Appendix 1

Casement Aerodrome – Obstacle Limitation Surfaces

a. The International Civil Aviation Organisation (ICAO) is an agency of the United Nations. It sets out the 'Standards and Recommended Practices' (SARP'S) for international aviation through the publication of 19 annexes. ICAO Annex 14 deals with airport surfaces to be protected to ensure safe instrument flight procedures at airports.

b. As part of the safeguarding of Casement Aerodrome, Annex 14 Obstacle Limitation Surfaces (OLS) defines that airspace around an aerodrome that is to remain free of obstacles. The OLS related to this document are:

   i. Approach Surface
   ii. Take Off Climb Surfaces.
   iii. The Transitional Surface
   iv. The Inner Horizontal Surface
   v. The Conical Surface
   vi. The Outer Horizontal Surface.

c. Details specific to Casement Aerodrome which are also relevant to Co. Kildare planning applications:

   i. ICAO Aerodrome Reference Code is 4D.

   ii. The Aerodrome Reference Point (ARP) is located north of the midpoint of Runway 28/10 at 53°18'10.77"N, 006°27'19.46"W and 97.2m above mean sea level (AMSL).

   iii. The Inner Horizontal Surface is at 131.6m AMSL

   iv. The Conical Surface is a surface extending upwards and outwards from the edge of the Inner Horizontal Surface, commencing at 131.6m AMSL at a slope of 5% to the height of the Outer Horizontal Surface.

   v. The Outer Horizontal Surface is a specified portion of a horizontal plane around an aerodrome beyond the limits of the Conical Surface. The Outer Horizontal Surface represents a level free from obstacles to facilitate practicable and efficient instrument approach procedures.

      (1) The Outer Horizontal Surface should extend from the periphery of the Conical Surface to a minimum radius of 15,000m from the Casement Aerodrome Reference Point.
      (2) The height of the Outer Horizontal Surface for Casement Aerodrome is 231.6m AMSL.

d. **Runway 10.**

   i. Runway 10 runs west to east and is the longest and primary instrument approach runway at Casement Aerodrome, mainly due to airspace configuration due to the proximity of Dublin Airport. Instrument approaches to Runway 10 are wholly contained within military airspace, which is primarily above Co. Kildare. Current instrument approaches to Runway 10 are ILS Cat 1, VOR/DME and Surveillance

Radar Approach (SRA). Runway 10 is used for instrument departures to the east and south west.

ii. Potential runway extension of 300m at the western end of Runway 10 is also safeguarded. The protection of two separate approach surfaces is therefore necessary. The Approach Surfaces will be taken from both current and new threshold locations to assure protection from obstacles. Both surfaces will cover similar areas however to ensure full protection and for clarity, two separate Approach Surfaces will be described and assessed for Runway 10.

iii. Existing Runway 10 details are shown in Table 1 and future Runway 10 details are shown in Table 2 below.

iv. Elevation and plan views are shown in Figures 1 and 2.

Existing Runway 10	
Threshold	53°18'16.88"N, 6°28'07.75"W
Threshold Elevation	86.6m
Runway End	53°18'4.66"N, 6°26'31.18"W
Inner Approach Surface	Begins 60m from the threshold
	Width is 120m
	Length is 900m
	Slope is 2%
Approach Surface	Inner edge is 280m wide
	Inner edge is 60m from the threshold
	Divergence each side is 15%
	Slope of first section is 2%
Take Off Climb Surface	Inner edge is 180m wide
	Inner edge is 60m from runway end
	Divergence each side is 12.5%
	Slope is 2%
Table 1	

Future Runway 10	
Threshold	53°18'18.85"N, 6°28'23.51"W
Threshold Elevation	85.0m
Runway End	53°18'4.66"N, 6°26'31.18"W
Inner Approach Surface	Begins 60m from the threshold
	Width is 120m
	Length is 900m
	Slope is 2%
Approach Surface	Inner edge is 280m wide
	Inner edge is 60m from the threshold
	Divergence each side is 15%
	Slope of first section is 2%
Take Off Climb Surface	Inner edge is 180m wide
	Inner edge is 60m from runway end
	Divergence each side is 12.5%
	Slope is 2%
Table 2	

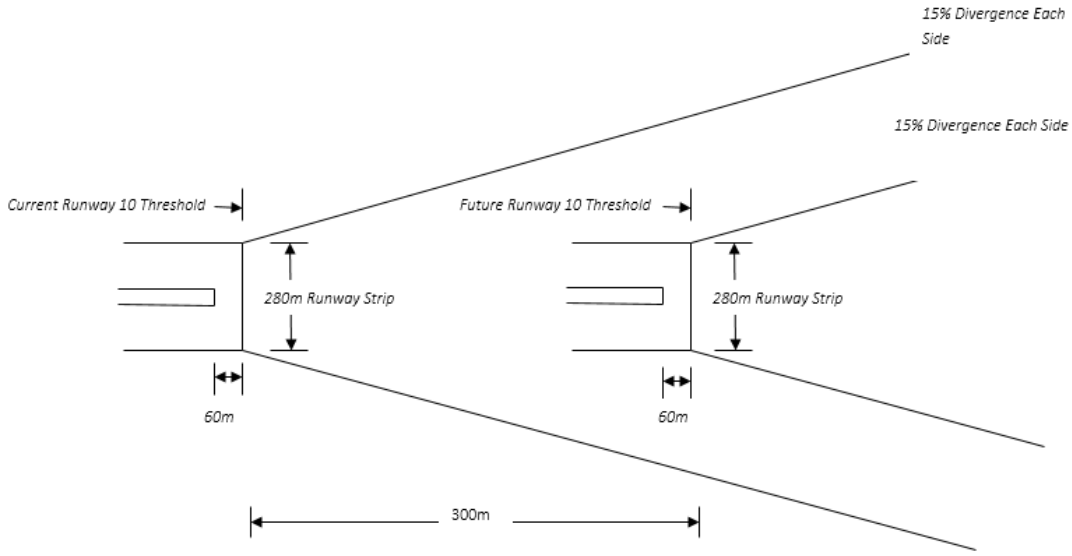

Figure 1 - Plan view of Approach Surfaces to current and future Runway 10 Thresholds. The Approach Surface commences 60m from the actual runway and 140m either side of the extended centreline, as outlined in ICAO Annex 14

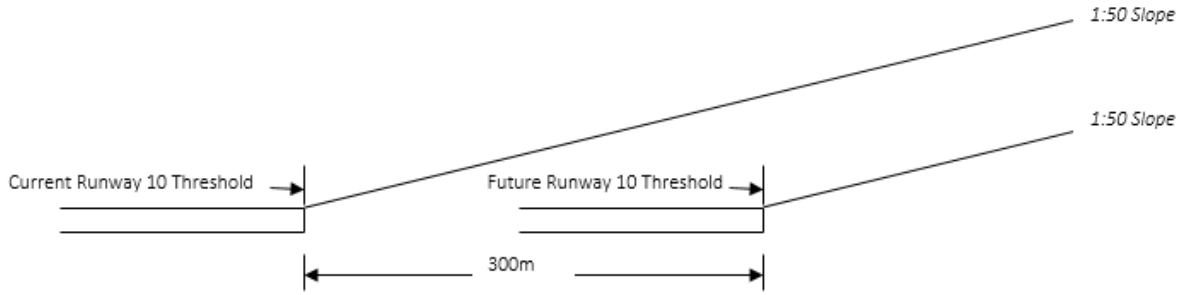

Figure 2 - Elevation view showing Approach Surfaces to current and future Runway 10 Thresholds. The first section of the Approach surface is protected out to 3000m at a 2% (1:50) slope as described in ICAO Annex 14.

e. **Runway 28.**

Runway 28 is the second longest runway at Casement Aerodrome running east to west. Although the approach surfaces for this runway lie within Co. Dublin airspace, the take-off and climb surfaces extend into Co. Kildare, hence its inclusion in this submission. Runway 28 details are shown in Table 3 below.

Runway 28	
Threshold	53°18'05.85"N, 6°26'40.68"W
Threshold Elevation	96.0m
Runway End	53°18'16.88"N, 6°28'07.75"W
Inner Approach Surface	Begins 60m from the threshold
	Width is 120m
	Length is 900m
	Slope is 2%
Approach Surface	Inner edge is 280m wide
	Inner edge is 60m from the threshold
	Divergence each side is 15%
	Slope of first section is 2%
Take Off Climb Surface	Inner edge is 180m wide
	Inner edge is 60m from runway end
	Divergence each side is 12.5%
	Slope is 2%

Table 3

f. **Runway 22.**

Runway 22 is the most frequently used runway for take-off and landing due to the prevailing wind. Runway 22 runs from the north east to south west. Although the approach surfaces for this runway lie within Co. Dublin airspace, the take-off and climb surfaces extend into Co. Kildare, hence its inclusion in this submission. Runway 22 details are shown in Table 4 below.

Runway 22	
Threshold	53°18'12.63"N, 6°26'22.02"W
Threshold Elevation	93.2m
Runway End	53°17'36.90"N, 6°27'13.73"W
Inner Approach Surface	Begins 60m from the threshold
	Width is 120m
	Length is 900m
	Slope is 2%
Approach Surface	Inner edge is 280m wide
	Inner edge is 60m from the threshold
	Divergence each side is 15%
	Slope of first section is 2%
Take Off Climb Surface	Inner edge is 180m wide
	Inner edge is 60m from runway end
	Divergence each side is 12.5%
	Slope is 2%

Table 4

g. **Runway 04.**
Runway 04 runs from south west to north east. It's approach surfaces lie within both Co. Dublin and Co. Kildare airspace. Runway 04 is not currently used for instrument approaches but is safeguarded as an instrument approach runway to protect against obstacles for instrument approach procedures in the near future. If the approach to Runway 04 is not protected, instrument approach procedures to Runway 04 may not be possible. Runway 04 details are shown in Table 5 below.

Runway 04	
Threshold	53°17'36.90"N, 6°27'13.73"W
Threshold Elevation	97.2m.
Current Runway End	53°18'12.63"N, 6°26'22.02"W
Approach Surface	Inner edge is 280m wide
	Inner edge is 60m from the threshold
	Divergence each side is 15%
	Slope of first section is 2%
Take Off Climb Surface	Inner edge is 180m wide
	Inner edge is 60m from runway end
	Divergence each side is 12.5%
	Slope is 2%

Table 5

h. **It is the position of the Department of Defence that planning applications or proposals for development within Co. Kildare, that underlie the ICAO OLS described above should be referred to the Property Management Branch of the Department of Defence for assessment of potential impact on flight operations.**

End