H3A APPENDIX : AIRPORT HEIGHT CONTROL SURFACES

Gisborne Airport has four runway strips, (one sealed runway and three grass runways), and associated taxiways and apron/aircraft picketing areas. These are illustrated in Figure One.

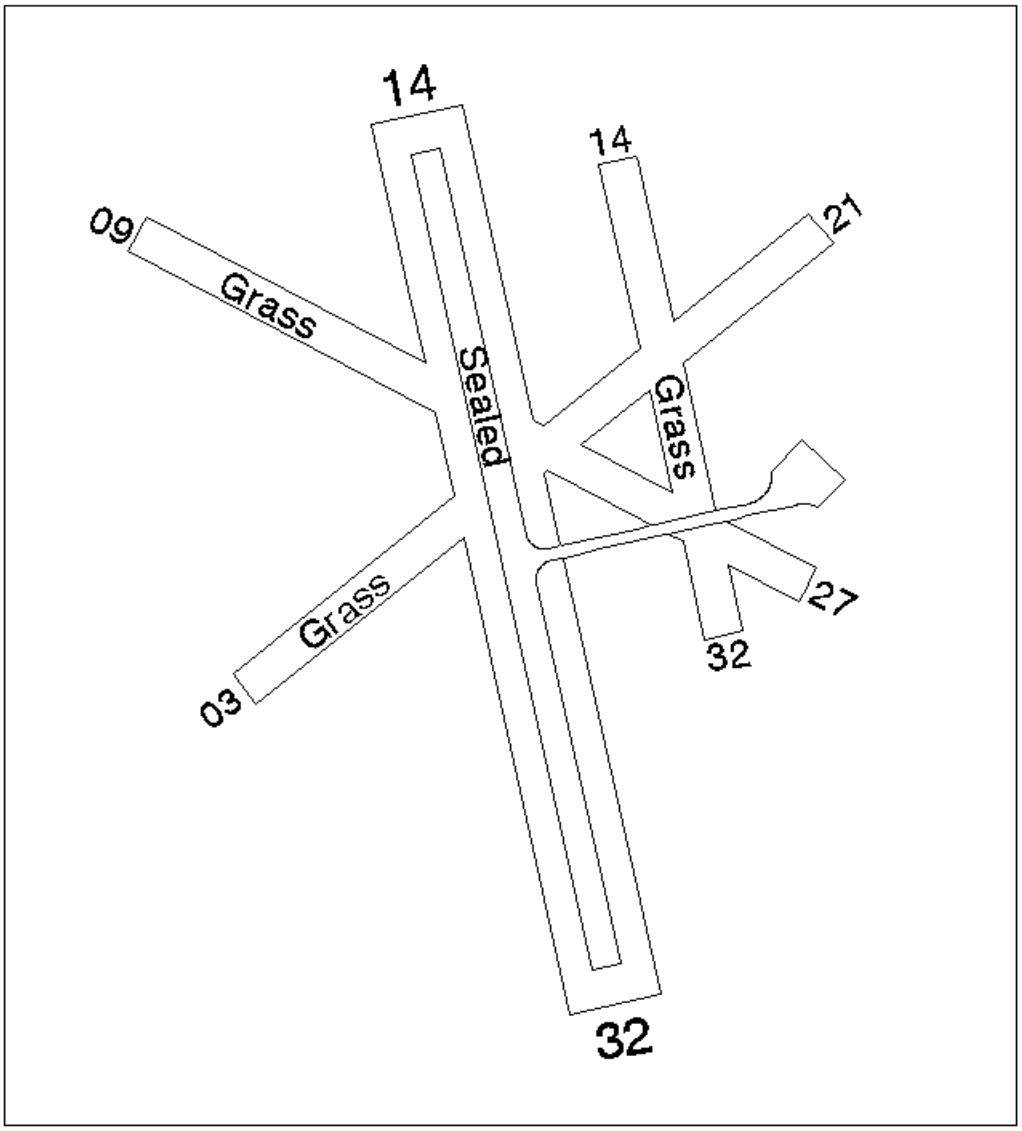

Figure One: Gisborne Airport Runways.

Gisborne Airport's height control surfaces are flight paths, or air corridors, for aircraft to take off, approach or turn. The height control surfaces consist of air corridors to and from each runway, together with transition side slopes, a horizontal surface and a conical surface laying over and radiating out from the aerodrome/runways. The different height control surfaces are illustrated in Figure Two.

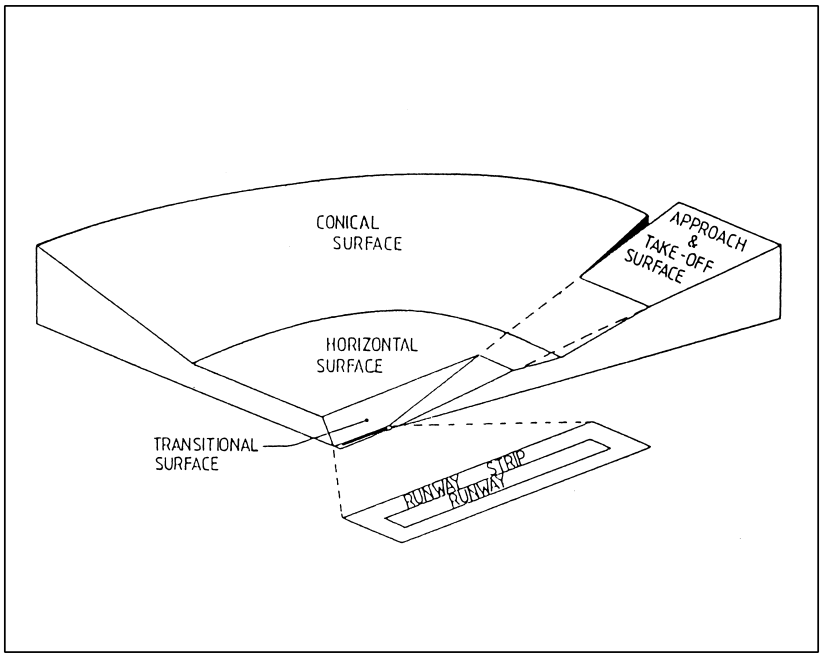

Figure Two: Airport Height Control Surfaces

Flight Paths

Flight paths are essentially a fan shaped air corridor from the inner edge of the runway strip. The inner edge of the runway strip is a line at right angles to the runway centre line and at 60m off the end of the runway.

The inner edge line is centrally located about the runway centre line and it's elevation is the highest ground level along the extended runway centre line between the runway end and the inner edge line.

A plan view of a flight path is illustrated in Figure Three. Note that the fan expansion angle is the angle that the fan expands outwards from the inner edge. The gradient of the fan is the vertical slope of the fan from the inner edge. Figure Three also illustrates the concept of side slopes (Transitional Surfaces) in a cross sectional view of a runway.

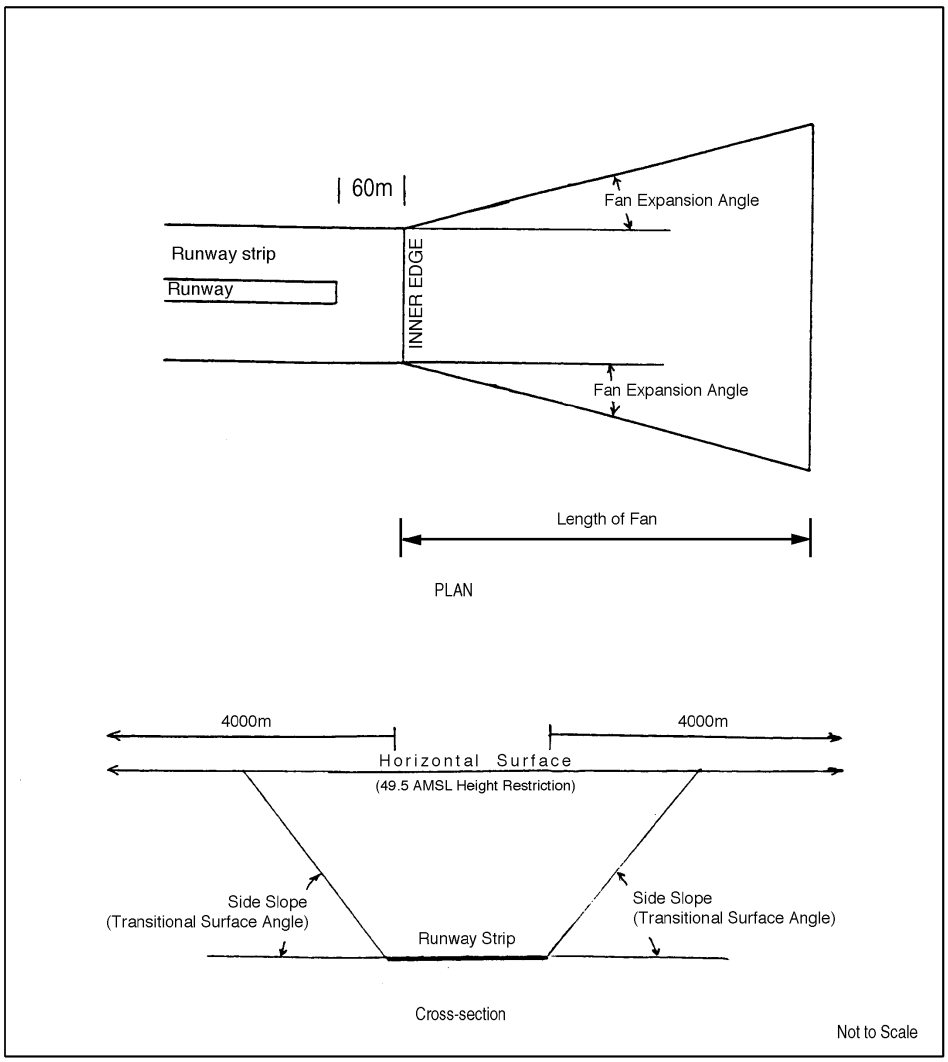

Figure Three: Airport Flight Path Corridor Fans and Transitional Slopes

Airport Protection Slopes

The airport protection slopes extend off the end of the runways in accordance with the following dimensions:

Runways 14/32 (Sealed Runway)

a)	Approach fan expansion angle	1 in 6.6
b)	Length of fan	15000m
c)	Length of inner edge	300m
d)	Gradient of fan	1 in 62.5
e)	Side slope (Transitional Surface).	1 in 7

PLUS Curved Take-Off Corridor (Sealed Runway 32)

There is also a curved take-off corridor (surface) rising from the northern end of the sealed runway. The curved take-off surface covers the same area as the straight take-off surface from this runway until a horizontal distance of 2750 metres is reached from the inner edge. At this distance the take-off surface commences to curve towards the west at a radius of 1470 metres and continues to turn until the centre line bears 164° T. The take off surface continues out to an overall distance of 15000m centre line horizontal distance. At the commencement of the turn the take-off climb surface is vertically displaced 4.6m from a height of 47.6m and this surface continues to rise at a gradient of 1 in 62.5 from this lower datum. The sides of the fan expand at a rate of 1 in 6.6 to a maximum width of 1800m and then continues parallel out to 15000m.

The runway 32 curved take-off corridor is illustrated in Figure Four. Note that the side slopes of the curved take-off air corridor are not illustrated in Figure Four.

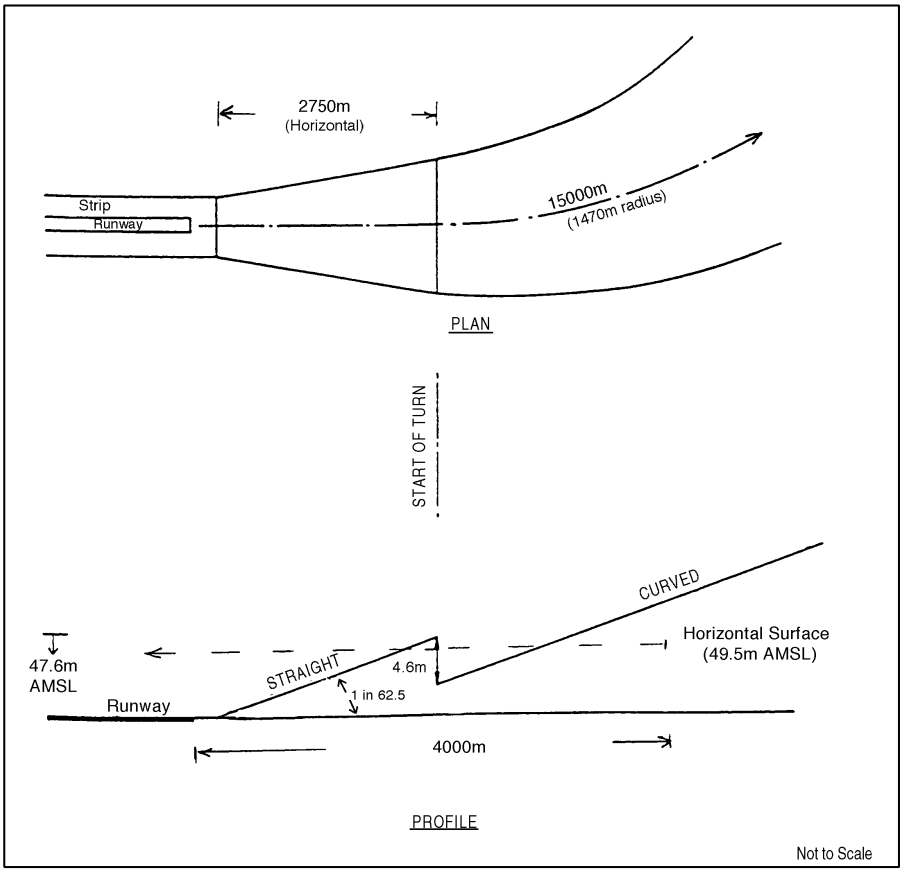

Figure Four: Runway 32 Curved Take-Off Corridor

Runway 09/27 (Grass)

a)	Fan expansion angle	1 in 6.6
b)	Length of fan	15000m
c)	Length of inner edge	150m
d)	Gradient of fan	1 in 50
e)	Side slope (Transitional Surface)	1 in 7

Runway 03 (Grass)

a)	Fan expansion angle	1 in 8
b)	Length of fan	15000m
c)	Final width of fan	1200m
d)	Length of inner edge	90m
e)	Gradient of fan	1 in 40
f)	Side slope (Transitional surface)	1 in 7

Runway 21 (Grass)

a)	Fan expansion angle	1 in 10
b)	Length of fan	1600m
c)	Length of inner edge	60m
d)	Gradient of fan	1 in 20
e)	Side slope (Transitional Surface)	1 in 5

Runway 14/32 (Grass)

a)	Fan expansion angle	1 in 10
b)	Length of fan	1600m
c)	Length of inner edge	60m
d)	Gradient of fan	1 in 20
e)	(e) Side slope (Transitional Surface)	1 in 5

Horizontal Surface

a) This surface is located in a horizontal plane which extends over the aerodrome and surrounding land at a height of 45 metres above the aerodrome datum. (Airport datum is 4.5m Above Mean Sea Level {AMSL}). This surface is illustrated in Figures Two and Three.

b) The outer limits of the horizontal surface is a locus of 4000m measured from the periphery of the runway strip 14/32 seal.

Conical Surface

The conical surface slopes upwards and outwards from the periphery of the horizontal surface at a gradient of 1 in 20 to a height of 150m above the aerodrome datum level. This concept is illustrated in Figure Two.

Air Corridor Boundary Map

The attached diagram titled "Air Corridor Height Limits" shows the (estimated) minimum heights of runways14/32 (sealed), 03/21 (grass) and 09/27 approach fans out to the horizontal surface boundary.

Note that this diagram is a guide only. For ease of interpretation, the following information has been excluded from this diagram:

i) Runways 14/32 (Grass) air corridor boundary heights.
ii) All side slopes (Transitional Surfaces).
iii) All corridor / surface boundaries (including associated side slopes) and heights beyond the horizontal surface boundary. (The conical surface boundaries and the runway 32 curved take-off corridor are also beyond the horizontal surface boundary).

Specific information concerning height boundaries must be calculated from the text of this appendix.