

M&E Services Visual Report

DATE OF ISSUE: 18/11/2022

ISSUE: P02

GLD REFERENCE: J295/MEP/RP01

PROJECT:

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PROJECT NAME: Millennium Powerhouse, Moss Side
REPORT NAME: Visual Survey Report
M&E Services Report
ISSUE STATUS: For Information
GLD REFERENCE: J295/MEP/RP01

DATE OF ISSUE: 18/11/2022
ISSUE: P02

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DOCUMENT HISTORY:

ISSUE	DATE	DETAILS
PO1	03.10.2022	ISSUED FOR INITIAL COMMENT
PO2	18.11.2022	CLIENT DETAILS UPDATED AND SKETCHES ADDED



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1. Executive Summary

A survey was undertaken by GLD Technical Consulting on Friday 16th September 2022, on behalf of Corstophine and Wright, to review the MEP systems to ascertain the extent of the existing services and condition.

The main existing M&E distribution systems were predominantly installed during the original build circa 2000 and as such, are approximately 20 years old. The main equipment, such as boilers and water heaters etc have been upgraded since the initial installation at different times.

The main boiler plant and hot water heating plant have been maintained and upgraded and could be reused as part of a refurbishment if required assuming that a regular maintenance program was kept in place moving forward and assuming that they meet with new building regulations and low carbon requirements.

The existing heating distribution systems have not been replaced in their entirety since the original installation and there may be a need to be replaced pipework from the existing installation due to corrosion. Intrusive surveys should be undertaken as required as the nature and content of any ongoing refurbishment or alterations are developed.

It was noted during the survey that the spaces in some areas are not being used as the original design intent which has created areas of over and underheating. Ventilation and cooling systems are not proving to be adequate and require upgrade or replacement.

Electric distribution systems could be upgraded to suit ongoing refurbishment works and current standards.

Lighting and emergency lighting systems require a review and likely a full replacement to overcome ongoing maintenance issues where lamps are difficult to replace and to bring all fittings to LED for energy saving.

There are 3 distinct areas within the building which may make refurbishment of the building simpler and allow some phasing.

The Powerhouse provides a valuable resource to the local community and currently provides some of the following facilities, some of which differ from the original design intent for the building.

- Sports Hall – used for varied indoor sports and community activities. It is a large space with concrete seating area on one side, which we understand is not used and a gallery on the other, which we understand is currently used for small group work when the sports hall is not in use. To one side of the hall is storage with access via large concertina doors (there is MEP plant within these spaces which is difficult to access) and to the front there is storage that houses movable raking seating, which is currently not used. Zone 1 on the attached plan
- Dance and music studios – these areas are generally used as offices.
- Library – zone 3 on the attached plan

- Offices – TYSS on the attached plan and also Zone 2 where the kitchen has been replaced with offices.
- Meeting Rooms
- Mental Health Services (offices) – these office spaces were originally designed to be living spaces and have been converted to office use. This has been identified as Zone 5 on the attached plan.
- External MUGA – the external pitch has recently been upgraded and does not form part of this review.

2. Introduction

GLD attended site on 16th September 2022 to undertake a non-intrusive, visual survey of the existing M&E services installations. Some of the ancillary offices were unavailable for access during the survey, mainly in zone 4, 8 and 10 as indicated on the attached plans. However, we understand that the installations within those areas are similar to other areas surveyed so assumptions have been made based on the survey information for similar areas.

This report provides a brief overview of the following existing M&E installations, their general suitability, condition, and likely life expectancy:

- Above ground soil & waste
- Domestic hot and cold-water services
- Heating systems
- Comfort conditioners
- Mechanical ventilation systems
- BEMS
- Low Voltage Power distribution
- Lighting
- General Small Power
- Fire alarms
- Security
- Telecoms
- Passenger Lifts
- Lightning protection and Earthing

3. Mechanical Services

3.1. Above Ground Soil & Waste

The above ground drainage stacks are concealed so could not be viewed during the survey. Based on the building being 22 years old, and on CIBSE guide part M, the stacks have exceeded their serviceable life and should be considered for replacement as part of any refurbishment or planned maintenance. Further intrusive surveys can be undertaken as part of any ongoing refurbishment works to determine where replacements will be needed.

3.2. Domestic Water Services

There is an incoming water service enters the building to the ground floor plant room within zone 4. It is assumed that this is the main incomer as the main cold water storage tank and booster set that serves the building is located within this plant room. The booster tank and set is manufactured by Flowtech.



*Cold water tank in
ground floor zone 4
plant room*



*Cold water booster
pump set arrangement
in zone 4 ground floor
plant room*

The mains cold water service appears to be distributed from this plant room underground to the zone 5 ground floor plant room and the zone 7 first floor plant room (it rises within a duct from ground floor where it enters the building).

Also located within this plant room is a hot water cylinder, Heatrae Sadia Megaflow CL 145 that we understand serves the hot water point within all zones excluding 5 and 8, which are served from separate services located within a different plant room.



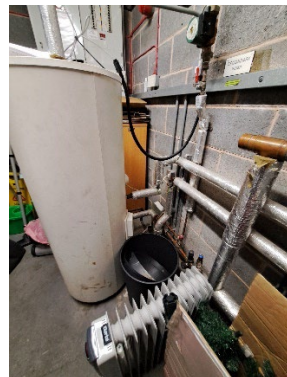
*Hot water storage
cylinder ground floor
zone 4 plant room*



Zone 5 and Zone 8 are mainly used as offices with some wc / shower provision. These areas have been converted from studio apartments to offices and have a dedicated plant room located on the ground floor in zone 5. Hot water is provided to these zones via a hot water cylinder and associated gas fired system boiler. MCW and gas services rise up from below ground into this plant room.



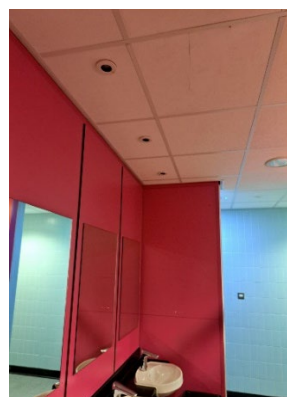
*Disabled WC
within Zone 5*



*Zone 5 ground
floor plant
room hot water
cylinder*



*Zone 7 plant
room hot water
cylinder*



*WC within
Zone 2*

43kw. There are service records within the boiler room that date back to 2015 which suggest that the original boiler has been replaced and this boiler is at least 7 years old.

There were no obvious signs of disrepair to any of the systems located within the ground floor Zone 4 plant room and all of the equipment appeared to be in working order.

The majority of pipework is lagged and exposed pipework appeared to be in reasonable condition.



*Gas fired boiler and
pressurisation unit in
ground floor zone 4
plant room*



*Microfill boiler
pressurisation unit in
zone 4 ground floor
plant room*

The heating in zones 5 and 8 is provided by the gas fired LPHW boiler located in the zone 5 ground floor plant room. This boiler is a Potterton Sirius 3 WH-50 45KW and is in new condition. We understand from the building manager that this boiler has recently been replaced.

3.3. Heating

Heating is provided via various methods. Some areas are heated via underfloor heating, some by LPHW radiators and some by warm air heating via LPHW heater batteries. The main heating circuit is a constant temperature follow and return which is generally run in the ceiling void of each level and drops to serve radiators / manifolds as needed.

3.3.1. Boilers

The heating to zones 4 and 10 is provided via the gas fired LPHW boiler located in the ground floor plant room of Zone 4. The boiler is a Remeha Quinta 45 manufactured by Broag, which has a rating up to



*New gas fired
boiler within zone
5 ground floor
plant room*

The main entrance building heating is served via 3 number Ideal Evomax boilers located in the Zone 7 first floor plant room (unable to determine size during survey). Gas and water services rise to this plant room via a service riser from the ground floor. Pipework is distributed below ground from the zone 4 plant room externally to this riser position.

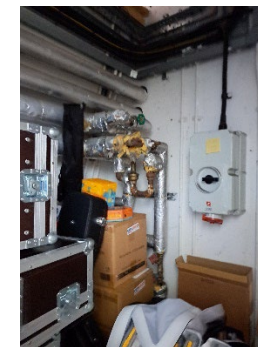
There is a solenoid valve included on the incoming gas pipework to this plant room also.

There is a flowtech pressurisation unit associated with the boiler installation located within this plant room also that appears to be in good condition



*First floor zone 7
plant room gas
fired boilers*

Most of the existing heating pipework within the main building is concealed within ceiling voids and is well lagged. However, there were a few areas where pipework was exposed, and the exposed elements were showing signs of corrosion. The extent of the corrosion could not be determined at time of survey. It would be advisable that any refurbishment works either make allowance for LPHW distribution pipework to be replaced or intrusive / destructive testing of key areas of pipework be undertaken to determine its soundness along with flushing / cleaning and testing of the circuit water for corrosive contaminants.



*LPHW pipework
connections in
sports hall storage
showing signs of
corrosion.*



*LPHW pipework
connections in
ground floor riser
showing signs of
corrosion.*

3.3.2. Flue System

Boilers are linked to a flue, the system is integral to the operation of the boilers and will be require replacement as part of any boiler works.

3.3.3. Heating pumps

Heating pumps viewed within the zone 4 and 5 plant areas were in line units and manufactured by Grundfoss. Limited access was available in the main zone 7 plant room to view the heating system pumps.

3.3.4. LPHW System

The majority of the building is served via LPHW heating systems. The systems are split into distinct areas which are served by the boilers in the various zones. The only areas where there appears to be separate or supplementary heating via VRF systems, is within the ground floor library and associated meeting and staff areas and within the first floor CAPS office and / or TYSS offices.

3.3.5. Radiators

In areas where the heating is provided by radiators these are typical standard radiators as Stelrad.

3.3.6. Heater Batteries

There is a heater battery / frost coil within the main zone 7 plant room AHU. There is a heater battery within the recirculation duct that heats the communal area next to the ground floor plant room in zone 5. This heater battery is located within the plant room.

The supply air units that serve the sports hall have an integral LPHW heater battery.

There is a fan convector over the main entrance which is also fed from the main heating system.

3.3.7. Underfloor Heating

There is underfloor heating provided to parts of the ground floor. The manifold is located within the ground floor services cupboard. It is not clear which area the underfloor heating serves but it is likely to be the ground floor circulation area by reception and the library.

It could not be ascertained during the survey if the underfloor heating pipework had degraded. An intrusive survey may be required to further review the condition of the underfloor pipework. However, it may be possible to reuse this system following testing to check soundness and flushing.

3.4. Comfort Cooling

3.4.1. Conditioners

Across the site there are various comfort conditioners that provide either heating and cooling or just cooling to specific spaces.



Ground mounted VRF units serving meeting and library area

The above units are Mitsubishi Mr Slim units PUHP100YHA with R410A refrigerant. The use of this refrigerant gas is being phased out and will not be available for new systems and this will affect some smaller existing systems moving forward. The building owner should be looking to either replace the gas in these units or replace the units within the next 3 years.

The location of the outdoor equipment in front of these condensers will be restricting the airflow around the units and they will not be working effectively with this arrangement.

We understand that these units were installed as part of the ground floor library area refurbishment that took place in 2009. We understand that the limited comfort conditioners at the first floor circular area are also served by these condensers.



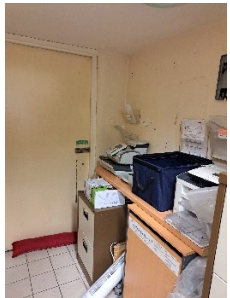
Roof mounted VRF units serving offices

The CAPS and / or the TYSS offices are served via VRF systems that are roof mounted. The details of these units were not determined during the survey.

The offices within zones 5 and 8 appeared to be suffering with high heat gains as the staff were making us of temporary plug-in comfort conditioners. This section of the building was originally designed for residential use and has been converted to offices, however the natural ventilation available through the small side windows is not adequate for the amount of people currently using the spaces which is contributing to the high heat gains, as well as the data cabinet, printers and numbers of pc's.



Data cab in cupboard ground floor offices zone 5



Printer area outside disabled wc ground floor offices zone 5

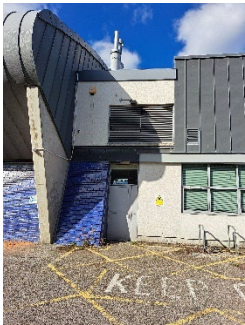


Ground floor zone 5 offices temporary comfort conditioner.

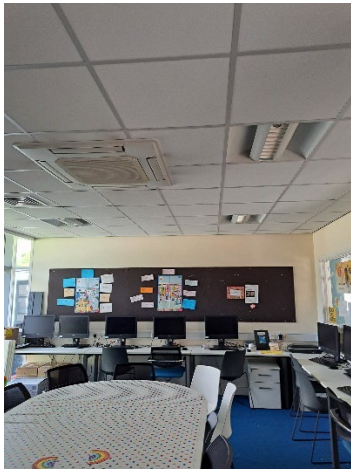
3.5. Ventilation

3.5.1. Air handling unit

The reception / library building is served via a supply and extract AHU located in the zone 7 first floor plant room. The AHU brings air in via a louvre located on the external wall of the plant room and we expect that the extract is released via ductwork connected to a roof cowl (not viewed at time of survey).



*Zone 7 plant
room louvre
with boiler flues
at roof level.*



*Library AC and
ventilation*

3.5.2. Air distribution

From the plant room supply and extract air is ducted to the ceiling void to serve the first-floor areas such as dance and the circular open plan area. Ventilation ducts drop into the services riser to the ground floor ceiling void where they are routed into the main library area.

Separate heat recovery units are used in some of the ground and first floor spaces. Details of these units were not obtained at the time of the survey.

Separate supply air units are provided to the sports hall within the side storage units. We could see actuators on the high-level windows at the other side of the sports hall and expect that these were intended to work in conjunction with the supply air units to provide cross ventilation for the sports hall. It was not clear at the time of the survey if this system was operating as intended.

Separate wc ventilation systems are provided for these areas and were seen to consist of separate supply and extract fans with associated ductwork and attenuation. The majority of the wc vent systems were concealed within the ceiling voids and only systems that were located in plant rooms in zone 4 and 5 were seen. The systems appeared to be running and there were little signs of corrosion.

We expect that the general office areas with openable window are naturally ventilated with a small supply and extract system provided to the offices to the rear of the hall which do not have direct access to windows for ventilation.

It was noted on the site visit that the rear office corridor at first floor level which had large amounts of glazing is subject to high heat gains in the summer.



*Supply air distribution
to the sports hall.*



*Supply air ventilation
units with LPHW
heater batteries
located inside
storage of sports hall*



Sports Hall high level window actuators for extract.



Sports Hall ventilation grilles between wall and grey cladding



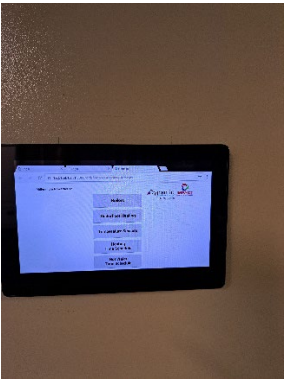
Supply ventilation grilles served from high level concealed ductwork in dance studio (now used as an office).



Supply ventilation grilles served from high level concealed ductwork in circular area at first floor.

3.6. Building Energy Management System (BEMS) and controls

The mechanical services systems are provided with an automatic control system. An LCD display screen has been retrofitted into the mechanical controls panel to allow easier user control of the system. The system appeared to be in good working order.



LCD display screen for mechanical system controls

4. Electrical Services

4.1. Electricity Supply & Distribution

The building is served via an LV incoming supply which enters the building at the sports hall side with the meter and main switches located within one of the side storage units. Equipment was seen to be stored directly in front of the distribution so access was not available, and the building manager should consider some form of partition at least 1m in front of the equipment to allow step back and prevent equipment being stored within the required maintenance zone.



Incoming supply point distribution within Sports Hall storage area. This is also the main meter location.

4.1.1. Low voltage switchgear

The buildings main low voltage switchboard is located within the reception building main plant room, zone &, level 1. The switchboard is manufactured by LT Switchgear to a panel board standard with an incoming supply rated at 250A three phase. The switchboard is approximately 20 years old and is in reasonable condition given its age. From the record drawings this panel has between 14 and 16 three phase ways and serves the distribution boards in the main building as well as the mechanical control panel located in the same plant room. We expect that this panel also serves the distribution boards located within the ground floor zones 4 and 5 plant rooms, or additional switches have been added at the incoming supply point in the sports hall to cater for these supplies after the original installation.

The panel board comprises several outgoing three phase ways, which serve numerous final sub-distribution equipment located throughout the building. The panel board was locked at the time of the survey so any further details have been taken from the record drawings available.

Outgoing sub-main cabling the MCCB Panel board is wired in XLPE/SWA/LSF cabling which is secured to galvanised cable tray or cleated direct to the building structure.

There is evidence of regular electrical testing being undertaken in the O&M manuals, however not the most recent tests. The building owner should make these records available so that they can be reviewed further.

4.1.2. Sub-distribution switchgear

The sub-distribution switchgear is generally located within plant rooms and distribution cupboards, sited on both floor levels

The distribution boards are in average condition and are circa 20 years old. In some instances, outgoing cable penetrations within the boards are not sealed.

In some areas it was noted that the existing fire penetration seals were broken and not resealed above some distribution boards.

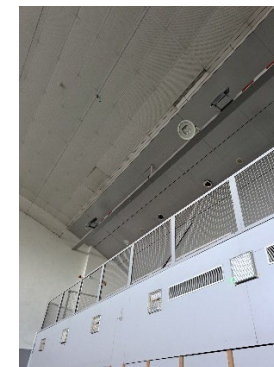
4.2. Lighting

The lighting installations both internally and externally appear to be a mix of different types of luminaires from different manufactures with different lamp sources. The building manager advised on the survey that some work had been undertaken to start to change fluorescent luminaires to LED but that there were still large areas of installation where this had not yet taken place.

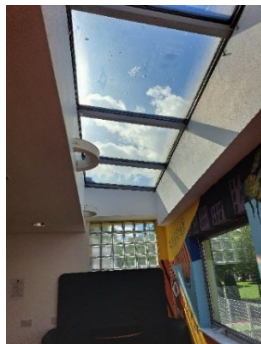
The luminaires generally are dated in appearance and in many areas are in a state of disrepair. We would recommend a replacement plan for all lighting is put in place which allows a full lighting design for the building to be undertaken which allows the lighting to be coordinated throughout the spaces.

Lighting switches is generally via wall switches. The sports hall lighting is controlled via a lighting control system for which the main control panel is located within the first-floor plant room to the rear of the sports hall. This system looks dated and is difficult to use as it is remote and has no sight lines to the sports hall. This system would benefit from being replaced with a system that is configured for easier use by the people using the facility.

Emergency lighting is installed throughout the building and comprises a mixture of self-contained non-maintained emergency luminaires and surface mounted emergency external bulkheads located above final exit doors. Illuminated emergency exit signage is installed throughout the building in accordance with BS5266. Local emergency key switches are sited adjacent to the relevant distribution boards that serve each particular area or adjacent the entrance to the plantroom/service cupboard. Some areas require review where the standard is not strictly adhered to and may require supplementing.



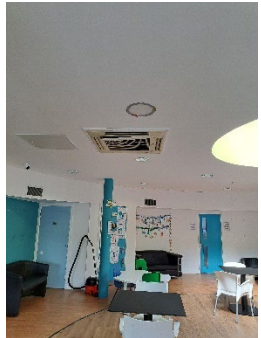
Hi level LED flood lights located on building structure understood to be Whitecroft and installed within the last 5 years. Recessed asymmetric wall washers also provide some illumination within the sports hall. Surface mounted panels for emergency, recessed downlights on balconys.



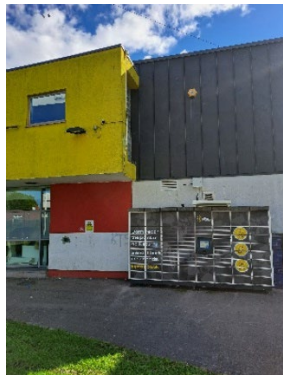
*Wall mounted
luminaires within
first floor lightwell*



*Ceiling recessed
compact fluorescent
within circulation
areas*



*Ceiling recessed
compact fluorescents
within open plan
areas*



*Wall mounted
external floodlights*



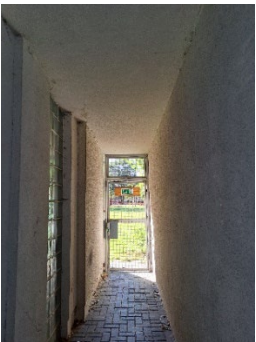
*Non matching
external floodlights
and surface mounted
fluorescents on
external stair landing
/ balcony*



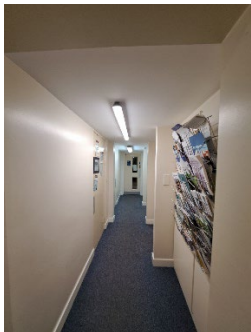
*External courtyard
floodlight with
surface mounted
conduit*



*External courtyard
showing surface
bulkhead luminaires,
brick lights and
floodlights*



*Emergency exit route
with no emergency
lighting*



*Surface mounted
fittings in corridor*



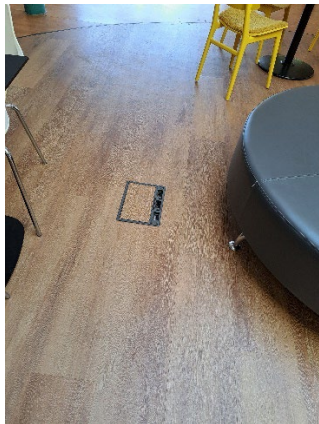
Office Lighting

4.3. Small Power

The presentation of the small power varies throughout the building. Some of the small power outlets are recessed, others are surface with surface mounted conduit. Some outlets are mounted on dado trunking offices and the circular first floor open plan areas is provided with floor boxes.

The recessed installations and floor boxes appear to be related to the initial installation with the surface mounted outlets and dado having been added on at later dates to suit the changing use of the building and the addition of new systems such as CCTV and door entry.

Standalone toilet alarm systems are installed throughout the disabled toilets at each level and appear to be in good working order. The central alarm panel for the disabled wc's appears to be located within the ground floor distribution riser cupboard.



*Floorbox located
within circular area
on first floor*

4.4. Fire Alarm

The building is protected by a working fire alarm system that is currently maintained via Tailored Fire and Security. The building manager reported no concerns with this system. Throughout the building there are smoke detectors with separate sounder circuits visible.

4.5. Security Systems

The building is fitted with a building alarm system and door access systems. These systems are maintained via Tailored Fire and Security and there are no current concerns recorded regarding these systems.

The building is clearly fitted with a system of external CCTV cameras which have views of all of the external areas around the building and within the courtyard.

This system appears to have been added over time and much of the power / data for the cameras is surface mounted.

4.6. Telecom / Data Systems

The existing incoming Telecom distribution point is located within the ground floor data intake room. A second distribution point is located within the zone 5 ground floor offices, and it is assumed that both data cabinets are linked and all data outlets within the building emanate from either of these data cabinets.

4.7. Passenger Lift Systems

There is 1 number passenger lifts installed within the building. This is located within the main circulation area of the main reception building and looks to be in a well-maintained condition.

4.8. Lightning Protection and Earthing

We were not able to identify if any lightning protection installations were installed during the survey.

No test certification for the system was evident during the survey.

We were not able to identify if any transient surge protection devices had been installed to the distribution system and have identified this as an item that would require adding if it does exist already.



A main earth bar was evident adjacent the main LV switchboard in the zone 7 first floor plant room and appeared in good condition.

5. Observations & Recommendations

To draw the attention to important comments, the following colour coded identification system has been applied to principal observations and recommendations from the M&E survey. CIBSE Guide M: Maintenance engineering & management has been referred to ascertain estimated M&E service indicative economic life expectancy.

1	Serious or critical issue requires action or resolution
2	Important issue: may not require action or resolution
3	Information only: no action required or routine maintenance or repair

Code	Observation	Recommendation
Domestic Water Services		
2	The domestic cold-water services have adequate capacity and pressure for the building's current use and reasonable future uses. The condition of the system is reasonable where it can be viewed	No work is recommended, unless intrusive surveys reveal any corrosion
Heating / Cooling		
1	Cooling units in some areas are in a state of disrepair and require replacement. Replacement refrigerant gas will be required within the next 5 years. Some areas suffering from overheating require attention.	This units should be considered for replacement.
2	The existing boiler plant is relatively new and is well maintained. However, with the current uplift in energy prices and required reduction in carbon emissions consideration should given to replacing / reducing these systems with either lower temperature versions or low carbon technologies	Consideration should be given to replacing these in the next 10 years. New building regulations will require either low temperature or low carbon options should a significant refurbishment take place.
2	The existing heating pipework is showing signs of corrosion.	Consideration should be given to full testing to determine the condition of the systems. Full or part replacement of the heating pipework may be required.
Ventilation		
1	The air handling units are 20 years old. although working consideration should be given to replacing the plant.	As these have reached their CIBSE recommended economic life expectancy, consideration should be given to their replacement.
1	The ventilation in some areas is inadequate and requires review.	Supplementary or new ventilation should be considered.
Controls		
2	The BEMS panel is working and would appear to have been upgraded. Modifications may be required for any plant upgrades / changes undertaken	Modifications / upgrades will be required for any new plant configurations.

Code	Observation	Recommendation
Main Electrical Supply		
2	The electrical supply to the building should be reviewed in line with any proposed changes to the building to ensure that it is adequate for the building needs.	The required supply capacity for the building should be checked with the REC to determine current maximum and demand and if any uplift in supply will be required for any changes to the development.
Low Voltage Switchgear		
2	The existing main landlord's switchboard, has reached its recommended service life (20 years). However, if it is deemed to be suitable to cater for the building moving forward the protective devices could be upgraded and the switchgear maintained for use for the next 10 years.	We would advise that a full intrusive condition assessment/testing is undertaken by a switchgear specialist to ensure that there are no existing hidden risks and problems such as overstressing of switchgear etc. and to schedule when items of switchgear will require replacing.
2	The distribution boards are generally in reasonable condition and assuming that the 5 year fixed wiring tests and associated works are undertaken some of the installations could last a further 10 years. However and areas of existing cabling from the original installation should be checked thoroughly for its condition and consideration should be given to replacing in the next 5 years	A full fixed wiring test for all the Landlords switchgear and sub-distribution boards should be undertaken to ascertain existing sub-main conditions and final circuits and to check if these existing boards are now redundant. Consider testing for insulation resistance and upgrading any existing wiring and distribution boards from the original installations.
Low Voltage Distribution		
3	Sub distribution supplies are via armoured power cables installed on cable trays and routed within dedicated electrical service risers and plantrooms. The majority of the sub-main cabling appears to be at least 20 years old, are in good condition and have at least a further 15 years life expectancy before replacement should be considered.	Consideration should be given to testing the existing sub-main cabling to check insulation resistance and replace where necessary. Consideration should be given to upgrading distribution boards to current standards where needed in terms of surge protection and RCBO's.
General Small Power		
3	Mix of systems throughout the buildings where services have been added since the original installation.	Consideration should be given to replacing the older general small power systems and accessories only when areas are refurbished.
Lighting & Emergency Lighting		
2	The mix of lighting varies in age and type, and some is still fluorescent.	Consideration should be given to replacing the existing fluorescent luminaires throughout with LED versions as these existing luminaires are nearing their estimated life expectancy.
1	Emergency lighting is located throughout all areas and comprises self-contained non-maintained luminaires, separate bulkheads and exit bulkheads, which are served from an existing emergency test key switches located throughout the electrical service risers, room entrances and plantrooms. The majority of the emergency luminaires appear to be at least 2-5 years old and appear in good condition.	Retaining the current maintenance regime should allow the expected service life of these emergency luminaires for at least another 15-20 years. Emergency luminaires should be supplemented where required to meet standards.
2	General switching in areas should be considered for replacement with PIR within circulation areas for energy saving. Sports hall lighting wiring and controls should be considered for replacement.	Review of automatic controls and PIR and daylight switching.
Fire Alarm		
2	Fire alarm system is currently functioning, however a further review of the panel should be undertaken and consideration given to replacement.	Review of the existing installation should be undertaken in line with any refurbishment works and if needed the main panel and devices replaced.
Security Installations		



Code	Observation	Recommendation
2	Door access / security / CCTV appear to have been added on over the years and the installations in some areas are exposed / surface mounted. Consideration should be given to replacing these installations with concealed versions.	Review installations and replace with concealed.
Lightning Protection & Earthing		
2	No system identified on survey.	Further review of installations required. New system may be required if there is none provided as existing.
Passenger Lifts		
2	One passenger lift in the building which has been well maintained.	Consideration should be considered to appoint an independent specialist lift engineer to undertake an intrusive survey of the existing passenger lifts and provide a detailed breakdown of items required in order to modernise the lifts and ensure they are fully compliant with latest Lift regulations and standards.



6. Services Zones and General Information from Site Visit

1. Drawings are to be read in conjunction with all relevant specifications, engineers, architects & services drawings, including approved builders work drawings. Contractor to notify engineer of discrepancies between structural drawings & specifications or other drawings.
2. All dimensions are in millimeters unless noted otherwise.
3. Do not scale from the drawings or the computer digital data, only figured dimensions are to be used.

- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5



P1	XX.11.2022	Preliminary Issue	IR	GD
Rev:	Date:	Amendment:	Drawn:	Check:
Drwn:	IR	Date: 15.11.2022	Scale: 1:100 @A1	
Chkd:	GD	Date: 15.11.2022	XRef: 10240	

C&W

Drawing Title:
Ground Floor Plan
Site Visit Layout

Status:
Preliminary



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Drawing No:
J295-GLD-00-DR-ME-6300-001

Rev:
P1

