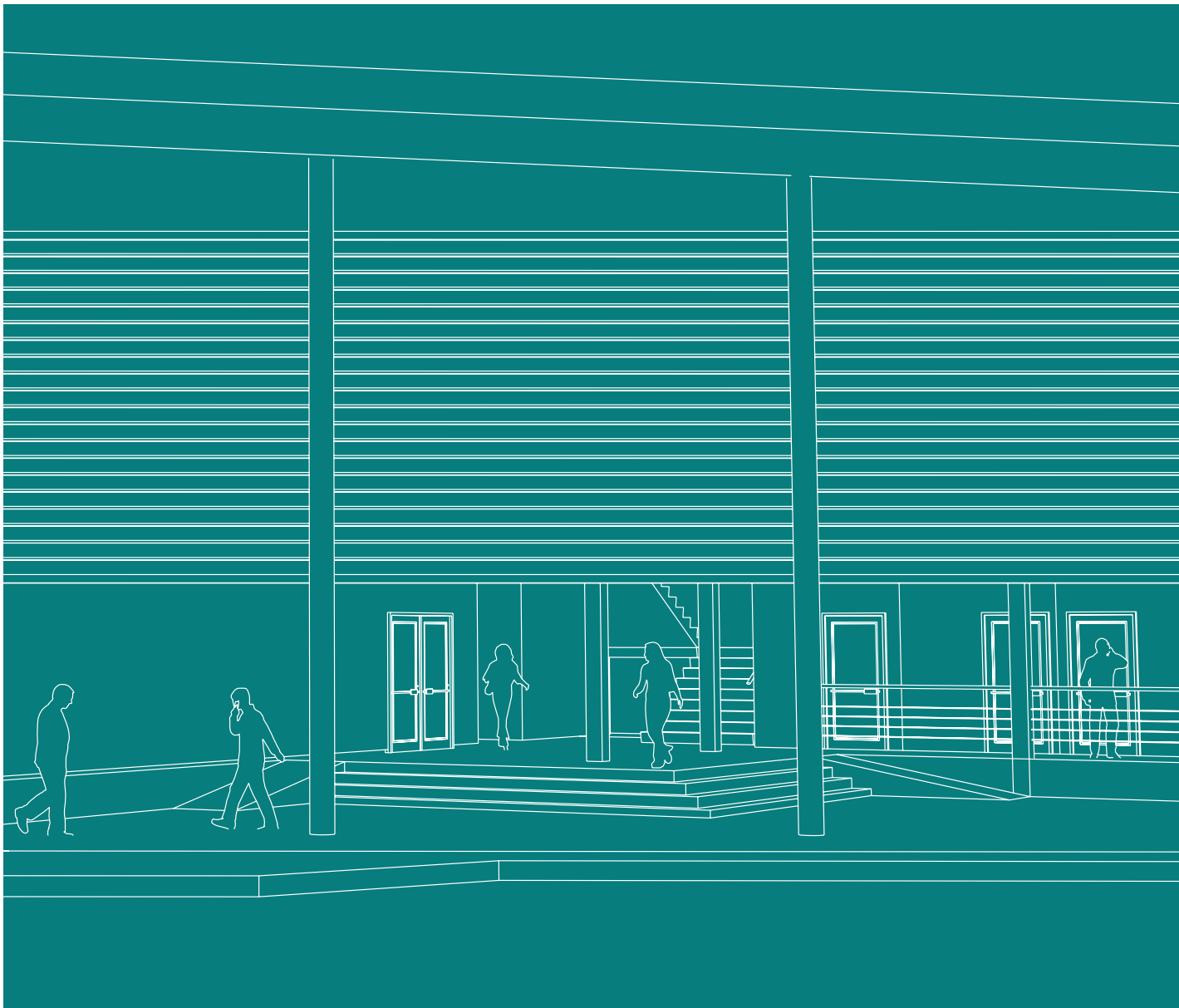
2.0
Health, Safety and Quality Management by Design



Health, Safety and Quality Management by Design

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 our three core business pillars of Stronger Business, Kaitiaki and Enhancing Customer Journeys.

This document outlines CIAL's Health, Safety and Quality Management by Design requirements for commercial projects with the aim of providing safe outcomes across design, delivery, operation, maintenance, modification and demolition of 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

This guideline is structured in two parts:
- 2A: Health & Safety by Design
- 2B: Quality Management by Design

2A: HEALTH & SAFETY BY DESIGN

2B: QUALITY MANAGEMENT BY DESIGN

APPENDIX

2A: HEALTH & SAFETY BY DESIGN

2A.1 OBJECTIVE

The purpose of this section is to outline the health and safety by design requirements for developments undertaken for CIAL.

Eliminating health and safety risks through design makes good business sense. This section of the guidelines is intended to ensure that considerations are made during the design phase to ensure upstream PCBU duties are met and that, so far as is reasonably practical, structures and plant are without risks to health and safety for their life cycle including design, construction, operation or use, maintenance and decommissioning.

2A.1.1 SCOPE

This section describes the practical requirements of parties involved in the design of structures or plant for CIAL to design and deliver safe and healthy constructions. The requirements outlined apply to all fixed or movable, temporary or permanent structures and include the following:

- Buildings
- Towers
- Frameworks
- Pipelines
- Roads and bridges
- Pavements
- Underground works
- Operational plant.

2A.2 DESIGN PRACTICES

2A.2.1 WHOLE-OF-LIFE CONSIDERATIONS

Risks to health and safety must be considered for the whole life of the building, structure or plant, from design through construction, operation/use, maintenance and finally demolition.

International research illustrates that considering the health and safety risks at the design stage is important for the following reasons:

- Good design can result in significant reductions in work-related ill-health and injuries.
- Good design reduces damage to property and the environment and the related costs.
- Good design enhances the health, wellbeing and productivity of workers.
- The most effective risk control measure – eliminating hazards – is often cheaper and more practicable to achieve at the design or planning stage than managing risks later in the life cycle.
- The design of plant or structures contributes to a significant proportion of work-related injuries, and solutions already exist for many of those design problems.
- It is more efficient and effective to manage risk in the design phase than to retrofit health and safety solutions.
- Design based on health and safety by design principles can reduce the need for retrofitting, personal protective equipment, health monitoring, exposure monitoring and maintenance.

2A.3 REFERENCES

The governing reference for this section of the guidelines is the Model Code of Practice: Safe Design of Structures (Safe Work Australia).

Other references include:

- An Introduction to Health and Safety by Design: An Introduction (WorkSafe New Zealand, August 2018)
- Design for Safety in Buildings and Other Structures (IPENZ Safety in Design Guidance Note No. 7, 2006)
- Injury Prevention Through Environmental Design (IPTED)
- Crime Prevention Through Environmental Design (CPTED)

2A.4 ROLES AND RESPONSIBILITIES

In addition to their primary duties under Health and Safety at Work Act (HSWA), there are further duties for upstream persons conducting a business or undertaking (PCBUs) who are designers. Generally, the more influence and control a PCBU has over a health and safety matter, the more responsibility they are likely to have in making sure, so far as is reasonably practicable, that structures and plant are without health and safety risks.

2A.4.1 CIAL DECISION MAKERS

Senior managers' decisions greatly influence design outcomes that may have significant health and safety implications. It is important that the extent and nature of the implications guide decisions in order to ensure ongoing compliance with legal requirements and internal company policies. The decision makers are responsible for the following:

- Engaging designers, project managers and construction contractors who are competent to deliver safe and healthy designs, structures and facilities.
- Consulting, cooperating and coordinating with the designer/design team so far as is reasonably practicable.
- Consideration of health and safety impacts for all construction or demolition projects.
- Ensuring so far as reasonably practicable that decisions defining budget and programme schedule do not introduce unacceptable health and safety risks to any stage of the structure life cycle.
- Consulting where possible with the workforce to ensure that the design of structures and facilities is fit for purpose and considers life cycle health and safety implications.
- Regular review of risk controls throughout the life cycle of the plant or structure to end of life.

2A.4.2 PROJECT MANAGERS

Project managers are responsible for setting up forums/opportunities to enable consultation, coordination and cooperation with the decision makers, those who have control of construction works and all designers involved.

2A.4.3
DESIGNERS

The definition of a designer in this section aligns with section 39 of the HSWA and includes anybody contributing sketches, plans or drawings for a project or anybody with the overall responsibility for the design of structures, plant or facilities. Designers include but are not limited to architects, engineers, building surveyors, interior designers and landscape designers. The definition of designer also extends to include anybody who:

- alters a design without consultation of the original designer
- makes decisions on a design that may impact the health, safety or environment of those who construct, use or carry out activity in relation to the structure
- designs critical features such as structure, ventilation, electrical or fire systems
- designs temporary works including but not limited to scaffolding, formwork, temporary support structures and sheet piling.

Designers are in a strong position to make work healthy and safe from the start of the design process and are responsible for the following:

- Defining the scope of design works as closely as possible.
- Identifying features of design essential to safe construction, operation/use, maintenance or demolition of the structure or plant. Deleting any essential features for project cost or timeline reasons is not acceptable.
- Providing information to the manufacturer/constructor about the purpose of the plant or structure, the results of any calculations and testing to make sure that risks are eliminated or minimised so far as is reasonably practicable and any conditions necessary to make sure that risks are eliminated or minimised so far as is reasonably practicable when used for its designed purpose or when being inspected, cleaned, maintained or repaired.
- Reviewing options for methods of construction, operation, maintenance, demolition and disposal to ensure health and safety and environment are prioritised.
- Reviewing materials used with regard to health and safety for those who construct, occupy, operate or demolish/dispose of structures being designed.
- Producing and maintaining a discipline-specific safety in design register for the project being designed. This register shall be completed on the attached CIAL safety in design register.
- Applying standard processes to identify and assess potential health, safety and environmental hazards across the full life cycle of structures that they design, influence or modify.
- Designing structures to eliminate where possible or alternatively minimise the risk associated with identified hazards.
- Consulting, coordinating and cooperating on design activities with those who have control of project management and construction works, as well as other designers involved.

2A.4.4
CONSTRUCTION CONTRACTORS

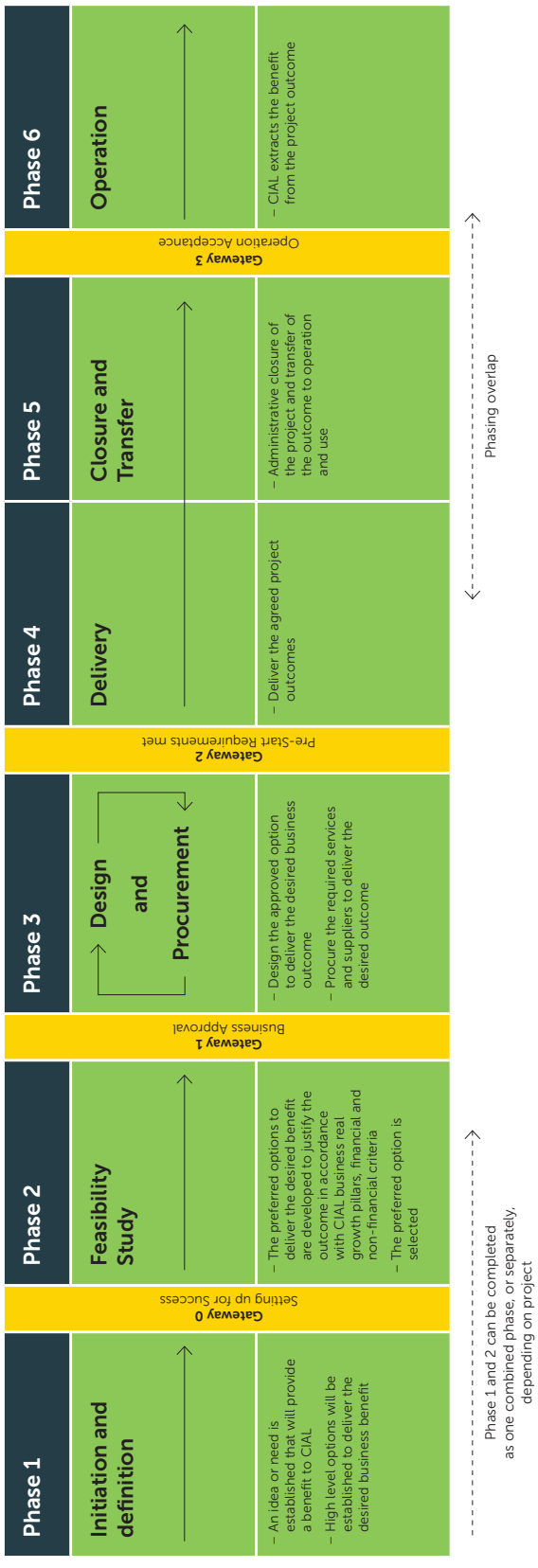
The responsibilities of construction contractors are defined by the scope of work they are appointed to deliver. All construction contractors have duties to ensure that the construction work for which they are responsible is planned and managed in a way that eliminates or minimises any health and safety risks so far as is reasonably practicable.

In particular, construction contractors are responsible to:

- participate in design review meetings as requested
- review designs and identify opportunities to improve the design to eliminate or minimise potential construction health and safety risk associated with construction of design elements
- alert the client or principal contractor to any health and safety risks associated with the design or changes to the design as they are identified in the course of delivering the works.

2A.5
SAFE DESIGN PROCESS

The safe design process shall follow the CIAL project management framework.



2A.5.1
PHASES 1 AND 2: INITIATION AND DEFINITION/FEASIBILITY STUDY

2A.5.1.1
Information gathering, concept and business case

- Include a section in the project concept report showing health and safety considerations for proposed and potential scope and complexity. As a minimum, this may include reference to:
  - any unique hazards considered to the specific development
  - high-consequence hazards, including hazardous or dangerous goods
  - pedestrian/vehicle access and separation
  - site and access needs – space, security, storage.

2A.5.2
PHASE 3: DESIGN AND PROCUREMENT

2A.5.2.1
Procurement

- The competency of the designer shall be assessed during the procurement process based on:
  - confirmed minimum 'safe design' skills and competencies
  - knowledge of health and safety legislation, codes of practice and other regulatory requirements
  - understanding of intended purpose of structure/project
  - knowledge of risk management processes
  - knowledge of technical design standards
  - appreciation and consideration of construction methods and their impact on the design
  - ability to apply data relating to human factors.
- The procurement process shall follow standard CIAL contractor procurement processes and also:
  - clearly communicate the expectations of the delivery of the structure with respect to safe design practices
  - provide sufficient health, safety and environmental risk information to communicate the scope and complexity of the risks and control options selected.

2A.5.2.2
Detailed design

- Identify legislation, codes of practice and standards with which the design must comply and outline how the proposed design will comply.
- Schedule a project design risk workshop on a scale relative to the project scope and complexity.
- Review the detailed project design for hazards and possible risks.
- Ensure the design refers to recognised design standards.
- Identify design hazards, assess risks and develop potential control options. Particularly consider hazards and risks associated with:
  - designs with atypical features that present specific hazards during construction and are unique to the design
  - surrounding land use and proximity to adjacent property or roads
  - impact on shared or public spaces – site boundaries, streets, road reserves etc.
  - construction near or over other structures
  - high-consequence hazards, including hazardous or dangerous goods and electrical installations
  - systems of work – prefabrication, materials, staging and coordination with other works
  - pedestrian/vehicle access and separation
  - site and access needs – space, security, storage
  - high-risk activities including working at heights, confined spaces, live electrical systems etc.
  - consideration of environmental conditions including weather, seismicity, noise etc.
  - emergency procedures.
  - incorporate risk control options into the detailed design.
- Confirm minimum skill and competency requirements for the project design and delivery team (health, safety and environmental).
- Identify critical features in the design that are essential to safe operation of the facility.
- Ensure that all products specified are manufactured or produced under safe and healthy conditions.

A2.5.3
PHASE 4: DELIVERY

2A.5.3.1
Construction pre-start

- The outcome from Phase 3 shall be clearly described to the delivery agent via a pre-start meeting.

2A.5.3.2
Project delivery

- The outcomes and mitigation measures developed during Phase 3 shall be reviewed progressively throughout delivery to ensure the mitigation measures are implemented.

2A.5.4
PHASE 5: CLOSURE AND TRANSFER

2A.5.4.1
Completion and handover

- Parties involved in the design and build process shall review:
  - issues arising during commissioning with regards to health and safety
  - hazard and risk levels arising as a result of deviation from the original design or changes in intended use
  - project learnings that can be incorporated into future safe design processes.

2A.5.5
PHASE 6: OPERATION

2A.5.5.1
Operation

- Include a health, safety and environmental section within the building handover documentation.

2A.5.5.2
Maintenance

- Ensure that operation and maintenance (O&M) manuals are prepared for all building services and architecture to ensure that the maintenance team can clearly identify maintenance items.
- O&M manuals shall include a section outlining any site-specific design items that impact the health or safety of maintenance operations.

2A.5.5.3
Modification

- Modification to buildings and services shall be undertaken in such a way that additional hazards and risks are not created on site where possible.
- Any modifications shall include update of any safety systems or access requirements to associated areas in order to comply with the most up-to-date health and safety legislation.

2A.5.5.4
Demolition

- Ensure the demolition process is undertaken as safely as practicable.
- All materials removed from the structure shall be recycled where possible.
- Decommission building services safely and in accordance with relevant standards.

2A.6
DESIGN SAFETY REPORT

The designer shall provide a written design safety report generally in line with the example included in Appendix 1. The report shall cover but not but not be limited to;

- the purpose of the structure/plant as communicated by the client in the project brief
- the parties consulted in undertaking the design
- the hazards and risks identified during the design process and control measures incorporated into the design specifically in relation to:
  - any hazardous materials specified in the design
  - any unusual or typical feature requiring specific attention during construction and manufacture
  - any features of the design that present specific risks
- the recommended control measures for any foreseeable activities (e.g. operation, maintenance, repair, dismantling, demolition, disposal) to be carried out during the life of the structure/plant when used for its intended purpose.

2B: QUALITY MANAGEMENT BY DESIGN

2B.7 OBJECTIVE

The objective of these quality management design guidelines is to ensure all work undertaken for CIAL is suitable for its intended use by defining it in an objectively measurable manner. This involves clearly specifying what constitutes completion (i.e. what 'done' means) beyond just referencing drawings and specifications. CIAL specifically emphasises the importance of installing critical assets in accordance with project requirements, relevant codes and New Zealand standards. This is to ensure that the installations meet quality, safety and regulatory standards necessary for the project's success. This attention to detail will help in preventing issues and ensure that the assets perform as intended within the project's framework. Typical critical assets that can be found on CIAL's commercial and industrial projects include:

- HV electrical systems
- LV electrical systems
- high pressure water ring main – Dakota Park
- gas reticulation
- height safety systems
- structural systems.

This does not imply these are the only assets CIAL is interested in from a quality perspective. However, it does highlight those that could have higher risk to health and safety outcomes.

2B.7.1 SCOPE

The guideline outlines the quality management requirements for all phases of development – design, construction, commissioning and handover. The requirements apply to all fixed, movable, temporary or permanent structures and assets, including:

- buildings
- building services
- campus-wide infrastructure
- roads
- pavements
- underground works
- operational plant.

2B.8 DESIGN PRACTICES

2B.8.1 QUALITY AND HEALTH & SAFETY BY DESIGN

Quality and health and safety by design are inherently interconnected, as deficiencies in one can often result in hazards in the other. CIAL's Health and Safety by Design Guideline aims to minimise workplace risks through proactive design and engineering controls, while this Quality by Design Guideline focus on ensuring consistency, reliability, compliance, customer satisfaction and continuous improvement.

Together, they provide a framework for identifying high-risk assets, determining appropriate approaches and establishing necessary quality assurance and control measures to ensure safety and high standards during construction, maintenance and use.

2B.8.2 WHOLE-OF-LIFE CONSIDERATIONS

Quality must be considered for the entire life of the building, structure or plant from design through construction, operation/use, maintenance, modification and finally demolition. Key considerations include:

- ensuring design specifications meet quality standards
- selecting materials and construction methods that enhance durability and performance
- incorporating features that facilitate easy maintenance and operation to ensure continuous performance.

2B.9 ROLES AND RESPONSIBILITIES

Relying solely on quality management processes and tools is insufficient. It's crucial to understand and modify behaviours that impact quality rather than depending on inspections and corrective actions after defects occur. The behaviour and actions of individuals managing and delivering CIAL's projects directly influence the quality of processes and our built environment.

Behaviour-based quality acknowledges that quality is a shared responsibility, promoting collaboration among project stakeholders – including managers, designers and contractors – to maintain consistent quality standards and facilitate effective communication.

2B.9.1 CIAL DECISION MAKERS

CIAL decisions greatly influence design outcomes that may have significant quality implications. They are responsible for:

- communicating CIAL's quality objectives
- engaging competent designers, project managers and construction contractors
- ensuring decisions do not introduce unacceptable quality risks at any stage of the development life cycle
- deciding on level of construction monitoring required by designers
- creating a positive culture of accountability among designers, project managers and construction contractors
- sharing lessons learned regularly.

2B.9.2 PROJECT MANAGERS

Project managers are responsible for ensuring that CIAL's quality objectives are understood and that those who control construction works as well as all involved designers have appropriate quality assurance and quality control processes in place to achieve the desired outcome. Additionally, they are responsible for:

- monitoring and reporting – regularly monitoring the progress of design and construction activities and reporting on quality performance to promptly identify and address any issues
- stakeholder engagement – actively engaging with all stakeholders, including CIAL, designers and contractors, to ensure that expectations and requirements are met throughout the project life cycle.

2B.9.3 DESIGNERS

Designers include architects, engineers, building surveyors, interior designers, landscape designers and design and build contractors. They are responsible for:

- discussing, agreeing and documenting performance objectives with CIAL
- understanding existing conditions – assessing and documenting existing conditions and infrastructure to inform design decisions and ensure compatibility with new designs
- identifying and prioritising critical assets, design features and compliance requirements essential for quality and safety
- capturing outcomes in a design quality plan, managed by the lead consultant, and making it available to CIAL upon request
- defining clear acceptance criteria for completed works – clearly defining what 'done' means
- ensuring CIAL design guideline compliance checklists are coordinated and completed by the various design disciplines at each stage of design and provided by the lead consultant to CIAL for review and discussion
- highlighting to CIAL if changes affect quality objectives and ensuring mitigation measures remain in place to deliver critical assets to the required standard.

2B.9.4
CONSTRUCTION CONTRACTORS

Construction contractors are responsible for ensuring that the construction work for which they are responsible is planned and managed in a way that meets quality standards. They should:

- understand existing conditions – assess and document existing conditions and infrastructure to inform construction planning and execution
- be aware of CIAL-identified high-risk asset requirements
- show leadership and active participation in quality-related risk assessments throughout the project life cycle and create a positive culture of collaboration and accountability
- develop a project-specific quality plan, including an inspection testing, commissioning and tuning plan
- implement suitable quality control measures, procedures and tools for individual elements of work
- ensure all team members receive adequate training on the project-specific quality standards and procedures
- alert CIAL to any quality risks associated with the design or changes to the design
- keep quality control records readily available throughout the project life cycle.

2B.10
QUALITY MANAGEMENT PROCESS

2B.10.1
PHASES 1 AND 2: INITIATION AND DEFINITION/FEASIBILITY STUDY

Include a section in the project concept report showing quality considerations for proposed and potential scope and complexity. This may include reference to:

- unique quality objectives – identify and document any unique attributes that require special attention
- high-consequence quality areas – highlight any assets with significant impact or risk that need to be addressed to ensure quality objectives are met.

2B.10.2
PHASE 3: DESIGN AND PROCUREMENT

2B.10.2.1
Procurement

- This is the time to start the discussion regarding quality assurance and quality control, including construction monitoring, appropriate to the design. The competency of the designer shall be assessed during the procurement process based on:
  - the brief being within their scope of competency and priced appropriately to provide for quality assurance, including consideration of the need for external peer review
  - knowledge of risk management processes related to design, material selection and construction methods and their impact on quality
  - use of quality processes and tools – confirm their use of quality management tools and software to track and manage quality issues
  - continuous improvement – assess their commitment to continuous improvement through feedback and lessons learned
  - training programmes – verify that they provide ongoing training to their staff on quality management practices.

2B.10.2.2
Detailed design

- Ensure the design complies with all necessary regulations and is consistent with CIAL's contract documents, including CIAL's preliminary and general (P&G) information and warranty schedule. Outline how the design meets these requirements.
- Schedule a quality risk workshop. Scale the workshop to the project's scope and complexity to address quality risks. This can form part of the health and safety by design process.
- Assess risks and compliance requirements and collaborate with CIAL to document mitigation measures in the design documentation. For high-risk design features, assets and building methods, include appropriate inspection and testing plans and construction monitoring requirements.
- For building services systems and other live assets, agree on commissioning requirements, the need for an independent commissioning agent and specific building or system tuning periods.
- Agree and document responsibility for signing off design and proprietary components.
- Conduct regular design reviews and audits to ensure compliance with quality standards and identify any deviations.
- Stakeholder engagement – ensure continuous communication with CIAL to gather feedback and address any concerns.

2B.10.3
PHASE 4: DELIVERY

2B.10.3.1
Construction pre-start

Communicate the outcomes from Phase 3 to the contractor via a pre-start meeting before construction begins.

2B.10.3.2
Project Delivery

Review outcomes and quality measures from Phase 3 progressively throughout delivery to ensure implementation. The contractor shall provide a project specific quality management plan, including an inspection testing, commissioning and tuning plan.

2B.10.4
PHASE 5: CLOSURE AND TRANSFER

2B.10.4.1
Completion and handover

Review the following with parties involved in the design, build and handover process:

- Verify completion of outstanding defects.
- Issues arising during commissioning and building regarding quality.
- Quality issues from deviations or changes in intended use.
- Ensure operation and maintenance (O&M) manuals are complete and include warranty requirements. These manuals should help the maintenance team clearly identify maintenance items and include a section outlining any site-specific design items that impact the quality of maintenance operations.
- Verify that as-built documents are accurate and comprehensive.
- Project learnings for future quality management processes

2B.10.4.2
Post-Project Evaluation

Conduct a thorough post-project evaluation to identify lessons learned, areas for improvement and successes.

2B.10.5
PHASE 6: OPERATION

2B.10.5.1
Operation

Include a quality management section within the building handover documentation.

2B.10.5.2
Maintenance

- Ensure that O&M manuals are prepared for all building services and architecture.
- Ensure maintenance staff are adequately trained on the specific requirements of the building and its systems.
- Keep detailed records of all maintenance activities, including dates, actions taken and any issues identified.
- Maintain a comprehensive list of all warranties associated with the building's systems and components. Track expiration dates and ensure that warranty claims are made promptly when issues arise.
- Ensure that all maintenance activities comply with warranty requirements. This may include using specific materials or following particular procedures outlined in the warranty documentation.
- Conduct regular reviews of warranty coverage to ensure that all aspects of the building are protected. This includes checking for any updates or changes to warranty terms.

2B.10.5.3
Modification

Undertake modifications to buildings and services without creating additional quality risks. Follow design/change processes and ensure O&M manuals, as-built information and compliance registers are updated.

2B.10.5.4
Demolition

Ensure demolition is carried out safely and efficiently. Decommission building services in accordance with relevant standards. Follow design/change processes and update compliance records, O&M manuals and as-built information. Remove or clearly label redundant infrastructure.

APPENDIX 1
EXAMPLE DESIGN SAFETY REPORT

See following pages.

Design Safety Report

Prepared:	
Approved:	

Document History			
Revision	**Date**	**Notes**	**Distribution**

Contents

1.0 Background

We are the Lead Consultant for this project. We have been involved in the project from concept .

The Health and Safety at Work Act 2015 (The Act) requ ires that all buildings, so far as reasonably practicable, are designed to be without risks to the health and safety of persons carrying out a reasonably foreseeab le act ivity throughout the life-cycle of the building including persons who :

- Construct the building
- Use or visit the building
- Maintain the building
- Dispose of the building

In addition, the Act requires that the designer of the building, or part of the building, must consult, co-operate and co-ordinate with other Persons Conducting Business or Undertakings (PCBUs) and designers owing overlapp ing duties and must also give specific health and safety information to each pe rson who is provided with the design, concerning;

- Each purpose for which the building was designed.
- Any conditions necessary t o ensure that the building is without risks to the health and safety of persons carrying out reasonably foreseeab e activities throughout the buildings lifecycle.

In compiling this report, we have assessed the specific and unusual workplace hazards which have been identified by the design team, and have recommended control measures to manage those risks. We have assumed that the usual workplace hazards (i.e. those that are common to all buildings and construction sites) are already sufficiently managed through the standard practice throughout the duration of their engagement. engagement of competent and qualified contractors and subcontractors who work to industry.

This report should be read in conjunction with the Building Design Features Report.

2.0 Project Description

The purpose of this building is for the sto rage and distribution of goods.

The building consists of portal frames supporting roofing and purlins together with steel clad walls with part height concrete wall panels. There are a number of unique safety risks associated with this type of construction .

There are also risks that are standard to all construction sites, such as working with power tools and working at height. While this report is not required to address normal risks, the builder should take all necessary steps to minimise these normal risks.

3.0 Consultation

The design for this building has been completed in consultation with the following people and organisations:

Client: CIAL

Tenant:

Contractor:

Architectural Designer:

St ructural Engineer:

Civil Engineer:

Fire Engineer:

Electrical Engineer:

HVAC Engineer:

We recommend that this report be further distributed by CIAL to all other parties who may be involved in this project, including but not limited to Contractor, Subcontractor, Future Owners, Maintenance/Cleaning Contractors, etc:

4.0 Safety in Design Documentation

The following pages contain a summary of our assessment of the identified risks inherent in this project . The following is a brief description of the terminology used in the following pages:

Hazard:
A source of potential damage, harm or adv erse effects, which could be realised under certain conditions.

Risk:
The chance or probability of damage, harm or adverse effects exposed to a hazard.

Inherent control measure:
A method of reducing risk which is already in place or is already required by an existing code, legis lation or standard of practice .

Likelihood:
The likelihood of a risk being realised.

Consequence :
The resultant damage, harm or adverse effect which may be suffered if a risk is realised.

Inherent risk rating:
A rating given to a risk, based on the likelihood of that risk occurring and the severity of the consequence, given the inherent control measures already in place (See table below).

Additional control measure:
A recommended method of reducing the inherent risk rating. Additional control measures can reduce either the likelihood (L) of the risk occurring, or the severity of the consequences (C)

Residual risk rating :
A rating given to a risk, based on the likelihood of that risk occurring and the severity of the consequence, upon implementation of the additional control measures recommended.

The following table illustrated how risk ratings have been derived:

Likelihood:	Consequence:					
		Insignificant (No injuries)	Minor (First aid treatment only)	Moderate	Major (Extensive injuries)	Catastrophic
	Almost Certain (Expected in most	High	High	Extreme	Extreme	(Medical treatment
	Likely (Will occur in most	Moderate	High	High	Extreme	Extreme
	Possible (Might occur at	Low	Moderate	High	Extreme	Extreme
	Unlikely (Could occur at	Low	Low	Moderate	High	Extreme
	Rare (May occur but only in exceptional	Low	Low	Moderate	High	High

Extreme:	Act now. Do something about the risk immediately. These risks require urgent attention.
High:	These risks urgently require the highest available management decision.
Moderate:	Management instructions regarding the risk should be followed.
Low:	OK for now. Record and review if equipment/people/materials/work processes or procedures change.

CIAL 5x5 RISK MATRIX

Risk Dimension	Insignificant	Minor	Moderate	Major	Catastrophic
People Health & Safety	First Aid or equivalent only	Medical Treatment Injury *(requiring medical intervention off site)*	Lost Time Injury *(One full missed shift as a result of the accident)*	Permanent Disability or Serious Harm *(being trauma injury; acute illness or injury; or chronic or serious occupational illness of injury)*	Individual or multiple fatalities
Operations	No material disruption *(0-15 minutes approx)*	Minor disruption affecting a small number of people *(15-60 minutes approx for that small group)*	A disruption affecting more than one group *(15-60 minutes plus approx of disruption for more than one group)*	Significant impact on a large number of people or groups	Unable to function
Reputation / Brand	Non headline exposure	Non headline exposure; clear fault and settled quickly	Medium impact on credibility and exposure	Headline profile; loss of credibility; potential for prosecution; compliance failure	Maximum high level exposure; prosecution; Ministerial censure
Assets	No impact or less than $20,000. Asset can function normally	Impact of less than $500,000. Asset able to function but not to full level	Impact of up to $1 Million. Intermittent impact on Asset performance	Impact of between $1 Million up to $5 Million. Severe effect on Asset performance	Upwards of $5 Million impact, or unable to function
Compliance *A condition, activity or process that does not conform/comply with internal policy, procedure or process or breaches regulatory requirements*	Isolated occurrences of non-conformances by company and/or individual staff members with no material impact	A non-conformance leading to minor impact in business or operational performance	A non-conformance with moderate impact in operational or business performance (or potential thereof)	A non-compliance with major impact in business or operational performance (or potential thereof), resulting in possible regulatory intervention	Loss of AOC/regulatory approvals and extensive disruption to services and business over an extended period. Significant company liability
Security *Entities or individuals that possess the capability, motivation and intent to pose a credible threat to the business*	Incidents requiring staff intervention, or resulting in a delay <3 mins	Incidents where the situation is quickly and successfully controlled by staff, delay <15 mins	Incidents where the matter is dealt with and a formal warning is issued	Incidents where intervention is required by staff and/or authorities. Includes disruptive protest action, unauthorised occupation of premises, runway incursion by protesters, act of unlawful interference	Intentional attack on aircraft, airport offices or other facilities using weapons designed to inflict injury, cause major damage or disrupt the operations (ie: IT cyber-attack)
Environmental Sustainability *Fuel usage, waste management, energy use, environmental compliance, emissions to air, land and water*	No environmental impact or financial consequences	Minor environmental issues; on site release immediately contained; minor financial implications	Moderate emissions to off site, pollutants to air/land/water, overuse/unnecessary depletion of resources, remediation cost involved; no consent or breach of consent conditions	Contamination remediated with minimal long term effect. Significant emissions or pollutants that can be contained, managed or controlled. A non-compliance resulting in possible regulatory intervention	Extensive release of contaminants or emissions to off site, uncontained, immediate and long term serious environmental damage
Completion of a Programme or Capital Project / Change Management	No time delay with the initiative but will incur a minimal decrease in benefits realised or increased cost	Minor delay with the initiative and/or minor decrease in benefits realised or increased cost	Substantial delays with the initiative and/or decrease in benefits realised or increased additional cost	Severe delays with the initiative and/or significant decrease in benefits realised or additional costs approaching unacceptable limits	Failure to realise benefits which adversely affects several segments and/or has an unacceptable level of additional cost
Impact on Op Ex / Op Rev	**<3%**	**3 – 5%**	**5 - 10%**	**10 - 20%**	**20% +**

CONSEQUENCES – SEVERITY

LIKELIHOOD	INSIGNIFICANT	MINOR	MODERATE	MAJOR	CATASTROPHIC
Frequently *Happens (or is expected to occur) daily or weekly in this location*	L8	M14	C20	C22	C25
Likely *Happens (or is expected to occur) monthly in this location*	L7	M10	M15	C21	C24
Possible *Will occur in some circumstances and has happened in the company before (every 1-5 years)*	L3	M9	M12	M17	C23
Unlikely *Could occur in some circumstances (every 5-50 years) and is known in the industry*	L2	L5	M11	M16	C19
Rare *Could occur but only in exceptional circumstances, possible in the industry (50 years +)*	L1	L4	L6	M13	M18

KEY: Risk Level

LOW (range from 1 – 8)		MODERATE (range from 9 - 18)		CRITICAL (range from 19 -25)	

V 1.0 04 May 2016

APPENDIX A
Health and Safety Risk Assessment

SID – Risk Assessment

Project Name:

File Number:

Date: **Revision:**

REF #	CATEGORY	HAZARD	RISK	INHERENT CONTROLS	INHERENT LIKELIHOOD	INHERENT CONSEQUENCE	INHERENT RISK RATING	ADDITIONAL CONTROLS	RESIDUAL LIKELIHOOD	RESIDUAL CONSEQUENCE	RESIDUAL RISK RATING	TASKS & RESPONSIBILITY
1	CONSTRUCTION	The site may be contaminated. Site is classified as a Category 1 contaminated site.	Exposure of workers to a hazardous substance.	A Contaminated Site Management Plan has been prepared by Tonkin and Taylor. The plan shall be included in the Contract documents if the site is still classified as Category 1.	Possible	Major	EXTREME	Testing shows site not contaminated.	Rare	Minor	LOW	
2	CONSTRUCTION	Deep foundation excavations	Collapse, person/machinery falls in	Limit the depth of foundations to 1500mm or less where structurally practicable.	Possible	Moderate	HIGH	The Contractor shall place barriers around or over excavations at all times. Contractor site specific task analysis when working near excavations.	Rare	Moderate	MODERATE	xxxxx to limit the depth of foundations to less than 1500mm where structurally practicable. The Contractor shall place barriers around or over excavations at all times. Contractor site specific task analysis when working near excavations.
3	CONSTRUCTION	Erection of precast and/or tilt-up panels	Collapse during erection	Panels are typical size and weight.	Unlikely	Catastrophic	EXTREME	The Contractors site foreman shall be experienced in the erection of precast and tilt up panels. CIAL to only tender the project to Contractors with suitable experience. Contractor to ensure lifting design is carried out by a suitably qualified engineer. Contractor to comply with "The Safe Handling, Transportation and Erection of Precast Concrete"	Rare	Catastrophic	HIGH	CIAL project managers to ensure that the project is tendered only to Contractors with suitable experience in precast and tilt-up construction. xxxxx to specify that the Contractor must comply with "The Safe Handling, Transportation and Erection of Precast Concret" xxxxx to specify that the Contractor must engnage a suitably qualified engineer to design the panel lifting. Contractor to ensure that the site foreman is experienced in tilt-up and precast construction and adhere to the
4	CONSTRUCTION	Stability of precast panels during construction	Collapse of precast panels during construction	Panels are typical size and weight. An experienced contractor is expected to be capable of securing the panels with standard propping systems.	Unlikely	Catastrophic	EXTREME	Contractor to produce a precast panel propping design, by an experienced engineer, in accordance with NZS1170 for stability of the panels during construction.	Rare	Catastrophic	HIGH	xxxx to specify that the Contractor shall prepare a propping design by a Chartered Engineer. The Contractor shall adhere to the specification.
5	CONSTRUCTION	Working at height.	Fall from height.	Working at height is a common hazard on building sites and an experienced contractor is expected to have equipment and proceedures to make working at height as safe as practicable.	Rare	Major	HIGH	Design the structure so that large sections of the roof can be constructed at ground level and lifted into position.	Rare	Major	HIGH	xxxx to design the structure so that large sections of the roof can be constructed at ground level and then lifted into position. Contractor to consider this as a construction method.
6	CONSTRUCTION	Stability of structural steelwork during erection.	Collapse of steelwork during erection.	Typical portal frame construction. Experienced steelworkers are expected to be familiar with safe erection procedures for this type of structure.	Unlikely	Catastrophic	EXTREME	The structural steelwork contractor shall comply with Section 11 of AS/NZS 5131:2016, and shall prepare an erection sequence methodology. The stability design in accordance with section 11.4 shall be prepared by a chartered engineer.	Rare	Catastrophic	HIGH	xxxx shall reference Section 11 of AS/NZS 5131:2016. The Contractor shall comply with the specification.
7	CONSTRUCTION	Comms duct and 300 dia watermain beside building.	Damage during foundation excavation.	Building has been set back from expected duct position.	Unlikely	Moderate	MODERATE	Include requirement on drawings for the contractor to locate the ducts prior to excavating.	Rare	Moderate	MODERATE	xxxx to include note on drawings that identifies the ducts and requires the contractor to locate them prior to excavating.
8	CONSTRUCTION	Soakpit construction. Workers in soakpit hole.	Collapse of hole while person inside.	Well know rule that workers cannon enter a hole greater than 1.5m deep if without shoring.	Rare	Major	HIGH	xxxxx has located the soakpit in an area where the gravels are shallow. The soakpit hole will be less than 1.5m deep.	Rare	Minor	LOW	N/A
9	OPERATION & OCCUPATION	Freezer/chiller environment.	Person gets trapped inside.	The tenant should have a H&S procedure to deal with people operating in the freezer/chiller.	Possible	Major	EXTREME	Ensure man doors openable from the inside without a key are located in all coolstore rooms.	Rare	Insignificant	LOW	xxxxto ensure each coolstore room has a mandoor that can be opened from the inside without a key.
10	OPERATION & OCCUPATION	Pedestrian safety within warehouse and coolstore.	Collison between person and forklift	Tenant should have a H&S procedure to deal with pedestrians within the warehouse and coolstore.	Possible	Major	EXTREME	Racking in aisle beside the office will contain retail product picked by hand. Forklifts may need to access this aisle rarely and when this occurs it shall be addressed by the Tenants safety plan. The ELA lobby has been made larger and barries located on the developed design plans to seperate pedestrains from forklift traffic.	Rare	Moderate	MODERATE	Tenant to prepare a H&S for pedestrains in the warehouse/coolstore area.
11	OPERATION & OCCUPATION	Limited warning available to others before a forklifts drives through a rapid rise door.	Collision between forklift and other users.	Tenant should have a H&S procedure to deal with rapid rise doors.	Possible	Major	EXTREME	Tenant has indicated preference for a warning system and vision panels. xxxxx to seek proposal from door manufacturers for evaluation.	Rare	Major	HIGH	xxxxx to seek proposal from door manufacturers for evaluation.
12	OPERATION & OCCUPATION	Forklift collision with door head/jambs, particularly in coolstore.	Damage to insulated panel structure.	Doorways openings to be sized to suit forklift mast height (TBC by tenant).	Likely	Minor	HIGH	This risk has been discussed with the Tenant. The tenant considers the probability to a forklift mast hitting the door head to be low, as the forklift masts are always down when the forlifts are travelling. The Tenant will still be presented with a option for bollard protection.	Unlikely	Minor	LOW	Tenant to confirm required door opening sizes. xxxxx to present bollard options.
13	OPERATION & OCCUPATION	Floor loads.	Overloading.	The floor shall be designed in accordance with NZS1170 for the building use and racking loads provided by the tenant.	Possible	Moderate	HIGH	Floor load limits shall be specified in the Structural Design Features Report. This shall be provided to the Tenant.	Rare	Moderate	MODERATE	xxxx to specify floor load limits in the Structural Design Features Report. CIAL to provide the Tenant with a copy of the Structural Design Features report.
14	OPERATION & OCCUPATION	Earthquake.	Structural damage to building.	Building designed in accordance with the NZ Building Code.	Rare	Major	HIGH	Owner to arrange inspection of the building by a suitably qualified structural engineer after a significant earthquake, prior to re-occupying the building.	Rare	Minor	LOW	Owner to arrange inspection of the building by a suitably qualified structural engineer after a significant earthquake, prior to re-occupying the building.
15	ONGOING MAINTENANCE	Roof access - no fall arrest system provided in design	Fall from roof	No roof access provided	Rare	Catastrophic	HIGH	If a person must access the roof, a system (temporary or otherwise) to prevent a fall from the roof must be installed.	Rare	Insignificant	LOW	If a person must access the roof, a system (temporary or otherwise) to prevent a fall from the roof must be installed.
16	ONGOING MAINTENANCE	Cleaning warehouse external gutters.	Fall	Gutters accessible by mobile access plant.	Unlikely	Major	HIGH	CIAL has advised the the gutter will be cleaned from an all terrain cherry picker or similar. Xxxxx to ensure 2.5m wide accessway is allowed for in the design.	Rare	Insignificant	LOW	xxxxx to design northern strip beside warehouse to be flat and stable for operation of an all terrain cherry picker or scissor lift. 2.5m wide access way to be allowed for in the design. CIAL to use appropriate access equipment for maintenance of the gutters.
17	ONGOING MAINTENANCE	Cleaning canopy gutter.	Fall	Exposed parts of gutter accessible by mobile access plant.	Unlikely	Major	HIGH	CIAL has advised that a specific saftey plan will be prepared in the event that a person needs to access the canopy roof.	Unlikely	Major	HIGH	CIAL to prepare a specific safety plan in the event that a person must access the canopy roof.
18	ONGOING MAINTENANCE	Cleaning office internal gutter.	Fall	Partial protection from office parapet, however parapet is less than 1.1m high.	Possible	Major	EXTREME	CIAL has requested that the office parapet is exteded to 900mm above the gutter to provide fall protection. CIAL will prepare a specific safety plan in the event that a person needs to access the office roof.	Rare	Catastrophic	HIGH	xxxxx to extend the parapet to 900mm above the gutter. CIAL to prepare a specific safety plan in the event that a person needs to access the office roof.
19	FUTURE DEMOLITION	Collapse of building elements during demolition	Injury of workers	Competent contractor following safe working practices. Conventional structural systems that contractors will be familiar with	Unlikely	Catastrophic	EXTREME	Demolition contractor should engage a qualified engineer to assist with demolitions strategy. The building owner should make the drawings and structural design features report available to the demolition contractor.	Rare	Major	HIGH	Demolition contractor should engage a qualified engineer to assist with demolitions strategy. The building owner should make the drawings and structural design features report available to the demolition contractor.

IMPORTANT NOTE: A number of risk events listed above have a residual rating of HIGH, due to the severity of the potential consequences. These will require appropriate consultation between the Contractor/s and Work Safe New Zealand. In addition, all workers involve in these potential risks (e.g. onsite) should be made aware of the likelihood and consequences of these risks, as well as all controls implemented to manage them. By continuing their involvement with this project, all parties acknowledge and accept these risks.

APPENDIX 2
DESIGNER EXPECTATIONS

- Discuss, agree and document performance objectives with CIAL in a **design quality plan.**
- Understand existing conditions – assess and document existing conditions and infrastructure to inform design decisions and ensure compatibility with new designs.
- Identify and prioritise critical assets, design features and compliance requirements essential for quality and safety and capture outcomes in the design quality plan.
- Define clear acceptance criteria for completed works and include in the **design quality plan** – i.e. clearly define what 'done' means.
- Ensure CIAL design guideline compliance checklists are coordinated and completed at each stage of design.
- Highlight to CIAL if changes affect quality objectives and ensure mitigation measures remain in place to deliver assets to the required standard.
- Ensure the design complies with all necessary regulations and is consistent with CIAL's contract documents, including CIAL's P&G information and warranty schedule. Outline how the design meets these requirements.
- Provide input into a quality risk workshop. Scale the workshop to the project's scope and complexity to address quality risks.
- Assess risks and compliance requirements and collaborate with CIAL to document mitigation measures in the design documentation. Develop appropriate inspection and testing plans to align with construction monitoring requirements.
- For building services systems and other live assets, agree on commissioning requirements, the need for an independent commissioning agent and specific building or system tuning periods.
- Stakeholder engagement – ensure continuous communication with CIAL to gather feedback and address any concerns.

On the following page there is a summary table of the construction monitoring expectations depending on the selected level. CIAL will NOT allow construction monitoring less than level 3 on any development.

CM3 Review	
Review random samples of important work for compliance with the requirements of the plans and specifications and fully review completed critical assets to enclosure or on completion as appropriate. Be available to provide the constructor with technical interpretation of the plans and specifications throughout delivery.	• Twice-weekly visit during construction (i.e. 60 visits over 30-week construction). • Weekly summary QA reports on progress complete and quality seen. • Full defect review and schedule to be created for ALL design elements. • Full on-site verification of defect close-out.

CM4 Review	
Review regular samples of all work and materials of construction and components for compliance with the requirements of the plans and specifications and review the majority of completed work prior to enclosure or on completion as appropriate. Be available to provide the constructor with technical interpretation of the plans and specifications throughout delivery.	• Every second day visit during construction (i.e. 75 visits over 30-week construction). • Weekly summary QA reports on progress complete and quality seen. • Full defect review and schedule to be created for ALL design elements. • Full on-site verification of defect close-out.

CM5	
Maintain personnel on site to constantly review work procedures, materials of construction and components for compliance with the requirements of the plans and specifications and review completed work prior to enclosure or on completion as appropriate. Be available on site to provide the constructor with technical interpretation of the plans and specifications throughout delivery.	• Full presence on site. • Weekly summary QA reports on progress complete and quality seen. • Full defect review and schedule to be created for ALL design elements. • Full on-site verification of defect close-out.

APPENDIX 3
CONTRACTOR EXPECTATIONS

Contractor's responsibilities

- Develop a **quality control plan** that identifies the required inspection, testing, commissioning and system tuning requirements as specified in the plans and specifications.

Quality control plan

- Inspection and testing plan (ITP): Develop detailed procedures for inspecting and testing all new assets.
- Commissioning plan: Outline procedures for commissioning activities, including system start-up and performance verification.
- Tuning plan: Identify clear post-completion tuning requirements for active systems over the defect liability period.
- Performance metrics: Establish metrics to evaluate the performance of installed systems and ensure they meet the requirements of the plans and specifications.
- Documentation: Maintain comprehensive records of ALL inspection, testing and commissioning activities.
- Notification: Implement a process for promptly notifying CIAL when test or inspection results do not meet the required standards. This ensures transparency and allows for timely corrective actions.