Solar Panel Suitability Assessment Report

Barnsley FC

Background

Building Location: Oakwell Ground, Grove St, Barnsley, South Yorkshire, S71 1ET

National Grid Ref: 435374 406326

3D Model

Type of Source Data: Aerial Photography

Date of Source Data: 27-09-2008

Accuracy of 3D Model: 40cm (XY)

The model has been used to establish the size, pitch and aspect of all potentially suitable roofs on this building. Potential obstructions (such as trees and other building) were also assessed and modelled.

The 3D model can be seen in figure 1.

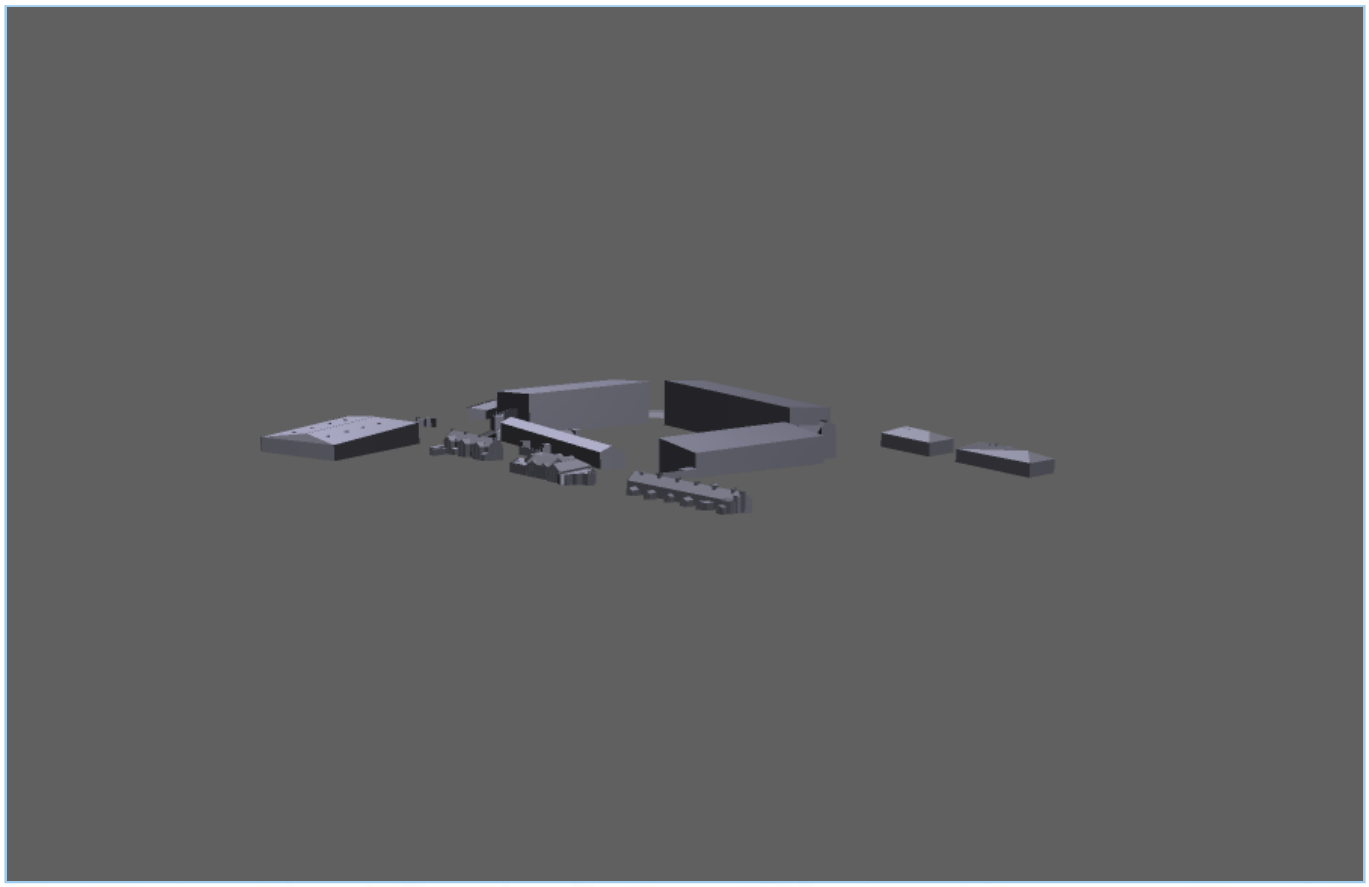


figure 1

To view this 3D view correctly please install the latest version of **Adobe Reader**

Click outside the image to continue to scroll through the report.

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Analysis

The building and it's immediate environment can be seen in the aerial photo in figure 2.



figure 2 Vertical aerial photography, date: 27-09-2008

Advanced modelling techniques, taking several parameters into account, including size, aspect, pitch and obstructors, were used to estimate the amount of solar energy received by each roof during an entire year. This can be seen visually in figure 3. Over an entire year the roofs receive an average of approximately 925kWh/m².

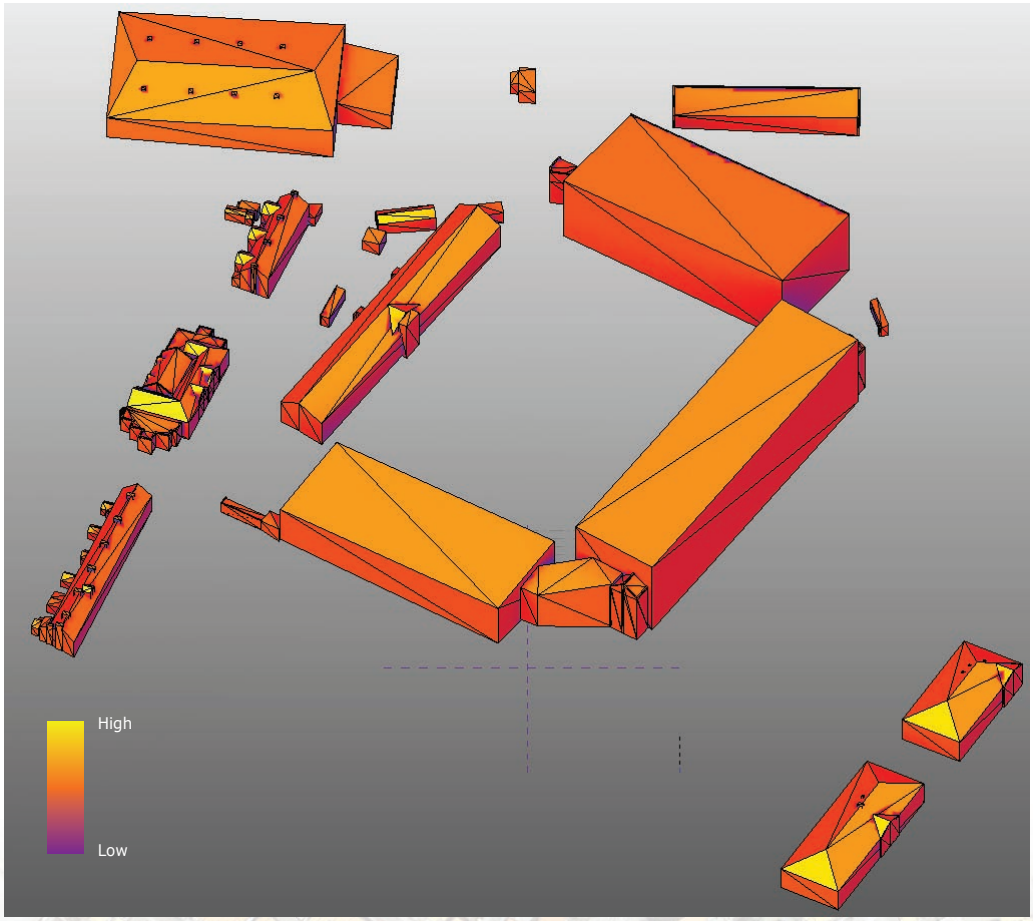


figure 3

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Results

Figure 4 shows the 3D model of the building with each suitable roof shown in blue, these have also been numbered for ease of analysis and interpretation. All other roofs have been determined as not suitable for solar panels.



figure 4 3D model showing suitable roofs

Roof Details and Results

Roof	Size					Aspect	Pitch	Irradiation (KWh/m2)		Obstruction
	Total X (m)	Total Y (m)	Usable X (m)	Usable Y (m)	Usable area (m²)			max	average	
1	71.5	28.7	64.9	21.1	1369	210°	4.6°	1053	941	No
2	20.3	10.7	0.0	0.0	0	165°	5.4°	-	-	Yes - roof 1 & 3
3	105.4	25.0	100.7	18.7	1883	120°	5.1°	1028	937	No
4	72.0	34.1	65.7	27.5	1807	30°	5°	1037	891	No
5	50.2	10.0	46.0	6.8	313	180°	5°	984	939	Yes - roof 4
6	91.5	7.4	87.7	6.1	437	118°	28.1°	983	915	Yes - "Dormer"
7	91.5	6.0	0.0	0.0	0	242°	23.7°	-	-	Yes - roof 6
8	16.0	5.1	0.0	0.0	0	167°	28°	-	-	Yes - roof 6

Roof: Roof number as shown in figure 4

Area: Area of roof in square metres

Pitch: Pitch of roof in degrees

Aspect: Orientation of roof in degrees (north = 0 and south = 180)

Irradiation: Based on an average of 818 kWh/m² which is the calculated average over an entire year for these roofs

Obstruction: A guide to objects that may obscure some direct sunlight on the roof at some part of the day. These potential obstructions have not been taken into account during the interpretation.

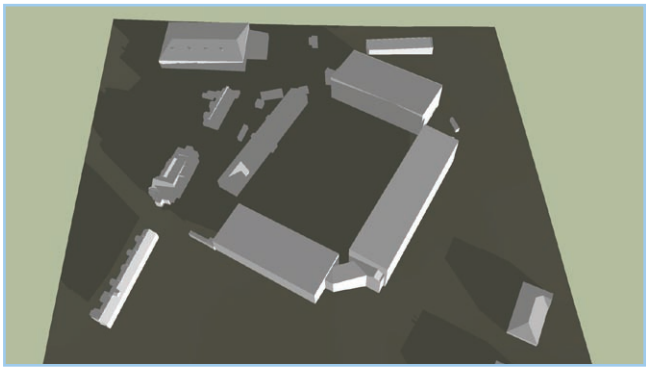
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Shadow Analysis

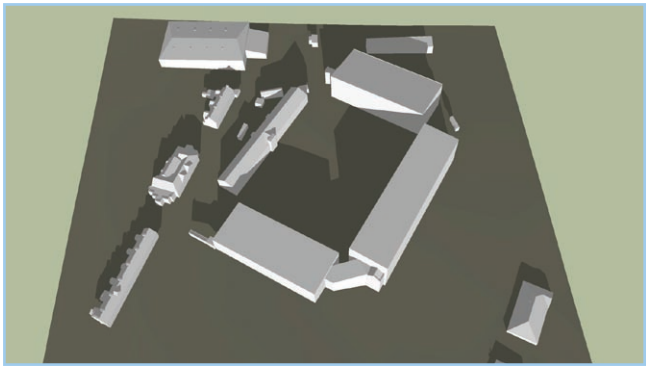
Due to the design of the building, most of the roofs have an aspect suitable for solar panels. However the pitch of all roofs is low putting them below the optimum. The building itself is built into north facing slope and therefore the roofs at the northern end of the building are lower than the southern end. The net result of this is that these roofs are obscured by the sun for significant parts of the year, and would therefore be less effective.

The most suitable roofs are 1, 3 5 and 6. Roof 5 is slightly shaded by roof 4, but it is a good aspect and pitch. Roof 6 is a good pitch, but is more easterly facing and has an obstruction on it. Roofs 1 and 3 are large, but flat to solar panel would need to be mounted on inclined frames. Roof 4 might also be useful, but actually slopes to the north. Roof 2 is small and is shaded by the stands either side. Roof 8 is again small and is subject to some shade from 6 and 7.

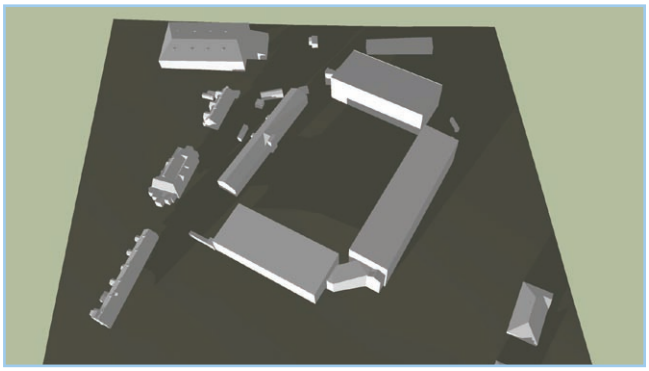
Quarter 1



January 2011 - 09:00

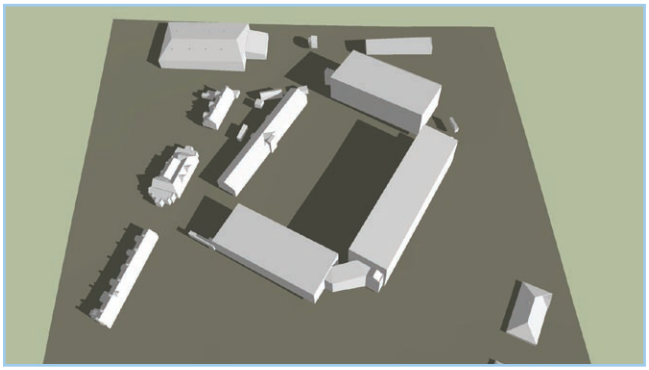


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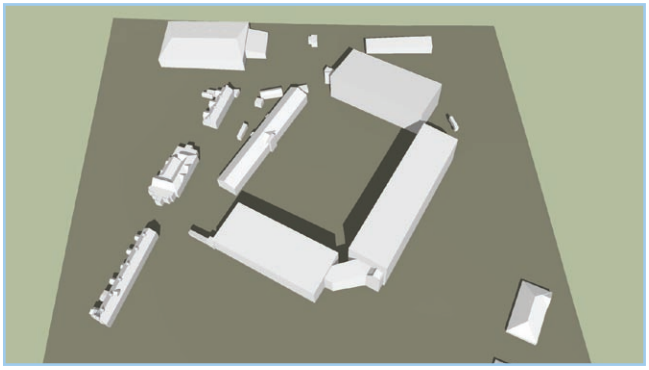


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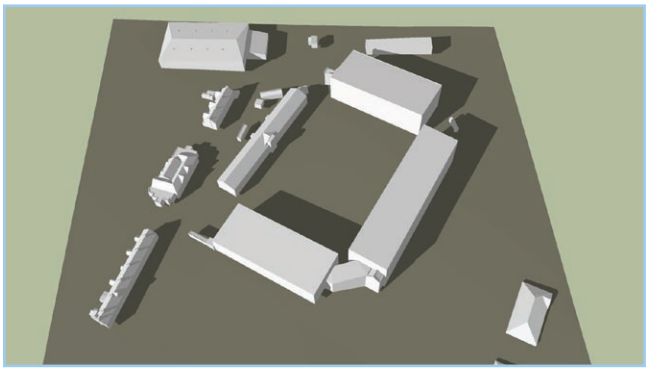
Quarter 2



April 2011 - 09:00



April 2011 - 12:00

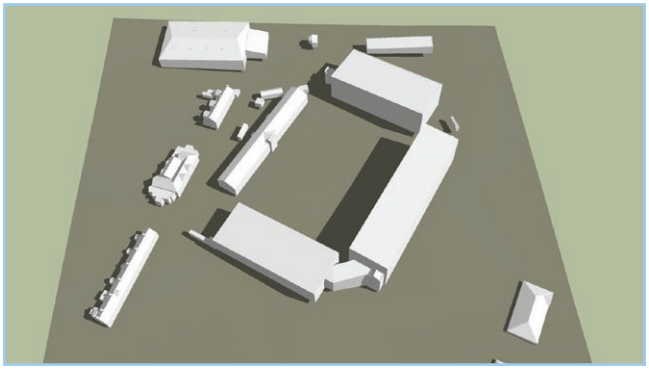


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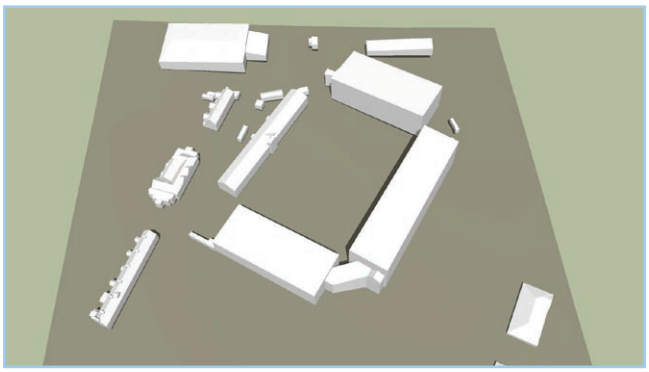
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Shadow Analysis

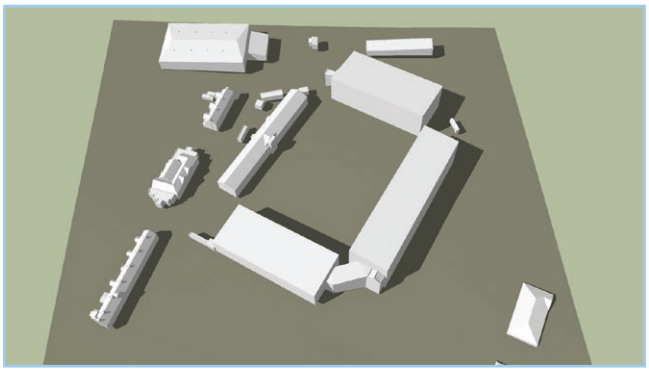
Quarter 3



July 2011 - 09:00

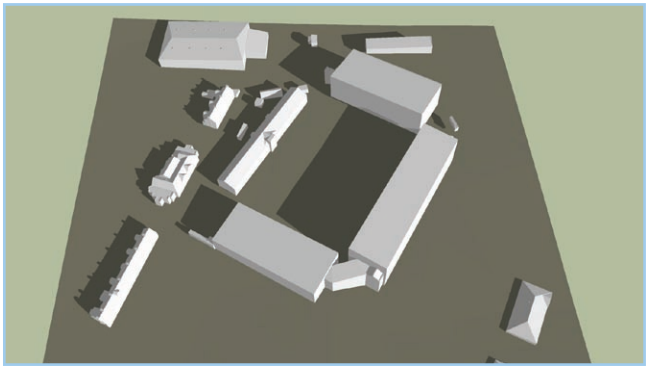


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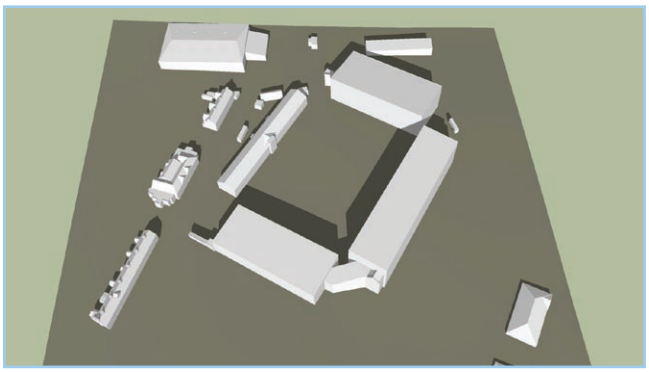


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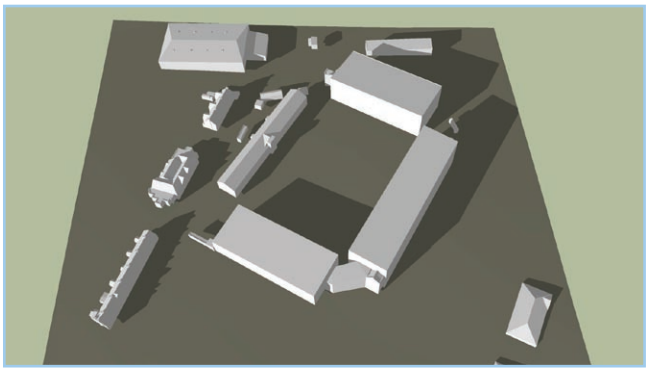
Quarter 4



October 2011 - 09:00



October 2011 - 12:00



October 2011 - 15:00

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