

AERONAUTICAL ASSESSMENT REPORT

**RE
PROPOSED HOUSING DEVELOPMENT
TO EAST OF
STONEY HILL ROAD, RATHCOOLE,
COUNTY DUBLIN**

PLANNING APPLICATION

BY
ROMEVILLE DEVELOPMENTS LTD.

JULY 2022



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Note: In all maps /diagrams /aerial photos in this report which do not contain a North Point, north lies to the top.

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1. Scope of Report, Location of the Site, and Site Zoning

- 1.1 This report assesses the aviation impact of a proposed Residential Development on a site of 2.9 hectares approx. in South County Dublin, located to the east of Stoney Hill Road at Rathcoole.

The site is shown outlined in red in the aerial photograph below.



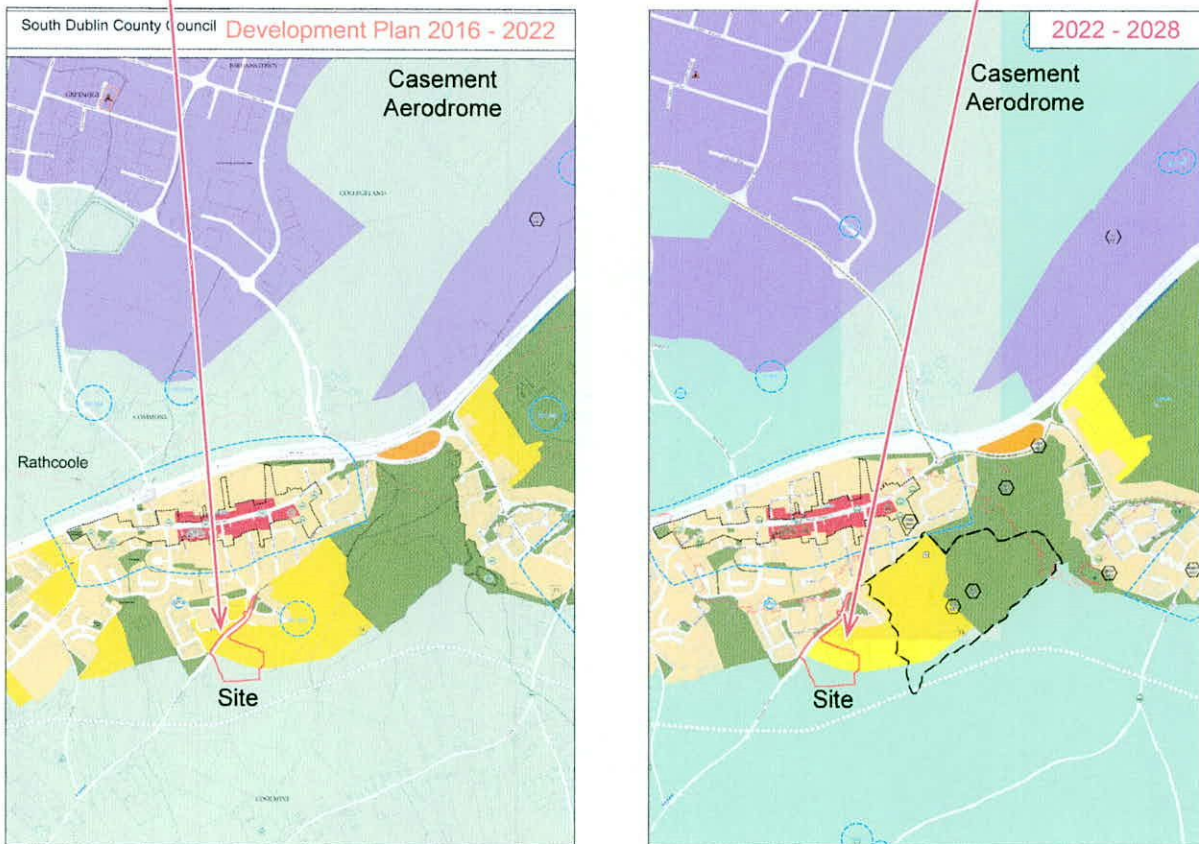
- 1.2 **Recent Aviation Changes** (subsequent to the 2016–2022 SDCC Development Plan, but which are provided for within the 2022–2028 Draft Development Plan).
- (i) In **December 2017**, the standards relating to eight international and regional airports in Ireland (including **Dublin**, but not Casement) came **under E.A.S.A.** [European Aviation Safety Agency] standards, rather than I.C.A.O. [International Civil Aviation Organization] standards as previously. Weston Airport is temporarily exempted, and remains (with Casement) under ICAO standards.
 - (ii) In **November 2018**, **I.C.A.O. issued revised 'Annex 14' Standards** bringing these in line with the new E.A.S.A. Aerodromes Specifications, with several changes to airport design specifications (including narrower Approach Surfaces).
 - (iii) In **February 2019**, **Casement's runway designations** were changed: its main runway (formerly 11/29, as in the 2016 SDCC Development Plan) was redesignated as **10/28**, and its subsidiary runway (formerly 05/23) was redesignated as **04/22**. This arose from a shift in magnetic variation which affected Casement. In this report we use the new 2019 designations, but they refer to the same runways as were in the 2016 SDCC Plan.

1.3 Zoning of the Site in the 2016-22 (and 2022-28) SDCC Development Plans

In the South Dublin County Council Development Plan **2016-2022**, the part of the site being developed has been zoned ‘Objective RES-N: to provide for new residential communities in accordance with approved area plans.’

And the site (to the east of Stoney Hill Rd.) has the same ‘Objective RES-N’ zoning in the upcoming SDCC Draft Development Plan **2022-2028**.

Extracts from Map 8 of both Development Plans are shown below, on which the site is arrowed and outlined in red.



1.4 Items of aeronautical significance in relation to the site are:

- (i) The land is elevated, with ground levels on the site rising from **127m OD** (at its northern edge) to **142.6m OD** (at its southern edge).
- (ii) The site is not far from Casement military aerodrome (within South County Dublin), at distances from the threshold of Casement’s Runway 04 of between **2.085 km** (to northern edge of housing area) and **2.25 km** (to its southern edge).
- (iii) The site lies within the area of Casement Aerodrome’s Inner Horizontal Surface, and beside various large trees marked as potential obstacles to aviation on data issued by the Irish Aviation Authority. [See diagrams in Section 8 on page 13]

2. Relevant SDCC Development Plan Paragraphs

- 2.1 The Development Plan extracts quoted below (in paragraphs 2.2, 2.3, & 2.4) are from **the 2016-2022 Development Plan**. The same provisions and requirements – with updated wordings – are also contained in the upcoming [Draft] SDCC Development Plan 2022-2028. It should be noted that all references to Casement’s Runways 11/29 and 05/23 in the 2016-22 Development Plan now refer to Casement’s Runways 10/28 and 04/22 (as re-designated in February 2019). These revised runway designations are used in the upcoming Draft Development Plan 2022-28, and are used in this report (which takes into account all aviation provisions contained in the upcoming 2022-28 Draft Plan).

Of relevance to the aeronautical assessment of the Stoney Hill Rd. site are the contents of the paragraphs reproduced below (*See on following page*) from the 2016-22 Plan.

2.2 The paragraphs on ‘Outer Approach Area’ on page 229 of the 2016-22 Plan (under its Section 11.6.6 ‘Aerodromes’):

[The longitudinal section mentioned below is included in this report at page 20.]

Outer Approach Area

Under the Outer Approach Surface (outside the Inner Approach Area but within the approach funnels), graded heights of development below the Obstacle Limitation Surfaces of the runways may be permitted, subject to demonstration that the development is not an obstacle to the operation of the runway.

The Planning Authority will consult with the DoD and the IAA, as required, in this assessment. The Planning Authority will require the applicant to submit a longitudinal section through the relevant Approach Surface funnel. The section drawing shall include the following:

- The Ordnance Datum (OD) of the relevant runway,
- The approach surface slope for the relevant runway in accordance with Table 3 & 4 of the IAA Guidance Material on Aerodrome Annex 14 Surfaces (2015) and set out in Table 11.26 below,

Table 11.26: Aerodrome Surface Slopes

APPROACH RUNWAY	SURFACE SLOPE	
Casement Runways 11/29	2% for first sector (3000m)	[i.e. Runways 10/28]
Casement Runways 05/23	3.33% (non – instrument runway)	[i.e. Runways 04/22]
Weston Runway 07/25	4%	

- The OD of the highest point and OD of the predominant height of the proposed development,
- A range of OD reference points for the existing ground levels on the subject site,
- The horizontal distance of the subject site from the Aerodrome, and
- Heights of existing permanent obstacles in the vicinity of the site if applying the principle of shielding (see Section 3.23 of the Irish Aviation Authority Guidance Material on Aerodrome Annex 14 Surfaces, 2015).

The distance from threshold shall be taken into account in the section drawing.

For significant developments and in instances of marginal cases, the applicant may be requested to submit an individual aeronautical assessment.

2.3 The paragraphs on ‘Inner Horizontal Surface’ on page 230 of the 2016-22 Plan (within Section 11.6.6 ‘Aerodromes’):

IMPLEMENTATION	SOUTH DUBLIN COUNTY COUNCIL DEVELOPMENT PLAN 2016 - 2022
<p>Inner Horizontal Surface</p> <p>Generally, development will be acceptable in this zone, subject to the development having an OD height below the height restriction of the Inner Horizontal Surface (generally 45 metres above the elevation datum of the Aerodrome). In general, this will be applicable to development above the prevalent building height (based on OD) of the area. The Inner Horizontal Surface of Casement is 86.6 metres OD and Weston is 91.3 metres OD. Similar to development within the Outer Approach Surface, the applicant should demonstrate that the proposed development is not an obstacle to the Aerodrome airspace.</p> <p>The applicant shall be required to detail the OD height of the proposed development, in the context of the relevant Aerodrome.</p>	<p>[correction: this should read 131.6m O.D.]</p>

2.4 And Paragraph (c), in regard to Casement’s Runway ‘05’ [now designated Runway 04] on page 137 of the Plan (under Section 7.8.1 – ‘IE8 Objective 2’):

<p>The airspace of Casement is defined by the Obstacle Limitation Surfaces, prepared and mapped on the County Development Plan map in accordance with the ICAO Standards and the Irish Aviation Authority ‘Guidance Material on Aerodrome Annex 14 Surfaces (2015)’, including the following:</p>
<p>c). Protect runway 05 as a Code 3 subsidiary visual approach runway due to the land contours in the area and prevent objects from penetrating the relevant approach, transitional, inner horizontal and conical limitation surfaces for a visual approach runway in accordance with Section 3.13 of the Irish Aviation Authority ‘Guidance Material on Aerodrome Annex 14 Surfaces’ (2015). The extent of the lands under the runway approach surface whereby no development is allowed for runway 05 (Rathcoole end) is shown on the Development Plan maps (i.e 1,100 metres) and the ICAO standards will not prejudice the development of zoned lands in Rathcoole.</p>

2.5 Section 5 below (page 9) deals with the site’s location in relation to the **Approach and Take-Off Climb Surfaces** from Casement Runways 04/22, and it may be noted that for Runway 04 (Code 3, visual approach), the Take-off Climb Surface is lower than the Approach Surface.

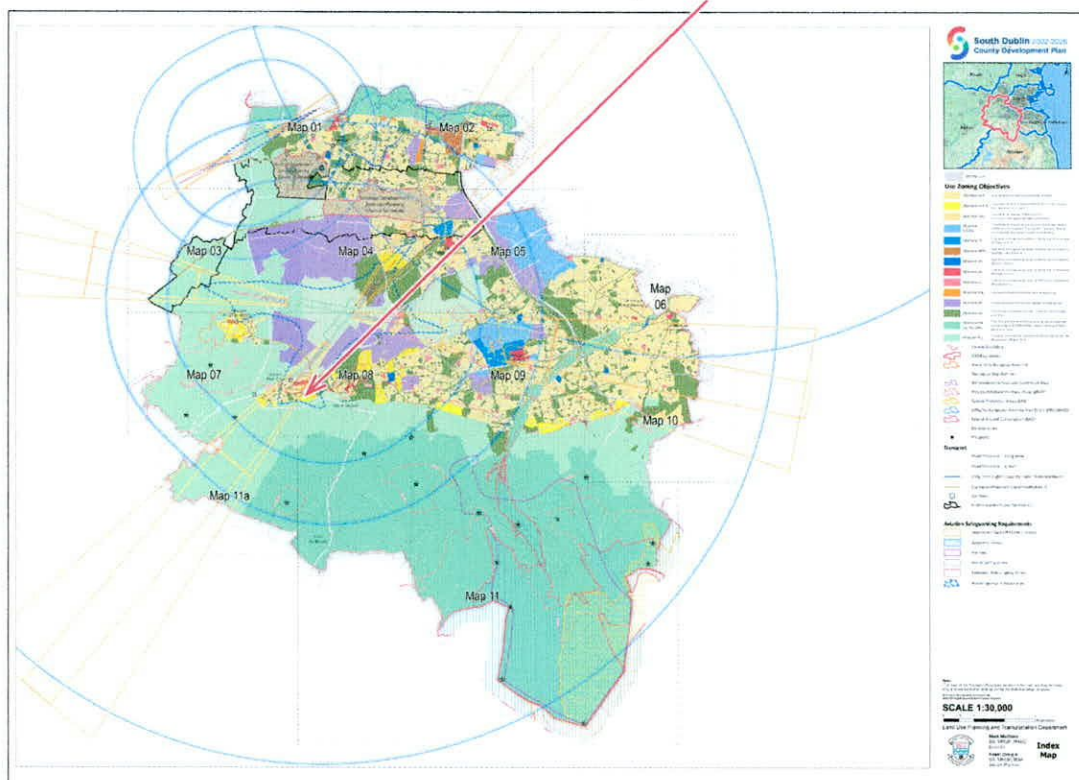
For this particular runway, the Take-off Climb Surface rises at 2% slope, while the Approach Surface rises initially at 3.33%. Additionally, the Take-off Climb Surface for this particular runway (whose inner edge is 180m wide) is narrower than its Approach Surface which is provided with full ‘instrument’ width and length (with an inner edge of 280m). These widths are relevant for the Stoney Hill Road site, as it is located towards the edge of Runway 04’s Approach Surface.

Section 6 below (page 10) contains our calculations in relation to the **Approach Surface** to Casement Aerodrome’s Runway 04 (rising at 3.33%), as provided for in the 2016-22 and in the 2022-28 SDCC Development Plans.

Sections 7 to 9 below (pages 11-19) contain our assessment in relation to Casement’s **Inner Horizontal Surface**, which lies above all of the site.

3. Obstacle Limitation Surfaces that Affect the Kingswood Site

- 3.1 The Department of Defence has adopted the International Civil Aviation Organization's [ICAO's] "Obstacle Limitation Surfaces" in relation to Casement Aerodrome. Being a military aerodrome, Casement is not bound by these *civil* aviation standards, but the Department of Defence has opted to apply these Standards at Casement to protect aircraft in flight. These "Surfaces" – similar to the E.A.S.A. Specifications which now apply at Dublin and other Irish airports – are set out by ICAO as *International Standards and Recommended Practices* in its *Annex 14 – 'Aerodromes'* document, [eighth revised edition of 8th November 2018].
- 3.2 The Inner Horizontal Surface for Casement Aerodrome, and the Approach and Take-off Climb Surfaces to/from Casement's Runway(s) 04/22, are all shown on the upcoming SDCC 2022-2028 Draft Development Plan Index Map (*illustrated below*) on which the site's location is indicated by the red arrow.



As indicated above, the three "Surfaces" relevant to this site at Rathcoole are:

- (i) the Approach Surface* to Casement's Runway 04;
- (ii) the Take-Off Climb Surface* from Casement's Runway 22; and
- (iii) the Inner Horizontal Surface** for Casement Aerodrome as a whole.

* The Approach and Take-Off Climb Surfaces are inclined planes of different widths which increase as distance from the runway increases, and which rise at different slopes depending on the category of runway (and distance from its threshold).

** The Inner Horizontal Surface is a flat plane at 131.6m OD (i.e. at 45m above Casement Aerodrome's datum level which is set at 86.6m OD).

4. Site Plan & Section Drawings with Elevations-OD

4.1 Below, to approximate scale 1:1500, is the Site Plan of the proposed development of 42 two- and three-storey houses, including elevations (OD) of the highest roof ridges of each terrace. The two-storey houses (of **8.85m height**) are in the more elevated locations, and the three-storey houses (of **10.2m height**) in the lower-lying locations. [A Site Section (which includes the highest house) is on the following page 8.]

In the diagram below, darker blue shading indicates more elevated roof ridges.

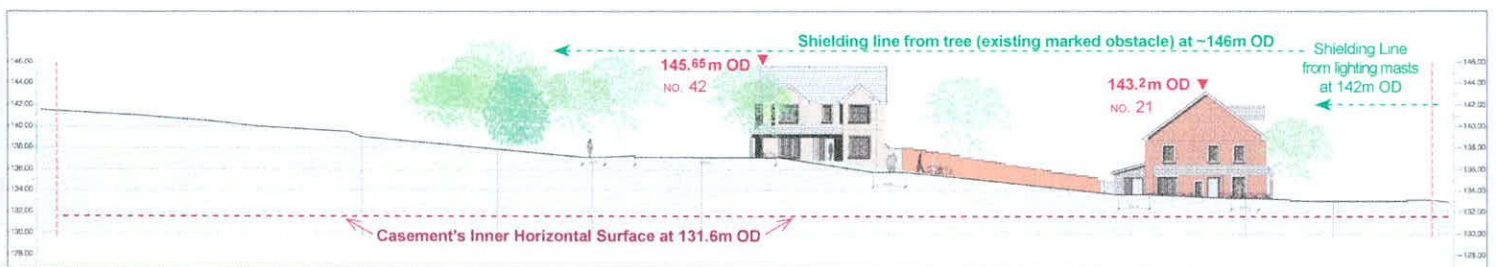


SITE PLAN OF PROPOSED DEVELOPMENT WITH ELEVATIONS (O.D.) OF HIGHEST PARTS SCALE 1:1500 APPROX.

4.2 Elevations-OD of Ground Floor & Roof Ridges of the Proposed Houses*:

House	Floor level	Roofridge level	House	Floor level	Roofridge level
01	130.00m	140.20m OD	22	131.20m	140.05m OD lowest
02	130.00m	140.20m OD	23	131.20m	140.05m OD lowest
03	130.25m	140.45m OD	24	131.95m	140.80m OD
04	130.25m	140.45m OD	25	131.95m	140.80m OD
05	130.75m	140.95m OD	26	132.50m	141.35m OD
06	130.75m	140.95m OD	27	132.50m	141.35m OD
07	131.25m	141.45m OD	28	133.00m	141.85m OD
08	131.25m	141.45m OD	29	133.00m	141.85m OD
09	132.00m	142.20m OD	30	133.75m	142.60m OD
10	132.00m	142.20m OD	31	133.75m	142.60m OD
11	132.50m	142.70m OD	32	134.65m	143.50m OD
12	132.50m	142.70m OD	33	134.65m	143.50m OD
13	132.75m	142.95m OD	34	135.15m	144.00m OD
14	132.75m	142.95m OD	35	135.15m	144.00m OD
15	132.85m	143.05m OD	36	135.80m	144.65m OD
16	132.85m	143.05m OD	37	135.80m	144.65m OD
17	132.85m	143.05m OD	38	135.80m	144.65m OD
18	133.00m	143.20m OD	39	136.50m	145.35m OD
19	133.00m	143.20m OD	40	136.50m	145.35m OD
20	133.00m	143.20m OD	41	136.80m	145.65m OD highest
21	133.00m	143.20m OD	42	136.80m	145.65m OD highest

*See house number locations on previous page 7. Houses 42 & 21 are shown below:

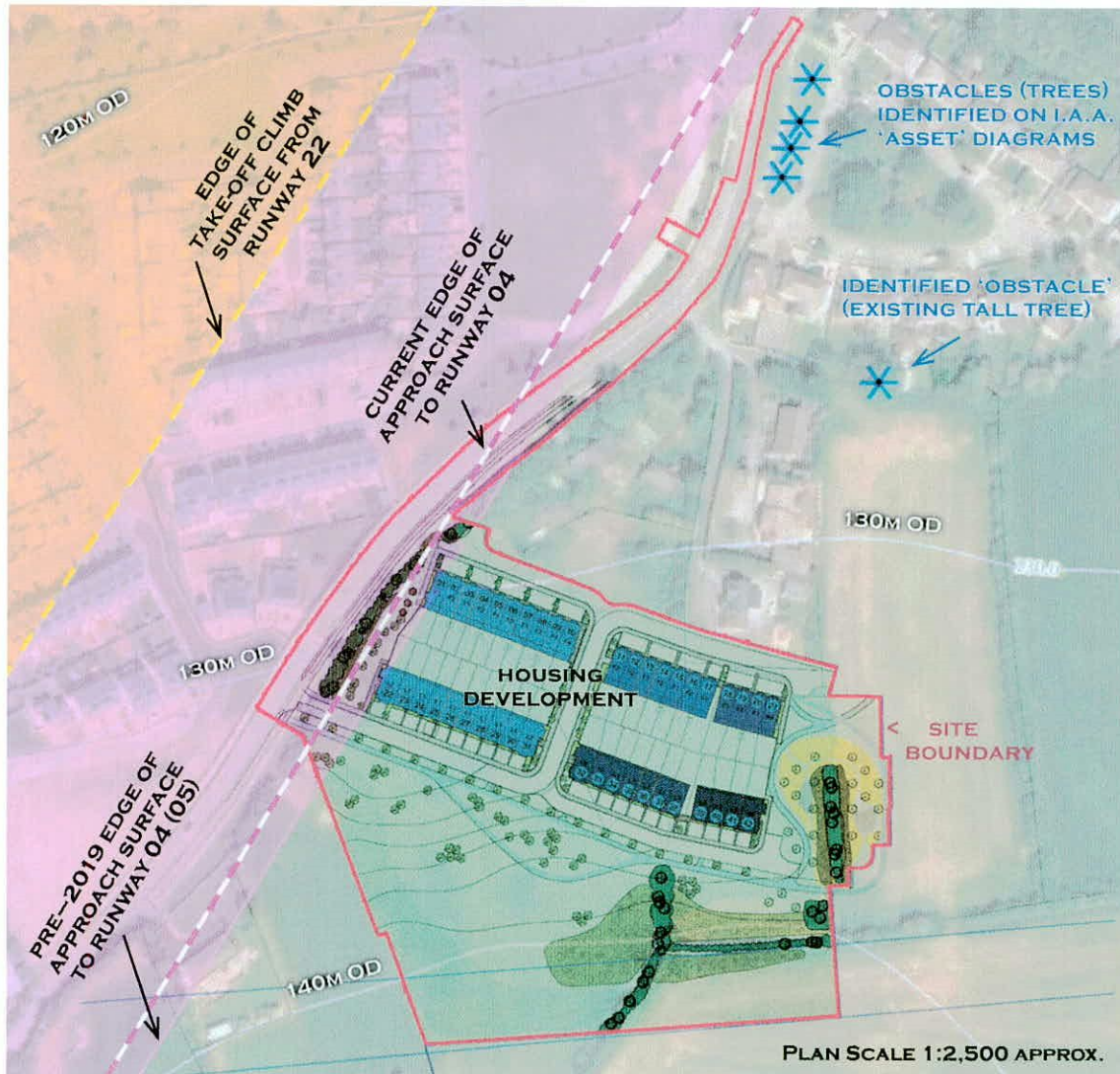


SITE CROSS-SECTION 3-3 (TO APPROX. SCALE 1:600)

4.3 As noted on page 6 above, the **Inner Horizontal Surface** at Casement Aerodrome lies at 131.6m OD, and the figures and diagram above show that the tops of all of the houses in this development – and the ground itself on which all but eight of these houses are to be built – project above this Surface (as do other existing buildings in the vicinity). An assessment of these heights in relation to Casement's Inner Horizontal Surface follows in Sections 8 & 9 of this report (on pages 12-19).

The location of the development in relation to the **Approach and Take-Off Surfaces** to Casement's Runway 04/22) is shown in Section 5 (page 9) following.

5. Location of the Site in Relation to the ICAO Obstacle Limitation Surfaces

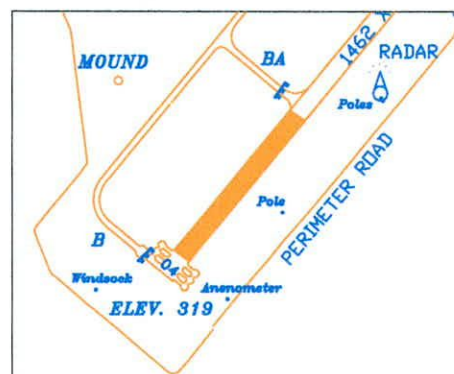


- 5.1 It can be seen that – while the Approach Surface to Runway 04 lies above the west edge of the site – all of the proposed houses lie outside this Approach Surface as currently plotted to ‘instrument’ width (although runway 04 is a ‘visual’ runway). At its former (pre-2018) width, an ICAO Approach Surface could have extended above two of the houses, but this is no longer the case. [In fact, at its closest, this Approach Surface (at 3.33%) lies at more than 36 metres above ground level along the western edge of the site (*see Section 6 following*).]
- 5.2 In relation to other ‘surfaces’, and nearby ‘obstacles’, it can be seen —
- (i) that the Take-Off Climb Surface (at 2% slope) is well clear of the site (*by 90 metres*);
 - (ii) that the Inner Horizontal Surface at 131.6m OD touches ground level on the site itself and *lies below ground level* on most of the site and to south of the site; and
 - (iii) that there are a very large number of existing identified obstacles (trees, pylons, poles, land, and buildings) which project above the Inner Horizontal Surface to significantly greater heights than any of the proposed development (with “shielding” provided by these other objects and identified obstacles).

6. The Site in relation to the Approach Surface to Casement Runway 04

6.1 Relevant Aerodrome Data:

The relevant runway threshold (04) is stated on the current Aerodrome Chart EIME AD 2.24-1 of 2020 [at right >] to be at 319ft elevation, i.e. at 97.2m OD, which is the elevation of its Approach Surface which commences at 60m from the runway threshold.



6.2 Distances to the Site:

The housing site lies at between between 2.085km and 2.25km from Threshold 04. To calculate the exact elevation of the Approach Surface above the site (or above other locations), it is necessary to calculate the distances along the extended runway centreline opposite which the relevant parts lie. Thus the corner of the site nearest to Runway 04 (which is at **430m approx. laterally** from the extended centreline of runways 04/22) lies at **2.04 km** from Threshold 04 when measured along the extended centreline of runways 04/22.

6.3 Calculations in Relation to the Approach Surface to Runway 04:

- (i) All of the proposed houses lie outside the Approach Surface to Runway 04, as is shown on the diagram on the previous page, and as drawn in the upcoming South Dublin 2022-28 Development Plan. Consequently no calculations arise in relation to the housing development itself.
- (ii) The following calculation relates to the strip of site (about 20m wide, along its western edge) above which the Approach Surface to Runway 04 does lie:

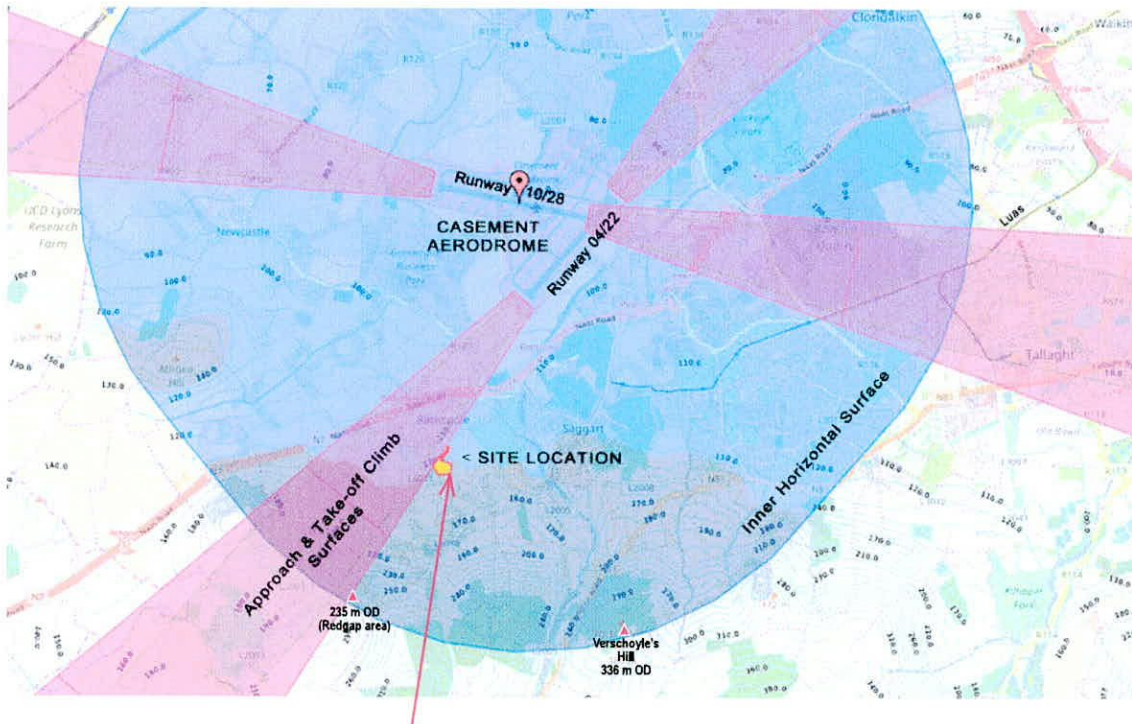
The Approach Surface has its inner edge at 60m from the Runway 04 Threshold, and – for this particular runway (as specified both in the 2016-2022 and in the upcoming 2022-2028 Development Plans) rises at 3.33% slope. [This is the ICAO slope for a ‘visual’ approach runway (as Runway 04 is), and in fact the very steeply rising ground in the Rathcoole area would not allow for a shallower slope.] The distance to the site along this Approach Surface is **1,980m** (i.e. 2,040m minus 60m), and at this location the Approach Surface will be at **163.1m OD** *

* calculated as follows: $1980 \times 3.33\% + 97.2m \text{ OD} = 65.9 + 97.2m = 163.1m \text{ OD}$

As ground level on the site in this location is at 127m OD, there will be **36.1 metres clearance** between ground level and the Approach Surface at this (lowest) point, and the Approach Surface will continue to rise at 3.33% above the rest of the western edge of the site. This 36.1m clearance is more than sufficient for any street lighting masts (or landscape elements) which may be required along the site’s western edge beside Stoney Hill Road.

7. The Proposed Development in relation to Casement's Inner Horizontal Surface

7.1 As noted above, the **Inner Horizontal Surface** at Casement Aerodrome is at 131.6 metres OD (45m above the Department of Defence's chosen datum of 86.6m – which is the elevation of the aerodrome's lowest runway threshold). On the drawing below [featuring Irish Aviation Authority 'Asset' data] the Inner Horizontal Surface is shown coloured blue, with the site's location marked in red+yellow, and Approach Surfaces included in purple. —



7.2 It can be seen that the site falls well within the area of the Inner Horizontal Surface of Casement Aerodrome, and that the ridges of houses 41 & 42 (the highest proposed element at 145.65m OD, as noted in para. 4.2 on page 7 above), would project by 14.05m above the Inner Horizontal Surface.

7.3 However, it can also be seen (from the contour lines included in the various drawings, and the elevations OD shown in the Longitudinal Section Diagram on page 19) that the Inner Horizontal Surface lies at *and below* the ground level on the site itself, and that a very large area of land (including part of the village of Rathcoole and about 1km of the Naas Road) lies *above* the 131.6 m OD elevation of the Inner Horizontal Surface. [This area is shown darker (grey-brown) in the diagram above.] In regard to the land which lies *above* the Inner Horizontal Surface (as coloured brown in the above drawing), the ground reaches 235m+ OD in the Redgap area to south-west of the site, i.e. *the ground lies above all four Surfaces* – Take-Off Climb, Approach, Inner Horizontal, and Conical; and the ground reaches 336m OD at Verschoyle's Hill to the south-east of the site, which is 204m *above* the Inner Horizontal Surface and ~250m *above* the aerodrome's datum elevation.

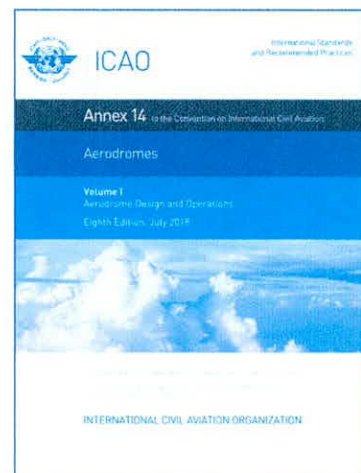
8. Assessment of the Site in Relation to Casement's Inner Horizontal Surface

In assessing the projections above Casement's **Inner Horizontal Surface** the following factors are considered:

- (i) The relative importance assigned by I.C.A.O. to the different Obstacle Limitation Surfaces, including the Inner Horizontal Surface.
- (ii) The purpose of an Inner Horizontal Surface as stated by I.C.A.O.
- (iii) The nature of the topography in the sector surrounding this site.
- (iv) The nature of flying operations in the sector surrounding this site.
- (v) The existence of any other nearby existing objects which project above the Inner Horizontal Surface, and whether these provide elements of 'shielding'.
- (vi) The choice of datum used for the setting of Casement's Inner Horizontal Surface level, and how it compares with national and international practice.

8.1 Relative Importance of the Various Surfaces:

While it is a 'Standard' of I.C.A.O. (i.e. a requirement, set out in paragraphs 4.2.19 and 4.2.15 of its *Annex 14*) that new objects should not project above an aerodrome's Approach or its Take-Off Climb Surfaces, it is merely a 'Recommendation' (defined by I.C.A.O. as 'desirable'), under paragraph 14.2.20 of *Annex 14*, that *'new objects should not be permitted above ... the inner horizontal surface, except when ... shielded by an existing immovable object or after aeronautical study it is determined that the object would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.'* The first consideration is that an Inner Horizontal Surface – while it should normally be protected – is not regarded by I.C.A.O. as one of the more critical Obstacle Limitation Surfaces.

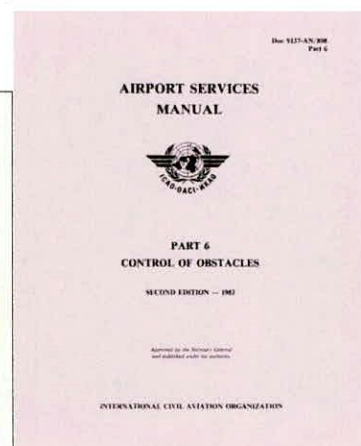
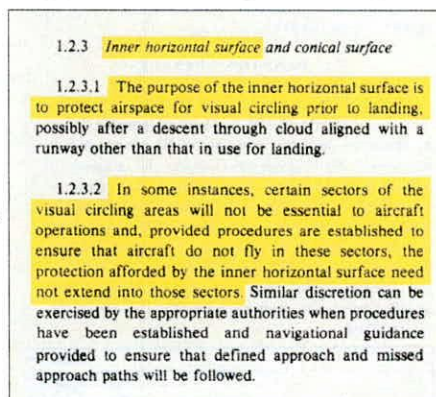


8.2 Purpose of an Inner Horizontal Surface:

The purpose of an Inner Horizontal Surface is stated by I.C.A.O. (in Section 1.2.3 of its *Airport Services Manual* >) as being *'to protect airspace for visual circling prior to landing'*. It also goes on to say that

'In some instances, certain sectors of the visual circling areas will not be essential to aircraft operations, and provided procedures are established to ensure that aircraft do not fly in these sectors,

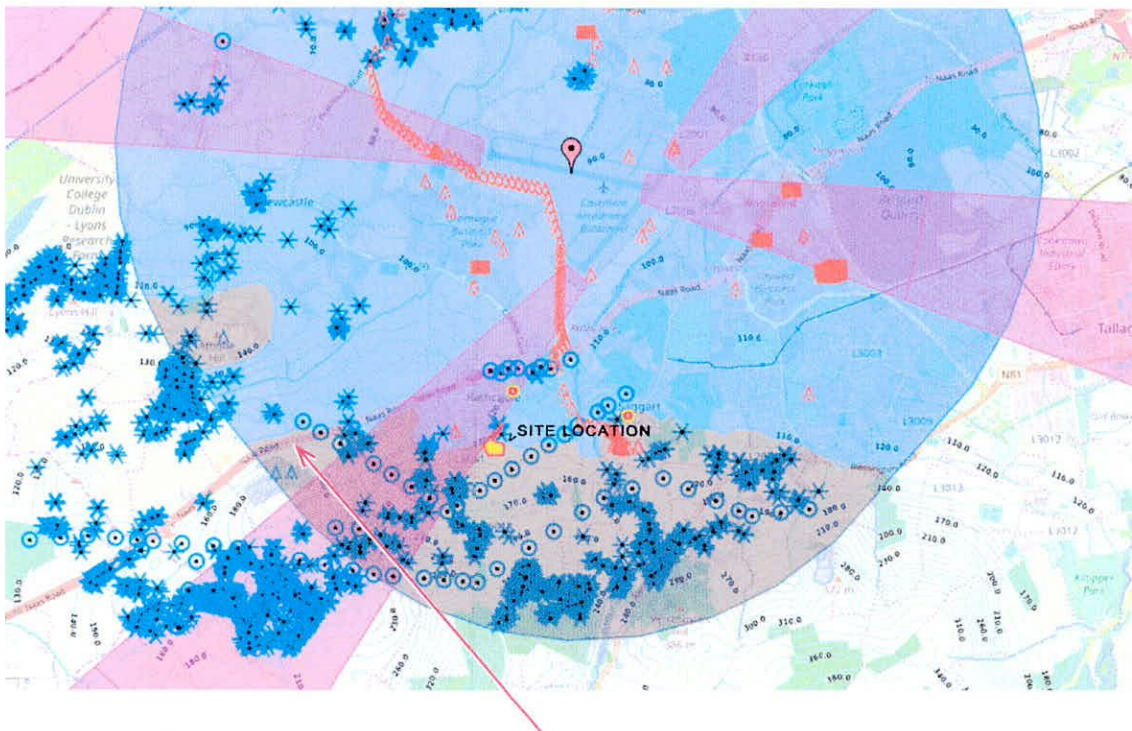
the protection afforded by the inner horizontal surface need not extend into those sectors.'



8.3 Existing Terrain and Objects Above Casement's Inner Horizontal Surface:

(i) To the south of Casement Aerodrome the land rises steeply, so that the ground itself – including 1 kilometre length of the Naas Road, and a large number of existing structures – penetrate Casement's I.H.S. to a significant extent. This means that aircraft cannot fly (or circle) anywhere near the elevation of Casement's Inner Horizontal Surface: they are required to fly at much higher 'obstacle clearance altitudes/heights' [as in the Chart on page 15]. Additionally, the *Rules of the Air Order* requires aircraft to fly generally at a minimum of 150m above ground level or above any structure. The existing intrusions above Casement's Inner Horizontal Surface include Verschoyle's Hill, to south-east of the Stoney Hill Road site. This Hill projects above Casement's Inner Horizontal Surface to an elevation of 336m OD, which is a projection of 204m – more than 4½ times the height of the Surface itself.

(ii) The diagram below indicates (in brown) the extent of existing land (and structures) that extend above Casement's Inner Horizontal Surface, and includes (in blue and orange) the very large number of existing 'obstacles' (as identified by the IAA and Air Corps) which surround the site. Two significant structures – Rathcoole church and Saggart church, which extend to 136m OD and 156m OD respectively, and which are not currently identified on charts (or fitted with aviation warning lights) – are marked with red+yellow dots.



(iii) On the following page is a photograph taken at the location where the Naas Road itself lies above Casement's Inner Horizontal Surface – at an elevation of 144m O.D., with its road signs and lighting masts extending to 153m OD, which is significantly higher than any part of the proposed development.

8.3 (iv) The photo

opposite [>]

is taken where the Naas Road surface lies at 144m O.D.

This road surface lies 12.5m

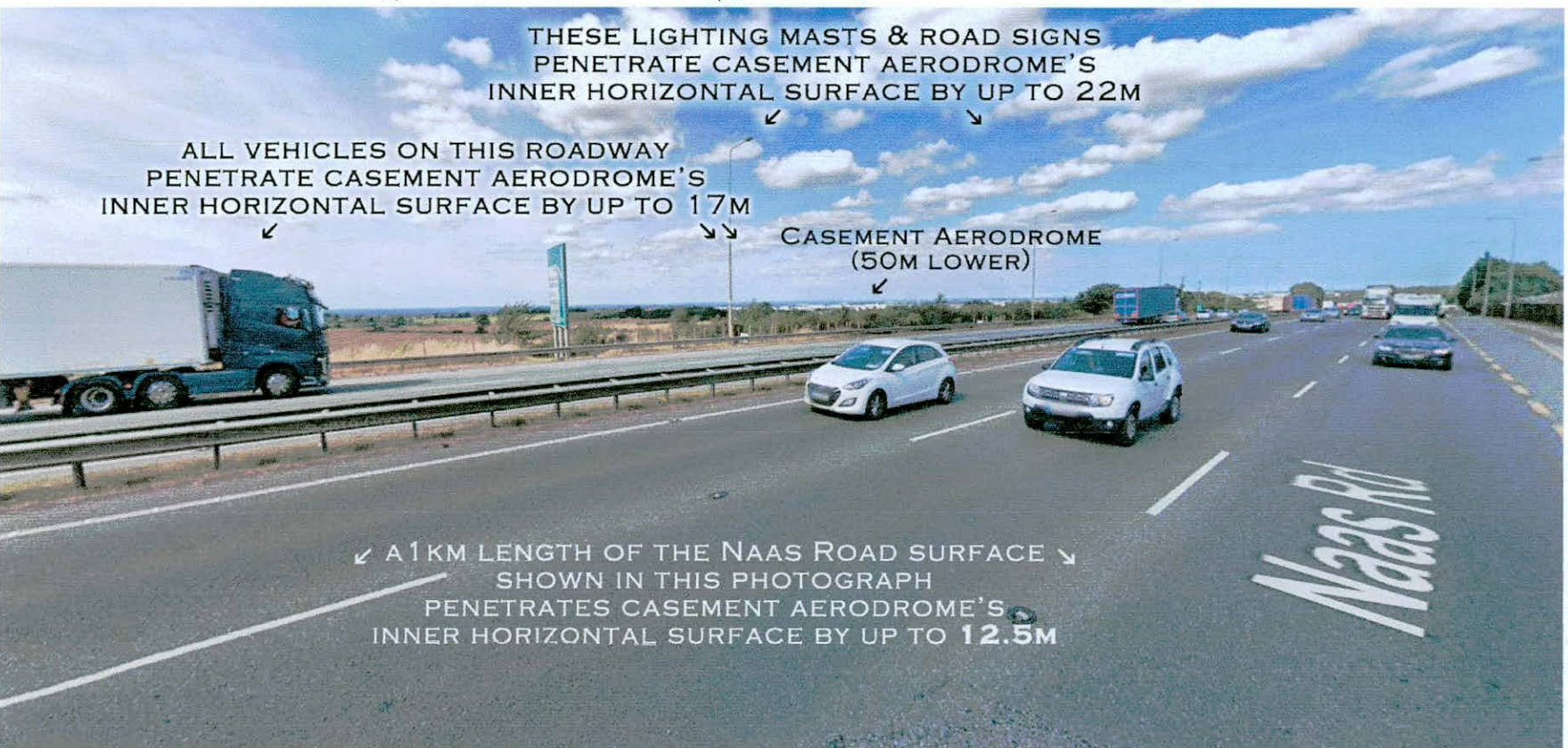
above Casement Aerodrome's

Inner Horizontal Surface, and there are significantly greater

projections by the road signs, lighting masts, and all vehicles on this roadway.

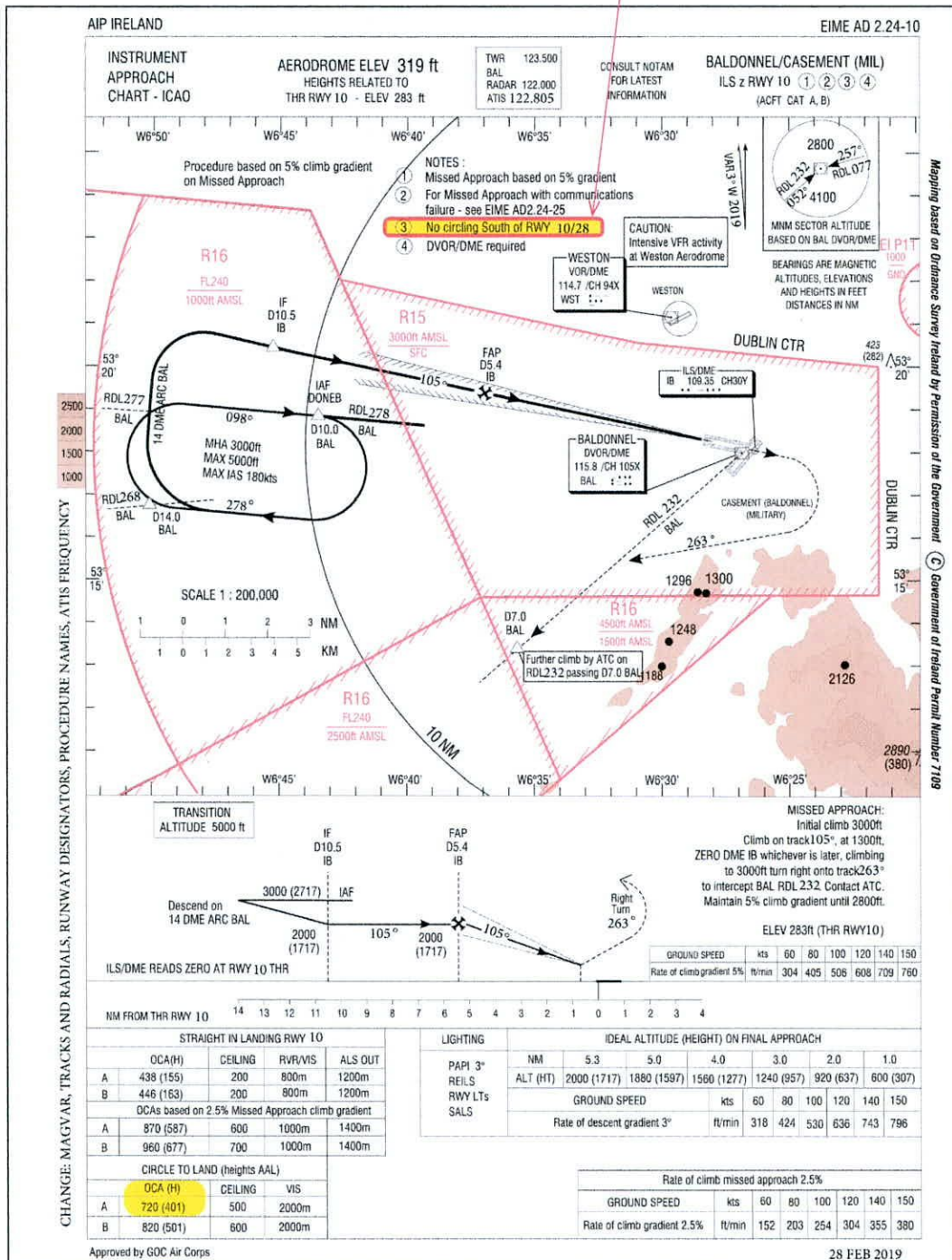
These projections are greater than the maximum projection of the Stoney Hill Road development (which is the 14.1m projection of the ridges of houses nos. 41 & 42).

Further details of buildings, trees, and pylons close to the Stoney Hill Road site are given and illustrated in paragraph 8.5 following [on page 16].



8.4 “No Circling South of [Casement] Runway 10/28”:

Due to the extensive rising ground to the south of Casement Aerodrome, circling by aircraft is prohibited by the I.A.A. (and by GOC Air Corps) in the area to south of Casement’s main Runway 10/28, and this is the sector where this Stoney Hill Road site is located. “No Circling South of Rwy 10/28” is stated on all current published Casement charts, of which one example is reproduced below.



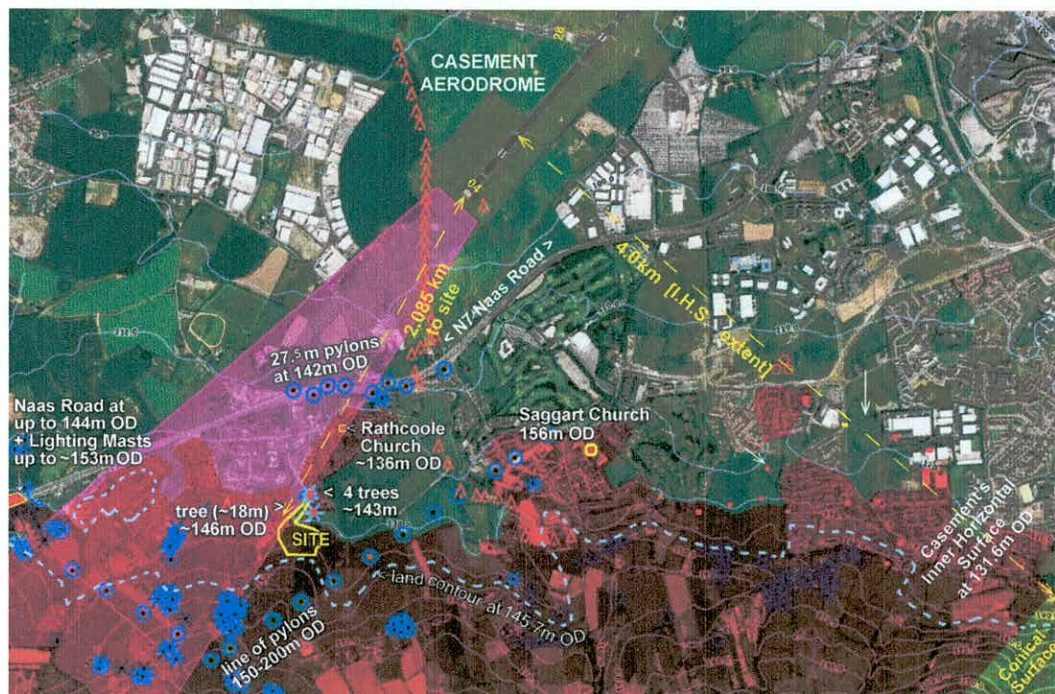
<< NOTE: ON AVIATION CHARTS, VERTICAL DIMENSIONS ARE GIVEN IN FEET, & HORIZONTAL DIMENSIONS IN METRES

This means that the provisions of I.C.A.O.’s paragraph 1.2.3.2 of its *Airport Services Manual* (quoted above in para. 8.2) applies – i.e. “the protection afforded by the inner horizontal surface need not extend” into the sector where the Stoney Hill Rd site is located.

8.5 “Shielding”:

In the immediate vicinity of the Stoney Hill Road site there are a large number of existing intrusions above Casement’s Inner Horizontal Surface which afford ‘shielding’ to the proposed development:

(i) ICAO provides (in its *Airport Services Manual* para. 2.9.3) that “the formula for shielding should be based on a horizontal plane projected from the top of each obstacle away from the runway [etc.]” Application of this principle means that an existing tree beside the site (an identified obstacle of ~18m height approx., on a ground contour of 128m OD) provides a shielding of 146m OD over the Stoney Hill Road site. This appears in the diagram below (and is also indicated in diagrams on pages 9, 13 & 19). [The red overlay in this diagram shows the extent of the land where the ground itself lies above Casement’s Inner Horizontal Surface, and the dashed pale-blue line is the location where the ground itself lies at 145.7m OD.]



(ii) Other existing objects (such as the belltower of Rathcoole church, several other tall trees to north of the site, and a nearby line of pylons, as indicated in the diagram above) provide shieldings of 136m-146m OD.

(iii) These existing tall objects thus provide shielding to all of the proposed development up to a height greater than the most elevated proposed item which extends (at houses 41 & 42) to 145.65m OD.

(iv) In other words (quite apart from all other considerations relating to Casement’s Inner Horizontal Surface), the existing objects and structures in the immediate vicinity of the proposed Stoney Hill Road development provide sufficient shielding for all of the development, so that (in I.C.A.O.’s terms) it “would not adversely affect the safety or affect the regularity of operations of aeroplanes.”

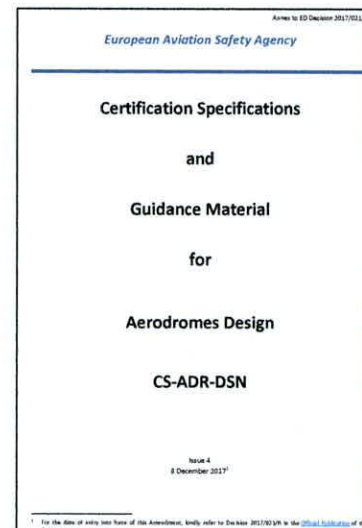
8.6 I.H.S. Datum at Casement:

(i) The choice of datum level for an Inner Horizontal Surface is, to a degree, subjective (unlike Approach and Take-Off-Climb Surfaces, the elevations of which are very precisely determined). It is up to each aerodrome to choose its own datum for the setting out of its I.H.S., and at Casement a *particularly low datum* (i.e. the level of the aerodrome's *lowest* threshold) was chosen, so that its I.H.S. is set at a relatively lower level than at other aerodromes.

A frequent datum for setting out an I.H.S. is the elevation of the Aerodrome's Reference Point – which for Casement has been given [on I.A.A. 'Asset' data] as 318.1ft /97m OD. If this 10.4m (34ft) higher datum had been chosen, the I.H.S. would lie at **142m OD**, i.e. above half of the housing development.

(ii) E.A.S.A. [The European Aviation Safety Agency] – which since the end of 2017 sets the standards for Dublin and all larger European aerodromes – provides (among others) the following guidance for the establishment of a datum for an Inner Horizontal Surface [$>$]:
“the elevation of the highest point of the highest threshold of the related runway”
 or
“the aerodrome elevation”, etc.

If either of these had been chosen for Casement Aerodrome, its Inner Horizontal Surface would lie at **142.2m OD** (45m above the aerodrome elevation of 97.2m), i.e. above most of the proposed Stoney Hill Road development, and above other nearby existing buildings.



(iii) I.C.A.O. states (in its *Airport Services Manual, Part 6 'Control of Obstacles'*) that 'selection of the datum' for an I.H.S. 'should take account of (a) the elevations of the most frequently used altimeter setting datum points;' and '(b) minimum circling altitudes in use or required.' If the altimeter setting datum at Casement were adopted as the datum for its I.H.S., as indicated by I.C.A.O., its I.H.S. would lie significantly higher, at **between 136m OD and 142.2m OD**.

(iv) The I.A.A. recommends consideration of a midpoint between runway end elevations as the datum for setting out an Inner Horizontal Surface (as done at Dublin Airport), which if applied at Casement would place its I.H.S. at up to **5.15m higher**.

9. Conclusion re Stoney Hill Road Site and Casement's Inner Horizontal Surface

9.1 We are satisfied, for the reasons given in paragraphs 8.1 to 8.6 above, that the proposed development is sufficiently shielded and that the intrusions above Casement's Inner Horizontal Surface (by varying amounts of up to 14.05m above it) are such that (in I.C.A.O.'s terms) these "*would not adversely affect the safety or affect the regularity of operations of aeroplanes.*"

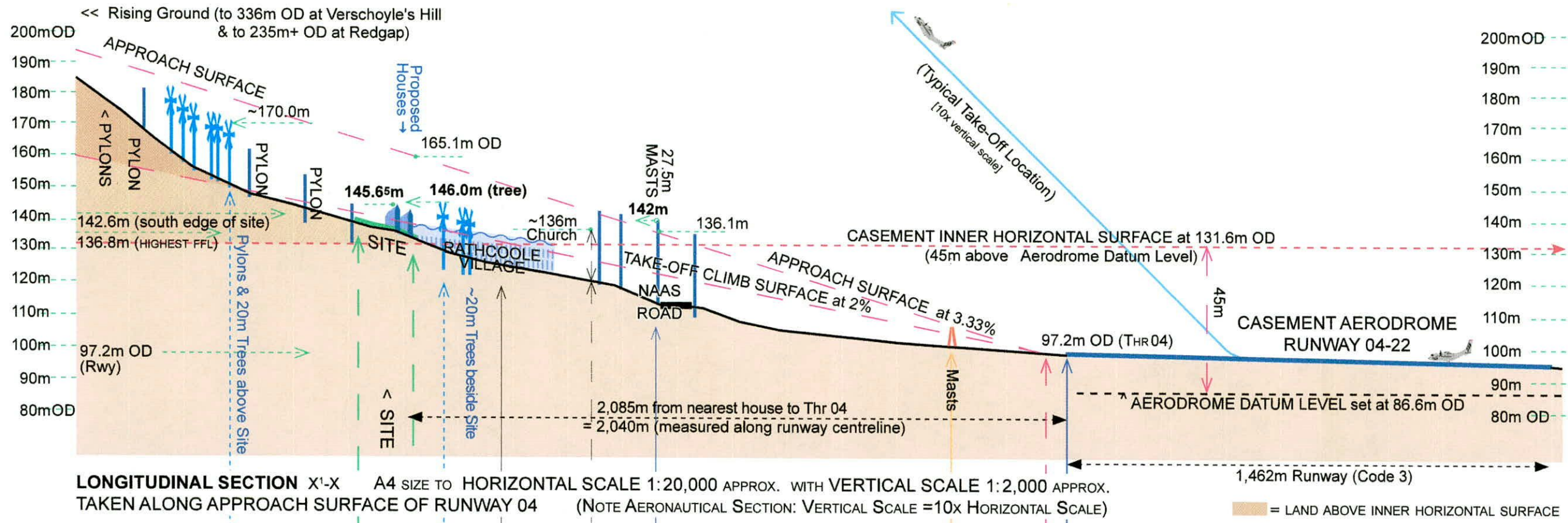
9.2 These reasons for this assessment can be summarized as follows:

- (a) There are large numbers of existing projections (of greater height), both land and structures, in the vicinity of the Stoney Hill Road site.
- (b) Because of this, circling of aircraft is not permitted by the I.A.A. or by the Air Corps in the sector (south of Casement's main runway) where this site is located.
- (c) Inner Horizontal Surface protection is not required in sectors where the visual circling of aircraft is not permitted.
- (d) The Inner Horizontal Surface is considered by I.C.A.O. as a less significant surface, and the avoidance of new projections above it is an I.C.A.O. "*Recommendation*" (i.e. "desirable") rather than an I.C.A.O. "Standard" (i.e. "necessary").
- (e) Existing identified objects in the immediate vicinity of the site in the Rathcoole area provide full "shielding" to all of the proposed development.
- (f) The Inner Horizontal Surface at Casement has been set at an unusually low elevation, and if a higher [97.2m OD] datum had been chosen (in accordance with E.A.S.A. and other international guidelines) there would be a maximum intrusion of no more than 3.5m above the Inner Horizontal Surface.

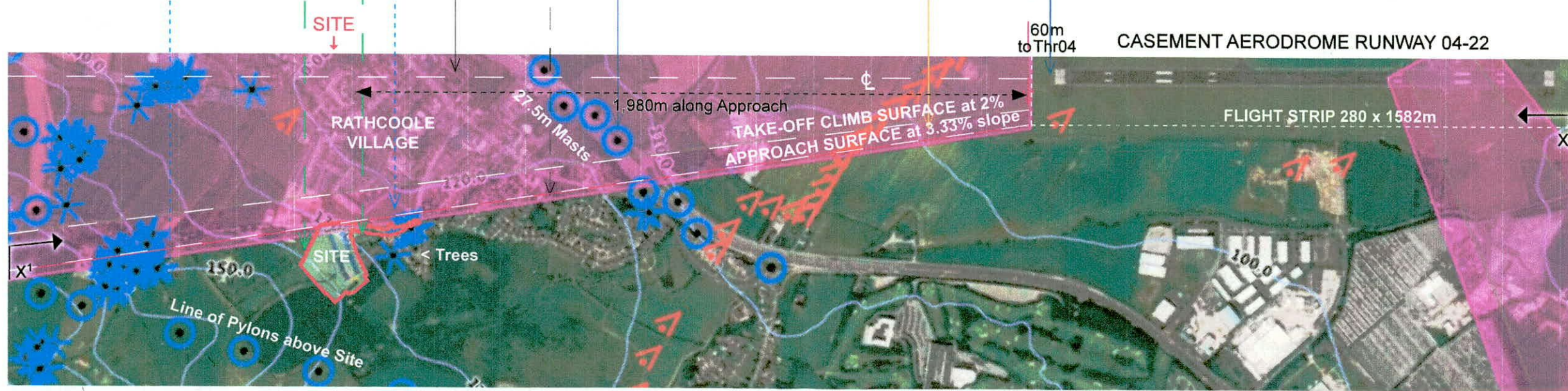
9.3 For all the above reasons, the intrusion of up to 14.05m above Casement's Inner Horizontal Surface – by a house of 8.85 metres overall height – would be considered aeronautically safe and acceptable in this location.

10. Longitudinal Section Diagram & Map

[A3-SIZE] 1:14,200 HORIZONTAL SCALE 1:1,420 VERTICAL SCALE



LONGITUDINAL SECTION X1-X A4 SIZE TO HORIZONTAL SCALE 1:20,000 APPROX. WITH VERTICAL SCALE 1:2,000 APPROX. TAKEN ALONG APPROACH SURFACE OF RUNWAY 04 (NOTE AERONAUTICAL SECTION: VERTICAL SCALE = 10x HORIZONTAL SCALE)



AERIAL PHOTO MAP WITH 10M CONTOURS AND OBSTACLES AS MARKED ON CASEMENT CHARTS PLAN SCALE [A4] 1:20,000 APPROX.

SITE OUTLINE: — OBSTACLES: * TREE ○ POLE/PYLON ▲ MAST (UNLIT)

O'DWYER & JONES DESIGN PARTNERSHIP AVIATION PLANNING CONSULTANTS © 7-2022

11. Other Aviation Considerations

11.1 Lighting

The Stoney Hill Road housing development is not in a location where aviation obstruction lighting is required as it does not lie under any Take-off Climb or Approach Surface, however due to the proximity of the site to these Surfaces (for Casement's runways 04/22) external lighting of the cut-off type is desirable.

11.2 Solar/PV Panels

No solar/PV panels are proposed on this site (so that no Glint+Glare Study arises).

11.3 Cranes during Construction

(i) Notifications:

Any cranes used in the construction of the proposed development could project to a greater extent above Casement's Inner Horizontal Surface. It will be necessary in any event [under S.I. 215 of 2005 – *Irish Aviation Authority (Obstacles to Aircraft in Flight) Order*] for prior notification of the use of any crane/s to be submitted, at least 30 days in advance, to the Irish Aviation Authority and to Casement Aerodrome, who may need to issue any necessary notifications to pilots, and who may require to have cranes on site fitted with obstruction lighting.

(ii) 'PANS-OPS*' Considerations:

As well as the Annex 14 Surfaces described above, there are other higher PANS-OPS* Surfaces [>>]. These are used to establish flying minima [OCA/H**] in the vicinity of an aerodrome, which are published in the Aerodrome's Approach/Departure Charts (as in the example on page 15 above).

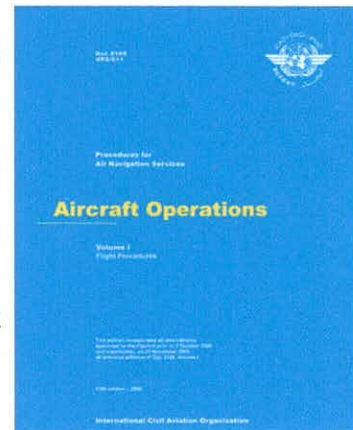
* = *Procedures for Air Navigation Services – Aircraft Operations*.

** = *Obstacle clearance altitude/heights*.

It is beyond the scope and purpose of this report to enter into any detailed PANS-OPS calculations.† These will have been prepared by the Air Corps for Casement Aerodrome (based on a survey of all controlling obstacles), and consultation with the Aerodrome is advised prior to construction on site, to ensure that any proposed temporary structures (in particular any cranes used) will not interfere with PANS-OPS surfaces or affect the aerodrome's published OCA/H.

† Our own outline calculation (per ICAO Doc 8168 †; for a Runway 22 'missed approach' turn) indicates an 'MOC' (*minimum obstacle clearance*) above the Stoney Hill Road site at 15.8m approx*** above the highest element on this site, i.e. at (or above) an elevation of 161.6m / 530.2ft OD. [*** $1.98 \text{ km} \times 0.8\% \text{ slope} = 15.8\text{m MOC.}$]

As the lowest OCA/H published for this more elevated sector is 219.5m / 720 ft OD [see Chart on p.12, with heights given in feet], it would seem that this 57.5m / 189ft distance between the MOC and OCA/H indicates that no amendment of procedural minimum altitudes is anticipated.



12. SUMMARY

12.1 Approach & Take-Off Climb Surfaces to/from Casement's Runway 04/22:

The Approach Surface to Casement Runway 04 extends above the western edge of the site, but no part of the housing development itself will lie under this Approach Surface, which is therefore unaffected by the proposed development.

The Take-Off Climb Surface from Runway 22 (which for this particular runway is lower and narrower than the Approach Surface) does not extend over any part of this site, and is not affected by the proposed development.

12.2 Inner Horizontal Surface of Casement Aerodrome:

The heights of the proposed houses are 8.85m and 10.2m above ground level, and the roofs of the houses project by varying amounts above Casement's Inner Horizontal Surface, which lies *underground* at the site's location. The highest element (the roof ridges of houses nos. 41 & 42) extends to 145.65m OD (i.e. to 14.05m above the I.H.S.). However, for the reasons listed in Section 9, and provided in detail in Section 8 above (i.e. 'shielding' etc.), this projection is not aeronautically significant or (in I.C.A.O.'s wording) likely to "affect the safety or the regularity of operation of aeroplanes".

12.3 Overall:

We consider that the proposed housing development complies with the aviation and aeronautical requirements affecting the location.



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25th July 2022
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