown in studies to improve employee productivity and reduce illness (among many other benefits) but do result in an increase in energy consumption. This should be considered alongside demand-based ventilation or heat recovery systems described above.
- EC fan motors, which generally consume less energy than other fan motors, are becoming standard practice.
- Post-occupancy tuning should be considered to ensure that commissioned services are operating as intended and identify any unexpected energy users.

1.1.7.2
Carbon

Low carbon emissions should be considered. Examples of these are:

- Low carbon concrete
- Review of using structural timber systems

1.1.7.3
Water

Water efficiency should be considered for water supply (i.e. hot and cold water) and drainage. Design priority should be given to low water use fittings and other technologies that can reduce the water consumption of the building.

Below is a brief list of water efficiency items that should be considered for each project. These should form part of the concept design report for each relevant discipline, along with project-specific recommendations.

Architect

- Low-flow fixtures and sensor taps should be considered to reduce domestic water usage (and hot water heating energy).

Hydraulic

- Low-flow fixtures and sensor taps should be considered to reduce domestic water usage (and hot water heating energy).
- Greywater harvesting could be utilised for secondary water (i.e. toilet pans).
- Rainwater harvesting could be used for landscape irrigation or secondary water.

Mechanical

- Leak detection should be installed if there is a water-based conditioning system, with an alarm to notify the tenants of leakage.

1.1.7.4
Materials and waste

Reduction of waste should be considered by the design team for both construction and operation of the building. Materials selection and build practices including prefabrication should be compared with typical building materials and methodology and incorporated where practical to do so.

Below is a brief list of waste efficiency items that should be considered for each project. These should form part of the concept design report for each relevant discipline, along with project-specific recommendations.

Architect

- Consider prefabricated design solutions to reduce site waste and improve on-site build time.
- Selection of low-VOC or Environmental Choice materials ensures that construction materials are sustainable and healthy for occupants. A list of generally approved materials is available on the Environmental Choice New Zealand website.
- Consider recycled products where appropriate.
- Waste-sorting stations (both internal and central external) to allow tenants to categorise waste into the correct collection bins.
- Location and size of waste storage areas to allow for access and removal.
- Consider the storage and treatment requirements of any tenant process waste.

Building contractor

- Building contractor should prepare an environmental management plan or have ISO 14001 certification that covers the construction of the project.
- Building contractor should prepare a site waste minimisation plan in accordance with REBRI guidelines.

1.1.7.5
Measurement and verification

Measurement and verification items should be considered to observe the operation of systems and can be used to give tenants a tangible reading of their building.

Below is a brief list of measurement and verification items that should be considered for each project. These should form part of the concept design report for each relevant discipline, along with project-specific recommendations.

Electrical/hydraulic/mechanical

- Electrical metering can be combined with the building management system (BMS), if installed, and a presentation screen/dashboard to inform building tenants of current operation and help with assessing operational issues (i.e. long operating hours, solar electricity generation etc.).
- Water metering can be combined with electrical metering and the BMS, if installed, to monitor major water users.
- The BMS can be integrated to optimise equipment operation and easily review systems. Typically, this is only appropriate for larger-scale buildings or sites. Some manufacturers offer a smaller BMS-style controls system that could be appropriate on a project-specific basis.

1.1.8
PROVISION FOR EXISTING INFORMATION

The design team is to contact CIAL to assess the extent of existing as-built documentation or existing condition reports available for the site being developed.

1.1.9
MINIMUM DISTRIBUTION OF GUIDELINES

The following matrix indicates preferred minimum distribution of the various sections of the Design Guidelines to members of the design team. The guidelines will be distributed by CIAL to the lead consultant following the initial project meeting for them to distribute to the design team.

It is important that all guidelines are considered for each design project. For this reason, where a design consultant is not involved in a project, responsibilities allocated to them in the associated guidelines should be passed to the next most appropriate party.

Responsibility for each section of the Design Guidelines is allocated as per the below numeric designations:

1 Key responsibility/ownership – the consultant is responsible for ensuring that information in the associated guidelines is incorporated into the design and coordinated with all other parties designated as having part responsibility.
2 Part responsibility – the associated guidelines likely contain information useful to the design or items required to be coordinated with the consultant with key responsibility/ownership.

	01. GENERAL	02. HEALTH AND SAFETY IN DESIGN	03. ARCHITECTURAL	04. STRUCTURE	05. MECHANICAL	06. ELECTRICAL, SECURITY AND COMMUNICATION	07. HYDRAULICS	08. CIVIL	09. FIRE AND LIFE SAFETY
Lead Designer / Lead Consultant / Project manager	1	1	2	2	2	2	2	2	2
Architect	2	2	1	2	2	2	2	2	2
Structural engineer	2	2	2	1	2			2	2
Geotechnical engineer	2	2	2	2				2	
Civil engineer	2	2	2	2			2	1	
Mechanical engineer	2	2	2		1	2	2		2
Electrical engineer	2	2	2		2	1			
Hydraulics engineer	2	2	2				1	2	
Fire engineer	2	2	2	2			2		1
Acoustic consultant	2	2	2	2	2				
ICT consultant	2	2	2			2			
Security consultant	2	2	2			2			
Planning consultant	2	2	2						2
Landscape architect	2	2	2					2	
Façade engineer	2	2	2	2					

1.2 CIAL SUPPORTING INFORMATION

1.2.1 PRECINCT MASTER PLAN

CIAL has established a clear vision for its campus up to 2040. The CIAL Master Plan 2040 provides high level context and framework for all new projects within the development zones. To obtain this document please contact your CIAL representative or email enquiries@cial.co.nz.

1.2.2 SUSTAINABILITY

At CIAL sustainability, under our business pillar of Kaitiaki, is at the heart of everything we do. Project teams should make themselves aware of what drives us from a sustainability perspective both within these guidelines but also the more general CIAL business sustainability framework. To obtain these guidelines please contact your CIAL representative or email enquiries@cial.co.nz.

1.2.3 ASSET PLANNING & MAINTENANCE POLICY

CIAL has established an Asset Planning & Maintenance Policy that clearly defines what our aims and goals are for asset management. Designers should be aware of these goals and look to drive outcomes that achieve them. To obtain this policy please contact your CIAL representative or email enquiries@cial.co.nz.

1.2.4 LANDSCAPE GUIDELINES

CIAL is looking to generate landscaping designs that align to a clear theme, create a level of consistency and keep maintenance costs low. The landscaping guidelines should be followed during the design of any new development. To obtain these guidelines please contact your CIAL representative or email enquiries@cial.co.nz.

1.3 CIAL PLANNING FRAMEWORK

The following provides a high-level overview of the CIAL planning framework. Design and project teams should investigate each project's needs individually and connect directly with their CIAL representative to ensure the right information and assessments have be completed.

Developments on CIAL owned land must be conducted in accordance with applicable environmental and planning regulations, the main regulatory requirements are summarised below:

1.3.1 DISTRICT PLANNING MATTERS

CIAL operates under a Designation, all airport purpose landuse activities can occur as of right and need to be formally established through an outline plan process.

CIAL also operates under a special purpose zone in the Christchurch District Plan called the "Special Purpose Airport Zone (SPAZ)", development of the CIAL campus must be undertaken in accordance with the SPAZ, or by resource consent. To obtain the SPAZ document please contact your CIAL representative or email enquiries@cial.co.nz.

1.3.2 REGIONAL PLANNING MATTERS

CIAL also must develop and operate in accordance with the Regional Planning Framework generally this framework applies to how land is used for earthworks, storage of hazardous substances discharges to land, air and water, and water takes. CIAL operate under several global consents under the regional planning framework, all CIAL development must occur in accordance with conditions of these consents or where required project specific resource consents are also required. For further information please contact your CIAL representative or email enquiries@cial.co.nz.

1.3.3
NATIONAL ENVIRONMENTAL STANDARD FOR ASSESSING AND MANAGING CONTAMINANTS IN SOIL TO PROTECT HUMAN HEALTH (NES SOIL)

The CIAL campus has been identified as a site where Hazardous Activities and Industries List, (HAIL) activities have either occurred in the past or are currently occurring. This means that under the Resource Management National Environmental Standard for assessing and managing contaminants in soil to protect human health (NES Soil) the airport campus is a HAIL site and a resource consent is required when any soil disturbance is undertaken.

CIAL holds a global resource consent (RMA/2016/844) under the NES Soil, providing for the disturbance of contaminated soil and potentially contaminated soil across the airport campus. Designers must refer to the contaminated soil risk category map to understand what risk category the earthworks is in and design accordingly. To obtain the contaminated land soil management framework please contact your CIAL representative or email enquiries@cial.co.nz.

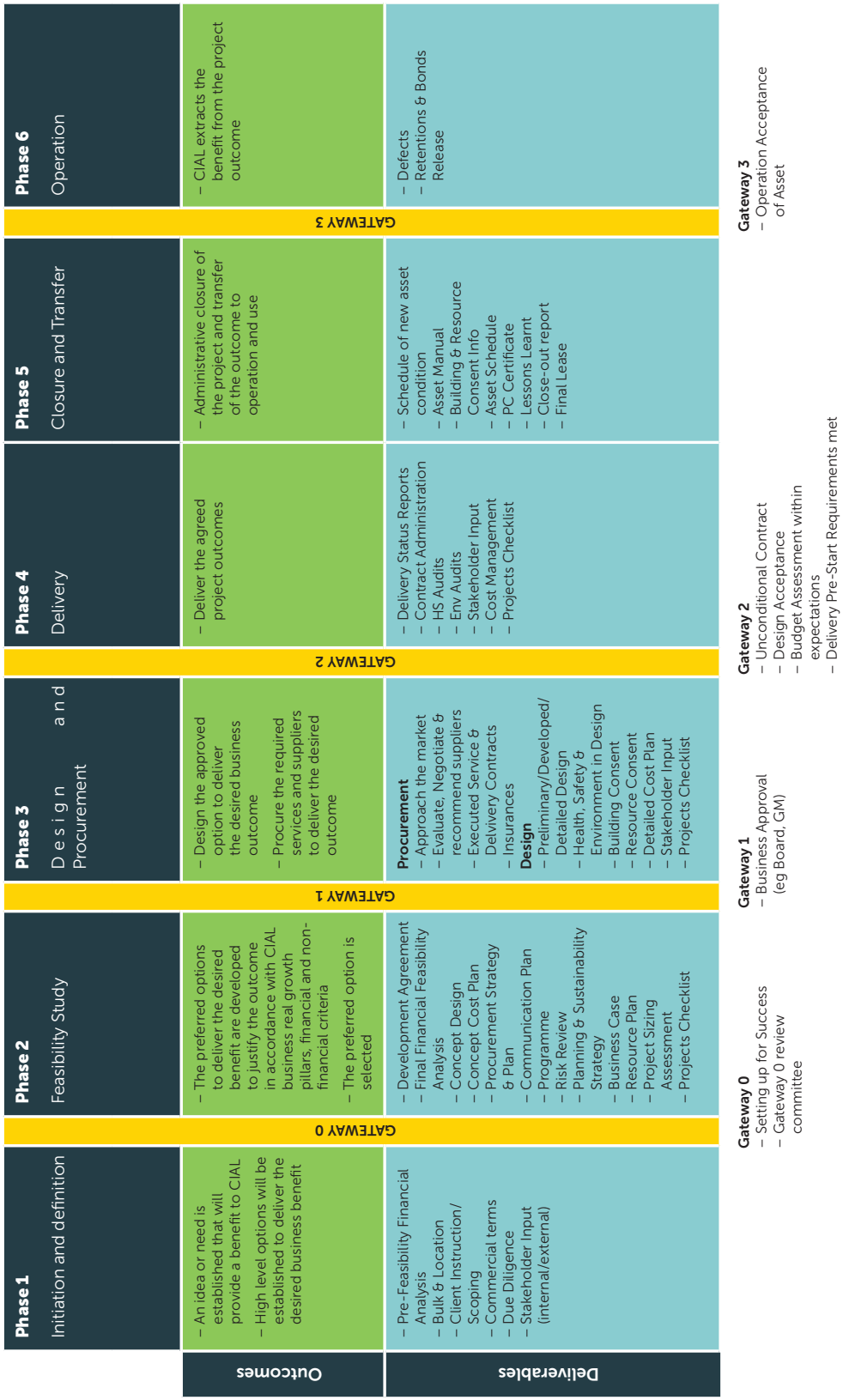
1.4
CIAL ROLES AND STAKEHOLDERS

The following groups and roles are key contributors to the development of CIAL properties and infrastructure. Contact details for each can be requested from CIAL Management.

- Project Sponsor
- Property Development
- Project Delivery
- Property Portfolio Management
- Asset Planning and Maintenance
- Health and Safety
- Strategy and Sustainability
- Strategic Procurement
- Finance
- Legal
- Digital Development and IT

1.5 PROJECT DELIVERY FRAMEWORK

The project delivery framework presented here is also available in the CIAL Project Management Framework document. To obtain this document please contact your CIAL representative or email enquiries@cial.co.nz.



1.6
DOCUMENT CONTROL

Control of the Design Guidelines defaults to CIAL. It is the document controller's responsibility to ensure that the suite of Design Guidelines made available to design teams contains the latest information

The following table lists the current revision number and date for each section of the Design Guidelines.

April 2020	CURRENT REVISION	DATE REVISED
01. General	1	April 2020
02. Health and Safety in Design	1	April 2020
03. Architectural	-	-
04. Structure	1	April 2020
05. Mechanical	1	April 2020
06. Electrical, Communication and Security	1	April 2020
07. Hydraulics	1	April 2020
08. Civil	1	April 2020
09. Fire and Life Safety	1	April 2020