SOUTHERN LINK INLAND PORT DEVELOPMENT

AVIATION IMPACT REPORT FOR SOUTHERN LINK PROPERTY LIMITED

FINAL REPORT – Revision 1

ASTRAL LIMITED

AVIATION CONSULTANTS

10 APRIL 2026

Contents

LIST OF ABBREVIATIONS

ABBREVIATION	MEANING
1:20	An OLS upslope of 1m vertical per 20m horizontal
1:50	An OLS upslope of 1m vertical per 50m horizontal
2GP	2nd generation Dunedin City District Plan
AC	CAA Advisory Circular
AIP	New Zealand Aviation Information Publication
CAA	Civil Aviation Authority of New Zealand
CAR	Civil Aviation Rules
DCC	Dunedin City Council
EMS	Emergency medical services
HO	Helicopters Otago
HSWA	Health and Safety at Work Act 2015
ICAO	International Civil Aviation Organisation
IFR	Instrument flight rules
NOTAM	Notice to Airman
NZAIP	New Zealand Aviation Information Publication
OAC	Otago Aero Club
OLS	Obstacle limitation surface (“flight fan”)
PCBU	Person(s) conducting a business or undertaking (HSWA)
SLIP	Southern Link Inland Port
SLPL	Southern Link Property Limited
VFR	Visual flight rules

1 Summary and recommendations

This report reviews the aviation safety aspects of Southern Link Property Limited's (SLPL) proposed approximately 40-hectare Southern Link Inland Port (SLIP) development located at 270 – 292 Dukes Road North, adjacent to Taieri Aerodrome at Mosgiel, Dunedin.

The report describes the proposal as it relates to aviation matters and identifies potential areas of aviation risk to both aircraft operations and persons on the ground on the SLIP site below aircraft flight paths.

Taieri Aerodrome has fixed wing and helicopter operations. Fixed wing flight paths taking off on runway 05 (towards the east) and landing on runway 23 (from the east) pass directly over the southern portion of the SLIP. The proposed Inland Port structures and buildings will be below the runways eastern "flight fans" (obstacle limitation surfaces (OLS)) and will comply with the relevant height standards for protection of aircraft operations.

There are no specific Civil Aviation Authority of New Zealand (CAA) rule preventing the proposed development providing it is below the 1:20 OLS, or requiring SLPL to provide clear areas in the event of an emergency landing by an aircraft at low level after take-off or on final approach to land.

While I have not undertaken a full risk assessment as part of this report, risks identified are:

a) Risk of injuries to pilots and passengers as well as persons on the ground beneath take-off flight paths in the event of an engine failure on take-off on runway 05.
b) Bird strike risk from the proposed stormwater attenuation pond located on the south-west corner of the site under the take-off and approach path, birds roosting on roofs and soil accumulated on site.
c) The height of any cranes used on site that may infringe the approach and landing 1:20 flight fan.
d) Glare from site lighting.
e) Potential impact on helicopter Instrument Flight Rule (IFR) operations.

The Otago Aero Club (OAC) has been consulted in the preparation of this report in its role as Aerodrome Operator and the primary fixed wing aircraft user. Helicopters Otago (HO), the primary helicopter operator, was also consulted.

I see no reason, on the grounds of aviation safety, why the proposed development should not go ahead subject to consideration and implementation of my recommendations summarised below, where reasonably practicable.

In my experience the best aviation safety outcomes are achieved when affected parties work together co-operatively with a free flow of information. In this context I recommend

SLPL and the OAC (in its role as Aerodrome Manager) set up a safety committee that meets regularly from the time construction commences forward, on an on-going basis. I understand SLPL proposes to do this.

Code of Conduct

The author of this report is David Park. My qualifications include a Bachelor's Degree in Mechanical Engineering, Master's Degree in aeronautical engineering and an MBA. I am a UK Chartered Engineer, a member of the Royal Aeronautical Society and the Honourable Company of Air Pilots.

I am a Director at Astral Limited, a New Zealand based aviation consultancy servicing a range of airport, airline and government clients within New Zealand and overseas. I have over 20 years' experience in airport design in relation to aircraft operations and prior to that 20 years' experience in aircraft operations with Air New Zealand and Qantas New Zealand. I have previously held a pilot's licence for light aircraft.

I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023. This report has been prepared in compliance with that Code, as if it was expert evidence presented in proceedings before the Environment Court. Unless I state otherwise, this report is within my area of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in this report.

Table of recommendations

	Recommendation	Report reference
1	SLPL advises CAA by filing a Notification to Construct under Civil Aviation Rule Part 77 as soon as the site layout is reasonably firm (but at least 90 days prior to construction commencing). This is a requirement under the CAR irrespective of whether it is included in a condition of consent.	4.2 page 13
2	SLPL keeps an area clear of buildings as shown in Figure 7 to provide a safe space for aircraft suffering an engine failure on take-off or on final approach to make a forced landing.	5.6.2 page 21
3	Prior to the commencement of development of the SLIP, SLPL prepares and implements, as part of its Wildlife Hazard Management Plan. The Bird Management Plan is to be shared with the OAC (Aerodrome part owner and Operator) for review and commenting prior to being certified as fit for purpose by Dunedin City Council.	5.6.3 page 22
4	Prior to commencement of development of the SLIP, SLPL prepares a Flight Fan Management Plan which includes aviation safety procedures to be implemented throughout construction and operation to protect against infringements of the 1:20 upslope OLS. The Flight Fan Management Plan is to be shared with the OAC (Aerodrome Manager) for review and commenting prior to being certified as fit for purpose by Dunedin City Council. The requirements of the Flight Management Plan are to be implemented in addition to any requirements / conditions deemed necessary as a result of the CAA Approval process.	5.6.4 Page 23
5	Prior to commencement of development of the SLIP, and as per Petersen Read's Lighting Effects recommendations, SLPL prepares a Lighting Management Plan to manage site lighting including possible night construction lighting requirements. The Lighting Management Plan is to be shared with the OAC (Aerodrome Manager) for review and commenting prior to being certified by Dunedin City Council.	5.6.5 (ii) and (ii) page 24
6	SLPL, in consultation with OAC (in its role as the Aerodrome part owner and Operator), sets up a SLIP Aviation Safety Consultation Committee that meets regularly to review any aviation safety issues arising out of the construction and ongoing operation of the SLIP.	

2 Background

SLPL is proposing to develop the SLIP at 270 – 292 Dukes Road North, Mosgiel, Dunedin (marked yellow in Figure 1) and undertake ancillary activities within the KiwiRail corridor (marked blue in Figure 1). The ancillary activities within the KiwiRail corridor are not being applied for as part of this application, do not impact on the content of this report and therefore are not discussed further.

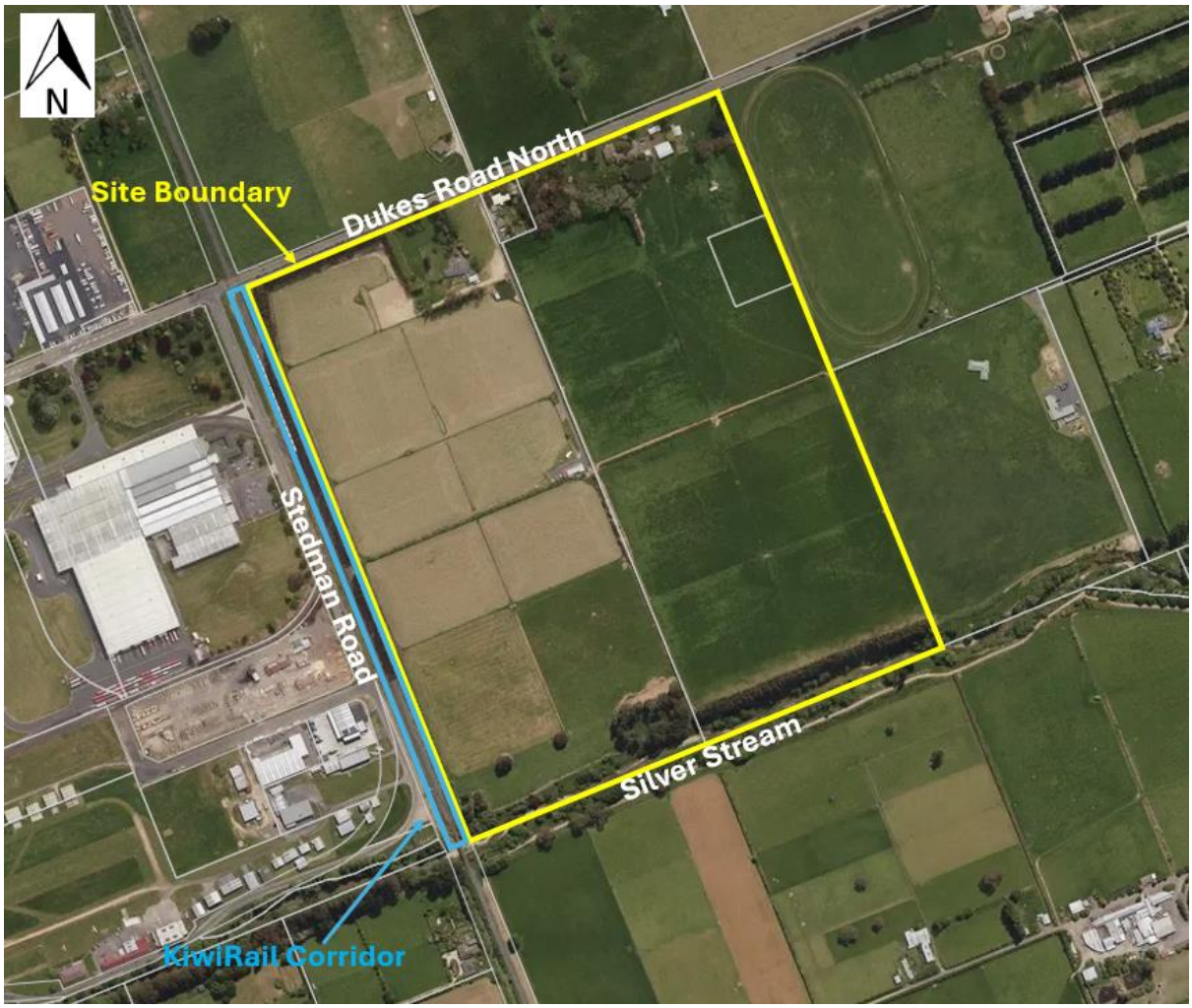

Figure 1: Project Site

The approximately 40-hectare Inland Port is a joint venture between Port Otago and Dynes Group. It is situated on the corner of Dukes and Stedman Roads, adjacent to Taieri Aerodrome's south-eastern boundary.

SLPL has commissioned this technical report to identify potential adverse impacts on aviation safety at Taieri Aerodrome and to identify suitable measures that can be implemented to eliminate or mitigate actual and potential risks to aviation safety.

Astral Limited is an aviation consultancy with over 20 years' experience in advising airports in New Zealand and abroad on aeronautical development and the safety of aircraft operations. We have prepared this study following the "so far as reasonably practicable" approach to risk management that is required under the NZ Health and Safety at Work legislation as well as compliance with the applicable Civil Aviation Rules (CAR) and the District Plan 2GP.

3 The Proposal

3.1 Spatial arrangement

Figure 2 illustrates where the proposed SLIP will be in relation to Taieri Aerodrome.

The take-off path for RWY 05 and approach path for RWY 23 will pass directly over the SLIP site, about 140m inside its south boundary. In this location the height of aircraft above site ground level will be approximately 30m (100ft) at the SLIP west boundary under the 05-23 flight path to 65m (210ft) at the SLIP east boundary.

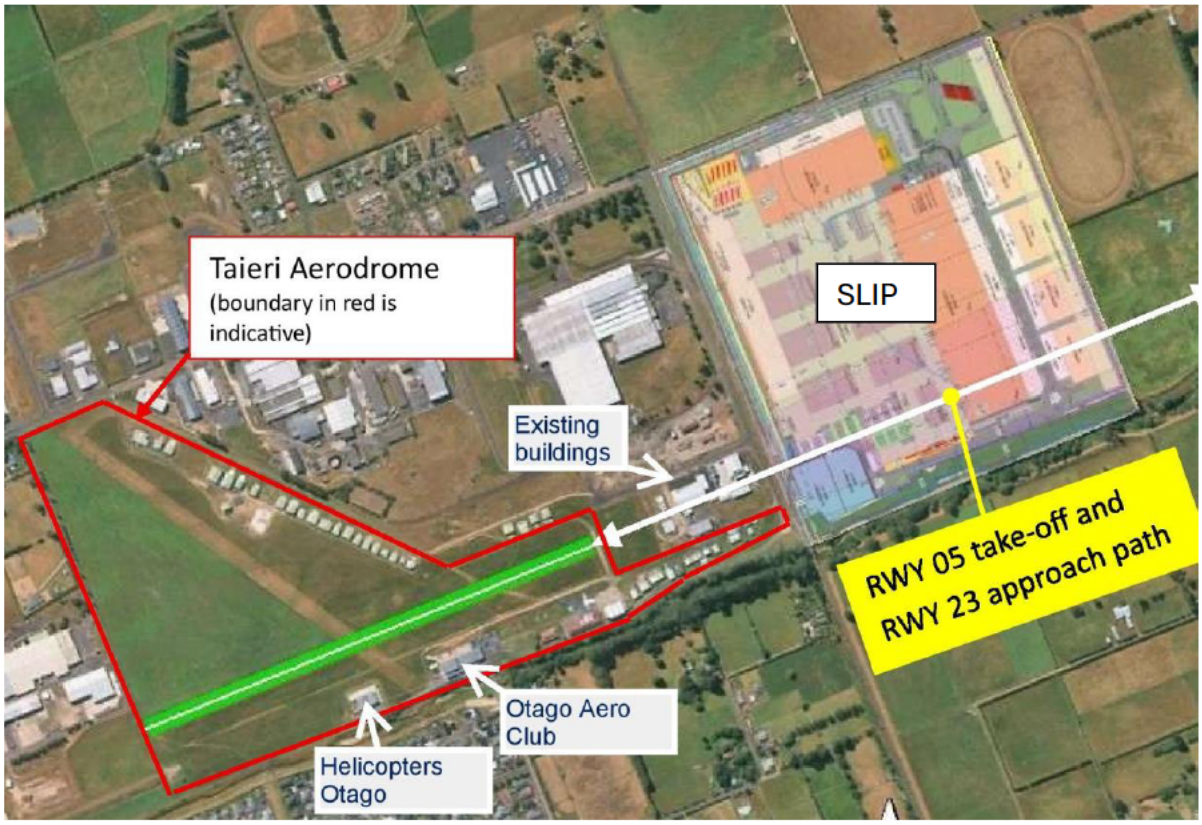

Figure 2: Spatial arrangement of aerodrome and SLIP

3.2 Taieri Aerodrome

3.2.1 Description

Taieri Aerodrome is a non-certificated facility, listed in the CAA Aeronautical Information Publication (AIP). [1] The aerodrome is sited on land owned by [redacted], [redacted], Otago Aero Club Incorporated, [redacted] and is operated by the Otago Aero Club.

The aerodrome is available for general use for private operations and, with the prior approval of the Operator, commercial operations. The aerodrome has two grass runways designated 05-23 (853m long) and 11-29 (749m long).[2] Runway 05-23 is the primary runway with the predominant take-off direction being 23 (towards the south-west).

The aerodrome has numerous hangars and a resident aircraft maintenance and repair organisation.

Helicopters Otago operates commercial and medical helicopters from its base next to the Aeroclub on the aerodrome's south boundary.

3.2.2 Operations

There is no form of air traffic control at the aerodrome. Pilots are responsible for separating their aircraft from other aircraft in the aerodrome area.

Fixed wing operations are conducted under visual flight rules (VFR) only i.e. the pilot must position the aircraft for landing by visual reference to the aerodrome and its surroundings. There are no night fixed wing aircraft operations as the runways do not have any lighting. However, the rescue helicopter operated by Helicopters Otago (HO) and occasionally other HEMS-NZ operators can, and does, operate at night and under instrument ("IFR" - poor weather) conditions.[3]

Helicopter operations under IFR use global positioning satellites (GPS) for navigation when landing. The instrument approach is from the southwest, aligned with runway (RWY) 05 to an "aiming point" at the threshold of 05. The "missed approach" procedure (if the pilot can't see to land at the minimum allowable height on approach) has the helicopter climbing on runway heading from approximately 1500m prior to the 05 threshold to an altitude of 600ft, then turning right to head south. This procedure is likely

[1] "Non-certificated" means the aerodrome is not certificated under CAA Rule Part 139. As it does not have regular operations of aircraft with 30 or more passenger seats it is not required to be certificated but still must meet minimum safety standards.
[2] Landing distance listed in the AIP, in the longest direction.
[3] HEMS-NZ is the umbrella organisation that provides rescue and medical helicopter services in the South Island.

to have the helicopter flying over the SLIP development but at a height of at least 500ft (150m) above the ground.

3.2.3 Movements

The OAC has provided estimated movements data for the aerodrome by month for calendar years 2024 and 2025.[4] These are plotted below as moving average annual movements by month for calendar year 2025.

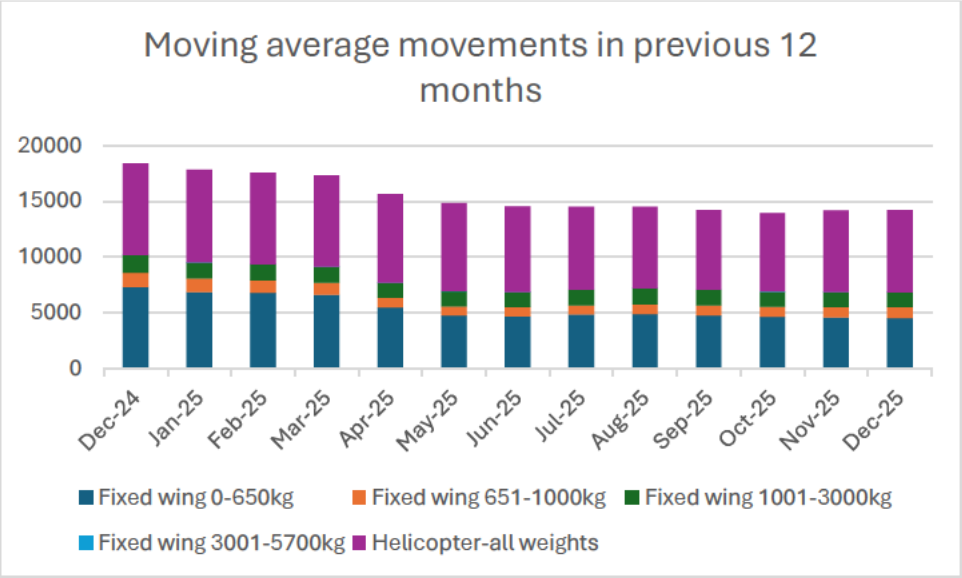

Figure 3: Estimated annual aircraft movements

The average movements are currently estimated to be about 14,000 per year. These are spit as shown below:

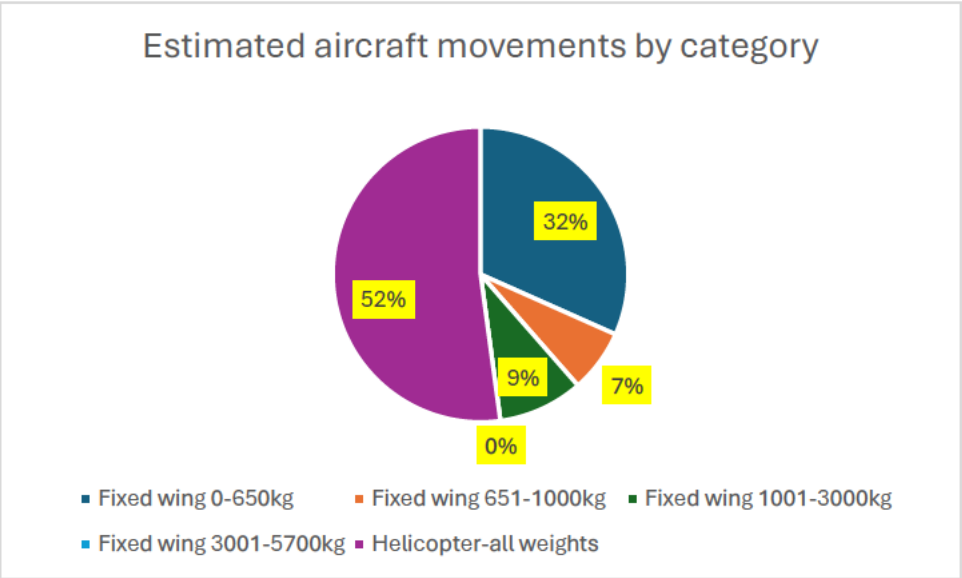

Figure 4: Split of movements by aircraft category

[4] A movement is a take-off or a landing

Fixed wing aircraft are categorised by weight for movements tracking and together account for 48% of all movements. The predominant weight of fixed wing aircraft is below 650kg, generally known as "microlight aircraft", being one or two seat piston-engine powered. 16% of movements are by larger piston engine aircraft seating four or more. There are very few movements of fixed wing aircraft over 3000kg maximum take-off weight.

The remaining 52% of movements are by helicopters which range from small two seat piston-engine private and training helicopters up to large twin turbine-engined machines uses for heavy commercial work and emergency medical services (EMS).

The estimated movement numbers at Taieri are relatively high for a small airport with only grass runways and are comparable to movement numbers at to Rotorua, Paraparaumu and Timaru, aerodromes all of which have some scheduled services and sealed runways.

3.3 Proposed Inland Port

Description

Figure 5 shows the SLIP concept plan.

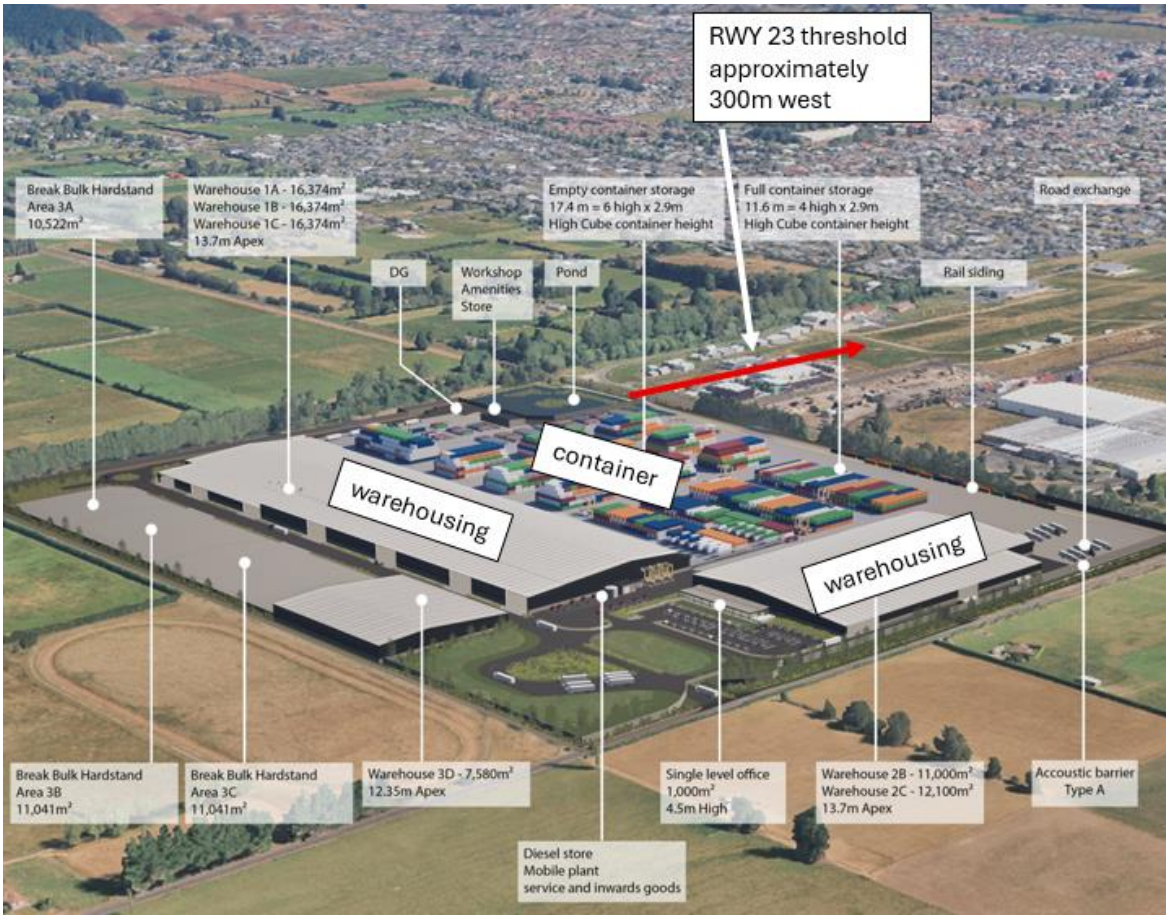

Figure 5: Southern Links Inland Port concept plan

Figure 6 shows the site in plan view. Note the "clear area" discussed later in this report.

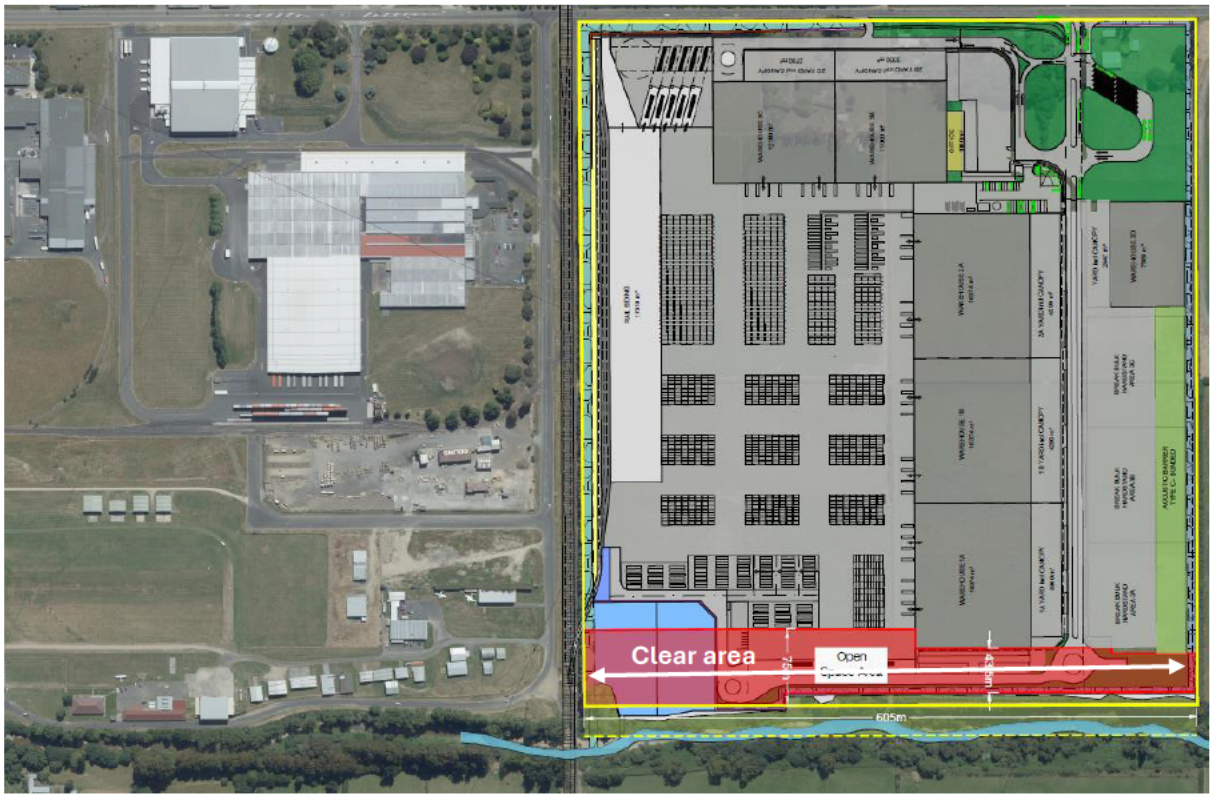

Figure 6: SLIP site plan

The development will occur in 3 stages over 1-10 years. Site infrastructure for the SLIP will include:

- A new rail siding off the Taieri Branch Line to enable loading, unloading and operation of a rail freight shuttle service to Port Chalmers and the wider rail network;
- Approximately 80,000 m^2 of high stud warehousing (chilled and ambient);
- Truck canopy and unloading areas;
- A 5 ha container depot facility enabling the inspection, cleaning, upgrading and repair of containers including for food grade repacking;
- Up to 5 ha of container terminal for storage of full containers including refrigerated containers;
- Break bulk storage facilities;
- Road widening; and

Ancillary activities to support the above including earthworks, construction of the rail siding, site access, internal roadways and parking, hardstand areas, landscaping, buildings for storage, administration and maintenance facilities, and associated infrastructure and works including measures necessary to manage stormwater and stabilise the site. We are advised that the maximum building/structure height will be

17m. Cranes may be utilised throughout construction at heights greater than this. Any necessary CAA Approvals will be obtained and the OAC notified so it can issue appropriate Notice to Airman (NOTAM) prior to their utilisation and operation.

SLPL is not proposing to have cranes above this height at the site on an on-going basis.

SLPL is aware of the potential impact of the development on the aerodrome's operations and has expressed willingness to work with the aerodrome operator to minimise risks so far as reasonably practicable.

4 Aviation statutory obligations on SLPL

4.1 General

Aviation safety in New Zealand is managed via CAR issued by the Minister for Civil Aviation under the Civil Aviation Act 2023. Compliance with the CAR is managed by the CAA. The CAR are generally performance-based rather than prescriptive in terms of how compliance is achieved and are largely based on International Aviation Standards and Recommended Practices issued by the International Civil Aviation Organisation under International Conventions to which New Zealand is a signatory state.

Acceptable means of compliance with the CAR are provided in various CAA Advisory Circulars. Other means of compliance can be used provided the CAA accepts an equivalent level of safety is achieved.

The CAR generally only apply to aviation "Document Holders" i.e. individuals or organisations who are directly undertaking an aviation activity e.g. pilots, aircraft engineers, airports, airlines. However, some rules apply to the wider public e.g. following flight crew instructions when on board an aircraft, carriage of dangerous goods and non-aviation activities which affect "navigable airspace" e.g. the erection of obstacles in aircraft flight paths.

4.2 CAA Rules

4.2.1 Part 77 requirement to notify CAA

CAR Part 77 *Objects and Activities Affecting Navigable Airspace* at 77.5 prescribes the requirements for providing notice to the CAA of construction or alteration of a structure. There is a requirement to notify, *inter alia*, if a proposed structure:

(a) extends more than 60 m in height above the ground level at its site; or
(b) is located below the approach or take-off surfaces of an aerodrome as outlined in Figures A.1 and A.2 of CAR 77 Appendix A and extends to a height greater than a surface, outlined in Appendix A, extending outward and upward at one of the following:

i. a slope of 1:83 from the fan origin of the take-off surface of a runway where the runway is used or intended to be used by aircraft with a MCTOW above 5700 kg:
ii. a slope of 1:50 from the fan origin of the take-off surface of a runway where the runway is used or intended to be used by aircraft with a MCTOW at or below 5700 kg:
iii. a slope of 1:25 from the nearest point of the safety area of a heliport; or

Part 77 Appendix A is attached for reference.

I am advised by SLPL that no structures on the SLIP site (including construction cranes) will exceed 60m above ground level so (a) above does not apply.

The item (b)(ii) approach and take-off surfaces refers to the runway 05-23 obstacle limitation surfaces as defined in CAA Advisory Circular (AC) 139-06, which is similar in plan form to the 2GP published flight fans[5]. I am advised by SLPL that the 2GP standards will be complied with.

The requirement to notify CAA of the proposal to construct SLIP structures under the take-off and approach surfaces is triggered due to the Part 77 upslope gradient threshold of 1:50, rather than the steeper 1:20 upslope limit included in the 2GP at Rule 33.6.4 Maximum Height paragraph (3). This applies irrespective of whether notification to CAA is specified in the consent conditions.

Item (b)(iii) above relating to helicopter flight paths does not apply as the specified helicopter take-off and landing area at the apex of runways 05-23 and 11-29 is approximately 750m from the SLIP west boundary. This results in a 1:25 upslope height limit for notification of 30m at that boundary which would not be infringed.

4.2.2 Notice period required

The general requirement under CAR 77.13 is for CAA to be notified at least 90 days prior to construction starting. There are additional notification requirements under 77.13 relating to the actual commencement date, when the structure has reached its highest point, and when construction is completed.

4.2.3 CAA action once notified

Once notified the CAA will prepare an aeronautical study (an aviation-specific risk assessment) on the proposal, to determine if it is going to be a hazard to aviation. The grounds determining a hazard in these circumstances may be:

(a) If the structure infringes the aerodrome's OLS. These would be as published in the 2GP on planning maps 28 and 29 i.e. with an upslope of 1:20 rather than the more

[5] AC136-6 Table 4-1 (approach) and Table 4-2 (take-off) for Code 2 non-instrument day only runways.

restricting 1:50 notification trigger level. As SLPL intends to keep structures below the 1:20 OLS it is unlikely that the CAA will determine the development to be a hazard on these grounds.

(b) If the structure affects an instrument flight procedure published for the aerodrome. The only such procedure for Taieri Aerodrome published in the AIP is for helicopter approaches at night and in poor weather along runway 05 heading east. The "missed approach" takes the helicopter over the SLIP site approximately on the runway extended centreline before turning to the south and climbing away.[6] This procedure should not be affected by the development as the maximum height of 18m above ground level is below some of the taller trees already in the area. We understand Helicopter Otago is of the view that the procedure will not be affected but we suggest for total certainty this is confirmed by Aeropath, the procedure designer.[7]

Notwithstanding (a) and (b) above the CAA may still, as a result of its aeronautical study, require mitigations but I believe there would be very limited grounds for this and at most it may be some form of marking or lighting the tallest parts of the structures on site and measures to control aggregation of wildlife (birds) on the site.

4.3 Aviation statutory obligations -Summary

SLPL will need to notify the CAA under Rule Part 77 of its intention to construct the SLIP. This is because the SLIP will infringe a 1:50 approach and take-off surface at the east end of runway 05-23. This application must be made at least 90 days before any construction commences, but we recommend it is applied for as soon as the site layout is reasonably fixed.

5 Discussions with affected aviation parties

5.1 Affected aviation parties

The Taieri aerodrome site is owned by the parties identified in section 3.2 above, but its operation is delegated to the OAC, which is based at the aerodrome. The OAC is listed in the NZAIP as the Aerodrome Operator which makes it responsible under the CAR for certain functions.

[6] The "missed approach" path is the path the pilot must fly to abort the landing if conditions are such that he/she cannot see the landing pad at the minimum safe descent altitude of approximately 500ft above the ground.

[7] Aeropath is a subsidiary of Airways Corporation of New Zealand, responsible for instrument flight procedure design at most New Zealand Airports.

Helicopters Otago operates commercial helicopter services from its base at the aerodrome. This includes corporate, agricultural, lifting, charter and flight training as well as medical emergency services on behalf of the Otago Southland Rescue Helicopter Trust.

There are also a number of individual aircraft owners whose aircraft are based at the aerodrome.

The following sub-sections provide a summary of the consultation undertaken to date with potentially affected aviation parties.

5.2 Otago Aero Club

SLPL conducted a TEAMS meeting with nine members of the OAC Committee on 19 Nov 2025 at which SLPL introduced the project via a video presentation and draft site Master Plan. Of note, feedback was given on:

a) the proposed lighting towers alongside the rail siding to be constructed on the west side of the SLIP site (adjacent to the aerodrome), which would have to be lowered to fit under the 2GP flight fans; and
b) the colour of site building roofs to avoid upwards glare.

SLPL confirmed the towers would be lowered to comply with the 2GP flight fans.

The Committee described the runway 23 aircraft circuit pattern, which extends laterally out to School Rd north of the runway, with glide approaches to land on runway 23 passing low over the SLIP site in a right bank attitude to line up with the runway.[8]

In person discussions were held with the OAC on 9 Dec 2025. Attending were Colin Chalmers (President) and Mike Beattie (Vice President) from the Aero Club and Joanne Dowd, Grant Driver, Bridget Irving and Dave Park representing SLPL.

Potential aviation safety risks raised by the Aero Club were:

c) Risk of injuries to pilots and passengers as well as persons on the ground beneath take-off flight paths in the event of an engine failure on take-off on runway 05.
d) Bird risk from the stormwater attenuation pond, which is an essential part of the development on the southwest corner of the site under the take-off and approach path, and birds roosting on roofs.
e) The height of construction cranes which may infringe the approach and landing 1:20 flight fan.
f) Glare from site lighting.
g) Impact on helicopter night flying operations.

[8] Glide approaches are a training procedure where the approach to land is made with the aircraft's engine throttled back to idle.

Note that most of these risks apply to light single engine propellor aircraft as predominantly used at the aerodrome. Helicopters have more flexibility with flight paths although CAR require them to conform to the fixed wing aircraft circuit if fixed wing aircraft are operating.

5.3 Helicopters Otago

SLPL and myself met with HO on 4 February 2026 to discuss the SLIP development. HO operates helicopters on commercial operations including air transport, agricultural , EMS, lifting and flight training. Its fleet comprises both single engine and twin engined turbine powered helicopters plus a single piston-engined two-seat training helicopter.

HO's primary operations are EMS on a 24/7 basis operating under IFR. Night vision goggles are used extensively for night operations.

Under IFR flight, departures are always in the runway 23 direction (towards the southwest) and do not fly over the SLIP site. IFR arrivals are in the runway 05 approach direction and also do not fly over the SLIP site, except if a "missed approach" procedure is required in the event a landing is not possible. The missed approach path requires a turn to the right (south) which may cross over the SLIP site in some situations.

The IFR procedures have been designed by Airways Corporation specifically for HO's helicopter operations. The procedures have to be reviewed every 5 years requiring an updated survey of obstacles in the approach and missed approach area to be commissioned from a registered surveyor and provided to Airways. HO does not anticipate the SLIP will result in any restrictions on the IFR approach in the future. I have the same view and note the height limit of the SLIP development is lower than existing trees in the area.

In good weather conditions VFR departures and arrivals can be in any of the four runway directions, two of which cross the SLIP site (runway 23 approach and runway 05 departure).

Having been briefed in detail on the SLIP development, HO does not have any concerns over it and sees no adverse impacts on its flying operations.

5.4 Private aircraft owners

Private aircraft owners and operators are required to seek approval from OAC, the aerodrome Operator, to base their aircraft at the aerodrome and are required to become members of the Aero Club. As such, consultation with OAC is considered to adequately cover the interests of resident private aircraft operators.

5.5 Taieri Aerodrome Owners

While the Taieri Aerodrome is owned by the six parties identified in section 3.2 of this report, management of the airfield and day-to-day operations are managed entirely by OAC (who is also one of the owners).

The details of SLPL's consultation with OAC have been discussed in section 5.2 above.

5.6 Discussion of the risks

5.6.1 Engine failure on take-off (runway 05) or landing (runway 23)

The infrastructure of the SLIP under the take-off and approach fan between 350m to 950m from the eastern end of runway 05-23 will increase the risk to aircraft operations on that runway compared to the existing flat, grassed rural land. This said, there are already substantial buildings within 100-200m of the east runway end, also under the take-off and approach fan.

The risk to aviation safety is that a single-engined aircraft taking off on runway 05 that suffers an engine failure shortly after lift-off may come down within the SLIP site. Development of the SLIP will limit the available space for an emergency landing on the site due to the construction of structures and buildings thereby increasing the hazard to an aircraft and its occupants in the event of an emergency landing.

An Australian Transport Safety Bureau (ATSB) report on light piston-engined aircraft engine failures between 2009 and 2014 found a failure rate of about 1.3 per 10,000 flight hours with one particular engine type having a rate 3 times this.[9] In the set of 322 engine failures or malfunctions described in the ATSB study, 80 (25%) were classified as being a low risk rating with a low or no accident outcome. The majority (224 or 69%) were classified as medium risk and 18 (6%) as high risk.

Failures attributed to non-engine causes such as fuel starvation were included as irrespective of the cause, the outcome is an engine stopping. Of 18 high risk accident outcome events in the study, eight (44%) were reported as occurring on take-off or in the initial climb and the remainder in cruise (33%), descent (6%) or approach (17%). There was no breakdown in the report for medium risk events.

[9] Australian Transport Safety Bureau, Aviation Safety Research Paper AR-2013-107 "Engine failures and malfunctions in light aeroplanes 2009-2014", 16 Mar 2016, Fig 3.

Failure rates for turbine helicopter engines are estimated to be lower by a factor of 10.[10] Additionally, HO advised that 50% of its helicopter fleet are twin engined which further reduces the risk of a forced landing in the event of the failure of one engine.

HO considers the risk of a helicopter forced landing in the SLIP site following an engine failure is minimal because but the time a helicopter on take-off gets to the SLIP west boundary it will have sufficient height to autorotate to the east or south sides of the site.[11]

Consequently, helicopters are not considered further with regards to forced landing risk on the SLIP site.

Total hours flown by small fixed wing aircraft in New Zealand in the year to 30 Sep 2025 are reported to be 156,470.[12]

Engine failure rates for this category of aircraft in New Zealand are not readily available. However, applying an average engine failure rate of 1.3 per 10,000 hrs from the Australian Study suggests there could be 20 engine failure events per year in NZ in these types of aircraft.

Applying the Australian figures of 44% of failure events on take-off and 6% resulting in serious injury suggests one serious engine failure event on take-off every two years in small aircraft per year in New Zealand.

By comparison a 10-year CAA study 1995 to 2004 identified 12 single engine aircraft accidents due to loss of engine power which resulted in 8 fatalities, 18 serious injuries and 14 minor injuries in the 10 years, an average rate of 1.2 events per year.[13] The report does not identify how many of these were on take-off but it does say a number were ditching accidents (aircraft forced landing on water).

CAA uses a risk likelihood/consequence matrix described in the CAA Aviation Risk Management Booklet 4 Annex C (see Appendix B to this report). This lists event likelihood levels on a graded scale from "likely" to "rare", "rare" being that it is not conceivable that this event could occur. The level above "rare" is "unlikely" meaning it is conceivable the event could happen, although only in unusual circumstances.

[10] The US Federal Aviation Administration cites a turbine engine failure rate of 1 per 375,000 hours. Turbine helicopter engines are understood to have a failure rate about 6 times higher than turbine engines in fixed wing aircraft suggesting one per 75,000hrs or 0.13 per 10,000hr.

[11] "Autorotation" is the helicopter equivalent of a fixed wing aircraft gliding. The rotational energy in the free-wheeling rotor provides lift and directional control to manage a safe landing.

[12] https://www.aviation.govt.nz/safety/read-reports-and-statistics/occurrence-and-activity-dashboard/dashboard/

[13] Wackrow A, New Zealand Fixed Wing Aviation Accidents - A review of all reported New Zealand registered
aeroplane accidents from 1995 to 2004, CAA 2005

Given engine failures on take-off in this class of aircraft have occurred in New Zealand, I consider "unlikely" is an appropriate likelihood level for an engine failure on take-off on runway 05 at Taieri, and similarly for failure on approach to land on 23.

The risk matrix described in the SMS booklet matches the likelihood level to the Consequence level of an accident event. The consequence levels range from "catastrophic" to "minor". The appropriate level for accidents known (from the CAA 10 year report) to have caused fatalities and serious injuries is, in my opinion "critical".

Application of the matrix suggests a medium risk level which requires mitigation where that is reasonably practicable.

5.6.2 Mitigation options

The southern end of the SLIP site lies directly underneath the take-off and approach paths for the eastern end of the Taieri Aerodrome runway. It is not practicable to keep this area wholly clear of development.

However, to mitigate the risk associated with a forced landing in this area, I am advised that SLPL has elected to design the layout of the SLIP site to provide an approximately 43.5 – 75m wide 'clear area' north of the site's southern boundary for an aircraft to land in an emergency. This 'clear area' would still be utilised as an internal road for the Inland Port but would be kept free of buildings, container stacks and substantial vegetation.

Figure 7 shows the proposed clear area.

This clear area will provide mitigation to the risk of engine failure on take-off or on approach.

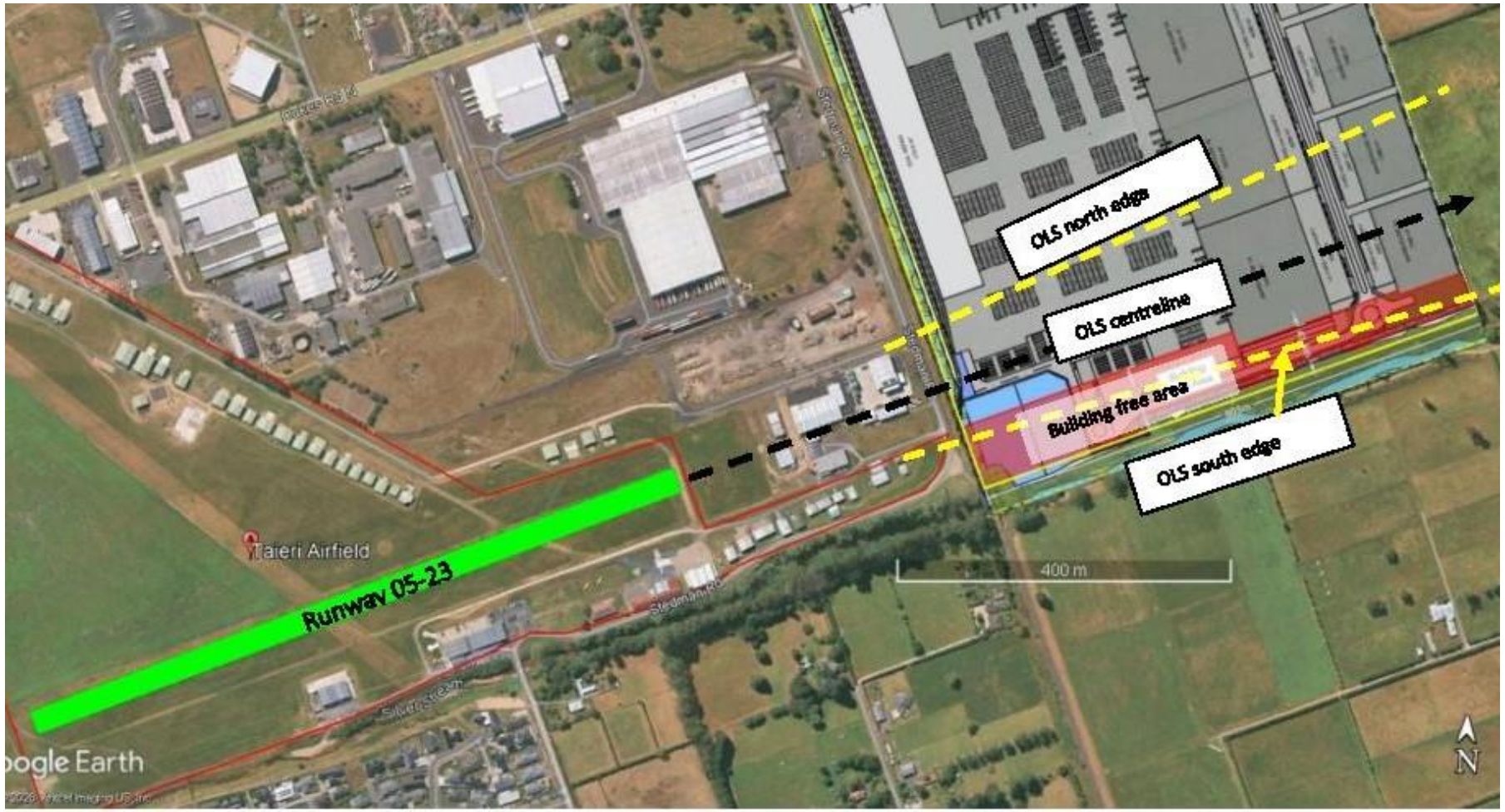

Figure 7: Proposed clear area

I consulted the Otago Aero Club on the clear area concept and they made the following comments: [14]

- They are supportive of the provision of a clear area for emergency landings.
- They suggested a smaller clear area may be sufficient once construction has started and they can see what the site is like to fly over with some of the buildings, landscaping and such already completed.

The proposed clear area would be beneficial for situations where the engine fails before an aircraft passes over the SLIP site as it would provide the option to safely land in the clear area without having to turn too far off the runway heading to land in the paddocks south of the site. Turns at low level in an attempt to reach a clear area can be very hazardous especially for inexperienced pilots.

The clear area reduces the risk to persons on the ground in the SLIP site as well as the occupants of an aircraft having to make a forced landing as it largely consists of ponds and roading and consequently it is not expected there would be a significant congregation of people within it.

For these reasons I support SLPL's proposal to provide the clear area as a practical risk mitigation for engine failure on take-off.

5.6.3 Bird hazards

Bird concentrations on and around aerodromes constitute a real threat to aircraft safety.[15] Consequently any activity adjacent to an aerodrome, and in particular under flight paths, that attracts birds should be adequately managed.

The CAA monitors bird collisions with aircraft ("bird strikes") for aerodromes in New Zealand with scheduled aircraft operations. The average bird strike rate for these aerodromes is currently 4 per 10,000 movements.

Existing bird hazards

No CAA birdstrike data is published for Taieri Aerodrome as it does not have scheduled aircraft operations. However I requested data from CAA for Taieri and was advised they have only one recorded bird strike incident at the aerodrome; a Plover on 2 October 2020. The CAA did not advise what damage, if any, the aircraft incurred.

In our discussion with the OAC they advised that bird strikes are not currently a concern but noted that gulls and plovers are prevalent in the aerodrome area.

[14] Email Colin Chalmers (Aero Club President) to Dave Park (Astral Aviation Consultants) 12 Jan 2026
[15] CAA Good Aviation Practice publication Oct 2020, page 11

Changes to bird hazards with the SLIP

SLPL has engaged specialist advice on the ecology of the SLIP site. The specialist's report identifies the following potential attractors of birds to the site:[16]

- The stormwater attenuation pond
- Large flat roofs and eaves on warehouse and storage facilities
- Temporary stockpiling of soil.

A stormwater attenuation pond totalling 12,715m^2 is proposed on the south-western corner of the SLIP site. The pond has been designed to store/manage excess water temporarily prior to its release into Silver Stream within 48 hours.

The pond would normally be dry apart from a very limited period during wet weather events. To reduce the risk of invertebrates becoming established in residual dry sediment in the pond, the Ecology specialist recommends the substrate of the pond is lined and any accumulated sediment is removed after wet weather events.

With the pond being dry most of the time and sediment removed, the specialist's advice is that the pond will have limited attractiveness to birds.

With regard to the building roofs and eaves, the specialist recommends removal of roosting and perching opportunities and deterrent measures such as spikes, slanted roofs and lack of eaves and ledges. To mitigate bird strike risk, including due to construction activities such as stockpiling soil on the site, both myself and the Ecology specialist recommend that SLPL implements an on-going bird management plan like those used at comparable-size aerodromes. We recommend specialist ornithology advice is obtained in preparing the bird management plan.

The CAA also publishes guidance information on wildlife hazard management at aerodromes.[17]

5.6.4 Height of construction cranes

General construction equipment should be kept below the 1:20 flight fan as published in 2GP. Construction equipment above the 1:20 flight fan may impact aviation safety which would require the Otago Aero Club, as the aerodrome operator, to close runway 05 for take-offs and runway 23 for landings. If it is essential to have cranes above 1:20 this must

[16] E3 Scientific, *Southern Links Inland Port Terrestrial Ecological EcIA,* Final Report, February 2026, pp42-43

[17] CAA Advisory Circular AC139-16, Wildlife Management at Aerodromes, Revision 1, 17 Nov 2025 available at https://www.aviation.govt.nz/assets/rules/advisory-circulars/ac-139-16.pdf

be co-ordinated with the Otago Aero Club so the appropriate NOTAM can be issued.[18] The CAA should also be advised.

When notified of proposed crane activity above 1:20, the CAA will assess the impact and may impose restrictions on either the aerodrome or the proposed crane activity. Depending on the extent of infringement, take-offs on runway 05 and landings on 23 may be prohibited temporarily, or they may be able to continue with a caution to pilots. Either would be advised to pilots by NOTAM issued by the Aero Club.

It is highly likely CAA will require cranes above the 1:20 to carry an obstruction light due to night helicopter operations. Even if they don't require it we highly recommend it as a collision risk mitigation that is very cost-effective.

We recommend appropriate construction safety procedures to ensure management and co-ordination of aviation risks are included in the future Construction Management Plan for the site to address this. CAA Advisory Circular AC139-5, *Operational Safety During Works on Aerodromes*, describes the preparation of "Method of Works Plan" documents intended for construction management. This would be a good model to SLPL to use to cover off aviation specific requirements in its construction management plan.

5.6.5 Glare from site lighting

Currently only the Otago Rescue Trust EMS helicopters operate at night from the aerodrome.

Pedersen Read Ltd., consulting electrical engineers, has undertaken an assessment of environmental effects (AEE) on lighting at the SLIP site.[19] The report proposes several actions and mitigations in relation to lighting:

i. Construction works associated with the Inland Port development will be undertaken during standard daytime working hours, consistent with the Project Description. Night-time construction is not proposed. In limited circumstances, such as early morning starts required for specific activities (e.g. large concrete pours), temporary construction lighting may be used to maintain safe working conditions within approved hours.
ii. Consultation with CAA and Taieri Aerodrome prior to construction, informing them of the proposed activity and demonstrate planned lighting control measures for their endorsement. Consider additional controls proposed by those parties.

[18] NOTAMs are the international standard means of communicating essential operational information relating to temporary situations to pilots. As the Taieri Aerodrome Operator, the Otago Aero Club is responsible under CAR 139 for issuing NOTAM in the event of any unsafe conditions affecting operations at the aerodrome.
[19] Pedersen Read Ltd, "Port Otago Inland Port Application Assessment of Environmental Effects (Lighting)" Revision A, 16 Dec 2025

iii. Consultation with affected neighbours regarding construction activities, if there is a specific need to undertake works at night.
iv. Compliance with glare and spill light limits at the Taieri Plain Rural, Industrial, Taieri Aerodrome and Rural Residential site boundaries.
v. Lighting design to consider the Taieri Aerodrome Flight Fan height limitations such that all lighting infrastructure is installed within the allowable height limits.
vi. All exterior lighting to be flat glass with zero upward component and installed without tilt.
vii. No feature uplighting of to be undertaken
viii. Utilise shielding to ensure spill light is controlled

I agree with these proposed mitigations. Regarding (ii) and (iii) above, we strongly support the proposal to consult with the Aero Club over site lighting and possible night construction with lighting requirements.

A copy of the Petersen Read report should be provided to the CAA with SLPL's Part 77 application.

6 Summary and recommendations

Aside from having to lodge a **Notice of construction or alteration of structure** with the CAA under CAR77 and comply with any conditions the CAA may attach to the approval, there are no CAR requirements for SLPL to meet.

SLPL's proposal for a building free area as shown in Figure 7 mitigates the hazard of an aircraft impacting solid structures in the event of a forced landing following a low level engine failure on runway 05 take-off or runway 23 approach.

If it is reasonably practicable for SLPL to provide the building free area then I believe it should be done.

It is likely that CAA Part 77 approval will specify conditions relating to:

a) Management of the height of construction equipment such that OAC can adequately notify by NOTAM any infringements of the 1:20 light fans.
b) Manage any features or activities on the SLIP site that may attract birds. This may include implementing a wildlife (bird) management programme.
c) Manage lighting on the site such that glare is not detrimental to pilots' vision when passing over the site.
d) Ensure building materials and cladding finish does not reflect sunlight into pilots' eyes.

SLPL can facilitate future safe aircraft operations at Taieri Aerodrome by working in consultation with OAC on SLIP activities that may impact the aerodrome. The ideal way to achieve this is to set up a joint OAC-SLPL consultation committee that meets regularly (I recommend every three months) during construction planning, construction and initial facility operation.

After a settling in period, meeting frequency may be able to be reduced to every six months.

The meetings should have a standard agenda and be minuted.

Appendix A: Part 77 Notification surfaces

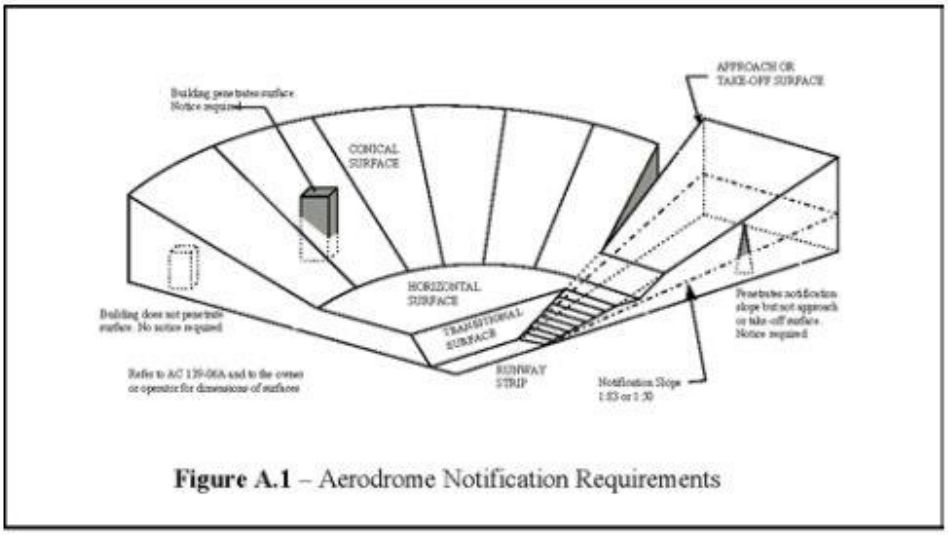

Figure A.1 – Aerodrome Notification Requirements

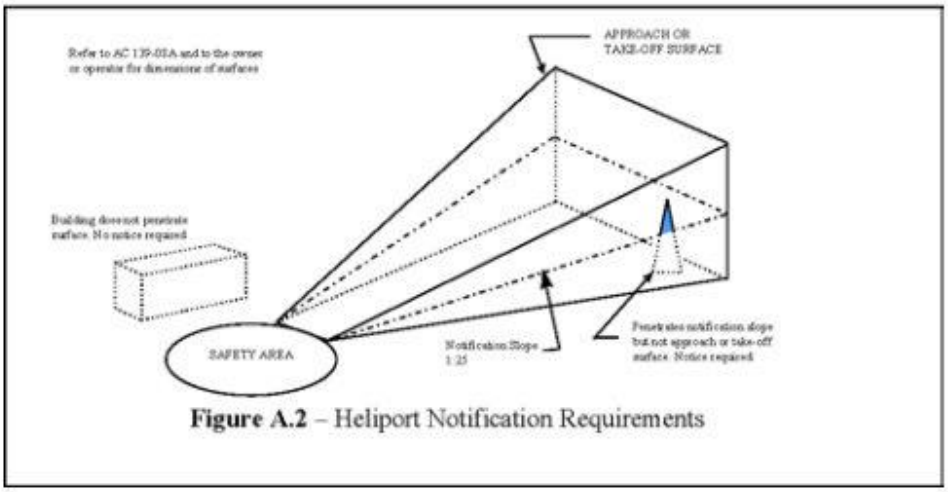

Figure A.2 – Heliport Notification Requirements

Note: Taieri Aerodrome does not have all these surfaces defined, only the approach or take-off surface.

Appendix B: CAA brochure 04 Aviation Risk Management - An Introduction

ANNEX C:
DEVELOPING A RISK MATRIX

Start by developing a set of consequence descriptors. The example shows how they could be constructed, but it's critical that you develop your own, so that they suit **your** organisation's operations, size and nature. The consequence levels need to be set for each dimension you choose (be it finance, reputation, etc). The table below outlines possible descriptors for a safety risk.

CONSEQUENCE LEVEL	DESCRIPTION
CATASTROPHIC	One or more fatalities Loss of aircraft or major equipment
CRITICAL	Serious injury to one or more people, resulting in permanent disability Sustained or extensive damage to aircraft or equipment
MAJOR	Injury that requires hospitalisation (with no permanent disability) Damage to aircraft or equipment resulting in temporary inability to use it
MODERATE	Injury requiring only First Aid (no permanent disability) Isolated and quickly-repaired damage to aircraft
MINOR	No injury or very minor injury that does not require First Aid Minor or no damage to aircraft or equipment

The next step is to determine your likelihood descriptors: again, these must reflect **your** organisation.

LIKELIHOOD LEVELS	DESCRIPTION
LIKELY	Expected to occur at least once during the task or activity
PROBABLE	Could occur during the task or activity
POSSIBLE	It's conceivable it could occur, but only expected infrequently
UNLIKELY	It's conceivable that this could happen, although only in unusual circumstances
RARE	It's not conceivable that this could occur

The examples show 5 levels of consequence and 5 of likelihood, but you can use more or less as appropriate – you could have 4 of one and 5 of the other. (Less than 3 of either is not much use).

Now you can build your risk matrix. The risk matrix connects the consequences and likelihoods to give a set of risk levels.

CONSEQUENCE	LIKELIHOOD: RARE	UNLIKELY	POSSIBLE	PROBABLE	LIKELY
CATASTROPHIC	MEDIUM (16)	MEDIUM (10)	HIGH (6)	HIGH (3)	HIGH (1)
CRITICAL	LOW (20)	MEDIUM (13)	MEDIUM (9)	HIGH (5)	HIGH (2)
MAJOR	LOW (21)	MEDIUM (15)	MEDIUM (11)	MEDIUM (8)	HIGH (4)
MODERATE	LOW (23)	LOW (19)	MEDIUM (14)	MEDIUM (12)	MEDIUM (7)
MINOR	LOW (25)	LOW (24)	LOW (22)	LOW (18)	MEDIUM (17)

Next, set the risk levels for **your** organisation. Number them in order of priority, and, if you need to, you can have more than these three.

RISK LEVEL	DESCRIPTION
HIGH	A considerable potential for fatalities or serious injuries, or the loss of an aircraft or equipment
MEDIUM	A moderate potential for injuries requiring hospitalisation, or the damage of an aircraft or equipment
LOW	Minimal potential for injuries (above those requiring First Aid) or for any consequential damage to aircraft or equipment

To use the matrix, use the descriptors to determine the consequence and the likelihood for each risk, and then read off the risk level from the matrix.

Now prioritise the risks from highest to lowest (that's where the associated risk level number on the risk matrix can help), and you can move on treating the risks in order of priority.