1 : SAMPLE CONTENT - BUILDING LOG BOOK

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1.1 BUILDING LOG BOOK

1.1.1 BUILDING HISTORY

1.1.1.1 Introduction

The log book should be reviewed annually as part of the organisations quality assurance system and an entry should be made for each review. Where the log book has been updated then the changed pages should be recorded.

1.1.1.2 Document History

Review Date	Description of Annual Log Book Review And Updates Made	Pages Updated or Added	Facilities Managers Signature	Date
April 2018	Document produced	All Sections		

1.1.2 PURPOSE & RESPONSIBILITIES

1.1.2.1 Purpose of a Building Log Book

This log book is an easily accessible focal point of current information for all those working in the building. It has four main functions:

1. **Summary of the building:** it is a summary of all the key information about the building, including the original design, commissioning and handover details, and information on its management and performance. In being a summary, it does not wholly duplicate or replace the OM manuals. The log book is necessary for compliance with Building Regulations Part L2 .
2. **Key reference point:** it is the single document in which key building energy information is logged. It may be regarded as the hub document linking many other relevant documents. The log book should provide key references to the detail held in less accessible OM manuals, BMS manuals and commissioning records. It should therefore be kept in a readily accessible (designated) position in the main building operations room and should not be removed without the approval of the facilities manager.
3. **Source of information/training:** it provides a key source of information for anyone involved in the daily management or operation of the building and to anyone carrying out work on the building and its services. It will be relevant to new staff and external contractors/consultants

and may play a role in staff training and induction.

4. **Dynamic document:** it is a place to log changes to the building and its operation. It is also used to log building energy performance and continual fine-tuning commissioning. It is essential that it is kept up-to-date. Alterations should only be made with the approval of the facilities manager and should be signed and dated by that person.

Further guidance on using building log books is given in the Carbon Trusts Good Practice Guide GPG 348: Building log books a users guide, available from www.carbontrust.com

1.1.2.1.1 This building log book was prepared by:

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1.1.2.1.2 Facilities manager responsible for log book

Company Name			
Address			
..			
..			
..			
Postcode		Phone	
Country		Fax	
www			

1.1.2.2 Key Responsibilities of Facilities Manager

1. To ensure that the log book is correct and up-to-date at building handover and when passing it on to a successor
2. To ensure that the log book is kept up to date on an ongoing basis including any changes to the building fabric, services, operation or management
3. To ensure that building maintenance and energy performance are logged
4. To ensure that all those working in the building are made aware of the information contained in the log book
5. To ensure that the log book is kept in its designated location at all times.

1.1.3 LINKS TO OTHER KEY DOCUMENTS

Refer to Health & Safety File Section for associated information.

1.1.4 MAIN CONTACTS

Refer to the Health & Safety File Project Section.

1.1.5 COMMISSIONING, HANDOVER AND COMPLIANCE

1.1.5.1 Commissioning Overview

Part L requires the building services systems be commissioned so that the system(s) and their controls are left in working order and can operate efficiently. CIBSE Commissioning Code M provides guidance on developing a commissioning plan and ensure that the systems operate correctly.

1.1.5.2 Commissioning

Commissioning Code (CIBSE)	Followed
Code A: Air Distribution Systems	Yes. Refer to the Mechanical O&M Manual
Code M: Commissioning Management	Yes. Refer to the Mechanical and Electrical O&M Manuals
Code B: Boilers	Yes. Refer to the Mechanical O&M Manual
Code C: Automatic Controls	Yes. Refer to the Mechanical O&M Manual
Code L: Lighting	Yes. Refer to the Electrical O&M Manual
Code W: Water Distribution Systems	Yes. Refer to the Mechanical O&M Manual

1.1.5.3 Commissioning Review

Commissioning Period	System & Controls Installed As Drawing	Does Operation Meet Design Spec In Required Modes	System Operates Efficiently In All Modes	Where No Indicate Problem & Remedial Works Etc,.
2018-12-01	Yes	Yes	Yes	

1.1.5.4 Air Infiltration

The air permeability test was carried out at The Primary School on 17/08/2018.
The building was designed to achieve 5.00 m3/(h.m) at 50 Pa.
The result of the air test was 4.95 m3/(h.m) at 50 Pa.

1.1.5.4.1 Supporting Documentation

Index	Reference	Description	Company	Link
5.6.5.4.1_001	10441899	Air PermeabilityTest Report	HRS SERVICES	Awaiting

1.1.5.5 Insulation Continuity

The building has been designed to ensure the insulation provided complies with the U values in accordance with Section 5 Model Designs as set out in the Approved Document Part L2A: 2003 Edition of the Building Regulations:-
External wall - 0.26W/m2k
Floor - 0.22W/m2k
Roof - 0.18W/m2k

Window/doors - 1.6W/m2k
Additional insulation has been provided where reasonably possible to eliminate thermal bridging.

1.1.5.6 Handover

Project	Handover took place on:	End of defect liability period:	The handover procedure was managed by:
Primary School	2018/08/31	2019/08/30	Mr Joe Bloggs - Main Contractor

1.1.6 OVERALL BUILDING DESIGN

1.1.6.1 General Description of Building

The scheme provides a new build 2 form-entry Primary School building within the grounds of The Academy, provided for pupils and members of staff and aims to provide an educational focused environment to enhance the learning experience of the attending pupils and staff.
The accommodation is generally formed of the following areas:

- Reception, General Teaching & Group Rooms
- Hall Area
- Manager,Staff and Administration areas
- Kitchen
- WC Facilities
- Circulation Spaces & Stairs
- Store Areas
- SEN (Special Educational Needs) Rooms
- LRC (Learning Resource Centre) Rooms

1.1.6.2 Design Criteria

External / Internal Conditions	-
Outside Summer Temperature	28 ºC dry bulb
Outside Winter Temperature	- 4.7 ºC dry bulb
LTHW Heating Flow/Return Temperatures	80/60ºC

1.1.6.3 Conceptual Design

1.1.6.3.1 Mechanical Conceptual Design

Domestic Services
Upon entry into the plantroom the incoming potable cold water supply shall serve a new packaged fluid category 5 storage tank and twin booster set.
Dedicated secondary ‘Category 5’ type packaged break tank and booster set shall be installed to serve the Hygiene room, the plantroom and generally where there is a potential risk of back syphonage due to the use of hose union taps or other high-risk outlets. This unit is located in a suitable store room/ceiling void local to the Hygiene rooms/required outlets.
The buildings domestic hot water service shall be generated from the gas fired high efficiency boilers

to serve an indirect hot water storage cylinder.

Heating

A variable temperature (VT) LTHW heating circuit shall typically serve the admin/office areas, admin support, WC's and circulation area heating requirements. These areas will predominantly be served from wall mounted radiators complete with tamper proof thermostatic radiator valves on flow and lock shield valves on return pipework.

Ceiling mounted radiant panels shall serve the stair areas, and the larger WC areas where the wall space is restricted. These shall be controlled from wall mounted tamperproof thermostats connecting to 2-port motorised control valves.

A constant temperature (CT) LTHW heating circuit will serve the supply ventilation heater batteries within the ground floor Kitchen, and external roof mounted AHU. A separate constant temperature (CT) LTHW heating circuit will serve the floor standing domestic hot water storage cylinder within the ground floor plantroom.

Variable Refrigerant Flow (VRF) systems shall provide simultaneous heating and cooling via indoor ducted fan coil units to serve classroom areas, and support spaces generally as indicated on the ventilation layout drawings. The units shall be concealed within the ceiling void and ducted to supply diffusers.

Noise Attenuation shall be provided via duct mounted attenuator's, with additional attenuators matched to the VRF fan coil units as required to mitigate plant noise.

A dedicated roof mounted variable volume supply & extract air handling unit shall be provided to serve the ground floor Main Hall area. This unit shall provide a tempered fresh air supply to meet with occupancy demands, as well as the heating and cooling requirements to the space. The AHU has an inbuilt heating/cooling direct expansion heat pump unit. A LPHW CT heater battery shall also be included for heating start-up purposes.

Ventilation:

All teaching classrooms shall be provided with mechanical ventilation with heat recovery to ensure enough fresh air is provided to achieve a daily average concentration of carbon dioxide during the required period of less than 1000ppm and so that the maximum concentration does not exceed 1,500ppm for more than 20 minutes each day. Night cooling will also be incorporated into the design where necessary to prevent summertime overheating.

Variable Refrigerant Flow (VRF) systems shall provide heating via indoor ducted fan coil units to classroom areas and support spaces as indicated on the ventilation and air conditioning layout drawings. The units shall be concealed within the ceiling void and ducted to diffusers complete with attenuation.

When outside air is introduced into a teaching space ventilation air and room air will be mixed to avoid cold draughts during wintertime. In wintertime, the minimum air temperature of air delivered to the occupied zone at 1.4m above floor level shall be not more than 5°C below the normal maintained air temperature.

Other support spaces with openable windows shall be naturally ventilated. Support/administration spaces without openable windows shall be provided with heat recovery supply & extract ventilation at 8 l/s/p.

Toilets, showers & changing rooms shall be provided with mechanical extract ventilation at a minimum rate of 10 air changes/hour and cleaners rooms with a minimum of 5 air changes/hour with make-up air transfer from adjacent areas via door under cutting/door transfer grilles as required. Local extract fans shall be controlled from a combination of the BMS, PIR or local lighting circuits.

The kitchen shall have a fully gas interlocked supply and extract ventilation canopy and system to suit the kitchen ventilation requirements in compliance with DW172 regulations. The kitchen ventilation

plant shall be located within the kitchen ceiling void. Fans shall be provided with proportional speed control.
The Main Hall shall be provided with a separate supply and extract packaged air handling unit (AHU) to ventilate and heat the space. The AHU shall be located on the Kitchen rooftop plant area.
Supply and extract ventilation ductwork shall route externally from the AHU before entering the hall ceiling void at high level to serve ceiling mounted louvre faced ventilation grilles. The supply air will be tempered before it enters the space via an inbuilt heating/cooling direct expansion heat pump unit.
The unit shall connect to the BMS system and be controlled with temperature and air quality sensors located within the space. When the sensor registers a specified CO2 concentration or elevated temperature, the fan speed shall increase.

Plantroom Installation:

2No. new wall mounted natural gas fired high performance condensing LTHW heating boilers shall be installed, with the connection of a separate indirect LTHW high efficiency hot water storage calorifier to serve all of the schools heating and hot water requirements.
A packaged cold-water break tank and booster set arrangement shall be used to provide potable domestic hot (via cylinder) and cold water supplies to serve all sanitary outlets throughout the school.

1.1.6.3.2 Electrical Conceptual Design

Lighting:

For general lighting LED's have been utilised. The full light output from LEDs are instantaneous so when switched on they don't take time to warm up and work better with automatic controls and daylight dimming.

Daylight saving control is provided to all areas where there is natural daylight. When the lights come on and there is sufficient day light in the room they will immediately dim down to a pre-set level dependant on the required luminance for that room such as detailed in the SSLD4.

For classrooms, other teaching areas and staff areas occupancy detection sensing set to absence detection is provided, this requires the luminaires to be switched on manually via a retractive switch and will then switch off automatically after a pre-set time if no one is detected in the room.
For corridors, toilets, store rooms etc. occupancy detection sensing set to presence detection is provided, this enables the luminaires to be switched on automatically and switched off after a pre-set time without sensing any occupancy. A key switch override is provided to all areas to enable the lighting to be switched on should this be required.

The kitchen and dining areas are manually controlled via standard switches, the kitchen for safety reasons and the dining area for functional reasons.

The emergency lighting installation utilises stand-alone LED automatic self-testing fittings.

Small Power:

For a general classroom power and data is provided at the Teacher space adjacent to the proposed Interactive AV device. A double outlet point mounted at high level is provided for a PoE wireless access point to each teaching space. In addition, there is a socket outlet in each room designated as a cleaner's socket which will be on a separate circuit to the sockets supplying the ICT equipment in

the room.

Fire Alarm System:

Fire Alarm system is based on a minimum of BS 5839: 2013 Category L2 system. Disabled Refuge Intercom is provided between the Disabled Refuge points on each floor and at the point of entry by the emergency services. Fire Alarm & Disabled Refuge Panels are located within the Main Entrance Lobby.

Security System:
Security alarm Movement detectors are provided to all perimeter rooms with accessible windows and door contacts to external doors.

Access Control provided to Main Entrance and CCTV is provided to externally to the building perimeter and internally to entrance.
External Services:

Security lighting has been provided to the perimeter of the building. Lighting has also been provided to the car park and adopted road to enable safe movement in hours of darkness.

1.1.6.4 Design Assessment

Carbon Emissions were assessed at Design Stage and were estimated to be 43,308 kg CO_2/ annum which achieves an A rating.

1.1.6.5 Key Interactions

The following interactions are important for the operation of the building:

- Gas solenoid interlock to kitchen supply ventilation
- Gas solenoid interlock with boilers
- Fire alarm link to fire dampers
- Fire alarm interlock to ventilation control panel
- $C0_2$ Sensors control classroom fans
- PIR control of Fans & Lights
- PIR control of water supplies in WCs
- Access control interact with locked doors to fail safe upon fire alarm activation

1.1.6.6 Key Do's and Don'ts

Do:

1. Monitor the heating plant via the BMS to ensure good operation.
2. Ensure regular maintenance and monitoring is carried out.

Don't:

1. Override the control time clock settings and operate plant 24 hours/day, 7 days/week.
2. Overheat the building / introduce additional heat gains (equipment or personnel which will

exceed the design parameters).
3. Run the plant at full speed during periods of non-occupancy.
4. Leave non essential equipment and lighting on during periods of non-occupancy.

1.1.7 SUMMARY OF AREAS & OCCUPANCY

1.1.7.1 Occupancy

The total occupancy for the School is 420 pupils.

Please see document Appendix for occupancy number schedule provided by Blue Sky.

1.1.7.2 Floor Areas

The total floor area of the School building is 2095.59 m^2 (based on the info provided by the Design Engineer in the table below).

Area Type	Untreated (%)	Naturally Ventilated (%)	Mechanically Ventilated (%)	Mixed Mode (%)	Heating and Cooling Only (%)	Full Air Conditioning with Humidity Control (%)	Total (%)	Total Area (m^2)
Classroom	0.00%	0.00%	20.19%	42.39%	0.00%	0.00%	62.58%	1311.5
Office	0.00%	2.89%	3.27%	0.00%	0.00%	0.00%	6.17%	129.22
Hall	0.00%	0.00%	11.71%	0.00%	0.00%	0.00%	11.71%	245.44
Kitchen	0.00%	0.00%	2.75%	0.00%	0.00%	0.00%	2.75%	57.57
Circulation	0.00%	6.07%	0.00%	0.00%	0.00%	0.00%	6.07%	127.12
WC	0.00%	0.00%	6.38%	0.00%	0.00%	0.00%	6.38%	133.7
Plant	1.10%	0.00%	0.00%	0.00%	0.00%	0.00%	1.10%	23.02
Store	0.00%	2.97%	0.00%	0.00%	0.00%	0.00%	2.97%	62.27
Server	0.00%	0.00%	0.27%	0.00%	0.00%	0.00%	0.27%	5.75

1.1.7.3 Tenancies

Not applicable.

1.1.7.4 Separately Managed & Special Areas

Not applicable.

1.1.7.5 Floor Plan

Refer to Section 5 of the Building O&M Manual for the General Layout Drawings.

1.1.8 SUMMARY OF MAIN BUILDING SERVICES PLANT

1.1.8.1 Summary of Main Plant & Equipment

Main plant items are shown below. The equipment schedules located within the Mechanical and Electrical O&M Manuals Schedule Sections provide further details.

Main plant	Location	Input	Output
EWH 0/01 Electric Water Heater	0-28	3 kW	3 kW
EWB 0/01 Electric Water Boiler	1-21	2.4 kW	2.4 kW
B01/B02 01/24 Gas Fired Boilers	0-45	173.3 kW	152.1 kW
COND 01/02 External Condensing Unit	0-52	2.61 / 2.60 kW (Nominal Heating / Cooling)	2.43 kW
COND 01/01 External Condensing Unit	0-52	15.86 / 14.83 kW (Nominal Heating / Cooling)	2.28 kW
COND 00/01 External Condensing Unit	0-52	12.93 / 12.57 kW (Nominal Heating / Cooling)	-
OVD_0001 Overdoor Heater	0-13	-	6 kW

1.1.8.2 Electrical Distribution

A low voltage (LV) supply has been provided to the School by the local supplying authority from their local network. The supply serves a main LV MCCB panel that in turn serves combined/split lighting and power MCB distribution boards as well as general power and lighting MCB distribution boards that deliver the final circuits to the building. Further final circuits are also provided from the main LV MCCB panel to isolators for items such as Air Conditioning Systems, Lifts, etc.

1.1.8.3 Lighting

The School has been provided with a complete lighting installation which has designed and installed to provide general, functional, decorative and display lighting using energy saving LED lamp technology which significantly minimises the carbon footprint of the School.
The School has been provided with emergency lighting to meet the necessary requirements and to effect the safe evacuation in the event of loss of power to the building or local area circuits.

External lighting has been installed to provide functional illumination to the School's entrances/exits.

1.1.8.4 Domestic Water Services

Cold Water
The School is provided with a Mains Cold Water Service (MCWS) from the local supplying authority. This MCWS serves a tank and booster set that deliver a Booster Cold Water Service (BCWS) to the building for domestic use and hot water via an indirect calorifier served with heat energy by the School's LTHW Heating System.
The BCWS also provides pressure and make-up water for the LTHW Heating System as well as Category 5 BCWS to the Hygiene/Shower Room and for wash down purposes.
Hot Water
The School has been provided with Hot Water Services (HWS) via an indirect calorifier that uses heat energy from the School's LTHW Heating System.
Direct, electrical water heating is also provided for the Category 5 HWS in the Hygiene/Shower Room and facilities for a water boiler are provided in the Staff Room.

1.1.8.5 Natural Gas Service

The School has been provided with a Natural Gas Service by the local supplying authority in order to directly provide the heat energy medium for its LTHW Heating System and Hot Water Service.

A service is also installed to the Kitchen for catering purposes.

1.1.8.6 Heating

fired boilers along with associated items of plant installed in the Mechanical Plantroom. The system generally distributes heat throughout the building via wall mounted radiators and ceiling mounted radiant heat panels although heat is also distributed to the Kitchen and Main Hall via the Mechanical Ventilation System through heater batteries located within air handling units.
The system also provides the heat energy medium for the School's general Hot Water Service.
An electrical overdoor heater is provided to the main entrance.

1.1.8.7 Ventilation

The School is provided with Mechanical Ventilation Systems using supply and extract heat recovery units and an air handling unit (for the Main Hall) that recover heat/cooling from the air extracted from the areas served and re-introduce it into the supply air path should the building be calling for heat/cooling.
Dedicated toilet extract systems are also installed to serve the WCs, Changing Rooms, Cleaner's Rooms, Hygiene/Shower Room, etc. and the Kitchen and Servery are provided with supply and extract systems that are interlocked with the catering appliances gas supply.

1.1.8.8 Air Conditioning

The School's larger teaching areas have been provided with cooling and heating via variable refrigerant flow (VRF) Air Conditioning Systems with external condensers that serve fan coil units in the rooms/areas served in conjunction with the Mechanical Ventilation Systems
A further, direct expansion (DX) Air Conditioning System is also provided that provides cooling for the Server Room.

1.1.8.9 System Schematics

Refer to Section 6 in the Mechanical and Electrical O&M Manuals for the various schematic drawings.

1.1.9 OVERVIEW OF CONTROLS/BMS

1.1.9.1 Controls Layout

The School has been provided with a Building Management System (BMS) to control and/or monitor various facets of the building's Mechanical and Electrical Services including utility metering.

The works were installed by the Specialist Installer who provided a DDC (Direct Digital Control)

System, using a Motor Control Centre (MCC) to access and serve plant.

1.1.9.2 Main Control Monitoring Functions

The BMS for the School is provided by an MCC in the Mechanical Plantroom that houses a BMS controller and display as well as all necessary power distribution, switch gear, relay logic, etc. as required for the automatic control of the plant and environmental control devices installed. All components within the MCC are accessible, maintainable, adjustable and replaceable if necessary via the front of the panel. All items of plant fed from the MCC are provided with local, appropriately sized and IP rated isolators.

HAND/OFF/AUTO or OFF/AUTO switches are provided on the panel fascia where appropriate for all controlled items of plant as a method of pre-isolation or for manual override of control.
The Mechanical Plantroom's gas safety shut-off system described in the Natural Gas Supply System Section is also operated by the BMS. The manual emergency push button at the entrances/exits to/from the Plantroom also activates the system as does the rise in temperature over the boilers automatically as detected by heat detectors.
The MCC is responsible for the control and/or monitoring of the building's LTHW Heating System (boilers, pumps, etc.) and for the monitoring of the Boosted Cold Water Service (BCWS) tank/booster set, Category 5 break tank/booster sets (x2), LTHW pressurisation unit, VRF and DX Air Conditioning Systems, heat recovery units (HRUs) as well as the monitoring of the incoming Mains Cold Water Services (MCWS), Gas and Electricity utility supplies.

1.1.9.3 Authorised Personnel

End User may wish to insert the name of those with authorised passwords to the BMS system changes.

1.1.10 OCCUPANT INFORMATION

1.1.10.1 Your Working Environment

In order to achieve a good working environment it is important that you understand how to control the building services in your space.

1.1.10.2 Heating

The School's LTHW Heating System is enabled overall by the BMS under a time schedule and is based on demand for temperature from the building, however the boilers are operated via their own controls
The heating pumps are supplied with power, protected and controlled from the BMS, for more details on all of the above items refer to the BMS Controls Section.
The heater batteries distribute heat as per the dictates of the BMS and temperature sensors installed in the areas served.
The radiators are controlled locally by thermostatic radiator valves. The radiant heat panels are also controlled locally by thermostatic radiator valves however these are fitted with remote adjustable

heads.
The overdoor heater is controlled by its integral ON/OFF, speed and temperature controls.

1.1.10.3 Ventilation/Air Conditioning

Ventilation

The heat recovery units are controlled by their integral controls and by remotely mounted controllers that allow the user to adjust fan speed and temperature settings, refer to the Manufacturer's Literature in Section 4 of this Manual for further details.

The air handling unit for the Main Hall is controlled by its integral controller and is enabled and monitored by the BMS. Temperature control is via the BMS and local temperature sensors.
The Kitchen supply and extract fans are controlled by the Kitchen's Gas Safety Shut-Off System panel such that the flow of gas cannot ensue if either fan is not operating or failing to deliver the required amount of fresh air/air movement, refer to the Natural Gas Section for further details.

In general, the extract fans run constantly at trickle speed by their integral controls and run up to boost speed upon detection of occupancy via the lighting PIR detectors.

Air Conditioning

The VRF and DX Systems are enabled by the BMS and are controlled by wall mounted controllers that are each equipped with an integral temperature sensor and a liquid crystal display that provides the user with temperature and fan speed settings, ON/OFF and timer functions, etc.

The systems and each unit's operational statuses are also monitored by the BMS.

1.1.10.4 Lighting

Within the circulating areas and WCs throughout the building, the lighting is controlled based on presence detection with passive infra-red (PIR) and microwave sensors that detect occupancy. The presence detectors switch the lighting ON automatically when detecting occupancy. The supply is maintained to the luminaires for a pre-determined, user defined period after the room is left unoccupied at which time the lights are switched OFF. The PIR occupancy detectors also provide the switching of the extract fans and the water shut-off valves in the WCs, Hygiene/Shower Room, etc., refer to the Mechanical Services O&M Manual for further details.
In the teaching rooms/spaces, offices, stores, etc., the lighting is controlled based on absence. The lighting is switched ON manually at retractive switches by the user and is switched OFF automatically after a pre-set period of inoccupancy as detected by the PIR detectors.
The Hall lighting is controlled by a scene setting controller that allows the user to select pre-set light levels and to manually increase or reduce light levels.
The lighting situated adjacent to windows is also controlled automatically to decrease/increase based on the amount of ambient lighting available. The evaluation of light levels is undertaken by the PIR detectors.
Each area/room is provided with a manual key switch that overrides the automatic controls.
In the Kitchen and Plantrooms, the lighting is manually controlled by local wall mounted switches.

External Lighting

The building's external lighting is controlled by programmable time switches in the PE Store and external photocells. The photocells switch the particular external luminaires they control ON when the ambient lighting level drops below that of the minimum required and the programmable time switches switch OFF the luminaires at the following pre-set times (holding OFF until dusk):

- Car Park and Roadways - ON at 15:00, OFF at 00:00 and ON at 05:00, OFF at 09:00.
- Security (including staff and pupil cycle storage) - ON at 15:00, OFF at 09:00

Override controls are also provided in the PE Store.

1.1.10.5 Windows

Where openable, windows are manually opened and closed.

1.1.10.6 Shading

Shading can reduce solar gain and glare on sunny days and can reduce the need for cooling.

1.1.10.7 Office Equipment

The more PCs, printers etc. are left on unnecessarily, the more likely that your space will overheat. This also wastes energy - make sure any energy saving features are turned ON to power down equipment automatically after a certain time.

1.1.10.8 Simple energy Do's & Don'ts

1. Ensure windows and doors are closed when heating or cooling systems are in use and only operate one system at a time, do not heat and cool simultaneously.
2. Avoid blocking ventilation grilles with furniture and books as this will result in a lack of heating/ventilation.
3. Set thermostats to the required temperature then leave them alone. Do not use them as ON/OFF switches.
4. Do not overheat or over-cool your space as this increases running costs and causes extra emissions of CO_2 into the external atmosphere, contributing to global warming.
5. Only switch the lights ON as and when necessary as they result in significant emissions of CO_2 into the external atmosphere, contributing to global warming.
6. Shut windows at night for security purposes and to prevent heat loss that could make your space cold when you come in the next day
7. Ensure that PCs, printers etc. are not left ON unnecessarily and have any energy saving features enabled as this will prevent your space from overheating and save energy, thereby reducing CO2 emissions to the external atmosphere that lead to global warming.

Refer to the following web site for further information:-
www.carbontrust.co.uk

1.1.11 METERING MONITORING AND TARGETING STRATEGY

1.1.11.1 Metering Schedule

The following provides a list of meters and design estimates of the likely end use consumptions. See CIBSE TM39 : Building energy metering, for an example, including how to arrive at a good metering schedule. CIBSE TM22 : Energy assessment and reporting method also provides a means of assessing energy use in buildings.

1.1.11.1.1 Consumption

Total estimated yearly consumption of Water, Gas and Electricity. Gas and Electricity estimates are as follows:

Category	Annual Energy Consumption (MWh)
Gas	35.59
Electricity	69.33

These can be broken down into the following sub-categories:

Category	Annual Energy Consumption (MWh)
Heating	18.32
Cooling	3.35
Auxiliary	3.18
Lighting	17.57
DHW	21.17
Equipment	41.33

1.1.11.1.2 Metering

Type of Incoming Energy	Main End-Use	Estimated End-Use Consumption	Meter no./ code	End Use/Area /System/ Circuit Or Tenancy To Be Measured	Measurement Method And Calculation Where Appropriate	Estimated Consumption Through Each Meter	List Of Meters	Location
Electricity	Incoming	69.33 MWh	n/a	Incoming	Meter	69.33 MWh	Main	Electrical Plantroom
Water	Incoming		n/a	Incoming	Meter		Main	Mechanical Plantroom
Gas	Incoming	35.59 MWh	n/a	Incoming	Meter	35.59 MWh	Main	Gas Meter Enclosure outside Plantroom

1.1.11.2 Metering Strategy

Read the meters yearly and log the readings on the meter reading pro forma in a separate file. From these readings add up the energy consumption for each end use for the year and log these in the building performance section. (A meter reading pro forma template is provided on the CD-ROM associated with CIBSE TM31).

1.1.12 BUILDING PERFORMANCE RECORDS

1.1.12.1 Overall Annual Energy Performance

Summary of overall annual electricity, fossil fuel consumption and CO_2 against simple benchmarks. Examples of these calculations and tables are shown in Good Practice Guide GPG 348: Building log books a users guide. A copy is included on the CD-ROM issued with CIBSE TM31 ; printed copies are available from (www . thecarbontrust .co. uk).
Building energy performance for period from [_____] to [_____]
Based on a gross floor area of 2095.59 m ^{2} (as advised by Design Engineer)

Energy Consumption Table

Total estimated Carbon Emissions for the building (including typical and good practice) are as follows:

Category	Annual Carbon Emissions (kg CO_2/ m^2)		
	Actual Building	Typical Building	Good Practice
Gas	3.67	35.424	24.408
Electricity	16.99	16.608	11.418

Typical and Good Practice estimates are taken from CIBSE Guide F (Third Edition).

Energy Consumption

This value may change year to year due to changes in the mix of electricity generation plant. Current figures are available from the Energy and Environment Helpline (0800 585 794) or www.actionenergy.org.uk
Ensure that actual consumption figures do not include estimated bills and ensure they relate to a full exact 12 month period. (If not then record actual and adjust by number of days missing/extra). Use the total gross floor area shown in section 5.
Multiply column (A) by column (B) to get (C) then divide by treated total building floor area to get (D) for comparison with benchmarks in columns (E) and (F). One overall performance indicator can be established by totalling column (D). Avoid adding column (A) as the fuels have different costs and CO_2 factors.
CIBSE TM22 : Energy assessment and reporting methodology provides software to help assess building energy performance using either a simple or a detailed approach. This includes benchmarks for a variety of buildings. A wider range of benchmarks is available in the series of Energy Consumption Guides produced by the Carbon Trust (www . thecarbontrust .co. uk), e.g. ECG019 : Energy use in offices, and CIBSE Guide F: Energy efficiency in buildings.

1.1.12.2 Asset & Operational Ratings

END USER to insert the asset and/or operational ratings taken from any energy certification process and enter into the table below.

Date	Asset Rating	Method Used	Operational Rating	Method Used

Date	Asset Rating	Method Used	Operational Rating	Method Used

1.1.12.3 Energy End Use Comparison

Annual summary of actual metered consumption per square metre and the design teams estimates versus benchmarks broken down by main end-uses.
Building energy performance for period from [_____] to [_____]
Based on a gross floor area of 2095.59 m ^{2} (as advised by Design Engineer)

Fuel Type	Main End Use	Actual Metered Incoming Consumption ((kW h)/Yr)	Actual Sub-Metered Main End Use Energy Consumption ((kW h/m^2)/Yr)	Design Estimates Main End Use Energy Consumption (kW h/m^2)/Yr	Good Practice Benchmark Main End Use Energy Consumption (kW h/m^2)/Yr
Electricity	Small Power				
Electricity	Lighting				
Electricity	Mechanical Services				
Electricity	Air Conditioning				
Total Electricity					
Gas	Heating				
Gas	Hot Water				
Gas	Catering				
Total Gas					

1.1.13 SUMMARY OF MAINTENANCE

1.1.13.1 Emergency Maintenance Action

For emergency action contact the School/Academy's Caretaker Mr J Bloggs on 0202 123 4567 extension 1234. t

1.1.13.2 Maintenance Overview

END USER to insert a summary of the general arrangement for maintenance including any maintenance contracts and who is responsible for which main systems.

1.1.13.3 Maintenance Review

Review Period ..../..../..... Signed.....	1. Are You Reasonably Satisfied With The Maintenance On This System? (Yes/No)	2. Is This System Capable Of Working In All The Required Modes? (Yes/No)	3. If Not, Is This Due To Poor Maintenance? (Yes/No)	Comments/Problems? E.G. Maintenance Not Carried Out (Give Reason)

1.1.13.4 Maintenance Review

END USER / Facilities manager to insert a summary of any major plant failures and how these relate to the maintenance regimes or contracts. This should describe what happened, when, why and what action was taken to overcome the problem.

1.1.14 RESULTS OF IN-USE INVESTIGATIONS

1.1.14.1 Defects Liability Work

END USER / Facilities manager to insert a summary of any major remedial work in the period between practical completion (handover) and the end of the defects liability period.

1.1.14.2 Sea Trials

END USER / Facilities manager to insert a summary of any initial 'sea trials' which involve members of the design team monitoring and fine-tuning the building after practical completion (handover).

1.1.14.3 Post Occupancy Evaluations

END USER / Facilities manager to insert a summary of any post occupancy evaluations, e.g. investigations of energy performance and/or occupant satisfaction.

1.1.14.4 Surveys

END USER / Facilities manager to insert a summary of results from any maintenance, condition or energy surveys.

1.1.14.5 Inspections

END USER / Summary of results of boiler or air conditioning inspections required under the EU directive 'Energy Performance of Buildings' and any actions taken.

1.1.15 APPENDIX: RELEVANT COMPLIANCE AND TEST CERTIFICATES

This appendix should act as a focal point to hold copies of all relevant key certificates/test reports etc.

1.1.15.1 Appendices

Link	Reference	Description
View	TC001	Test Cert 001