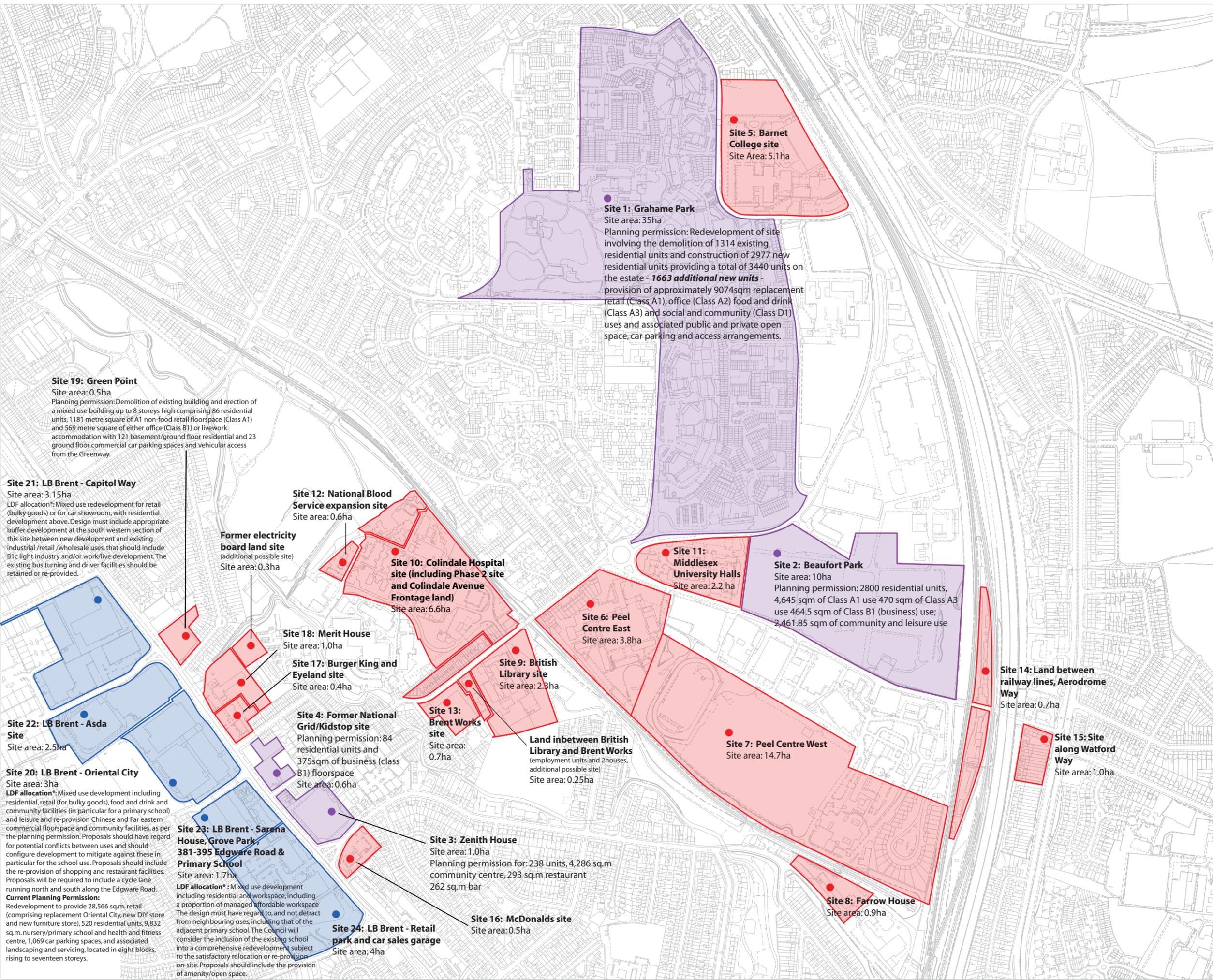


Appendix B: Colindale AAP Site Allocations and Land Use Assumptions



Site 19: Green Point

Site area: 0.5ha
 Planning permission: Demolition of existing building and erection of a mixed use building up to 8 storeys high comprising 86 residential units, 1181 metre square of A1 non-food retail floorspace (Class A1) and 569 metre square of either office (Class B1) or livework accommodation with 121 basement/ground floor residential and 23 ground floor commercial car parking spaces and vehicular access from the Greenway.

Site 21: LB Brent - Capitol Way

Site area: 3.15ha
 LDF allocation*: Mixed use redevelopment for retail (bulky goods) or for car showroom, with residential development above. Design must include appropriate buffer development at the south western section of this site between new development and existing industrial/retail/wholesale uses, that should include B1c light industry and/or work/live development. The existing bus turning and driver facilities should be retained or re-provided.

Former electricity board land site

(additional possible site)
 Site area: 0.3ha

Site 12: National Blood Service expansion site

Site area: 0.6ha

Site 10: Colindale Hospital site (including Phase 2 site and Colindale Avenue Frontage land)

Site area: 6.6ha

Site 18: Merit House

Site area: 1.0ha

Site 17: Burger King and Eyeland site

Site area: 0.4ha

Site 4: Former National Grid/Kidstop site

Planning permission: 84 residential units and 375sqm of business (class B1) floorspace
 Site area: 0.6ha

Site 13: Brent Works site

Site area: 0.7ha

Land inbetween British Library and Brent Works

(employment units and 2houses, additional possible site)
 Site area: 0.25ha

Site 11: Middlesex University Halls

Site area: 2.2 ha

Site 2: Beaufort Park

Site area: 10ha
 Planning permission: 2800 residential units, 4,645 sqm of Class A1 use 470 sqm of Class A3 use 464.5 sqm of Class B1 (business) use; 2,461.85 sqm of community and leisure use

Site 6: Peel Centre East

Site area: 3.8ha

Site 9: British Library site

Site area: 2.3ha

Site 14: Land between railway lines, Aerodrome Way

Site area: 0.7ha

Site 22: LB Brent - Asda Site

Site area: 2.5ha

Site 20: LB Brent - Oriental City

Site area: 3ha
 LDF allocation*: Mixed use development including residential, retail (for bulky goods), food and drink and community facilities (in particular for a primary school) and leisure and re-provision Chinese and Far eastern commercial floorspace and community facilities, as per the planning permission. Proposals should have regard for potential conflicts between uses and should configure development to mitigate against these in particular for the school use. Proposals should include the re-provision of shopping and restaurant facilities. Proposals will be required to include a cycle lane running north and south along the Edgware Road.
Current Planning Permission:
 Redevelopment to provide 28,566 sq.m. retail (comprising replacement Oriental City, new DIY store and new furniture store), 520 residential units, 9,832 sq.m. nursery/primary school and health and fitness centre, 1,069 car parking spaces, and associated landscaping and servicing, located in eight blocks, rising to seventeen storeys.

Site 23: LB Brent - Sarena House, Grove Park, 381-395 Edgware Road & Primary School

Site area: 1.7ha
 LDF allocation*: Mixed use development including residential and workspace, including a proportion of managed affordable workspace. The design must have regard to, and not detract from neighbouring uses, including that of the adjacent primary school. The Council will consider the inclusion of the existing school into a comprehensive redevelopment subject to the satisfactory relocation or re-provision on-site. Proposals should include the provision of amenity/open space.

Site 3: Zenith House

Site area: 1.0ha
 Planning permission for: 238 units, 4,286 sq.m community centre, 293 sq.m restaurant 262 sq.m bar

Site 16: McDonalds site

Site area: 0.5ha

Site 24: LB Brent - Retail park and car sales garage

Site area: 4ha

Site 5: Barnet College site

Site Area: 5.1ha

Site 1: Grahame Park

Site area: 35ha
 Planning permission: Redevelopment of site involving the demolition of 1314 existing residential units and construction of 2977 new residential units providing a total of 3440 units on the estate - **1663 additional new units** - provision of approximately 9074sqm replacement retail (Class A1), office (Class A2) food and drink (Class A3) and social and community (Class D1) uses and associated public and private open space, car parking and access arrangements.

- Development sites in Colindale AAP (except Watford Way site)
- Development sites within Colindale AAP with planning permission
- Development sites in London Borough of Brent

All site areas are approximate; ha = hectare
 *London Borough of Brent LDF Site Specific Allocations Submission Version November 2007

No.	Revision/Issue	Date



Project and Title:
Colindale AAP
 Plan to accompany Land use assumption table

Drawing Number:	CAAP/AJM/LUTPlan
Date:	29.05.2008
Scale:	N/A

Colindale AAF - Land use assumptions for SATURN Modelling - table 7.1 in Technical Note produced by Colin Buchanan

Location	Site number	Site Area (Ha)	PTAL	Existing land use	Land use (possible land use(s))	Density Applied dw/ha#	2011		2016 cumulative		2021 cumulative		Comments
							units*	Other uses	units*	Other uses	units*	Other uses	
Sites in Barnet													
<i>Grahame Park (Lanacre Avenue)</i>	1	35	1, 2	Residential, neighbourhood centre	Residential led mixed use (neighbourhood centre)	112	554	Various - see pp	1108	Various - see pp	1663	Various - see pp	1663 additional net units. Phasing unknown at this stage
<i>Beaufort Park (Aerodrome Road)</i>	2	10	1, 2	Vacant	Residential led mixed use (neighbourhood centre)	278	2800	Various - see pp	3200	Various - see pp	3200	Various - see pp	Planning permission for 2800 units; possible additional 400 units
<i>Zenith House (Edgware Road)</i>	3	1	3	Office/warehouse	Residential, restaurant, bar	195	215	Various - see pp	215	Various - see pp	215	Various - see pp	Possible scope for additional 100 units through a revised scheme
<i>Former National Grid/Kidstop Premises (Edgware Road)</i>	4	0.6	3	National Grid, Kidstop premises	Residential, BI use (375sqm)	140	84	BI (375sqm)	84	BI (375sqm)	84	BI (375sqm)	Currently being built
Barnet College (Grahame Park Way)	5	5.1	1	Barnet College (350 parking spaces)	Residential, primary school	112	0		428	Primary school	428	Primary school	A quarter of the site to be used for primary school. Overall, Grahame Park densities apply
Peel Centre East (Colindale Ave/Aerodrome Road)	6	3.8	2, 3	Residential + Met Police training	Residential-led mixed use	150	0		170	Retail	400	Retail	Higher density, higher PTAL close to Colindale tube
Peel Centre West (Aerodrome Road)	7	14.7	1, 2	Met Police training	Residential, employment, primary school	120	0		0	Primary school	1764	Primary school	Lower density, lower PTAL rating
Farrow House (Colindale Lane)	8	0.9	1	Met Police training	Employment	-	0		0	Employment	0	Employment	Assume same level of employment is provided. Site context suggests an employment-only site
British Library (Colindale Avenue)	9	2.3	3	British Library Storage facility (50 staff)	Residential-led mixed use (may result in employment loss)	150	0		345	Retail	345	Retail	Higher density, higher PTAL close to Colindale tube
Colindale Hospital (including frontage & Phase 2)	10	6.6	2, 3	Vacant, Nurses accommodation, Residential	Residential-led mixed use, Barnet College (50 parking spaces)	150	0		780	Barnet College, Retail	990	Barnet College, Retail	Higher density, higher PTAL close to Colindale tube. College includes construction facility
Middlesex University Halls (Grahame Park Way)	11	2.2	2	Student accommodation (600 beds)	Student accommodation-led (2000 beds - 50 staff) mixed use	-	0		0	Student village, retail	0	Student village, retail	Additional 1400 student bedrooms, potential retail on ground floor
National Blood Service expansion site	12	0.6	2	Vacant	National Blood Service expansion (employment)	-	0		0	Employment	0	Employment	Expansion of National Blood Service. Size of expansion not known at this stage
Brent Works (Colindale Avenue)	13	0.7	3	Vacant	Residential	150	0		105		105		Higher density, higher PTAL close to Colindale tube
Land between railway line (Aerodrome Road)	14	0.7	1	Vacant	Employment	-	0		0	Employment	0	Employment	Not suitable for residential use. Likely building 7-9,000 sqm
Site along Watford Way	15	1	1	Residential	Residential	100	0		100		100		Site includes block on corner fronting Aerodrome Road. Recent refusal due to noise, access and scale
McDonalds Site (Edgware Road)	16	0.5	2	McDonalds	Residential-led mixed use	200	0		100		100		Assume McDonalds remains. Higher density, opposite Zenith House, important corner site
Burger King & Eyeland site (Edgware Road)	17	0.5	2	Burger King, Eyeland	Residential-led mixed use	200	0		100		100		Assume Burger King and Eyeland remain. Higher density, fronting important transport corridor
Merit House (Edgware Road)	18	1	2	Office (approximately 350 parking spaces)	Residential, office (presume existing office use remains)	200	0		0		200		Assume some office use remains. Higher density, fronting important transport corridor
<i>Green Point (Edgware Road/The Greenway)</i>	19	0.46	3	Light industrial	Residential-led mixed use	200	86	Retail, office (see pp)	86	Retail, office (see pp)	86	Retail, office (see pp)	Planning permission recently granted at appeal 03/04/04. Includes total of 144 parking spaces
Sites in Brent													
<i>Oriental City (Edgware Road)</i>	20	3	2, 3	Retail	Retail, residential, primary school	181	0		520	Various - see pp	520	Various - see pp	LDF site allocation
Capital Way (Edgware Road)	21	3.2	3	Garage, light industrial	Residential-led mixed use	200	0		0		640		Assume existing uses remain. LDF site allocation
Asda site (Edgware Road)	22	2.5	2	Asda	Aud, residential	200	0		500		500		Assume existing uses remain. Higher density fronting important transport corridor
Sarema House & school (Edgware Road)	23	1.7	2	Light industrial, school	Residential, workspaces, primary school	200	0		0		340		Assume existing uses remain. LDF site allocation
Retail Park (Edgware Road)	24	2.6	2	Retail	Retail, residential	200	0		520		520		Assume existing uses remain. Higher density fronting important transport corridor
Total units in Barnet							3739		6821		9780		
Total other uses in Barnet								CB to advise on how these are accounted for		CB to advise on how these are accounted for		CB to advise on how these are accounted for	
Total units in Brent							0		1540		2520		
Total other uses in Brent								CB to advise on how these are accounted for		CB to advise on how these are accounted for		CB to advise on how these are accounted for	
Total units in Barnet and Brent							3739		8361		12300		
Total other uses in Barnet and Brent								CB to advise on how these are accounted for		CB to advise on how these are accounted for		CB to advise on how these are accounted for	

Notes:

Sites in red *italics* have planning permission; "Density applied" refers to the net density of the approved scheme

PTAL ratings approximate, taken from LB Barnet - Public Transport Accessibility Levels map revised September 2006

Density applied refers to residential net density only - dwellings per hectare. Density applied figures have regard to table 3A.2 of London Plan (2008) and table 4B.1 of Mayor of London's Supplementary Planning Guidance Housing. The densities applied are for traffic modelling only and may be subject to change at preferred options stage due to site specific urban design work.

* refers to residential units only. Units built by 2016 includes units built by 2011. Units built by 2021 includes units built by 2011 and 2016

N.B.Extract from paragraph 6.7 of Mayor of London's SPG Housing 'The table should not be seen as prescriptive, and should be applied flexibly in light of local circumstances, but is a valuable tool to help arrive at initial appropriate density ranges for particular sites. Higher densities may be possible where this can be justified by local circumstances'.

Table updated: 28.04.2008

Appendix C: SuDS Guidance

Table C-1: Summary of SuDS Techniques and their Suitability to meet the Three Goals of Sustainability

Management Train			Component	Description	Water Quantity	Water Quality	Amenity Biodiversity	
Regional	Catchment	Area	Site	Green roofs	Layer of vegetation or gravel on roof areas providing absorption and storage.	●	●	●
				Rainwater harvesting	Capturing and reusing rainwater for domestic or irrigation uses.	○	○	○
				Permeable pavements	Infiltration through the surface into underlying layer.	●	●	○
			Area	Filter drains	Drain filled with permeable material with a perforated pipe along the base.	●	●	
				Infiltration trenches	Similar to filter drains but allows infiltration through sides and base.	●	●	
				Soakaways	Underground structure used for store and infiltration.	●	●	
	Bio-retention areas	Vegetated areas used for treating runoff prior to discharge into receiving water or infiltration		●	●	●		
	Swales	Grassed depressions, provides temporary storage, conveyance, treatment and possibly infiltration.		●	●	○		
	Sand filters	Provides treatment by filtering runoff through a filter media consisting of sand.		●	●			
	Area	Basins	Dry depressions outside of storm periods, provides temporary attenuation, treatment and possibly infiltration.	●	●	○		
		Ponds	Designed to accommodate water at all times, provides attenuation, treatment and enhances site amenity value.	●	●	●		
		Wetland	Similar to ponds, but are designed to provide continuous flow through vegetation.	●	●	●		

Key: ● – highly suitable, ○ - suitable depending on design

Table C-2: Specific Drift Deposits Geology

Drift Deposit	Permeability	General Characteristics	Locations	Likely SuDS Measures
Alluvium	Variably Permeable	Generally clay with some gravel sand and silt	Found within Silk Stream river valley	Infiltration and combined infiltration/attenuation systems and attenuation systems e.g. permeable surfaces, sub surface infiltration, basins and ponds, swales and filter strips i.e. a combined system subject to water quality controls
River Terrace Deposits	Variably Permeable	Sandy gravel, clayey in places local veneer of clayey silt	May be present outside immediate Silk Stream river valley, on site ground investigations required to confirm presence and thickness	Infiltration and combined infiltration/attenuation systems and attenuation systems e.g. permeable surfaces, sub surface infiltration, basins and ponds, swales and filter strips i.e. a combined system subject to water quality controls

Table C-3: Specific Solid Geology

Solid Geology	Permeability	General Characteristics	Locations	Likely SuDS Measures
London Clay Formation	Impermeable	Clay, Orange brown becoming blue grey with depth, variably silty with thin sand and rare pebble beds. Some siltstone nodules and bands and Selonite Crystals, occasional shell fragments.	The dominant solid lithology across the district.	Attenuation systems e.g. basins and ponds, green roofs, tanks, rainwater harvesting etc

Introduction

The London Plan and the accompanying Supplementary Planning Guidance (SPG) includes policy recommendations regarding surface water drainage, which are discussed within section 3.4 of the main report. The SPG sets out the following essential and preferred standards, therefore

Essential Standards

- Use of Sustainable Drainage Systems, wherever practical;
- Achieve 50% attenuation of the undeveloped site's surface water run-off at peak times.

Mayor's Preferred Standard

- Achieve 100% attenuation of the undeveloped site's surface water run-off at peak times.

This appendix provides further information regarding potential SuDS techniques for use within the Colindale AAP.

Green Roofs

Within urbanised areas, space is often a large constraint to the use of SuDS measures. However, there is a large area of roof space that is currently under utilised which lends itself to the use of green roofs.

Green roofs are just that, they are a layer of vegetation, placed over a drainage layer that are designed to intercept and retain rainfall leading to a reduction in the volume of runoff. The use of green roofs can reduce the size of downstream SuDS and drainage infrastructure that is required.

According to the English Nature research report 'Green Roofs: Their existing status and potential for conserving biodiversity in urban areas', 71% of rain falling on a 100mm turf layer can be retained within the turf layer, greatly reducing storm water runoff.

There are two main types of green roof, extensive and intensive.

An extensive green roof is a covering of the whole roof area with low growing, low maintenance plants. They usually comprise of 25 – 125mm thick soil layer in which a variety of hardy, drought tolerant, low level plants are grown. Extensive green roofs are designed to be self sustaining and cost effective and can be used in a wide variety of locations often described as an 'ecological protection layer'.

Figure C. 1 - Illustration of an extensive green roof at Schiphol Airport, Amsterdam



(Source: The Green Roof Research Programme)

An Intensive green roof is a landscaped area which can include planters or trees and are usually publicly accessible. They may include irrigation and storage for rainwater. They often require more maintenance and impose a greater load on the roof structure than extensive green roofs. Some city parks are in fact intensive green roofs such as the parks within the Canary Wharf Estate, Canada Square and West Ferry Circus and the roof of Cannon Street Station in London.

Figure C.2 - Illustration of an intensive green roof in London



(Source 'Living roofs' website)

Rainwater Harvesting

Rainwater harvesting is also recommended as a potential mitigation method to reduce surface water flood risk. The rainwater harvesting process is essentially the collection of rainwater from roofs into containers, which can be stored above or below ground. The stored rainwater can then be re-used as and when required for every day non potable uses such as washing machines and toilets. Alternatively, collected rainwater can be released into the sewerage system once the rainfall event has subsided to reduce the risk of flooding and sewerage overflows.

Pervious Pavements

A further SuDS method that would be suitable for use in Colindale is permeable pavements. Pervious pavements allow rainwater to infiltrate through the surface into underlying construction layers where water is stored prior to infiltration to the ground, reused or released to a surface water drainage system or watercourse at an attenuated rate.

Pervious surfaces can be incorporated into soft landscaping and oil interceptors can be added to improve pollutant retention and removal. In urban areas where there is a high percentage of hard cover the use of pervious surfaces for car parks and hard areas is a valuable technique that should be used wherever possible.

While pervious pavements are a good choice of SuDS for use within Colindale, consideration of the proximity of basements and foundations must be made. Where pervious pavements are located within 5m of foundations or basements, an impermeable membrane liner is required to prevent infiltration.



Figure C.3 - Illustration of a Pervious Pavement using Block Paving
(Source CIRIA website)

Site geology should also be taken into account when deciding on suitable SuDS measures. Some SuDS systems rely on infiltration which due to the low permeability of London Clay may be technically unfeasible at many of the proposed sites.

If SuDS infiltration methods are proposed permeability tests should be carried out to establish infiltration rates.

Due to the geology throughout the study area, an integrated surface water management strategy could be developed which seeks to integrate a conventional piped drainage system (serving the individual site) and a wider SuDS system, which will attenuate runoff from the larger development area. These measures should be planned and incorporated in accordance with relevant policy and guidance such as PPS25, National SUDS Working Group (2004), BRE 365, CIRIA report C522 for SUDS, CIRIA 523 (SUDS Best Practice Manual) and CIRIA C697 (the SUDS Manual).

Construction Costs Considerations

The costs for installation of SuDS in the Collindale Area Action Plan depends on a number of factors including:

- Erosion and sediment control for construction,
- Material costs,
- Construction labour and supplies,
- Planting and landscaping, and
- Ongoing maintenance lifecycle costs, including regular minor activities and infrequent significant remediation.

Total costs will also depend on the scale of measures being installed. Sites that are predominantly retrofitting will be more expensive than where incorporated into new building developments. Single site installations will have higher unit costs than for multiple sites constructed simultaneously.

A guide to unit-rates for SuDS components is shown in the table below, sourced from the CIRIA SuDS Manual. Not included in this listing is Green Roofs, which is described further below.

Table 25.1 *SuDS components capital cost ranges (HR Wallingford, 2004)*

Component	Cost	Unit	2008 Cost*
Filter drain	£100- £140	/m ³ stored volume	£131-£184
Infiltration trench	£55-£65	/m ³ stored volume	£72-£85
Soakaway	> £100	/m ³ stored volume	>£131
Permeable pavement	£30-£40	/m ² permeable surface	£39-£52
Infiltration basin	£10-£15	/m ³ detention volume	£13-£20
Detention basin	£15-£20	/m ³ detention volume	£20-£26
Wetland	£25-£30	/m ³ treatment volume	£33-£39
Retention pond	£15-£25	/m ³ treatment volume	£20-£33
Swale	£10-£15	/m ² swale area	£13-£20
Filter strip	£2-£4	/m ² filter strip area	£3-£5

*2008 cost based on annual inflation of 7% for 4 years

Source: original table with 2004 costs from C697 CIRIA SuDS Manual

These base cost rates and inflation rates should be used for indicative purposes only. They are approximate values and should be confirmed prior to any decision making.

Green Roof Costs

Green roofs as a category vary widely in the types and associated construction costs, with cost factors including the degree of cultivation, landscaping and additional amenities incorporated into their area. Basic green roofs may consist of a gravel or grass media across the roof. A complex green roof may include extensive planting, an irrigation system that may also include stormwater harvesting, landscaping elements of paths, benches, feature planting, and public amenity items such as outdoor furniture and fittings with a high standard of fit-out. These value adding aspects can result in wide cost-ranges. Discussion and consultation with the involved architect can provide cost guidance for the specific sites and development types.

Anecdotal Construction Cost Evidence

Lamb Drove – SuDS residential scheme, Cambourne via Cambridge

Information sourced from http://www.ciria.org/suds/cs_lamb_drove.htm

Conclusions for the summary of the Lamb Drove SuDS project, at the website above include:

- Many aspects of SuDS can be installed and maintained at a lower cost compared to more traditional forms of drainage.
- In high density developments, SuDS are likely to rely more heavily on special treatments of hard areas (such as permeable paving or green roofs) with potentially higher costs and different maintenance requirements.
- The full attenuation of the 1 in 100 year storm within the development site boundary is both costly and difficult to achieve without the use of multi-use open spaces (e.g. public open space).

-
- SUDS should be implemented and integrated from the beginning of the design phase as part of a holistic approach to sustainable development. This should be at Master Planning stage and preferably as part of the Development Plan.
 - High quality specification and quality control in the construction phase is important to reduce whole life costs and future problems.



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