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KAPITI COAST AIRPORT NEW CONTROL TOWER

KAPITI ROAD,
PARAPARAUMU

KAPITI COAST AIRPORT HOLDINGS LTD

VERSION A

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ISSUE AUTHORISATION

Project: Kapiti Coast Airport New Control Tower, Kapiti Road, Paraparaumu

Project No. 107266.09

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A	21 July 2016	Preliminary	MCH	HXF

Version	Extent of revision

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The building owner must be aware that the fire safety solutions described in this report address the requirements of the Building Code. Consideration of protection of the building owner's property is not included unless this has been specifically requested.



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1 PURPOSE

The purpose of this report is to determine the minimum fire safety precautions that must be installed within the proposed New Control Tower at Kapiti Coast Airport, Paraparaumu to demonstrate compliance with Section 17 of the New Zealand Building Act 2004 with respect to the fire regulations.

This is a legal requirement whereby it must be shown that after the completion of works, the objectives of clauses of the New Zealand Building Code relating to means of escape from fire, protection of other property, and structural and fire rating behaviour are satisfied.

This Fire Safety Strategy Report includes a performance based Scope of Works advising of fire safety issues affecting architecture, building services and structure in accordance with the requirements of the New Zealand Building Code.

As such this report is a performance document that is intended to be used by the Architect and other consultants in implementing their detailed designs and preparing their working drawings and specifications. The consultants whose documentation is required to incorporate the requirements of this Fire Safety Strategy Report are expected to have read this report, understood the implications as it affects their scope of work and have incorporated the relevant fire safety requirements into their drawings and specifications.

This is not a 'For Construction' document, and shall be read in conjunction with all other appropriate project design documents (drawings, specifications, and other documents) prepared by the other design disciplines.

This report is issued for the purpose of allowing the design to develop in compliance with the fire safety requirements of the Building Code.

Additional comments have been included in shaded boxes similar to this to give further information for consideration by the design team.

This report will not be suitable for submission for Building Consent until all issues are resolved, options selected and these shaded boxes removed from the report and also the report developed to include the assessment of compliance with C/AS5 for review by the Building Consent Authority.

2 DESIGN PHILOSOPHY

To demonstrate compliance with the relevant fire safety clauses of the Building Code, the following Compliance Documents have been adopted as the design basis:

1. C/AS5 –Acceptable Solution for Buildings used for Business, Commercial, and Low Level Storage, Risk Group WB, Amendment 3, 1 July 2014.



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3 GENERALLY

The project consists of the construction of new airport control tower facilities at Kapiti Coast Airport, Paraparaumu. The facilities will comprise of a 2 level tower with a single internal stair and separate adjacent single level buildings housing offices and an equipment room.

4 SCOPE OF WORKS

We believe that the proposed new Control Tower and offices will be in compliance with the objectives of the New Zealand Building Code clauses C1 to C6 Protection from Fire, to the extent required by the Building Act, based on implementation of the following Scope of Works. This shall be read in conjunction with the attached Fire Safety Sketches.

4.1 Active Fire Safety Systems

- 4.1.1 A new smoke/heat detection system is required to be installed throughout the buildings in accordance with NZS 4512.

Smoke detectors are not required to be installed in all areas where ambient environmental conditions are likely to result in nuisance alarms such as in kitchen areas. Heat detectors will act to provide adequate warning in these areas.

- 4.1.2 A new manual fire alarm system is required to be installed throughout the buildings in accordance with NZS 4512.

- 4.1.3 Any air-conditioning and mechanical ventilation plant connecting to multiple firecells is required to have an in-duct smoke detection system.

When any smoke detection system is activated, it shall automatically turn off all air-conditioning and mechanical ventilation plant which is not required or designed for fire safety.



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4.2 Means of Escape and Wayfinding

- 4.2.1 Doors leading in to the stair shall have a minimum clear opening width of 875 mm.

The stairs shall have a width of at least 1000 mm. Handrails are permitted to impinge into the required escape route width by up to 100 mm without affecting the required vertical travel width.

- 4.2.2 All locking devices on doors on escape routes shall be clearly visible, located where such a device would normally be expected, designed to be easily operated without a key or other implement and allow the door to open in a normal manner.
- 4.2.3 Doors on escape routes that are fitted with electronic locking devices shall also be fitted with a push button or switch that releases the lock and allows the door to be opened (in the direction of escape) without a swipe card or key code, unless the doors act under free handle. This push button or switch may be placed behind a break-glass panel but must be clearly labelled "Emergency door release". Electromechanical locks that are not free handle are required to unlock (fail safe/open) in the event of power failure or door malfunction.
- 4.2.4 Vision panels are to be provided to doors into exitways (into safe path stairs) and to doors in corridors along an escape route, and those that swing in two directions. Vision panels in smoke control doors shall be no less than 150 mm from the leaf edge.
- 4.2.5 Escape routes shall comply with NZBC D1. Stairs, landings, handrails, doors, vision panels and openings shall comply with the Acceptable Solution D1/AS1.
- 4.2.6 Emergency lighting is required to be installed within the building in accordance with F6/AS1.
- 4.2.7 Exit signage is required to be installed throughout the building in accordance with F8/AS1 (note that F8/AS1 4.5.1 permits signs to be internally illuminated, externally illuminated or photoluminescent).

Indicative locations of exit signs are shown on the attached plans; however these do not take account of possible obscuration due to the installation of storage racks, plant, furniture and other fittings and therefore should not be assumed to depict all required signs.

- 4.2.8 Fire related safety features within the building are required to be provided with signage in accordance with F8/AS1. This includes signs to manual call points, fire and smoke control doors and signs in the stairwell to identify the floor level.



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4.3 Control of Internal Fire and Smoke Spread

- 4.3.1 All doors on escape routes shall have a clear height of no less than 1955 mm for the required width of the opening.
- 4.3.2 Primary supporting structures for all fire rated elements are required to achieve a fire resistance rating of not less than 60/-/- under the design dead and live loads required by NZBC B1 and any additional loads caused by the fire (e.g. from deformations/elongations of building elements due to elevated temperatures).

The structural engineer is required to identify the supporting structure for all fire rated elements and these are in turn required to be suitably fire rated or demonstrated by calculation to not require treatment.

Fire rated walls may be cantilevered from a structural base having a FRR of no less than the building element concerned, or be supported by primary elements outside the firecell.

- 4.3.3 Fire separations are required to be continuous from the ground or floor slab below, up to the underside of the fire rated floor slab or fire rated ceiling above, or underside of the roofing material, as applicable.
- 4.3.4 All penetrations through fire separations (created by wires, cables, pipes, flush boxes, etc) are required to be fire stopped with systems (collars, wraps, sleeves, mastics, etc) that are approved for the proposed use (e.g. rating, orientation, penetration type, construction type) in accordance with AS 1530 and AS 4072.1. Where fire stopping systems to AS 4072.1 are not able to be provided, it is acceptable to incorporate systems tested to BS EN 1366.3, or UL 1479. Fire stopping systems are required to be installed strictly in accordance with the manufacturer's instructions.
- 4.3.5 All access panels or hatches within fire separations are required to be certified to AS 1530.4 to achieve a FRR of no less than -/30/- sm.
- 4.3.6 Fire dampers are required to be installed where HVAC ductwork penetrates through fire separations. Dampers are to be installed in accordance with AS 1682 and the manufacturer's instructions.
- 4.3.7 Throughout the building the internal surface finishes shall meet the following early fire hazard indices limitations (when tested to ISO 9705 as per C/VM2 Clause A1.2, or ISO 5660 as per C/VM2 Clause A1.3).

Building Elements	Location	Maximum Material Group
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Building Elements	Location	Maximum Material Group
Ceilings and walls	Control Tower	1S
Ceilings and walls	All other occupied spaces	3
HVAC ducts	Internal surfaces	2
	External surfaces	3

The correlation of wall and ceiling surface finishes derived from Australian or European classifications to the Group Number requirements of NZBC Clause 3.4(a) can, without the need for further testing, be taken as described in the following table.

Group Number to NZBC Clause C3.4(a) using ISO 9705:1993	Australian Group Number to NCC Specification C1.10 Clause 4 using AS ISO 9705:2003	European Classification to EN 13501-1:2007+A1:2009
1-S	Group 1, and a smoke growth rate index not more than 100	Class A1, A2 or B and Smoke production rating s1 or s2
1	Group 1	Class A1, A2 or B
2-S	Group 2, and a smoke growth rate index not more than 100	Class C and Smoke production rating s1 or s2
2	Group 2	Class C
3	Group 3	Class D

4.3.8 Any foamed plastic building materials or exposed combustible insulating materials forming part of a wall, ceiling or roof system are required to have a completed system (foamed plastic and/or foamed plastic plus a surface lining) meeting the above maximum material group number as applicable for the location of this building material. In addition the foamed plastic is to meet the flame propagation criteria as specified in AS 1366. It is strongly recommended that foamed plastic materials are not used.

4.3.9 The flooring shall meet the following critical radiant flux limitations (when tested to ISO 9239-1).

Area of Building	Minimum Critical Radiant Flux [kW/m ²]
Exitways (safe path stair)	2.2
All other occupied spaces	1.2



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- 4.3.10 Within the building any suspended flexible fabrics shall have a Flammability Index of no greater than 12 (when tested to AS 1530.2).
- 4.3.11 Flexible fabrics used as underlay to roofing or exterior cladding that is exposed to view, shall have a flammability index of no greater than 5 (when tested to AS 1530.2).
- 4.3.12 Any solid fuel, gas burning, and oil fired appliances and downlights, shall be designed and installed to C/AS1 to C/AS6 Part 7 and the manufacturer's requirements.

4.4 Control of External Fire Spread

The external faces of the building are permitted to 100 % unprotected if the building is located 5 m or more from the property boundary. If any face of the building is located within 5 m of the boundary it is required to be constructed to achieve an FRR of at least (120)/120/120sm.

4.5 Firefighting

- 4.5.1 Vehicular access needs to provide access to within 20 m of the Fire Service Inlets. The fire alarm control panel shall also be located nearby (as to be approved by the NZ Fire Service).
- 4.5.2 As the building may be located remote from the street boundaries of the property, the pavements (where indicated on the site plan) will be used for vehicular access and therefore need to comply with the following items.
- Internal access roads and pavements shall withstand a laden weight of up to 25 tonnes with an axle load of 8 tonnes, or have a load-bearing capacity of no less than the public roadway serving the property, whichever is lower.
 - Be trafficable in all weathers.
 - Have a minimum width of 4.0 m.
 - Provide a clear passageway of no less than 3.5 m width and 4.0 m in height at site entrances, internal entrances and between buildings.
- 4.5.3 A site hydrant system complying with SNZ PAS 4509 is required where the following criteria are not satisfied by the hydrants located in the public street.
- The flowrate required is 12.5 litres/second from one hydrant located within 135 m, and an additional 12.5 litres/second from a second hydrant located



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within 270 m, when providing the required flowrate the minimum running pressure shall be 100 kPa.

The scope of works above lists the fire safety precautions needed for compliance with the fire safety requirements of the Building Code, this scope of works should be read with the plans appended to this report. Information contained within the following sections of this report is technical information intended to assist in the approvals process only.



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5 MEANS OF ESCAPE

5.1 Risk Groups and Occupant Loads

The following is a summary of the design occupancies and risk group classifications within the building.

Table 1: Summary of Risk Groups and Occupant Loads

Level	Description	Risk Group	Area [m ²]	Occupant Density [m ² /person]	Occupant Load
1	Air Control	WB	40	10	4
G	Offices/Equipment Room	WB	36	5	8
	Total				12

The above occupant loads are based upon the methods recommended in the Acceptable solutions C/AS5.

5.2 Fire Safety Precautions and Fire Resistance Ratings

The following summarises the fire safety precautions for the building from C/AS5.

Table 2: Fire Safety Systems Required

Risk Group	Occ. Load	Escape Height [m]	Systems	Notes
WB	< 100	4.0 to 25	4, 9, 18 ¹	≤5.0 m storage height limit.

Explanatory Notes:

1. Not required where Fire Service hose run distance from the point of Fire Service vehicular access to any point on any floor is less than 75 m.

Table 3: Fire Resistance Ratings Required

Risk Group	Life Rating [min]	Property Rating [min]
WB	60	120

Given the above the proposed fire safety features are shown below with comparison to the requirements of C/AS5 as appropriate.



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Table 4: Proposed Fire Safety Precautions

Feature	C/AS5 Requirement	Proposed Features
Fire Rating	(60)/60/60 between firecells.	The building is considered a single firecell no internal fire separations are required or proposed.
Alarm System	An automatic fire alarm system consisting of smoke detectors and manual call points.	A smoke detection system is to be provided in both buildings in accordance with NZS 4512.
Fire Hydrant System	Not required as Fire Service hose run distance is less than 75 m.	Not required as Fire Service hose run distance is less than 75 m.
Other Protection	Smoke control in air handling systems.	Air handling system will not span across firecells and therefore smoke control is not required.

Table 5: Other Precautions Related to Means of Escape

Feature	F6/AS1 and F8/AS1 Requirement	Existing/Proposed Features
Visibility in Escape Routes	Emergency lighting fixtures to be provided in accordance with F6/AS1.	Emergency lighting fixtures to be provided in accordance with F6/AS1.
Exit & Directional Signage	Exit and directional signage required accordance with F8/AS1.	Exit and directional signage required accordance with F8/AS1.

DUTY OF CARE

Please note that the solution we are proposing herein will meet the requirements of the New Zealand Building Code to the extent required by the Building Act with respect to the means of escape from fire, protection of other property, and structural and fire rating behaviour only.

Under the New Zealand Building Act 2004, there is no requirement for the building owner to protect their own property other than to satisfy the life safety objectives of the Building Act. As such, in the event of a fire, it is possible that the property loss within the building could be significant.

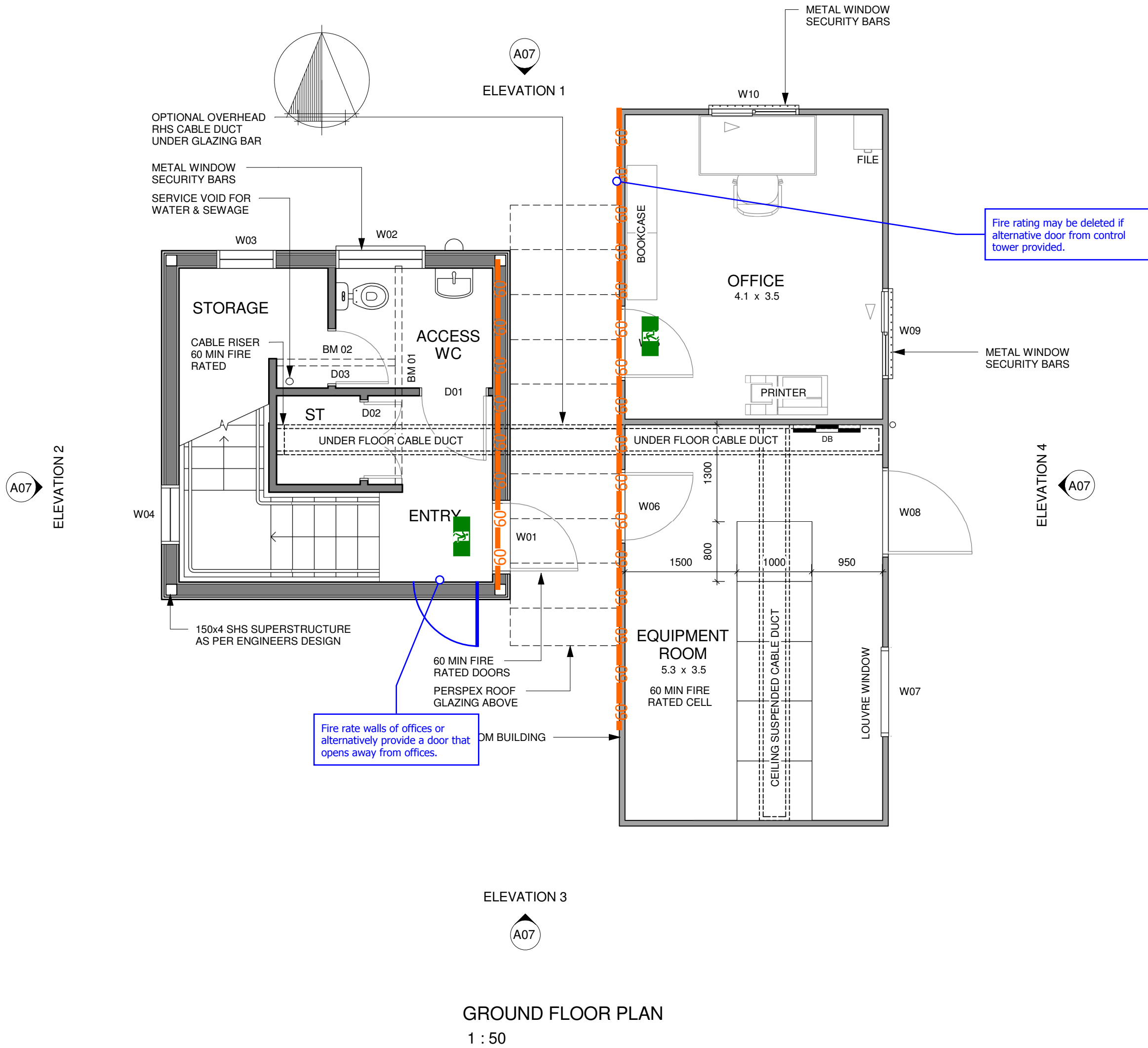
The extent of emergency lighting specified in this fire report are minimum for fire safety only and does not specifically account for lighting that may be needed for other emergencies. Please note that other emergency lighting not specified in this report and not related to fire safety may be required for compliance with Clause F6 of the New Zealand Building Code.



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Escape route widths specified in this fire report are minimum widths for fire safety only and do not specifically account for widths that may be needed for access for people with disabilities. Also note that other escape routes features (not specified in this report) and not related to fire safety may be required for compliance with Clauses D1 and F4 of the New Zealand Building Code.

The details provided in this report are meant only for the design team during design stage, and does not constitute sufficient detail for Building Consent.



1	09-06-16	Design Changes
Rev	Date	Description

a. ADarchitecture
Applied Design

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NOT FOR CONSTRUCTION

CONTROL TOWER
 for KCAHL
 AIRPORT
 PARAPARAMU

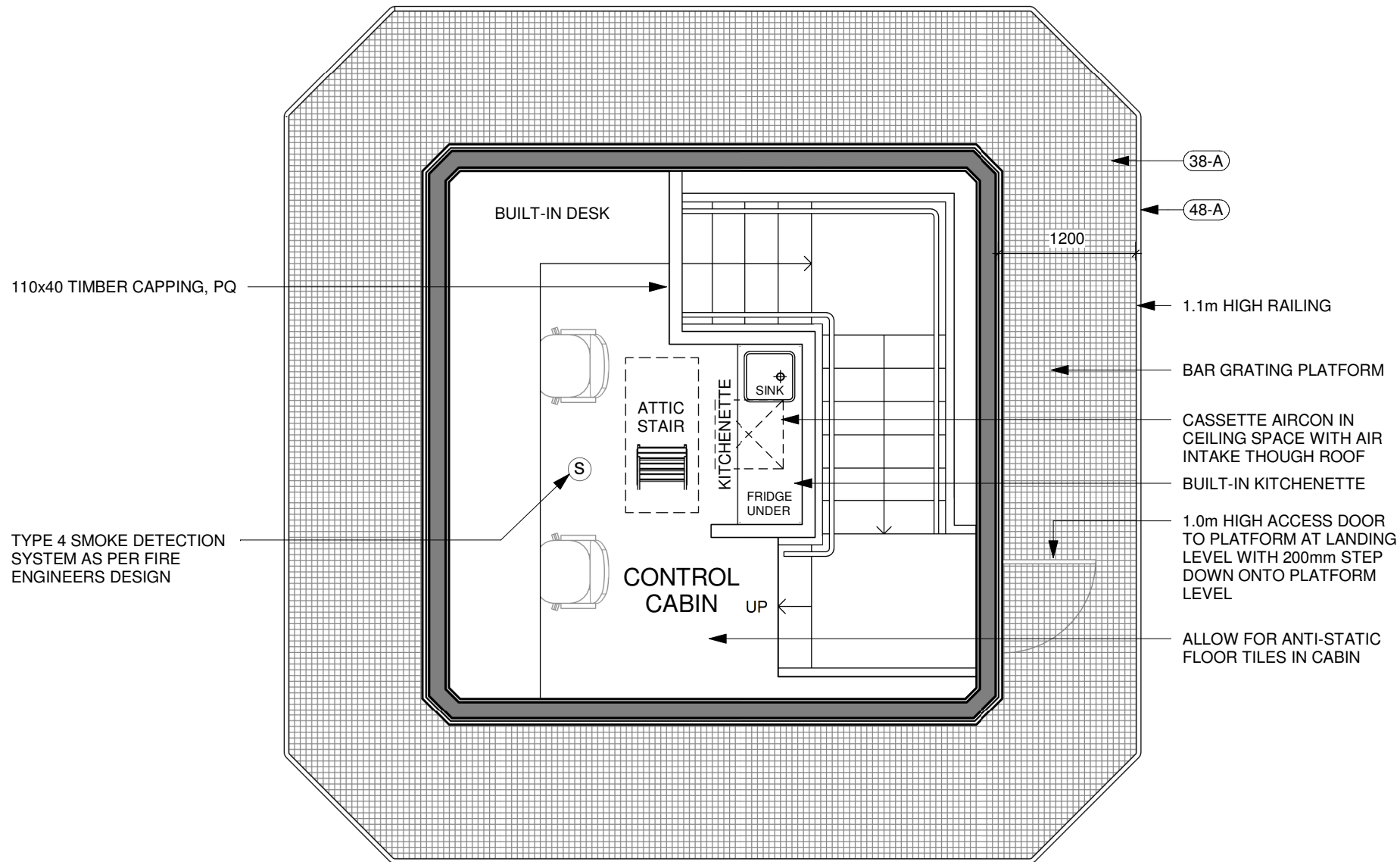
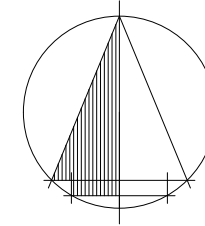
PROGRESS

GROUND FLOOR PLAN

DO NOT SCALE DRAWING

Job	Date	Sheet(A3)	Rev.
16082	26/05/16	A05	1

GROUND FLOOR PLAN
 1 : 50



1	09-06-16	Design Changes
Rev	Date	Description



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NOT FOR CONSTRUCTION

CONTROL TOWER
for KCAHL
AIRPORT
PARAPARAUMU

PROGRESS

CONTROL CABIN FLOOR PLAN

DO NOT SCALE DRAWING

Job	Date	Sheet(A3)	Rev.
16082	26/05/16	A06	1

CONTROL CABIN FLOOR PLAN
1 : 50