

## 6.7 Aircraft Protection

### 6.7.1 Introduction

- a. This introduction is to assist the lay reader to understand how this sub-chapter works and what it applies to. It is not an aid to interpretation in a legal sense.
- b. 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 Christchurch International Airport and the Wigram helipad only.
- c. The objectives, policies, rules and appendices in this sub-chapter provide for aircraft protection in the following forms:
  - i. Aircraft Protection Surfaces for Christchurch International Airport - These are defined surfaces in the airspace above and adjacent to the aerodrome (see Appendix [6.11.7.1](#) and [6.11.7.2](#)). 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.
  - ii. Runway End Protection Areas (REPAs) - These relate to four specific areas located at the end of the runways for the Christchurch International Airport (see Appendix [6.11.7.3](#)). 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](#).
  - iii. 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 (see Appendix [6.11.7.5](#) for the extent of this area). 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](#).
  - iv. Protection Surfaces for Defence Wigram – These relate to two defined surfaces located in the airspace above and adjacent to the Wigram helipad (see Appendix [6.11.7.6](#)). The provisions in the plan seek to avoid activities that would protrude through these protection shafts to enable helicopters to maintain a satisfactory level of safety while manoeuvring at low altitude in the vicinity of the helipad.
- d. The provisions in this sub-chapter give effect to the [Chapter 3 Strategic Directions Objectives](#).

## 6.7.2 Objective and Policies

### 6.7.2.1 Objective

#### 6.7.2.1.1 Objective — Safe and efficient aircraft operation

- a. Aircraft are able to safely and efficiently approach, land, take-off and depart from airports, airfields or helipads.

### 6.7.2.1 Policies

#### 6.7.2.1.1 Policy — Avoidance of physical obstructions

- a. Avoid physical obstructions that are not essential to [aircraft operations](#) in take-off, approach, landing or departure paths and in Runway End Protection Areas (**REPAs**).

#### 6.7.2.1.2 Policy - Avoidance or mitigation of navigational or operational impediments

- a. Avoid or mitigate the potential effects of activities that could interfere with the safe navigation and control of aircraft, including activities that could interfere with visibility or increase the possibility of [birdstrike](#).

#### 6.7.2.1.3 Policy - Risk minimisation

- a. Avoid or mitigate activities at the ends of runways that would exacerbate the effects of an aircraft accident.

## 6.7.3 How to interpret and apply the rules

- a. The rules that apply to activities within the areas covered by Christchurch International Airport's Protection Surfaces, **REPAs** and Birdstrike Management Area, and to landfills within [Christchurch District excluding Banks Peninsula Ward](#), are contained in the activity status tables (including activity specific standards) in Rules [6.7.4.1](#), [6.7.4.2](#) and [6.7.4.3](#).
- b. The rules that apply to activities within the areas covered by Defence Wigram's Protection Surfaces are contained in the activity status tables (including activity specific standards) in Rule [6.7.5.1](#).
- c. Activities within the areas covered by Christchurch International Airport's Protection Surfaces, **REPAs** and Birdstrike Management Area (and landfills within [Christchurch District excluding Banks Peninsula Ward](#)), and Defence Wigram's Protection Surfaces, are also subject to the rules in the relevant zone chapters.
- d. The activity status tables, rules and standards in the following chapters also apply to activities within the areas covered by Christchurch International Airport's Protection Surfaces, **REPAs** and Birdstrike Management Areas (and landfills within [Christchurch](#)

District excluding Banks Peninsula Ward), and Defence Wigram’s Protection Surfaces, (where relevant):

- 4 Hazardous Substances and Contaminated Land.
- 5 Natural Hazards;
- 6 The other sub-chapters of General Rules and Procedures;
- 7 Transport;
- 8 Subdivision, Development and Earthworks;
- 9 Natural and Cultural Heritage; and
- 11 Utilities and Energy;

- e. The [Resource Management \(National Environmental Standards for Electricity Transmission Activities\) Regulations 2009 \(NESETA\)](#) contain a separate code of rules for the operation, maintenance, upgrading, relocation or removal of [National Grid transmission lines](#) existing on 14 January 2010. The Regulations in the [NESETA](#) apply where such works penetrate the protection surfaces set out in Rule [6.7.4.4](#) and would otherwise be prohibited by Rule [6.7.4.1.6](#) (PR1).

## 6.7.4 Rules – Christchurch International Airport

### 6.7.4.1 Activity status tables – Protection Surfaces

#### 6.7.4.1.1 Permitted activities

- a. Within the areas covered by Christchurch International Airport’s Protection Surfaces as specified in Rule [6.7.4.4](#) and shown on the diagrams in Appendix [6.11.7.1](#) and [6.11.7.2](#), the activities listed below are permitted activities.
- b. Activities may be controlled, restricted discretionary, discretionary, non-complying or prohibited as specified in Rules [6.7.4.1.2](#), [6.7.4.1.3](#), [6.7.4.1.4](#), [6.7.4.1.5](#) and [6.7.4.1.6](#).

Activity		Activity Specific Standards
P1	Any activity not specifically provided for as a restricted discretionary or prohibited activity in Rules <a href="#">6.7.4.1.3</a> or <a href="#">6.7.4.1.6</a> .	Nil

#### 6.7.4.1.2 Controlled activities

There are no controlled activities.
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### 6.7.4.1.3 Restricted discretionary activities

- a. Within the areas covered by Christchurch International Airport’s Protection Surfaces as specified in Rule 6.7.4.4 and shown on the diagrams in Appendix 6.11.7.1 and 6.11.7.2, the activities listed below are restricted discretionary activities.
- b. Discretion to grant or decline consent and impose conditions is restricted to the matters of discretion set out in the following table.

Activity		The <b>Council’s</b> discretion shall be limited to the following matters
<b>RD1</b>	<ol style="list-style-type: none"> <li>a. Any alteration, relocation or replacement of a tower of a <b>National Grid transmission line</b> existing on 14 January 2010 that penetrates the Protection Surfaces.</li> <li>b. Any application arising from this rule shall not be publicly notified or shall be limited notified only to Christchurch International Airport Limited and the Director of the Civil Aviation Authority (absent their written approval).</li> </ol>	<ol style="list-style-type: none"> <li>a. The extent to which any adverse effects on navigable airspace, representing a hazard to the safety or regularity of <b>aircraft operations</b>, are avoided or mitigated.</li> <li>b. The adequacy of consideration of possible alternatives.</li> </ol>

### 6.7.4.1.4 Discretionary activities

There are no discretionary activities.

### 6.7.4.1.5 Non-complying activities

There are no non-complying activities.

### 6.7.4.1.6 Prohibited activities

- a. Within the areas covered by Christchurch International Airport’s Protection Surfaces as specified in Rule 6.7.4.4 and shown on the diagrams in Appendix 6.11.7.1 and 6.11.7.2, the activities listed below are prohibited activities.

Activity	
<b>PR1</b>	<p>Any part of a <b>building</b>, structure, tree or <b>utility</b> that penetrates the Protection Surfaces (other than provided for by Rule 6.7.4.1.3 RD1), except for:</p> <ol style="list-style-type: none"> <li>a. <b>navigational aids</b> for aircraft; and</li> <li>b. maintenance or repair works on any existing <b>building</b>, structure or <b>utility</b>, including minor upgrading of existing <b>support structures</b> for <b>transmission lines</b> or <b>electricity distribution lines</b> where this does not increase the <b>height</b> or external envelope of the <b>utility</b>.</li> </ol>

## 6.7.4.2 Activity status tables — Runway End Protection Areas

### 6.7.4.2.1 Permitted activities

- a. Within the Runway End Protection Areas (REPAs) as shown in Appendix 6.11.7.3, the activities listed below are permitted activities.
- b. Activities may be controlled, restricted discretionary, discretionary, non-complying or prohibited as specified in Rules 6.7.4.2.2, 6.7.4.2.3, 6.7.4.2.4, 6.7.4.2.5 and 6.7.4.2.6.

Activity		Activity specific standards
P1	Any activity not specifically provided for as a prohibited activity in Rule 6.7.4.2.6.	Nil

### 6.7.4.2.2 Controlled activities

There are no controlled activities.

### 6.7.4.2.3 Restricted discretionary activities

There are no restricted discretionary activities.

### 6.7.4.2.4 Discretionary activities

There are no discretionary activities.

### 6.7.4.2.5 Non-complying activities

There are no non-complying activities.

### 6.7.4.2.6 Prohibited activities

- a. Within the Runway End Protection Areas (REPAs) as shown in Appendix 6.11.7.3, the activities listed below are prohibited activities.

Activity	
PR1	Any <u>building</u> or <u>utility</u> , excluding: <ol style="list-style-type: none"><li>a. <u>navigational aids</u> for aircraft;</li><li>b. structures associated with upgrades for State Highway 1;</li><li>c. maintenance or repair works on any existing <u>building</u> or <u>utility</u>;</li><li>d. enclosed walkways associated with vehicle <u>parking areas</u> which are no greater than 2.4 metres in <u>height</u> and 1.8 metres in width; and</li><li>e. the establishment or replacement of any underground <u>utility</u>.</li></ol>
PR2	<u>Mass assembly of people</u> .
PR3	The use or storage of <u>hazardous substances</u> in fuel storage facilities or for other industrial or commercial operations.

Activity	
<b>PR4</b>	<p>Production of direct light beams or reflective glare that could interfere with the vision of a pilot excluding:</p> <ol style="list-style-type: none"> <li>a. normal operational reflection from glass and mirrors used in motor vehicles; and</li> <li>b. normal operational light from motor vehicles.</li> </ol> <p>Advice note:</p> <ol style="list-style-type: none"> <li>1. Refer also to Rule <a href="#">6.3.4.1.5</a> with regard to rules applying to outdoor lighting within 500 metres of the threshold of a runway at Christchurch International Airport.</li> </ol>

### 6.7.4.3 Activity status tables – Birdstrike Management Areas

#### 6.7.4.3.1 Permitted activities

- a. In the Birdstrike Management Area (within 3 km of the thresholds of the runways at Christchurch International Airport) as shown in Appendix [6.11.7.5](#), the activities listed below are permitted activities if they meet the activity specific standards set out in the following table.
- b. Activities may be controlled, restricted discretionary, discretionary, non-complying or prohibited as specified in Rules [6.7.4.3.2](#), [6.7.4.3.3](#), [6.7.4.3.4](#), [6.7.4.3.5](#), and [6.7.4.3.6](#).

Activity	Activity specific standards	
<b>P1</b>	<p>Any activity not specifically provided for as a permitted, controlled, restricted discretionary or discretionary activity in Rules <a href="#">6.7.4.3.1</a> <a href="#">6.7.4.3.6</a>.</p>	Nil
<b>P2</b>	<p>Fish processing or packing plants, abattoirs or freezing works.</p>	<ol style="list-style-type: none"> <li>a. Storage, processing and disposal of all organic material takes place within enclosed <a href="#">buildings</a>.</li> <li>b. There is no disposal of effluent onto land associated with the plant or works.</li> </ol>
<b>P3</b>	<p>Creation of a new:</p> <ol style="list-style-type: none"> <li>a. stormwater basin; or</li> <li>b. <a href="#">water body</a> (including wastewater oxidation pond) which exceeds 500m<sup>2</sup> in area.</li> </ol> <p>Except that</p> <p>This rule does not apply to any area of a <a href="#">water body</a> covered by an aviary/s.</p>	<ol style="list-style-type: none"> <li>a. The combined area of all stormwater basins and/or <a href="#">water bodies</a>, that are wholly or partly within 0.5km of the proposed <a href="#">water body</a> or stormwater basin's edge, shall not exceed 1000m<sup>2</sup>.</li> <li>b. Any stormwater basin has been designed by a suitably qualified person, with experience in stormwater management systems, to the following standards:</li> </ol>

Activity		Activity specific standards
		<ul style="list-style-type: none"> <li>i. Stormwater infiltration basins shall be designed to fully drain within 48 hours of the cessation of a 2% AEP storm event;</li> <li>ii. Sufficient rapid soakage overflow capacity shall be provided to minimise any ponding of stormwater outside the infiltration area(s); and</li> <li>iii. Plant species used shall be limited to those listed in Appendix 6.11.9.</li> </ul> <p>c. Any <b>water body</b> has been designed by a suitably qualified person, with experience in stormwater management systems, to the following standards:</p> <ul style="list-style-type: none"> <li>i. Side slopes shall be at least as steep as 4V:1H except for: <ul style="list-style-type: none"> <li>A. any side slope treated with rock armouring; or</li> <li>B. any area required for vehicle access, provided that such access has a gradient of at least 1V:8H:</li> </ul> </li> <li>ii. No permanent island features shall be included, that could provide perching sites for birds; and</li> <li>iii. Plant species used shall be limited to those listed in Appendix 6.11.9.</li> </ul>

#### 6.7.4.3.2 Controlled activities

- a. In the Birdstrike Management Area (within 3 km of the thresholds of the runways at Christchurch International Airport) as shown in Appendix 6.11.7.5, the activities listed below are controlled activities.

Activity		The matters over which <b>Council</b> reserves its control:
C1	Any activity listed in Rule 6.7.4.3.1 P2 that does not meet one or more of the activity specific	a. Mitigation of <b>birdstrike</b> risk, including by design measures

Activity		The matters over which <b>Council</b> reserves its control:
	standards. Applications must be accompanied by a <b>birdstrike</b> risk assessment from a qualified and experienced ornithologist, and that assessment must include recommendations for appropriate conditions for mitigation of <b>birdstrike</b> risk.	and operation or management procedures.

#### 6.7.4.3.3 Restricted discretionary activities

- a. In the Birdstrike Management Area (within 3 km of the thresholds of the runways at Christchurch International Airport) as shown in Appendix 6.11.7.5, the activities listed below are restricted discretionary activities.
- b. Discretion to grant or decline consent and impose conditions is restricted to the matters of discretion set out in the following table.

Activity		The <b>Council's</b> discretion shall be limited to the following matters
<b>RD1</b>	Any activity listed in Rule 6.7.4.3.2 C1, where the application is not accompanied by the required <b>birdstrike</b> risk assessment.	a. Scale and significance of <b>birdstrike</b> risk likely to be created at the location proposed.
<b>RD2</b>	Any activity listed in Rule 6.7.4.3.1 P3 that does not meet one or more of the activity specific standards.	b. Mitigation of <b>birdstrike</b> risk including by design measures, operation or management procedures, direct intervention practices and monitoring.

#### 6.7.4.3.4 Discretionary activities

- a. The activities listed below are discretionary activities.

Activity	
<b>D1</b>	New landfills, excluding cleanfills, within <b>Christchurch District excluding Banks Peninsula Ward</b> (as shown in Appendix 2.1).

#### 6.7.4.3.5 Non-complying activities

There are no non-complying activities.

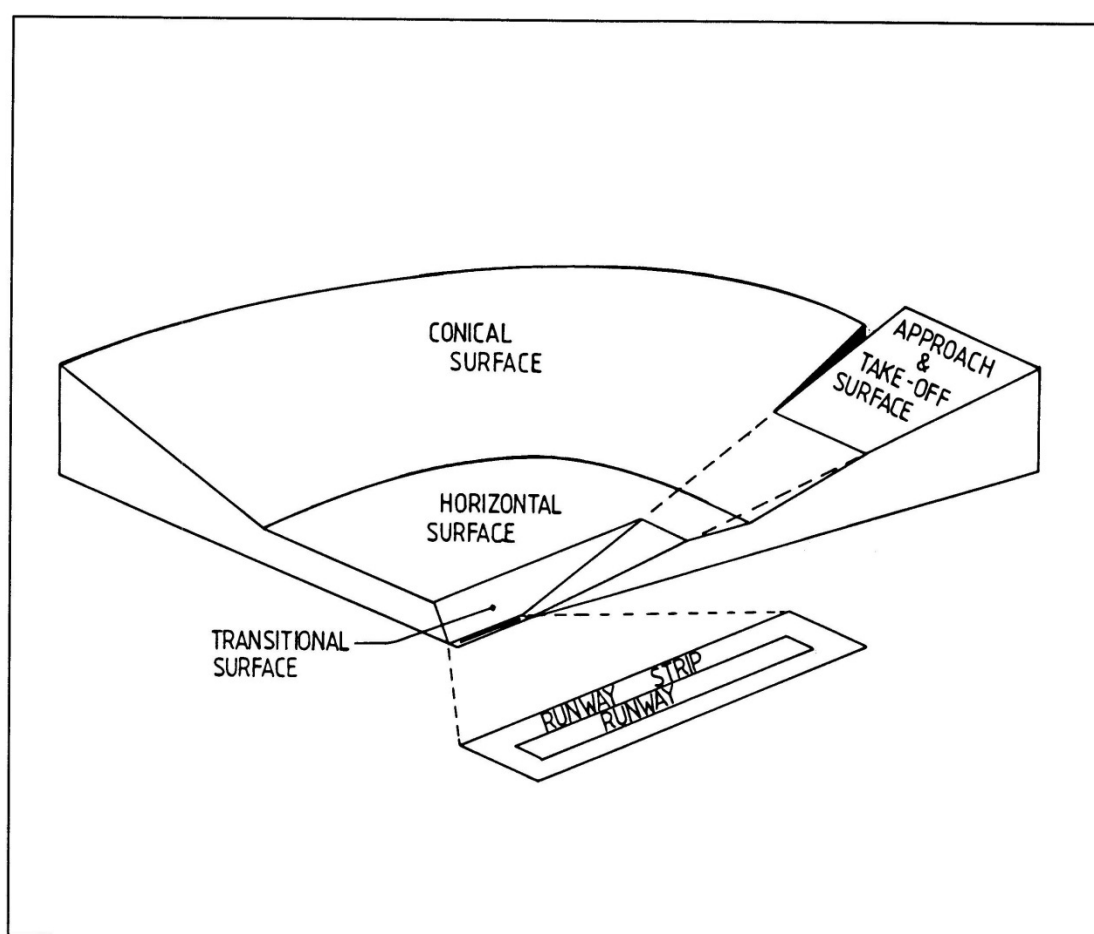
#### 6.7.4.3.6 Prohibited activities

There are no prohibited activities.



#### 6.7.4.4 Protection Surfaces for Christchurch International Airport

- a. General explanation
  - i. The environs of Christchurch International Airport are protected by a series of protection surfaces - defined surfaces in the airspace above and adjacent to the aerodrome (see Figure 6.7.1 below and Appendix 6.11.7.1 and 6.11.7.2).
  - ii. These protection surfaces are necessary to enable aircraft to maintain a satisfactory level of safety while manoeuvring at low altitude in the vicinity of the aerodrome.
  - iii. These surfaces are in accordance with the [Civil Aviation Authority of New Zealand Rule Part 139 Appendix E](#) with surface dimensions as noted in [Advisory Circular 139-6 \(AC 139-6\)](#).



**Figure 6.7.1: Illustration of categories of airport protection surfaces. From Civil Aviation Authority Advisory Circular Aerodrome Design AC139-6 Revision 4 (2011) p.55.**

- b. Horizontal surface for Christchurch International Airport
  - i. The horizontal surface consists of a surface located in a horizontal plane above the aerodrome and its environs and having its outer limits at a locus of 4000 metres measured from the periphery of the runway strip.

- ii. The inner horizontal surface is located 83 metres AMSL (45 metres above the aerodrome elevation datum (RL 38.00 AMSL)).
- c. Conical surface for Christchurch International Airport
  - i. The conical surface is a surface sloping upwards and outwards from the periphery of the horizontal surface.
  - ii. The lower edge is coincident with the periphery of the horizontal surface and rises upwards and outwards at a gradient of 1:20 to an elevation of 150 metres above the aerodrome datum level (RL 38.00 AMSL).
  - iii. The slope is measured in a vertical plane perpendicular to the periphery of the horizontal surface i.e. 5%.
- d. Approach surfaces for Christchurch International Airport
  - i. Each runway has an inclined approach surface. The approach path is located within a defined area called the approach fan.
  - ii. The origin of the approach fan is an inclined plane originating at the end of the strip. The coordinates of the centre-line of the strip are shown in [Appendix 6.11.7.1](#).
  - iii. The fan is essentially a truncated triangle with a cut-off apex line called the inner edge. The width of this inner edge is 300 metres.
  - iv. The expanding sides of the approach fan diverge at a constant rate of 1:6.6 (15%,  $8^{\circ} 31' 51''$ ) related to the distance from the end of the strip, and extend to a distance of 15,000 metres from the origin except that at any point on the Port Hills where the distance between the ground and the protection surface is less than 10m, the protection surface will be assumed to be at 10 metres.
  - v. The elevation of the inner edge of the approach fan is equal to the elevation of the midpoint of the threshold.
  - vi. The slope of the approach surface is 1:50 (2%,  $1^{\circ} 8' 45''$ ) and is measured in the vertical plane containing the centre line of the runway.
- e. Transitional surfaces for Christchurch International Airport
  - i. Transitional surfaces originate along the side of the strip and part of the side of the approach surface that slopes upwards and outwards to the horizontal surface.
  - ii. From the sides of the strip and the approach surfaces, the transitional surfaces slope upwards and outwards at a gradient of 1:7, extending until they reached the horizontal surface.
- f. Take-off surfaces for Christchurch International Airport
  - i. Each runway has a take-off surface. The take-off path is located within a defined area called the take-off fan which originates from the end of the runway strip.
  - ii. The take-off fan is essentially a truncated triangle with the cut-off apex line called the inner edge. The width of this inner edge is 180 metres. The distance from the inner edge to the runway ends is:

Runway end 02 (north)	432 metres
Runway end 11 (east)	60 metres
Runway end 20 (south)	60 metres
Runway end 29 (west)	300 metres

- iii. The expanding sides of the take-off fan diverge at a constant rate of 1:8 (12.5%, 7° 07' 30") related to the distance from the origin. It expands to a maximum width of 1,200 metres and then the sides remain parallel for a distance of 15,000 metres except that at any point on the Port Hills where the distance between the ground and the protection surface is less than 10 metres, the protection surface will be assumed to be at 10 metres.
- iv. The elevation of the inner edge of the take-off fan is equal to the elevation of the midpoint of the threshold.
- v. The slope of the take-off climb is 1:62.5 (1.6%) and is measured in the vertical plane containing the centre line of the runway.

## 6.7.5 Rules – Defence Wigram

### 6.7.5.1 Activity status tables – Protection surfaces

#### 6.7.5.1.1 Permitted activities

- a. Within the areas covered by the Defence Wigram Protection Surfaces as specified in Rule 6.7.5.2 and shown on the diagrams in Appendix 6.11.7.6, the activities listed below are permitted activities.
- b. Activities may be controlled, restricted discretionary, discretionary, non-complying or prohibited as specified in Rules 6.7.5.1.2, 6.7.5.1.3, 6.7.5.1.4, 6.7.5.1.5 and 6.7.5.1.6.

Activity		Activity Specific Standards
P1	Any activity not specifically provided for as a prohibited activity in Rules. 6.7.5.1.2 -6.7.5.1.6.	Nil

#### 6.7.5.1.2 Controlled activities

There are no controlled activities.

#### 6.7.5.1.3 Restricted discretionary activities

There are no restricted discretionary activities.

#### 6.7.5.1.4 Discretionary activities

There are no discretionary activities.

### 6.7.5.1.5 Non-complying activities

There are no non-complying activities.
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### 6.7.5.1.6 Prohibited activities

- a. Within the areas covered by the Defence Wigram Protection Surfaces as specified in Rule 6.7.5.2 and shown on the diagrams in Appendix 6.11.7.6, the activities listed below are prohibited activities.

Activity	
PR1	Any part of a <a href="#">building</a> , <a href="#">utility</a> or tree that penetrates the Protection Surfaces, except for <a href="#">navigational aids</a> for aircraft.

## 6.7.5.2 Protection Surfaces for Defence Wigram

- a. General explanation
- i. The environs of the New Zealand Defence Force (NZDF) land at Wigram are protected by two protection surfaces associated with the helipad safety area. The protection surfaces for the NZDF land at Wigram include two inclined approach and take-off climb surfaces with alignments suitable to different conditions (a northwest approach for use in strong northwest winds and a southwest approach that provides for safe operations during the predominant northeast wind).
  - ii. The protection surfaces are defined surfaces in the airspace above and adjacent to the helipad. These protection surfaces are necessary to enable helicopters to maintain a satisfactory level of safety while manoeuvring at low altitude in the vicinity of the helipad.
  - iii. These surfaces are in accordance with the [Civil Aviation Authority of New Zealand Advisory Circular 139-8 \(Revision 2, 2007\), Chapter 4](#), paragraphs 4.1.1 to 4.1.2.
- b. Approach and take-off climb surfaces for Defence Wigram
- i. The origin of the approach fans is an inclined plane originating at the edge of the helipad. The fan is essentially a truncated triangle with the cut-off apex line called the inner edge.
  - ii. The elevation of the inner edge of the protection surface is the same as the highest point on the helipad.
  - iii. The slope of the approach protection surfaces rise upwards at 1.8 (12.5%) from the centre edge of the helipad to an elevation of 152.4 metres.

#### Northwest Approach and Take-off Climb Surface

- iv. The expanding sides of the northwest protection surface diverge at a constant rate of 1:6.6 (15% 80 31' 51") from the helipad and extend to a distance of 1225 metres.

#### Southwest Approach and Take-off Climb Surface

- v. The southwest protection surface expands outwards at a gradient of 1:10 (day) and 1:6 (night) until it reaches the widths of 114.1 metres (day) and 163 metres (night). Beyond that point the sides extend parallel to a distance of 1225 metres from the helipad.