

Extensions and Subterranean Developments in RBKC - Response to Operational Carbon report submitted by Ashmount Consulting prepared for the Council by Eight Associates

April 2014

This response aims to provide comments concerning the Ashmount Consulting (March 2014) report analysis and conclusions, submitted under the second public consultation period.

1. Eight Associates Comments on the Analysis:

There appears to be some discrepancies in relation to the window openings in the SAP model.

In the Basement SAP input document the total window openings are 25.5m²:

Opaque Elements:

Type:	Gross area:	Openings:
<u>External Elements</u>		
New Basement Walls	122	16.1
Existing Front Walls	97	9.4

In the Extension SAP input document the total window openings are 9.4m²:

Opaque Elements:

Type:	Gross area:	Openings:
<u>External Elements</u>		
NEW	122	0
Existing Front Walls	97	9.4

Note that the Existing dwelling's openings are 31.8m².

However, the solar gains for the Basement and the Extension are identical:

Solar gains in watts, calculated for each month												(83)m = Sum(74)m	(82)m
(83)m=	153.85	298.14	476.64	708.44	863.21	901.52	874.67	760.2	570.02	363.09	191.26	126.92	(83)

Total gains – internal and solar (84)m = (73)m + (83)m , watts												(84)	
(84)m=	1043.13	1176.36	1314.52	1486.92	1581.68	1569.65	1516.88	1418.18	1265.58	1118.29	1010.24	993.36	(84)

(Basement)

Solar gains in watts, calculated for each month												(83)m = Sum(74)m	(82)m
(83)m=	153.85	298.14	476.64	708.44	863.21	901.52	874.67	760.2	570.02	363.09	191.26	126.92	(83)

Total gains – internal and solar (84)m = (73)m + (83)m , watts												(84)	
(84)m=	1049.06	1182.17	1319.97	1491.88	1586.13	1573.74	1520.81	1422.21	1269.96	1123.17	1015.63	999.12	(84)

(Extension)

The addition of an extension has resulted in a significant reduction (70%) in the area of openings in the dwelling. Clearly, the scope for forming openings in basements is limited, however, for extensions there are far fewer limitations. Also, the solar gain for the Extension and Basement should not be identical, they should be evidently different. Such a vast reduction in the glazing area in the Extension would result in less solar gain (heat) entering through the glazing, this would result in a higher space heating requirement.

2. **Eight Associates Comments on Areas:**

In the SAP worksheet for the above extension is 75 m² (as written in the methodology), however, it is 72 m² for the subterranean extension. Although it is only an error of 4%, both case studies do not have the same area as stated in the document.

The analysis assumes the same external wall area (122m²) for both the Extension and Basement. An extension by definition is attached to the existing dwelling so it would reduce the heat loss area of the existing walls, and, the new extension wall area would be less than a basement, because an extension would be attached to the existing via a wall, whereas a basement would be attached via the 'floor'.

It is also not possible to assess the geometry of the new extension relative to the basement as there are no plans provided. As mentioned in the previous point, if an extension with too much external heat loss area has been modelled then the space heating requirement will increase accordingly and the carbon emissions will be inflated.

3. **Eight Associates Comments on Services:**

There has been no additional means of ventilation added for the Basement SAP model. Basements typically need mechanical ventilation to meet adequate ventilation requirements. Even if this was not in the form of a localised system as opposed to a centralised system, it should be reflected within the SAP. However, the worksheets provided show no difference in the ventilation inputs between the Extension and Basement.

4. Comment from the Ashmount Consulting report: **"The RBK&C case studies considered result in an average "extension" floor area of 25.1sqm against an average "single basement" floor area of 142.8sqm and "large basement" area of 470.8sqm. This report demonstrates that to directly compare developments of such different floor area is neither a valid nor accurate method of analysis."**

Eight Associates response: The case studies reviewed under the scope of the Eight Associates report were selected to be a representative sample of the reality of the projects submitted for planning in the Council. Due to space restrictions in the Council, the majority of planning applications of above ground extensions are smaller in area. It was not possible to find case studies with larger GIA for above ground extensions submitted for planning in the Council. The scope of the report was to provide a comparative analysis of the carbon footprint of above ground extensions vs. subterranean extensions in the context of the RBKC Council built environment. The Council is facing an unprecedented number of planning applications for subterranean extensions that often have bigger areas than the dwelling itself and therefore the environmental impact of such should be considered.

5. Comment from the Ashmount Consulting report: **"This report demonstrates that when comparing a like-for-like development floor area the Operational Carbon emissions for an above ground extension is significantly greater than a basement development. This can be simply explained by the fact that a basement has a reduced heat loss due to the added benefit of the surrounding ground."**

Eight Associates response: This comment is flawed because it extrapolates general conclusions for all types of basements and above ground extensions from the analysis of a single case study. The same authors have produced a report for the first public consultation period where their conclusions showed that an above ground extension has a better carbon footprint in the first 44 years of the building life cycle than a subterranean extension (please see page 13 of the August 2013 Ashmount report - also submitted by Basement Force for this consultation period). This is at odds with the 2014 submittal. These comments should be reviewed and considered relevant only for this case study and schemes of a very similar nature, as the size of the sample analysed (the number of case studies) is very small and not representative of the Council's built environment.

Also, as highlighted in criticisms from other reports submitted by Cranbrook and Basement Force by other private consultancies, it is incorrect to draw conclusions regarding the general carbon footprint of above ground extensions vs. subterranean extensions based only on 2 case studies.

In summary there appear to be some discrepancies in the building geometry, openings and services. Moreover, the findings are very specific to the case study in question and using the assertions concluded within the report to extrapolate more widely should be avoided without further clarification and a more balanced case study selection.