heal's commercial, tottenham court road, london
access statement

TUFFIN FERRABY TAYLOR

## Introduction

### Access Statement

This Access Statement has been produced by Tuffin Ferraby Taylor LLP for Threadneedle and comments upon the accessibility of the proposed refurbishment of the office space to the rear and upper levels of the Heal's Building. It is based on the drawings listed and discussions with the design team.

The report contains an explanation of measures incorporated within the proposed refurbishment to improve access to, and use of, the building by all people including people with a mobility, sensory or cognitive impairment and wheelchair users. It forms part of the Planning Application and indicates how the proposals meet relevant legislation including Part M of the Building Regulations (and the Approved Document M (ADM)) and, in addition, how the scheme follows other good practice guidance.

Where the design differs from the guidance in Approved Document M, the statement outlines the design rationale behind this and any compensatory measures put into place in order to meet the design considerations of the ADM.

The assessment includes the approach, parking, entrances, horizontal circulation, vertical circulation and the various facilities within the building.

### Criteria used for the assessment

The following criteria have been used for the assessment:

1.0 Part M of the Building Regulations and the associated Approved Document (ADM).

2.0 BS8300:2009 (+AI:2010) - Design of buildings and their approaches to meet the needs of disabled people – Code of Practice.

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3.0 Other currently recognised good practice design guidance including the following:

Fire Safety Risk Assessment Supplementary Guidance – Means of Escape for Disabled People

Sign Design Guide

Guidance on the use of Tactile Paving (DETR)

Inclusive Mobility (Dept of Transport)

Designing for Accessibility (CAE)

4.0 Part B of the Building Regulations and the associated Approved Document Volume 2.

5.0 BS9999:2008 Code of practice for fire safety in the design, management and use of buildings.

6.0 Requirements and implications of the Equality Act 2010

## Design approach

The original Heal's Building dates back to 1854. It has been extended, refurbished and altered over the years and today comprises a large complex building with a convoluted layout of retail and office space with illegible circulation routes to the many tenancy entry points. The refurbishment proposes to improve the access and legibility of the building while having due regard to the requirements under the Building Regulations Part M, employers' and service providers' duties under the Equality Act, the building's historic fabric and imposed financial cost constraints in order to better facilitate access and use by all people including disabled people.

## Access consultant involvement

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Judy Russell, access consultant with Tuffin Ferraby Taylor, has provided advice to the design team in the form of access appraisals during August and September 2011

Accessibility has been incorporated while being mindful of the overall aesthetic and design aims of the scheme, conservation and budget constraints.

**The Building Regulations and the Equality Act 2010 (EA)**

Part M of the Building Regulations requires reasonable provision to be made for all people to gain access to and use buildings.

The EA does not include standards for accessible building design. However, the premises are and will continue to be a place of employment with the potential for public access/service provision to the areas to be refurbished and the EA places duties upon both employers and service providers.

In order that service providers are able to meet their duties under the EA the development should anticipate the possible needs of disabled visitors and make reasonable adjustments to provide access to the building and its services.

The EA, in its strictest sense, requires employers to respond to a disabled employee's requirements on an individual basis as and when the need arises. However the areas to be refurbished will be designed to be as accessible as possible so that the need for future adaptations will be minimised and will ensure that it is possible to employ a wide diversity of people with the minimum of fuss.

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### Project Documents

The Access Statement has been prepared in conjunction with design team and on the basis of the following scope and general arrangement drawings:

**Scope drawings showing the areas included within the refurbishment:**
**Revision 03**
1262/G200/SP/B1, 1262/G200/SP/00, 1262/G200/SP/01, 1262/G200/SP/02, 1262/G200/SP/03, 1262/G200/SP/04, 1262/G200/SP/05, 1262/G200/SP/06, 1262/G200/SP/RF

**Proposed general arrangement drawings option 3:**
**Revision 02**
1262/G200/P/B1, 1262/G200/P/00, 1262/G200/P/01, 1262/G200/P/02, 1262/G200/P/03, 1262/G200/P/04, 1262/G200/P/05, 1262/G200/P/06, 1262/G200/P/RF

**Proposed general arrangement drawings option 3:**
**Revision 01**
1262/G500/P/00, 1262/G500/P/01, 1262/G500/P/02, 1262/G500/P/03, 1262/G500/P/04, 1262/G500/P/05, 1262/G500/P/06

### Outline of the proposed development

The proposed development comprises the refurbishment of main entrance, courtyard area, some circulation routes and office areas to the rear and upper levels of the building as indicated on the scope drawings. The development aims to improve the building's legibility, access and sanitary provision for all people including disabled people.

## Element Sections

## 1.0 Arrival

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## 1.1 Transport

The development is located in the heart of London and its numerous transport links. Goodge Street underground station is located on Tottenham Court Road opposite the Heal's Building although it is acknowledged that the underground system is inaccessible to many disabled people as a result of its stepped access and lack of information in both audible and visual formats. Euston and St Pancras main line stations are within 500 metres of the Building.

Bus stops in Tottentham Court Road and Gower Street are within 50 metres of the development and are on bus routes serving areas throughout London. Buses generally make provision for wheelchair users and ambulant disabled people in the form of step-free access; grab rails, good use of colour and tonal contrast and audible and visual signals of destination and stop reached.

The area is well served by London black cabs. The newer black cabs such as the TX4 have improved access for all people by incorporating an integral fold-down ramp, a wheelchair retention system, an intermediate step and a swivel seat system to assist people with a mobility impairment to get into the cab, an adjustable centre rear seat belt harness to suit younger and smaller passengers and voice intercom, door handle lights and good use of colour and tonal contrast to assist people with a sensory impairment

## 1.2 Vehicle set-down

There is no official set down point In Torrington Place adjacent to the main entrance to the Heal's Building.

## 1.3 Parking

The car parking provision is to be as follows:

i. There are 10 No existing off street standard size car parking spaces within the basement and these are to be retained.

Access to the basement is via the steep vehicular ramp or steps and it is therefore not suitable for use by wheelchair users and some ambulant disabled people. In view of this a designated parking space with 1200mm side and rear transfer zones is to be provided at ground floor level in conjunction with a step free pedestrian route, min 1200mm wide, from the designated parking space to the main entrance to the building in Torrington Place.

ii. There is no on street parking within Torrington Place although pay and display, meter and disabled person's Blue and Green Badge bays are located in adjacent streets, web page www.camden.gov.uk has detailed maps on location of parking and loading locations and restrictions.

### 1.4 Pedestrian Approach

Footpaths to and around the development are generally level. Surfacing is in good condition with well designed crossing points that include dropped kerbs and appropriate tactile paving. Controlled toucan or pelican crossings are provided at major junctions. Alfred Mews provides access for deliveries to Heal's retail, to the Heal's and Habitat customer pick up points and to the entrances to the offices at the end of Alfred Mews; the route does not accommodate disabled people as footpaths are narrow, intermittent and provided with poorly designed/no dropped kerbs at crossing points. It is expected that staff and visitors requiring access to the office accommodation within the scope of works will use the main entrance on Torrington Place and not the stair core off Alfred Mews.



### 1.5 Cycle parking

It is proposed to locate 52 cycle racks within the basement and associated shower, changing and locker facilities. As access to the basement for cyclists is via the steep vehicular ramp and there is only stepped access available for pedestrians moving between the basement and office accommodation, the design team are looking to provide some cycle racks at ground floor level that can be made available for use by ambulant disabled people as and when the need arises.

## 2.0 Entrances

### 2.1 Main Entrance off Torrington Place

The detail of the main entrance doors has not yet been finalised but it is proposed that a canopy will help to identify the main entrance and the entrance doors will comprise two sliding leaves which open automatically via push pads located internally and externally. The push pads will be provided in accordance with ADM i.e. accessible to people in a standing and seated position and be highly visible. Level access is to be provided through the entrance doors. If glazed the doors will be clearly marked for visibility in accordance with the ADM and not 'lost' within the entrance screen.

### 2.2 Entrances/escape doors on Alfred Mews

Outside the scope of works; all to remain as existing.

## 3.0 Reception and waiting area

### 3.1 Main entrance off Torrington Place

The reception desk is to be located adjacent to the entrance doors and will be highly visible to people entering the building. The details of the desk are not yet agreed but it will be designed to accommodate people in a standing or seated position at the front of the desk. Induction loops will be provided at the desk and lighting will illuminate the faces of staff to assist lip reading. The desk will be open and not fitted with a glazed screen to maximise visual and audible communication.

Access control barriers will be installed between the reception and atrium areas, the details have yet to finalised but all barriers when in the open position will permit the passage of ambulant disabled people and wheelchair users.

Step free access is to be provided from the reception area to and through the atrium to the new lifts and courtyard and will incorporate shallow 'ramped' sections with gradients shallower than 1:30. New stepped and platform lift access will be provided from the atrium to existing lift 03. The new platform lift and stepped access will be designed in accordance with the ADM.

## 4.0 Horizontal Circulation

Currently access routes are convoluted with no landmarks to aid orientation. The provision of the new atrium and associated walkways and lift landings provide an invaluable landmark and greatly simplify horizontal circulation at ground, first, second, third and forth floor levels by linking into existing circulation routes and, where possible, providing direct access to adjacent office accommodation as follows:

a First Floor – walkways provide level access from the atrium lifts to the office accommodation occupied by Group Line and 'ramped' access shallower than 1:20 to the lobby area adjacent to Stair 07 and Heal's retail.

b Second Floor – a walkway provides level access from the atrium lifts to the office accommodation occupied by RTKL Architects and to the existing corridor adjacent to the Tsunami office. The existing corridor is to be widened to 1800mm adjacent to the Tsunami office, to enable wheelchair users to pass in opposite directions, and the corridor extended to link to Stair 07. A ramp approx 1100mm wide and with gradient 1:13 is to be provided to overcome the difference in floor levels between the extended corridor and Stair 07. The existing stepped access between Stair 07 and the landing to the Betty TV demise is to be retained as both the structure and historic fabric prevent the provision of ramps that would meet the ADM.

c Third Floor – a walkway from the atrium lift provides level access to the office accommodation occupied by RTKL Architects and a 1:14 ramped access to the existing corridor adjacent to offices occupied by DAA and CSR. In the existing corridor, which is approx 1280mm wide, two ramps with gradient 1:13 and 1:14 and intermediate landing 1500mm x 1500mm will be provided in lieu of the existing steps to overcome changes in level between the corridor and Stair 07. A third 'ramp' with gradient 1:24 will be provided in lieu of the stepped access between Stair 07 and the office accommodation currently occupied by Agenda 21.

d Fourth Floor – a walkway from the atrium lift provides level access to the office accommodation occupied by Eulogy and 1:12 ramped access to the existing lobby adjacent to the WC core and offices occupied by Magna High and Fiery Angel. The change in level of approx 80mm between the walkway and the Eulogy demise is to be accommodated by the provision of a 1:12 ramp within the Eulogy demise.

e Fifth and Sixth Floor – horizontal circulation remains as existing.

The new walkways adjacent to the lifts will have a minimum clear width of 1800mm which will enable wheelchair users to turn through 180 degrees and to pass in opposite directions, the link walkway at first floor level will have a clear width of 1500mm.

Existing corridors vary in width throughout the building. The extent of the refurbishment of retained horizontal circulation routes has still to be agreed but it is likely to be limited to new lighting, replacement of floor coverings and redecoration.

## 5.0 Vertical Circulation

### 5.1 Changes in level on horizontal circulation routes

Changes in level on circulation routes have been discussed in Section 4.0.

### 5.2 Passenger lifts

A new platform lift will provide access from ground level to the upper ground floor level and existing Lift 03 which will continue to provide step free access from the upper ground floor level to accommodation on the first to fifth floors to the north east corner of the building. At ground floor level access to the existing Lift 04 is stepped and the lift is to be removed. Within the new atrium a bank of two lifts will provide step free access between the ground floor and the new walkways at first, second, third and fourth floors

The new platform lift will be designed in accordance with the ADM. The new atrium lifts will be designed to meet the requirements of the ADM and the EN 81 series of standards and particularly BS EN 81-70: 2003. No further details are available at present. There is currently no proposal to upgrade or refurbish the retained Lift 03.

### 5.3 Stairs

The new stairs from the ground floor atrium to the Lift 03 lobby and RTKL reception at first floor level and from fourth to fifth floor level between the Magna High and Puma offices are to be designed to meet ADM i.e. risers 150 - 170mm, treads min 250mm, edge of treads and risers clearly identified, handrails easily grasped, extended 300mm horizontally beyond top and bottom risers and continuous at landings, good colour and tonal contrast to assist people with a visual impairment to define the boundaries of the space and the location of key features. Flights are to be designed to have a maximum of 12 No risers.

The extent of the refurbishment of the existing stair cores has still to be agreed however owing to the historic fabric of the building the stair structure and handrails will remain all as existing. Where stairs are refurbished the design team will incorporate good colour and tonal contrast to assist people with a visual impairment define the boundaries of the space and the location of key features.

## 6.0 Doors

Owing to the limitations of the scope and the Listed status of the building many of the existing doors will be retained. However, where replaced or where new doors are provided they will be designed in accordance with the AD M as follows:

- At least one leaf of external doors to public areas will have a clear effective width of 1000mm.
- At least one leaf of all external doors to non-public areas and all internal doors will have a min clear effective width of 800mm when located on a min 1500mm corridor. Where corridors are less than 1500mm doors will have a min clear effective width of 825mm.
- Closers will only be fitted where required for fire control, or in some instances where privacy is lost if the door is left ajar, and will operate with a maximum force, measured at the leading edge of the door of 30 N from 0-30º and 22.5 N from 30-60º of the opening cycle. Where this cannot be achieved the doors will be fitted with hold open devices interfaced with the fire alarm system or assisted opening devices.

- Ironmongery will have good colour and tonal contrast with the background against which it is seen and be easily grasped and operated e.g. use of lever handles in lieu of knobs and use of large thumbturns which can be operated with a clenched fist. Lever handles will be located at, and pull handles will extend to 900 mm above floor level.

- Level access is to be provided through all new doors; at external doors the max vertical face of water bars/ramped sections will be 5mm except where a larger vertical face to the threshold detail is required in order to meet the building regulations for weathertightness, airtightness and acoustic performance.

- Details of glazed doors and screens and associated manifestation, finishings and colour and tonal contrast all to be agreed.

- Vision panels that extend to 500mm above floor level will be provided to doors on circulation routes.

- A 300mm clear space will be provided to the leading edge of all doors

- Manifestation will be provided to fully glazed doors in accordance with the ADM.

## 7.0 Sanitary Facilities

### 7.1 Generally

As part of the refurbishment the lavatory facilities, including wheelchair accessible WCs, are to be increased in number. This improved provision will result in the tenanted areas within the scope of works having step free access to a wheelchair accessible WC not more than 40 metres from any workstation. The one exception to this is the first floor tenancy currently occupied by Betty TV to which there is only stepped access.

### 7.2 Male and female WCs

The male and female WCs will include one cubicle designed for use by ambulant disabled people meeting guidance in the ADM with an outward opening door and suitable grab rails. The internal finishes will provide contrast between the main features and fixtures to assist visually impaired people. Taps will be automated or lever type to assist people with limited manual dexterity.

### 7.3 Wheelchair accessible WCs

Wheelchair accessible WCs are to be a minimum 1500mm wide by 2200mm deep with an outward opening door to meet current design guidance. The WCs will be fitted out with grab rails, shelves and fittings that meet the guidance in the ADM and an alarm cord and reset button that will have audible and visual signals outside the WC and to a permanently staffed area. The basin will have a thermostatically controlled lever type tap to assist people with limited manual dexterity. Internal finishes will incorporate a good level of colour and tonal contrast between floor and walls and between the fixtures and their background to assist people with a visual impairment.



### 7.4 Shower facilities

A wheelchair accessible shower facility designed in accordance with ADM will be provided within the common parts at first floor level.

Unisex shower facilities reached via a stepped approach are to be provided in the basement (as part of the cyclist changing facilities), off the reception area at ground floor level, in the common parts at third floor level, in the Weapon 7 demise at third floor level and in the Heal's demise at fifth floor level. These showers will be designed to be as accessible as possible by the incorporation of good colour and tonal contrast to identify key features, fittings that can be operated with a clenched fist and low profile shower trays.

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## 8.0 Special Areas

### 8.1 Courtyard

Indicative layouts only are provided at present but we can confirm that there is to be level/step-free access to the courtyard and to all associated areas.

## 9.0 Finishes, Services and Colour

Finishes, services and colours will be developed as part of the detailed design but we confirm that colour and tonal contrast will be used to help define spaces and to enable easy identification of features. Lighting type/location will be designed to avoid glare and wall and floor surfaces will be provided that minimise light reflection.

## 10.0 Signage

No details of signage are available at this stage but the design team are committed to providing signs that meet current good practice guidance.

## 11.0 Emergency Evacuation

The fire strategy for the building is being developed; under review is the compartmentation of the building and provision of refuges to enable people requiring assistance to escape the building to call for that assistance and wait in relative safety for that assistance. As part of this process it will be ensured that management policy procedures and training requirements are developed in conjunction with a means of escape strategy for the safe evacuation of disabled people, whether staff or visitors. This will include the preparation of Generic and, when appropriate, Personal Emergency Egress Plans which will require an understanding of the passive and active measures incorporated into the refurbished building which at present include the following:

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- To areas within the scope of works new fire lobbies, or alterations to existing fire lobbies, have been provided to protect escape stair cores as follows:

  Stair 01 – first to fifth floors (to office areas currently occupied by RTKL and Yellow Door)
  Stair 02 – second to fourth floors
  Stair 07 – first and second floors
  Stair 10 – first to third floors
  Stair 23 – third floor

  In all cases the above lobbies have incorporated refuge spaces with EVCs to enable people to call for assistance to evacuate the building and to wait in relative safety for that assistance. Where the existing un-lobbied arrangement is retained for example to Stair 01 at sixth floor level refuge areas and EVCs have not been provided.

- The smoke detection system within the building will be specified so that accurate detection can provide early warning and location of the fire source to provide maximum time for planning evacuation.

- The alarm system will incorporate visual alarms, in addition to audible alarms, to ensure deaf and people hard of hearing are alerted of the need to evacuate.

- Account for existing stairs that are not designed in accordance with the ADM and therefore make little provision for people with limited mobility or a sensory impairment.

# 6.0 | **ACCESS STATEMENT**

# 7 | LANDSCAPE

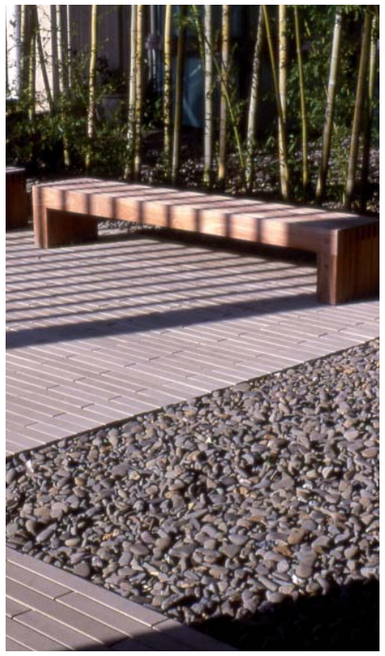
# 7.0 | LANDSCAPE

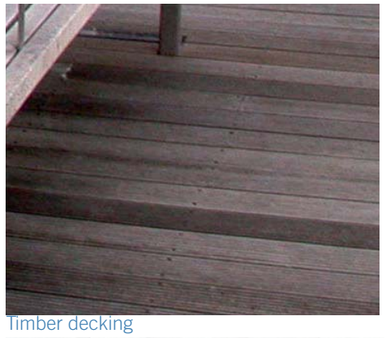
The proposed courtyard space located at ground floor level will provide amenity space for both tenants and visitors. The atrium and courtyard floor level will be raised to allow level access to all associated areas with shallow ramps along the entrance route into the courtyard.

This area adjacent to the new created atrium will contain a combination of hard landscaped surface in form of stone paving and timber decking, fixed furniture, an area (22 sqm) of low level planting and small trees. A mix of evergreen and seasonal perennials will give variety of colour and seasonal interest.


Geranium spp

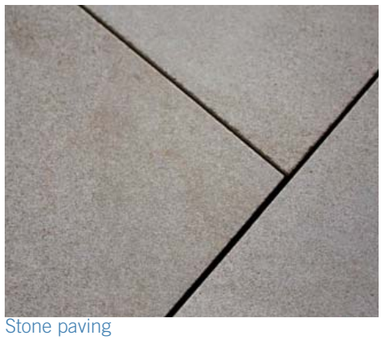

Viburnum plicatum




Timber decking


Lonicera pileata

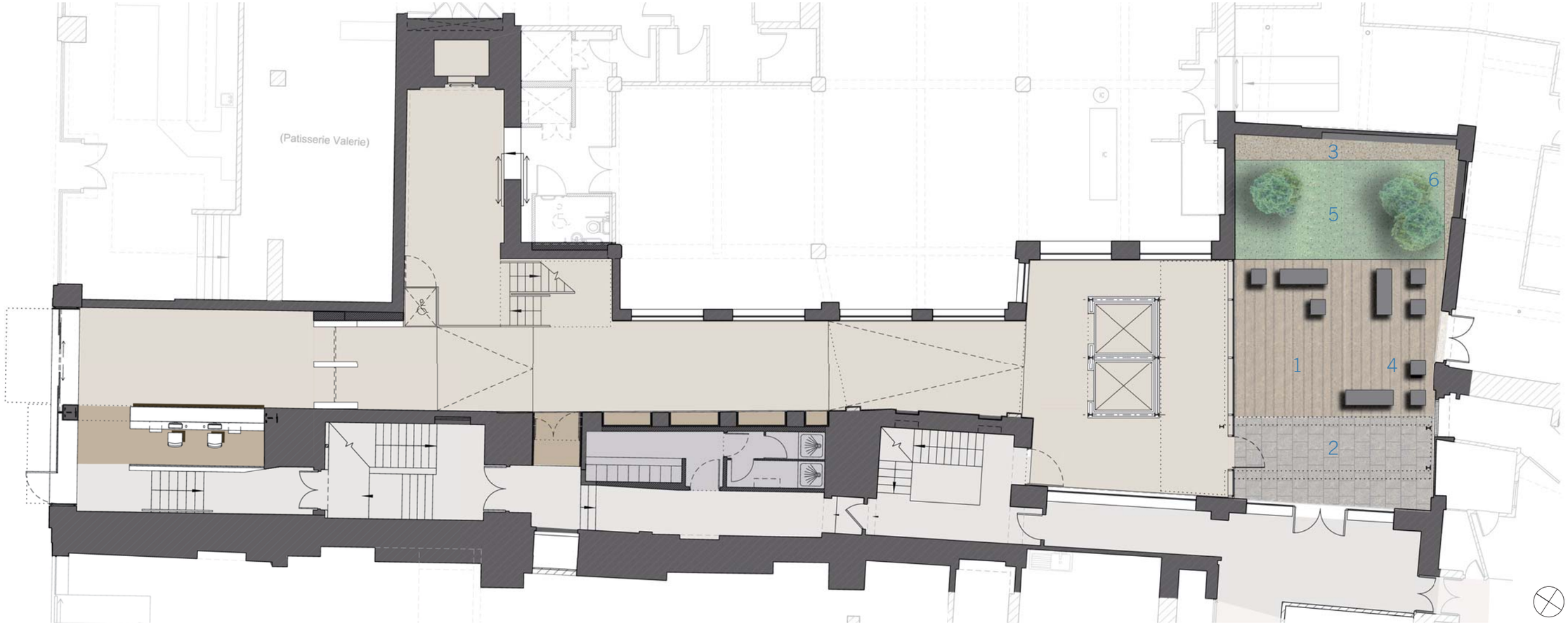

Asstible spp


Stone paving


Gravel

# 7.0 | LANDSCAPE

1 Timber decking
2 Paving
3 Gravel
4 Fixed furniture
5 Low level planting
6 Small trees
7 Extensive green roof




**Ground Floor Plan**

# 7.0 | LANDSCAPE

The following diagram shows the proposed provision of 350 sqm self maintaining extensive green roofs. The installation of a green roof, for example, Emmorsgate`s ER1F Wildflowers will provide a high biodiversity.

The plants will be selected for their resistance to harsh environments and will be supplemented with grasses to provide visual amenity to the adjacent properties which look over the buildings and enhance the local bio-diversity.

The green roof areas are accessible only for maintenance purposes.

# 7.0 | LANDSCAPE

1 Timber decking
2 Paving
3 Gravel
4 Fixed furniture
5 Low level planting
6 Small trees
7 Extensive green roof
8 Solar Panels


**Roof Plan**

NOTE: Areas shown in grey are excluded from refurbishment

# 8 | SUSTAINABILITY PRINCIPLES

# 8.0 | SUSTAINABILITY PRINCIPLES

This section provides a summary of the sustainability measures planned for the proposed refurbishment of the office accommodation at The Heal's Building on Tottenham Court Road in London. Sustainability is being incorporated into the design of the refurbishment to ensure that policies CP13, DP22 and DP23 of LB Camden's Core Strategy and Development Control Policies DPD have been addressed. In addition, a BREEAM 2008 Office pre-assessment completed for the proposed development shows that a score greater than 55 points should be achieved, resulting in BREEAM Very Good rating. This score is in line with the requirements of London Borough of Camden's Development Policy DP22.

It is important to note that this assessment is at a preliminary stage and will be subject to further detailed analysis as the project progresses. The design team is, however, committed to ensuring that the scheme remains above the threshold for BREEAM Level 'Very Good' at all times subject to the requirement to preserve the significance of the listed building. We also note that it is a Council requirement that within the BREEAM assessment the following minimum scores are achieved in three key categories: 60% of the Energy credits; 60% of the Water credits; and 40% of the Materials credits.

**Management**

The proposed development can achieve the majority of credits available under the Management category of BREEAM Offices. Proposed undertakings include the appointment of an appropriate team member to monitor commissioning in line with current best practices. In addition, seasonal commissioning can be conducted.

As the proposed development is located on an urban site, the contractor will operate under the Considerate Constructors Scheme and will aim to achieve beyond best practice, demonstrating exemplar performance. Construction site impacts will also be monitored. We anticipate that a Construction Management Plan will be secured by condition to ensure the successful management of the construction phase.

A Building User Guide will be developed on the operational and environmental performance of the building. Camden and the local Crime Prevention Advisor (CPDA) have been consulted throughout the design development. Their recommendations will be incorporated within the scheme design to ensure security of future tenants and building occupants. Further details can be found in Section 5.10 of the Design and Access Statement.

**Health and Wellbeing**

As a refurbishment of existing office space, the comfort of future tenants and building occupants is integral to the design of proposed development. In order to achieve credits under the Health and Wellbeing category, high frequency ballasts will be installed on all fluorescent/compact fluorescent lamps and internal/external lighting will be provided in line with appropriate levels. The comfort of building users is considered through the implementation of undertakings related to lighting zones, indoor air quality, thermal comfort, thermal zoning and acoustic performance. The design team is evaluating whether the proposed development can achieve credits for daylighting and visual amenity through views out of the building.

**Energy**

As a Grade II* listed building, a balance needs to be struck between improving the energy efficiency of the building and the preservation of its special interest. The design team will make reasonable efforts to improve the energy efficiency of the building's fabric and services within the constraints of the significance of the building which has been identified by McAslan and Partners. Features such as shading devices are unlikely to be suitable; however passive measures to reduce energy consumption and improve occupant comfort will be incorporated.

Other energy efficiency measures will be incorporated to meet sustainability targets in this category, including low-energy lighting, heat exchangers to air handling plant and tenancy areas and the replacement of existing lifts with energy efficient lifts. A detailed Energy Statement will be submitted with the planning application which details how policy DP22 of the Council's Development Management Policies has been addressed for The Heal's Building, detailing how energy efficiency and low and zero carbon technologies have been incorporated. The Energy Statement can be found in Appendix C.

The design team will be aiming to achieve Camden's requirement that 60% of the BREEAM energy credits is achieved. Further detailed analysis will be undertaken as part of the design development in order to establish the level of energy savings and efficiency that can be achieved within the constraints of this important listed building.

By introducing a glass roof to cover the central light well, an intermediate, temperate zone will be created. The advantage of this approach is that it allows the improvement of circulation and disabled access whilst not requiring additional energy resources. This is because the waste heated or cooled air from the offices is discharged into the space (as shown in the sectional diagram).

**Water**

The proposed development will reduce internal water consumption through the careful specification of water efficient fixtures and fittings, particularly WCs and WHBs. In compliance with mandatory requirements of the Water category, adequate water meters will be incorporated into the design. The design team will investigate the implementation of a major leak detection system and sanitary supply shut off systems. The site should comply with Camden's requirement that 60% of the credits in this category are achieved.

Further to this, additional water saving systems such as grey water recycling will be investigated in-line with DP23 Water; however for a building of this nature it is likely that installing such a system will be impractical and prohibitively expensive. Any areas that benefit from planting and landscaping will be carefully irrigated and where it is possible water butts will be installed.

**Waste**

Credits under the Waste category will be achieved through demonstrating compliance with a Site Waste Management Plan (likely to be secured by condition) which ensures that waste streams from the site are at least comparable with best practice guidelines. The design team will ensure that an area is dedicated to the storage of the proposed development's recyclable waste.

**Materials**

The design team will ensure the careful selection of sustainable building materials in order to achieve credits under the Materials category. In addition, default credits are awarded for the reuse of existing building elements. As the proposals are effectively for the re-use and rationalization of the existing office accommodation significant portions of the existing building façade and building structure will be sustainably reused, whilst improving access, internal circulation and architectural quality. The site should comply with Camden's requirement that 40% of the credits in this category are achieved.

**Transport**

The proposed development is located within the heart of Central London and is within the designated Central Activities Zone and has a PTaL of 6a. It will therefore score highly in the Transport category. The building is easily accessible through a number of underground, rail and bus links and is located within very close proximity to a wide range of local amenities. There is existing off street car parking provided within the basement and a parking bay for disabled drivers within the loading bay area at ground floor level. With respect to the building design, cyclist facilities will be improved and the design team will ensure that safe and adequate pedestrian and cycle access to the building will be achieved.

**Land Use and Ecology**

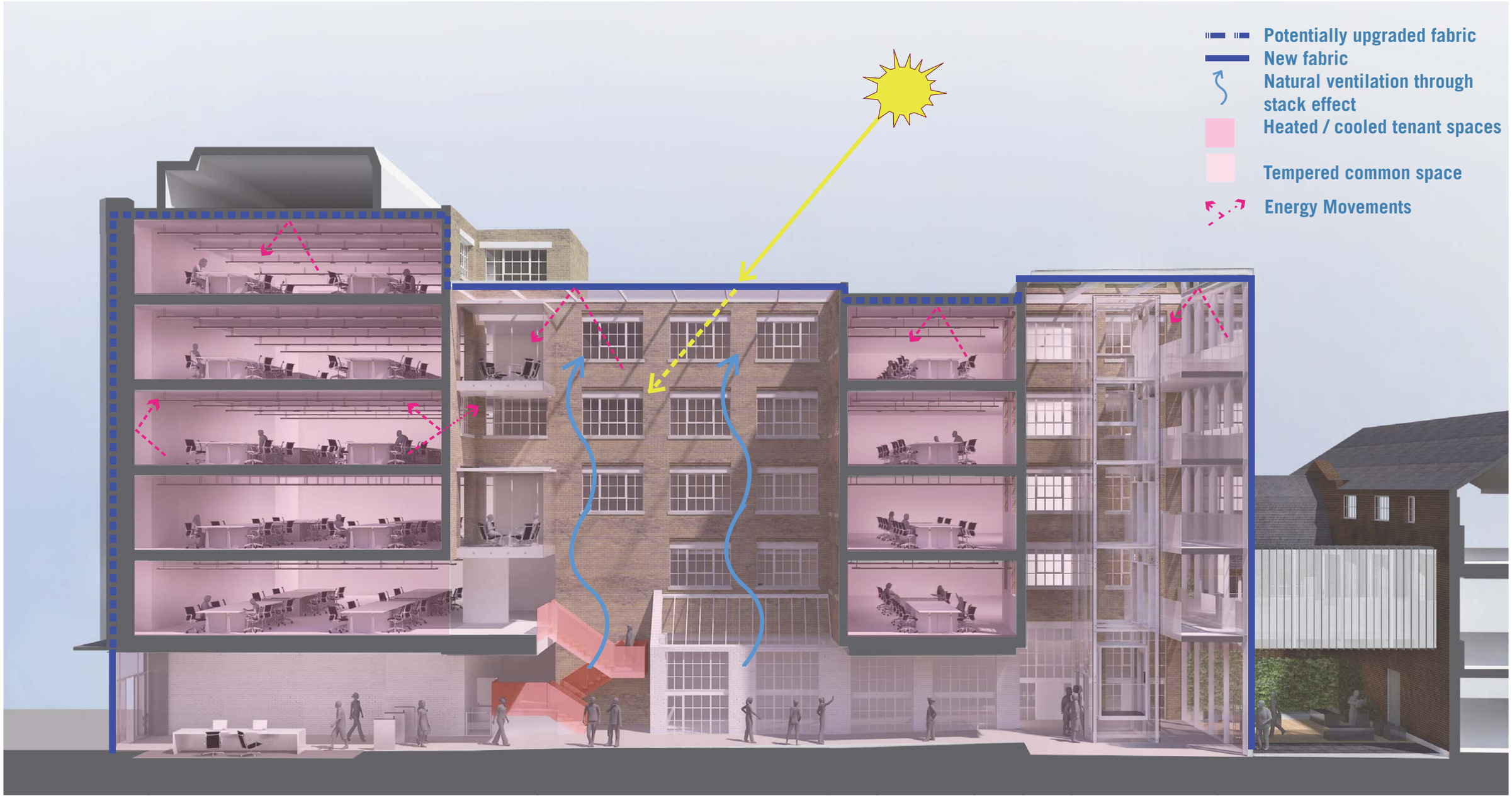
The proposed refurbishment will be contained entirely within the existing building, and therefore credits are achieved for reusing land under the Land Use and Ecology category. As an existing urban site without significant ecological features, low ecological value can be assigned to the land. An ecologist has been appointed to assist the design team with potential enhancements to the site ecology and long term impact on biodiversity. The ecologist will also provide advice to the team with respect to guidance provided by Camden council detailing best practice examples of habitat provision and enhancement. On of the measures incorporated in the scheme and in accordance with Camden policy, is the formation of green roofs ( as detailed earlier in Section 7.0 of the Design and Access Statement). Green roofs and other potential enhancements will be considered and developed during the detailed design stage. Other potential enhancements will be considered and developed during the detailed design stage. The design team will ensure that any enhancements respect the historic and architectural features of the development.

**Pollution**

The site is situated in a zone defined by the Environment Agency as having a low annual probability of flooding. The design team will look to incorporate measures to reduce run-off, potentially as an integral part of any landscaping or planting scheme.

As the site is located in an existing urban area in Central London, efforts will be undertaken by the design team to ensure that external lighting reduces night time light pollution and mitigates any adverse noise effect.

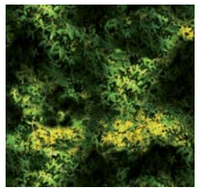
# 8.0 | **SUSTAINABILITY PRINCIPLES I** ENVIRONMENTAL CROSS SECTION




Water use will be reduced through the fixtures and appliances

Cycle parking at basement level

High efficiency low energy lighting throughout the building.



Green roof

Careful selection of sustainable building materials

Well connected to public transport and a wide range of local amenities

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**HEALS BUILDING, TOTTENHAM COURT ROAD**

**VISUAL IMPACT STUDY**

DECEMBER 2011

miller | hare

# 9.0 | VISUAL IMPACT STUDY

Contents



## HEALS BUILDING, TOTTENHAM COURT ROAD

## VISUAL IMPACT STUDY

DECEMBER 2011

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Modified
05 December 2011

File name
2244_8300

History

Visualisation
Miller Hare

# 9.0 | VISUAL IMPACT STUDY

## 1 INTRODUCTION Scope

1.1 This study tests the visual impact of the Proposed Development at the Heals Building, Tottenham Court Road. It consists of a series of accurately prepared photomontage images or Accurate Visual Representations (AVR) which are designed to show the visibility and appearance of the Proposed Development from a range of publicly accessible locations around the site. The views have been prepared by Miller Hare Limited.

1.2 The views included in the study were selected by the project team. Where requested, view locations have been refined and additional views added. The full list of views is shown in thumbnail form at the beginning of this section, together with a map showing their location. Detailed co-ordinates for the views, together with information about the source photography is shown alongside each view and summarised in the table shown in Appendix A1 "VIEW LOCATIONS AND CO-ORDINATES".

1.3 In preparing each AVR a consistent methodology and approach to rendering has been followed. General notes on the AVRs are given in Appendix A4 "ACCURATE VISUAL REPRESENTATIONS", and the detailed methodology used is described in Appendix A5 "METHODOLOGY FOR THE PRODUCTION OF ACCURATE VISUAL REPRESENTATIONS".

1.4 From each viewpoint a large format photograph has been taken as the basis of the study image. The composition of this photograph has been selected to allow the Proposed Development to be assessed in a meaningful way in relation to relevant elements of the surrounding context. Typically, photographs have been composed with a horizontal axis of view in order to allow vertical elements of the proposals to be shown vertically in the resulting image. If required in order to show the full extent of the proposals in an natural way the horizon line of the image has been allowed to fall above or below the centre of the image. This has been achieved by applying vertical rise at source using a large format camera or by subsequent cropping of the image. In all cases the horizon line and location of the optical axis are clearly shown by red arrow markers at the edges of the image.

1.5 The lenses chosen for the source photography have been selected to provide a useful Field of View given the distance of the viewpoint from the site location. The lenses used for each view are listed in Appendix A1 "VIEW LOCATIONS AND CO-ORDINATES".

1.6 For each AVR image, the precise Field of View, after any cropping or extension has been applied is shown clearly using indexed markings running around the edges of the image. These indicate increments of 1, 5 and 10 degrees marked away from Optical Axis. Using this peripheral annotation it is possible to detect optical distortions in parts of the image away from the Optical Axis . It is also possible to simulate a different field of view by masking off an appropriate area of the image. More detailed information on the border annotation is contained in Appendix A4 "ACCURATE VISUAL REPRESENTATIONS".

**Conditions**

1.7 From each selected viewpoint a set of accurate images have been created comparing the future view with the current conditions represented by a carefully taken large format photograph. In this study the following conditions are compared:

- Existing – the appearance today as recorded on the specified date and time
- Proposed – the future appearance were the Proposed Development to be constructed.

*Styles*

1.8 For each viewpoint, the Proposed Development is shown in a defined graphical style. These styles comply with the definitions of AVR style defined by the London View Management Framework. The styles used in this study are:

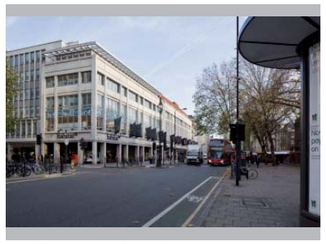
- AVR 1 – a wireline representation showing the silhouette of the proposed plant. The plant location is shown in blue.

**Schemes**

1.9 The Proposed Development shown in the study has been defined by drawings and specifications prepared by the client's design team issued to Miller Hare in Novembre 2011. Computer models reflecting the Proposed Development have been assembled by Miller Hare. An overview of the study model annotated with key heights is illustrated in Appendix A2 "Plant Location".

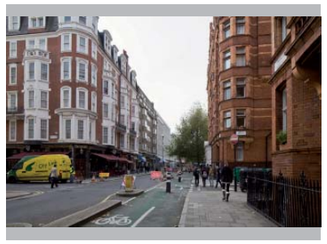
# 9.0 | VISUAL IMPACT STUDY

## 2 THE VIEWS



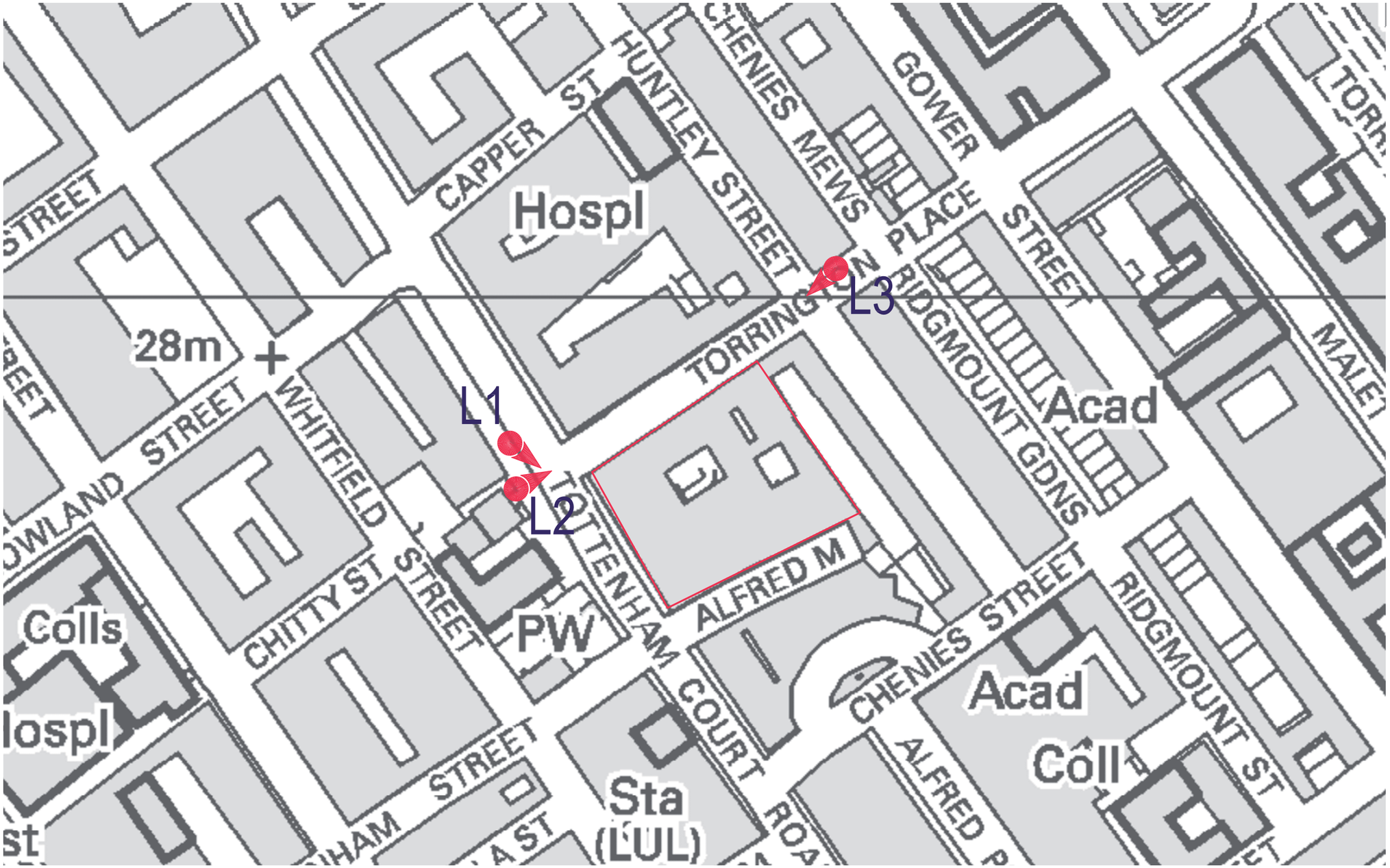
*L1 | Tottenham Court Road*

*L2 | Tottenham Court Road: junction with Torrington Place*



*L3 | Torrington Place*

# 9.0 | VISUAL IMPACT STUDY

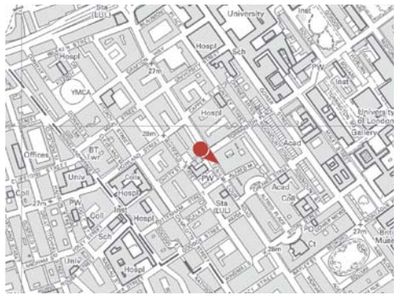



View location map

# 9.0 | VISUAL IMPACT STUDY

**L1** Tottenham Court Road


2244_1101



*Camera Location*
National Grid Reference 529458.8E 181941.3N
Camera height 29.15m AOD
Looking at Centre of Site
Bearing 128.5°, distance 0.1km

*Photography Details*
Height of camera 1.60m above ground
Date of photograph 24/11/2011
Time of photograph 15:25

*Existing*

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# 9.0 | VISUAL IMPACT STUDY

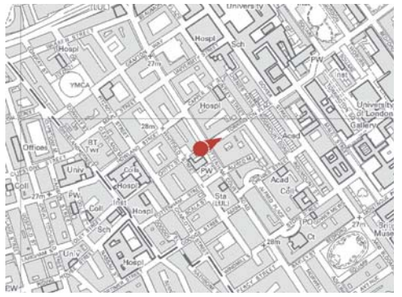
Tottenham Court Road **L1**


*Proposed*

# 9.0 | VISUAL IMPACT STUDY

**L2** Tottenham Court Road: junction with Torrington Place


2244_1201



*Camera Location*
National Grid Reference 529461.3E 181923.1N
Camera height 29.04m AOD
Looking at Centre of Site
Bearing 63.1°, distance 0.1km

*Photography Details*
Height of camera 1.60m above ground
Date of photograph 24/11/2011
Time of photograph 15:20

*Existing*

# 9.0 | VISUAL IMPACT STUDY

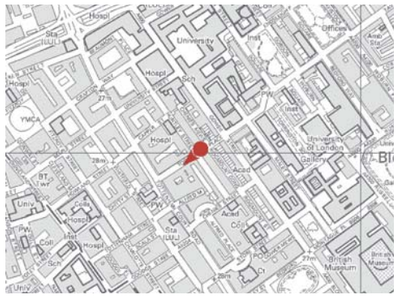
Tottenham Court Road:  junction with Torrington Place **L2**


*Proposed*

# 9.0 | VISUAL IMPACT STUDY

## L3 Torrington Place


2244_1307



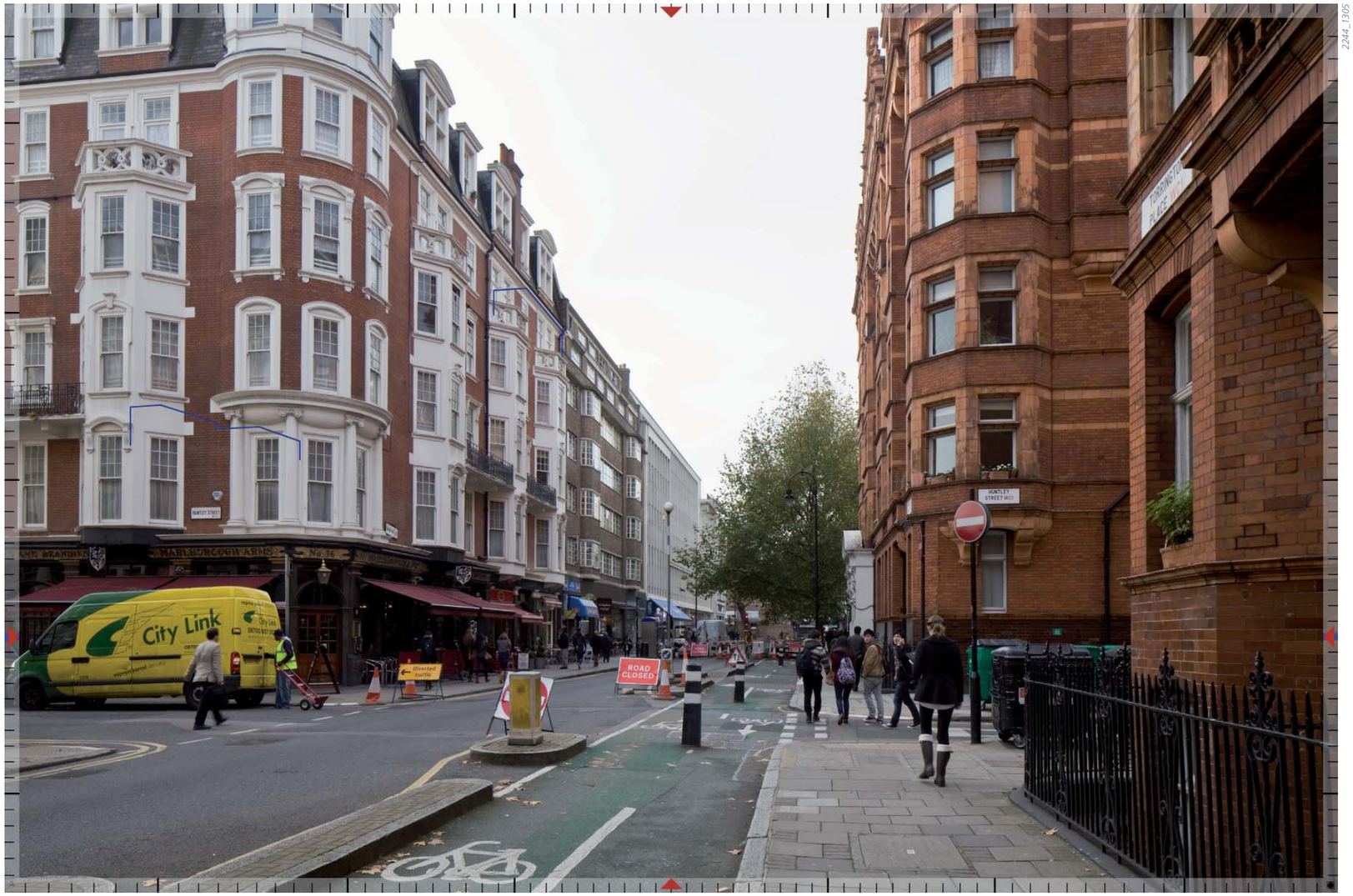
*Camera Location*
National Grid Reference 529588.6E 182010.7N
Camera height 28.88m AOD
Looking at Centre of Site
Bearing 227.0°, distance 0.1km

*Photography Details*
Height of camera 1.60m above ground
Date of photograph 23/11/2011
Time of photograph 13:07

*Existing*

# 9.0 | VISUAL IMPACT STUDY

Torrington Place **L3**




*Proposed*

# 9.0 | VISUAL IMPACT STUDY

## APPENDICES

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# 9.0 | VISUAL IMPACT STUDY

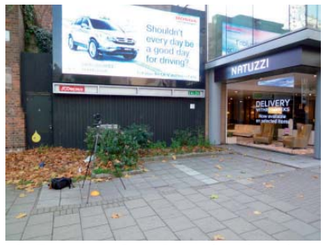
## A1 VIEW LOCATIONS AND CO-ORDINATES

| View | Description | MH Reference | Type | Method | Camera Easting | Northing | Height | Target Easting | Northing | Height | Camera | Format | Lens | HFOV Photo | Image | Photo date/time | Bearing | distance (km) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L1 | Tottenham Court Road | 1100 | outline | Surveyed | 529458.8 | 181941.3 | 29.15 | 529512.2 | 181898.7 | 29.25 | Canon EOS 5D Mark II DSLR | FX | 24mm | 73.3 | 73.3 | 24/11/2011 15:25 | 112.6 | 0.1 |
| L2 | Tottenham Court Road: junction with Torrington Place | 1200 | outline | Surveyed | 529461.3 | 181923.1 | 29.04 | 529537.7 | 181961.8 | 30.23 | Canon EOS 5D Mark II DSLR | FX | 24mm | 72.6 | 72.6 | 24/11/2011 15:20 | 93.6 | 0.1 |
| L3 | Torrington Place | 1300 | outline | Surveyed | 529588.6 | 182010.7 | 28.88 | 529525.6 | 181952.1 | 28.59 | Canon EOS 5D Mark II DSLR | FX | 24mm | 72.8 | 72.8 | 23/11/2011 13:07 | 220.9 | 0.1 |

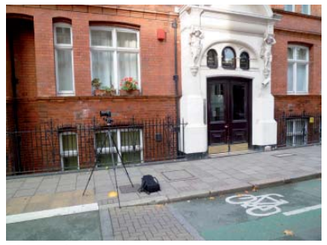
# 9.0 | VISUAL IMPACT STUDY

## A2 VIEW LOCATION PHOTOGRAPHY


*L1 | Tottenham Court Road*




*L2 | Tottenham Court Road: junction with Torrington Place*



*L3 | Torrington Place*

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# 9.0 | VISUAL IMPACT STUDY

## A3 PLANT LOCATION

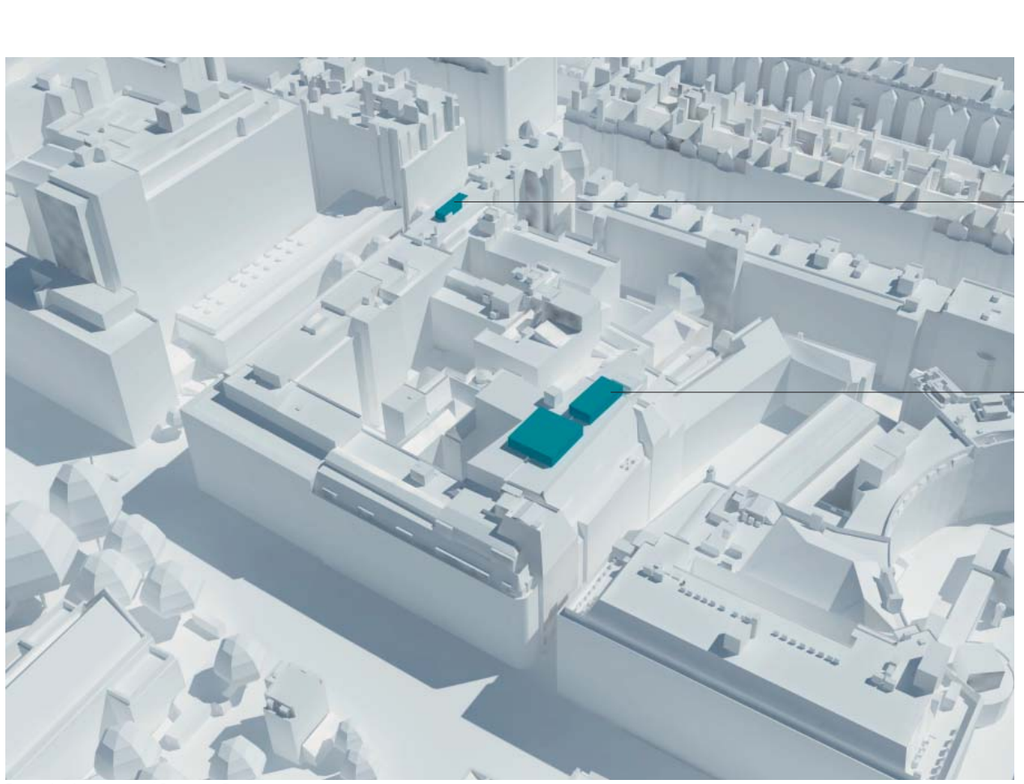


Figure 1 - Aerial view of Proposed Development

# 9.0 | VISUAL IMPACT STUDY

## A4 ACCURATE VISUAL REPRESENTATIONS

A4.1 Each of the views in this study has been prepared as an Accurate Visual Representation (AVR) following a consistent methodology and approach to rendering. Appendix D of the London View Management Framework: Revised Supplementary Planning Guidance (May 2010) 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 development. 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."*

A4.2 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**

A4.3 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.

A4.4 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.

A4.5 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**

The term 'Field Of View' (FOV) or more specifically Horizontal Field of View (HFOV), refers to the horizontal 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'.

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 proportions. It is also possible to compare computer renderings with photographic images.

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.

| Add | HFOV degrees | Lens focal length (mm) 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 dimensions of 48.9mm x 36.7mm.

A4.6 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 appropriate to make use of a telephoto lens.

A4.7 Secondly, where the wider context of the view must be considered 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.

A4.8 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 situations it is appropriate to provide a panorama comprising of a number of photographs placed side by side.

A4.9 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 cumulative schemes**

*Classification of AVRs*

A4.10 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.

| AVR level | showing | purpose |
|---|---|---|
| AVR 0 | 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 |

A4.11 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.

*AVR 3 - Photoreal*

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

A4.12 The purpose of a Level 3 AVR is to represent the likely appearance of the Proposed Development under the lighting conditions 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.

A4.13 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 buildings 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.

A4.14 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 interpretation of the concept lighting strategy.

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*AVR 1 - Outline*

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

A4.15 The purpose of a wire-line view is to accurately indicate the 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.

A4.16 In AVR1 representation each scheme is represented by a single line profile, sometimes 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 between different schemes.

A4.17 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 representing 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.

*Framing the view*

A4.18 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.

A4.19 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.

A4.20 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.

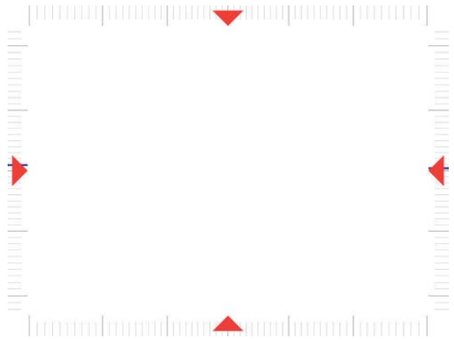
**Documenting the AVR**

*Border annotation*

A4.21 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.

A4.22 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.

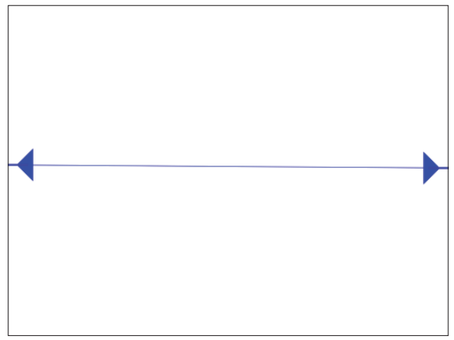
A4.23 If the point indicated by these marks lies above or below the centre of the image, this indicates either that vertical rise was used when taking the photograph or that the image has subsequently been cropped from the top or bottom edge. If it lies to the left or right of the centre of the image then cropping has been applied to one side or the other, or more unusually that horizontal shift was applied to the photograph.



Sample graticule showing optical axis markers

A4.24 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.

A4.25 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 camera in the field.



Sample graticule showing horizon line markers

*Comparing AVRs with different FOVs*

A4.26 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.

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## A5 METHODOLOGY FOR THE PRODUCTION OF ACCURATE VISUAL REPRESENTATIONS

### Overview of Methodology

A4.27 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).

A4.28 The methodology employed by Miller Hare is compliant with Appendix D of the London View Management Framework: Revised Supplementary Planning Guidance (July 2010)..

A4.29 The project team defined a series of locations in London where the proposed buildings might have a significant visual effect. At each of these locations Miller Hare carried out a preliminary study to identify specific Assessment Points from which a representative 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.

A4.30 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 foreground 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 impression of the impact of the Proposed Development on the selected view in terms of scale and location.

### Spatial framework and reference database

A4.31 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 Survey (OS) Newlyn Datum.

A4.32 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 the resulting photomontages.

A4.33 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.

A4.34 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 architects, Miller Hare has used its best endeavours to ensure that the models are positioned accurately both in plan and in overall height.

### Process - photographic context

*Reconnaissance*

A4.35 At each Study Location the Visualiser conducted a photographic 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.

A4.36 The Visualiser assigned a unique reference to each Assessment Point and Photograph.

*Final Photography*

A4.37 From each selected Assessment Point a series of large format photographs were 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

A4.38 The centre point of the tripod was marked and a digital photograph 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*

A4.39 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.

A4.40 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.

A4.41 From these the local survey stations, the requested alignment points were surveyed using conventional observation.

A4.42 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 re-projected into OSGB36 (National Grid) coordinates, and with additional interpreted lines to improve the clarity of the surveyed data.

A4.43 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*

A4.44 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.

A4.45 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.

A4.46 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*

A4.47 A preliminary view definition was created within the visualisation system using the surveyed camera location, recorded target point and FOV based on the camera and lens combination selected for the shot

A4.48 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.

A4.49 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 adjustments were made to the camera definition. When using a wide angle lens observations outside the circle of distortion are given less weighting.

A4.50 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.


Example of alignment model overlaid on the photograph

*Preparing models of the Proposed Development*

A4.51 A CAD model of the Proposed Plant locations was created from 2D drawings supplied by the Architect. The level of detail applied to the model is appropriate to the AVR type of the final images.

A4.52 Models of the Proposed Development and other schemes are located within the spatial framework using reference information 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.

*Determining occlusion and creating simple renderings*

A4.53 A further rendering was created using the aligned camera, which combined the Proposed Development with a computer-generated 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.

A4.54 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 background layers.

A4.55 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.

# 9.0 | VISUAL IMPACT STUDY

*Documenting the study*

A4.56 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.

A4.57 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 described.

A4.58 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.

A4.59 Any exceptions to the applied policies or deviations from the methodology were clearly described.

A4.60 Where appropriate, additional images were included in the study report, showing the Proposed Development in the context of other consented schemes.

# 10 | CONSULTATIONS

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