

CHRISTCHURCH CITY PLAN
PROPOSED PLAN CHANGE
CHRISTCHURCH INTERNATIONAL AIRPORT
RUNWAY END PROTECTION AREAS – RUNWAY 11/29

Change to Amend:

Volume 3, Chapter 9 - General City Rules, as associated with Clause 6 Airport Protection Surfaces:

- (A). Introduction of a new development standard (Rule 6.3.1) 'Deferred REPA'
- (B). Amend and re-number Rule 6.3 to incorporate Runway End Protection Areas ('**REPA**');
- (C). Delete existing Rule 6.3.7 'REPA'
- (D). Amend and re-number Rule 6.3.4 'Approach Surfaces'.
- (E). Insert clause 6.5 'Assessment matters for resource consents'.
- (F). Amend and re-number clause 6.4 'Reasons for Rules'.
- (G). Amend Appendix 4 maps and associated text: 'Map for interpretation of runway end protection area (REPA) - CIAL'; and ' Map for interpretation of – airport protection surfaces – CIAL – Approach slopes'.

Background

Note: This plan change will not require, or relate to any amendment to the existing noise contours as contained within the City Plan. Any increase in noise generation as a consequence of aircraft movements, either due to the increased growth of airport operations, or increased usage of Runway 11/29 ('**cross-wind runway**') as a consequence of this Plan Change, will be able to be accommodated within those noise contours as contained within the City Plan for this planning period.

New Zealand Civil Aviation Authority (NZCAA) Advisory Circular AC139–06A (Part 139) prescribes the regulator's methods to show compliance with design requirements for the certification, operation, and use of aerodromes. Chapter 4 of this document deals with *Obstacle Restriction and Removal*. The chapter begins by stating "*The obstacle*

limitation surfaces of an aerodrome are defined surfaces in the airspace above and adjacent to the aerodrome. These obstacle limitation surfaces are necessary to enable aircraft to maintain a satisfactory level of safety while manoeuvring at low altitude in the vicinity of the aerodrome.”

One of the key surfaces defined by Part 139 is the “strip” which is an area of land kept clear of all obstacles surrounding the sealed runway surface. The existing strip for Runway 11/29 (cross-wind runway) is 150 metres wide (extending 75m either side of the runway centerline). According to Part 139, this strip width dimension is applicable to non-precision approach runways that cater for international and domestic aircraft operations with, inter alia, a non-visual aid providing only lateral (horizontal) guidance adequate for a straight-in approach, without vertical (glideslope) instrument guidance. However, the dimension is inconsistent with the International Civil Aviation Organisation (ICAO) design guidelines that prescribe a strip width of 300 metres for a precision runway such as Runway 11/29 (cross-wind runway) for larger Code Aircraft. For practical reasons NZCAA has chosen to apply a lesser standard because Wellington’s main runway and Christchurch’s cross-wind runway would currently be unable to apply the ICAO 300 metre requirement.

The United States Federal Aviation Administration (‘FAA’) designates Runway Protection Zone (RPZ) standards at the ends of major airport runways. These standards have been adopted by CIAL and incorporated in the City Plan as ‘REPA’ although there is currently no NZCAA requirement for a REPA to be provided. REPA therefore relate to land adjacent to the ends of the airport runway strips that are required to be kept free of obstructions or activities that could interfere with aeronautical navigation.

The FAA designates such ‘Protection Zones’ as highly sensitive areas for reasons of airport safety. Land uses permitted under the FAA’s RPZ standards include:

- Golf courses (but not club houses);
- Agricultural operations (other than forestry or livestock); and
- Car parking.

Land uses prohibited include:

- Residences and public places of assembly (churches, schools, hospitals, office buildings, shopping malls etc); and

- Fuel storage facilities.

The FAA's RPZ dimensions are based on runway characteristics, and are also a function of the type of aircraft and approach visibility minimums associated with precision instrument approach operations.

Applying the FAA design standards, the existing REPA dimensions provided for in the City Plan as applied to the operation of Runway 11/29 (cross-wind runway) are currently designed to accommodate up to Code C aircraft operations under Visual Flight Rules (VFR). These aircraft types include all commercial jet propeller aircraft as well as small turbo fan (jet) aircraft up to and including the B737-800 and A320-200 aircraft fleets. In addition, the current REPA provides for limited Code D aircraft type operations, which include the B767-300 aircraft flying under VFR.

Recent advise from airline operators is that the new generation Code E future fleet additions are lighter and more aerodynamic than current commercial aircraft flying to Christchurch and consequently they are more sensitive to strong cross winds. For future precision approach operations with the larger and faster Code E aircraft including the B777-200, the FAA standard (RPZ) dimensions required are:

- Inner width 300m;
- Outer width 525m; and
- Length 750m.

Explanation of proposed Plan Change

The proposed Plan Change amends REPA provisions and Approach Surface provisions as they relate to the cross-wind runway (Runway 11/29) at the Christchurch International Airport ('the Airport') to enable increased airfield operational capacity, and more efficient and safe use of the Airport's combined runway system. This proposed Plan Change makes provision for the enlargement (both widening and lengthening) of the existing REPA and the widening of the existing strip for the cross-wind runway (Runway 11/29).

The change also introduces 'Deferred REPA' provisions that will protect land to be affected by a possible future relocation of this cross-wind runway to a new alignment 182.5m to the south of its existing centerline.

The proposed change will not necessitate any alteration to the projected air noise contours currently shown within the City Plan within this planning period.

Existing REPAs are provided at the end of each of the Airport's runway strips ("strips" are areas of land kept clear of all obstacles surrounding the sealed runway surface). While some parts of these areas are located on land within the 'Special Purpose (Airport) Zone', a significant proportion of such areas is within land zoned 'Rural 5 ('Airport Influences)'. REPAs are areas within which statistically there are greater chances of aircraft related accidents. It is therefore desirable that limiting the range of land use activities permitted in the REPA reduce the public's exposure to such risks.

Land uses in the existing REPAs at each end of Runway 11/29 are controlled by the Christchurch City Plan in Volume 3, Chapter 9, Rule 6.3.7. That rule states that *"these areas (REPA) are required to be free of obstructions or activities which could interfere with aeronautical navigational aids... All buildings or structures except those required for aeronautical purposes are prohibited...and all activities which generate or have the potential to generate any of the following effects are prohibited.*

- *Mass assembly of people;*
- *Release of any substance which would impair visibility or otherwise interfere with the operation of aircraft, including the creation of smoke, dust and steam;*
- *Concentration of dangerous substances;*
- *Production of direct light beams, or reflective glare which could interfere with the vision of a pilot;*
- *Production of radio or electrical interference which could effect aircraft communication or navigational equipment;*
- *Attraction of birds."*

The current REPAs serving Runway 11/29 are trapezoidal in shape. At the eastern end of the runway, the REPA extends a distance of 515m from the runway threshold (the end of the runway), currently terminating approximately at the State Highway (SH1), Russley Road. This REPA is contained wholly within both the Special Purpose (Airport) zone, and also within the area designated for 'Airport Purposes'. At the western end of Runway 11/29, the REPA begins some 305m from the western runway threshold, a small

proportion of it being contained within the Special Purpose (Airport) Zone and also within the designation for 'Airport Purposes'. The remainder of the western REPA is located predominantly within an underlying Rural 5 zone, with a small portion zoned Rural 6. This displacement allows for a 244 metre future extension of Runway 11/29.

The locations of the REPAs at the Airport are currently referred to in the text of Rule 9-6.3.7. That rule also makes reference to a diagram showing the "*Runway end Protection Zones*". This diagram is included in the on-line version of the Plan as Appendix 4 to Section 9 but was omitted from the hardcopy version of the operative City Plan by administrative error and will be reinserted when the Plan is next reprinted. This proposed change includes an amended version of that diagram.

The proposed Change provides for the enlargement of the existing REPAs serving Runway 11/29 to cater for precision approach operations for all aircraft types, including the future trend of services by such aircraft as the Airbus A350, Boeing 787, Boeing 777, and Boeing 767. The main runway 02/20 does not require any amendment to accommodate such operations. This Change also introduces a 'Deferred REPA' area which is intended to enable planning consideration to be given to protecting the land affected by a foreseeable relocation of the existing REPA as a result of the possible future relocation of the cross-wind Runway 11/29 (beyond the life of the current District Plan).

Currently, the predominant role of Runway 11/29 is to cater for aircraft movements during strong northwest wind conditions. Typically in Christchurch, northwest conditions produce warm dry weather and good visibility for pilots. Therefore, based on the current functioning of this runway all aircraft movements can be safely undertaken using Visual Flight Rules (VFR).

Recent studies contributing to the CIAL Airport Master Plan 2006 have identified the desirability for Runway 11/29 to be used in the foreseeable future to increase airfield capacity during peak demand periods in conjunction with Runway 02/20, by operating Simultaneous Operations (SIMOPS). This will require the operation of Runway 11/29 in a broader range of weather conditions, with certain aircraft to approach from the northwest to land on Runway 11, whilst larger aircraft continue to land and take off to the northeast on the main Runway 02.

Such a mode of operation on Runway 11 will see commercial aircraft of all sizes operating under Instrument Flight Rules (IFR) in potentially all weather conditions. This change in operational practices translates to the need for Runway 11/29 to be used during periods of reduced visibility, which will in turn require associated precision approach and consequential procedural changes. It is this move to precision instrument approaches under IFR that triggers the need for a more generously proportioned REPA associated with Runway 11/29.

There are no resultant amendments to the existing Composite 65dBA Ldn and 95SEL dBA Air Noise Boundary, or the 50 dBA Ldn Outer Control Boundary within the life of the current City Plan given that these contours are predicated upon the future operational capacity of the airport's current two-runway configuration, which will not be reached within the life of the current City Plan. Current mitigation mechanisms in association with lessening the potential noise impacts from the airport operations include:

- CIAL managing airport operations such that the noise from aircraft operation do not exceed the Ldn 65 dBA outside the Ldn 65dBA airport noise contours demarcated in the City Plan;
- Airways Corporation of New Zealand Memorandum of Understanding, including a general statement for the reduction in noise emissions where possible; and
- Noise monitoring.

These measures will continue to be undertaken by CIAL.

The existing Runway 11/29 (cross-wind runway) has a strip width of 150m and a length of 1,741m, Future proposed operational changes include:

- That the 11/29 runway strip be widened to 300m to meet ICAO requirements for precision approach runways;
- That the Airport will have the capability to operate flights in cross-wind conditions for precision landings;
- That Runway 11/29 will used for precision approaches under SIMOPs in times of peak runway demand, mainly by turboprop aircraft and smaller jet aircraft;
- That Runway 11/29 may (beyond the life of the present City Plan) be lengthened up to 2,000m to provide for enhanced take-off capability for Code D (e.g. B767)

and Code E (e.g. B777, B787, A350) aircraft flying on medium and long haul routes in northwest wind operational conditions;

- That beyond the life of the present City Plan (circa 2015) but in the reasonably foreseeable future, the CIAL Airport Master Plan 2006 indicates the potential for Runway 11/29 to be reconstructed on a new parallel alignment 182.5m to the south of its existing centre line and having an extended overall length of 3,000m. A 3,000m runway extension would necessitate ancillary changes to the associated REPA demarcation to the North West. Such runway realignment would then enable the southerly expansion of the airport terminal precinct and the more efficient provision of freight areas. The existing runway pavement for Runway 11/29 would then be utilised as a parallel taxiway; and
- That, in the event that Runway 11/29 was realigned further to the south, the associated 11/29 REPA and Approach Slope for Runway 11/29 would also then need to be shifted to the south and adjusted by a further Plan Change (including the removal of REPA and Approach Slope provisions for areas of land which would no longer be needed for the present runway location). This proposed Plan Change therefore includes a 'Deferred REPA' to enable potential protection of the further extent of land that would be necessary for the future southern alignment and reconstruction of Runway 11/29 (consistent with the present offset north west REPA position in association with a 2000m runway length). Refer Plan 1 and 2 'Runway End Protection Areas (Deferred REPA)'.

No changes to any of the City Plan's objectives, policies or zone boundaries are proposed, nor is there any alteration to the area of land currently 'designated' for Airport Purposes. While it is anticipated that SIMOPS will result in an increase in the number of aircraft movements (particularly landings from the northwest and take-offs to the northwest) on Runway 11/29 (cross-wind runway) during the life of the current City Plan, these will not necessitate any alteration to the projected air noise contours currently shown within the City Plan within this planning period.

Plan 1- Runway 11/29 City End REPA extents



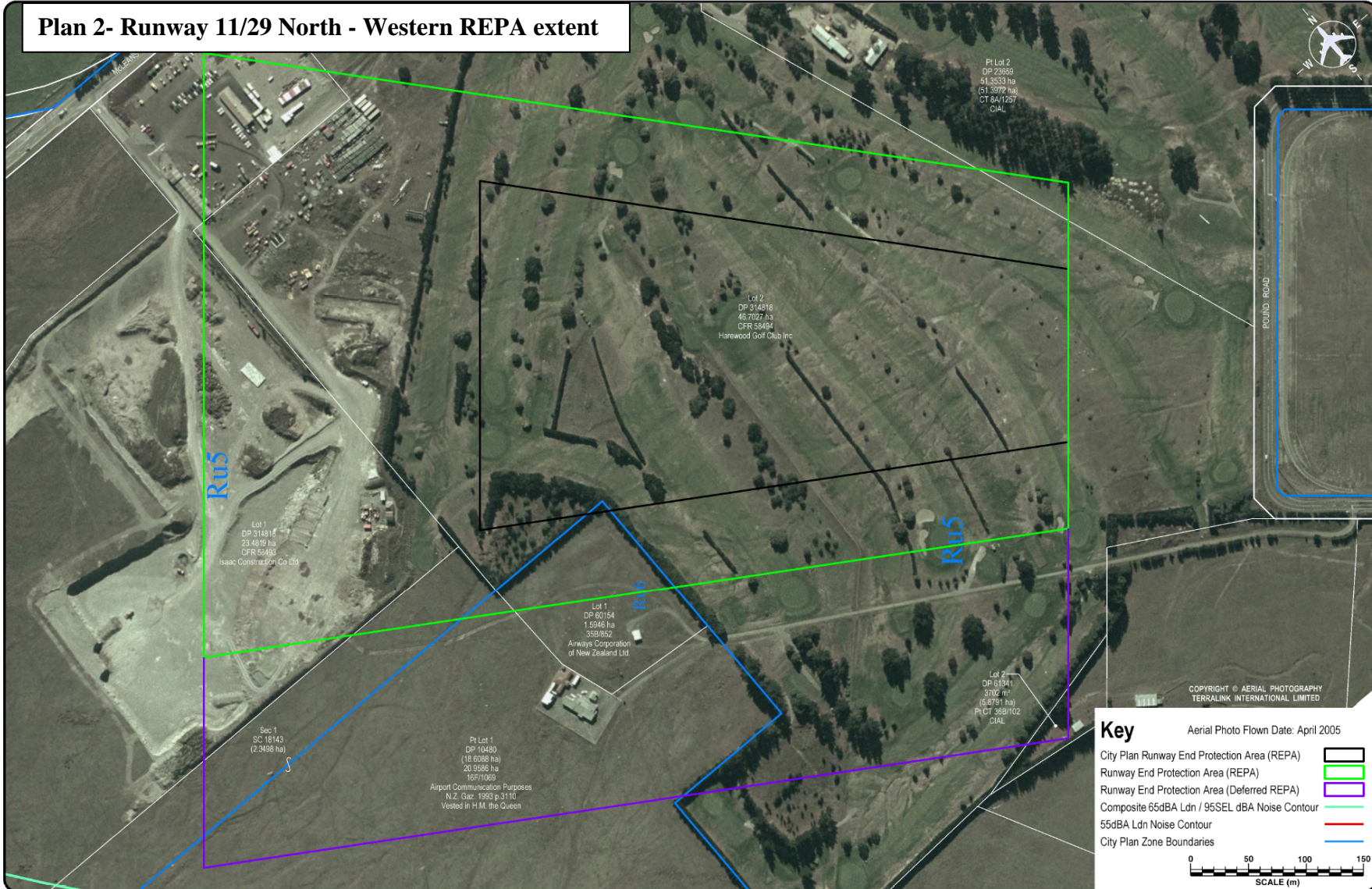
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SHEET 1 OF 2

Plan 2- Runway 11/29 North - Western REPA extent



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SHEET 2 OF 2

Proposed Plan changes

Insert after Volume 3, Section 9, following clause 6.2 General Rule, a further rule to read as follows:

6.3 Development Standard

6.3.1 Deferred REPA

(a) **Any activity that would result in either: a building, other structure, or any utility (except a navigational aid for aircraft) within the 'Deferred REPA' (but not in the REPA) indicated on Appendix 4,**

or

(b) **the following activities within the 'Deferred REPA' referred to in clause 6.4.7 (but not in the REPA) and indicated on Appendix 4:**

- **mass assembly of people;**
- **release of any substance which would impair visibility or otherwise interfere with the operation of aircraft, including the creation of smoke, dust and steam;**
- **concentration of dangerous substances;**
- **production of direct light beams, or reflective glare which could interfere with the vision of a pilot;**
- **production of radio or electrical interference which could effect aircraft communication or navigational equipment;**
- **attraction of birds.**

Shall be assessed as a restricted discretionary activity.

Amend Volume 3, Section 9, rule 6.3, as follows, and renumber Rule 6.3.1 - 6.3.6 to 6.4.1 - 6.4.6 and reposition all subclauses accordingly:

6.34 ~~Critical Standard~~ Prohibited Activity

An activity shall be a **prohibited activity** for which no resource consent shall be granted where:

(a) a building or other structure, or any utility (except a navigational aid for aircraft) shall penetrate the protection surfaces described in clauses 6.4.1– 6.4.6, **or be**

located within the REPA (but not the Deferred REPA) indicated on Appendix 4;

or

(b) any tree that penetrates the protection surfaces described in clauses 6.4.1– 6.4.6;

or

(c) any activity likely to result in the following within the REPA (but not the Deferred REPA referred to in clause 6.3.1) indicated on Appendix 4:

- mass assembly of people;
- release of any substance which would impair visibility or otherwise interfere with the operation of aircraft, including the creation of smoke, dust and steam;
- concentration of dangerous substances;
- production of direct light beams, or reflective glare which could interfere with the vision of a pilot;
- production of radio or electrical interference which could effect aircraft communication or navigational equipment;
- attraction of birds.

Delete Volume 3, Section 9, rule 6.3.7.

6.3.7 Runway end protection areas (REPAs)

~~REPAs are provided at the end of each runway strip. These areas are required to be free of obstructions or activities which could interfere with aeronautical navigational aids. They are also areas in which statistically there are greater chances of aircraft related accidents. It is therefore desirable that the public's exposure to such risks be reduced by limiting the range of activities permitted in the REPAs.~~

~~The REPAs comprise fan shaped areas commencing at the ends of the runway strips (defined in the Section Airport Protection Surfaces) consistent with the dimensions shown in the diagram Runway End Protection Zones.~~

~~All buildings or structures except those required for aviation purposes are prohibited for which no resource consent will be granted within the runway end protection areas and all activities which generate or have the potential to generate~~

~~any of the following effects are prohibited for which no resource consent will be granted:~~

- ~~• mass assembly of people;~~
- ~~• release of any substance which would impair visibility or otherwise interfere with the operation of aircraft, including the creation of smoke, dust and steam;~~
- ~~• concentration of dangerous substances;~~
- ~~• production of direct light beams, or reflective glare which could interfere with the vision of a pilot;~~
- ~~• production of radio or electrical interference which could effect aircraft communication or navigational equipment;~~
- ~~• attraction of birds.~~

Amend the renumbered Rule 6.3.4 (Approach Surfaces) now numbered 6.4.4, as follows:

6.34.4 Approach surfaces

Each strip is provided with an inclined approach surface such that aeroplanes approaching to land have a clear, obstacle-free path with a guaranteed clearance surface. This approach path is located within a defined area called the approach fan (see Appendix 4).

(a) Description

The origin of the approach fan is an inclined plane originating at the end of the strip, the co-ordinates of the centre line of which are shown in Appendix 4.

(b) Characteristics

- (i) The fan is essentially a truncated triangle with the cut-off apex line called the inner edge. The width of this inner edge is 300m for RW02/RW20 and ~~450~~ **300**m for RW 11/29.
- (ii) The expanding sides of the approach fan diverge at a constant rate of 1:6.6 (15%, 8 ° 31' 51") related to the distance from the end of the strip, and extend to a distance of 15,000m from the origin.

(c) Elevation

- (i) The elevation of the inner edge of the approach fan is the same as the highest point on the extended centre line between the end of the runway and the end of the strip ie RW02 RL37.7. RW20 RL26.4. RW11 RL36.0. RW29 RL28.8.
- (ii) The slope of the approach surface is 1:50 (2% , 1 ° 8 ' 45") and is measured in the vertical plane containing the centre line of the runway.

Volume 3, Section 9, Insert new clause as follows:

6.5 Assessment matters for resource consents

In considering the effects of any application for buildings or activities within the 'Deferred REPA', the Council's discretion shall be restricted to the assessment of the effects of any of the activities referred to in clause 6.3.1 on the future economic and efficient development and operation of the Airport.

Volume 3, Section 9, Re-number existing clause "6.4 Reasons for Rules" as: "**6.6 Reasons for Rules**". Add the following text after the last sentence which concludes "*...will not grow to a height that will obstruct them*":

REPAs are provided at the end of each runway strip. These areas are required to be free of obstructions or activities which could interfere with aeronautical navigational aids. They are also areas in which statistically there are greater chances of aircraft related accidents. It is therefore desirable that the public's exposure to such risks be reduced by limiting the range of activities permitted in the REPAs.

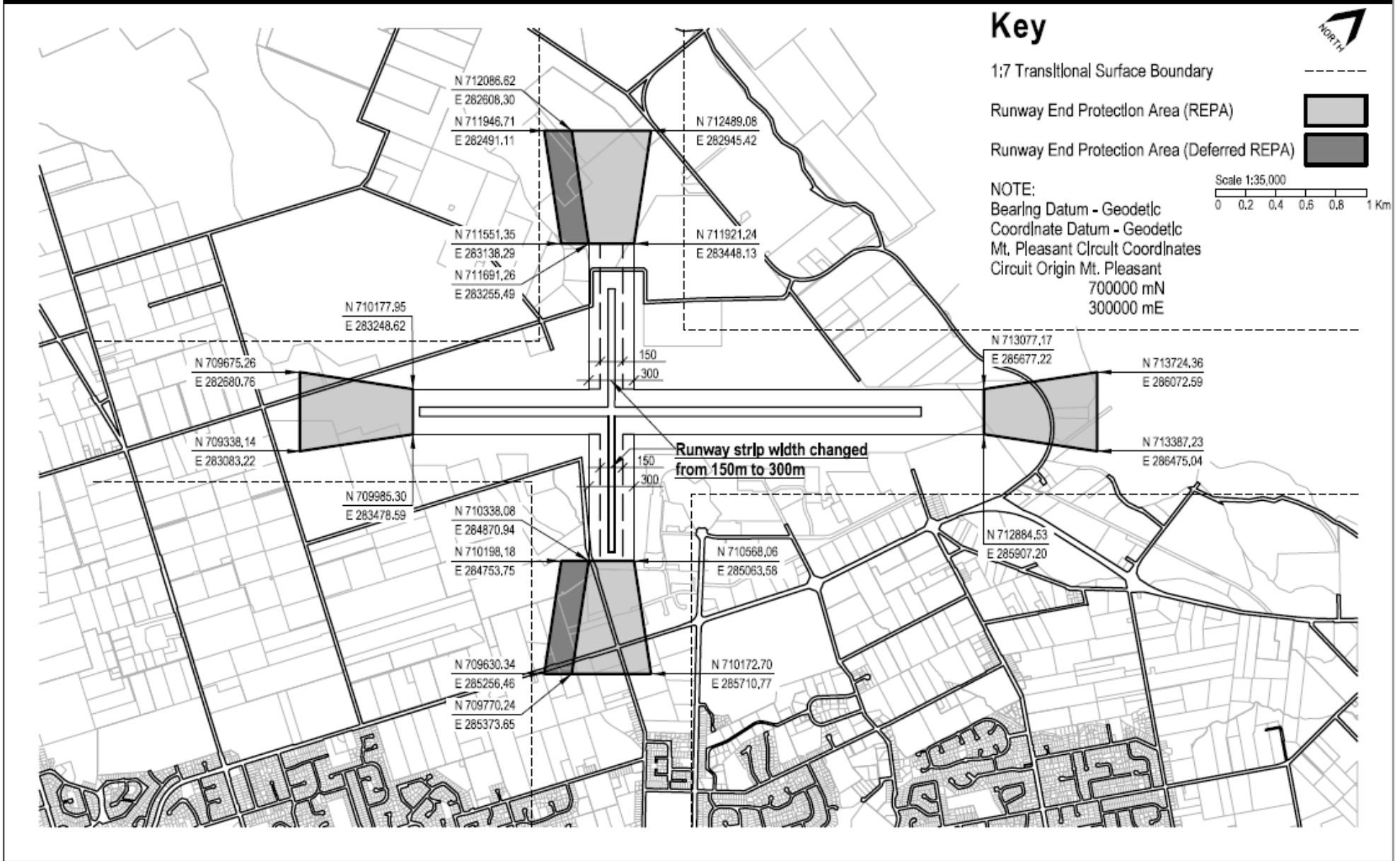
The REPAs comprise fan shaped areas commencing at the ends of the runway strips as shown in Appendix 4 (defined in the Section Airport Protection Surfaces) consistent with the dimensions shown in the diagram Runway End Protection Areas

Volume 3, Section 9, General Rules, replace "Appendix 4 – Map for Interpretation of Runway End Protection Area (REPA) – CIAL" with the new Appendix 4 Map as attached. Amend Appendix 4 - Map for Interpretation of Airport Protection Surfaces – CIAL-Approach Slopes" as attached.

Consequential references to the proposed provisions are also to be made in:

Volume 3, Section 8, Special Purpose (Airport) Zone following clause 3.2.6 as "Reference to other development standards" and following clause 3.3.4 as "Reference to other critical standards".

Appendix 4 – Map for interpretation of runway end protection area (REPA) - CIAL



Appendix 4 – Map for interpretation of –airport protection surfaces – CIAL – Approach slopes

