The Pears Building

Appendix A: Hayes Davidson Methodology

Surveying

5.0 Hayes Davidson identified key static points such as building corners, garden features and fencing within each photograph. A chartered measured engineering surveying company surveyed the points as described below and the information was issued digitally. The surveyors identified 3 or 4 objects within the scene, which fell along the horizon line of each photograph. Numbered camera positions were surveyed using line of sight surveying and aligned to the local site grid in easting, northing and elevation supplied by the architect and to the Ordnance Survey National Grid (OSGB36) in easting and northing, and in elevation to the Ordnance Survey Datum (OSD) using the OSTN02 GPS transformation.

5.1 A line of sight, two station baseline is established, coordinated and levelled utilising GPS observations.

5.2 The survey control stations were observed by GPS observations and traversed from GPS-observed points. The Ordnance Survey OSNET active GPS correction service was used to transform the data to the Ordnance Survey National Grid and Datum and is accurate in both position and height. Relative height accuracies comparable to geodetic levelling can be achieved, without visiting any existing OS bench marks. Finally, these positions are transformed to the local grid and to a 'pseudo' OS grid which has a scale factor of 1.0.

5.3 A Total Station capable of measuring horizontal and vertical angle observations combined with an internal co-axial non contact distance measuring device accurately measured and stored the three dimensional coordinates of the key features from the control stations.

5.4 The required horizon line within the image is established using the horizontal collimation of the Total Station. The horizon line coordinates were surveyed and stored.

5.5 Surveying equipment used:

Trimble S6 electronic Total Station with a 3" angle measuring accuracy and 3mm + 2ppm distance measuring accuracy.

GPS – Trimble VRS R8 Receiver.

GPS – Trimble VRS R10 Receiver.

5.6 Processed Data Delivery:

Coordinate and level data in Excel file format DWG and JPG files detailing the observed points and the horizon line.

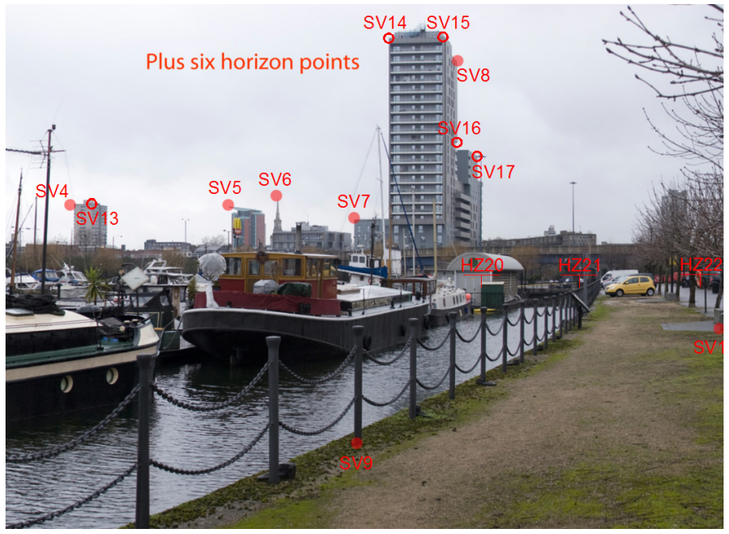

fig 3a AutoCAD DWG showing marked up surveyed context points

fig 3c Trimble 5600 Reflectorless Total Station

HayesDavidson **Accurate Visual Representation - surveyed viewpoints**

Project name:	Poplar Business Park			**Date:**	02/05/2010
Job reference:	WG001			**View reference:**	View 3
		OS Grid co-ordinates			
	Reference	**Easting**	**Northing**	**Elevation**	**Accuracy (A-D**
Camera Position	L3	538369.211	180363.220	5.434	A
Surveyor viewpoint1	SV1	538250.536	180431.204	23.796	A
Surveyor viewpoint2	SV2	538222.242	180497.941	18.624	A
Surveyor viewpoint3	SV3	538238.276	180497.432	23.822	A
Surveyor viewpoint4	SV4	537838.268	181044.153	62.131	A
Surveyor viewpoint5	SV5	537981.825	181023.878	55.818	D
Surveyor viewpoint6	SV6	538063.733	180940.239	54.953	A
Surveyor viewpoint7	SV7	538209.542	180728.334	27.670	A
Surveyor viewpoint8	SV8	538266.412	180672.075	73.630	A
Surveyor viewpoint9	SV9	538364.933	180372.964	5.325	A
Surveyor viewpoint10	SV10	538367.095	180393.236	5.435	A
Surveyor viewpoint11	SV11	538395.996	180510.867	12.527	A
Surveyor viewpoint12	SV12	538374.180	180380.060	5.576	A
Surveyor viewpoint13	SV13	537852.072	181047.347	62.174	A
Surveyor viewpoint14	SV14	538253.487	180648.421	76.588	A
Surveyor viewpoint15	SV15	538269.285	180650.934	76.602	A
Surveyor viewpoint16	SV16	538266.358	180672.066	48.239	A
Surveyor viewpoint17	SV17	538263.602	180701.649	47.244	A

fig 3b Survey coordinates supplied as an Excel file

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Appendix A: Hayes Davidson Methodology

Digital Images and Colour Correction

6.0 The digital images supplied by the photographer were saved as Photoshop PSD/TIFF/JPG files for use in the verification process.

6.1 Using the surveyed horizon points as a guide, each image is checked and rotated, if necessary, to ensure that the horizon line on the photograph is level, based upon the information received from the surveying team.

6.2 Any incorrect colour 'casts' are adjusted to match the original processed image. Similarly the brightness/contrast ratios of the image are corrected to match the original image (fig. 4b).

6.3 In professional architectural photography, having the camera pointing 'horizontally' (parallel with the ground) is desirable to ensure that vertical elements of the photographed scene remain perpendicular to the horizon. In reality the eye and brain compensate for non-perpendicular verticals and it is desirable to replicate this with photography. The tripods used by professional architectural photographers have built-in spirit level 'bubbles' to assist the photographer in keeping the vertical building elements 'vertical'.

6.4 Following from 6.3 above, the cameras used by professional architectural photographers have the ability to 'shift' the camera back upwards which removes the 'static' nature of having the horizon midway along the vertical dimension of the photograph (as opposed to a standard 35mm camera) and allows for the inclusion of more sky over immediate foreground. This is standard practice within architectural photography and more realistically reflects the viewers experience on site.

6.5 The 'virtual' cameras in proprietary 3D software typically do not have this 'shift-negative' feature and so their horizon line will always bisect the vertical dimension of the view when the virtual camera's view cone is positioned parallel to the ground plane. Consequently the digital image is further resized to ensure that the surveyed horizon line bisects the background image in the vertical dimension. (fig 4b).

fig 4a High resolution image as supplied before colour correction

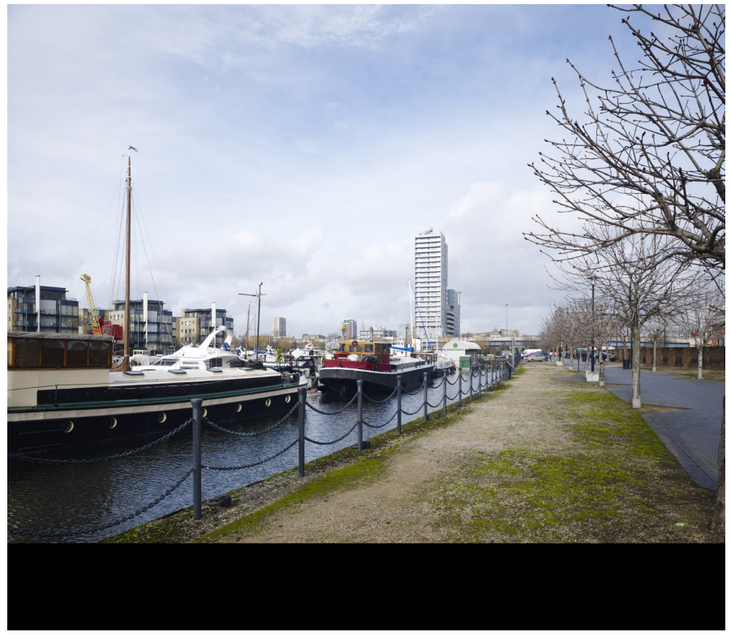

fig 4b High resolution image after colour correction. The image has been rotated and resized to ensure that the surveyed horizon line is level and bisects the vertical dimension equally

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Appendix A: Hayes Davidson Methodology

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 Hopkins 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 Hopkins Architects. This computer model was precisely aligned to the surveyed coordinate system and the aligned scene using a information provided by Hopkins 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

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Appendix A: Hayes Davidson Methodology

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

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Appendix B: Hayes Davidson Methodology – Technical Details

View No.	View description	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)
A	Haverstock Hill opposite Rowland Hill Street	Winter	Rendered	1.6	160.0	72.1	35	30/12/14	13:50	527138.213	185307.05	77.753	79.353
B	Pond Street	Winter	Rendered	1.6	120.0	79.1	35	29/12/14	15:10	527176.524	185475.615	68.061	69.661
E	Haverstock Hill Junction Ornan Road	Winter	Wireline	1.6	120.0	73.4	35	30/12/14	13:40	527182.613	185256.799	75.941	77.541
F	Haverstock Hill	Winter	Wireline	1.6	120.0	79.1	35	29/12/14	14:00	527244.504	185187.331	73.177	74.777
G	Rowland Hill Street	Winter	Wireline	1.6	130.0	110.4	35	29/12/14	10:40	527198.255	185339.913	74.926	76.526
H	Rosslyn Hill	Winter	Wireline	1.6	120.0	73.6	35	29/12/14	15:30	526990.743	185422.801	78.634	80.234
I	Rosslyn Hill opposite St. Stephen's Church	Winter	Wireline	1.6	120.0	80.3	35	29/12/14	12:05	527051.884	185375.491	77.862	79.462
K	Belsize Lane	Winter	Rendered	1.6	120.0	81.8	35	29/12/14	11:25	527105.45	185327.043	77.458	79.058