Proposed Industrial Development
104 Ryans Road, Christchurch

CHRISTCHURCH INTERNATIONAL AIRPORT SAFEGUARDING ASSESSMENT

for Carter Group

14 August 2025

L+R AIRPORT CONSULTING

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Revision	Date	Description	Author	Verifier	Approver
0	13.08.25	Draft	BJH	BMW	BJH
1	14.08.25	Final	BJH	BMW	BJH

Executive Summary

L+R Airport Consulting was engaged by Carter Group to undertake an aviation safeguarding and airport compatibility assessment of the proposed development at 104 Ryans Road, Christchurch, as it relates to Christchurch International Airport (CIA), to accompany an application for fast-track approval under the Fast Track Approvals Act 2024.

The scope of our review is limited to airport safeguarding matters and considers the matters addressed in the Assessment of Effects on the Environment (AEE) within the *Fast-Track Approval – Resource Consent Applications & Wildlife Act Permit* report (April 2025, and subsequent amendments as described later in this report) prepared for Carter Group by Novo Group Ltd, in relation to relevant planning provisions and other guidelines for the safeguarding of airport and aircraft operations from potential impacts associated with the proposed development.

L+R Airport Consulting found that a number of airport safeguarding aspects, including airspace protection for aircraft operations, light spill and glare, wildlife hazards, activities which may impair pilot visibility and those which may promote incompatible activities such as congregations of people or noise sensitive uses, are covered adequately by the operative Christchurch District Plan. The development will comply with these provisions and otherwise volunteers consent conditions that further reinforce these requirements for future owners and developers of the land.

In relation to aspects not covered within the planning provisions, L+R Airport Consulting has also considered navigational aids, helicopter operations in the vicinity of the site, and building generated windshear and turbulence risks. The key findings and proposed mitigations for these are as follows:

- **Navigational aids**
  - The AEE references consultation with Airways, who has provided information regarding the technical requirements for protection of the ILS and the DVOR navigation aids at CIA. This information has been included in the scheme plans and conditions of consent are proposed to prevent any impacts on these navigational aids.
  - The AEE consultation with Airways also refers to the possible upgrade of the Runway 02 approach lighting system to CAT III (from CAT I) which would result in an enhanced approach lighting array. Based on recommended light plane requirements within ICAO Annex 14 Volume I Aerodromes, development on the proposed site should not obstruct the visibility of the approach lighting by pilots.
- **Helicopter Operations**
  - Carter Group proposes to include the GCH helicopter protection surfaces, as provided by CIA within the scheme plans and introduce consent conditions ensuring they remain free from intrusions.
- **Building Generated Windshear and Turbulence**
  - Australian guidance sets out a multi-step process for mitigating the potential impact of windshear and turbulence caused by buildings in the vicinity of runways. This is not mandated nor are provisions around this matter adopted with the CDP. Nevertheless, Carter Group proposes to incorporate the advisory 1:35 slope assessment trigger surface within the scheme plans Airport Safeguarding Set and include a condition of consent that requires assessment by a suitably qualified and experienced professional in alignment with the recommendations of the Australian guidance.

  Based on the above key findings and proposed mitigations, and our experience, L+R Airport Consulting believes the proposal appropriately safeguards the safety, efficiency and regularity of CIA operations, in the context of development proposals of a similar nature adjacent to airports such as CIA.

Glossary

Aerodrome	'Aerodrome' is the international term for the area defined for landing, departure and surface movement of aircraft, and is used when referring to regulatory matters.
AC	Advisory Circular
AEE	Assessment of Environmental Effects
AMSL	Above Mean Sea Level
CAA	Civil Aviation Authority of New Zealand
CAR	Civil Aviation Rules (New Zealand)
CASA	Civil Aviation Safety Authority (Australia)
CDP	Operative Christchurch District Plan
CIA	Christchurch International Airport
CIAL	Christchurch International Airport Limited
DVOR	Doppler VHF (Very High Frequency) Omni-directional Range
DME	Distance Measuring Equipment
FATO	Final Approach and Take Off area (for a helicopter landing site)
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules
NASF	National Airports Safeguarding Framework
NZAA	New Zealand Airports Association
OLS	Obstacle Limitation Surfaces
PSA	Public Safety Area
REPA	Runway End Protection Area
VFR	Visual Flight Rules

1. Introduction

L+R Airport Consulting is the specialist aviation division of the Lambert & Rehbein (L+R) group, a 100% Australian owned and operated, multi-disciplinary consultancy offering services in the aviation, civil, structural, traffic, environmental, project management, and infrastructure sectors. We have been providing airport owners and operators, airlines, government agencies, construction companies, property developers and other consultants with a range of specialist aviation consulting services since 1992. Our team includes a chartered civil engineer and with a postgraduate degree in airport planning and a qualified planner, both with over 25 years aviation industry experience, and a qualified PANS-OPS flight procedure designer. The team has undertaken numerous aviation safeguarding and aeronautical impact assessments.

L+R Airport Consulting was engaged by Carter Group to undertake an aviation safeguarding and airport compatibility assessment of the proposed development at 104 Ryans Road, Christchurch, as it relates to Christchurch International Airport (CIA), to accompany an application for fast-track approval under the Fast Track Approvals Act 2024.

The scope of our review is limited to airport safeguarding matters and considers the matters addressed in the Assessment of Effects on the Environment (AEE) within the *Fast-Track Approval – Resource Consent Applications & Wildlife Act Permit* report (April 2025) prepared for Carter Group by Novo Group Ltd, in relation to relevant planning provisions and other guidelines for the safeguarding of airport and aircraft operations from potential impacts associated with the proposed development.

This aviation safeguarding report is a desktop assessment based only on publicly available information as it relates to CIA and other information provided to Carter Group through consultations relating to the proposal.

In relation to airport safeguarding aspects where there is an absence of specific Christchurch District Plan (CDP) provisions, as referenced in the AEE, consideration has been given to the Australian National Airports Safeguarding Framework (NASF), in line with the guidance in the New Zealand Airports Association (NZAA) Airport Master Planning Best Practice Guide.

2. Proposed Development

The proposed 55-hectare industrial subdivision will deliver 126 freehold industrial lots with infrastructure including roads, utilities and landscaping, which will provide for subsequent development for industrial businesses that would be permitted in the CDP's Industrial General zones. The objectives of the project include:

- Providing additional industrial land supply to meet growing demands for general and airport -related industrial land in this location;
- Creating job opportunities and stimulating economic growth; and
- Ensuring compatibility with the adjacent airport operations.

The following particular activities which represent key safeguarding considerations are specifically excluded/not provided for within the application

- Residential activities (aircraft noise -sensitive);
- Education activities (aircraft noise-sensitive);
- Service stations (hazard risk);
- Yard based landscape / garden suppliers (birdstrike risk); and
- Heavy industrial activities including fish processing or packing plants and abattoirs or freezing works (birdstrike risk).

The AEE also proposes general conditions in relation to glare/light spill and airport protection surfaces and considers the effects of the development proposal on strategic infrastructure in relation to CIA including aircraft Protection Surfaces, Runway End Protection Areas, Navigation, Birdstrike Risk and Reverse Sensitivity.

The application has since been updated to provide amended conditions that specifically address aircraft and airport safety matters as prepared by Novo Group and noted in their memorandum *FTAA-2504-1054: Ryans Road Industiral Development Airport Safety Measures*.

3. Christchurch International Airport

CIA is located 10 km northwest of Christchurch city centre and is a critical piece of significant national and regional infrastructure as recognised in the CDP. The airport is operated by Christchurch International Airport Limited (CIAL). As well as key domestic and direct international airline services, the airport is home to the Antarctic research programmes of the USA and New Zealand.

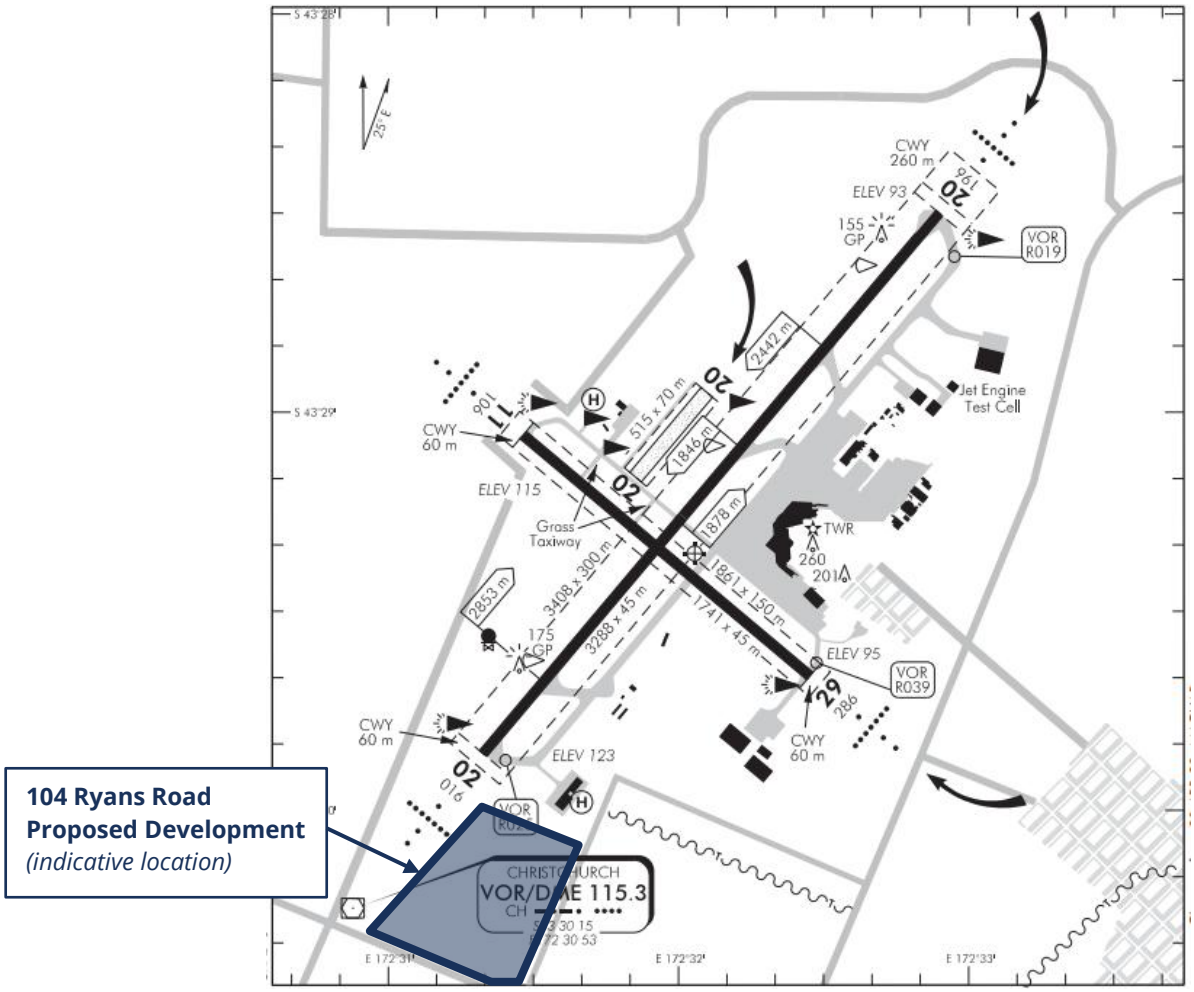
CIA has two sealed runways:

- The main runway, oriented approximately southwest-northeast and designated 02/20, is 3,288 m long and 45 m wide and accommodates aircraft up to Airbus A380 in size; and
- The crosswind runway, oriented approximately northwest-southeast and designated 11/29, is 1,741 m long and 45 m wide and accommodates aircraft up to Boeing 737/Airbus A320 types.

In addition, there is a short grass runway 02/20 and two designated heliports – Helicentre and Garden City (GCH). Key navigation aids include approach lighting and instrument landing system (ILS) to the main Runway 02/20, and a co-located VOR/DME radio beacon to the south of Runway 02 which supports instrument flight procedures, including approaches to the airport and enroute navigation.

Figure 1, extracted from the Aeronautical Information Publication (AIP) New Zealand illustrates the CIA facilities along with the indicative location of the proposed 104 Ryans Road subdivision.

Figure 1: CIA AIP Extract and Proposed Development Location



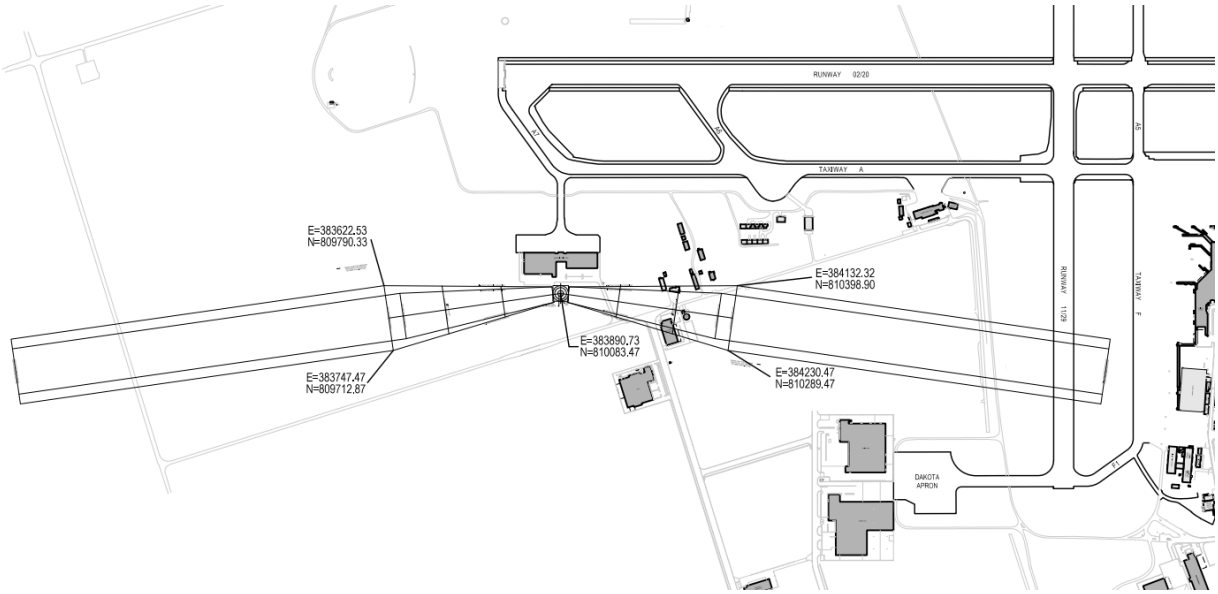
Source: AIP New Zealand

CIA operates predominantly as a controlled aerodrome, meaning aircraft are subject to air traffic control tower services managing the flow of air traffic. Fixed-wing aircraft operations in direct proximity to the proposed development site consist of aircraft approaching Runway 02 for landing, or taking-off departing Runway 20.

Protection surfaces, called Obstacle Limitation Surfaces (OLS) to protect these operations, form part of the aerodrome design requirements set out by the Civil Aviation Authority of New Zealand (CAA) to holders of an aerodrome operator certificate under the requirements of Civil Aviation Rule (CAR) Part 139 – *Aerodromes – Certification, Operation and Use*. CIA is certificated under CAR Part 139.

Helicopter operations to and from the Helicentre, located north of Runway 11/29 and west of Runway 02/20 are largely confined to the west of the airport. Helicopter arrival and departures operating from GCH may be assigned the Copter South Arrival/Departure, which passes over the proposed development. CIA has provided its Drg ASI-1204 which sets out details of the OLS required in accordance with the applicable CAA specifications, as shown in **Figure 2**.

Figure 2: CIA GCH Helicopter Protection Surfaces

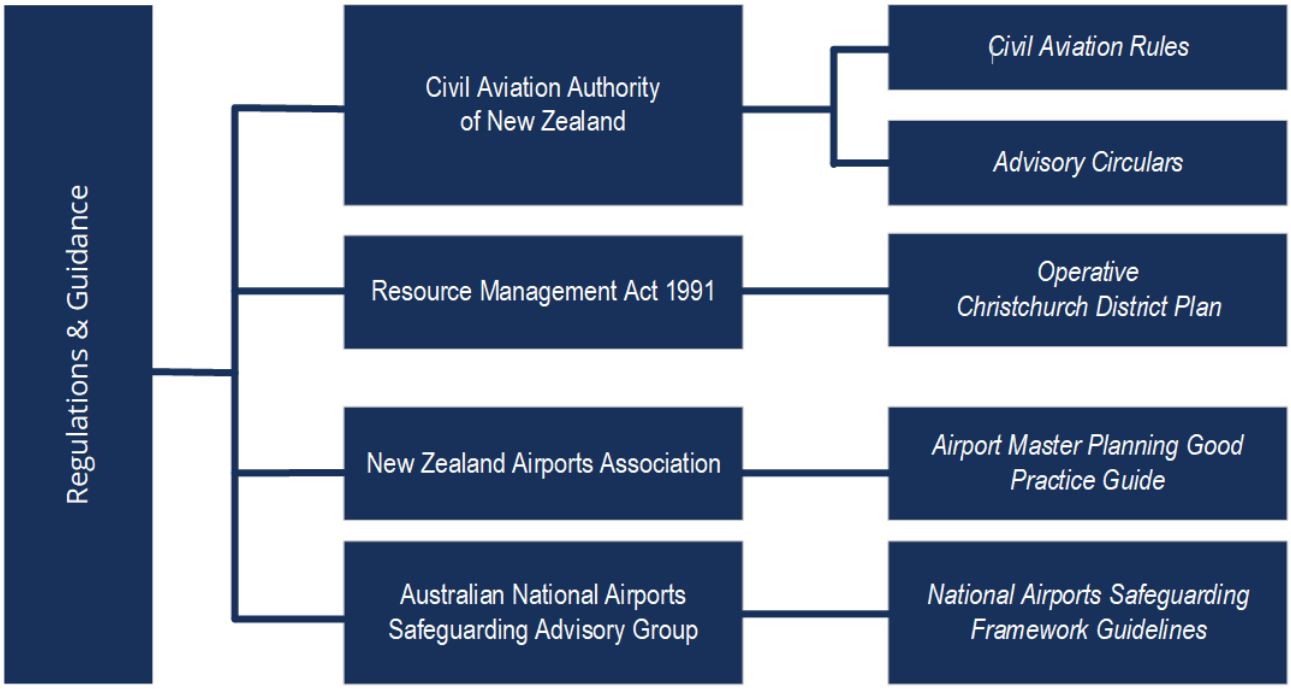


Source: CIA extract from DWG No. ASI-1204/AB

4. Regulatory Environment & Guidelines

There are a number of regulatory and policy documents that govern the operations of aerodromes and airspace in New Zealand, as well as the land use in the vicinity of airports. Those most relevant to this safeguarding assessment are set out in **Figure 3** below.

Figure 3: Regulations & Guidelines



4.1 Civil Aviation Authority of New Zealand

The Civil Aviation Authority of New Zealand (CAA) establishes and maintains the rules that all pilots, engineers, aircraft operators, airlines and aerodromes must follow to keep flying operations safe. The CAA publishes the Civil Aviation Rules of which Part 139 prescribes the rules governing the certification and operation of aerodromes.

CIA is a certificated aerodrome under the Civil Aviation Authority of New Zealand (CAA) Civil Aviation Rules (CAR) Part 139 *Aerodromes – Certification, Operation and Use*.

The CAA publishes a series of Advisory Circulars (ACs) provide guidance on acceptable means of compliance with various aspects of the CARs (Civil Aviation Rules).

4.2 Operative Christchurch District Plan

The Christchurch District Plan (CDP) is established under the Resource Management Act 1991 (the Act) in conjunction with the community. The purpose of the Act is to promote the sustainable management of New Zealand's natural and physical resources. The CDP sets a framework for development and the management of resources in the district in a manner that meets the goal of sustainable management of those resources. It defines the various zones and the rules for what activities are permitted to occur in each zone.

4.2.1 General Rules and Procedures

Chapter 6 General Rules and Procedures includes two sub-chapters which have particular relevance to CIA safeguarding considerations, specifically Noise and Aircraft Protection.

Sub-chapter 6.2 Noise relates to the management of adverse noise effects, recognising the impact such effects can have on the amenity values and health of people and communities. This sub-chapter sets out general, zone specific and activity specific noise rules as well as rules near infrastructure and matters of discretion. 6.1.2.1.5 Policy – Airport noise, requires the management of aircraft operations and engine testing at CIA and the mitigation of adverse noise effects from the operations on sensitive activities by restricting development.

Sub-chapter 6.3 Outdoor Lighting, which includes restrictions on lighting which may cause glare, or other hazard to aircraft safety, including Appendix 6.11.7.4 Map of Christchurch International Airport Ground Lighting and Aircraft Safety Control Areas.

Sub-chapter 6.7 Aircraft Protection, seeks to provide for the protection of aircraft so they can safely and efficiently approach, land, take-off and depart from airports, airfields or helipads. The aircraft protection provisions in the sub-chapter relate to the CIA and Wigram helipad only. Aircraft protection for CIA is provided for in the following forms:

- Aircraft Protection Surfaces for Christchurch International Airport: Defined surfaces in the airspace above and adjacent to the aerodrome. Activities that protrude through these protection shafts are restricted or prohibited to enable aircraft to maintain a satisfactory level of safety while manoeuvring at low altitude in the vicinity of the aerodrome. The description of the protection surfaces is included in 6.7.4.4 Protection Surfaces for Christchurch International Airport and illustrated in Appendix 6.11.7.1 and Appendix 6.11.7.2 of the CDP.
- Runway End Protection Areas (REPAs): These relate to four specific areas located at the end of the runways for the Christchurch International Airport as illustrated in Appendix 6.11.7.3 of the CDP. The provisions in the plan seek to avoid activities at the ends of runways that would interfere with the vision of a pilot or exacerbate the effects of an aircraft accident. For example, the provisions seek to avoid unwanted light sources, the mass assembly of people, most buildings, and the use and storage of hazardous substances.
- Birdstrike Management Area (within 3 km of the thresholds of the runways at Christchurch International Airport) and new landfills: Activities that have the potential to attract birds are managed within a defined radius of Christchurch International Airport, to avoid or mitigate the potential for increased risk of birdstrike on aircraft taking off and landing. Examples of activities the provisions seek to manage include the creation of new water bodies, fish processing plants and abattoirs within the Birdstrike Management Area, and new landfills within Christchurch District excluding Banks Peninsula Ward.

4.2.2 Christchurch Airport Designation

Chapter 10 Designations and Heritage Orders identifies Christchurch International Airport Limited (D) Designation Schedule – Christchurch International Airport Limited (D1).

4.3 NZAA Airport Master Planning Good Practice Guide

The New Zealand Airports Association (NZAA) is the national industry voice for airports in New Zealand of which CIA is a member.

The NZAA prepared a guide for airport master planning in conjunction with the Australian Airports Association which provides guidance on the preparation of an airport master plan inclusive of off airport planning objectives and airport safeguarding.

The airport safeguarding section of the NZAA *Airport Master Planning Good Practice Guide* February 2017 refers to the Australian National Airports Safeguarding Framework in the absence of a New Zealand equivalent at the time of publication.

4.4 Australian National Airports Safeguarding Framework

The National Airports Safeguarding Framework (NASF) is an Australian national land use planning framework that aims to:

- Improve community amenity by minimising aircraft noise-sensitive developments near airports including through the use of additional noise metrics and improved noise-disclosure mechanisms; and
- Improve safety outcomes by ensuring aviation safety requirements are recognised in land use planning decisions through guidelines being adopted by jurisdictions on various safety related issues.

The full NASF principles and guidelines can be found on the Australian Department of Infrastructure, Transport, Regional Development, Communications and the Arts at:

https://www.infrastructure.gov.au/infrastructure-transport-vehicles/aviation/aviation-safety/aviation-environmental-issues/national-airports-safeguarding-framework

NASF provides guidance on planning requirements for developments that affect aviation operations and currently incorporates nine (9) Guidelines as follows:

- Guideline A: Measures for Managing Impacts of Aircraft Noise;
- Guideline B: Managing the Risk of Building Generated Windshear and Turbulence at Airports;
- Guideline C: Managing the Risk of Wildlife Strikes in the Vicinity of Airports;
- Guideline D: Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers;
- Guideline E: Managing the Risk of Distraction to Pilots from Lighting in the Vicinity of Airports;
- Guideline F: Managing the Risk of Intrusions into the Protected Airspace of Airports;
- Guideline G: Protecting Aviation Facilities - Communication, Navigation and Surveillance (CNS);
- Guideline H: Protecting Strategically Important Helicopter Landing Sites; and
- Guideline I: Managing the Risk in Public Safety Areas at the Ends of Runways.

This assessment utilises the NASF guidelines as a framework to assess the safeguarding of Christchurch International Airport with respect to the industrial development proposal at 104 Ryans Road, by supplementing with the Australian guidance where there is an absence of New Zealand regulations, Operational Christchurch District Plan provisions or other relevant New Zealand aviation guidelines.

5. Christchurch International Airport Safeguarding Assessment

This assessment considers key matters relating to the potential impacts associated with the proposed development on aviation operations associated with CIA. Where there is an absence of relevant planning provisions within the CDP as referenced in the AEE, consideration has been given to the Australian National Airports Safeguarding Framework (NASF), in line with the guidance in the New Zealand Airports Association (NZAA) Airport Master Planning Best Practice Guide. This is a desktop assessment only based only on information provided by Carter Group to L+R Airport Consulting.

5.1 Protection Surfaces

As noted in the AEE, CIA is recognised in the Canterbury Regional Policy Statement (CRPS) and the CDP as regionally significant infrastructure and is afforded protection to provide for its continued safe and efficient operation. This protection avoids physical obstructions which could intrude on the Civil Aviation Authority of New Zealand (CAA) mandated Obstacle Limitation Surfaces under the Civil Aviation Rules (CAR) Part 139 *Aerodromes – Certification, Operation and Use*.

The AEE notes that the CDP appendices are difficult to interpret, and a more detailed plan (the Capture plans, included at Appendix 03 of the AEE) of these limits is proposed to be included within conditions of consent (with associated consent notice on future titles) to ensure the CDP rules relating to the CIA protection surfaces are adhered to.

L+R Airport Consulting recommends that the final plans to be included in the consent condition are verified by CIA and the CAA as appropriate to ensure they are accurate and a suitably precise reflection of the CDP.

L+R Airport Consulting notes that the Protection Areas specified in the CDP do not include specific protection for helicopter operations relating to the Garden City Helicopters (GCH) facility which is situated to the north of the site. This is discussed further in **Section 5.7**.

5.2 Runway End Protection Areas

The CDP Runway End Protection Areas (REPAs) activity status tables prohibit activities involving any building or utility other than navigational aids for aircraft and some other limited exceptions, the mass assembly of people and the storage or use of hazardous substances. These rules provide safeguarding against incompatible uses with respect to managing the risks to persons and property as a result of aircraft crash at the ends of runways. The REPAs activity status tables also prohibit the generation of direct light beams or reflective glare that could interfere with the vision of a pilot.

The REPA extent over the site is accounted for in the CIA airport designation under the CDP. The AEE indicates (para 64) that the restrictions that arise from the CIA REPA are also accounted for and that parts of the site within the REPA (i.e. airport designation) are not to be built on without CIA approval.

5.3 Wildlife

The site is located within the Bird Strike Management Area within 3 km of the threshold of the CIA runways.

As indicated above, the proposals specifically exclude certain activities as a result of their potential to create or increase bird strike risks. The AEE also references the proposed consent conditions requiring that comprehensive Wildlife Hazard Management Plans (WHMPs) be implemented in consultation with CIA to cover both pre- and post-development aspects including landscape planting, stormwater, lighting,

communications plans, roles and responsibilities, passive and active wildlife management methods (including prevention of foraging in bins), monitoring and review procedures. In our experience, these mitigations are consistent with good bird strike management practices.

The AEE notes that consent pursuant to Rule 6.7.4.3.3 of the CDP is required as the combined area of stormwater basins does not meet this rule. However, recent amendments to the proposal have been made to fully comply with the requirements of this rule. Compliance with this standard (and otherwise noting the Avifauna assessment concludes the attractiveness of the basins to species attracted to water is low and the residual risk of roosting can otherwise be managed through a WHMP prepared in consultation with CIA), is intended to appropriately manage wildlife strike risk. The application of the WHMP as mitigation is also consistent with the recommendation of NASF Guideline C in relation to managing wildlife strike risk.

5.4 Lighting Effects

The CDP includes the following provisions to avoid light sources that may cause confusion or glare to pilots:

- 6.3 Outdoor Lighting deems (NC1) that any activity resulting in a greater than 2.5 lux spill (horizontal or vertical) into any land outside the Specific Purpose (Airport) Zone that is within 500 metres of the threshold of a runway at Christchurch International Airport is non-complying; and
- Appendix 6.11.7 Aircraft Protection – Diagrams and Maps includes Appendix 6.11.7.4 Map of Christchurch International Airport Ground Lighting and Aircraft Safety Control Areas. This map specifies Light Control Areas 4,500 m long from each runway end and 750 m wide each side of the extended runway centreline within which Rule 6.4.3.5 NC2 applies. This Rule deems any non-aeronautical ground lights within the Light Control Areas that shine above the horizontal to be non-complying.

Together, the application of these Rules would adequately safeguard against impacts from non-aeronautical lighting.

The AEE (para 185) proposes a condition of consent that that requires each site to have a lighting assessment by an appropriately qualified lighting engineer, familiar with the instruments of the CAA and the CDP, along with a consent notice to future owners.

Restrictions on construction are also proposed (para 182) requiring no artificial lighting for construction during the hours of darkness to be permitted as well as incorporation of the recommendation of the lighting expert that flat glass fittings with zero upward light component and no tilt be employed for street lighting (para 182 & 183). The recommendation applies to areas within the site within 500 m of the runway threshold (NC1) and also to areas within the areas shown in CDP Appendix 6.11.7.4 (NC2).

5.5 Noise and Reverse Sensitivity

To address reverse sensitivity, the conditions proposed in the application specifically exclude residential activities, residential units, guest accommodation and education facilities (AEE para. 232) as well as adopting the IG zone provisions relating to retail and office facilities ancillary to industrial uses. Such components would be required to meet the acoustic insultation requirements of Rule 6.1.7.2.2 Activities near Christchurch Airport. Such proposals are expected to avoid reverse sensitivity effects on CIA (AEE para 234).

Acoustic assessment has been undertaken by others and provided as part of the AEE (Appendix 4). Section 6 addresses airport noise effects and concludes: "... the establishment of industrial activities within the development site is appropriate and has precedent."

5.6 Navigational Aids

Navigational aids are protected from interference by buildings within the CIA designation under the CDP. However, outside of the designation, no specific protections appear to be afforded to these facilities under the planning provisions.

The AEE references consultation with Airways, who has provided information regarding the technical requirements for protection of the ILS and the DVOR navigation aids at CIA. This information has been included in the Capture scheme plans as follows:

- The ILS zone, in relation to the site, is contained almost wholly within the airport designation area, and thus buildings would be subject to approval by CIA.
- The DVOR restrictions are more complex and affect the southwest corner of the site. Whilst a portion of the restriction area affecting the site is within the airport designation, the majority is not. Carter Group proposes to incorporate building restriction information provided by Airways within airport safeguarding conditions on consent.

The AEE consultation with Airways also refers to the possible upgrade of the Runway 02 approach lighting system to CAT III (from CAT I) which would result in an enhanced approach lighting array. Based on recommendations within ICAO Annex 14 Volume I Aerodromes, a light plane should be established over the approach lighting array which should not be penetrated by objects. The light plane extends 60 m from the extend runway centreline on each side and this dimension does not vary with the category of the approach lighting array. As such the light plane would extend to the boundary of the proposed development land but remain within the airport land and so development on the proposed site should not obstruct the visibility of the approach lighting by pilots for either the existing or an upgraded system.

5.7 Helicopter Operations

5.7.1 Protection Surfaces

As discussed in **Section 3**, has advised Carter Group of the protection surfaces for Garden City (GCH) helicopter operations, specifically for the south approach and take-off which passes over the site. CIA provided details of the protection surfaces to Carter Group, however we note that these surfaces are not specified within the CDP for GCH (only the Wigram helipad is included). The CIA surfaces meet the OLS requirements provided in CAA Advisory Circular *AC 139-8 Aerodrome Desing: Heliports*.

Carter Group proposes to include the GCH helicopter protection surfaces within the Scheme Airport Safeguarding Set and introduce consent conditions ensuring they remain free from intrusions.

5.7.2 Rotor Downwash

Helicopter operators are required to ensure the aircraft can land, or take-off from, a place safely. This includes consideration of the safety of persons, animals or things from the effects of rotor downwash and outwash. The CAA Good Aviation Practice (GAP) *Wake Turbulence* states

A helicopter generates considerable downwash – high velocity outwash vortices that extend to a distance three times the diameter of the rotor. The outwash vortices circulate outward, upward, around and away from the main rotor (or main rotors) in all directions

In Australia, CASA has published an Advisory Circular AC 91-29 v. 1.3 *Guidelines for Helicopters – suitable places to take off and land.* For helicopter landing at surface level sites CASA recommends a safety distance of typically 2 to 3 rotor diameters from the helicopter or a minimum of 30 m downwash safety distance

for light helicopters. A safety distance for medium, heavy or extra heavy helicopters is recommended to be 50 to 65 m.

The subject site is located approximately 150 m from the GCH helipad and therefore would exceed the three rotor diameters described in the CAA GAP and the safety distances recommended by CASA. Downwash impacts from helicopters passing over the site are therefore not expected to be of concern.

5.7.3 Forced landings

NZ CAA Advisory Circular AC139-8 (Rev 4) notes that:

- Heliports should have approach and take-off paths such that, if the helicopter is not a performance Class 1 helicopter, an autorotative landing can be conducted without any undue risk to any person on the ground; and
- Ideally the approach and take-off surfaces should be over water, or land, free of third parties and with a minimum of obstructions. Approach and take-off flight paths over residential or industrial areas, playgrounds, occupied car parks, or any other populated area should be avoided.

Clearly there are practical limitations on complying with this advice within an urban environment. In relation to the reciprocal approach and take-off path to the northeast of GCH, buildings and development commence approximately 200 m from the FATO. A similar buffer along the approach and take-off path over the site would extend approximately 50 m into the northern edge of Lot 121. Given the size of this lot, it is likely that it will incorporate a fair proportion of open/unoccupied space which would be consistent with the above AC 139-8 objectives.

5.8 Building Generated Windshear and Turbulence (BGWT)

Australian NASF Guideline B sets out a multi-step process for mitigating the potential impact of windshear and turbulence caused by buildings in the vicinity of runways. It is emphasised that (within Australia) this remains guidance only and is not mandated, and New Zealand has no equivalent guidelines nor are provisions around this matter adopted with the CDP.

The first step is the application of a building generated windshear and turbulence assessment trigger area, which is applied to the runway threshold and extends 900 m prior to the threshold, 500 m along the runway and 1,200 m either side of the centreline. The site would fall within the assessment trigger area of Runway 02 under NASF Guideline B.

For proposed developments within the assessment trigger area, the guideline refers firstly to the mitigation of BGWT risk by height and applies a '1:35 rule' to identify if further assessment is required. For buildings whose distance from the runway centreline is more than 35 times the building height (above the runway) no further assessment is required. For buildings which fail this '1:35 rule' and whose height exceeds 35 times the distance from the runway, further assessment by a qualified wind engineer of BGWT risks is recommended.

The Australian NASF Guideline B process is accepted as quite conservative (with respect to the 1:35 screening rule) and is based on practices adopted other jurisdictions such as the Netherlands.

Nevertheless, Carter Group proposes to incorporate the advisory 1:35 slope surface within the Scheme Airport Safeguarding Set of plans and include a condition of consent that requires assessment by a suitably qualified and experienced professional in alignment with the recommendations of NASF Guideline B for any building proposals that fail the 1:35 rule.

6. Summary

Table 1 summarises the key findings of our review with respect to each of the key airport safeguarding considerations which, in our experience, are typically of concern to airport operators in relation to developments close to airports.

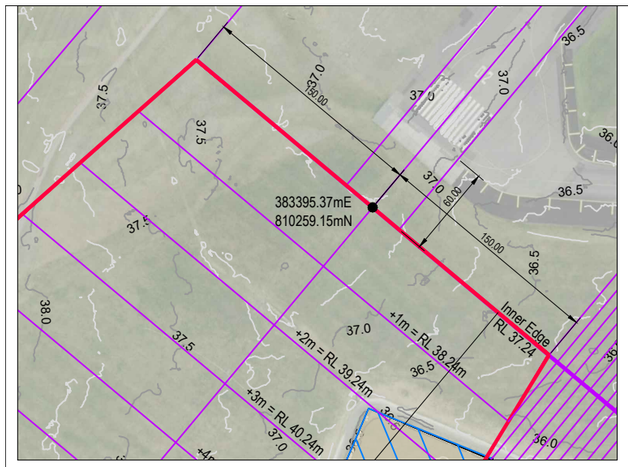
Table 1: Key Findings

Safeguarding Consideration	Planning provision	AEE Assessment/Mitigation Proposals	Appropriate Safeguards?
Noise and Reverse Sensitivity (NASF Guideline A)	6.1.7.2.2 Activities near Christchurch Airport	Conditions proposed specifically exclude 'sensitive activities'. Will meet the requirements of CDP rule 6.1.7.2.2	**Yes**
Building Generated Windshear & Turbulence (NASF Guideline B)	Not included	Conditions propose to adhere to the BGWT Guideline.	**Yes**
Wildlife strike (NASF Guideline C)	Bird Strike Management Area	Plantings will be from the list in CDP Appendix 6.11.9. A WHMP will be implemented both pre- and post-development in consultation with CIAL	**Yes**
Wind farms (NASF Guideline D)	Not applicable	Not applicable	N/A
Lighting and Glare (NASF Guideline E)	Runway End Protection Areas 6.3 Outdoor Lighting	The existing airport relate lighting standards will all be complied with both during the subdivision/construction phase and when sites are subsequently developed	**Yes**
Protected Operational Airspace (NASF Guideline F)	Aircraft Protection Surfaces (physical) Runway End Protection Areas (visual)	Compliance is proposed with CDP Rule 6.7.4.1 and 6.7.4.4 restricting intrusion into the Protection Surfaces. Compliance is proposed with the current CDP rule 6.7.4.2 restricting activity within the REPA	**Yes**
Communication, Navigation & Surveillance Facilities (NASF Guideline G)	Designation Schedule (partially)	DVOR Airways Restriction Plan provided by CIA will be adhered to	**Yes**

Safeguarding Consideration	Planning provision	AEE Assessment/Mitigation Proposals	Appropriate Safeguards?
Helicopter Operations (NASF Guideline H)	Not included	Protection surfaces as provided by CIAL will be consent conditions ensuring they remain free from intrusions.	**Yes** (some reduction in forced landing area availability from the status quo is acknowledged)
Public Safety (NASF Guideline I)	Runway End Protection Areas	Compliance is proposed with the current CDP rule 6.7.4.2 restricting activity within the REPA	**Yes**

Based on the above key findings and proposed mitigations, and our experience, L+R Airport Consulting believes the proposal appropriately safeguards the safety, efficiency and regularity of CIA operations, in the context of development proposals of a similar nature adjacent to airports such as CIA.

Appendix A: Capture Scheme Plans – Airport Safeguarding Set



INSET A

Existing Ground Contours are LIDAR NZVD 2016

Airport Protection Surfaces Notes:
CIAL Level at Inner Edge = RL37.59m (AMSL)
This is equivalent to NZVD RL37.24.
(AMSL is 350mm above NZVD)

Blue Hatched Area = Horizontal Surface
83m above AMSL, RL 82.65m NZVD

NOTES :

1. SCHEME PLAN ONLY, AREAS & DIMENSIONS ARE APPROXIMATE & SUBJECT TO FINAL SURVEY.

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL
B	05/08/25	HORIZ SURFACE ADDED	TL
C	07/08/25	MINOR REVISIONS	TL
D	12/08/25	MINOR REVISIONS	TL

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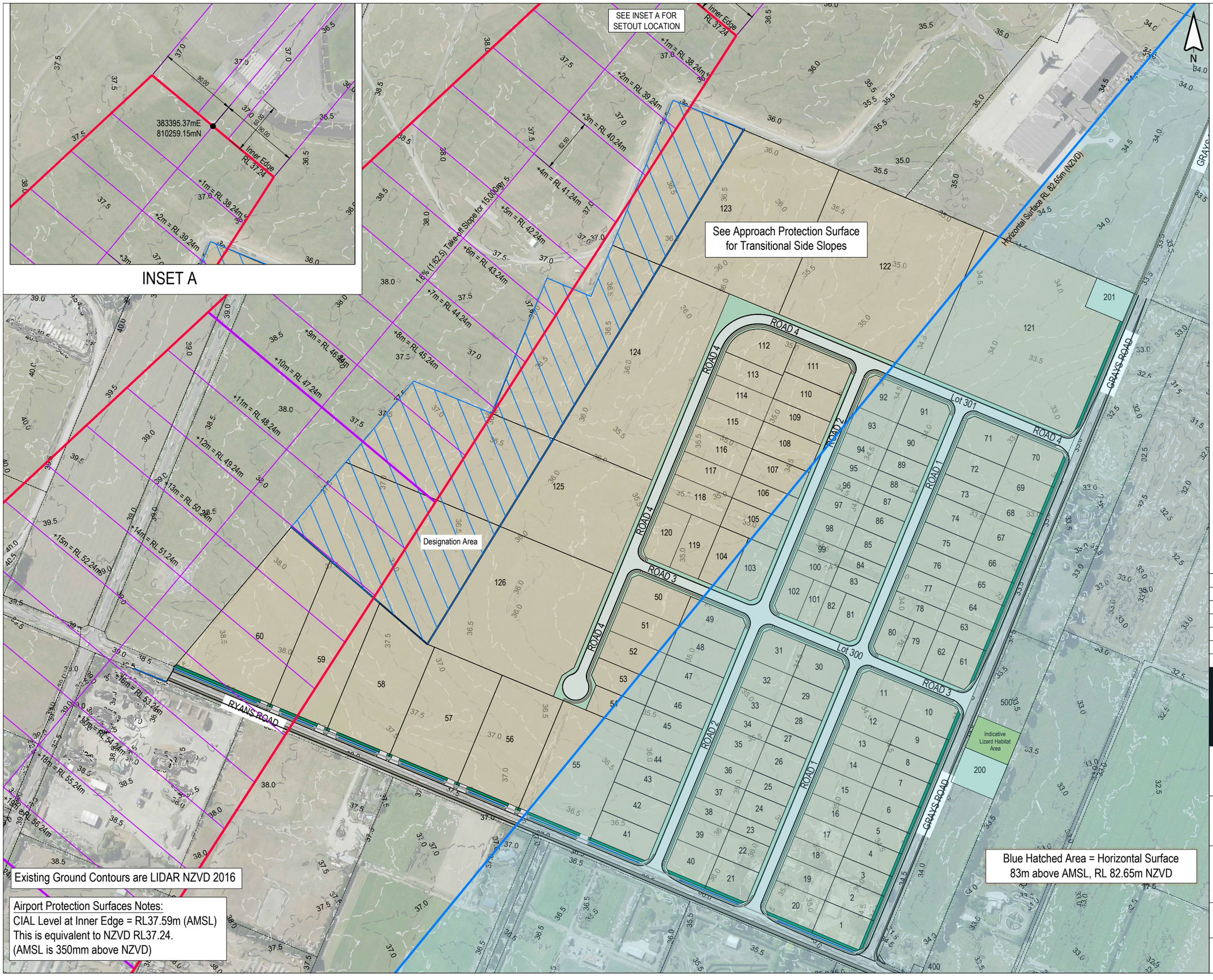
PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
CIAL RUNWAY APPROACH PROTECTION SURFACES

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	1:4000	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-PG120	D



NOTES :

1. SCHEME PLAN ONLY, AREAS & DIMENSIONS ARE APPROXIMATE & SUBJECT TO FINAL SURVEY.

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL
B	05/08/25	GENERAL REVISIONS	TL
C	07/08/25	MINOR REVISIONS	TL
D	12/08/25	MINOR REVISIONS	TL

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PROJECT

104 RYANS ROAD, HAREWOOD

DRAWING TITLE

CIAL RUNWAY TAKE-OFF PROTECTION SURFACES

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	1:4000	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-PG121	D

Existing Ground Contours are LIDAR NZVD 2016

ILS Zone
Total Area within
Lot 123 = 0.50ha

0.49ha

0.01ha

35.00°

35.00°

Instrument Landing System

Extention of Runway Centreline

R300m

R200m

R150m

R100m

DVOR
(assumed ground level of
38.80 NZVD2016 based
on lidar information)

Airport Designation

Area
0.37ha

Area
0.005ha

Area
0.35ha

Area
1.62ha

Area
0.45ha

Area
1.00ha

Area
0.74m²

Area
0.44ha

Area
1.09ha

Area
0.20m²

R 300m +16.60m

R 325m +17.69m

R 350m +18.78m

R 375m +19.87m

R 400m +20.96m

R 425m +22.06m

R 450m +23.15m

R 475m +24.44m

R 500m +25.33m

RYANS ROAD

GRAYS ROAD

ROAD 1

ROAD 2

ROAD 3

ROAD 4

Lot 300

Lot 301

Indicative
Lizard Habitat
Area

N

LEGEND :

Airport Designation

Doppler very high frequency omni-directional range (DVOR). Refer to plan PG123 for height restriction requirements.

NOTES :

DVOR Information shown on the plan has been sourced from Airways Plan "NZ DVOR Designation Site & Sitting Criteria Graphic" Drawing Number 50253 Issue A.

1. Heights of obstacles shown (m) are the maximum at the furtherest distance within a given area (unless otherwise noted). Allowed heights must stay under given vertical angle from the DVOR and thereforte will be less than shown if the obstacle is located closer to the DVOR.
2. Information is referenced from Indra and Thales DVOR siting criteria. (Refer also Eurocae and FAA).
3. All power and communication cables are to be laid underground for a minimum of 150m from DVOR antenna. The line of approach for power and communications cables should be be alignment with the radials from the DVOR.
4. Where there are multiple structures near each other, these are to be considered as one structure (combined) when completing scalloping analysis.
5. The metal framing and/or metallic materials included in non-metallic structures needs to be considered as part of the analysis, i.e reinforcing in concrete walls.
6. Scalloping analysis is to be completed for all objects and structures within 300m of the DVOR and any other objects outside 300mm that may interfere with the DVOR coverage.
7. ICAO document EUR015 European Guidance Material on Managing Building Restricted Areas provides guidance for determining whether the physical presence of structures have an adverse effect on the availability or quality of navigational signals.
8. Terrain restrictions need to be considered when completing coverage analysis.

REV	DATE	REVISION DETAILS	ISSUED
A	29/01/25	FOR INFO	TL
B	03/02/25	GENERAL REVISIONS	TL
C	05/08/25	FOR APPROVAL	TL
D	12/08/25	GENERAL REVISIONS	TL

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PROJECT
104 RYANS ROAD, HAREWOOD

AIRWAYS RESTRICTION PLAN

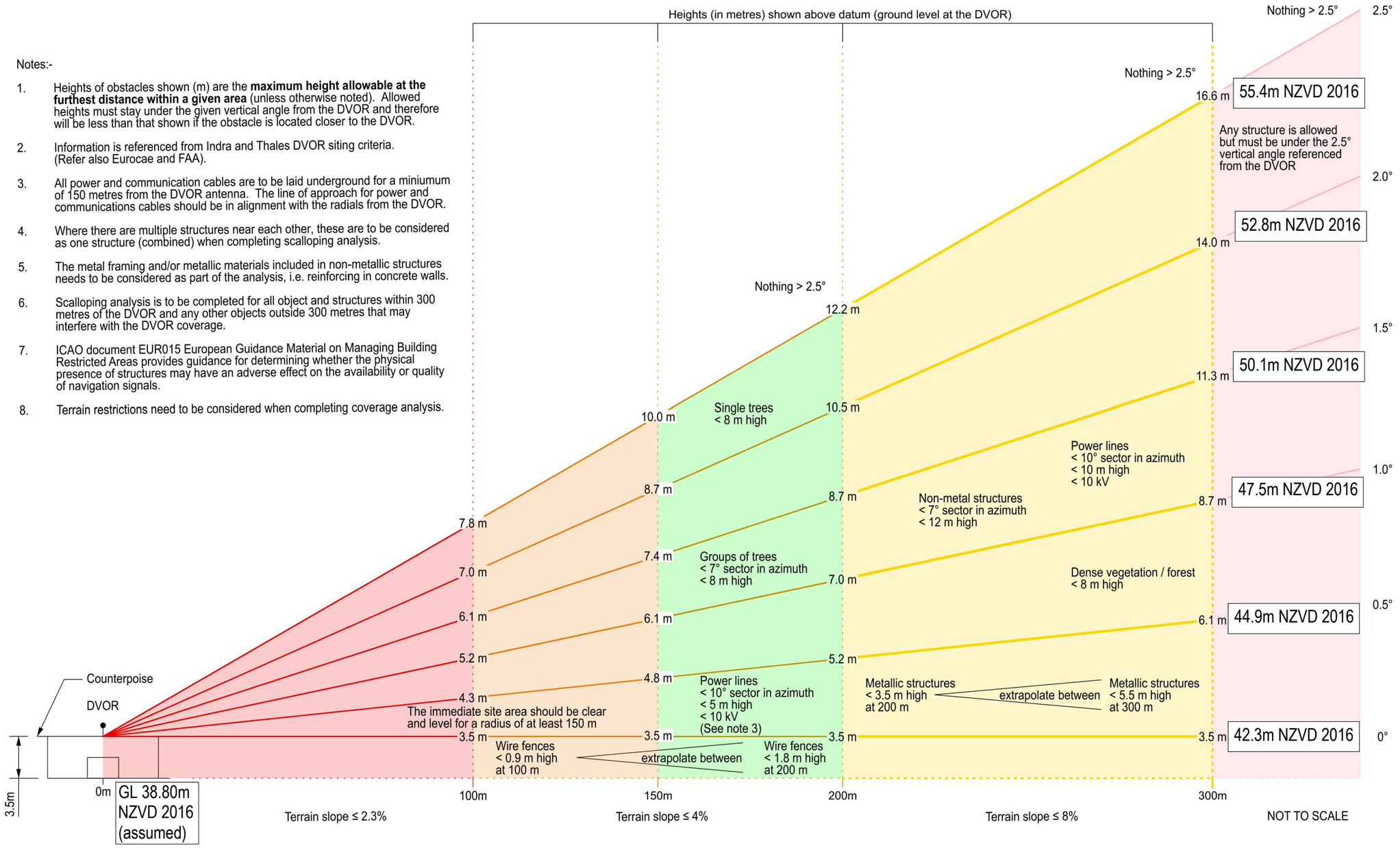
STATUS	SCALE	SIZE
FOR APPROVAL	1:4000	A3

PROJECT	DRAWING NO	REVISION
1252	RC-PG122	D

c:_cam jobs\1252 - carter group ryans road\rc plans\1252 rc sheet 122

Notes:-

1. Heights of obstacles shown (m) are the **maximum height allowable at the furthest distance within a given area** (unless otherwise noted). Allowed heights must stay under the given vertical angle from the DVOR and therefore will be less than that shown if the obstacle is located closer to the DVOR.
2. Information is referenced from Indra and Thales DVOR siting criteria. (Refer also Eurocae and FAA).
3. All power and communication cables are to be laid underground for a miniumum of 150 metres from the DVOR antenna. The line of approach for power and communications cables should be in alignment with the radials from the DVOR.
4. Where there are multiple structures near each other, these are to be considered as one structure (combined) when completing scalloping analysis.
5. The metal framing and/or metallic materials included in non-metallic structures needs to be considered as part of the analysis, i.e. reinforcing in concrete walls.
6. Scalloping analysis is to be completed for all object and structures within 300 metres of the DVOR and any other objects outside 300 metres that may interfere with the DVOR coverage.
7. ICAO document EUR015 European Guidance Material on Managing Building Restricted Areas provides guidance for determining whether the physical presence of structures may have an adverse effect on the availability or quality of navigation signals.
8. Terrain restrictions need to be considered when completing coverage analysis.



REV	DATE	REVISION DETAILS	ISSUED
A	03/02/24	FOR INFO	TL
B	05/08/25	FOR APPROVAL	TL

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PROJECT
104 RYANS ROAD, HAREWOOD

AIRWAYS RESTRICTION PLAN
(NZ DVOR DESIGNATION SITE & SITING CRITERIA TABLE)

STATUS	SCALE	SIZE
FOR APPROVAL	Not to Scale	A3

PROJECT	DRAWING NO	REVISION
1252	RC-PG123	B

LEGEND :

AIRPORT DESIGNATION

LIGHTING CONTROL AREA (SEE RULE 6.3.4.5 NC2)

NOTES :

1. SCHEME PLAN ONLY, AREAS & DIMENSIONS ARE APPROXIMATE & SUBJECT TO FINAL SURVEY.
2. LOTS 200-201 ARE TO BE VESTED AS LOCAL PURPOSE UTILITY RESERVES (STORMWATER)
3. LOTS 300-301 ARE TO BE VESTED AS ROAD
4. LOT 400 IS TO BE VESTED AS LOCAL PURPOSE UTILITY RESERVE (WATER)
5. LOT 500 IS A BALANCE LOT.

REV	DATE	REVISION DETAILS	ISSUED
A	25/02/25	FOR APPROVAL	TL
B	12/08/25	MINOR REVISIONS	TL

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PROJECT
104 RYANS ROAD, HAREWOOD

LIGHTING CONTROL AREA

STATUS	SCALE	SIZE
FOR APPROVAL	1:4000	A3

PROJECT	DRAWING NO	REVISION
1252	RC-PG124	B

c:_cam jobs\1252 - carter group ryans road\rc plans\1252 rc sheet 124

NOTES :

1. SCHEME PLAN ONLY, AREAS & DIMENSIONS ARE APPROXIMATE & SUBJECT TO FINAL SURVEY.

2. GARDEN CITY HELICOPTER PROTECTION SURFACES INFORMATION SUPPLIED FROM CHRISTCHURCH AIRPORT PLAN ASI-1204 REV AB DATED 01/02/2018.

REV	DATE	REVISION DETAILS	ISSUED
A	05/08/25	FOR APPROVAL	TL
B	07/08/25	MINOR REVISIONS	TL
C	12/08/24	MINOR REVISIONS	TL

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PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
GARDEN CITY HELICOPTERS PROTECTION SURFACES

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	1:4000	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-PG125	C

NOTES :

1. SCHEME PLAN ONLY, AREAS & DIMENSIONS ARE APPROXIMATE & SUBJECT TO FINAL SURVEY.

REV	DATE	REVISION DETAILS	ISSUED
A	05/08/25	FOR APPROVAL	TL
B	07/08/25	GENERAL REVISIONS	TL
C	12/08/25	MINOR REVISIONS	TL
D	13/08/25	MINOR REVISIONS	TL

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PROJECT
104 RYANS ROAD, HAREWOOD

DRAWING TITLE
WINDSHEAR & TURBULENCE ASSESSMENT AREA

STATUS	*SCALE*	*SIZE*
FOR APPROVAL	1:4000	A3

PROJECT	*DRAWING NO*	*REVISION*
1252	RC-PG126	D

INSET A

Existing Ground Contours are LIDAR NZVD 2016

Airport Protection Surfaces Notes:
CIAL Level at Inner Edge = RL37.59m (AMSL)
This is equivalent to NZVD RL37.24.
(AMSL is 350mm above NZVD)

Yellow Hatched Area = Windshear and Turbulence Assessment Trigger Area. (900m prior to runway threshold and 1200m either side of runway centreline)