## View 5: Hyde Way adjacent to footbridge steps



View as existing

#### Existing

This view is north of view 4, where the service road meets the western end of Hyde Way, and at the foot of the pedestrian bridge that crosses the rail line. The view is dominated by the southern elevation of the listed former grain silos and the Boiler House chimney. The railway footbridge steps land behind the viewpoint and the edge of the red brick annex building can be seen to the far right, obstructing views eastwards from this point. The rail tracks formerly serving the factory buildings run northwards, in the foreground, to the west elevations of the Boiler House, Grain House, silos and the multi storey production hall. The principal core of the original listed former factory buildings dominates the view.



Camera Location National Grid Reference 524088.6E 212863.4N Camera height 87.00m AOD Looking at Centre of Site Bearing 51.6°, distance 0.1km

Photography Details Height of camera 1.60m above ground Date of photograph 17/06/2010 Time of photograph 15:17

The proposed office building (plot F) will replace the plain 1950s garage building, at the foot of the eastern range of silos in this view, and the undistinguished annex buildings south of Hyde Way will be cleared to the right. The principal core of the original listed former factory buildings will be retained and set within newly landscaped spaces designed to support and direct the public accessibility of this new urban quarter. The settings of the retained listed structures will not be harmed by the Proposed Development; indeed they will be enhanced as the sculptural focal point of a new publicly accessible urban centre.

Significance of Impact: major, beneficial



View as proposed

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TOWNSCAPE AND VISUAL IMPACT ASSESSMENT

## View 6: Site access road from Bridge Road



View as existing

BROADWATER ROAD WEST, WELWYN GARDEN CITY I SEPTEMBER 2010

#### Existing

This view looks southward along a site access road leading south from Bridge Road. The foreground is made up dense wild vegetation which has outgrown the fencing that marks the boundary between the factory site and the railway lines. This foliage and trees continue south into the distance. Behind the foliage the listed 1926 multi storey production hall steps up to the south. No other part of the listed former factory is visible from here.



Camera Location National Grid Reference 524126.0E 213043.9N Camera height 86.18m AOD Looking at Centre of Site Bearing 171.1°, distance 0.1km

Photography Details Height of camera 1.93m above ground Date of photograph 17/06/2010 Time of photograph 17:00

The view will be opened up by a new landscaped space with car park to the south, revealing the full western elevation of the former multi story production hall along the eastern boundary of the space. The green tiled spandrel panels of the production hall will be removed and the proportions of its expressed structure to window openings consequently improved. Its relationship to the former grain store and Boiler House will now be evident and they will provide a varied architectural frontage to the new space, which will be closed to the south by the edge of the residential building in the distance (plot K) and more directly by the leisure centre (plot A). The settings of the retained listed structures in view will not be harmed by the Proposed Development; indeed they will be enhanced by their new publicly accessible urban setting.

#### Significance of Impact: major, beneficial



View as proposed



## View 7: Bridge Road, junction with Bessemer Road



View as existing

BROADWATER ROAD WEST, WELWYN GARDEN CITY I SEPTEMBER 2010

#### Existing

This view looks southwest towards the former factory site and its eastern Broadwater Road boundary across the junction of Bridge Road (to the right) and Bessemer Road joins from the north (right). Central to the view is the northeast corner of the former factory complex, which is the later addition office entrance building, constructed in 1958-9. Visible to the left of the 1950s office complex is the single storey production hall constructed in 1938. Above the single storey production hall rise the eastern end of the silos, a sculptural and prominent local landmark that draws the eye. The top of a warehouse building (1958-9) is set above the production hall to the left. The original factory buildings the silos and multi storey production hall are obscured (partially or wholly) by the later additions from this busy street junction.



Camera Location National Grid Reference 524333.5E 213031.5N Camera height 86.74m AOD Looking at Centre of Site Bearing 239.6°, distance 0.1km

Photography Details Height of camera 1.60m above ground Date of photograph 17/06/2010 Time of photograph 11:21

The full northern elevation of the listed former grain silos will become visible, as will the stepped form of the restored multi storey production hall to the right. The later additions will be replaced by new buildings that have been designed to complement i n scale and architectural character t he retained core of original listed former factory buildings. The folding roof of the new Tesco will provide the horizontal datum above which the silos and multi storey production hall will rise. The new office building (plot F) will replace the warehouse building (1958-9) to mark a new entrance to the Site. The former office entrance building will be replaced by a single storey staff building with large windows to reveal a landscaped courtyard within, and a folding screen wall concealing the loading area will run parallel to Bridge Road. The low scale of the corner will reveal the full visual impact of the silos, reinforcing their landmark quality. The settings of the retained listed structures in view will not be harmed by the Proposed Development; indeed they will be enhanced as the sculptural focal point of a new publicly accessible urban centre.

#### Significance of Impact: major, beneficial



View as proposed



## View 8: Broadwater Road, north of junction with Hyde Way



View as existing

#### Existing

This view, located on Broadwater Road just north of the junction with Hyde Way, looks west, the east of the former grain silos being the principal visual draw. More generally, the view concentrates on the eastern elevations of the former factory site; to the right of the view is the southern end of the single storey production hall (1938), which connects to a dispatch building of the same date at centre, which in turn connects to a later warehouse (1958-9) partially obscured by a large tree. Beyond the warehouse are the grain silos (1926 and 1938), and to their right a small part of the southeast corner of the multi storey production hall is visible. The foreground of the view is dominated by the main road which runs through the Broadwater Road Industrial Estate.



Camera Location National Grid Reference 524277.9E 212895.0N Camera height 87.49m AOD Looking at Centre of Site Bearing 285.9°, distance 0.1km

Photography Details Height of camera 1.60m above ground Date of photograph 17/06/2010 Time of photograph 12:02

The full eastern elevation of the listed former grain silos will be opened up to view, a well landscaped pedestrian space in its foreground flanked to the south by the new office building (plot F) and the new Tescos to the north (plot D), which will be distinctive for its folding roof and canopy across its southern entrance elevation. A new bus stop on the Broadwater road at this point and the absence of roads on the Site here will ensure that pedestrians have priority over traffic, and the ground floor of the office building and silos will have cafes and similar outlets, which along with the Tesco store will support activity here. The setting of the retained listed former silos in view will not be harmed by the Proposed Development; indeed they will be enhanced as the sculptural focal point of a new publicly accessible landscaped space.

Significance of Impact: major, beneficial



View as proposed



## View 9: Hyde way, junction with Broadwater Road



View as existing

BROADWATER ROAD WEST, WELWYN GARDEN CITY I SEPTEMBER 2010

#### Existing

This view, located on Hyde Way at the junction with Broadwater Road, looks northwest. The view focuses on the southeast corner of the factory site; most clearly visible is the two storey warehouse building that was added to the site in 1958-9. To the right of the warehouse building part of the single storey production hall (1938) can be seen, its northern roof lights providing a distinctive roofline. The conveyor room at the very top of the silos is just visible, but little of its landmark sculptural quality. The foreground of the view is dominated by the road, pavement and suburban greenery: high hedges, grass verges and mature trees.



Camera Location National Grid Reference 524272.2E 212827.5N Camera height 86.97m AOD Looking at Centre of Site Bearing 319.6°, distance 0.0km

Photography Details Height of camera 1.60m above ground Date of photograph 17/06/2010 Time of photograph 12:44

The late 1950s warehouse will be replaced by the office building (plot F), the southern elevation of which will mark the entrance along Hyde Way for vehicles gaining access to the underground car park: the new public square will be visible at the western end of Hyde Way t he railway station and Welwyn's shopping centre beyond. The cylindrical tanks and Boiler House chimney adjacent to this new urban square will provide the memory of the Site's former factory function, and an orientation marker for the new open space north of the pedestrian route to the rail station. The new Tesco store will have a scale similar to the former single storey production hall and with the office building will frame the new pedestrian space leading from the bus stop to the grain silos (see View 8 above).

Significance of Impact: major, beneficial



View as proposed



TOWNSCAPE AND VISUAL IMPACT ASSESSMENT

## View 10: Broadwater Road, south of junction with Hyde Way



View as existing

#### Existing

This view, located on Broadwater Road to the south of the junction with Hyde Way, looks northwest. From here much of the factory is hidden behind a large mature tree though the lower parts of the late 1950s warehouse and the upper parts of the silos are just discernible. Further north along Broadwater Road the single storey production hall is set behind the tall hedge bordering the pavement and verge. To the left a brick office building turns the corner



Camera Location National Grid Reference 524250.4E 212802.4N Camera height 87.07m AOD Looking at Centre of Site Bearing 348.7°, distance 0.0km

Photography Details Height of camera 1.60m above ground Date of photograph 17/06/2010 Time of photograph 12:20

New planting will allow the Proposed Development to become more visible, providing Broadwater Road with a more distinctive built edge of high quality buildings. The brick building to the left (plot J) will contain predominantly residential and care housing on the upper floors, and a Doctors surgery on the ground and first with a small ancillary retail unit adjacent to the new public square (visible at the end of Hyde Way in View 9). Together with the new office building proposed across Hyde Way (plot F) they will frame the vehicular and pedestrian entrance into the Site from Broadwater Road, providing a new physical order and dignity more suitable to spaces that will be publicly accessible. The conveyor room above the silos will just be visible beyond the roof of the office building. The distinctive roof of the proposed Tesco store (plot D) will fold northwards along Broadwater Road. Less of the listed former silos will be visible from here, though this loss is more than mitigated by the greater visibility of the silos from further north (at View 8). The Tesco store will become the principal landmark on a much enhanced Broadwater Road.

#### Significance of Impact: major, beneficial



View as proposed

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## View 11: Polycell site, looking south



View as existing

BROADWATER ROAD WEST, WELWYN GARDEN CITY I SEPTEMBER 2010

#### Existing

This southerly view is dominated by the vacant former Polycell site to the south of the Proposed Development Site. Visible at the end of the empty site is the Grade II Listed Roche Products factory set amidst trees and bushes. Plans are presently being prepared for the retention and reuse of the significant parts of the Listed former Roche Products factory. The brownfield site of the former Polycell factory in the foreground visibly detracts from the setting of this Listed Building.



Camera Location National Grid Reference 524136.0E 212753.2N Camera height 86.95m AOD Looking at Centre of Site Bearing 178.1°, distance 0.1km

Photography Details Height of camera 1.60m above ground Date of photograph 17/06/2010 Time of photograph 10:53

The vacant plot will be replaced by a linear park flanked by residential buildings on either side. Any development on the former Polycell Factory site is likely to obscure views across it to some degree and consequentially much of the Listed Building will be concealed from view. A small part of the Listed former Roche Products factory will, however, be partially visible at the end of this well landscaped vista, and will help to orientate people walking through this new open green space. This pedestrian route through the site will also allow greater public proximity to the Listed Building and will improve the visual and physical experience of its setting overall. The Site will be positively transformed and the setting of the listed building enhanced.

Significance of Impact: major, beneficial



View as proposed



## View 12: Welwyn Garden City footbridge, above platform 4



View as existing

BROADWATER ROAD WEST, WELWYN GARDEN CITY I SEPTEMBER 2010

#### Existing

This view, located on the Welwyn Garden City station footbridge, above platform 4, looks eastward towards the former factory buildings. The view position is situated between Views 1 and 2 described previously. From this elevated position much of the western and southern facades of the former factory can be seen. Most prominent in the view are the tall concrete silos and the Boiler House chimney at the core of the factory site. To the left of the view the multi storey production hall (1926) can be seen stepping down towards the north. To the right, the grain house (1926) is visible, the yellow square on its western façade denoting where the 'Shredded Wheat Factory' sign was once displayed, and beyond the grain house the late 1950s warehouse. The foreground of the view is made up of neglected railway land and lines, the random planting and scrub bushes adding to the run down character of the view. Located close to Welwyn's shopping centre and the first view of eastern Welwyn for those arriving by train this is clearly a site in need of major regeneration.



Camera Location National Grid Reference 523991.3E 212885.6N Camera height 92.49m AOD Looking at Centre of Site Bearing 70.4°, distance 0.1km

Photography Details Height of camera 1.60m above ground Date of photograph 17/06/2010 Time of photograph 16:01

The proposed leisure centre (plot A) will mark the edge of the Proposed Development Site, the YMCA and (out of shot) Hotel building will be visible to the north from here, formally landscaped open space in between and providing a new setting for the restored multi storey production hall which steps upwards behind the leisure centre. The top of the grain silos and the Boiler House chimney will retain their local landmark quality on the skyline, drawing pedestrians along the extended railway footbridge into the heart of the new urban quarter.

Significance of Impact: major, beneficial



View as proposed



### Conclusions 7

#### Architectural quality and response to context

- townscape character.
- will be referred to:

  - (December 2008);
  - Options (March 2008)

### **PPS1 (2005)** (Ref 1-4) and By Design (2000) (Ref 1-9)

scale and visibility.

#### Planning Policy Statement 5 (PPS5) - Planning and the Historic Environment (March 2010) (Ref. 1-3) and Planning Practice Guide (Ref. 1-3a)

### Welwyn Hatfield District Plan (2005) (Ref 1-5)

7.1 The Proposed Development will significantly improve the existing Site and the surrounding locality. It will set the highest design standards for the regeneration of an area of central Welwyn Garden City, which has major visibility when arriving by train at the city, which currently suffers from a poor

7.2 By way of concluding this assessment, the relevant sections of four key national, regional and local planning policy documents

i) PPS1 (2010) and By Design (2000);

ii) Planning Policy Statement 5 (PPS5), this is considered in detail in the PPS5 Statement;

iii) Welwyn Hatfield District Plan (2005);

iv) Broadwater Road Supplementary Planning Document

v) Welwyn Hatfield Borough Council Core Strategy Issues and

7.3 The physical and spatial, urban and architectural design of the Proposed Development has been assessed in chapter 5.0 above in relation to PPS1 and By Design, and it is concluded there that it will relate positively to the local and wider townscape and balance any potentially adverse impacts arising from its

7.4 The Proposed Development is not located within a Conservation Area. There are, however, Listed Buildings on the Site that have been identified and characterised for their significance in the PPS5 Statement and assessed in relation to the Views Assessment. The Broadwater Road SPD recognises that the majority of the buildings on site are largely of little quality except those that are Grade II Listed. It is judged that the impact of the Proposed Development will be beneficial to the setting of the retained listed buildings because of the high design character and quality of the Development. The Development will not harm the setting of any heritage assets.

7.5 The policies in the WHDP with which the townscape assessment above and associated PPS5 Statement have had particular regard to are: R25 (Works to Listed Buildings), R26 (Alternative Uses for Listed Buildings), R27 (Demolition of Listed Buildings), D1 (Quality of Design), D2 (Character

and Context) and EMP3 (Mixed Use Development Site at Broadwater Road West). It will be evident from the detailed architectural and urban design assessments made already above that the Proposed Development will be fully compliant with these policies.

#### **Broadwater Road Supplementary Planning Document** (December 2008) (Ref 1-6)

- 7.6 The Broadwater Road SPD was produced to guide redevelopment of this key site. The objectives of the Council's vision for the site relevant to the TVIA have been responded in order to create:
  - a sustainable neighbourhood is proposed with an appropriate mix of uses for its central location;
  - strong connections will be made between the east side of town, the site and through to the town centre;
  - the industrial heritage has provided a cue for form. character and identity a nd listed structures have been retained and enhanced where practical and appropriate and the Proposed Development has been designed sympathetically in relation to their forms and spaces;
  - innovative and sustainable uses have been designed drawing on the natural, infrastructure and spatial assets of the site:
  - an urban grain capable of supporting appropriate uses while reflecting the town centre morphology have been designed;
  - large scale uses best be located near the centre have been proposed;
  - a live-work community; and
  - an enhanced biodiversity.
- 7.7 The Broadwater Road SPD recognises that the majority of the buildings on site are largely of little quality except those that are Grade II Listed. The CPUK factory (Shredded Wheat factory) located on the application Site has been assessed in detail in the separate PPS5 Statement. The Roche Products Factory located to the south of the Site and is considered in relation to the proposals in the Views Assessment above. The SPD objectives have consequently been met.

#### Welwyn Hatfield Borough Council Core Strategy Issues and Options (March 2008) (Ref 1-7)

7.8 The policies in the WHBC Core Strategy Issues and Options, which will eventually replace the Welwyn Hatfield District Plan. The townscape assessment above and associated PPS5 Statement confirms that the Core Strategy Statement on the Historic Environment will be satisfied.

#### **Final Conclusions** Impacts on Surrounding Character

7.9 The Proposed Development will deliver a high quality complex of commercial, leisure and residential buildings and associated public spaces, including a linear park conceived as an integral part of the locality close to the city's railway station, which will enhance the townscape character of the locality and the sense of arrival, and the character of Welwyn Garden City in general.

#### Impacts on Local Views and Views from Surrounding **Sensitive Receptors**

- 7.10 The impact of the Proposed Development on some local views is judged to be particularly sensitive, but still beneficial because of the very high architectural and urban design quality of the Proposed Development.
- 7.11 The retained elements of the Listed Building will be sensitively restored so as to appear closer to their original character, and new spaces and routes in between them will open up new views to allow greater public enjoyment of the Listed Building.
- 7.12 The proposed new buildings and spaces have been designed so as to complement the character of the retained Listed Building elements, enhancing local views of the Listed Building in approaches from the west across the rail line and creating new views through the site from the east on Broadwater Road.
- 7.13 The cleared former Polycell factory site allows uninterrupted views of the Listed former Roche Products factory at present which development on site will inevitably obscure to some degree. The new linear park will channel this southerly view and enhance the setting of both Listed former factory buildings. The proposed residences have been laid out on the southern part of the Site to form a new townscape that will relate to the character of Welwyn Garden City.
- 7.14 The Proposed Development will not harm the setting of any of the retained heritage assets. Indeed, their settings will be enhanced by the publicly accessible environment and high quality buildings proposed.
- 7.15 Based on the Views Assessment and the PPS 5 Statement, the likely impact significance on heritage assets will range between negligible to major significance, and this is judged to be entirely beneficial. This is due to the high design quality of the Design Proposals and recognition that:

• This is a vacant site, with a redundant factory complex that would benefit from regeneration:

• This locality is suitable for the scale and mass of the Proposed Development in relation to relevant National, Regional and Local Policy and Guidance, and will not have

a detrimental impact on any key views locally; and • The Proposed Development will enhance the character of the area dominated by a railway station and vacant and occupied sites having a low townscape, architectural and urban character

# 8 References

Ref 1-1

Guidelines for Landscape and Visual Impact Assessment (2002)

#### Ref 1-2

The London View Management Framework Supplementary Planning Guidance (LVMF SPG) (July 2010)

Ref 1-3 Planning Policy Statement 5 (PPS5), Planning and the Historic Environment (March 2010)

Ref 1-3a Planning Policy Statement 5 (PPS5) Planning for the Historic Environment, Historic Environment Planning Practice Guide, (March 2010)

Ref 1-4 Planning Policy Statement 1 (PPS1) Delivering Sustainable Development (2005)

Ref 1-5 Welwyn Hatfield District Plan (2005)

Ref 1-6 Broadwater Road Supplementary Planning Document (SPD) (December 2008)

Ref 1-7 Welwyn Hatfield Borough Council Core Strategy (No Date)

#### Ref 1-8

Welwyn Hatfield Borough Council, Welwyn Garden City Conservation Area

Ref 1-9 By Design. Urban design in the planning system: towards better practice (2000)



LI	WGC Station, south	0100	OVerified	523965.2	212827.1	87.84	524141.2	212895.7	85.79	Digital technical camera w/ Phase One P45 digital back	P45	35mm	69.5	68.7		101.4	0.1	
L2	WGC Station, north	0110	OVerified	523999.8	212950.5	88.50	524132.7	212940.2	92.24	Digital technical camera w/ Phase One P45 digital back	P45	35mm	68.6	68.6		146.4	0.2	
L3	Bridge Road railway bridge (centre)	0120	OVerified	524034.8	213103.7	94.75	524124.8	212934.4	95.23	Digital technical camera w/ Phase One P45 digital back	P45	35mm	69.5	68.7		167.9	0.3	
L4	Hyde Way by Polycel site entrance gates	0320	OVerified	524078.7	212825.2	86.88	524184.8	212976.8	86.80	Digital technical camera w/ Phase One P45 digital back	P45	35mm	68.8	45.2		139.8	0.0	
L5	Hyde Way adjacent to footbridge steps	0140	OVerified	524088.6	212863.4	87.00	524138.9	212903.3	86.89	Digital technical camera w/ Phase One P45 digital back	P45	35mm	69.3	68.8		169.8	0.1	
L6	Site access road from Bridge Rd	0220	OVerified	524126.0	213043.9	86.18	524134.5	212990.1	86.30	Digital technical camera w/ Phase One	P45 digital back	P45	35mm	68.7	68.7		186.1	0.3
L7	Bridge Rd junction with Bassemer Rd	0260	OVerified	524333.5	213031.5	86.74	524278.2	212999.1	87.12	Digital technical camera w/ Phase One P45 digital back	P45	35mm	70.1	69.1		225.2	0.3	
18	Broadwater Rd north of junction with Hyde Way	0250	OVerified	524277.9	212895.0	87.49	524149.4	212931.5	87.59	Digital technical camera w/ Phase One P45 digital back	P45	35mm	69.3	69.3		241.9	0.2	
L9	Hyde Way junction with Broadwater Rd	0180	OVerified	524272.2	212827.5	86.97	524251.4	212852.0	86.65	Digital technical camera w/ Phase One P45 digital back	P45	35mm	70.3	69.1		260.9	0.2	
L10	Broadwater Rd south of junction with Hyde Way	0190	OVerified	524250.4	212802.4	87.07	524246.3	212822.8	87.16	Digital technical camera w/ Phase One P45 digital back	P45	35mm	69.8	69.0		269.1	0.2	
L11	Polycel site looking south	0200	OVerified	524136.0	212753.2	86.95	524140.9	212603.7	87.43	Digital technical camera w/ Phase One P45 digital back P45	35mm	70.5	69.1		322.4	0.1		
L12	WGC Station footbridge - above platform 4	0210	OVerified	523991.3	212885.6	92.49	524117.7	212930.7	92.45	Digital technical camera w/ Phase One P45 digital back	P45	35mm	69.1	68.7		128.2	0.1	





L 2





L 3



L 5



L9



L 10







L6





L12

### Verified View Methodology 9

#### Accurate visual representations

- 9.1 Each of the views in this study has been prepared as an Accurate Visual Representation (AVR) following a consistent method¬ology and approach to rendering. Appendix C of the London View Management Framework: Supplementary Planning Guidance (July 2007) defines an AVR as: "An AVR is a static or moving image which shows the location of a proposed development as accurately as possible; it may also illustrate the degree to which the development will be visible, its detailed form or the proposed use of materials. An AVR must be prepared following a well-defined and verifiable procedure and can therefore be relied upon by assessors to represent fairly the selected visual properties of a proposed develop¬ment. AVRs are produced by accurately combining images of the proposed building (typically created from a three-dimensional computer model) with a representation of its context; this usually being a photograph, a video sequence, or an image created from a second computer model built from survey data. AVRs can be presented in a number of different ways, as either still or moving images, in a variety of digital or printed formats."
- 9.2 In this study the baseline condition is provided by carefully taken large format photography. The proposed condition is represented as an accurate photomontage, which combines a computer generated image with the photographic context. In preparing AVRs of this type certain several key attributes need to be determined, including:
  - the Field of View
  - the representation of the Proposed Development
  - documentation accompanying the AVR

#### Selection of Field of View

- 9.3 The choice of telephoto, standard or wide-angle lens, and consequently the Field of View, is made on the basis of the requirements for assessment which will vary from view to view.
- 9.4 In the simple case the lens selection will be that which provides a comfortable Viewing Distance. This would normally entail the use of what most photographers would refer to as a "standard" or "normal" lens, which in practice means the use of a lens with a 35mm equivalent focal length of between about 40 and 58 mm.
- 9.5 However in a visual assessment there are three scenarios where constraining the study to this single fixed lens combination would not provide the assessor with the relevant information to properly assess the Proposed Development in its context.

#### Field Of View

Using this measure it becomes practical to make a comparison between photographs taken using lens of various focal lengths captured on to photographic film or digital camera sensors of various size and propor-tions. It is also possible to compare computer render-ings with photographic images.

	Lens focal length (mm)						
HFOV degrees	Add	Large format	High resolution digital	35mm format			
Digital wide angle lens	69.9	-	35	-			
Large format wide angle lens	67.6	90	-	-			
35mm wide angle lens	65.5	-	-	28			
35mm medium wide lens	54.4	-	-	35			
Large format telephoto lens	42.9	150	-	-			
50mm standard lens	39.6	-	-	50			
35mm telephoto lens	16.4	-	-	125			
Digital telephoto lens	13.2	-	210	-			

The FOV of digital cameras is dependent on the physical dimensions of the CCD used in the camera. These depend on the make and model of the camera. The comparison table uses the specifications for a Phase One P45 digital back which has CCD dimen-sions of 48.9mm x 36.7mm.

The term 'Field Of View' (FOV) or more specifically Horizontal Field of View (HFOV), refers to the hori¬zontal angle of view visible in a photograph or printed image and is expressed in degrees. It is often generally referred to as 'angle of view', 'included angle' or 'view cone angle'.

Studies of this type use a range of camera equipment; in recent times digital cameras have largely superseded the traditional film formats of 35mm, medium format (6cm x 6cm) and large format (5in x 4in). Comparing digital and film formats may be achieved using either the HFOV or the 35mm equivalent lens calculation, however quoting the lens focal length (in mm) is not as consistently applicable as using the HFOV when comparing AVRs.

#### 9 **Appendices**

- 9.6 Firstly, where the relationship being assessed is distant. the observer would tend naturally to focus closely on it. At this point the observer might be studying as little as 5 to 10 degrees in plan. The printing technology and image resolution of a print limit the amount of detail that can be resolved on paper when compared to the real world, hence in this situation it is appro-priate to make use of a telephoto lens.
- 9.7 Secondly, where the wider context of the view must be consid¬ered and in making the assessment a viewer would naturally make use of peripheral vision in order to understand the whole. A print has a fixed extent which constrains the angle of view available to the viewer and hence it is logical to use a wide angle lens in these situations in order to include additional context in the print.
- 9.8 Thirdly where the viewing point is studied at rest and the eye is free to roam over a very wide field of view and the whole setting of the view can be examined by turning the head. In these situ-ations it is appropriate to provide a panorama comprising of a number of photographs placed side by side.
- 9.9 For some views two of these scenarios might be appropriate, and hence the study will include two versions of the same view with different fields of view. Representation of the Proposed Development and cumu-lative schemes

#### Classification of AVRs

9.10 AVRs are classified according to their purpose using Levels 0 to 4. These are defined in detail in Appendix C of the London View Management Framework: Supplementary Planning Guidance (July 2007). The following table is a summary.

A1 (D		
AVK	snowing	purpose
level		
AVR O	Location and size of proposal	Showing Location and size
AVR 1	Location, size and degree of visibility of proposal	Confirming degree of visibility
AVR 2	As level 1 + description of architectural form	Explaining form
AVR 3	As level 2 + use of materials	Confirming the use of materials

9.11 In practice the majority of photography based AVRs are either AVR 3 (commonly referred to as "fully rendered" or "photo¬real") or AVR 1 (commonly referred to as "wire-line"). Model based AVRs are generally AVR 1.



Example of AVR 3 - confirming the use of materials (in this case using a 'photo-realistic' rendering technique)

- 9.12 The purpose of a Level 3 AVR is to represent the likely appear-ance of the Proposed Development under the lighting condi-tions found in the photograph. All aspects of the images that are able to be objectively defined have been created directly from a single detailed description of the building. These include the geometry of the building and the size and shape of shadows cast by the sun.
- 9.13 Beyond this it is necessary to move into a somewhat more subjective arena where the judgement of the delineator must be used in order to define the final appearance of the building under the specific conditions captured by the photographic and subsequent printing processes. In this area the delineator is primarily guided by the appearance of similar types of build¬ings at similar distances in the selected photograph. In large scope studies photography is necessarily executed over a long period of time and sometimes at short notice. This will produce a range of lighting conditions and photographic exposures. The treatment of lighting and materials within these images will respond according to those in the photograph.
- 9.14 Where the Proposed Development is shown at night-time, the lightness of the scheme and the treatment of the materials was the best judgment of the visualiser as to the likely appearance of the scheme given the intended lighting strategy and the ambient lighting conditions in the background photograph. In particular the exact lighting levels are not based on photometric calculations and therefore the resulting image is assessed by the Architect and Lighting Designer as being a reasonable interpre-tation of the concept lighting strategy.
- 9.15 The purpose of a wire-line view is to accurately indicate the



Exampe of AVR 1 confirming degree of visibility (in this case as an occluded 'wire-line' image)

location and degree of visibility of the Proposed Development in the context of the existing condition and potentially in the context of other proposed schemes. 9.16 In AVR1 representation each scheme is represented by a single

- between different schemes.

#### Framing the view

line profile, sometime with key edges lines to help understand the massing. The width of the profile line is selected to ensure that the diagram is clear, and is always drawn inside the true profile. The colour of the line is selected to contrast with the background. Different coloured lines may be used in order to distinguish between proposed and consented status, or

9.17 Where more than one scheme is represented in outline form the outlines will obscure each other as if the schemes where opaque. Trees or other foliage will not obscure the outline of schemes behind them. This is because the transparency of trees varies with the seasons, and the practical difficulties of repre-senting a solid line behind a filigree of branches. Elements of a temporary nature (e.g. cars, tower cranes, people) will similarly not obscure the outlines.

9.18 Typically AVRs are composed with the camera looking horizontally i.e. with a horizontal Optical Axis. This is in order to avoid converging verticals which, although perspectively correct, appear to many viewers as unnatural in print form. The camera is levelled using mechanical levelling devices to ensure the verticality of the Picture Plane, being the plane on to which the image is projected; the film in the case of large format photography or the CCD in the case of digital photography.

9.19 For a typical townscape view, a Landscape camera format is usually the most appropriate, giving the maximum horizontal angle of view. Vertical rise may be used in order to reduce the proportion of immediate foreground visible in the photograph. Horizontal shift will not be used. Where the prospect is framed by existing buildings, portrait format photographs may be used if this will result in the proposal being wholly visible in the AVR, and will not entirely exclude any relevant existing buildings.

9.20 Where the Proposed Development would extend off the top of the photograph, the image may be extended vertically to ensure that the full height of the Proposed Development is show. Typically images will be extended only where this can be achieved by the addition of sky and no built structures are amended. Where it is necessary to extend built elements of the view, the method used to check the accuracy of this will be noted in the text.

#### Documenting the AVR

Border annotation

- 9.21 A Miller Hare AVR image has an annotated border or 'graticule' which indicates the field of view, the optical axis and the horizon line. This annotation helps the user to understand the characteristics of the lens used for the source photograph, whether the photographer applied tilt, vertical rise or horizontal shift during the taking of the shot and if the final image has been cropped on one or more sides.
- 9.22 The four red arrows mark the horizontal and vertical location of the 'optical axis'. The optical axis is a line passing through the eye point normal to the projection plane. In photography this line passes through the centre of the lens, assuming that the film plane has not been tilted relative to the lens mount. In computer rendering it is the viewing vector, i.e the line from the eye point to the target point.
- 9.23 If the point indicated by these marks lies above or below the centre of the image, this indicates either that vertical rise was used when taking the photograph or that the image has subsequently been cropped from the top or bottom edge. If it lies to the left or right of the centre of the image then cropping has been applied to one side or the other, or more unusually that horizontal shift was applied to the photograph.



- 9.24 The vertical and horizontal field of view of the final image is declared using a graticule consisting of thick lines at ten degree increments and intermediate lines every degree, measured away from the optical axis. Using this graticule it is possible to read off the resultant horizontal and vertical field of view, and thereby to compare the image with others taken using specific lens and camera combinations. Alternatively it can be used to apply precise crops during subsequent analysis.
- 9.25 The blue marks on the left and right indicate the calculated location of the horizon line i.e. a plane running horizontally from the location of the camera. Where this line is above or below the optical axis, this indicates that the camera has been tilted; where it is not parallel with the horizontal marking of the optical axis, this indicates that the camera was not exactly horizontal, i.e. that "roll" is present. Note that a small amount of tilt and roll is nearly always present in a photograph, due to the practical limitations of the levelling devices used to align the









Sample graticule showing horizon line markers

camera in the field.

9.26 The yellow shaded bars mark the horizontal and vertical area within the image where the Proposed Devleopment is located. The markers are shown even if the scheme is hidden in a



Sample graticule showing scheme location

### **Appendices**

#### **Comparing AVRs with different FOVs**

9.27 A key benefit of the index markings is that it becomes practical to crop out a rectangle in order to simulate the effect of an image with a narrower field of view. In order to understand the effect of using a longer lens it is simply necessary to cover up portions of the images using the graticule as a guide.

#### Methodology for the production of accurate

#### **Overview of Methodology**

- 9.28 The study was carried out by Miller Hare (the Visualiser) by combining computer generated images of the Proposed Development with large format photographs at key / strategic locations around the site as agreed with the project team. Surveying was executed by Marshall Survey Associates (the Surveyor).
- 9.29 The methodology employed by Miller Hare is compliant with Appendix C of the London View Management Framework: Supplementary Planning Guidance (July 2007). Relevant sections of The Landscape Institute/Institute of Environmental Management and Assessment, "Guidelines for Landscape and Visual Impact Assessment", Second Edition, London 2002 are also taken into account
- 9.30 The project team defined a series of locations in London where the proposed buildings might create a significant visual impact. At each of these locations Miller Hare carried out a preliminary study to identify specific Assessment Points from which a repre-sentative and informative view could be taken. Once the exact location had been agreed by the project team, a photograph was taken which formed the basis of the study. The precise location of the camera was established by the Surveyor using a combination of differential GPS techniques and conventional observations.
- 9.31 For views where a photographic context was to be used additional surveying was carried out. A number of features on existing structures visible from the camera location were surveyed. Using these points, Miller Hare has determined the appropriate parameters to permit a view of the computer model to be generated which exactly overlays the appropriate photograph. Each photograph has then been divided into fore-ground and background elements to determine which parts of the current context should be shown in front of the Proposed Development and which behind. When combined with the computer-generated image these give an accurate

(AVR Level 3).

### Spatial framework and reference database

- Survey (OS) Newlyn Datum.
- the resulting photomontages.
- overall height.

#### **Process - photographic context**

#### Reconnaissance

- Point

#### **Final Photography**

impression of the impact of the Proposed Development on the selected view in terms of scale. location and use of materials

9.32 All data was assembled into a consistent spatial framework, expressed in a grid coordinate system with a local plan origin. The vertical datum of this framework is equivalent to Ordnance

9.33 By using a transformation between this framework and the OSGB36 (National Grid) reference framework, Miller Hare have been able to use other data sets (such as OS land line maps and ortho-corrected aerial photography) to test and document

9.34 In addition, surveyed observation points and line work from Miller Hare's London Model database are used in conjunction with new data in order to ensure consistency and reliability.

9.35 The models used to represent consented schemes have been assembled from a variety of sources. Some have been supplied by the original project team, the remainder have been built by Miller Hare from available drawings, generally paper copies of the submitted planning application. While these models have not been checked for detailed accuracy by the relevant archi¬tects. Miller Hare has used its best endeavours to ensure that the models are positioned accurately both in plan and in

9.36 At each Study Location the Visualiser conducted a photo-graphic reconnaissance to identify potential Assessment Points. From each candidate position, a digital photograph was taken looking in the direction of the Proposed Development using a wide angle lens. Its position was noted with field observations onto an OS map and recorded by a second digital photograph looking at a marker placed at the Assessment

9.37 The Visualiser assigned a unique reference to each Assessment Point and Photograph.

9.38 From each selected Assessment Point a series of large

format photographs were taken with a camera height of approxi¬mately 1.6m. The camera, lens, format and direction of view are determined in accordance with the policies set out above

9.39 The centre point of the tripod was marked and a digital photo–graph showing the camera and tripod in situ was taken to allow the Surveyor to return to its location. Measurements and field notes were also taken to record the camera location, lens used, target point and time of day.

#### Surveying the Assessment Points

- 9.40 For each selected Assessment Point a survey brief was prepared, consisting of the Assessment Point study sheet and a marked up photograph indicating alignment points to be surveyed. Care was taken to ensure that a good spread of alignment points was selected, including points close to the camera and close to the target.
- 9.41 Using differential GPS techniques the Surveyor established the location of at least two intervisible stations in the vicinity of the camera location. A photograph of the GPS antenna in situ was taken as confirmation of the position.
- 9.42 From these the local survey stations, the requested alignment points were surveyed using conventional observation.
- 9.43 The resulting survey points were amalgamated into a single data set by the Surveyor. This data set was supplied as a spreadsheet with a set of coordinates transformed and reprojected into OSGB36 (National Grid) coordinates, and with additional interpreted lines to improve the clarity of the surveyed data.
- 9.44 From the point set, the Visualiser created a three dimensional alignment model in the visualisation system by placing inverted cones at each surveyed point.

#### Photo preparation

- 9.45 From the set of photographs taken from each Assessment Point, one single photograph was selected for use in the study. This choice was made on the combination of sharpness, exposure and appropriate lighting.
- 9.46 The selected photograph was copied into a template image file of predetermined dimensions. The resulting image was then examined and any artefacts related to the digital image capture process were rectified.

9.47 Where vertical rise has been used the image is analysed and compensation is applied to ensure that the centre of the image corresponds to the location of the camera's optical axis.

#### Calculating the photographic alignment

- 9.48 A preliminary view definition was created within the visuali-sation system using the surveyed camera location, recorded target point and FOV based on the camera and lens combina¬tion selected for the shot
- 9.49 A lower resolution version of the annotated photograph was attached as a background to this view, to assist the operator to interpret on-screen displays of the alignment model and other relevant datasets.
- 9.50 Using this preliminary view definition, a rendering was created of the alignment model at a resolution to match the scanned photograph. This was overlaid onto the background image to compare the image created by the actual camera and its computer equivalent. Based on the results of this process



Example of alignment model overlaid on the photograph

adjustments were made to the camera definition. When using a wide angle lens observations outside the circle of distortion are given less weighting.

9.51 This process was iterated until a match had been achieved between the photograph and alignment model. At this stage, a second member of staff verified the judgements made. An A3 print was made of the resulting photograph overlaid with the alignment model as a record of the match. This was annotated to show the extents of the final views to be used in the study.

#### Preparing models of the Proposed Development

#### Determining occlusion and creating simple renderings

- back¬ground layers.

### Creating more sophisticated renderings

9.52 A CAD model of the Proposed Development was supplied by the Architect. The level of detail applied to model is appropriate to the AVR type of the final images.

9.53 Models of the Proposed Development and other schemes are located within the spatial framework using reference informa-tion supplied by the Architect or, when not available, by best fit to other data from the spatial framework reference database . Study renders of the model are supplied back to the Architect for confirmation of the form and the overall height of the Proposed Development. The method used to locate each model is recorded. Each distinct model is assigned a unique reference code by the Visualiser.

9.54 A further rendering was created using the aligned camera, which combined the Proposed Development with a computergenerated context. This was used to assist the operator to determine which parts of the source image should appear in front of the Proposed Development and which behind it. Using this image and additional site photography for information, the source file is divided into layers representing foreground and background elements.

9.55 In cases where the Proposed Development is to be represented in silhouette or massing form (AVR1 or AVR2), final renderings of an accurate massing model were generated and inserted into the background image file between the foreground and

9.56 Final graphical treatments were applied to the resulting image as agreed with the Architect and environmental and planning consultants. These included the application of coloured outlines to clarify the reading of the images or the addition of tones to indicate occluded areas.

9.57 Where more sophisticated representations of the Proposed Developments were required (AVR3) the initial model is developed to show the building envelope in greater detail. In addition, definitions were applied to the model to illustrate transparency, indicative material properties and inter-reflection with the surrounding buildings.

9.58 For each final view, lighting was set in the visualisation system to match the theoretical sunlight conditions at the time the

#### 9 Appendices

source photograph was taken, and additional model lighting placed as required to best approximate the recorded lighting conditions and the representation of its proposed materials.

- images.
- photography records.
- photographs.

#### Documenting the study

- by Ordnance Survey.
- described.

9.59 By creating high resolution renderings of the detailed model, using the calculated camera specification and approximated lighting scenario, the operator prepared an image of the building that was indicative of its likely appearance when viewed under the conditions of the study photograph. This rendering was combined with the background and foreground components of the source image to create the final study

9.60 A single CAD model of the Proposed Development has been used for all distant and local views, in which the architectural detail is therefore consistently shown. Similarly a single palette of materials has been applied. In each case the sun angles used for each view are transferred directly from the

9.61 Material definitions have been applied to the models assembled as described. The definitions of these materials have been informed by technical notes on the planning drawings and other available visual material, primarily renderings created by others. These resulting models have then been rendered using the lighting conditions of the

9.62 Where the Proposed Development is shown at night-time, the lightness of the scheme and the treatment of the materials was the best judgment of the visualiser as to the likely appearance of the scheme given the intended lighting strategy and the ambient lighting conditions in the background photograph.

9.63 For each Assessment Point a CAD location plan was prepared, onto which a symbol was placed using the coordinates of the camera supplied by the Surveyor. Two images of this symbol were created cross-referencing background mapping supplied

9.64 The final report on the Study Location was created which shows side by side, the existing and proposed prospect. These were supplemented by images of the location map, a record of the camera location and descriptive text. The AVR level is

9.65 Peripheral annotation was added to the image to clearly indicate the final FOV used in the image, any tilt or rise, and whether any cropping has been applied.

- 9.66 Any exceptions to the applied policies or deviations from the methodology were clearly described.
- 9.67 Where appropriate, additional images were included in the study report, showing the Proposed Development in the context of other consented schemes.

#### Process - modelled context

#### Reconnaissance

- 9.68 At each Study Location the Visualiser conducted a photo-graphic reconnaissance to identify potential Assessment Points. From each candidate position, a digital photograph was taken looking in the direction of the Proposed Development using a wide angle lens. Its position was noted with field observations onto an OS map and recorded by a second digital photograph looking at a marker placed at the Assessment Point.
- 9.69 The Visualiser assigned a unique reference to each Assessment Point and Photograph.

#### **Reference Photography**

- 9.70 From each selected Assessment Point a large format photo¬graph was taken with a camera height of approximately 1.6m. The camera, lens, format and direction of view are determined in accordance with the policies set out above
- 9.71 The centre point of the tripod was marked and a digital photo¬graph showing the camera and tripod in situ was taken to allow the Surveyor to return to its location. Measurements and field notes were also taken to record the camera location, lens used, target point and time of day.

#### Surveying the Assessment Points

- 9.72 For each selected Assessment Point a survey brief was prepared consisting of the Assessment Point study sheet.
- 9.73 Using differential GPS techniques the Surveyor established the location of at least two intervisible stations in the vicinity of the camera location. A photograph of the GPS antenna in situ was taken as confirmation of the position.

#### Creating the context model

- 9.74 Three dimension model data from a variety of sources was assembled to determine the location of significant roofscape features (parapet edges, ridge lines, chimneys etc) and groundscape features (kerb and dock edges, walls etc).
- 9.75 From this data an accurate roofscape model was prepared. For buildings close to the site fenestration detail was added to the model to aid in understanding the scale of the context. Indicative trees with estimated height and width where added to the model. Additional entourage (cars, buses, street furniture etc) was inserted in order to provide scale. Figures 3 and 4 show the resulting model of the existing condition.

#### Creating the study model

- 9.76 Using drawings and 3D models supplied by the Architects, an accurate massing model of the project was created showing all significant elements of the building that would affect that overall silhouette of the proposals. A palette of simple abstract materials is applied to the model. In general specific construc-tion materials are not shown, except for glass which is used in order to indicate a degree of transparency where this affects the profile of the Proposed Development.
- 9.77 Using data supplied by the Architects that defined the relation¬ship of the building grid to the Ordnance Survey, the completed study model was located in the same geometric space as the context model, the survey and other reference data.
- 9.78 Indicative trees with estimated height and width where added to the model. Additional entourage (cars, buses, street furniture etc) was inserted in order to provide scale. Figures 5 and 6 show the resulting model of the Proposed Development in context.

#### **Rendering and Post-production**

9.79 For each selected view, a virtual camera was created at the same location as the digital photograph and using a similar FOV and target. Renders of both the existing model and the proposal model were produced using lighting from a sun at an appropriate time of day. As the models are internally consistent the relationship of the Proposed Development to the context is exact.

### Documenting the study

- described.

9.80 For each Assessment Point a CAD location plan was prepared, onto which a symbol was placed using the coordinates of the camera supplied by the Surveyor. Two images of this symbol were created cross-referencing background mapping supplied by Ordnance Survey.

9.81 The final report on the Study Location was created which shows side by side, the existing and proposed prospect. These were supplemented by images of the location map, a record of the camera location and descriptive text. The AVR level is

9.82 Peripheral annotation was added to the image to clearly indicate the final FOV used in the image, any tilt or rise, and whether any cropping has been applied.

9.83 Any exceptions to the applied policies or deviations from the methodology were clearly described.

9.84 Where appropriate, additional images were included in the study report, showing the Proposed Development in the context of other consented schemes.