

ENVIRONMENTAL ASSESSMENT REPORT

SUSTAINTABILITY STATEMENT

DEVONSHIRE HOUSE SCHOOL 69 FITZJOHN'S AVENUE LONDON, NW3 6PD

FIRST ISSUE 18TH MARCH 2015

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368-150318 69 Fitzjohn's Ave-Sust Strategy 0

Page 1 of 41

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INDEX

NDEX	2
1.0 EXECUTIVE SUMMARY	3
2.0 INTRODUCTION	4
3.0 Overview of environmental standards, targets and policies	5
4.0 ENERGY EFFICIENCY AND CO2 EMISSIONS REDUCTIONS INCLUIDING RETRO FITTING MEASURES	7
5.0 DATA	7
6.0 MAKING THE MOST OUT OF DAYLIGHT	9
7.0 INTERNAL DAYLIGHT CALCULATIONS RESULTS	13
9.0 WATER STRATEGY	26
10.0 SUSTAINABLE USE OF MATERIALS	29
11.0 FLOODING	30
12.0 CLIMATE CHANGE ADAPTATION	34
13.0 BIODIVERSITY	34
14.0 URBAN FOOD GROWING	36
15.0 CONCLUSION	37
APPENDIX A - SITE LOCATION PLAN	38
APPENDIX B – ENERGY AND CO2 EMISSIONS ZONES AS PROPOSED	39



1.0 EXECUTIVE SUMMARY

This assessment was instructed by Crawford and Gray Architects, on behalf of Devonshire School and carried out by ECOstudio XV ® Ltd.

This Sustainability Statement outlines the strategy for maximising the environmental performance of Devonshire House School located at 69 Fitzjohn's Av, London NW3 6PD.

This report should be read in conjunction with the Energy Statement, issued as a separate report. It includes retro-fitting measures for the existing refurbished areas.

Devonshire House School is situated in the heart of Hampstead. The application site is located on a large 19th Century building currently in use as an independent preparatory school.

The proposed development consists of:

- An extension of the existing basement under the existing raised terrace;
- g FIGURE 01 PERSPECTIVE VIEW OF THE PROPOSED EXTENSION

- A new light well to the south of the building;
- The replacement of the non-original full width pitched roof rear extensions with a new glazed flat roofed extension.

The development aspires to maximise sustainable design features wherever possible by implementing a complete and integrated Environmental Strategy.

This report provides a review of the sustainability strategies appropriate for the development and sets out targets for the proposed development. These strategies include:

- Energy Efficiency and CO2 emissions reductions
- Daylight Harvesting
- Water efficiency
- Sustainable use of materials
- Green roofs.
- Flood Risk
- Climate change adaptation.
- Biodiversity.
- Urban food growing.

368-150318 69 Fitzjohn's Ave-Sust Strategy 0



Page 3 of 41

2.0 INTRODUCTION

This Sustainability Strategy outlines the strategy for maximising the environmental performance of Devonshire House School located at 69 Fitzjohn's Av, London NW3 6PD.

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The development aspires to maximise sustainable design features wherever possible by implementing a complete and integrated Environmental Strategy. This report provides a review of the sustainability strategies appropriate for the development and sets out targets for the proposed development. This strategies include:

- Daylight Harvesting
- Water efficiency
- Sustainable use of materials
- Green roofs.
- Flood Risk
- Climate change adaptation.
- Biodiversity.
- Urban food growing.





3.0 OVERVIEW OF ENVIRONMENTAL STANDARDS, TARGETS AND POLICIES.

This section provides an overview of the environmental rating schemes, mandatory regulations and policy documents applicable to the Devonshire House School extension development.

The mandatory environmental benchmarks include:

- Core Strategy Policy Tackling climate change through promoting higher environmental standards (adopted 2010)
- CPG 3 Camden Planning Guidance Sustainability (adopted September 2013)

3.1 CPG3 SUSTAINABILITY

The Camden Council is committed to reducing Camden's carbon emissions. This will be achieved by implementing large scale projects such as installing decentralised energy networks alongside smaller scale measures, such as improving the insulation and energy performance of existing buildings.

This guidance provides information on ways to achieve carbon reductions and more sustainable developments. It also highlights the Council's requirements and guidelines which support the relevant Local Development Framework (LDF) policies:

- CS13 Tackling climate change through promoting higher environmental standards.
- DP22 Promoting sustainable design and construction.
- DP23 Water.

Guidance covers:

- Energy Statements
- The energy hierarchy (Energy efficiency, Decentralised energy and CHP, Renewable energy)
- Water efficiency
- Sustainable use of materials
- Sustainability assessment tools- Code for Sustainable Homes, BREEAM and EcoHomes.
- Green roofs, brown roofs and green walls.
- Flooding
- Climate change adaptation.
- Biodiversity.
- Urban food growing.

Camden Council requires a full model of the building to ensure the design optimises solar gain and daylight without resulting in overheating for developments comprising 5 dwellings or more or 500m2 or more of any floor space.

3.2 CPG6 AMENITY

A key objective of the Camden Core Strategy is to sustainable manage growth so that it avoids harmful effects on the amenity of existing and future occupiers and to nearby properties.

The guidance provides information on all types of amenity issues within the borough and includes the following sections:

- Air quality
- Contaminated land
- Noise and vibration
- Artificial light

- Daylight and sunlight
- Overlooking, privacy and outlook
- Construction management plans
- Access for all
- Wing and micro-climate
- Open space, outdoor sport and recreation facilities

A daylight report should assess the impact of the development following the methodology set out in the most recent version of Building Research Establishment (BRE) "Site layout planning for daylight and sunlight: A guide to good practice"

4.0 ENERGY EFFICIENCY AND CO2 EMISSIONS REDUCTIONS INCLUIDING RETRO FITTING MEASURES

A separate Energy Statement report has all the relevant details following the London Plan and Camden Council requirements. Please refer to it for further details.

ENVIRONMENTAL ASSESSMENT REPORT

ENERGY STATEMENT INCLUDING RETRO-FITTING MEASURES TO REFURBISHED AREAS

DEVONSHIRE HOUSE SCHOOL 69 FITZJOHN'S AVENUE LONDON, NW3 6PD

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5.0 DATA

The information has been taken directly from digital files provided by the Design Team. The height of the obstructions has been taken from survey data.

FIGURE 02 – BIRD'S EYE VIEW OF THE SITE AS EXISTING LOOKING NORTH



368-150318 69 Fitzjohn's Ave-Sust Strategy 0

Page 8 of 41

6.0 MAKING THE MOST OUT OF DAYLIGHT

6.2.1. BUILDING RESEARCH ESTABLISHMENT (BRE) "SITE LAYOUT PLANNING FOR DAYLIGHT AND SUNLIGHT: A GUIDE TO GOOD PRACTICE".

This guide advice on site layout planning to achieve good sunlighting and day lighting both within buildings and in the open spaces between them. It is intended to be used in conjunction with the interior daylight recommendation in the British Standard Code of practice for daylighting, BS 8206-2. It contains guidance on site layout to provide good natural lighting within a new development; safeguarding of daylight and sunlight within existing buildings nearby; and the protection of daylighting of adjoining land for future development.

6.2.2. AVERAGE DAYLIGHT FACTOR:

Average Daylight Factor is a measure of the daylight level in a room. It can be used to establish whether a room will have a predominantly daylit appearance. It provides light levels below which a room should not fall even if electric lighting is provided, The Average Daylight Factor can be used as a measure to determine whether a room will receive adequate daylight (expressed as a percentage). The ADV takes into account the:

- Net glazed area of windows;
- The total area of the room surfaces (ceiling, floor, walls, and windows);
- The average reflectance; and
- The angle of visible sky.

If a predominately daylit appearance is required, then the daylight factor should be 5% or more if there is no supplementary electric lighting, or 2% or more if supplementary electric lighting is provided. This figure should be as high as possible to enable occupiers to rely on as much natural light and not use artificial lighting, but as a minimum for dwellings the figures should be 2% for kitchens, 1.5% for living rooms and 1% for bedrooms.

6.2.3 BRITISH STANDARD BS8206:PT2 AND SITE LAYOUT PLANNING FOR DAYLIGHT AND SUNLIGHT, A GUIDE TO GOOD PRACTICE, BY P J LITTLEF AIR, BRE 2011.

The criteria to comply with both standards in terms of daylight is:

- 1.0% average Daylight Factor for bedrooms,
- 1.5% average Daylight Factor for living dining rooms and studies,
- 2.0 % average Daylight Factor for kitchens

AND

• View of the Sky criteria for all kitchens, dining rooms, living rooms (80% or more).

FIGURE 03 - VIEW OF THE SKY FORMULA DIAGRAM





FIGURE 04 – AT THE NO SKY LINE, THE LAST VISIBLE PATCH OF SKY ABOVE THE OBSTRUCTION WILL JUST DISAPPEAR WHEN THE WINDOW HEAD IS SIGHTED THROUGH A POINT AT WORKING PLANE HEIGHT



FIGURE 05 – A MIRROR CAN BE USED TO SIGHT THE NO SKY LINE POSITION



TABLE 05 - AVERAGE REFLECTANCE VALUES FOR ROOM SURFACES ACCORDING TO BS 8206 PT 2

space	Internal wall finishes	R value	Internal ceiling finishes	R value	Internal floor finishes	R value
BS-01 Replacement Teaching Room	Default value as per BS8206 PT2	0.65	Default value as per BS 8206 PT2 White 00E55 (BS 4800 colour code)	0.85	Default value as per BS8206 PT2	0.30
BS-03 Dining Hall	Default value as per BS8206 PT2	0.65	Default value as per BS 8206 PT2 White 00E55 (BS 4800 colour code)	0.85	Default value as per BS8206 PT2	0.30
BS-05 Catering	Default value as per BS8206 PT2	0.85	Default value as per BS 8206 PT2 White 00E55 (BS 4800 colour code)	0.85	Default value as per BS8206 PT2	0.30
GF-06 Teaching Staff Room	Default value as per BS8206 PT2	0.65	Default value as per BS 8206 PT2 White 00E55 (BS 4800 colour code)	0.85	Default value as per BS8206 PT2	0.30
GF-08 Lobby GF-09 Lobby	Default value as per BS8206 PT2	0.65	Default value as per BS 8206 PT2 White 00E55 (BS 4800 colour code)	0.85	Default value as per BS8206 PT2	0.30

R is the average reflectance of the room surfaces.
The above default values have been used as stated in the British Standard BS 8206 Pt2 when the above information is not available.



7.0 INTERNAL DAYLIGHT CALCULATIONS RESULTS

368-150318 69 Fitzjohn's Ave-Sust Strategy 0

Page 13 of 41



FIGURE 06 – BASEMENT HABITABLE SPACES IN SOLID RED



Page 14 of 41



TABLE 07 – GF HABITABLE SPACES RESULTS

UNIT TYPE	FLOOR	ROOM NAME	ROOM ID	AVERAGE DAYLIGHT FACTOR %	VIEW OF THE SKY %	COMPLIES WITH: BS8206: Pt2?	NOTES
69 Fitzjohn´s Ave B	BASEMENT	Replacement Teaching Room	BS-01	3.20	1.00	YES	
		Dining Hall	BS-03	2.70	1.00	YES	
		Catering	BS-05	2.90	1.00	YES	



FIGURE 07 – BASEMENT – DAYLIGHT FACTOR ANALYSIS RESULTS



Page 16 of 41



FIGURE 08 - BASEMENT – DAYLIGHT FACTOR ANALYSIS RESULTS



Page 17 of 41



FIGURE 09 - BASEMENT – VIEW OF THE SKY FACTOR ANALYSIS RESULTS



Page 18 of 41



FIGURE 10 - BASEMENT – VIEW OF THE SKY ANALYSIS RESULTS



Page 19 of 41



FIGURE 11 – GF HABITABLE SPACES IN SOLID RED



368-150318 69 Fitzjohn's Ave-Sust Strategy 0

Page 20 of 41



TABLE 08 – GF HABITABLE SPACES RESULTS

UNIT TYPE	FLOOR	ROOM NAME	ROOM ID	AVERAGE DAYLIGHT FACTOR %	VIEW OF THE SKY %	COMPLIES WITH: BS8206: Pt2?	NOTES
69 Fitzjohn´s Ave	GF	Teaching Staff Room	GF-06	14.20	1.00	YES	
		Lobby	GF-07, GF-08	20.80	1.00	YES	



FIGURE 12 - GROUND FLOOR – DAYLIGHT FACTOR ANALYSIS RESULTS – PLAN VIEW



Page 22 of 41

FIGURE 13 - GROUND FLOOR – DAYLIGHT FACTOR ANALYSIS RESULTS- AXONOMETRIC VIEW



Page 23 of 41



FIGURE 14 - GROUND FLOOR – VIEW OF THE SKY ANALYSIS RESULTS- PLAN VIEW



Page 24 of 41



FIGURE 15 – GROUND FLOOR – VIEW OF THE SKY ANALYSIS RESULTS- AXONOMETRIC VIEW



Page 25 of 41

9.0 WATER STRATEGY

9.1 REQUIREMENTS

Core Strategy Policy CS13 protects the borough's existing water infrastructure to ensure we have an adequate water supply as well as adequate water storage and foul water capacity. Development Policy DP23 (Water) expects all developments to be designed to be water efficient and to minimize the need for further water infrastructure. Measures should be considered to reduce the consumption of water such as dual flush toilets, low flow taps and shower heads, green/brown roofs and collecting rain water and grey water reuse.

Details relating to sustainability measures including water efficiency can be found in Camden Planning Guidance 3 (Sustainability).

- At least 50% of water consumed in homes and workplaces does not need to be of drinkable quality re-using water.
- All developments are to be water efficient.
- Developments over 10 units or 1000m2 should include grey water recycling. As the development is less than 1000m2 grey water recycling doesn't apply.
- Developments designed to be water efficient by minimizing water use and maximizing the re-use of water. This includes new and existing buildings.

- Minimize water use through installing efficient water fittings and plumbing, such as: dual flush toilets, low flow taps and shower heads and low water consuming washing machines and dishwashers.
- Maximize water re-use: At least 50% of water consumed in homes and workplaces does not need to be of drinkable quality. For example, rain water can be water used for flushing toilets, washing laundry and watering plants and gardens.

9.2 STRATEGY

The proposed development extension does not include kitchen nor toilets. If these facilities would be installed in the future, the following measures will be implemented:

- Dual flush toilet 4 /2.6 litre
- Wash hand basin 1.7 litre / minute @ dynamic pressure of 3+/- 0.2 bar
- Kitchen-s sink 5 litre / minute with aerating tap
- Dishwasher 17 litre per use

9.3 COLLECTING RAIN WATER

- This involves collecting rainwater from the building's roof, as well as its surroundings, and storing it in a tank. Once filtered of leaves and larger objects, the water can be re-used watering plants.
- The proposed curved roof to the prosed extension will collect rain water with water butts for irrigation.
- The total volume will be around 200 litters.
- Water butts will be provided to irrigate the green roof and adjoining landscaped areas following this specifications:
 - They will have a lid
 - A tap or other suitable arrangement for drawing-off water
 - They will be connected to the rainwater down pipes with automatic overflow into the conventional rainwater drainage system
 - They will be detachable from the rainwater down pipe with a removable top or base for cleaning the interior.

FIGURE 16 – WATER BUTT



9.4 GREEN ROOFS, BIODIVERSITY AND COLLECTING RAIN WATER

- Green and brown roofs are roofs that are specially designed and constructed to be waterproof and covered with material to encourage wildlife and to help plants grow. They can be left without planting 'brown' or planted with a range of vegetation 'green' depending on the depth or the soil or substrate.
- An extensive roof will be implemented, which are generally light weight, with a thin layer of substrate and vegetation.
- An extensive sedum roof will be implemented, with high plants on the perimeter. These either take the form of Sedum mats or plug planted Sedum into a porous crushed brick material. Sedum roofs are relatively light weight and demand low levels of maintenance. They can be more readily fitted on to existing roofs.

FIGURE 17 – SEDUM ROOF



SEDUM IS A TYPE OF NATIVE VEGETATION. THEY ARE GENERALLY PLANTS WITH SHALLOW ROOTS AND THICK LEAVES.

10.0 SUSTAINABLE USE OF MATERIALS

- All existing building elements that are being retained will achieve an 'A rating' under the Green Guide for Specification.
- Whenever possible, new building elements will achieve an A rating under the Green Guide for Specification.
- Most of the new basic and finishing materials will be responsibly sourced, with proof gained either through compliance with an accredited scheme (E.g. FSC [Forest Stewardship Council] timber), or supplemented with an Environmental Management System for production.
- Materials with low Volatile Organic Compounds (VOCs) will be used throughout, including paints, coatings, carpets and sealants.
- Dedicated recycling bins will be provided for internal recycling facilities for glass, paper, cardboard, metal and food.

11.0 FLOODING

In accordance with the evidence (figures 18-21) the site is located in Flood Zone 1 – Very Low Probability of flooding– land assessed as having a 1 in 1,000 annual probability of river flooding (>0.1%).

FIGURE 18 - SITE LOCATION MAP





FIGURE 19 – SITE LOCATION- AERIAL VIEW



Page 31 of 41



FIGURE 20 – SITE LOCATION- BIRD'S EYE VIEW



Page 32 of 41

FIGURE 21 – ENVIRONMENT AGENCY FLOOD RISK MAP FOR PLANNING



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12.0 CLIMATE CHANGE ADAPTATION

The development whenever possible has made the following previsions for future climate change adaptation as follows:

- Exposed thermal mass
- High performance solar glazing
- External automated blinds
- Natural ventilation in main habitable rooms.

13.0 BIODIVERSITY

12.1 REQUIREMENTS

Biodiversity measures will need to be integrated into the design, as requested by Camden Council. There will be a green roof above the basement extension, including plants and bird boxes to reduce the impacts on biodiversity and enhance it wherever possible.

12.2 STRATEGY

- The construction of the proposed development will protect any existing ecological features of value. Protection includes clear exclusion procedures for construction traffic/personnel and material storage, as well as physical barriers.
- The trees and any other existing planting of ecological value will be protected according to British Standard BS 5837:2005 Trees in relation to Construction.
- Trees of over 100 mm trunk diameter, and/or of significant ecological value, will be protected by barriers. Barriers will prohibit construction works in the area between itself and the tree trunk. Minimum distance between tree trunk and

FIGURE 22 - PERSPECTIVE VIEW OF THE PROPOSED EXTENSION



368-150318 69 Fitzjohn's Ave-Sust Strategy 0

Page 34 of 41

barriers will be either the distance of branch spread or half tree height, whichever is the greater.

- In all cases trees will be protected from direct impact and from severance or asphyxiation of the roots.
- The school will adopt good horticultural practice by the use of no pesticides, and limited herbicides.
- Mulch (preferably bark chippings) will be used in and around trees, shrubs and flower beds.
- 75% of the planting will consist of native and shrub species, some of which will be berry forming. Native shrubs will be managed to provide dense cover for invertebrates and birds.
- The proposed landscaping proposals will include species that are rich in nectar and pollen to benefit common and widespread pollinators.
- Bird boxes suitable for common and widespread species, will be provided, including robin, blue tit and great tit within the development. The locations to be selected in consultation with an ecologist.
- The sedum roof will be designed with a planting scheme that will provides suitable habitat for invertebrates and black redstart.
- The contractor programs site works will be developed to minimize disturbance to wildlife, flora and/or fauna habitats exist on site. For example, site preparation, ground works, and landscaping have been, or will be, scheduled at an appropriate time of year to minimize disturbance to wildlife.

14.0 URBAN FOOD GROWING

Urban Food Growing can be defined as growing fruits, herbs, and vegetables in cities.

A process that is accompanied by many other complementary activities such as processing and distributing food, collecting and reusing food waste & rainwater, and educating, organizing, and employing local residents in a community. Urban Food Growing is integrated in individual urban communities and neighbourhoods, as well as in the ways that cities function and are managed, including municipal policies, plans, and budgets.

The energy-efficient nature of Urban Food Growing can reduce each city's carbon footprint by reducing the amount of transport that occurs to deliver goods to the consumer. Also these areas can act as carbon sinks offsetting some of carbon accumulation that is innate to urban areas, where pavement and buildings outnumber plants. Plants absorb atmospheric carbon dioxide (CO2) and release breathable oxygen (O2).

There are many social benefits that have emerged from Urban Food Growing practices, such as improved overall social and emotional well-being, improved health and nutrition, increased income, employment, food security within the household, and community social life.

As part of its learning / teaching programme the school with start a plan for urban food growing within the school. Composting from the kitchen will be used as a fertilizer.

FIGURE 23 – URBAN FARMING



15.0 CONCLUSION

This Sustainability Statement outlines the strategy for maximising the environmental performance of Devonshire House School located at 69 Fitzjohn's Av, London NW3 6PD.

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Devonshire House School is situated in the heart of Hampstead. The application site is located on a large 19th Century building currently in use as an independent preparatory school.

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APPENDIX A - SITE LOCATION PLAN



APPENDIX B – ENERGY AND CO2 EMISSIONS ZONES AS PROPOSED

BASEMENT - AS PROPOSED, ZONES IN PINK OUTLINE



GF - AS PROPOSED, ZONES IN PINK OUTLINE





3D VIEW OF THE BUILDING AS PROPOSED

