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10 September 2024

VOLUME CALCULATION

Re: Planning Application at 28 Albemarle Avenue, Twickenham TW2 6AJ
for the proposed:
Hip to gable roof Loft Extension with new dormer window to rear and velux rooflights on roof frontage

We have created simplified computer models, showing both the existing and the proposed roof volumes. (Images below and on the next page)

Existing roof:
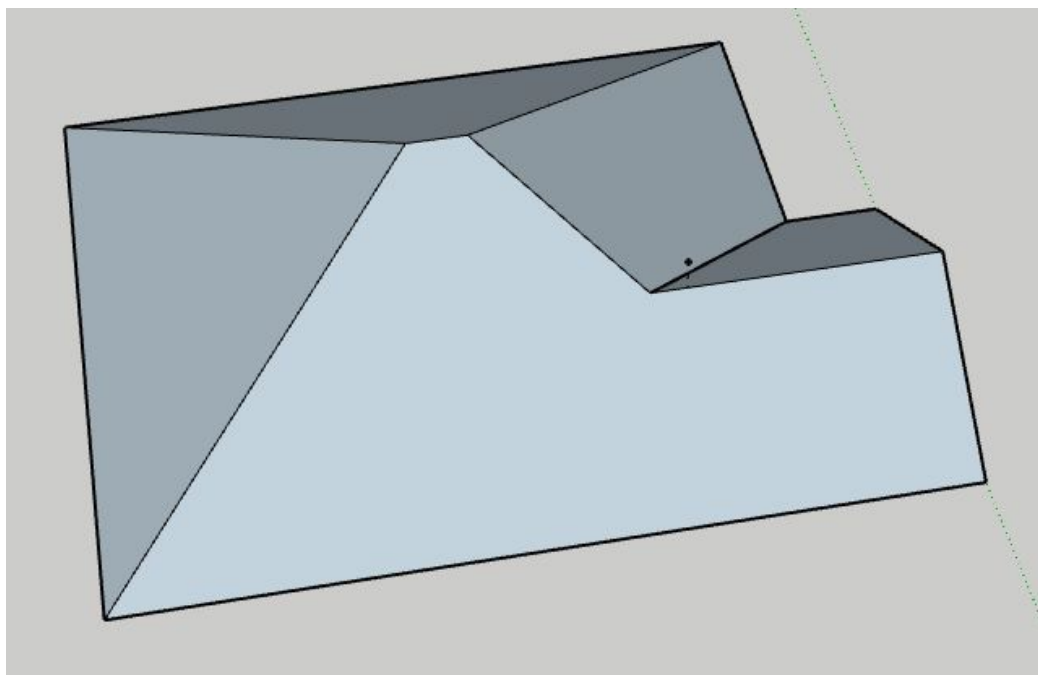
The existing roof volume is shown in grey
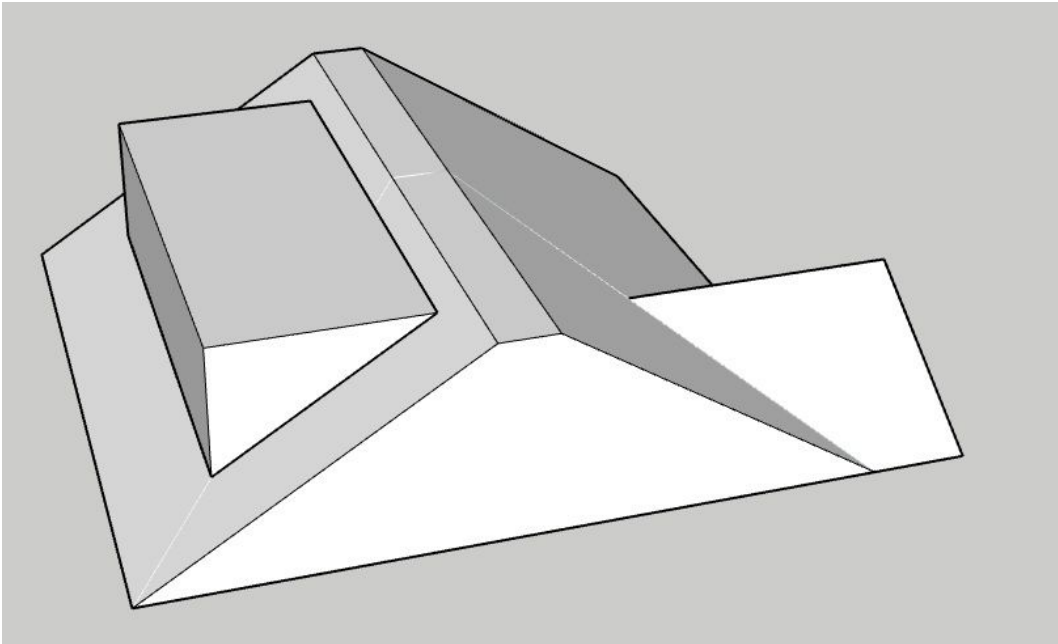
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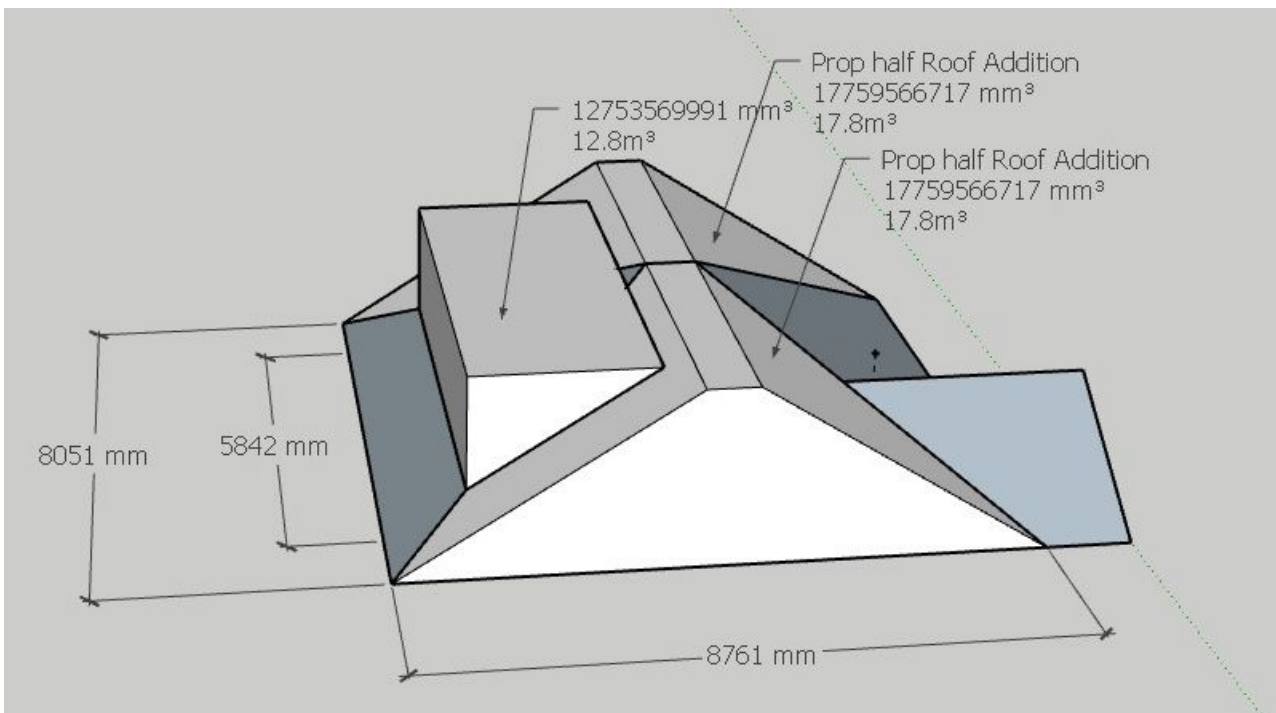
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Proposed roof:

With the existing roof volume is shown in grey:

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Calculations were performed by the software itself.
(Results are displayed on the image above)

According to it:

Dormer Volume: 12.8 m³

Hip to gable extensions: 17.8 m³ each

Therefore the total new proposed volume would be

V= 12.8 + (17.8 x 2) = 48.4   m³ (which is below the 50 m³ permitted threadshold)

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RELEVANT PLANNING HISTORY

A previous application (Ref. no. 4/0960/PS192) had been submitted for the very same development, and refused on the 22nd August 2024.

According to the Planning Report, the only reason for the refusal was Point B.1 (d): *the cubic content of the resulting roof space would exceed the cubic content of the original roof space by more than (ii) 50 cubic metres in any other case*

Previous planner calculation which led to the refusal has been copied below:

Dormer

(2.6 x 5.8 x 1.65) / 2 = 12.44

Hip to gable extensions

(2.57 x 0.75 x 4) x 2 = 15.42m3

(2.57) x (8.05) x (4) / 6 = 13.80
13.8 x 2 = 27.6m3

=43.02m3

TOTAL

43.02 + 12.44 = **55.46m3**

There seems to be an error in the calculation highlighted in yellow below.
As far as It is understood, the calculation above comprises 3 different sets of volumes:

1. Dormer
 Dormer
 (2.6 x 5.8 x 1.65) / 2 = 12.44 m³

2. Central crown roof portions
(2.57 x 0.75 x 4) x 2 = 15.42m³

3. Hip roof corners
(2.57) x (8.05) x (4) / 6 = 13.80 m³
13.8 x 2 = 27.6 m³

TOTAL 27.6 +15.42+ 12.44 = 55.46 m³
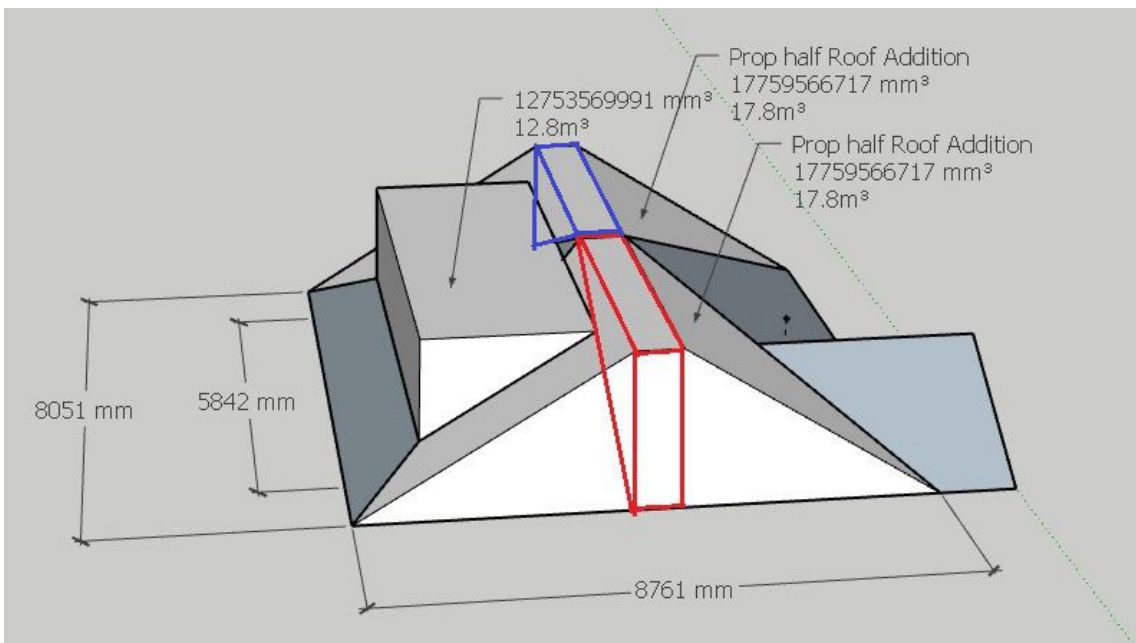
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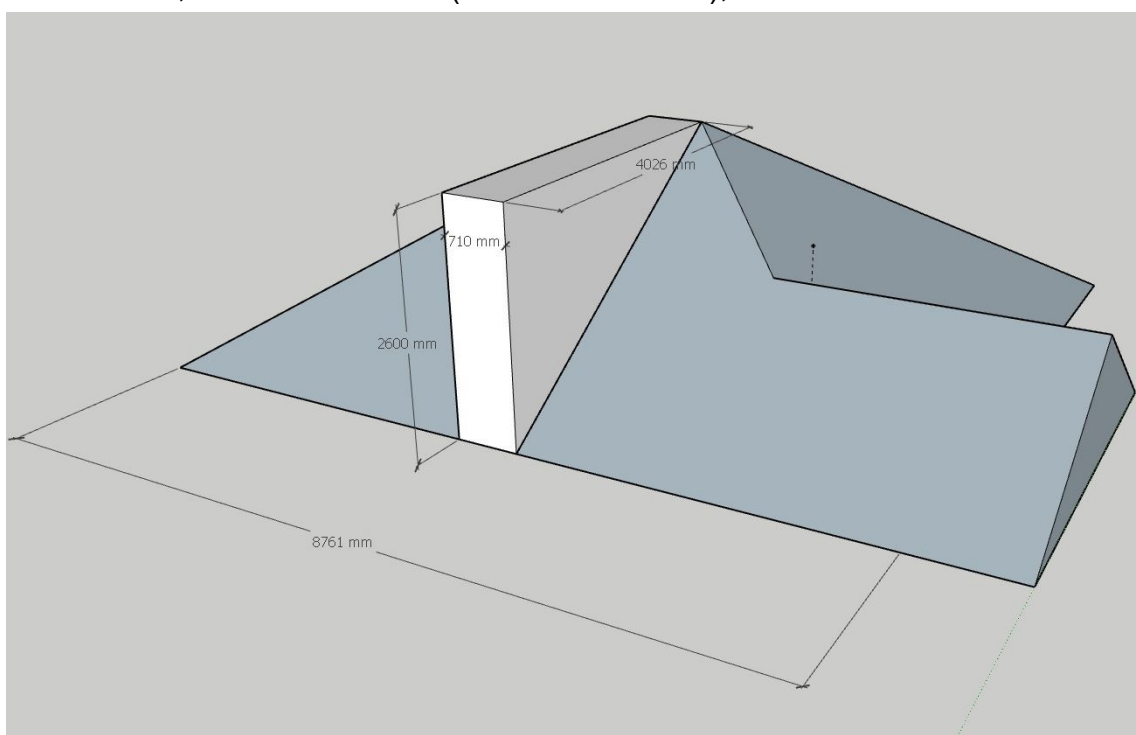
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To avoid confusion,
Point 2 above (Central crown roof portions)
relates to the portions roughly shown in red and blue in the image below

One of them, shown on its own (in a different view), with dimensions annotated on:

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Consequently, the previous calculation at point 2

The white small volume in the image above (part of the central crown roof portion) according to the calculation made by the computer software, has a 3.7m³ volume.

As a matter of fact, being that half of a parallelepiped, it can be calculated as:

(710 x 2600 x 4026) / 2 = 7431,9 / 2 = 3715 mm³ = 3.7 m³

The calculation provided in the report doesn't seem to divide by two this volume, taking also the existing half in to account.

Therefore the point 2. should be
0.71 (2.6 x 4.026 /2) = 3.71cubic metres

This figure would be then have to be multiplied by two, as there are two of these portions,one on each side of the roof (as shown in red and blue earlier)

3.7 x 2= **7.4 m³**

(not 15.42 m³ as per calculation provided in the report)

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To be consistent and verify all the parts, also the proposed dormer and one the remaining hip to gable portions (one corner is highlighted in blue in the image below) of the volume have been re-calculated and shown in the model image below.
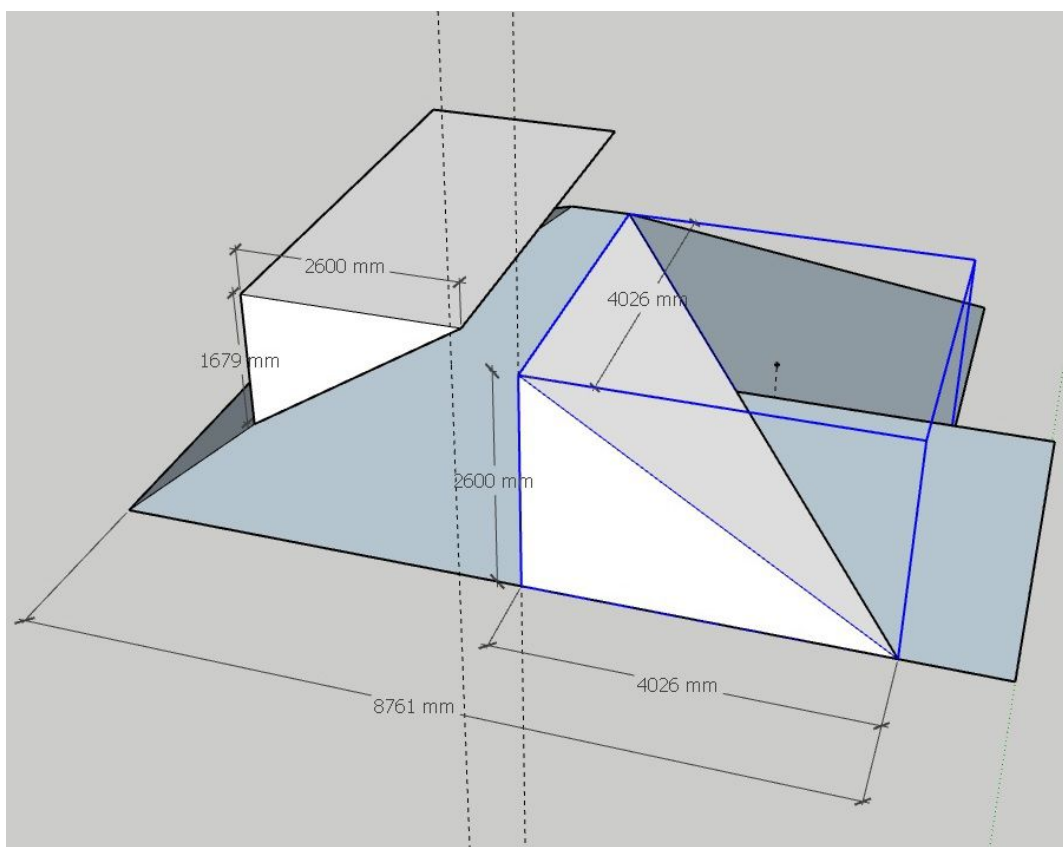
1. Dormer volume:
   $(2600 \times 5842 \times 1679) / 2 = 12751$ mm³ = **12.8 m³**

2. Central crown roof portions:
   Each (of 2) central crown roof portion has a volume of 3.7m³
   3.7 x 2= **7.4 m³**
   (As made clear in the previous pages)

3. Hip roof corners:
   Each (of 4) hip roof corner has a volume of 7.05 m³

   It can be calculated using the Pyramid volume formula
   The volume of a pyramid is found using the formula:
   V = (1/3) BxH
   where 'B' is the base area and 'H' is the height of the pyramid.

In our case:

The base area:
B= *(4026x2600)/2* = 5233800mm³

H = 4026mm³

Therefore:
Vp= (1/3) BxH = 1/3 (5233800 x 4026) =7023 mm³ = 7.05 m³

As there are four of these portions,one on each corner of the roof:

7.05 x 4 = **28,2 m³**

TOTAL VOLUME PROPOSED IS THEN:

(as per previuos calculations at points 1, 2 and 3)

12.8 + 7.4 + 28.2 = 48.4 m³

which is below the 50m³ limit