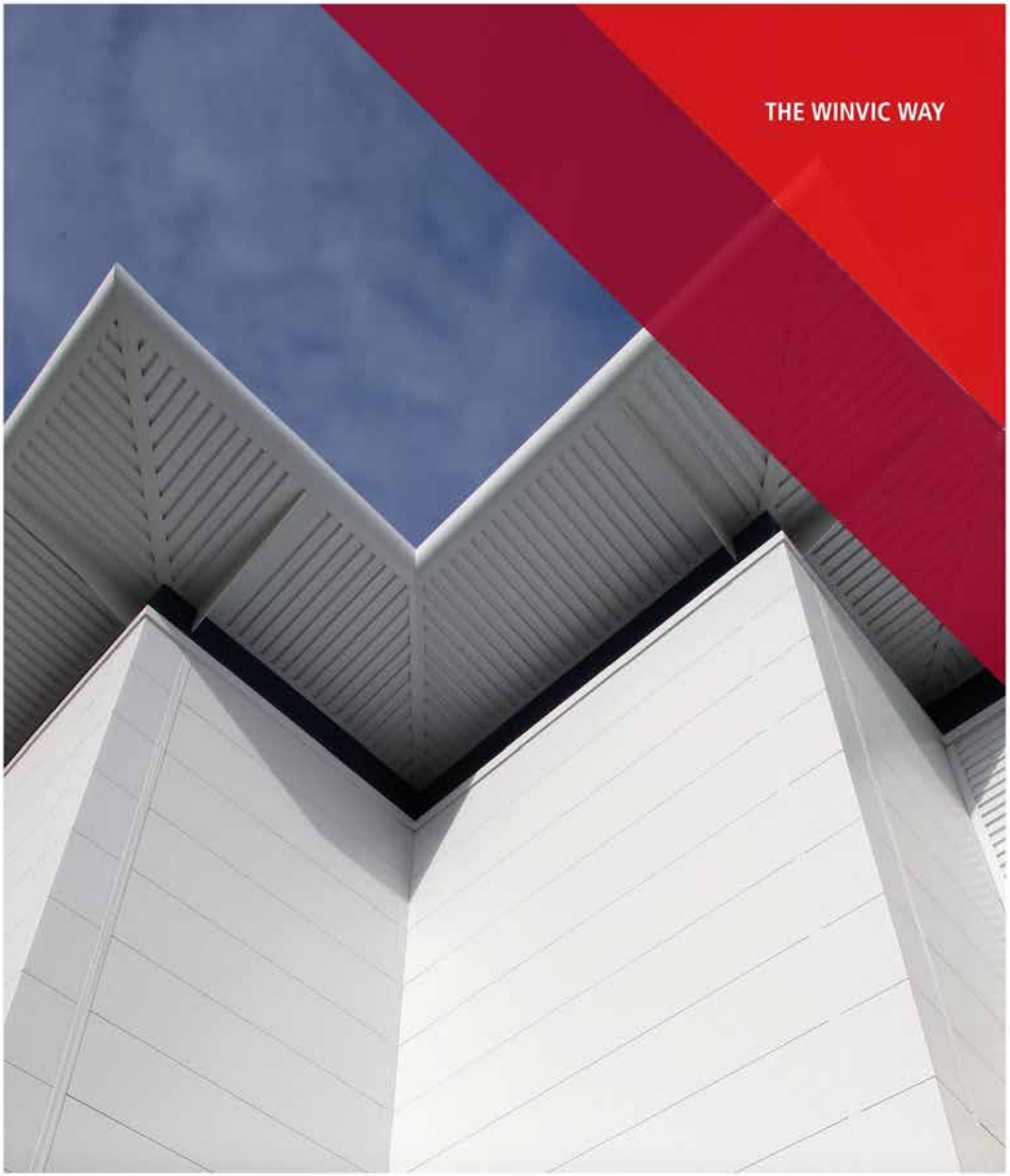
2.2.7 Building Log Book



P21-024 CALDER PARK

Wakefield

Building Logbook | May 2022

winvic

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BUILDING LOG BOOK

CALDER PARK

Project Ref	P21-024
Revision:	First Issue
Prepared by:	Carter Electrical Services / WINVIC
Reviewed by:	Darren Johnston
FM Responsible:	TBA Client End User
Date	May 2022

This building log book is analogous to a car handbook, providing the facilities manager with easily understood information about how the building is intended to work. It also allows ongoing building energy performance and major alterations to be recorded.

Please ensure that this log book is kept up-to-date and in a readily accessible (designated) position, e.g. in the main building operations room. It contains important information for anyone carrying out work on the building and its services.

This log book is always kept in: ... TBA Client End User

Electronic master is kept at: ... TBA Client End User

Contents

1. Updates and Annual Reviews

The log book should be reviewed annually as part of the organisation's 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.

Review date	Description of annual log book review and updates made	Pages updated or added	Facilities manager's Signature	Date
	Document handed over			

1. Purpose and Responsibilities

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:

- **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 O&M manuals. The log book is necessary for compliance with Building Regulations Part L2.
- **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 O&M 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.
- **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 is relevant to new staff and external contractors/consultants and may play a role in staff training and induction.
- **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 Action Energy Good Practice Guide GPG 348: *Building log books — a user's guide*, available from www.actionenergy.org.uk

This building log book was prepared by:

Winvic Construction Ltd
Brampton House
Moulton Park
Northampton
NN3 6PZ

Dated: May 2022

Facilities manager responsible for log-book:…….

Signed:……..

Contact No:……..

Signed:…… Date:……

Key responsibilities of facilities manager:

— To ensure that the log book is correct and up-to-date at building handover and when passing it on to a successor
— 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
— To ensure that building maintenance and energy performance are logged
— To ensure that all those working in the building are made aware of the information contained in the log book
— To ensure that the log book is always kept in its designated location.

2. Links to Other Key Documents

Document	Location
Emergency Procedures	Section 1 of the O & M Manual
Health and Safety	Section 1 of the O & M Manual
Schedule of Hazards Associated with Materials Used	Section 1 of the O & M Manual
Record Drawings	Section 3 of the O & M Manual
Equipment Log Books (e.g. Boiler log book)	With Equipment
Testing & commissioning certificates & reports	Section 2 of the O & M Manual
Plant & Equipment data	Section 2 of the O & M Manual

3. Main Contacts

Emergency Contact Name 1	TBA Client End User
Emergency Contact Name 2	TBA Client End User
Electricity Emergency Contact	TBA HVSS
Gas Emergency Contact	0800 111 999 (CADENT)
Water Emergency Contact	0800 573 553 (Yorkshire Water)
Lead Designer Contact Name	HTC Architects David Wainwright 0113 2443457
Building Services Design Contact Name	Carter Electrical Services: Darren Carter
Principle Contractor	WINVIC Construction 01604 678960
Mechanical Services Installer	Carter Electrical Services: Darren Carter
Commissioning Managers Name	WINVIC Construction Darren Johnston
Electrical Services Installer	Carter Electrical Services: Darren Carter
Planning Supervisor Name	Assent Building Control 01455 289997
O&M and Log Book Author Name	WINVIC Construction
Mechanical & Electrical Consultant	The Engineering Practice 01926 436010
Facilities Management Contractor Name	TBA Client End User
Maintenance Contractor Name	TBA Client End User

4. Commissioning, Handover and Compliance

Commissioning overview

CIBSE Commissioning Code	Followed? (Yes/No)	Certificate included in appendix? (Yes/No)
Code M: Commissioning Management	Yes	No Section 8 O & M Manual
Code A: Air Distribution Systems	Yes	No Section 8 O & M Manual
Code C: Automatic Controls	Yes	No Section 8 O & M Manual
Code L: Lighting	Yes	No Section 8 O & M Manual
Code R: Refrigeration	Yes	No Section 8 O & M Manual
Code W: Water Distribution Systems	Yes	No Section 8 O & M Manual

Commissioning results

Commissioning period **07.12.15 to 18.12.15** **Signed:**	**1. Were the system and its controls installed as shown in the design drawings? (Yes/No)**	**2. Did operation meet the design specifications in all the required modes? (Yes/No)**	**3. Did the system operate efficiently in all modes? (Yes/No)**	**Comments/problems?** Where the answer is NO, indicate any commissioning problems or significant changes that have been made to the designs during (or as a result of) installation/commissioning, or any value engineering exercises, including any significant commissioning failures and remedial work that took place.
Emergency lighting				
Lift				
Lightning protection				
Ventilation				
Heat Recovery Ventilation				
Toilet Extract Ventilation				
VRF/Split DX Systems				
Electric HWS Heaters				
Automatic Controls				
VRF Fan coil units				
Fire alarm				
Disabled Refuge System				
Disabled WC Alarm				
Office Lighting Control				
EV Chargers				

Air infiltration

A building air pressure test was carried out on the …… and showed a measured air permeability of ……..which was within the specified target refer to building manuals for full rest report.

Handover

Handover took place on:	XX XXXXXXXX XXXX
End of defects liability period:	XX XXXXXXXX XXXX
The handover procedure was managed by:	Gareth Orchard (Project Manager)

The documents handed over are listed in section 3 – Key Documents

5. Overall Building Design

General description of building

The following mechanical services have been provided:

- External mains cold water distribution pipework & entry location within the offices
- Heat recovery units internally located, extract ventilation serving toilets. ductwork distribution incorporating attenuators, fire dampers, volume control dampers and room air terminals.
- Mains cold water services system to serve all cold outlets within the building, incorporating, pipework, valves, controls and thermal insulation.
- Hot water served via local water heaters.
- Toilet extract system.
- An above ground drainage system to remove waste water from all sanitaryware appliances throughout the buildings to drain.
- Thermal insulation to all domestic hot and cold-water services as necessary.
- The chlorination of all domestic hot and cold-water systems serving all new installations.
- Commissioning and balancing of all plant & equipment

The following electrical services have been installed:

- LV Main Panel Board, Sub Split Metered Power & Lighting Distribution Boards for both the office and the warehouse, a distribution board to cater for the external services.
- Primary cable basket containment systems within ceiling voids with secondary containment consisting of PVC conduit drops within wall fabric. Basket containment has been installed within the floor void for future data use.
- Designated cleaner's sockets are installed within the perimeter walls. An Electrak under floor power track system has been installed within the office areas to provide a flexible power solution, floor boxes have 2xTSSO with integral RCD protection & 4G data plate for future utilization. Hand dryer power supplies for future use by end client have been installed.
- Power supplies to mechanical equipment to include extract ventilation, electric panel heaters, water heaters, heating and cooling equipment and BMS system.
- Internal lighting with automatic presence / absence control, dimming facility within office areas.
- External lighting consisting of perimeter low level LED fittings to illuminate walkways to the side and rear of the building, high level, high power LED fittings to the front of the building to adequately illuminate the loading areas and lighting columns for the car park areas.
- Emergency Lighting throughout the office and core areas, exit signage within the warehouse & external bulkheads above doors.
- Life safety systems include Fire Alarm, Accessible WC Alarm and Disabled Refuge System.
- Electric vehicle chargers within car park complete with back of house load management and charge management facility.
- Testing & Commissioning of all services.

Client requirements

The services to the building have been designed in accordance with all relevant building regulations
And the design criteria detailed below:

Mechanical Design Criteria

Design Criteria – Unit 1, Quedgeley East Business Park

The following design parameters have been employed when carrying out of all design works.

External	
Winter	
Summer	

Internal				
Area	**Temperature**		**Infiltration**	**Mechanical**
	Winter	***Summer***		
Offices				
Reception Areas				
Toilets				
Stores/Cleaners				
Circulation Areas				
Frost Protection to Office				
Warehouse				

Internal Heat Gains	
Occupancy	
Lighting	
Small Power	
Occupancy	
Offices	
Fresh air temperatures	
Winter	
Summer	
Air filtration	
Office fresh air supply	
Noise Criteria	
Office Areas	
Toilets	
Circulation Areas	
Cleaners	
External	
Hot & Cold-Water Services	
Max Velocity	
Pressure Drop	
Ductwork	
General Supply & Extract Systems	
Max duct velocities	
Max louvre face velocity	
Max duct pressure drop	

Special design features

The services are energy efficient based on high efficiency heat recovery air handling units, zoning of VRF comfort cooling/heating, high efficiency VRF heat pump cooling/heating systems, use of a building management system and high efficiency lighting.

Design assessment

In accordance with the requirements of the Building Regulations Part L2 carbon emissions were assessed using the carbon emissions method. This showed the annual carbon emissions of the building were proved to be no greater than that of from a notional building of the same size and shape designed to comply with the elemental method.

The assessment carried out on the building and issued to Building Control verified that the building fabric meets with the minimum performance levels stipulated and the plant and equipment selected for the M&E services systems were within maximum carbon emission limits. The submission to Building Control also demonstrated that the M&E systems were controlled in such a way the energy wasted was minimised.

Key interactions

The HVAC systems will interact with the building, zone and individual room occupancy to offer increased energy savings.

The VRF central controls system is paramount in ensuring that the high efficiency & modern technologies employed on this building are used to their maximum effect to maintain indoor air temperature and quality during variances in outdoor weather and occupancy changes. The offices are split into several heating/cooling zones throughout the building to ensure optimum conditions and energy efficiency.

Office lighting is controlled via PIR's with a maximum of 6 fitting / PIR. Daylight override is provided to the main offices consisting of perimeter zones to the windows 4m deep by 6m long maximum with adjustable level sensing to provide dimming to 10% of maximum.

The building management system is integrated to the energy saving controls employed within the building to provide monitoring, profile checks, logging and maintenance reporting.

Benefits and limitations of the design

Supply ventilation to comply with building regulations has been installed to the occupied offices and areas, it should be noted that occupancy densities over the stated design criteria and occupancy levels figures may result in insufficient air quality to this space and this should be monitored, and corrective balancing measures taken to comply with building regulation Part F.

The building provides excellent natural lighting to the offices due to large expanses of external glazing and glazed partitions to internal cellular offices.

All temperature-controlled areas of the building are provided with small or individual control zones fitted with adjustable temperature sensors, these temperature sensors operate the VRF fan coils and can be used for mode selection, temperature adjustment, fan speed etc. The core areas are fitted with electric panel heaters with integral temperature control.

Key ‘dos and don’ts’

Do:

1. Monitor heating, cooling and ventilation via the controls to ensure good operation
2. Be aware of all risks
3. Monitor energy usage within the building, this will enable the facilities manager to adjust timed starts/holiday periods etc to avoid excessive energy waste.
4. Follow the manuals regarding regular maintenance
5. Consult the relevant person for advice and instruction if required
6. Employ specialists to service and maintain major plant items and systems including air source heat pump, solar thermal, rainwater recovery, VRF systems and controls, this will ensure their continued efficiency and use.
7. Consult with control specialist to request further training and demonstrations if necessary, this will ensure that the building management system is operating to its best with regards to the specific building.

Don’t:

1. Operate the plant 24 hours/day, seven days a week unless occupancy hours dictate this
2. Overheat the building
3. Leave heat generating equipment/machines left on unnecessarily and have energy saving features enabled as this will prevent your space from overheating and save energy
4. Open windows if cooling system operational.
5. Adjust set points or control logic from that set up without prior consultation with consultants or energy manager.

6. Summary of Areas and Occupancy

Occupancy and activities

The total number of occupants in the building is…… (Based on core hours of use)

Main occupied areas	Weekday hours	Saturday hours	Sunday hours	Total hours/week	Flextime (Yes/No?)	Late working sometimes (Yes/No?)	No. of occupants
Office Block							

Insert a summary of the main activities in each different zone of the building. Insert a summary of the likely occupancy patterns including numbers of people and occupancy periods.

Floor areas

The total floor area is m^2 (based on gross floor area)

	% Of total area by servicing system						Total %	Total area (m^2)
Area type	Untreated	Naturally ventilated	Mechanically ventilated	Heating Only	Heating & Cooling	Heated & Ventilated		
Office								
Reception/Offices								
Toilets								
Corridors/Circulation								
Cleaners								
Risers/Lifts								
Warehouse								
Total (%)								
Total area (m^2)								

Tenancies

Not applicable

Separately managed and special areas

Not applicable

Floor plans

7. Summary of Main Building Services Plant

The main energy using plant installed at the site at handover is the condensing boilers, water heaters, VRF air conditioning systems & ventilation systems.

Main plant items are shown below. The operation & maintenance manuals provide further detail.

Main plant	Location	Input (kW)	Output (kW
AC External Condensers	External Compound		
Heat Recovery Units	Ceiling Void		
Water Heaters	Cleaners, Toilet Area's & Kitchen		

SYSTEMS:

Mechanical Services

Drawings:

Description	Drg No:
Domestic Water Services Layout	
DX Heat Pump/VRF Services Layout	
Public Health Services Layout	
Ventilation Services Layout	
Mechanical Wiring Layout	
External Services	

MAIN OFFICES

ELECTRIC HEATING

The toilets, corridor and stairs and where not heated by VRF heat pump system and heat loss is in excess 200 watts heating are to be provided with standalone electric panel heater with integral time and temperature control.

MAINS COLD WATER SERVICES

A new MDPE protectaline cold water main enters the hub office within the warehouse at gridline E/11 and terminates with isolating valve, double check valve, drain cock and leak detection check meter. From this incoming location the mains cold water adapts to copper.

Mains cold water services pipework distributes within the warehouse and ceiling voids to serve the following equipment/systems:

- Electric Hot Water Heaters
- All cold outlets including WC's

Mains cold water pipework is installed to all outlets with service valves within 300mm of the appliance.

All pipework where concealed, within voids, plantrooms or risers is fitted with Koolphen phenolic thermal insulation with identification applied in accordance with the specification.

HOT WATER SERVICE

The domestic hot water to the warehouse office is provided from local instantaneous, vented and unvented electric hot water heaters.

The hot water is generated locally from a Zip multi-point unvented electric water heater located at low level in the toilet IPS and vanity units, Zip instantaneous water heaters located below basins in the disabled toilets and unisex WC's

The unvented water heaters are fitted with expansion kits consisting of isolating valve, check valve, pressure reducing valve, expansion vessel and pressure relief valve. The pressure relief valve discharges to Hepworth dry traps within the vanity unit or IPS.

To ensure hot water is provided to the draw off without delay lengths of uncirculated pipework will be kept to a maximum of 3m for unblended water and 2m after any blending valve installation.

Thermostatic blending valves or blending taps are incorporated on hot water outlets to disabled wash basins. Cleaner's sinks, tea room sinks and general basins shall be supplied with unregulated hot water, service valves are fitted within 300mm of the appliance or associated blending valve.

All pipework where concealed and within vanity unit are fitted with phenolic thermal insulation with identification applied in accordance with the specification.

PUBLIC HEALTH SERVICES

The public health installation is installed throughout the building to collect the soil and waste from each sanitary appliance. The installation shall also prevent the transmission of foul air in to the building. Ventilated stacks and branch pipes shall be installed throughout the floors and shall discharge to atmosphere with bird cage or be fitted with air admittance valve within the void.

All appliances discharge foul water into stacks installed to concealed locations within IPS or voids etc, each stack is fitted with an inspection cover at 1.0m a.f.f.l. on each floor. Fire collars are fitted where the p.v.c. pipework passes through fire compartments.

The soil and waste pipework is grey UPVC soil pipework and white MUPVC waste pipework all manufactured by Geberit Terrain and solvent welded throughout.

VRF HEAT PUMP

The ground & first floor offices & meeting rooms are serviced with the installation of a Daikin variable refrigeration volume air conditioning system with heat recovery. One system is installed in total as below:

- System 1 – Ground floor reception & first floor open plan office.

The air conditioning system has the flexibility to provide heating and cooling simultaneously to all units, which means that two adjacent spaces can be operated differently at any one time due to the incorporation of solenoid valve kits to the system.

Condensers are sited externally within a compound remote from the building and are charged with R410A refrigerant gas which when activated pumps the refrigerant around the systems to a series of solenoid valve kits via refrigerant grade pipework insulated with class O armaflex on galvanised metal tray. The solenoid valves are energised in the correct sequence to give heating or cooling within the dedicated space.

The indoor evaporator elements of the system are all ducted fan coil units concealed within the ceiling void. This equipment contains the evaporator coil, filter and fan. The fan coil fresh air is supplied to the rear of the fan coil via galvanised sheet metal ductwork.

From the fan coil discharge plenum secondary air insulated galvanised ductwork & flexible ductwork is extended to square louvre faced diffusers where ceilings are installed with blanking plates fitted to the neck of the diffuser to ensure correct throws and terminal velocities.

The diffusers are fitted with galvanised plenum boxes with side entry spigots and connected to galvanised ductwork with flexible insulated ductwork a maximum of 500mm long. All plenum boxes on conditioned air is provided with acoustic and thermal lining internally.

Open diffusers of a matching style to the supply diffusers are to be used for extracting vitiated air into the ceiling plenum and then to the filtered rear of the fan coil unit.

All the indoor units are connected via a two-wire control cable to a central controller mounted on the BMS panel facia, this allows each individual unit to be addressed and controlled independently. All indoor units are fitted with return air sensors mounted within the filter section of the fan coil, room controllers are also fitted within each serviced space to allow user

Grey MuPVC condense pipework is installed within the ceiling void and connects to all indoor units the unit drains are either pumped from an integral pump. These condense drain terminate with 32mm Hepworth HepVo dry traps to local soil stacks.

SUPPLY & EXTRACT VENTILATION

The first floor is provided with supply and extract ventilation by two packaged heat recovery air handling units located within the ceiling void of each floor.

The air handling unit incorporates the following equipment:

Supply Side	-	F7 filter
	-	Recuperator
	-	Supply fan
Extract Side	-	EU5 filter
	-	Recuperator Inc. face & bypass damper
	-	Extract fan

The air handling units will be provided complete with electrical power and control wiring to control box with construction from double skinned insulated panels on a frame an access panels is fitted to the unit for maintenance.

An induct 1.5 kW electric heater battery is fitted in the fresh air ductwork 2m from the unit c/w interface to the packaged HRU and with flying lead duct sensor to ensure discharge temperature within the space is maintained.

The fresh air and exhaust air ductwork is connected to the respective unit spigots and extended to external louvres with silencers fitted to ensure noise breakout externally and within the room are within acceptable limits.

The supply and extract ductwork from the unit connections run within the ceiling void, silencers are fitted immediately after the unit to ensure noise levels within the space are within acceptable limits. The ductwork is routed within the ceiling void to all areas.

Penetrations through the offices fire compartments will be fitted with standard fusible link fire dampers and access door to damper.

All main branches are to be fitted with opposed blade volume control dampers for regulation, branches to terminals are fitted with opposed blade or single blade volume control dampers where necessary.

The ductwork distributes in the ceiling void to discharge pre-heated air to the rear of fan coil units or directly into the room through four-way diffusers.

All primary grilles and diffusers will be fitted with galvanised plenum boxes with side or top entry spigots and connected to galvanised ductwork with flexible un-insulated and un-insulated ductwork a maximum of 500mm long. Where required the supply diffusers will be provided with blanking plates or reduced neck boxes to ensure the correct throw and distribution of air within the space.

The return air to the heat recovery units is from the void above the occupied space, ductwork fitted with multiple low velocity bell mouth terminations open in the void again using the plenum as a return air path draw air into the ductwork distribution system and back to the plantroom. Cross talk silencers are fitted to allow transfer from small office to the main areas.

To affect the free passage of air from the space into the void four-way open diffusers will be used with sufficient free area to ensure an unrestricted path into the void.

The heat recovery unit fresh air inlet, supply & return air ductwork is fitted with 25mm mineral wool thermal insulation with identification applied to insulated and un-insulated ducts in accordance with the specification.

TOILET EXTRACT SYSTEM

The toilets and cleaners' rooms are provided with extract ventilation from a dedicated twin extract fan mounted within the ceiling void of the first floor lobby.

The toilet extract system consists of a series of circular extract valves to the core area toilets on all floors connected via galvanised extract ductwork distribution system. A twin direct drive fan set with auto-changeover controls & back draught shutter is fitted internally and supported on anti-vibration mountings.

The exhaust air ductwork is extended to connect onto the exhaust air louvre in the external elevation.

The toilet extract ductwork from the unit connection run within the ceiling void, silencers are fitted immediately after the unit to ensure noise levels within the space are within acceptable limits. The ductwork is routed within the ceiling void to all areas.

Penetrations through the offices fire compartments will be fitted with standard fusible link fire dampers and access door to damper.

The fan is fitted with an integral auto-changeover panel which indicates the fan running and activates the automatic changeover and duty/share option, the unit is time controlled.

All main branches are to be fitted with opposed blade volume control dampers for regulation, branches to terminals are fitted with single blade dampers where necessary.

SITE WIDE

· **NATURAL GAS INSTALLATION**

Within the base build works a new medium pressure gas supply has been extended to within the site boundary. From this point the gas supply connects to a new gas meter & governor externally.

From the outlet of the meter steel pipework is extended through the gas meter kiosk floor slab and into the ground where it adapts to MDPE. A low-pressure site wide MDPE main is installed to the building operating at 21 mbar, MDPE pipework is extended to the building entry location at gridline E/11 where it adapts to steel below ground rises above ground into the building.

At the Incoming entry the point into the building the gas incoming locations has been fitted with purge valve, additional emergency control valve and de-commissioning valve and fitted with blanking flange for future connection.

DOMESTIC MAINS COLD WATER SERVICES

A new blue protectaline water main has been installed to the site from the main road to the site boundary. This main terminates with water meter and isolating valve provided by the water authority on the boundary.

From the outlet of the meter Blue protectaline pipework is installed to all the incoming location within the building all pipework being laid below 750mm from the finished ground level and surrounded by sand for protection.

At each entry point of entry to the building a stopcock, double check valve and draincock will be fitted, a leak detection meter linked to the leak detection panel and pulsed output water meter linked to BMS will be provided to the areas detailed below:

The following locations will be served from the site wide domestic water main:

- Main Office gridline E/11– Leak detection unit fitted.

SYSTEMS:

Electrical Services

Drawings:

Description	Drg No:
LV SCHEMATIC	
GROUND & FIRST FLOOR CONTAINMENT LAYOUT	
GROUND & FIRST FLOOR SMALL POWER & DATA LAYOUT	
GROUND & FIRST FLOOR LIGHTING LAYOUT	
GROUND & FIRST FLOOR FIRE ALARM LAYOUT	
LIGHTNING PROTECTION LAYOUT	
EXTERNAL LIGHTING LAYOUT	
EXTERNAL ELEVATIONS	

Description of Systems:

Main Switchgear & Distribution

The main contractor's utility supplier has installed a 400A Heavy Duty Cut-Out fused at 315A 190kVA 3Ph electrical service into the warehouse located next to the whitewall of the core area complete with consumer meter.
From this we have installed a Schneider MGFS4003C Fuse switch disconnector 400A TP&N, this then feeds a Schneider MG6C18 PowerPact4 18way 400A/630A Panelboard which supplies 2 X SEA9BPN12516S6 Isobar P 125A TP&N 16/6 split metered distribution boards which supplies the electrical needs of the warehouse and office areas independently and 1 X SEA9BPN4 Isobar P 4W TP&N distribution board which caters for the external supplies. The lift fire & disabled refuge supplies originate from the main panel board also.

Containment

Primary containment consists of cable baskets & tray installed at high level within the ceiling voids of each floor and suspended from the roof structure via the use of Gripple cable wire products.
Cable basket & tray is also installed in the accessible floor void.
A future data containment infrastructure has been installed.
Secondary containment consists PVC conduit drops within walls and surface mounted Dado trunking within offices.
External cables run within ducting in the ground.

Small Power

General small power is provided via the use of floor boxes consisting of 2 X TSSO with RCD module and data plate ready for future data wiring. Cleaners sockets are provided throughout the building and are wall mounted. Circuits are wired in LSF multicore cables installed upon cable baskets/trays and in PVC conduits within walls, floor boxes are energised via 63A TP busbars and SP for managers office/ meeting room.
Power supplies provided for Hand Dryers within each toilet. Fused connection units located high level with outlet below at hand dryer height for future use.

Lighting & Emergency Lighting

The internal lighting within the core/office areas consists of LED 600mm x 600mm recessed modular fittings, LED circular recessed downlights and LED surface amenity bulkheads and exit blades.

All lighting is controlled via automatic presence / absence detection and switching to meet Part L requirements of the building regulations.
Lights are powered via a plug-in arrangement to either individual or multi way lighting control modules for ease of future isolation and maintenance.
Emergency lighting is integral to the general lighting with emergency key switch test switches located adjacent each distribution board within the warehouse
Illuminated exit signage provided to escape routes.

External Lighting

The external lighting consists of low level building mounted LED fittings providing perimeter lighting around walkways with high level high output building mounted LED fittings providing lighting for car park areas and loading bays. The service yard is covered by column mounted high output LED fittings.
The external lighting circuits are fed from the main distribution boards and controlled via an external photocell and digital timer.

Fire Alarm

The automatic fire detection system provides L1 coverage throughout the core & office area with M coverage within the warehouse area with scope for expansion in accordance with BS 5839.
The main panel is located within the reception area.
The devices within the office & core area sit on one loop whilst the warehouse devices sit on another.
The fire alarm is interfaced with the Lift and the BMS system.

Accessible WC Alarms

An accessible WC alarm is installed to the accessible WC's on the ground and first floors. Both systems provide audio visual activation indication local to the toilets which are situated in the core area. Each system alarm consists of a red pullcord, rest button and audio-visual indicator.

Disabled Refuge

A disabled refuge system is installed with points located at the top of the office stairwell leading out to the warehouse and the stop of the stairwell within the core area. The main panel is located within the reception area adjacent to the fire alarm panel.

Lightning and Surge Protection Systems

Lightning protection has been installed as per the strike risk assessment.
Lighting protection has been installed to meet the requirements of BS 62305.
Surge protection is installed within the main MCCB panel board.

Mechanical Services Power

Power supplies have been installed to mechanical equipment to include ventilation, water heaters, heating and cooling systems & BMS.

Earthing & Bonding

Designed and installed as per the specification and in accordance with the current IET Wiring Regulations BS7671:2018 (18th Edition).
Main earthing conductor incoming Main MCCB Panel Board.
Supplementary bonding incoming water services, structural steel, lightning & gas.

Testing, Commissioning & Certification

The entire electrical installation works shall be inspected, tested and commissioned and certificated in accordance with all relevant British Standard Specifications and Codes of Practice IET Wiring Regulations BS7671:2018 (18th Edition).

8. Occupant Information

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.

The building management system controls and monitors all heating, cooling and ventilation systems, however, local control is available to radiators and room set temperatures if required.

Heating:

Your working environment is heated with ceiling void mounted VRF ducted fan coil units controlled from the Daikin central controller on the main office plant room control panel and local room controllers, the toilets, core areas and corridors are served via electric panel heaters.

Set the temperature you require and then leave it for a while to see how the temperature settles down. Make minor adjustments if necessary but don't alter them too much as the system may over compensate and you will get too hot/cold. Avoid overheating the space as this waste's energy and the resulting CO_2 emissions contribute to global warming.

Cooling:

Your working environment is conditioned with a Daikin VRF heat pump system. The units are controlled for the space and once set up and maintaining conditions correctly this controls should not be changed without authorisation.

Set the temperature you require and then leave it for a while to see how the temperature settles down. Make minor adjustments if necessary but don't alter them too much as the system may over compensate and you will get too hot/cold. Avoid over cooling the space as this waste's energy and the resulting CO_2 emissions contribute to global warming.

Ventilation:

All the offices areas and occupied spaces are ventilated from a heat recovery unit located in the ceiling void which uses the heat extracted from the areas and uses this to temper the incoming air to provide the adequate air changes needed.

Toilet areas are ventilated from dedicated fans for each area including the cleaner's cupboards.

Windows:

All windows contain double glazed units to avoid over heating and excessive heat loss.

Shading:

Simple blinds are to be employed to reduce solar gain within the occupied spaces.

Office equipment:

Ensure that P.C.'s, printers, machines etc. are not left on unnecessarily and have energy saving features enabled as this will prevent your space from overheating and save energy.

Simple energy ‘dos and don’ts’

- Avoid blocking radiators or ventilation grilles with furniture and books as this will result in a lack of heating/ventilation.
- Set thermostats to the required temperature then leave them alone. Do not use them as ON/OFF switches.
- Set thermostatic radiator valves (TRVs) to the required temperature then leave them alone. Do not use them as ON/OFF switches. If you turn these fully OFF on Friday night, then don’t expect heat on Monday morning.
- Do not overheat your space as these increases running costs and causes extra emissions of CO_2 into the external atmosphere, contributing to global warming.
- 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.
- 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.
- Switch off all manually controlled fans and equipment when not in use; designate a person to ensure this is carried out.
- Ensure that P.C.’s, printers etc. are not left on unnecessarily and have energy saving features enabled as this will prevent your space from overheating and save energy, thereby reducing CO_2 emissions to the external atmosphere.

9. Metering, Monitoring and Targeting Strategy

Metering schedule

The following provides a list of meters and design estimates of the likely end use consumptions. See Action Energy General Information Leaflet GIL 65: *Metering energy use in new non-domestic buildings,* for an example, including how to arrive at a good metering schedule. A copy is provided on the CD-ROM associated with CIBSE TM31 and printed copies are available from (www.actionenergy.org.uk). CIBSE TM22 also provides a means of assessing energy use in buildings.

Total estimated incoming fuel			Electricity: kHz/yr. Other: Litres					
Energy			**Meters**		**Method**		**Meter location**	
Type of incoming energy	Main end-use	Estimated end-use consumption (kHz/yr.)	Meter no./code	End use/ area/system/ circuit or tenancy to be measured	Measurement method and calculation where appropriate	Estimated consumption through each meter (kHz/yr.)	List of meters	Location
Water								
Electric								

10. Building Performance Records

(Not more than three pages)

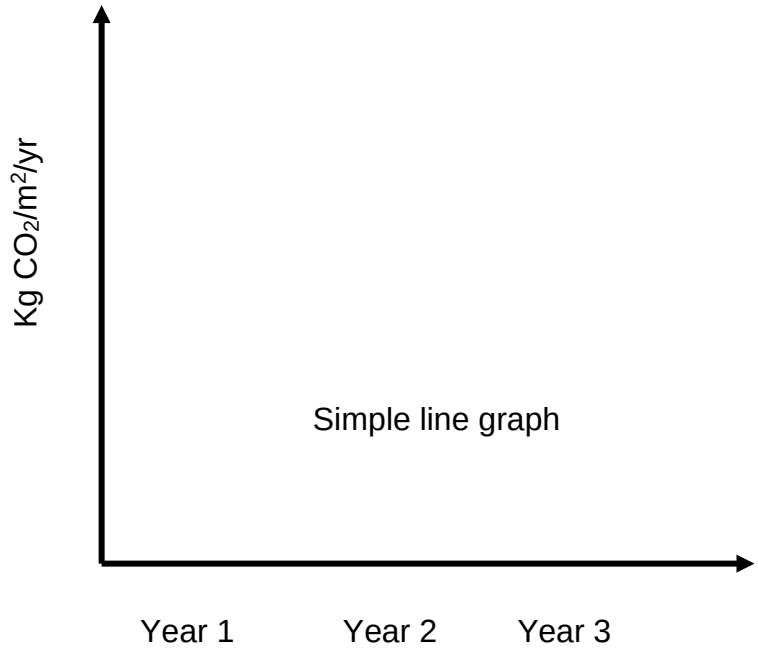
Overall annual energy performance

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 user's guide*. A copy is included on the CD-ROM associated with CIBSE TM31; printed copies are available from (www.energyaction.org.uk).

Building energy performance for period from *[date]* to *[date]* **Based on a treated floor area of *4027* m²**							
Fuel	**Quantity**	**(A)** (kW·h)	**(B)** **CO_2 ratio**	**€** (kg CO_2)	**(D)** **Actual** (kg CO_2/m^2)	**€** **Design estimates** (kg CO_2/m^2)	**(F)** **Good practice benchmark** (kg CO_2/m^2)
Gas							
Electricity							
TOTAL							

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 € 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.

Historical Building Performance Graph



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 Action Energy

(www.actionenergy.org.uk), e.g. ECG19: *Energy use in offices*, and CIBSE Guide F: *Energy efficiency in buildings*

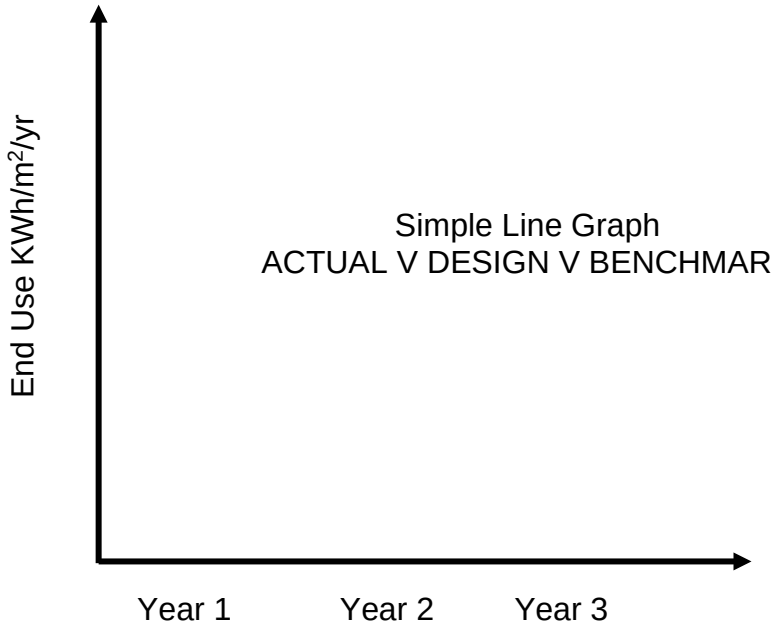
Energy end use comparison

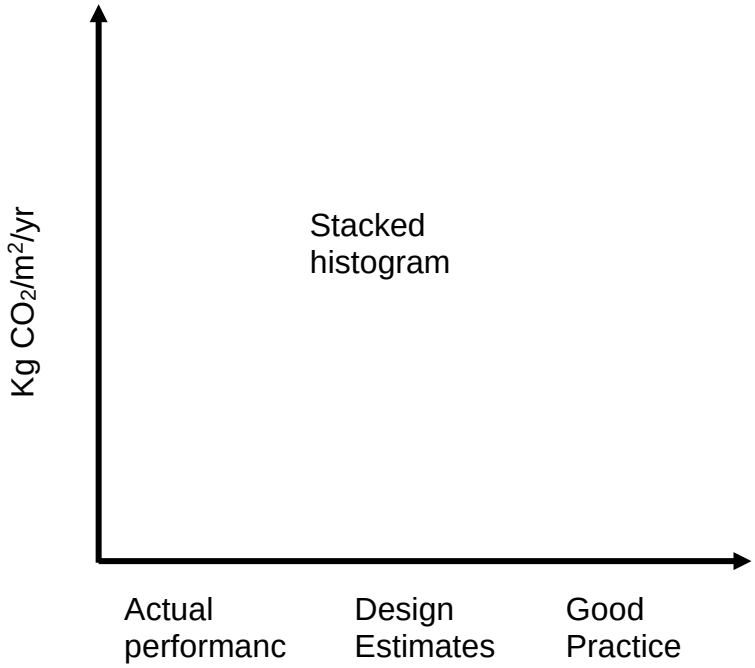
Annual summary of actual metered consumption per square metre and the design team's estimates versus benchmarks broken down by main end-uses. Examples of these calculations and tables are shown in Good Practice Guide GPG 348: *Building log books – a user's guide*. A copy is included on the CD-ROM associated with CIBSE TM31; printed copies are available from (www.energyaction.org.uk).

Building energy performance for period from *[date]* to *[date]* **Based on a treated floor area of *6688* m²**					
Fuel type	**Main end use**	**Actual** Metered incoming consumption ((Kw·h)/yr)	**Actual** Sub-metered main end use energy consumption ((Kw·h/m²)/yr)	**Design estimates** Main end use energy consumption (Kw·h/yr	**Good practice benchmark** Main end use energy consumption ((Kw·h/yr)
Electricity	Incoming				
	Lighting				
	Machines				
	General Power				
	Pumps & Fans				
	VRF Heat & Cool				

Keep the fuels separate as they have different costs and CO_2 emissions

Historical Graph of End-Use Performance





References

a. *Energy efficiency in offices* Energy Consumption Guide ECG19 (Action Energy) (2000) (www.actionenergy.org.uk)

(2) *Energy Assessment and Reporting Methodology – Office Assessment Method* CIBSE TM22 (London: Chartered Institution of Building Services Engineers) (2003)

(3) *Building log books — a user's guide* GPG 348 (Action Energy) (2000) (www.actionenergy.org.uk)

11. System of Maintenance

Emergency maintenance action

Emergency Contact No. 1 **Emergency Contact No. 2**

Maintenance overview

The building is managed by a specialist maintenance contractor and they are responsible in ensuring the correct periodic and preventative maintenance regimes are followed to ensure correct plant and system operation.

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) Indicate any major changes to the general arrangement for maintenance including any changes in maintenance regimes or contracts
Emergency lighting				
Lift				
Lightning protection				
Ventilation				
Heat Recovery Units				
VRF DX units				
Automatic Controls				
Fan coil units				
Fire alarm				
Disabled Refuge System				
Office Lighting Control system				

Maintenance/plant failures

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.

12. Major Alterations

Any major alterations made to the building, its services, its operation or management should be logged below, e.g. boiler replacement, BMS upgrade, changes in use, new management regime etc. Each change should be signed and dated by the facilities manager alongside the other page numbers of the log-book that have been updated/added to reflect the alteration.

Description of alteration	Other log book pages updated or added	Signed	Date

13. Results of In-use Investigations

Defects liability work

Facilities manager to insert a summary of any major remedial work in the period between practical completion (handover) and the end of the defect's liability period

Post occupancy evaluations

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

Surveys

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

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, including:

Please refer to mechanical and electrical operation and maintenance manuals volume D1 for all relevant commissioning and test results applicable to the main contract.