

5.14 Masterplan illustrating locations of design amendments - made as part of the substitutions issued to the GLA under the Refused Scheme



LEGEND		STRUCTURES		FEATURE	
<b>GENERAL</b>		<b>STRUCTURES</b>		<b>FEATURE</b>	
	Site Planning Application Boundary		Fence Type 1 1.2m high fence to street		Metrol Railway Track For use in future housing along railway
	School Planning Application Boundary		Fence Type 2 1.8m high fence to street	<b>LIGHTING</b>	
	Secondary School Boundary		Fence Type 3 1.8m high fence to street		Lighting Column 1.5m high street lighting
<b>PAVING</b>			Fence Type 4 1.2m high fence to street		Lighting Column 1.5m high street lighting
	Paving Type 1 Asphalt paving		New Footwall 1.2m high fence to street		Striped Lighting Mast 1.5m high street lighting
	Paving Type 2 Asphalt paving		Masonry pier 1.2m high fence to street		Striped Lighting Mast 1.5m high street lighting
	Paving Type 3 Asphalt paving		Existing Footwall Retained 1.2m high fence to street		Striped Lighting Mast 1.5m high street lighting
	Paving Type 4 Asphalt paving		Gate Type 1 1.2m high fence to street	<b>PLANTING</b>	
	Paving Type 5 Asphalt paving		Gate Type 2 1.2m high fence to street		Short Mown Grass
	Paving Type 6 Asphalt paving		Gate Type 3 1.2m high fence to street		Planting Mix Mixed grass and flower planting
	Paving Type 7 Asphalt paving		Gate Type 4 1.2m high fence to street		Rain Garden Planting Mixed grass and flower planting
	Paving Type 8 Asphalt paving		Gate Type 5 1.2m high fence to street		Low Shrub Planting Mixed grass and flower planting
	Paving Type 9 Asphalt paving		Gate Type 6 1.2m high fence to street		Hedge Type 1 1.2m high
	Paving Type 10 Asphalt paving		Gate Type 7 1.2m high fence to street		Existing Hedge
	Paving Type 11 Asphalt paving		Gate Type 8 1.2m high fence to street		Mature Planting Mixed grass and flower planting
	Paving Type 12 Asphalt paving		Gate Type 9 1.2m high fence to street		Existing Trees to be Retained Mixed grass and flower planting
	Paving Type 13 Asphalt paving		Gate Type 10 1.2m high fence to street		Proposed Trees
	Paving Type 14 Asphalt paving		Gate Type 11 1.2m high fence to street		
	Paving Type 15 Asphalt paving		Gate Type 12 1.2m high fence to street		
	Paving Type 16 Asphalt paving		Gate Type 13 1.2m high fence to street		
	Paving Type 17 Asphalt paving		Gate Type 14 1.2m high fence to street		
	Paving Type 18 Asphalt paving		Gate Type 15 1.2m high fence to street		
	Paving Type 19 Asphalt paving		Gate Type 16 1.2m high fence to street		
	Paving Type 20 Asphalt paving		Gate Type 17 1.2m high fence to street		
	Paving Type 21 Asphalt paving		Gate Type 18 1.2m high fence to street		
	Paving Type 22 Asphalt paving		Gate Type 19 1.2m high fence to street		
	Paving Type 23 Asphalt paving		Gate Type 20 1.2m high fence to street		
	Paving Type 24 Asphalt paving		Gate Type 21 1.2m high fence to street		
	Paving Type 25 Asphalt paving		Gate Type 22 1.2m high fence to street		
	Paving Type 26 Asphalt paving		Gate Type 23 1.2m high fence to street		
	Paving Type 27 Asphalt paving		Gate Type 24 1.2m high fence to street		
	Paving Type 28 Asphalt paving		Gate Type 25 1.2m high fence to street		
	Paving Type 29 Asphalt paving		Gate Type 26 1.2m high fence to street		
	Paving Type 30 Asphalt paving		Gate Type 27 1.2m high fence to street		
	Paving Type 31 Asphalt paving		Gate Type 28 1.2m high fence to street		
	Paving Type 32 Asphalt paving		Gate Type 29 1.2m high fence to street		
	Paving Type 33 Asphalt paving		Gate Type 30 1.2m high fence to street		
	Paving Type 34 Asphalt paving		Gate Type 31 1.2m high fence to street		
	Paving Type 35 Asphalt paving		Gate Type 32 1.2m high fence to street		
	Paving Type 36 Asphalt paving		Gate Type 33 1.2m high fence to street		
	Paving Type 37 Asphalt paving		Gate Type 34 1.2m high fence to street		
	Paving Type 38 Asphalt paving		Gate Type 35 1.2m high fence to street		
	Paving Type 39 Asphalt paving		Gate Type 36 1.2m high fence to street		
	Paving Type 40 Asphalt paving		Gate Type 37 1.2m high fence to street		
	Paving Type 41 Asphalt paving		Gate Type 38 1.2m high fence to street		
	Paving Type 42 Asphalt paving		Gate Type 39 1.2m high fence to street		
	Paving Type 43 Asphalt paving		Gate Type 40 1.2m high fence to street		
	Paving Type 44 Asphalt paving		Gate Type 41 1.2m high fence to street		
	Paving Type 45 Asphalt paving		Gate Type 42 1.2m high fence to street		
	Paving Type 46 Asphalt paving		Gate Type 43 1.2m high fence to street		
	Paving Type 47 Asphalt paving		Gate Type 44 1.2m high fence to street		
	Paving Type 48 Asphalt paving		Gate Type 45 1.2m high fence to street		
	Paving Type 49 Asphalt paving		Gate Type 46 1.2m high fence to street		
	Paving Type 50 Asphalt paving		Gate Type 47 1.2m high fence to street		
	Paving Type 51 Asphalt paving		Gate Type 48 1.2m high fence to street		
	Paving Type 52 Asphalt paving		Gate Type 49 1.2m high fence to street		
	Paving Type 53 Asphalt paving		Gate Type 50 1.2m high fence to street		
	Paving Type 54 Asphalt paving		Gate Type 51 1.2m high fence to street		
	Paving Type 55 Asphalt paving		Gate Type 52 1.2m high fence to street		
	Paving Type 56 Asphalt paving		Gate Type 53 1.2m high fence to street		
	Paving Type 57 Asphalt paving		Gate Type 54 1.2m high fence to street		
	Paving Type 58 Asphalt paving		Gate Type 55 1.2m high fence to street		
	Paving Type 59 Asphalt paving		Gate Type 56 1.2m high fence to street		
	Paving Type 60 Asphalt paving		Gate Type 57 1.2m high fence to street		
	Paving Type 61 Asphalt paving		Gate Type 58 1.2m high fence to street		
	Paving Type 62 Asphalt paving		Gate Type 59 1.2m high fence to street		
	Paving Type 63 Asphalt paving		Gate Type 60 1.2m high fence to street		
	Paving Type 64 Asphalt paving		Gate Type 61 1.2m high fence to street		
	Paving Type 65 Asphalt paving		Gate Type 62 1.2m high fence to street		
	Paving Type 66 Asphalt paving		Gate Type 63 1.2m high fence to street		
	Paving Type 67 Asphalt paving		Gate Type 64 1.2m high fence to street		
	Paving Type 68 Asphalt paving		Gate Type 65 1.2m high fence to street		
	Paving Type 69 Asphalt paving		Gate Type 66 1.2m high fence to street		
	Paving Type 70 Asphalt paving		Gate Type 67 1.2m high fence to street		
	Paving Type 71 Asphalt paving		Gate Type 68 1.2m high fence to street		
	Paving Type 72 Asphalt paving		Gate Type 69 1.2m high fence to street		
	Paving Type 73 Asphalt paving		Gate Type 70 1.2m high fence to street		
	Paving Type 74 Asphalt paving		Gate Type 71 1.2m high fence to street		
	Paving Type 75 Asphalt paving		Gate Type 72 1.2m high fence to street		
	Paving Type 76 Asphalt paving		Gate Type 73 1.2m high fence to street		
	Paving Type 77 Asphalt paving		Gate Type 74 1.2m high fence to street		
	Paving Type 78 Asphalt paving		Gate Type 75 1.2m high fence to street		
	Paving Type 79 Asphalt paving		Gate Type 76 1.2m high fence to street		
	Paving Type 80 Asphalt paving		Gate Type 77 1.2m high fence to street		
	Paving Type 81 Asphalt paving		Gate Type 78 1.2m high fence to street		
	Paving Type 82 Asphalt paving		Gate Type 79 1.2m high fence to street		
	Paving Type 83 Asphalt paving		Gate Type 80 1.2m high fence to street		
	Paving Type 84 Asphalt paving		Gate Type 81 1.2m high fence to street		
	Paving Type 85 Asphalt paving		Gate Type 82 1.2m high fence to street		
	Paving Type 86 Asphalt paving		Gate Type 83 1.2m high fence to street		
	Paving Type 87 Asphalt paving		Gate Type 84 1.2m high fence to street		
	Paving Type 88 Asphalt paving		Gate Type 85 1.2m high fence to street		
	Paving Type 89 Asphalt paving		Gate Type 86 1.2m high fence to street		
	Paving Type 90 Asphalt paving		Gate Type 87 1.2m high fence to street		
	Paving Type 91 Asphalt paving		Gate Type 88 1.2m high fence to street		
	Paving Type 92 Asphalt paving		Gate Type 89 1.2m high fence to street		
	Paving Type 93 Asphalt paving		Gate Type 90 1.2m high fence to street		
	Paving Type 94 Asphalt paving		Gate Type 91 1.2m high fence to street		
	Paving Type 95 Asphalt paving		Gate Type 92 1.2m high fence to street		
	Paving Type 96 Asphalt paving		Gate Type 93 1.2m high fence to street		
	Paving Type 97 Asphalt paving		Gate Type 94 1.2m high fence to street		
	Paving Type 98 Asphalt paving		Gate Type 95 1.2m high fence to street		
	Paving Type 99 Asphalt paving		Gate Type 96 1.2m high fence to street		
	Paving Type 100 Asphalt paving		Gate Type 97 1.2m high fence to street		

## 5.15 Conclusion

This report has outlined the landscape strategies for the establishment of a green and biodiverse environment for the new Secondary School.

The illustrative plans and the explanatory diagrams set out the principles for the arrangement of the outdoor spaces and their materiality. The masterplan for the school site has been designed to follow the original Concept Plan from LBRuT and maintain the open space character of the current site. The site plan includes a Multi-Use Games Area (MUGA), a Habitat Area associated with the school outdoor recreational facilities and, as part of Application A, the provision of a new Community Park along the Lower Richmond Road frontage.

The planting strategy, allowed for the planting of flower rich perennial planting, that will attract bees and birds, and provided a habitat area at the south-east corner of the school for educational purposes that meets the Education Funding Agency's and Department of Education's requirements.

Regarding trees, the landscape strategy proposed planting more than 60 new trees and retaining mature existing trees or tree clusters where possible. Native small trees will be located in a grove in the pocket park below the school, providing community access and educational opportunities for students.

Overall, the landscape proposals have created a rich green environment that will be a valuable new habitat for local fauna and contribute to the well-being of the students and the local residents.

## 6.0 Design Strategies

### 6.1 Security

The proposal aims at providing an attractive and safe environment in which to teach, work and learn.

The design balances the desire for improved security whilst still retaining a welcoming appearance. Principles of Secured by Design have informed the design and the building's limited points of entrance make controlling access and egress into the building much easier to monitor in terms of security.

The entrance provides an 'air lock' which can control visitors entering the school. The 'Community Sports Entrance' is positioned on the West facade and allows controlled access to the Sports Hall and sports pitches as well as associated changing rooms and storage areas out of hours. The remainder of the school will not be accessible to the community thus ensuring the safety of students and teaching facilities.

The proposals provide enhanced security to the site and school building. The new building will serve as part of the secure line controlling access into the site, thereby limiting the extent of fencing and providing a more welcoming frontage. Access into the school and grounds are well overlooked by the administration facilities. Existing mature trees are being retained wherever possible and a new weld mesh fence will be introduced to form a secure line around the school building and grounds and to control access and egress from the school grounds.

The entrance/exit points into the site are the key to maintaining the secure perimeter. Site entrances will be controlled wherever possible, with surveillance (either 'natural surveillance' or CCTV), and appropriate lighting covering these areas. The site security will consist of new weld mesh fence to the boundary.

Planting on the site will be maintained so as not to reduce the effectiveness of CCTV. Trees will not be allowed to mask lighting columns nor placed too close to buildings to provide climbing aids. Hidden, secluded spaces and corners have been designed out as far as possible. Trees and shrubs will be pruned to ensure clear lines of vision around the site. Planting will be maintained to create the impression of a well-cared for environment, which it is hoped, will discourage anti-social behaviour.

Within the simple plan layout of the new building and the strategic placement of doors, community sports facilities can be utilised independently as required. Staff and management facilities have been spread throughout the plan to provide passive supervision. This security strategy should facilitate the management of out-of-hours use of the building.

The design also considers the seven attributes of sustainability that are particularly relevant to crime prevention as set out in Safer Places – the Planning System and Crime Prevention.

The seven attributes of safe, sustainable places are:

1. Access and Movement: places with well-defined routes, spaces and entrances that provide for convenient movement without compromising security
2. Structure: places that are structured so that different uses do not cause conflict
3. Surveillance: places where all publicly accessible spaces are overlooked
4. Ownership: places that promote a sense of ownership, respect, territorial responsibility and community
5. Physical Protection: places that include necessary, well-designed security features
6. Activity: places where the level of human activity is appropriate to the location and creates a reduced risk of crime and a sense of safety at all times
7. Management and Maintenance: places that are designed with management and maintenance in mind, to discourage crime in the present and the future

### 6.2 Servicing, Refuse and Recycling

It is proposed that service and waste vehicles will serve the site via the new access road to the east of the site. Vehicle access and egress will be in a continuous single direction route and should not require vehicle turning. Service and refuse vehicles will be able to utilise the two bus parking spaces adjacent to the main entrance outside of school opening and closing hours. These spaces are adjacent to external bin store/recycling area as well as entrance doors and service corridor that lead to the school kitchen and storage areas. This will allow ease of kitchen deliveries and waste disposal.

Plant rooms that require direct external access are all arranged on the building facade at ground floor level and allow for ease of access for replacement and/or maintenance of equipment.

Occasional arranged access for maintenance and emergency vehicles as well as school buses for special trips will be provided via demountable bollards at the access to a generous pedestrianised area to the North of the Building.

Provision has been made for recycling and refuse bins within the refuse area adjacent to the main entrance to the school. Recycling facilities have been incorporated into the waste disposal area. These facilities are intended to encourage reuse and recycling, by providing storage for recyclable waste so that it does not deteriorate or become contaminated.

### **6.3 Cleaning and Maintenance**

In order to provide safe provision for cleaning and maintenance of the building a number of features have been incorporated or provided within the design:

- Stair access to roof level will be provided
  
- All accessible areas of the roof will be enclosed within free standing balustrades
  
- Plant areas have been arranged so that they can be easily accessible for maintenance purposes
  
- Cleaning of the façade may be from poles, or from mobile platforms
  
- The main building roof will be flat and balustraded to provide a safe area for accessing plant
  
- Internally, services will be accessible through ceilings and accessible containment

A full detailed Access, Cleaning and Maintenance Strategy will be developed further to the selection of a school operator.

## **7.0 Access**

### **7.1 General Vehicular Circulation and Deliveries**

The car parking spaces to the East of the site consist of 15 spaces of which 5 are disabled spaces. Two bus parking spaces are provided to the south of the car parking spaces and the main entrance to the school. This allows for the safe drop-off and collection of pupils via the generous gathering space next to the main entrance. These bus parking spaces will also be used as a means of access for emergency, maintenance and delivery vehicles.

### **7.2 Kitchen Deliveries and Refuse Collection**

Kitchen deliveries will be made via the bus parking spaces as described above. Deliveries will then be trolleyed along the path to the east of the building and in to the short service corridor that leads to the kitchen which is at the centre of the building plan.

Similarly, refuse collection will utilise the bus parking spaces as a means of access. Bins will be easily accessible from these spaces since the bin stores will be located on the adjacent Eastern boundary fence.

Deliveries and collection will be infrequent and arranged outside collection/ drop-off hours to avoid conflict with bus movements.

### **7.3 Pedestrian Circulation**

Pedestrians arrive at site to the eastern boundary via the proposed public footpath alongside the new access road to the east of the new school. This route connects to Lower Richmond Road and the wider area to the South of the site

Another new pedestrian avenue will be provided to the North of the school building. This will provide pedestrian links with Williams Lane and the wider context to the West of the site.

### **7.4 Cycle Parking**

Cycle parking is contained within the hard social area that is enclosed behind the secure line on the boundary fencing to the South East of the school. 84 spaces are provided and these spaces can be observed from the general office.

### **7.5 Maintenance Access**

Vehicular access gates permit access around the building perimeter for the purposes of maintenance for mobile access platform-type equipment.

### **7.6 Emergency Vehicle Access**

Fire access is proposed along the Northern, Western and Eastern building perimeters. In an emergency there is ambulance access to the hard social area that is adjacent to the playgrounds, sports pitches and social spaces around the building.

## 7.7 Inclusive Access

The new building has been designed to be accessible and inclusive. All spaces in the new building are accessible by all – the floors are flat, thresholds level, there is a lift serving all levels and there are no narrow doorways. Colour contrast will be used to define areas and highlight differences where appropriate.

The design proposals have been developed with reference to Approved Document M, the DfEs Building Bulletin 91 'Access for Disabled People to School Buildings', Building Bulletin 102 'Designing for disabled children and children with special educational needs' and BS8300: 2009 'Design of Buildings and their Approaches to meet the Needs of Disabled People – Code of Practice.'

It is envisaged that the lift will be accessible to all disabled students, staff and visitors by way of key operated or swipe card controlled access. It is not intended for everyday circulation, but only for mobility impaired persons or for moving heavy and bulky items between floors.

All of the spaces as far as possible will be designed to comply with BB93 and good practice acoustic design. Poor acoustics can have a significant negative impact on the educational development of children. Whilst adults can make guesses at words missed, children often find it harder to do so, and so wherever possible improvements will be made to the room acoustics, including sound insulation between spaces (airborne and impact), reverberation within teaching and study spaces and adequate sound absorption for corridors, stairwells and entrance halls. It is also envisaged that induction loops would be installed to assist those with hearing aids at strategic points throughout the building.

An inclusive design needs to consider all disabilities, and the design will cater for the visually impaired, those with poor manual dexterity, physical disabilities, and good practice design guidelines will be followed at all times, including:

- Clearly visible lift access
- Doorways all Part M compliant
- Flush thresholds across all entry and egress points
- Circulation widths to allow crossovers of movement
- Visual manifestation considered through changes of material
- Ironmongery and taps specified to ensure ease of use and good ergonomics
- Suitable WC facilities on all floors of the building

Parking – incorporates designated accessible parking spaces, is properly lit, and has appropriate markings.

Approach – The routes into the building are clear, will be signed and demarcated appropriately using landscape treatments. Changes in level have as far as possible been designed to meet the appropriate requirements.

Entrances – The entrance is clearly defined. Powered entrance doors will be provided. The entrance is staffed by a receptionist.

Staircases – are wide and designed to ambulant standards with handrails of appropriate type and position, closed risers and contrasting nosings.

Lift – There is a centrally located lift which is wheelchair compatible.

Learning Spaces – The learning spaces will be designed to accessible standards, be appropriately lit, incorporate height-adjustable furniture and have acoustic attenuation to meet BB93.

Emergency Evacuation – The building is designed with appropriate refuges to allow for managed and assisted evacuation.

## 8.0 Sustainability

### 8.1 Sustainability Strategies

The Sustainability Statement submitted in support of the application sets out the measures that will be implemented related to the sustainability of the School buildings and landscape. The sustainability measures are summarised below:

- Water - The school will be provided with water efficient fixtures, fittings and appliances.
- Materials - Building elements will be selected in accordance with the BRE Green Guide to Specification, with the aim of selecting elements in the range A+ to C to minimise environmental impact. A Resource Management Plan (RMP) will be produced that will outline how recycling of construction, demolition and excavation material can be maximised and reused on site. All timber used at the Proposed Development will be FSC certified and where possible and practicable materials will be locally sourced.
- Waste - The contractor will be required to produce and adhere to a RMP which clearly sets out requirements to maximise diversion of demolition and construction waste from landfill. The School will be provided with suitable internal and external waste storage facilities for the segregation of recyclable materials, designed to meet the requirements of BS5096 (Waste Management in Buildings), LBRuT policies and guidance and BREEAM.
- Transport - Secure cycle storage, changing and showering facilities will be provided for staff and pupils. The aim of such facilities is to encourage the use of sustainable transport.
- Biodiversity - Native species or species of benefit to wildlife will be incorporated where possible in the landscaped areas of the school grounds.
- Pollution - Systems at the the School will be selected to minimise emissions of Nitrous Oxide (NOx) and other pollutants which can lead to adverse air quality impacts. The School will be serviced through the provision of CHP engines with NOx abatement technologies and low NOx emission boilers to minimise the generation of air pollution, and cycling will be encouraged through the provision of cyclist facilities. These measures are consistent with those identified by LBRuT within their Air Quality Action Plan. Details are provided in the Environmental Impact Assessment. External luminaires will be selected with suitable output to direct lighting appropriately

to minimise light pollution and loss of light to the sky. The main contractor will operate to minimise the risk of pollution during construction and will be required to register with the Considerate Constructors Scheme.

### 8.2 Reducing Carbon Emissions

The Energy Strategy has demonstrated that through implementation of passive design and energy efficiency measures and the installation of air-source heat pumps (ASHPs), that overall the Proposed Development is anticipated to achieve a 23.8% reduction in regulated CO2 emissions beyond the requirements of the Building Regulations Part L (2013) 'baseline'.

Passive design measures to be implemented at the school include:

- a. Suitable glazing ratio and glass g-value (0.35) to balance heat losses, heat gains and daylight ingress
- b. Fabric insulation levels achieving improvements over Building Regulations Part L (2013) requirements of 25% - 100%
- c. Fabric air permeability achieving improvements over Building Regulations Part L (2013) requirements of 75% and 70% for dwellings and commercial spaces respectively

Energy efficiency measures to be implemented include:

- a. Efficient space heating systems with zonal controls linked to a BMS.
- b. Efficient low-energy lighting throughout. External lighting will be coupled to daylight sensors to minimise unnecessary use
- c. Efficient mechanical ventilation with heat recovery which will limit the need for space heating in winter months, aid the mitigation of high internal temperatures in summer months and maintain good indoor air quality
- d. Appropriately insulated pipework and ductwork (and air sealing to ductwork) to minimise losses and gains
- e. Variable speed pumps and fans to minimise energy

consumption for distribution of services

At this stage the School has been considered to include ASHPs to serve the school only. As the school is to be brought forward by LBRuT and not the Applicant, it has been considered to be serviced separately to the Proposed Development.

It is anticipated that with ASHPs, allowing for losses and pumping associated with distribution, could reduce regulated CO2 emissions by approximately 31 tonnes per annum. This is equivalent to a reduction of ~17.6% beyond the Building Regulations Part L 2013 'baseline'.

A summary of the anticipated CO2 emissions and reduction at each step of the energy hierarchy is given in Table 3 opposite.

### 8.3 Meeting Air Quality Standards

Systems at the School will be selected to minimise emissions of Nitrous Oxide (NOx) and other pollutants which can lead to adverse air quality impacts.

### 8.4 BREEAM for Schools

The school is targeting a score of 72.3% to achieve a BREEAM 'Excellent' rating as a minimum under BREEAM New Construction. A 'Fully Fitted' assessment has been assumed for the School.

Table 3: Summary of CO2 emissions reductions and carbon offset for Application B (School)

School Areas	Total Regulated Emissions (Tonnes CO2/ year)	Estimated Regulated Carbon Dioxide Emission Savings for the School	
		C02 Savings (Tonnes CO2/ year)	Percentage Savings (%)
Part L 2013 baseline	176	-	-
Be clean	166	11	6.3%
Be clean	135	31	17.6%
Be clean	135	-	-
Total Cumulative Savings	42	42	23.8%
Total Target Reduction	-	62	35%



## **9.0 Services, Structure and Fire**

### **9.1 Services**

The following MEP services are proposed to serve the school:

- Dedicated ASHPs providing LTHW heating and hot water. These will also provide chilled water for cooling.
- Heating via radiators generally, served from a variable volume secondary system.
- Heating and cooling via 4-pipe FCU in IT suites, with ASHPs located at roof level.
- Heating via UFH in sports hall and main hall
- Cold Water storage and boosted water pumping
- Dedicated electrical substation
- LV and Comms rooms with distribution to floor boxes in raised access floors
- Small power, Security, Fire Alarm, Comms, Lighting, smoke detection etc.
- Natural gas will be provided to serve the kitchen and specialist teaching areas such a laboratories etc.

### **9.2 Energy Management**

Energy meters shall be provided on the main central plant and linked to a Building Management System (BMS) to log and monitor the energy use of the various systems (heating, hot water, gas, electricity and cooling), in accordance with the latest Building Regulations and BREEAM requirements.

### **9.3 Electrical Infrastructure**

The electrical infrastructure will consist of the following:

- Dedicated electrical substation
- LV and Comms rooms with distribution to floor boxes in raised access floors
- Small power, Security, Fire Alarm, Comms, Lighting, smoke detection etc.

## **9.4 Ventilation and Cooling**

The ventilation system shall consist of the following systems:

- Full mechanical ventilation due to external acoustic constraints. This will be provided via Air Handling units with heat exchangers at roof level.
- High efficiency Air cooled chillers with variable volume pumping on the secondary circuit.
- Displacement ventilation via floor swirl diffusers – ductwork distribution in raised access floors (see notes floor and ceiling void requirements)
- Chilled beams/Multi-service beams, exposed mass/soffits
- All air system in sports hall/main hall
- Dedicated ventilation system to kitchen, consisting of kitchen extract plant with grease traps and filters.
- Local or central ventilation to toilet areas
- Specialist ventilation as required (Kiln room etc).

### **9.5 Lighting and Daylighting**

LED lighting will be provided throughout the school in line with best practice and be provided with lighting control to allow the zones within the classrooms to turn of automatically via PIR when there is sufficient daylighting.

### **9.6 External Lighting**

External lighting will be provided for general accessibility and safety around the building and entrances. There will also be flood lighting of the external play spaces, in particular the 3G pitch and the MUGA, which allow these spaces to be used for extended hours through the year.



