

AERONAUTICAL ASSESSMENT REPORT

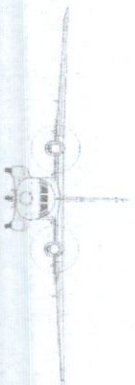
RE

**PROPOSED WAREHOUSE ON
SITE AT KINGSWOOD ROAD
AND KINGSWOOD AVENUE,
CITYWEST BUSINESS CAMPUS,
DUBLIN 24**

BY

ROCKFACE DEVELOPMENTS LIMITED

21ST JUNE 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, & Site Zoning

1.1 Site Location

This report addresses the aviation impact of a proposed warehouse development on a site of 2.56 hectares approx. in South County Dublin, at Kingswood Road and Kingswood Avenue, Citywest Business Campus, Dublin 24.

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

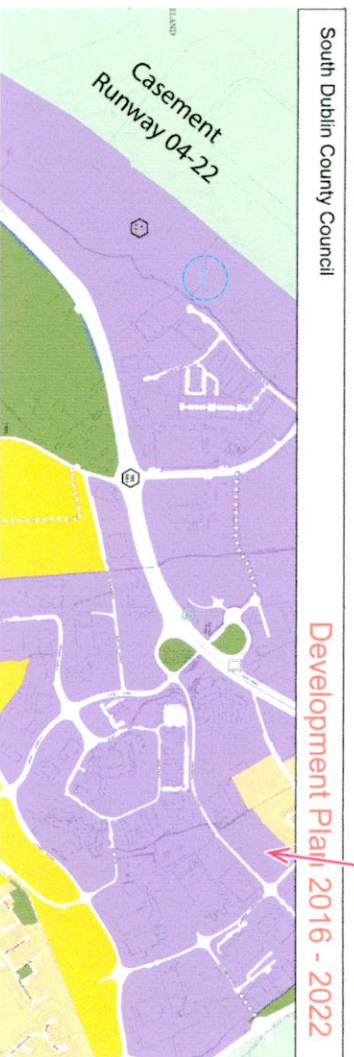


1.2 Some Aviation Changes to Note (subsequent to the 2016-2022 SDCC Development Plan, and provided for within the 2022-2028 Draft Development Plan).

- (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 are in the 2016 SDCC Plan.

1.3 Zoning of the Site in Current (and upcoming) S.D.C.C. Development Plan

In the current South Dublin County Council Development Plan 2016-2022, this site at Citywest Business Campus is zoned ‘Objective EE: To provide for enterprise and employment related uses.’ The site is indicated by a red arrow on the extract from the current 2016–22 Development Plan Map 8 below.



1.4 The site has the same ‘Objective EE’ zoning in the upcoming SDCC Draft Development Plan 2022-2028. An extract from the upcoming [2022-28] Map 8 is shown below, on which the site is indicated by another red arrow.



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

- (i) The site lies under the Approach and Take-Off Climb Surfaces to/from Casement Aerodrome’s main runway 10/28 in South County Dublin, at a distance of 1.71 km to 1.9 km from the threshold of Runway 28.
- (ii) The site also lies under the Inner Horizontal Surface that surrounds Casement military aerodrome (see illustration in Section 7 on page 11).
- (iii) The ground level on the site (at ~98.3m OD) lies ~2.3m above the level of the threshold of Casement Aerodrome’s Runway 28, and 11.7m higher than the aerodrome’s datum level (which is at 86.6m OD).

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 current 2016-2022 Development Plan**. The same provisions and requirements – with updated wording – 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), and 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 Kingswood site are the extract paragraphs reproduced below (and on the following page) from the 2016-22 Plan.

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

[The longitudinal section mentioned below is included in this report at page 13.]

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 IA, 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)
Casement Runways 05/23	3.33% (non – instrument runway)
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 Plan (within Section 11.6.6 'Aerodromes');

IMPLEMENTATION	SOUTH DUBLIN COUNTY COUNCIL DEVELOPMENT PLAN 2016 - 2022
Inner Horizontal Surface	<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>

[Correction: 131.5m O.D.]

2.4 And Paragraph (a), in regard to Casement's Runway 11/29 [now designated runway 10/28] on page 137 of the Plan (under Section 7.8.1 – TE8 Objective 2):

<p>The airspace of Casement is defined by the Obstacle Limitations 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>a). Prevent objects from penetrating the Obstacle Limitation Surfaces for runway 11/29. The existing main runway (11/29) is considered as an instrument approach Code 4 runway and the relevant Obstacle Limitation Surfaces of the Irish Aviation Authority 'Guidance Material on Aerodrome Annex 14 Surfaces' (2015) are applicable.</p>

2.5 Section 5 below (page 9) contains our calculations in relation to the Approach Surface to Casement Aerodrome's Runway 28 (rising at slopes of 2% and 2.5%), as provided for in the SDCC Plan.

Section 6 below (page 10) contains our calculations in relation to the **Take-Off Climb Surface** from Casement Runway 10, and it may be noted that for this category of runway (Code 4, precision approach, *with displaced threshold*) – the Take-off Climb Surface is lower than the Approach Surface.

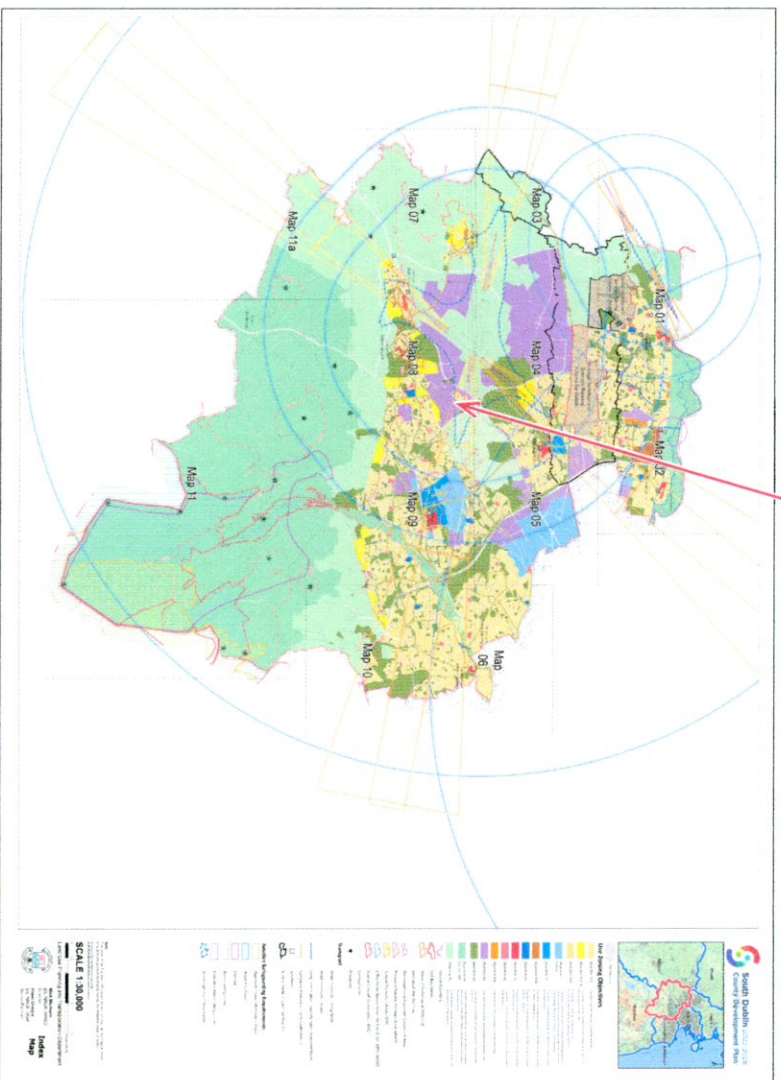
For this category of runway, the Take-off Climb Surface rises continuously (over 15km) at 2% slope, while the Approach Surface slope changes from 2% to 2.5% after 3km. Additionally, the Take-off Climb Surface (whose inner edge is 180m wide) is narrower than the Approach Surface (whose inner edge is 280m *(per ICAO revision of 2018)*). This difference in width is relevant for the Kingswood site, which is located towards the edges of both Surfaces.

Section 7 below (page 11) contains our calculations in relation to Casement's **Inner Horizontal Surface**.

3. Obstacle Limitation Surfaces that Affect the Kingswood Site

3.1 The Department of Defence has adopted the International Civil Aviation Organization [ICAO] “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) 10/28, are all shown on the upcoming SDCC 2022-2028 Development Plan Index Map (illustrated below) on which the site’s location is indicated by the red arrow.



As indicated above, the three “Surfaces” lying above this site at Kingswood are –

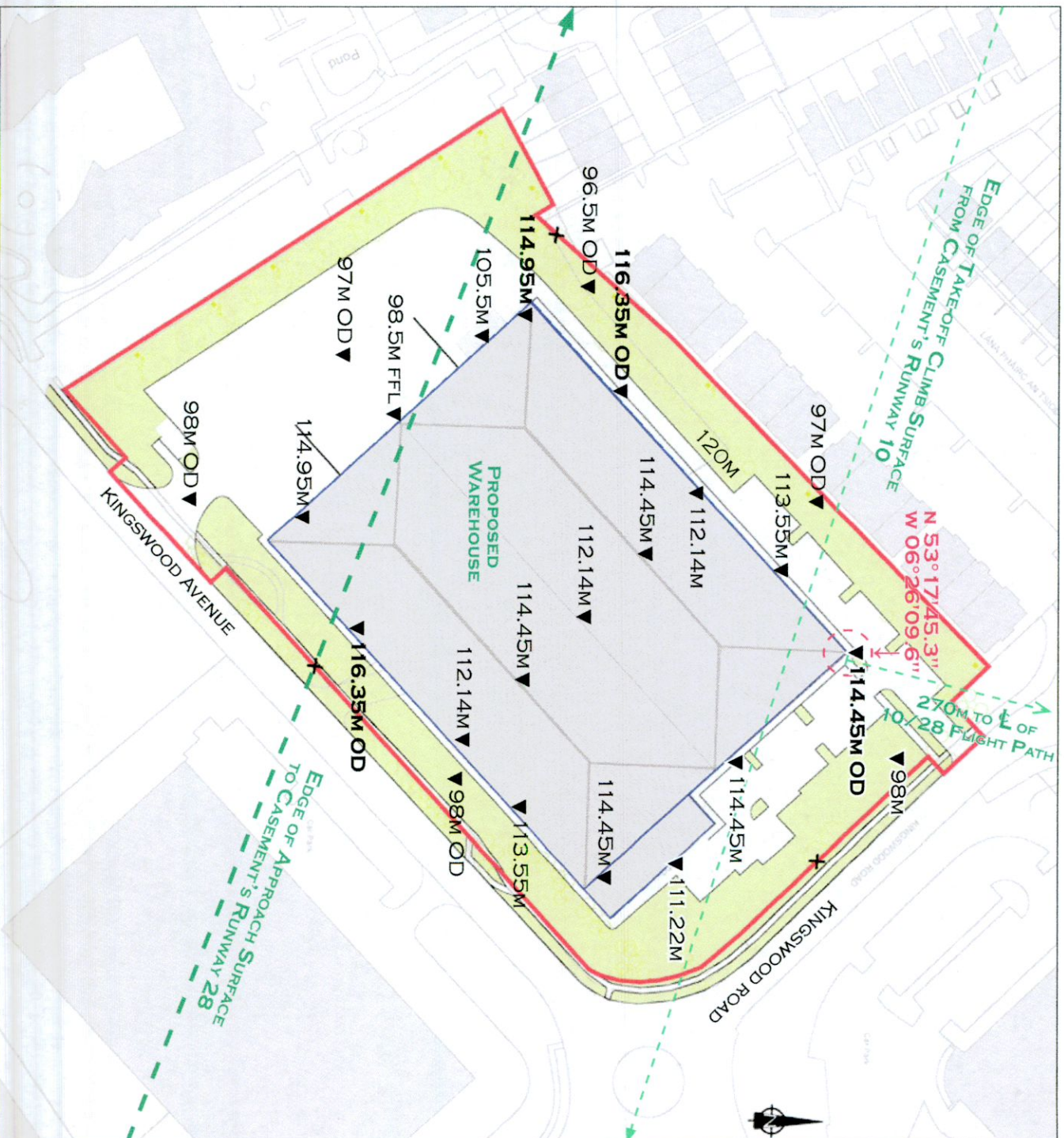
- (i) the Approach Surface* to Casement’s Runway 28;
- (ii) the Take-Off Climb Surface* from Casement’s Runway 10; and
- (iii) the Inner Horizontal Surface** for Casement Aerodrome as a whole.

* 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. Layout, Elevations-OD, & Coordinates of the Proposed Development

- 4.1 Below, to approximate scale 1:1500, is a Roof Plan of the Warehouse development, with elevations (OD) of highest elements, and coordinates of the building's north corner (the nearest point to Runway 10/28 flight path). The Approach Surface to Runway 28 lies above ~94% of the warehouse building, and the Take-off Climb Surface from Runway 10 lies above ~2% if it (extending to 12.5m from its northern corner).



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

4.2 Coordinates and Horizontal Distances

- (i) The coordinates of the corner of the warehouse that is nearest to the flight path to/from Casement's Runway 10/28 are: **53° 17' 45.3" N, 006° 26' 09.6" W** (circled on page 7).
- (ii) And the coordinates of the displaced threshold of Runway 28 (see chart extract >) are: **53° 18' 05.85" N, 006° 26' 40.68" W**.
- (iii) The direct distance between these two sets of coordinates is **1.80 km**.

AIP IRELAND			
AERODROME CHART N			
ICAO			
RWY	DIRECTION	THR	
04	044°	N 53°17'36.90"	W 006°27'13.73"
10	105°	N 53°18'16.88"	W 006°28'07.75"
22	224°	N 53°18'12.63"	W 006°26'22.02"
28	285°	N 53°18'05.85"	W 006°26'40.68"

- 4.3 In order to establish the exact location of the proposed warehouse in relation to the Approach Surface to Runway 28 (which has a displaced threshold), and the Take-off Climb Surface from Runway 10, it is necessary to calculate —
- (i) the distance of the proposed building from the extended centreline of Casement's Runway(s) 10/28; and (ii) the distance along that extended centreline opposite which the nearest corner of the proposed building lies.

Using the two sets of coordinates quoted above, plus the coordinates of Threshold 10 (at **53° 18' 16.88" N, 006° 28' 07.75" W**, as in the chart extract above) it is established that the building is at **270m*** laterally from the extended centreline of Runway 10/28, and lies opposite a point at **1,780m*** from Thr28 along that runway's extended centreline (as illustrated below).

* These figures are confirmed by the equation: $1800 \times 1800 = 270 \times 270 + 1780 \times 1780$



- 4.4 Similarly, it can be established that the nearest corner of the building to Thr28 (its west corner) is at **1.75km** from that Threshold, and opposite a point at **1.735km** from Thr28 along the extended runway centreline.

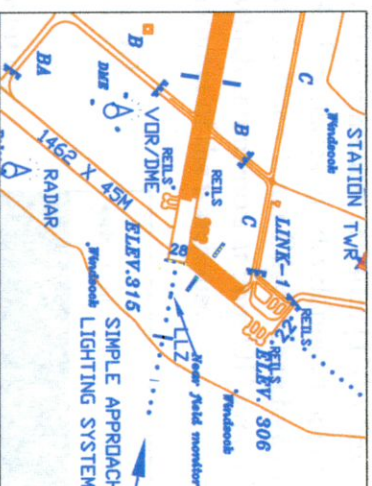
The dimensions above form the basis of the height calculations in the following Sections 5 & 6 >

5. Calculations with regard to the Approach Surface to Runway 28

The calculations in this Section relate to all upcoming Draft CDP 2022-28 provisions.

5.1 Relevant Data:

The relevant runway threshold (28) is stated on the current Aerodrome Chart [7] to be at 315ft AMSL elevation, i.e. at **96m OD**, which is therefore the elevation of the Inner Edge of the Approach Surface commencing at **60m** from that runway threshold.



By deducting 60m from the 1,780m listed in paragraph 4.3 (*on the previous page*) it is established that the nearest corner of the site lies at **1,720m** from the inner edge of the Approach Surface to Casement's Runway 28 (as measured along the centre of that Surface – i.e. along the extended centreline of Runway 28).

- 5.2 This Approach Surface commences at 280m width and increases by 15% to each side, so that, at 1,720m from its 'Inner Edge', its width from centreline to side will be: 140m + 1720×15% = 398m. This means that a large part of the site and of the warehouse (which at its nearest is 270m from the centreline of the Surface) will lie under the Approach Surface. (*See Roof+Site drawing on page 7 above*).

- 5.2 The ground levels on the site are at ~98.3m OD, i.e. at 2.3m higher than the Threshold of Casement's Runway 28.

- 5.3 The slopes of the **Approach Surface to Runway 28** are at 2% for its first 3,000 metres.

Therefore at the nearest corner of the site to the flight path for Runway 10/28 (at **1,720m** from the Surface's Inner Edge) the Approach Surface to Rwy28 lies at **130.4m OD***, and therefore at 14.05m above the highest points of the warehouse (which are at 116.35m OD).

** calculated as follows —*

$$(1720 \times 2\%) + 96m \text{ OD} = 34.4 + 96m = 130.4m \text{ OD}$$

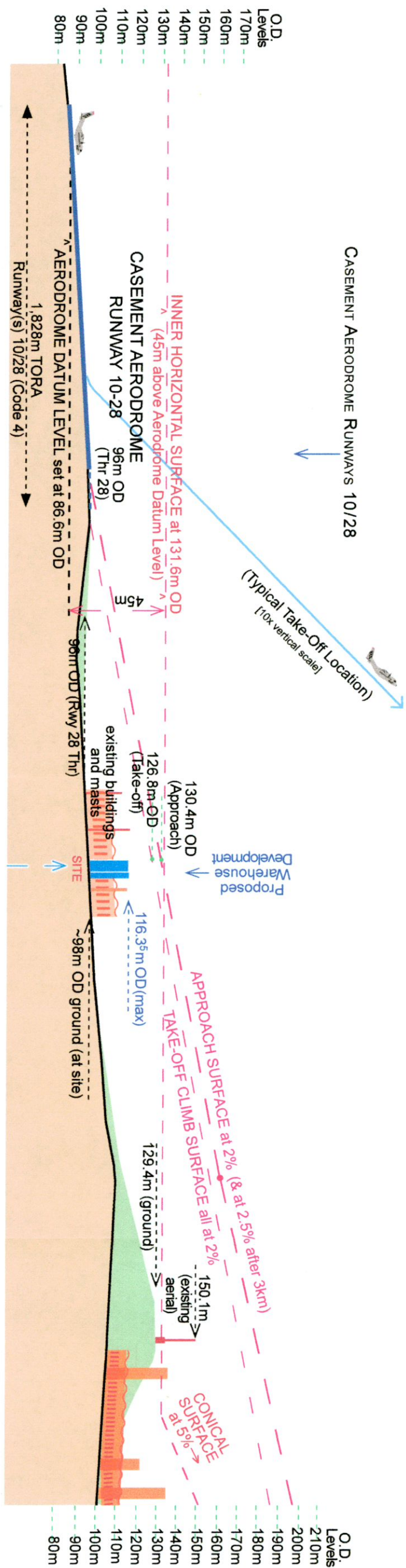
And above the west corner of the warehouse [opposite a point at 1,675m (1735-60) along the Approach Surface], this Surface will be at **129.5m OD** (33.5+96m).

- 5.5 Thus the Approach Surface to Runway 28 lies well above all of the proposed warehouse development, which complies fully with the requirements of the current (and the upcoming) S.D.C.C. Development Plan with regard to this Surface.

- 5.6 A Longitudinal Section Diagram (*in Section 9 on page 13*) illustrates the features noted above.

9. Longitudinal Section Diagram

A4-SIZE SCALE 1:30,000 HORIZONTAL & 1:3,000 VERTICAL APPROX.
 A3-SIZE SCALE 1:2,000 HORIZONTAL & 1:2,200 VERTICAL APPROX.



LONGITUDINAL SECTION X'1-X' [A4-size] TO HORIZONTAL SCALE 1:30,000 APPROX. WITH VERTICAL SCALE 1:3,000 APPROX.
 TAKEN ALONG CENTRE-LINE OF RUNWAY 10/28 (NOTE AERONAUTICAL SECTION: VERTICAL SCALE =10X HORIZONTAL SCALE)



AERIAL PHOTO MAP PLAN SCALE [A4-size] 1:30,000 APPROX. WITH 10M CONTOURS AND OBSTACLES AS MARKED ON CASEMENT CHARTS
 SITE OUTLINE: 10M CONTOURS: OBSTACLES: MAST (UNLIT) BUILDING
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10. Other Aviation Considerations Relevant to this Site

10.1 Outer Horizontal Surfaces for Dublin Airport

The site at Kingswood and the proposed development lie well outside the Outer Horizontal Surface for Dublin Airport (*included on SDCC Index Map on p.6 above*), and this is wholly unaffected by the development.

10.2 Solar/PV Panels

There are no Solar/PV panels proposed as part of this development, so that no separate Glint & Glare study is required.

10.3 External Lighting

Being under the Approach and Take-off Climb Surfaces to and from Runway(s) 10/28, it is recommended that any external lighting (including any road lighting) should be of the cut-off type (i.e. showing no light above the horizontal).

10.4 Use of Cranes During Construction

It is envisaged that mobile cranes will be used during construction, and that any cranes used will operate below all of Casement's Obstacle Limitation Surfaces, the lowest of which lies at 12m+ above ~2% of the roof of the development (with 14-15m+ clearances over most of the warehouse roof area).

In any event, it will be necessary [under S.I. 215 of 2005 – *‘Irish Aviation Authority (Obstacles to Aircraft in Flight) Order’*] for prior notification of the use of any cranes to be submitted, at least 30 days in advance, to the Irish Aviation Authority, and to Casement Aerodrome [at airspaceandobstacles@defenceforces.ie or 01-4037681], who may need to issue notifications to pilots, and who may require cranes to be fitted with aviation warning lights.

10.5 Aviation Noise

The proposed building's offices lie outside the Noise Contour plotted around Casement Aerodrome (and indicated on the Development Plan Index Maps) so that no additional noise insulation would be required.

11. SUMMARY

11.1 Approach & Take-Off Climb Surfaces

The proposed development lies comfortably lower than the Approach Surface to Casement's Runway 28 and the Take-off Climb Surface from its Runway 10, which are the significant Obstacle Limitation Surfaces in relation to this site; and which both extend above parts of the proposed warehouse roof.

At its nearest the sloping Take-off Climb Surface lies 12m+ above the proposed development's northern corner; and at its nearest the sloping Approach Surface lies 14m+ above the development's highest elements (its parapets rising to 116.35m OD), and both of these surfaces are unaffected by the development. The development is also below the 1.2% slope above which it would be required to be identified as a potential obstacle on aerodrome charts.

11.2 Inner Horizontal Surface

Casement Aerodrome's Inner Horizontal Surface lies at 131.6m OD above all of the Kingswood site, i.e. at a level that is 15m+ above the highest points of the proposed warehouse roof; and this Surface is unaffected by the development.

11.3 Overall

We consider that the proposed warehouse development at the Kingswood site complies fully with all aviation and aeronautical requirements which affect the site.



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21st June 2022

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