The 3D Model and View Verification Process

7.0 All drawn and digital information regarding the proposed development was supplied to Hayes Davidson in digital format by BMJ Architects.

7.1 At each view position a virtual camera was set up in the 3D software using the coordinates provided by the surveyor. The 3D coordinates of the additional surveyed verification points were used to create an accurate model of the contextual surveyed parts of the scene. The scene was verified by matching the contextual surveyed points between the data scene and the photograph (fig. 5a). The contextual survey points were used as a check against the target position and the field of view of the virtual camera.

7.2 Hayes Davidson used a 3D model of the proposed development supplied by BMJ Architects. This computer model was precisely aligned to the surveyed coordinate system and the aligned scene using a information provided by BMJ Architects. (fig. 5b)

7.3 Where multiple images were required to create the wider scene, Hayes Davidson used an in-house technique called Multi-Lens. Each individual image was aligned using the process above then the virtual cameras are merged into a single scene in the 3D software, thus creating a merged wide image. This technique reduces the distortion caused by using wider lenses.

7.4 Using the verified camera described previously, the computer produces an image, known as a render, of the proposed building using the geometry specified. This produces the wireline image (fig. 5c).

fig 5a Contextual survey points matched to the scene

fig 5b The wireframe 3D model placed into the scene

fig 5c The wireline image

Image Production

8.0 Buildings with a similar orientation to the proposed building within the scene can be used as a reference to obtain valuable visual clues as to how the light would react with the proposed building.

8.1 Hayes Davidson analysed the scene and assessed tonal values. We used the computer to take multiple digital samples of values for hue, saturation and brightness from a number of scenes in the photography. From this an analysis and assessment of the likely tonal and colour values in the scene was made.

8.2 The computer generated image of the proposals is combined with the background photography using proprietary digital compositing software.

Notes

8.3 Subject to accurate survey information, the position and scale of a building in a scene can be verified mathematically. Whilst position, height and scale will be objectively accurate, subjective judgement must be used when lighting is being assessed and therefore a definitive and objectively verified agreement on lighting is not possible.

8.4 The computer can accurately assess the relative contrast between the faces of a building at a particular time. The computer can also render approximate material definitions. However, not every aspect of what is seen visually on screen is able to be simulated using an automatic or wholly objective process. Reflected light, local lighting conditions, detailed material definitions, climatic conditions including moisture content of the air both across the scene as a whole and locally cannot be accurately assessed or simulated by current computer technology.

8.5 We therefore turn to the scene for visual clues in order to set the render of the proposed development into the photograph.

fig 6a The scene with the features in the foreground marked so that the proposed development can be positioned

fig 6b The rendered model of the development accurately positioned

fig 6c The completed photomontage

Bloomsbury Research Institute

Hayes Davidson Methodology – Technical Details

View No.	Summer / Winter	Wireline / Rendered	Camera / Tripod height (m)	Horizontal field of view (degrees)	Vertical field of view (degrees)	Lens used (mm)	Date	Time	Easting (m)	Northing (m)	Elevation (mAOD)	Eye Level (mAOD)
1	Summer	Wireline	1.6	68.0	70.9	35	25/03/15	09:52	529961.788	182288.388	24.961	26.561
2	Summer	Wireline	1.6	67.7	70.6	35	25/03/15	09:29	530014.328	182326.092	24.679	26.279
3	Summer	Wireline	1.6	67.9	70.8	35	25/03/15	10:53	530263.083	182463.021	22.765	24.365
4	Summer	Wireline	1.6	67.8	70.7	35	25/03/15	12:35	529981.961	182505.554	23.817	25.417
5	Summer	Wireline	1.6	67.9	65.4	35	25/03/15	15:37	530015.959	182594.439	23.333	24.933
6	Summer	Rendered	1.6	67.7	75.6	35	12/06/15	13:38	530030.261	182447.666	23.970	25.570