Grenfell Tower Refurbishment Mechanical, Electrical and Public Health

Stage D

Rev B – 8 Oct 2013

MAX FORDHAM

MAX FORDHAM

Max Fordham LLP
2 Melville Street
Edinburgh
EH3 7NS

T [redacted]
F

maxfordham.com

ISSUE HISTORY

Issue	Date	Description
*	22/11/2012	
Revision A	23/09/2013	Revised proposals based on central boiler installation.
Revision B	08/10/2013	Updated to incorporate team comments.

MAX FORDHAM LLP TEAM CONTRIBUTORS

Engineer	Role
Duncan Campbell	Senior Partner
Matt Smith	Engineer

CONTENTS

MAX FORDHAM

INTRODUCTION

Stage D

This report describes the mechanical, electrical, public health (MEP) and environmental design for the Grenfell Tower refurbishment. It supersedes the previous Stage D report dated 22 November 2012.

The report should be read in conjunction with the relevant drawings listed in this report.

The information presented in this report will form the basis of the Stage E - Detailed Design documents. It is therefore essential that the systems and strategies described are in line with the client's requirements. All stake holders should review and comment on this information to allow their comments to be incorporated into the final detailed design proposals for the project.

Key Assumptions/Risks to Project

The following points have been identified as key assumptions/risks:

- Planning will approve the proposed energy strategy as per the Sustainability & Energy Statement revision C issued on the 27th of June 2013.
- Building Control agree to the extension of the existing smoke ventilation system based on the current strategy.

As is always the case with an existing building, risk arises whenever an existing system is proposed to be reused. The following list highlights areas where it is proposed to interface new systems with existing systems and therefore poses a risk.

Drainage
Connecting into existing drainage which is assumed to be in good condition. A survey of the final parts of the drainage system will be carried out.

Water Services
Some of the existing water systems will be reused, the major items being:

- Existing potable and non-potable water booster sets
- Existing basement and roof potable and non-potable water tanks
- Existing boosted mains cold water pipes from the basement to the roof top plant room.

The tanks will be surveyed to establish their condition.

Dry Riser
The existing dry riser will be extended. The pipework should be in good working order but will be pressure tested by the installing contractor after the new pipework has been installed.

Ventilation
Rubbish extract fans are to be retained and the ventilation system extended down to mezzanine level. The fans appear to be in reasonable working order but maintenance records will be checked to confirm this or if records are not available, a check will be carried out.

New central bathroom extract fans will be installed and connected to existing ductwork. A survey of the existing ductwork is being arranged.

Smoke Ventilation
It is assumed the existing brick built smoke extract shafts are able to hold the required pressure.

The existing smoke extract fans are to be retained and it is assumed they can provide the flow rates required by Building Control.

Low Voltage Distribution
Some existing equipment is proposed to be reused and it is assumed the system and equipment is in good working order. Main system test certificates have been provided by TMO and test certificates for the flats have been requested.

Lighting and Emergency Lighting

It may be possible to retain some of the fittings. Any fittings proposed to be retained will be visually inspected to check for any obvious deficiencies.

CCTV
The viability of extending the existing system to incorporate new cameras will be discussed with the current CCTV maintenance contractor.

Access Control
A new access control and door entry system will be required. This will be included within the scope of works for this project. Details of the type of system, etc. are yet to be agreed.

MAX FORDHAM

Health & Safety Risks and Design Mitigations

Core Services "Hot" Works
Traditional pipe jointing techniques require hot works to be carried out. This is undesirable as the works themselves will require modification to several of the life safety systems (smoke extract, fire alarm and detection and dry riser). In order to mitigate the risk of hot works causing fires, all pipe jointing techniques specified are cold jointing methods.

Drainage Systems "Working Live"
Work to the existing drainage system has been limited as much as possible. However the new drainage at podium levels will need to be connected into the existing system at basement level. The contractor to mitigate risks to workers by making sure workers are appropriately trained and given appropriate PPE for the job. The contractor to work with KCTMO to inform tenants when the drainage system should not be used to allow works to progress with minimal hazards to workers.

Working on Live Systems
The boilers in the basement of Grenfell Tower provide the heating and hot water to the 120 flats in Grenfell Tower and the "finger blocks" of the Lancaster West estate. Isolating the heating system or the power that provides will cause considerable disruption.

Working on these live systems carries with it the risks of burning from 80°C LTHW and electrocution from the 400V, 3 phase electrical systems.

Whenever possible working on live systems should be avoided but when it is unavoidable operatives will need to be trained in doing so and have the correct level of PPE provided.

00 SITE WIDE SERVICES

Overview and Scope

The scope of the site wide services works at Grenfell Tower is summarised below:

- The proposals highlight where any major penetrations need to be made for the new mechanical, electrical and public health installations.
- Provide new above ground drainage to the podium levels of the tower.
- Provide new electricity supplies to the new dwellings on the podium levels.
- Provide new pedestrian lighting to base of tower
- Provide an extension to the existing CCTV network.

P(3-) - Builders Work In Connection with MEP Services

The P(3-) series drawings provide preliminary information on service penetrations that are required to be made in the existing structure to accommodate the new mechanical, electrical and public health services.

These are very preliminary and will be further developed along with the development of the MEP systems design during Stage E.

R(10) – Rainwater

Rainwater is collected from outlets on the tower roof where it is conveyed to ground level via internal cast iron rain water pipes.

It is not proposed to make any changes to the rainwater system in this project apart from any requirements arising from the new works.

R(11) - Above Ground Drainage

Connect all new appliances requiring a foul water connection to the new drainage systems shown on the R(11) series drawings.

New foul drainage system will serve the first four floors with as few new stacks as possible. A design intent drawing will be produced to indicate how this can be achieved.

New drainage material to be HDPE. Stacks to be ventilated using air admittance valves (AAV) located at the top of each stack.

The new system will connect to the existing drainage system at basement level.

R(12) - Below Ground Drainage

The new works do not require any alterations to the existing below ground drainage.

V(20) - Electrical Connection

Grenfell Tower is served by a single utility owned transformer located on the east side of the tower at ground level. This connects to the adjacent main switch room.

Modifications will be made to the electricity distributing equipment located in the main switch room. This is described further in Part 01_Central Services - Section V(20).

Applications will be made to UKPN for new single phase domestic electricity supplies to the new dwellings from the main switch room.

It is likely that UKPN will choose to install new Ryefield fuse-boards in the main electrical distribution risers on the Mezzanine level and Walkway +1 to serve the new dwellings, but further information will be obtained during the next design stage.

V(21) - External Lighting

The new external lighting design relates to the external areas immediately adjacent to Grenfell Tower.

The area immediately adjacent to the tower will be lit to a minimum level of 15 lux.

The area around the main entrance will be lit to a level of 30 lux. Uniformity across the area will be 0.4.

The path leading from Grenfell Walk to the West of the Tower will be lit via directional wall mounted luminaires.

The use of directional lighting is necessitated by the need to prevent light spill into the residential properties on the Mezzanine level. This will be limited to a maximum of 5 lux as per the *Guidance Notes for the Reduction of Obtrusive Light* by the Institution of Lighting Engineers.

The use of low-level uplighters has been avoided in order to prevent malicious damage to fittings and to reduce upward light pollution.

The external lighting strategy for the Tower will be developed in the next design stage. Where necessary, the choice and placement of fittings will be coordinated with the adjacent KALC project.

W(10) – Telecommunications

Grenfell Tower is currently served by a community satellite system. This system will become the only source of satellite TV in the tower and all personal satellite dishes will be removed as part of the refurbishment works.

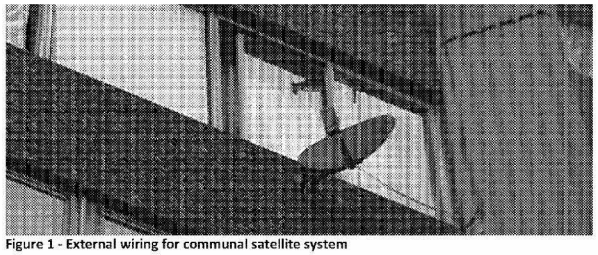


Figure 1 - External wiring for communal satellite system

The proposed cladding will cover the existing external coaxial cabling (Figure 5) for the communal satellite system. This will eliminate all access to the cables so provision needs to be made for future maintenance or replacement of the cables.

New internal riser routes will be provided within existing riser ducts within the common parts and provisional routes identified to get the cables from the risers into the flats. Cables will not be installed at this stage.

The scope of work for this project does not include any enhancement of the existing system.

NB: There is a telecoms installation marked 'London Ambulance Service' located within the rooftop plant room. Further information is required to ensure that works to power and data systems do not affect this installation.

W(20) – CCTV

The existing CCTV system will be extended to provide security cover for the new areas created by this project.

The details of camera types, system facilities, recording storage, connectivity, etc. will be developed during the next stage of the design.

W(52) – Lightning Protection

The lightning protection strategy for the building will remain as currently provided – i.e. - down-tapes connecting to earthing pits at ground level.

The system will be surveyed prior to any work commencing and any defects identified and repaired.

01 CENTRAL SERVICES

Overview and Scope

The scope of the core works at Grenfell Tower is summarised below;

- Provide a new low temperature hot water (LTHW) heating system with central boiler to serve the existing residential floors and the new areas in the podium levels.
- Provide heat interface units (HIU's) for each flat to provide space heating and primary heat for domestic hot water. Each flat will have a new radiator heating system installed.
- Provide a new cold water down service to deliver potable water to all floors.
- Connect the existing domestic hot water system in each flat to the secondary side of the HIU. The new system will provide sufficient pressure to enable tenants to install showers.
- Renew the outdated smoke extract system with new components to bring it up to modern standards.
- Provide a new fire detection system.

S(10) & S(11) – Cold and Hot Water

Existing
There is one main incoming water service to Grenfell Tower. Water is run to potable and non-potable water storage break tanks in the basement before being pumped to potable and non-potable storage tanks in the roof plant room.

No change to the existing incoming water main is required as the water consumption is likely to remain as it currently is or may decrease as a result of the refurbishment works.

Strip Out
All water services to be surveyed and labelled prior to strip out works.

Remove all water services serving the podium levels while ensuring that the water services to the existing flats is not interrupted.

Any water storage to be removed should be isolated for at least 24 h before permanent work is done to remove the service.

The existing cold water service to each flat will remain live until the new cold water supply has been installed and connected.

Proposed New System
It is proposed to continue with the current strategy of pumping mains water to storage tanks on the roof, but the storage strategy will be amended such that all stored water will be potable.

Ideally, the existing potable and non-potable tanks will be reused as this will provide the greatest amount of water storage. Both sets of tanks will be inspected to establish their condition. The non-potable tanks will also be assessed to see how viable it would be to take them up to potable standard.

Should the condition of the tanks prove to be unsatisfactory, new potable water tanks will be installed to provide potable water to both the current potable and non-potable cold water systems.

The capacity of the new tanks would be determined by achieving a balance between maximum storage and reasonable cost.

An additional pump set will be required for a number of flats on the upper floors as the static pressure alone from the storage tanks would not be sufficient to ensure a reasonable flow of water through the heat interface unit. This additional pump set will be located in the roof plant room.

New potable cold water pipework will be run from the roof storage tanks to serve all areas of the building. The pipework will run in a vertical duct located in the lift lobbies outside the flats.

Hot water will be generated locally by the HIU's. The HIU's have two heat exchangers, one for space heating and one for domestic hot water heating. The domestic hot water heating heat exchanger has a primary heating circuit fed from the building's heating system. It also has a secondary circuit which is fed by the cold water supply from the roof tanks. The heat exchanger transfers heat from the primary heating circuit to the cold water thereby providing domestic hot water for the flat. Complete hydraulic separation is maintained between the primary and secondary circuits.

It should be noted that the temperature of the hot water will not be as hot as tenants have previously had available from their Elson tanks, however, the HIU's are similar in principle to 'Combi' boilers which generate instantaneous hot water and are extensively used in new housing developments with little complaint from the users.

The new system will provide sufficient hot and cold water pressure to enable tenants to install showers.

Apart from the final connections to the new cold water service and the HIU, the water services pipework within the flats will not be replaced.

The extent of metering and type of meters that might be appropriate has yet to be agreed. Further investigation into meter types and options for recording water usage will be progressed and a summary of options provided in order to decide on the eventual metering strategy.

It is understood that as a minimum, the Nursery and the Boxing Club are both required to be metered.

As the new system will provide a single water supply to each area, only one meter will be required for each space.

The new cold water and domestic hot water system will be provided with minimal interruption to the existing supplies. The work will be phased to minimise any disruptions. All work will be planned and coordinated with the TMO throughout the duration of the works to allow tenants to be adequately warned of any supply disruptions.

Although it will be the contractor's responsibility to plan and coordinate the works without disruption to the existing services, a suggested phasing approach has been set out in Appendix A of this report.

Hot and cold pipework will be specified as Pegler Yorkshire Xpress Copper or equal and approved.

Copper has been proposed due to its anti-microbial properties which can help to inhibit growth of harmful bacteria like E.Coli or Staphylococcus aureus.

The Xpress system has also been proposed to reduce the amount of "hot work" required to be carried out. The fire and smoke vent system will be refurbished as part of the Works and there may be periods when these systems will not be in operation. Reducing the risk of fire by using mechanical jointing is therefore the preferred option.

All Hot and Cold pipework will be insulated with Kingspan Tarec Kooltherm foil faced phenolic foam having zero ozone depletion potential (ZODP) or equal and approved. Various thicknesses of insulation will need to be used to coordinate with the limited head height in the lift lobby areas. The following general rules shall apply but thicker insulation should be used if possible:

- Main runs - 25mm thick
- Branches - 20 mm thick
- Final Branches to individual units - 15 mm thick

Isolation valves shall be installed on all branches from the main pipework to each flat and on the final connections to all appliances, to allow maintenance and isolation in the event of a leak.

As all water services will be provided from tanks in the roof top plant room the lower levels will experience water pressures up to 8 Bar. This pressure will be reduced by pressure reducing valves located at the branch pipes between the core services distribution and the dwelling/commercial unit to between 1 and 3 Bar (adjustable to suite application).

All pressure reducing valves will be 'drop-tight' so that the pressure does not increase under zero flow conditions.

The system will need to be sterilised at some point so the contractor will need to factor this into their works programme in a way which ensures minimum disruption to tenant's water supplies.

S(32) - Natural Gas

Existing
One main incoming gas service enters the basement level on the east side of the tower.

The incoming gas supply is split into separate supplies within the building. One supply is metered at basement level and serves the main boiler heating plant. The other supply splits into six risers to run up the building to provide gas for cooking in the flats. These supplies are individually metered within each flat.

The route for the gas pipework to the flats has yet to be traced, but it is likely that it runs within the core up to level 04 where the pipework offsets under the floor slab to rise in six service ducts up to the flats. It is not proposed to alter any of the utility gas pipework as part of these works, apart from any rerouting which may be required at Podium level.

Strip Out
All natural gas services routed through the podium levels will be surveyed and labelled.

Once the survey is complete, an assessment of any necessary rerouting will be made.

Proposal
It will not be necessary to make any application to the utility company for a change in the existing gas supply as the gas consumption of Grenfell Tower will decrease as a result of the refurbishment works.

A new gas connection will be taken from the main gas supply serving the existing boilers to serve the new boilers in the basement plant room. Consideration should be given as to whether or not the Tower gas supply should be separately metered.

As the basement boiler room is a relatively low risk fire hazard, the new gas connection can be steel pipework. The majority of the pipework can be pre-fabricated off-site with final connections made on site. Welding or flame cutting of pipework on site should be kept to an absolute minimum.

S(61) –Dry Riser

Modifications will be made to the existing dry riser at Grenfell Tower as described below.

The inlet breaching valve will be relocated from the core service riser to the external elevation to comply with current regulations. The new position of the inlet valve shall be within 18 metres of the hard standing provided for fire tenders.

New landing valves will be added to the system at Mezzanine, Walkway and Walkway +1 levels.

The whole system will be pressure tested on completion.

T(31) - Heating System

Existing System
The residential units are heated by a single loop ladder arrangement which also provides domestic hot water (DHW) via a hot water cylinder in each flat. The pipework serves the flats via six risers (1 per flat on each floor) and from there runs within the flats to radiators through pipework cast into the screed floor finish.

The basement heating plant consists of 3 No. gas-fired boilers located in the basement. These boilers currently serve Grenfell Tower and the "Finger Blocks" to the south of Grenfell Tower.

These boilers are old, inefficient and unreliable with an estimated efficiency of around 60%. Hot water for both heating and DHW is pumped from the basement up the six risers to the flats on each floor. As these risers supply both the DHW and heating systems, there is a requirement for the heating system to operate during and outside the heating season.

The heating system was comprehensively surveyed in 2008 and found to have a useful service life of approximately 10 years remaining (5 years left at time of writing).

Proposed New System
A new gas fired boiler heating system will provide all heating to Grenfell Tower. The boilers will only serve the Tower and will not be connected to the existing heating system.

The boilers will be located in the basement plant room. New flow and return pipework will run from the plant room to serve the Podium areas and the flats.

Each flat will have a 'Heat Interface Unit' (HIU) which will be connected to the new heating mains to provide space heating and to heat the domestic hot water supply. The HIU's will be located in the cupboard where the existing Elson hot water tank is located.

The HIU's will have two heat exchangers, one for space heating and one for domestic hot water heating. The heating heat exchanger has a primary heating circuit fed from the building's heating system. It also has a secondary circuit which circulates heat to the radiators in the flat. The heat exchanger transfers heat from the primary circuit to the secondary circuit while maintaining complete hydraulic separation between the two circuits.

The HIU domestic hot water heat exchanger has a primary heating circuit fed from the building's heating system. It also has a secondary circuit which is fed from the cold water supply. The heat exchanger transfers heat from the primary heating circuit to the cold water thereby providing domestic hot water for the flat. Again, complete hydraulic separation is maintained between the two circuits.

The existing systems will remain active throughout the duration of the works to maintain an uninterrupted heating and hot water system to Grenfell Tower and the "Finger Blocks". Once Grenfell Tower is connected to the new system the existing system connections to Grenfell Tower will be removed leaving only the required components to continue serving the 'Finger Blocks'.

In order to maintain an uninterrupted heat supply to the Tower during the works it is necessary to carry out the works in separate phases. Although it will be the contractor's responsibility to plan and coordinate the works without disruption to the existing services, a suggested phasing approach has been set out in Appendix A of this report.

Routing and Pipework
Pipework is to be Pegler Yorkshire Xpress Stainless Steel throughout (or equal and approved). Stainless steel pipework is proposed due to its high corrosion resistance performance and strength. The "cold joining" connection method has been selected to avoid hot works as described earlier in section S(10) & S(11) – Cold and Hot Water.

The main heating pipes will rise vertically through the building with branch connections running through the lift lobby at each floor level.

Significant problems can arise in common parts where heat from pipework has not been removed and the heat build-up results in very high temperatures. The preferred way to limit this will be to provide high levels of insulation to reduce the heat emanating from the pipework and then ventilate the space as efficiently as possible. The pipework will be very well insulated, but providing ventilation from the lift lobby will be difficult. It may be possible to incorporate some passive ventilation into the smoke vent system as this is being renovated and this option is being pursued with Building Control/Fire Officer to obtain their approval.

Static Pressure, Differential Pressure and Flow Control
Static system pressure will reach 9 Bar at the bottom of the main pipe risers. All equipment and valves will be provided to operate safely at this pressure.

The contractor shall design the system to take these high pressures into account, but one way of achieving this could be to provide differential pressure control valves, such as Oventrop Hydromat DTR, to regulate and maintain the differential pressure across the flow and return of each level from approximately 35 to 70 kPa per floor. This will ensure the quiet operation of thermostatic radiator valves.

A flow regulating valve such as Oventrop Hydromat QRT to work in parallel with the differential pressure control valves would help to protect against excessive flow conditions which can sometimes be experienced in variable speed pumping systems.

Figure 26 below shows how the flow regulator and differential pressure control valve working together to achieve excellent hydronic balancing.

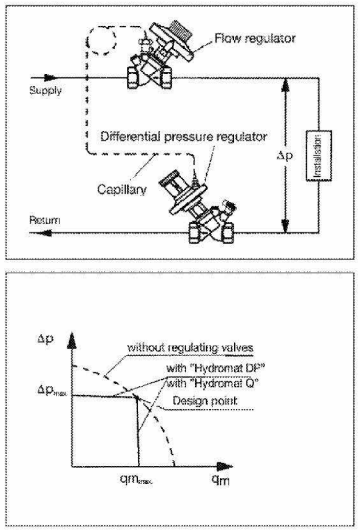


Figure 2 - Close branch control with flow and differential pressure regulation

Auto-fill, Dosing and Leak Detection System
The primary sealed heating system shall be filled and pressurised by a pressurisation & automatic dosing unit. The unit will have two digital control panels with a pressure transducer monitoring the system pressure. The controller will have three volt-free relay outputs for – boiler run with high and low pressure cut-out, general fault and combined warning and fault. The unit will feature a built-in electronic water meter with a volt free warning relay, which shall activate should the monthly consumption exceed 50 litres per month.

Metering
The extent of metering and type of meters that might be appropriate has yet to be agreed. Further investigation into meter types and options for recording heat consumption will be progressed and a summary of options provided in order to decide on the eventual metering strategy.

It is understood that as a minimum, the Nursery and the Boxing Club are both required to be metered.

It would be possible to provide remote operated isolation to allow isolation of flats where tenants have not paid for their heating. There are various ways of doing this and further discussion and guidance as to what is required will be agreed in the next stage of design development.

T(--) - Cooling System

It is not proposed to provide air conditioning or cooling to any of the areas.

U(10) – General Ventilation

Core Circulation
The existing lift lobbies are currently not ventilated apart from a small amount of fortuitous ventilation provided through the poorly sealed smoke extract and air supply dampers at each level. As part of the refurbishment these leaky dampers will be replaced with well-sealed dampers which will eliminate the small amount of ventilation that is currently provided.

To provide general ventilation in the core circulation areas as well as providing some heat removal, it is proposed to use the automatic smoke extract system to provide general ventilation. As stated above, this strategy will need to be agreed with Building Control and the Fire Officer. It is important that some ventilation to the lift lobbies is achieved as otherwise significant overheating may be experienced in these areas due to the addition of the new heating pipework at each level.

For further information on the operation of the smoke ventilation system see section U(14) – Smoke Extract.

Refuse Ventilation
The access to the refuse chute from the main circulation is via an enclosed lobby. Mechanical ventilation is provided to this lobby via supply and extract grilles located at high and low level next to the chute entrance. The supply and extract fans are located in the roof plant room. It is not proposed to carry out any work on the existing fans or ductwork.

Access to the refuse chute is currently provided from Walkway +2 upwards. Additional access to the refuse chute will be provided on Walkway +1 and Mezzanine levels.

The general ventilation system will be extended down to Mezzanine level and Walkway +1 level to provide general supply and extract ventilation to the newly formed refuse chute access rooms.

Bathroom Ventilation
The bathrooms are currently ventilated by a central extract system with fans in the roof level plantroom. It is proposed to clean the systems and replace the final length of ductwork and grilles to each bathroom.

U(14) – Smoke Extract

Existing System
Every lift lobby area from level 04 to 24 is provided with a smoke clearance system. The system consists of two separate smoke extract ducts located at high level in the lobby area and two air supply ducts located at low level on the opposite side of the area.

Extract fans are installed to enable the Fire Brigade to increase the supply and extract rate of ventilation. The fans are located within the roof plant room.

It is understood the system also incorporates supply fans located at the bottom of the supply riser at Walkway +1 level (Group Medical Practice) above a false ceiling in the entrance lobby area, however access has not yet been available so this will be verified during the next design stage.

In the event of a lobby smoke detector being activated, the automatic smoke vents in that lobby open to allow a natural ventilation path through the affected lobby to remove the smoke.

The fans remain off until the Fire Brigade arrive and decide to switch them on using the manual switch at Ground floor level.

As only one set of dampers are likely to open at any one time and with air-tight dampers, this would be a viable solution. However, it has been demonstrated by smoke testing (see AECOM report dated 19 Oct 2011) that some of the existing dampers leak slightly when in the closed position. It is therefore possible that smoke from a fire on a lower floor could leak through the 'closed' dampers on an upper floor and into the lift lobby.

New System
A meeting was held with Building Control, Max Fordham, Studio E and Exova on the 17 September 2013 to discuss the overall fire strategy for the building. The lift lobby smoke clearance system was discussed as part of this meeting.

Building Control were generally receptive to the description of the proposed new system but requested a written summary of the proposals so they could discuss further with the Fire Brigade. They will then respond with comments as necessary.

The proposed new system is essentially similar to the existing one, but with replacement motorised dampers and control system. The existing fans will be inspected and a decision made as to the viability of retaining these.

The system will be extended to serve the new residential areas on the lower floors.

The system would be controlled as at present such that the dampers on each floor level remained open until a fire situation is detected in which case, all dampers will close, apart from the ones on the affected level. The fans would remain off until operated by the Fire Brigade using a switch on the panel at ground floor.

The source of the power supply to the system needs to be agreed with Building Control. It is likely that two separate supplies from different sources will be required. It may be possible to agree two supplies from the main incoming supply board with fire-rated cables taking separate protected routes to get to the fans. Alternatively, a separate source from outside the building or from a static invertor may be required.

It is also intended to use the system to ventilate the lift lobbies to reduce heat build-up generated by the new heating pipes. The controls for this will be kept as simple as possible with the dampers at each level being controlled by a thermostat in the lobby. The possibility of linking the temperature control to operate the fans will be investigated further during the next stage of design development.

The safe operation of the system is paramount and all equipment will fail-safe in the event of a fire condition.

At the meeting with Building Control, some issues arose regarding lobbying and venting the new lower levels which may require some controlled ventilation. Further information will be provided by Exova/Studio E.

V(20) - Low Voltage Distribution

Electricity

Existing
The switch room has 3 No. TP&N incoming Utility supplies, two of which serve the residential flat supplies and one which supplies the landlord's busbar.

The landlord's supply connects to an 800 amp busbar that provides supplies to the various landlord items that require power such as the lifts, fire alarm, common area lighting, etc.

Power supplies to the residential units rise through the building with meters provided for each flat.

Strip Out
All electrical services affected by the works are to be surveyed and labelled before any services are removed. Some services may be the property of UKPN, in which case, disconnection of these supplies will be applied for in due course.

Electrical supplies to all residential systems are to remain active throughout the duration of the works. The exact routes of the existing electricity supplies are unknown, however it seems likely from the available drawings and visual site inspections that all services are routed within the core area when possible.

Temporary supplies may be required to maintain the following services over the duration of the works;

- Existing Dwellings supplies
- Refuse Room
- Main lifts
- Roof top plant room power supply
- Basement lighting and power
- Basement control panel
- Landlord's lighting and power
- Static invertor to existing smoke control (including fire alarm) panel and static invertor
- British Relays (purpose unknown but live)

Some of the above systems will be upgraded during the refurbishment. Where the system is being renewed the existing system must be kept operational for as long possible to minimise the down time between the new and existing systems.

Proposal
Provide new electricity supplies to the following new landlord areas as follows:

- New smoke extract system
- Community meeting room small power and lighting
- Concierge office small power and lighting
- External lighting
- New fire alarm and detection
- Boxing club small power and lighting (metered)
- Nursery small power and lighting (metered)
- BMS panel in basement plant room
- New booster pumps in roof plant room

These new supplies will be provided from the existing landlord busbar tap offs that are freed up as part of the strip out process.

Distribution routes to be via existing main electrical riser in the central core area. New Ryefield boards can be installed in the existing risers with sub-mains feeding cable heads and utility meters within the dwellings/commercial units.

New elements in Common Areas
New lighting power to be taken from existing lighting final circuits.

V(21) – General Lighting

New Areas
New common areas will be designed to meet the light levels listed in Table 13 below.

Room Type	luminance (Lux) on Working Plane	Working Plane Height
Corridors	100	FFL
Store Room	150	FFL
New Lift Lobbies	200	FFL

Table 1 – Core Area Lighting Levels

Generally where a ceiling void exists the lighting in new areas will be provided via recessed downlights as shown in Figure 7 below.

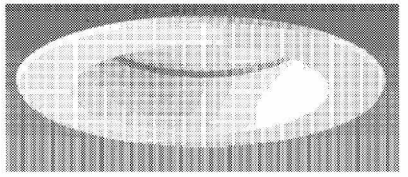


Figure 7 - Recessed Downlight for use in corridors.

Where ceiling heights are restricted in the ground floor and mezzanine levels a wall mounted light (Figure 38) will be used.

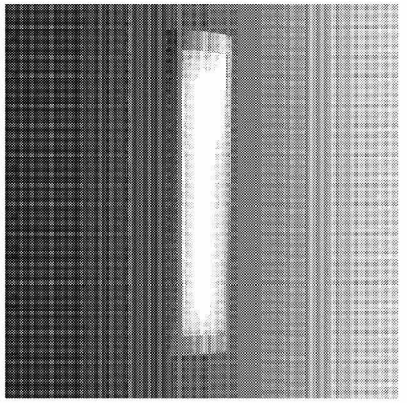


Figure 3 - Low profile wall light used in areas with low ceiling heights

Existing Residential Lift Lobby Areas
To conceal the new pipework in the common areas, it is proposed to drop the ceiling level. The extent of this is yet to be finalised, but new light fittings will be provided in these areas. The new lighting will be recessed downlights such as those shown in Figure 7. Light levels will comply with those shown in Table 1.

Prior to final selection, TMO will be offered a range of suitable light fitting for them to select their preferencces.

V(22) – General Low Voltage Power

No alteration to existing sockets positions, wiring or accessories are proposed to the existing core areas.

A single RCD protected cleaner's socket will be provided on each new floor.

V(40) – Emergency Lighting

Emergency lighting will be provided to all new areas in accordance with the requirements of BS 5266, Building Control and the local fire authority.

Emergency luminaires to be provided with 3 hour self-test facility.

Maintained emergency luminaires will be provided over all building final exits and to all escape routes complete with all necessary conversion kits and change over relays.

W(10) – Telecommunications

Existing
There is currently a BT services distribution room in the basement plant room. It is assumed this is the only BT equipment in the building (excluding small junction boxes in the main mechanical risers in the main core areas) serving both the podium and the existing residential levels.

The presence of other media/telecoms companies has not been established, but a Virgin connection box was noted in the 2-bed void flat. TMO have been contacted to see if they can provide any further information on the communications systems.

Strip Out
The existing equipment and lines need to be surveyed prior to any strip-out.

All lines to be identified and labelled.

Al lines to existing residential, life safety systems and lift operation must be protected and kept live throughout the duration of the refurbishment. All other lines to be stripped back to main distribution cabinet for the duration of the works.

Proposal
New lines to the new dwellings on the mezzanine level and walkway+1 will have new applications made to install a phone line to the dwellings.

BT or other supplier to reinstate telecoms from main equipment cabinet to the Nursery, Boxing Club and Reception. Number of phone lines to be as per the service descriptions for each individual area.

W(15) - Facilities for the Disabled

Facilities for the disabled will be provided in accordance with the relevant regulations and good practice.

W(40) - Access Control and Entry Phone

The existing access control/entry-phone system is to be replaced. It has been agreed this will be incorporated within the existing scope. The type of system is yet to be finally agreed and this will be developed during the next stage of the design.

W(41) – Security Detection and Alarm

Additional CCTV cameras will be provided and integrated with the existing CCTV system. The number/location/type of camera, etc. will be agreed with the client's security specialist.

W(50) - Fire Detection & Alarm

The provision of a new fire alarm and detection system will be provided in accordance with Building Regulations and the Fire Officer's requirements.

It is propsed that a complete new L4 fire detection and alarm system in accordance with BS5839 will be provided to all core areas of the building.

Two detectors will be provided to each lift lobby.

A new main fire alarm panel will be provided in the new entrance lobby.

The scope of this work includes:

- An analogue addressable main fire control panel located within the entrance lobby.
- Smoke/heat detectors throughout the common parts and within the refurbished Podium areas.
- Break glass call points in accordance with BS5839 and where shown on drawings.
- Sounders located in accordance with BS5839.

Provide fire alarm interface relays to the following;

- Existing lift 1
- Existing lift 2
- Smoke Control system (capable of communicating to the smoke extract system which floor the fire alarm has been triggered)
- Interface with Boxing Club system
- Interface with Nursery fire alarm system

W(51) – Earthing and Bonding

Earthing and bonding will comply with BS 7671. It is assumed that no special earthing and bonding arrangements are necessary.

W(60) – Controls

A new power and control system will serve the new mechanical plant.

The system is to be developed and confirmed, but is likely to have the following attributes:

- Simple day-to-day user-friendly plant operation, monitoring, overriding and fault identification and to enable remedial actions by plant operators who do not have a detailed knowledge of control systems.
- Monitoring and logging of the environmental conditions and plant operational performance, including instantaneous status reporting of conditions, both at the building and at remote station(s) via the internet; also to enable alterations of all control parameters, software and set points both at the building and remotely via the telephone system on password control.
- To be continuously commissioned over the first year of occupancy to ensure correct operation over a range of weather conditions.
- Archive all the logged data to allow long term monitoring of the performance of the buildings systems.
- Monitoring/logging of heat meters/water meters to allow the client to automatically produce billing information for building sub-tenants.

02 NURSERY

OVERVIEW

With the exception of connecting to the central services for heating, cold water and power supply, the Nursery unit is intended to run as a self-contained unit with minimal interfaces between the systems of the Nursery and the other building areas. A detailed brief has not yet been received, but it is anticipated the systems outlined below or similar, will be required.

The servicing strategy has been developed with a view to keeping the systems as simple and robust as possible and the control easy to use.

New mechanical, electrical and public health systems will be provided throughout.

R(11) - Above Ground Drainage

Connect all new appliances requiring foul water connection to a new drainage system.

New drainage material to be HDPE.

Stacks to be ventilated using air admittance valves (AAV) located at the top of each stack as it is not possible to terminate to atmosphere.

S(10) & S(11) – Cold and hot Water

Existing
The Nursery's cold water and drinking water supply is currently served from the central system. It has not been possible to identify if the Nursery is fed from the cold water down service from the water storage tanks in the roof plantroom or if it is connected directly to the cold water rising main.

Strip Out
Isolate and cap off the Nursery from either the rising cold water service or the cold water down service.

All water services to the Nursery to be surveyed, labelled and removed.

Water supplies to be isolated for at least 24 hours before permanent work is done to remove the service.

Proposal
Potable cold water will be supplied from the new cold water system. The new supply will be metered.

Metering information will be collected by the BMS.

A heat interface unit (HIU) will be provided to generate hot water.

Hot and cold water pipework materials, etc. will be as described previously for the Tower systems.

Each wash hand basin (WHB), local group of WHBs and shower will be limited to a maximum hot water flow temperature of 43°C using a thermostatic control valve (TM3 standard).

S(32) - Natural Gas

It is assumed that the Nursery does not currently have a gas supply and that a gas supply is not required.

T(31) - Heating System

LTHW will be supplied to the Nursery from the new central boiler system. A Heat Interface Unit (HIU) will be provided which will operate in a similar fashion to the flats as described in section 01.

The LTHW supply to the Nursery will be heat metered. Metering information will be collected by the building management system. The metering will allow the TMO to bill the Nursery for their heat usage.

Low surface temperature radiators are proposed as the preferred heating solution for the Nursery as they do not have any impact on the floor levels and are quick to respond to rapid heat requirement changes caused by changeable occupancy.

Figure 411 shows the type of radiator that will be installed throughout the Nursery. This type of radiator limits the surface temperature of the radiator to 43°C which is low enough to ensure it is impossible to burn yourself on the heating surface.

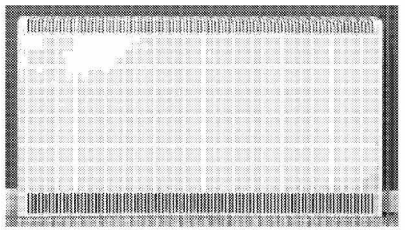


Figure 4 - Low Surface Temperature Radiator

Heating Control
Heating will be controlled via the 4 zone Heatmiser™ TM4, 4 zone heating time switch. The touch screen interface shown below in Figure 512 will be located in the Nursery office. Wall mounted thermostats as shown in Figure 13 will be located in each zone.

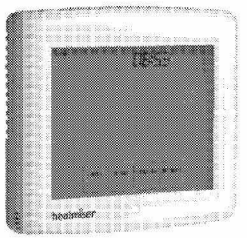


Figure 5 - Touch screen 4 zone heating time clock

Zone	Time clock	Temperature Control
Entrance area	Yes	Wall mounted thermostat*
Play Area	Yes	Wall mounted thermostat*
Quiet Area	Yes	Wall mounted thermostat*

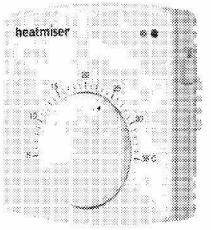


Figure 6 - Wired zone thermostat

See Nursery heating schematic T(--)03.200 for further information.

T(--) - Cooling System

Mechanical cooling ('air conditioning') will not be provided. Natural ventilation will be provided by opening windows in the building façade. The windows will be controlled manually by the Nursery staff.

High level windows to be openable via mechanical window winders as shown in Figure 714.

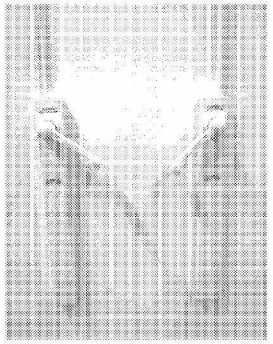


Figure 7 - Mechanical Window Winder

U(10) – General Ventilation

Main open plan areas with access to external windows
General background ventilation via acoustic trickle ventilators will be built into window frames to comply with Part F of the Building Regulations.

WCs, Accessible WC and Kitchen Area
Surface mounted local extract ventilation. Extract ventilation controlled via local passive infra-red (PIR) detector with timed overrun.

V(20) - Low Voltage Distribution

Existing
The Nursery is currently supplied from a 60A TP&N tap off from the landlord's main bus bar located in the ground floor switch room. This supply is metered.

Strip Out
Remove current electricity meter and supply cable back to the main bus bar.

Proposal
Using the space created by the removal of the existing Nursery electricity supply equipment provide a new metered supply to the Nursery from the landlord's main bus bar.

Provide a new distribution board in the Nursery store cupboard. Meters to be mounted within extension box at the bottom of the board.

V(21) – General Lighting

Areas will be designed to meet the light levels listed in Table 14 below.

Room Type	luminance (Lux) on Working Plane	Working Plane Height
Office (Background)	200	750 mm
Office (Task Lighting)	500	750 mm
WCs	200	FFL
Corridors	100	FFL
Store Room	150	FFL
Kitchen	500	900
Nursery General	300	FFL

Table 2 - Nursery Lighting Levels

Due to the limited floor to ceiling heights there will be no ceiling void to recess lighting in. Therefore all the lighting to the Nursery must be surface mounted.

Provide slim line surface fittings as shown in Figure 85 to provide general lighting to the Nursery.

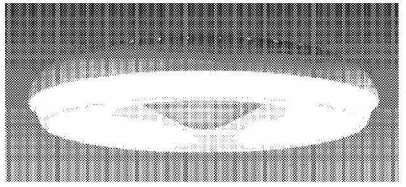


Figure 8 – Nursery Low profile light fitting

Provide slim line batten fittings in store rooms.

Lighting Control
Play Area and Quiet Room
Manual switching to allow selection of lighting arrangements within the Play Area and the Quiet Room.

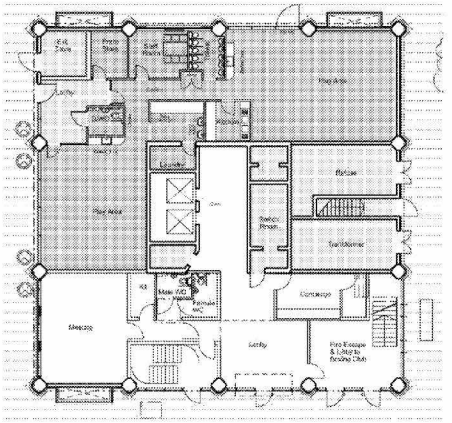


Figure 9 – Nursery Room Layout

Corridors, WCs, stores, kitchen and cupboard
Lighting to be controlled via PIR's.

V(22) – GENERAL Low Voltage Power

Final circuits wired in LSF insulated cables. Containment to be appropriate to whether cable route is surface or concealed.

Play Area and Quiet Room
Electrical accessorises to be MK Metalclad in surface mounted boxes as shown below in Figure 107.

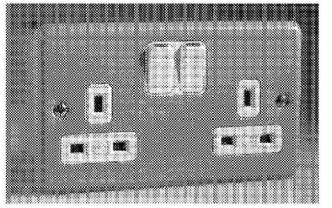


Figure 10 - MK Metalclad Double Socket

See V(90)03_100 Combined electrical services layout for number and location of power outlets.

Office area
Electrical accessories to be MK Metalclad mounted in MK Prestige 3D compact power and data dado perimeter distribution as shown in Figure 118.

MAX FORDHAM

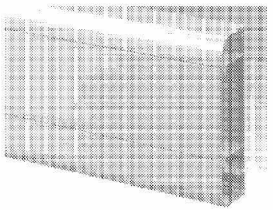


Figure 11 - MK Prestige 3D Dado Trunking

Number and location of sockets and extents of dado trunking is shown on V(90)03_100.

V(40) – Emergency Lighting

Emergency lighting will be provided to all spaces via the integrated emergency versions of the general lighting.

Provide self-illuminated emergency exit signage where indicated on the drawings.

Emergency lighting test switches to be provided.

V(41) - External Lighting

Provide switching control for one final exit light (with 3 hour emergency battery backup) and switching to illuminate any external signage (if required).

W(10) – Telecommunications

Existing
It is assumed there are existing telephone lines to the Nursery, number and location unknown.

Strip Out
Specialist to survey existing equipment and lines. Lines to the Nursery will then be identified and stripped back to the main BT distribution cabinet for the duration of the works.

Proposal
Specialist to reinstate telecoms from main equipment cabinet to the Nursery. The number of phone lines and phone numbers as existing and terminated in the Nursery office.

W(15) - Facilities for the Disabled

Provide alarm system to accessible WCs to allow persons in difficulty to request help.

Alarm activation switching will be via a pull cord provided within the accessible WC. Audible and visual alarm indicators will be installed locally to the accessible WC. A single repeater panel located at the Nursery main entrance will be provided to allow the alarm to be raised centrally.

It is assumed a public address system is not required.

It is not proposed to install an induction loop system in the Nursery as no main reception area is provided and no class room or lecture areas can be identified from the layouts.

Strobe beacons will be fitted in every WC to alert occupants who have difficulty hearing that the fire alarm has been activated.

W(20) – CCTV

No CCTV system is proposed to the interior of the Nursery. See section 01 _ Central Services section W(20) for details of site wide CCTV.

W(40) - Access Control

No access control to be provided to the Nursery, traditional security ironmongery only.

W(41) – Security Detection and Alarm

The level of security to be provided are yet to be finalised, but it is anticipated that a complete intruder alarm to NACOSS Grade 2 will be required.

Provide a single zone alarm with control via a single control panel located next to the main entrance.

W(50) - Fire Detection & Alarm

The Nursery, the Boxing Club, the Community Room and the ground and walkway offices will all be provided with at least a Type "M" system as defined in BS 5839-1(5). Each area will be "stand alone" but interlinked so that an outbreak of fire in one of them will be enunciated on all fire alarm control panels.

All cabling to be MICC or flexible fire resistant cabling (enhanced standard) - e.g. Prysmian FP plus LSOH.

W(51) – Earthing and Bonding

Earthing and bonding to comply with BS 7671, It is assumed no special earthing and bonding arrangements are necessary.

W(60) – Controls

All controls are covered by stand-alone lighting and heating controls.

W(70) – Structured Cabling System

It is assumed a structured cabling system is not required in the Nursery.

03 EMB OFFICE

OVERVIEW

With the exception of connecting to the central services for heating, cold water and power supply, the EMB Office is intended to run as a self-contained unit with minimal interfaces between the systems of the office and the other building areas.

The servicing strategy has been developed with a view to keeping the systems as simple and robust as possible and the control easy to use.

New mechanical, electrical and public health systems will be provided throughout.

R(11) - Above Ground Drainage

Connect all new appliances requiring foul water connection to a new drainage system.

New foul drainage system to serve first four floors remains separate from existing drainage until after the final rest bend. New and existing drainage connected at high level in basement plantroom.

Work on live drainage systems cannot be avoided. Contractor will need to coordinate drainage work with residents to avoid hazards.

New drainage material to be HDPE.

Stacks to be ventilated using air admittance valves (AAV) located at the top of each stack as it is not possible to terminate to atmosphere.

S(10) & S(11) – Cold and hot Water

Existing
The office cold water and drinking water supply is currently served from the central system. It has not been possible to identify if this is fed from the cold water down service from the water storage tanks in the roof plantroom or if it is connected directly to the cold water rising main.

Strip Out
Isolate and cap off the area from either the rising cold water service or the cold water down service.

All water services to the related areas to be surveyed, labelled and removed.

Water supplies to be isolated for at least 24 hours before permanent work is done to remove the service.

Proposal
Potable cold water will be supplied from the new cold water system. The new supply will be metered.

Metering information will be collected by the BMS.

A heat interface unit (HIU) will be provided to generate hot water.

Hot and cold water pipework materials, etc. will be as described previously for the Tower systems.

Each wash hand basin (WHB), local group of WHBs and shower will be limited to a maximum hot water flow temperature of 43°C using a thermostatic control valve (TM3 standard).

S(32) - Natural Gas

There is no natural gas supply currently, and there is no requirement for one in the new layout.

T(31) - Heating System

The heating system for landlord areas such as the EMB Office, Community Room and Reception area is dependent upon the metering strategy used. This will be further developed in the next design stage.

Pipework to be Pegler Yorkshire Xpress Stainless Steel throughout.

All LTHW pipework with the exception of the final connections to heat emitters to be insulated with with Kingspan Tarec Kooltherm foil faced phenolic foam Zero Ozone depletion potential (ZODP).

- Main runs = 25mm wall thickness
- Branches = 25 mm
- Final Branches to individual units = 15 mm

Heat Emitters
Radiators have been chosen as the preferred heating solution as they do not have any impact of the floor levels, are quick to respond to rapid heat requirement changes caused by changeable occupancy levels.

Fig. 19 shows the type of radiator that will be installed around the perimeter of the office and within the reception.

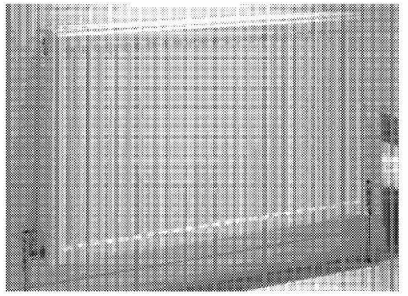


Figure 12 - Double Panel Radiator

Figure 1320 shows the type of radiator that will be installed in the accessible WC. This type of radiator limits the surface temperature of the radiator to 43°C which is low enough to ensure it is impossible to burn yourself on the heating surface.

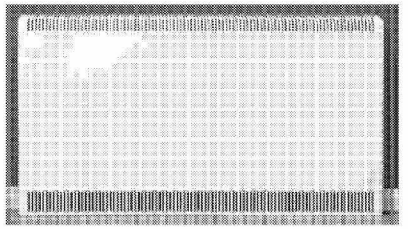


Figure 13 - Low Surface Temperature Radiator

LST radiators are recommended where there is anyone that is likely to be unable to react quickly if they fall against a radiator, usually the very young, elderly or mobility impaired.

Heating Control
Heating to be controlled via the single zone Heatmiser™ TM1, 1 zone heating time clock. The touch screen interface is shown below in Figure 14 will be located in the Office area.

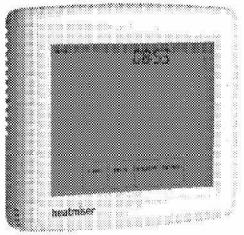


Figure 14 - Heat Miser Single Zone Time Clock

Temperature to be controlled via a wireless thermostat in the office area with local control via TRVs on the radiators in the Reception and WC.

Zone	Temperature Control
Office	Wall mounted thermostat*
Reception	Thermostatic Radiator Valve (TRV)
WC	TRV

*Wall mounted thermostat to be Heatmiser™ DS1 dial type thermostat as shown in Figure 15.

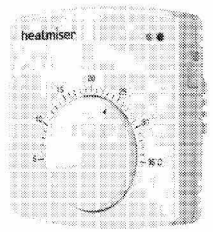


Figure 15 - Wired zone thermostat

Thermostatic radiator valves to be lockable where provided.

See Office/Reception heating schematic T(--)04_200 for further information.

T(--) - Cooling System

Cooling provided by external air, no mechanical cooling to be provided.

External air enters and is controlled by opening windows in the building façade. The windows will be controlled manually by the staff.

High level windows to be openable via mechanical window winders. Chain openers to be Rockburn Limited T150 chain openers or equal and approved with 380mm of opening travel. Each window to be commissioned to allow maximum opening within the operational limits of the chain openers.

All windows in the office to be openable.

Windows must open to full extent that the chain opener will allow.

U(10) – General Ventilation

Office/Reception
Ventilation to office via acoustic trickle ventilators built into window frames to comply with Part F of the Building Regulations.

Accessible WC
Local extract ventilation integrated into the IPS connecting to a grille located in the West Office façade.

Extract ventilation controlled via light PIR with timed overrun.

V(20) - Low Voltage Distribution

Electricity
Existing electricity supply to this area to be surveyed, labelled and striped back.

Provide a new electricity supply from the landlords bus bar in the switch room to a new power and lighting board located in the concierge room.

V(21) – General Lighting

Areas will be designed to meet the light levels listed in Table 35 below.

Room Type	luminance (Lux) on Working Plane	Working Plane Height
Office (Background)	200	750 mm
Office (Task Lighting)	500	750 mm
Reception	200 (500 on reception desk by task lighting)	750 mm
WCs/Changing Room	200	FFL

Table 3 – Office/Reception Lighting Levels

The limited floor to ceiling height available on the ground floor will necessitate the use of low-profile surface mounted ceiling lights as shown in 23 (Thorn Planar C). These will be used in both the Office and Reception.

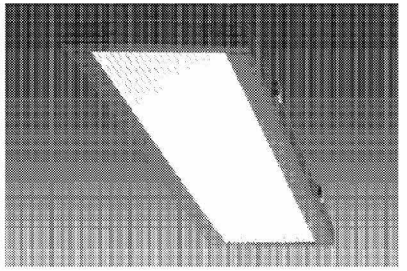


Figure 16 - Low Profile Office Lighting

Lighting to the WC will be via a surface mounted LED downlight similar to that shown in Figure 174. The luminaire will also act as emergency lighting with an integral 3hr back up.

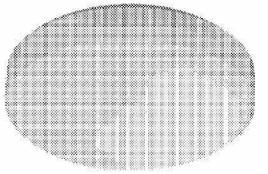


Figure 17 - Surface mounted LED Downlight for use in WC

Lighting Control
The Office and Reception area lighting is controlled by switches at the entrance. The WC lighting is controlled via a PIR.

V(22) – General Low Voltage Power

Office / Reception
Final circuits wired in LSF insulated and sheathed multicore cable.

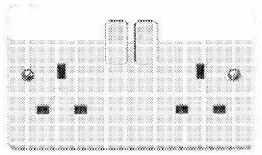


Figure 18 - MK Logic Plus Double Socket

Electrical accessories to be MK Logic Plus (Figure 185) mounted in MK Prestige 3D compact power and data dado perimeter distribution as shown in Figure 19. Floorboxes comprising of 2x double sockets and 4x data points will be provided in the office area.

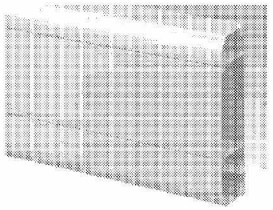


Figure 19 - MK Prestige 3D Dado Trunking

V(40) – Emergency Lighting

Emergency lighting will be provided to the accessible WC via the integrated emergency version of the general lighting shown in Figure 17.

Self-illuminated emergency exit lighting to be provided at the exit.

Emergency lighting test switches to be provided within the space the switch is testing.

W(10) – Telecommunications

Existing
Assumed to be existing telephone lines to the reception area, number and location unknown.

Strip Out
BT to survey existing equipment and lines. Lines to the reception/office area to be identified. Lines to be stripped back to main BT distribution cabinet for the duration of the works.

Proposal
BT to reinstate telecoms from main equipment cabinet to reception area and office.

One phone line for the Reception and an additional line for the Office will be installed by BT.

W(15) - Facilities for the Disabled

Provide alarm system to Accessible WC to allow persons in difficulty to request help.

Alarm activation switching will be via a pull cord provided within the accessible WC. Audible and visual alarm indicators will be installed within the Reception area.

An induction loop system will be installed in the Reception area.

Strobe beacons will be fitted in the WC to alert occupants who have difficulty hearing that the fire alarm has been activated.

W(20) – CCTV

Extent of any CCTV coverage to be determined during next stage of design.

W(40) - Access Control

No access control to be provided to Office/Reception area, traditional security ironmongery only.

W(41) – Security Detection and Alarm

Provide a complete intruder alarm to NACOSS grade 2.

Provide a single zone alarm with control via a single control panel located next to the main entrance.

Provide three dual technology detectors to cover the Office and Reception.

Provide a Honeywell Galaxy series alarm with an MK7 Keypad at main entrance to allow user to set alarms when securing the building.

W(50) - Fire Detection & Alarm

The Nursery, the Boxing Club, the Community Room and the ground and walkway offices will all be provided with at least a Type "M" system as defined in BS 5839-1(5). Each area will be "stand alone" but interlinked so that an outbreak of fire in one of them will be enunciated on all fire alarm control panels.

All cabling to be in MICC or flexible fire resistant cabling (enhanced standard) - e.g. Prysmian FP plus LSOH.

Surface mounted runs of fire-resistant cabling must be finished to a very high standard of workmanship, with straight runs and neat, swept, 90-degree bends only.

W(51) – Earthing and Bonding

Earthing and bonding to comply with BS 7671, no special earthing and bonding arrangements assumed necessary.

W(60) – Controls

All controls are covered by stand-alone lighting and heating controls.

W(70) – Structured Cabling System

Provide a fully tested CAT6 structured wiring system originating from a wall mounted patch panel located next to the area distribution board to the data outlets located in the dado trunking.

Structured cabling system to run in dado trunking around the perimeter of the office.

Wall mounted data cabinet to be to the following spec;
21U 600 mm deep cabinet capable of holding 500 mm deep servers, lockable glass front, removable lockable side panels.

04 MEZZANINE 1 & 2 BED DWELLINGS

OVERVIEW

Provide a new full mechanical, electrical and public health installation to the new mezzanine level flats.

R(11) - Above Ground Drainage

Connect all new appliances requiring a foul water connection to a new drainage system.

New foul drainage system to serve first four floors with as few new stacks as possible.

New drainage material to be HDPE.

Stacks to be ventilated using air admittance valves (AAV) located at the top of each stack.

New system will connect to existing drainage system at basement level before connecting to the existing below ground drainage connections.

S(10) & S(11) – Cold and hot Water

The hot and cold water services will be as described in section 01 Central Services.

S(32) - Natural Gas

No natural gas is to be provided to the new residential dwellings. Cooking hobs are to be electric.

T(31) - Heating System

The heating system will be as described in section 01 Central Services.

Radiators will be installed around the perimeter of the flats. Figure 20 shows the type of radiator that will be provided.

A towel rail will be provided in the bathroom. This will either be a radiator with a towel rail above or a proprietary towel rail connected to the heating system. As space in the bathroom is very tight, the specification of the towel rail will be finalised in the next design stage.

All radiators to be tested to 13 Bar and to have a maximum safe operating pressure of 10 Bar.

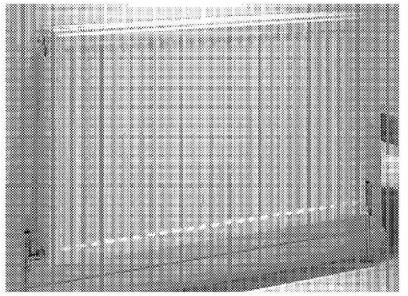


Figure 20 - Double Panel Radiator

Heating Control
Heating to be controlled via a wireless room thermostat/programmer located within the living room, see Figure 21 . The thermostat controls a motorised 2-port valve on the LTHW flow.

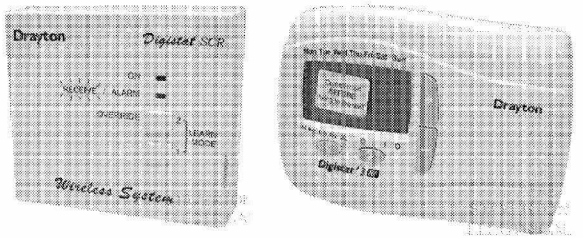


Figure 21 - Drayton Digistat 3RF Wireless Thermostat/Programmer

Local temperature control is to be via thermostatic radiator valves (TRVs) on each radiator.

Radiator balancing via lock shield valves on radiators.

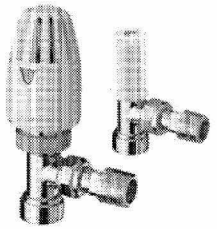


Figure 22 - Room Thermostatic Radiator Valve and Lock Shield Valve

U(10) – General Ventilation

Background Ventilation
Background ventilation is via acoustic trickle vents above the window heads of all windows.

Provide a minimum requirement of 2,500 mm^2 equivalent area of background ventilation to all non-wet rooms.

There must be a gap of at least 500 mm between extract vents and background vents.

Purge Ventilation
Purge ventilation is via opening windows and purge panels located adjacent to opening windows. See Grenfell Tower stage C section 4.2 for further details.

Continuous Extract Ventilation
The dwellings will have a continuous extract system with extract grills located within the kitchen and bathrooms.

To maximise ceiling height the mechanical extract system will be ducted via rectangular section ducts boxed in at ceiling level in the corners of the rooms, see Figure 2330.

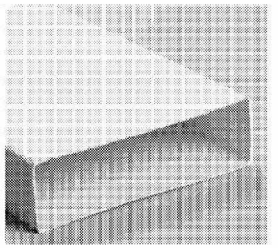


Figure 23 - Flat channel ducting

Provide a central extract unit (Figure 2431) located at high level within a kitchen cupboard. The extract duct will exit the dwelling via a grill above the kitchen purge ventilation panel.

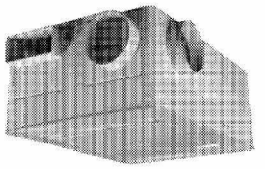


Figure 24 - Nuaire MEVDC Multi-Point Extract unit

The low-level mechanical background extraction to wet rooms is boosted via the light switch in the bathrooms (with overrun timer) and by a boost switch incorporated into the cooker hood in the kitchen.

V(20) - Low Voltage Distribution

Proposal
An application to UKPN to be made for a new utility supply to the residential dwellings. Each unit will have a meter for billing purposes.

V(21) – General Lighting

The limited floor to ceiling height of the mezzanine level prevents the inclusion of a service zone above the plasterboard ceiling useful enough to recess lighting into. For this reason batten fittings as shown in Figure 2532 are proposed for all areas.

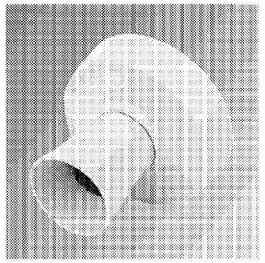


Figure 25 - MK Batten Lampholder

Provide light switches in MK Logic Plus to all areas as shown on V(90)05_101.

V(22) – General Low Voltage Power

Final circuits wired in LSF insulated and sheathed multicore cable. Main distribution in ceiling distribution void and walls.

Electrical accessories to be MK Logic Plus in recessed boxes.

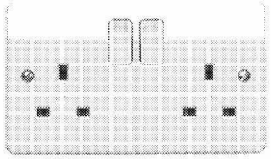


Figure 26- MK Logic Plus Double Socket

V(40) – Emergency Lighting

No Emergency lighting provided to the interior or the dwellings.

W(10) – Telecommunications

Provide one new telephone line per dwelling to be installed by BT from the existing telecommunications cabinet in the basement.

Each new dwelling is to be connected into the existing Integrated Reception System (IRS) for communal access to satellite television services. See 00_site wide services for further details.

W(40) - Access Control

Entry phone to be installed and connected to central system.

W(41) – Security Detection and Alarm

No security alarm to be provided.

W(50) - Fire Detection & Alarm

Provide complete category LD3 fire detection and alarm system in accordance with BS 5839-6:2004.

No bedroom is to be further than approximately 3m from a fire alarm.

The system in each flat will be "stand alone".

W(51) – Earthing and Bonding

Earthing and bonding to comply with BS 7671. Assumed no special earthing and bonding arrangements necessary.

W(60) – Controls

Heating controls only, see section T(31).

MAX FORDHAM

05 WALKWAY+1 4 BED DWELLINGS

See section "04 MEZZANINE 1 & 2 BED DWELLING" for service descriptions.

06 COMMUNITY ROOM

OVERVIEW

The fit-out of the Community Room area of the ground floor is intended to be simple and robust. The mezzanine level has limited headroom so all service routing will be perimeter where possible.

Provide a new full mechanical, electrical and public health installation to the new Community Room.

R(11) - Above Ground Drainage

Connect all new appliances requiring foul water connection to a new drainage system.

New foul drainage system to serve first four floors remains separate from existing drainage until after the final rest bend. New and existing drainage connected at high level in basement plantroom.

Work on live drainage systems cannot be avoided. Contractor will need to coordinate drainage work with residents to avoid hazards.

New drainage material to be HDPE.

Stacks to be ventilated using air admittance valves (AAV) located at the top of each stack as it is not possible to terminate to atmosphere.

S(10) & S(11) – Cold and hot Water

New potable cold water and domestic hot water supplies to be supplied from the new central distribution.

Hot water will be generated by an electric point of use unit.

Hot and cold pipework to be Pegler Yorkshire Xpress Copper where concealed; Pegler Yorkshire Xpress Chromium Copper where exposed.

All hot and cold pipework to be insulated with Kingspan Tarec Kooltherm foil faced phenolic foam Zero Ozone depletion potential (ZODP).

- Main runs = 25mm wall thickness
- Branches = 25 mm
- Final Branches to individual units = 15 mm

Install isolation valves on all branches from the main pipework and on the final connections all appliances to allow maintenance and isolation in the event of a leak.

Main domestic hot water branches do not require trace heating beyond the core services trace heating that ends at the DHW meter. Assuming that the maximum length of DHW "dead leg" or the length of DHW pipework that is not trace heated between the appliance and trace heated pipework is less than 5m.

The hot and cold water supply is to be metered. Metering information will be collected by the building management system. The metering is to be sufficiently high enough grade to allow the KCTMO to sub-bill the user for their water hot and cold water usage.

DHW Control
Provide a thermostatic control valve (TM3 standard) to kitchen sink to limit the maximum hot water flow temperature to 43°C.

S(32) - Natural Gas

No natural gas supply to the Community Room proposed.

T(31) - Heating System

LTHW will be supplied to Community Room from the new central distribution system.

The LTHW supply is to be heat metered. Metering information will be collected by the building management system. The metering is to be sufficiently high enough grade to allow the KCTMO to sub-bill the user for their heat usage.

Pipework to be Pegler Yorkshire Xpress Stainless Steel throughout.

All LTHW pipework with the exception of the final connections to heat emitters to be insulated with foil faced mineral wool or equivalent.

All LTHW pipework with the exception of final run outs to heat emitters to be insulated with Kingspan Tarec Kooltherm foil faced phenolic foam Zero Ozone depletion potential (ZODP).

- Main runs = 25mm wall thickness
- Branches = 25 mm
- Final Branches to individual units = 15 mm

Heat Emitters
Radiators have been chosen as the preferred heating solution as they do not have any impact of the floor levels, are quick to respond to rapid heat requirement changes caused by changeable occupancy levels.

All radiators to be tested to 13 Bar and to have a maximum safe operating pressure of 10 Bar.

Figure 2734 shows the type of radiator that will be installed around the perimeter of the Community Room.

Client to confirm that Low Surface Temperature (LST) radiators are not required in community room.

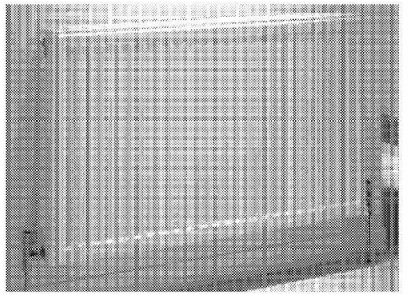


Figure 27 - Double Panel Radiator

MAX FORDHAM

Heating Control
Heating to be controlled via the single zone Heatmiser™ TM1, 1 zone heating time clock. The touch screen interface is shown below in Figure 535 will be located in the kitchen area.

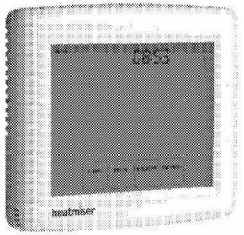


Figure 28 - Heat Miser Single Zone Time Clock

Wall mounted thermostat to be Heatmiser™ DS1 dial type thermostat as shown in Figure 2936.

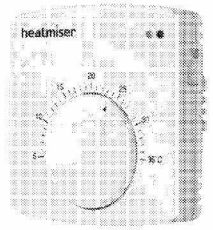


Figure 29 - Wired zone thermostat

Thermostatic radiator valves to be lockable where provided.

See Community Room heating schematic T(--)07_200 for further information.

T(--) - Cooling System

Cooling provided by external air, no mechanical cooling to be provided.

External air enters and is controlled by opening windows in the building façade.

The windows will be controlled manually by the staff.

High level windows to be openable via mechanical window winders. Chain openers to be Rockburn Limited T150 chain openers with 380mm of opening travel. Each window to be commissioned to allow maximum opening within the operational limits of the chain openers.

All widows in the office to be openable.

Windows should open to full extent that the chain opener will allow.

U(10) – General Ventilation

Ventilation to Community Room via acoustic trickle ventilators built into window frames to comply with Part F of the Building Regulations.

Provide a surface mounted extract ventilation fan capable of 60 l/s into the community rom kitchen area.

Fan to connect to a grill located in the east façade above the purge ventilation panel.

Duct to be low profile rectangular duct mounted at high level to maximise available headroom.

Extract ventilation controlled via kitchen light switch with timed overrun.

V(20) - Low Voltage Distribution

Provide a new LV electricity supply to this area.

Provide a new 9 way single phase and neutral distribution board to the community room.

V(21) – General Lighting

The limited floor to ceiling height available on the mezzanine level will necessitate the use of low-profile surface mounted ceiling lights as shown in Figure 837 (Thorn Planar C).

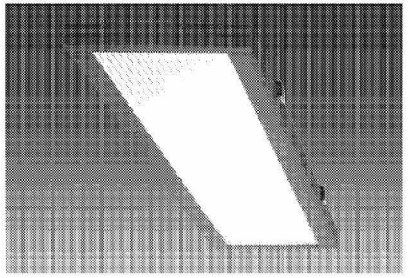


Figure 30 – Low Profile Lighting

Lighting Control
The Community Room area lighting is controlled by switches at the entrance.

V(22) – GENERAL Low Voltage Power

Final circuits wired in LSF insulated and sheathed multicore cable.

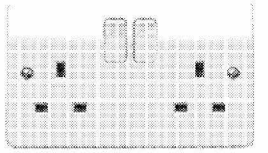


Figure 31 - MK Logic Plus Double Socket

Electrical accessories to be MK Logic Plus mounted in MK Prestige 3D compact power and data dado perimeter distribution as shown in Figure 3239.

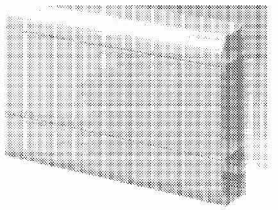


Figure 32 - MK Prestige 3D Dado Trunking

V(40) – Emergency Lighting

No emergency lighting required as the community room is less than 60 m^2 in floor area.

W(10) – Telecommunications

No telephone lines to community room.

W(20) – CCTV

See 01 – Central Services section W(20) for details of site wide CCTV.

W(40) - Access Control

No access control to be provided to Community Room area, traditional security ironmongery only.

W(41) – Security Detection and Alarm

No security alarm proposed.

W(50) - Fire Detection & Alarm

The Nursery, the Boxing Club, the Community Room and the ground and walkway offices will all be provided with at least a Type "M" system as defined in BS 5839-1(5). Each area will be "stand alone" but interlinked so that an outbreak of fire in one of them will be enunciated on all fire alarm control panels.

All cabling to be in MICC or flexible fire resistant cabling (enhanced standard) - e.g. Prysmian FP plus LSOH.

Surface mounted runs of fire-resistant cabling must be finished to a very high standard of workmanship, with straight runs and neat, swept, 90-degree bends only.

W(51) – Earthing and Bonding

Earthing and bonding to comply with BS 7671, no special earthing and bonding arrangements assumed necessary.

W(60) – Controls

All controls are covered by stand-alone lighting, heating and ventilation sections.

W(70) – Structured Cabling System

Provide a single double data point to the community room.

Wire these data points back to the patch panel provided to the reception office.

Data caballing to be CAT 6 standard.

This will allow a wireless router and or a telephone to be provided in the community room via the reception office infrastructure.

07 BOXING CLUB

OVERVIEW

With the exception of connecting to the central services for heating, cold water and power supply, the Boxing Club is intended to run as a self-contained unit with minimal interfaces between the systems of the Club and the other building areas.

A services brief has not been provided by the Boxing Club, but it is anticipated that they will require services similar to those described below.

The servicing strategy has been developed with a view to keeping the systems as simple and robust as possible and the control easy to use.

New mechanical, electrical and public health systems will be provided throughout.

R(11) - Above Ground Drainage

Connect all new appliances requiring foul water connection to a new drainage system.

A new foul drainage system serving the first four floors will remain separate from the existing drainage until connecting at high level in the basement plantroom.

Work on live drainage systems cannot be avoided, so the contractor will need to carefully plan work on the existing systems.

Stacks will be ventilated using air admittance valves (AAV) located at the top of each stack as it is not possible to terminate the stacks to atmosphere.

The drainage stacks from the Boxing Club will need to be carefully coordinated with the dwelling layout below to make sure that soil stacks do not drop within bedroom areas. Where possible, stacks will drop through the dwellings' own service zones. Where it is necessary to drop stacks through sleeping areas stacks will need to be acoustically lagged and boxed in with double plasterboard boxes.

S(10) & S(11) – Cold and Hot Water

Existing
The Boxing Club's cold water and drinking water supply is currently served from the central system. We have not been able to identify if the Boxing Club is fed from the down service (therefore using the water storage tanks in the rooftop plantroom) or if it is connected directly to the cold water rising main.

Strip Out
Isolate and cap off the Boxing Club from either the rising cold water service or the cold water down service.

All water services to the Boxing Club to be surveyed, labelled and removed. Water supplies to be isolated for at least 24 h before permanent work is done to remove the service.

Proposal

Cold Water

A new potable cold water service will be provided from the new common cold water down service. This will provide water to all sanitary appliances.

It will also provide the cold feed supply for the domestic hot water.

Hot Water

Hot water will be provided by an indirect storage calorifier. A calorifier is proposed as there may be sustained demand for hot water from the four showers. Primary heating to the calorifier will be provided by direct connection to the new heating mains.

Hot water branches will be trace heated where necessary to maintain a temperature of 60°C.

Each wash hand basin (WHB), local group of WHBs and showers will be limited to a maximum hot water flow temperature of 43°C using a thermostatic control valve (TM3 standard).

The water supplied to the Boxing Club will be metered. Metering information will be collected by the building management system. The metering is to be sufficiently high enough grade to allow the KCTMO to bill the Boxing Club for their water usage.

S(32) - Natural Gas

Existing
It has been assumed that the Boxing Club does not currently have a gas supply.

Strip Out
All natural gas services routed through the Boxing Club to be surveyed, labelled and removed. Gas supplies to be isolated for at least 24 h before permanent work is done to remove the service. This time delay will allow unforeseen disruptions in service to come to light before the service is permanently disconnected.

Proposal
No natural gas to the Boxing Club.

T(31) - Heating System

LTHW will be supplied to the Boxing Club from the new central distribution system via a heat interface unit.

The LTHW supply to the Boxing Club to be heat metered. Metering information will be collected by the building management system. The metering is to be sufficiently high enough grade to allow the TMO to sub-bill the Boxing Club for their heat usage.

Pipework to be Pegler Yorkshire Xpress Stainless Steel throughout.

All LTHW pipework with the exception of the final connections to heat emitters to be insulated with Kingspan Tarec Kooltherm foil faced phenolic foam Zero Ozone depletion potential (ZODP).

- Main runs = 25mm wall thickness
- Branches = 25 mm
- Final Branches to individual units = 15 mm

All exposed low level insulated heating pipework to be mechanically protected using aluminium sheeting with a minimum thickness of 0.56mm.

Heat Emitters
Radiators have been chosen as the preferred heating solution to the training area as they do not have any impact of the floor levels, are quick to respond to rapid heat requirement changes caused by changeable occupancy levels.

Figure 33 shows the type of radiator that will be installed around the perimeter of main training area.

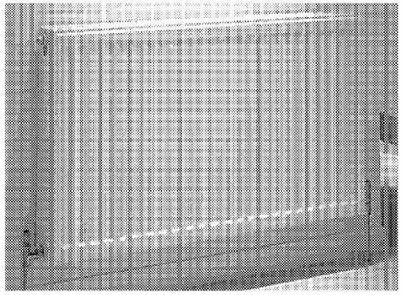


Figure 33 - Double Panel Radiator

Figure 34 - Low Surface Temperature Radiator shows the type of radiator that will be installed in the accessible WCs and Shower rooms. This type of radiator limits the surface temperature of the radiator to 43°C which is low enough to ensure it is impossible to burn yourself on the heating surface.

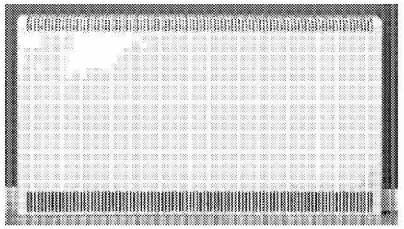


Figure 34 - Low Surface Temperature Radiator

Boxing Club to confirm that low surface temperatures (LST) will not be required to the main training area. LST radiators are recommended where there is anyone that is likely to be unable to react quickly if they fall against a radiator, usually the very young, elderly or mobility impaired. This is not normally required in a supervised environment but if people are going to use the space that fall into the categories above then LST radiators may be required.

To maximise wall space in the changing area radiators will be installed below the perimeter benches as shown below in Figure 35.

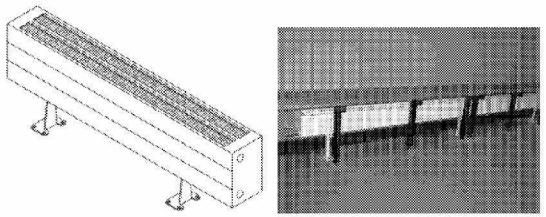


Figure 35 - Below bench radiator installed at a sports centre

Heating Control
Heating to be controlled via the 4 zone Heatmiser™ TM4, 4 zone heating time clock. The touch screen interface is shown below in Figure 36 will be located in the Boxing Club office.

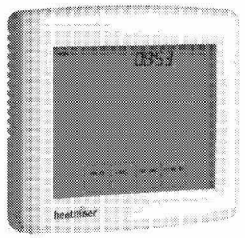


Figure 36 - Touch screen 4 zone heating time clock

Zone	Time clock	Temperature Control
Training West	Yes	Wall mounted thermostat*
Training East	Yes	Wall mounted thermostat*
Changing and Office	Yes	Thermostatic Radiator Values (TRV)

*Wall mounted thermostat to be Heatmiser™ DS1 dial type thermostat as shown in Figure 37.

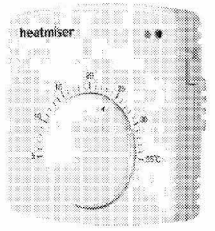


Figure 37 - Wired zone thermostat

Thermostatic radiator valves to be lockable where provided.

T(--) - Cooling System

Cooling provided by external air, no mechanical cooling to be provided.

External air enters and is controlled by opening windows in the building façade.

The windows will be controlled manually by the Boxing Club staff.

High level windows to be openable via mechanical window. Each window to be commissioned to allow maximum opening within the operational limits of the chain openers.

All widows in the Boxing Club to be openable, opening restrictions do not apply to the Boxing Club windows. Windows should open to full extent that the chain opener will allow.

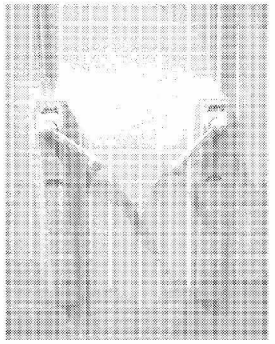


Figure 10 - Mechanical Window Winder

U(10) – General Ventilation

Main Training Area
Ventilation to training via acoustic trickle ventilators built into window frames to comply with Part F of the Building Regulations.

WCs, accessible WV and Accessible Shower Room
Local extract ventilation located above a false ceiling connecting to a grill located in the purge window section.

Extract ventilation controlled via local passive infra-red (PIR) detector with timed overrun.

Main Changing and Shower Area
Small supply and extract ventilation unit with heat recovery located above a false ceiling in the changing area.

Ventilation controlled via local PIR with times overrun.

V(20) - Low Voltage Distribution

Existing
The boxing club is currently supplied from a 60A TP&N tap off from the landlord's main bus bar located in the ground floor switch room. This supply is metered.

Strip Out
Remove current electricity meter and supply cable back to the main bus bar.

Proposal
Using the space created by the removal of the existing boxing club electricity supply equipment provide a new metered 63 A TP&N supply from the landlord's main bus bar.

Provide a new 20 way three phase split busbar (12/8) Schneider electric ISOBAR 4C TP&N Type B distribution board in the Nursery store. Meters to be mounted within extension box at the bottom of the panel.

V(21) – General Lighting

Areas will be designed to meet the light levels listed in Table 46 below.

Room Type	luminance (Lux) on Working Plane	Working Plane Height
Office (Background)	200	750 mm
Office (Task Lighting)	500	750 mm
Reception	200 (500 on reception desk by task lighting or fixed feature lighting)	750 mm
WCs/Changing Room	200	FFL
Corridors	100	FFL
Store Room	150	FFL
Kitchen	500	900
Boxing Club General	300	FFL
Boxing Club Ring	Class 3 (500 Lux Horizontal, 250 Vertical)	At ring level

Table 4 - Boxing Club Lighting Levels

The Boxing Club training area will be lit using robust sports hall fittings as shown in Figure 386.

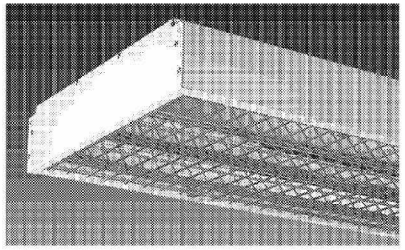


Figure 38 - Sports Hall Fitting

Additional spot lights will be provided as necessary to provide the vertical luminance levels required by class 3 Boxing Club lighting.

Lighting to core WC areas and changing rooms to be recessed downlights as shown in Figure 397. Where required downlights will be provided with appropriate IP rated covers to allow their use in wet areas.

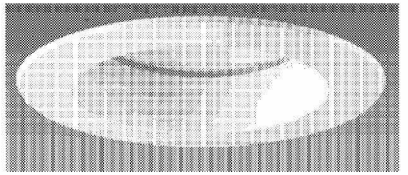


Figure 39 - Recessed Downlight for use in WC and Changing Areas

Lighting Control
Main area training area
Manual switching allowing individual switching zones within the training area. Boxing Club to advise how many zones will be required.

A bank of control switches to be located in the boxing office to control all lighting.

Each light fitting contains three lamps which are individually switched allowing three different light levels to be set. The three light levels will correspond to overcast day, night and competition.

Lighting to be controlled via PIR for small spaces and microwave detectors for large spaces.

V(22) – GENERAL Low Voltage Power

Final circuits wired in LSF insulated and sheathed multicore cable. Main distribution in basket and pop-ups in galvanized steel conduit.

Training area
Electrical accessorises to be MK Metalclad in surface mounted boxes as shown below in Figure 409.

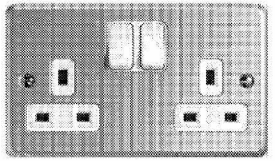


Figure 40 - MK Metalclad Double Socket

Sockets in training area provided for cleaning only.

Office Area
Electrical accessories to be MK Metalclad mounted in MK Prestige 3D compact power and data dado perimeter distribution as shown in Figure 4150.

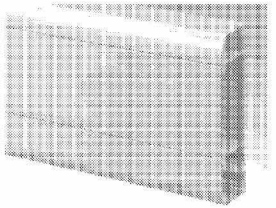


Figure 41 - MK Prestige 3D Dado Trunking

V(40) – Emergency Lighting

Training Area
Emergency lighting to the open training area to be provided by Thorn Voyager Twin Spot emergency luminaires or similar as shown in Figure 4251.

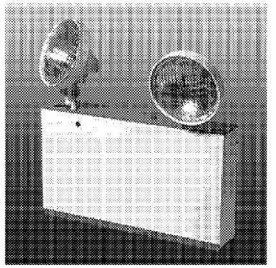


Figure 42 - Training area emergency lighting

Emergency lighting will be provided to all other spaces via the integrated emergency versions of the general lighting.

Emergency lighting test switches to be provided within the space the switch is testing.

V(41) - External Lighting

Boxing Club to have switching control over one number final exit light and switching to illuminate any external signage (if required).

For information on all other general lighting see section "00 Site Wide Services" for further information.

W(10) – Telecommunications

Existing
Assumed to be existing telephone lines to the Boxing Club, number and location unknown.

Strip Out
Existing equipment and lines to be surveyed. Lines to Boxing Club to be identified. Lines to be stripped back to main distribution cabinet for the duration of the works.

Proposal
Telecoms lines from main equipment cabinet to Boxing Club to be reinstated. The number of phone lines and phone numbers to be as existing and terminated in the Boxing Club office.

W(15) - Facilities for the Disabled

Provide alarm system to Accessible WCs to allow persons in difficulty to request help.

Alarm activation switching will be via a pull cord provided within each accessible WC. Audible and visual alarm indicators will be installed locally to the accessible WC. A single repeater panel located at the Boxing Club main entrance will be provided to allow the alarm to be raised centrally.

Provide the building with appropriate public address systems to meet the needs of accessibility.

It is not proposed to install an induction loop system in the Boxing Club as no main reception area is provided and no class room or lecture areas can be identified from the layouts.

Strobe beacons will be fitted in every WC and the changing area to alert occupants who have difficulty hearing that the fire alarm has been activated.

W(20) – CCTV

No CCTV system is proposed to the interior of the Boxing Club. See 01 – Central Services section W(20) for details of site wide CCTV.

W(40) - Access Control

No access control to be provided to Boxing Club, traditional security ironmongery only.

W(41) – Security Detection and Alarm

The level of provision for security is still to be agreed with the Boxing Club.

W(50) - Fire Detection & Alarm

The Nursery, the Boxing Club, the Community Room and the ground and walkway offices will all be provided with at least a Type "M" system as defined in BS 5839-1(5). Each area will be "stand alone" but interlinked so that an outbreak of fire in one of them will be enunciated on all fire alarm control panels.

All cabling to be in MICC or flexible fire resistant cabling (enhanced standard) - e.g. Prysmian FP plus LSOH.

Surface mounted runs of fire-resistant cabling must be finished to a very high standard of workmanship, with straight runs and neat, swept, 90-degree bends only.

W(51) – Earthing and Bonding

Earthing and bonding to comply with BS 7671, no special earthing and bonding arrangements assumed necessary.

W(60) – Controls

All controls are covered by stand-alone lighting and heating controls.

W(70) – Structured Cabling System

No structured cabling system proposed to be installed in the Boxing Club.

It is assumed that any computers will be located in the main office. These computers could be connected to the internet if required through a broadband connection.

08 GENERIC 4 BED DWELLING (WALKWAY +1)

See section "04 MEZZANINE 1 & 2 BED DWELLINGs" for service descriptions with the exception of the general lighting section below.

V(21) – General Lighting

The floor to ceiling height of the Walkway +1 level is considerably greater than that of the mezzanine level. For this reason pendant fittings as shown in Figure 52 are proposed for all areas.

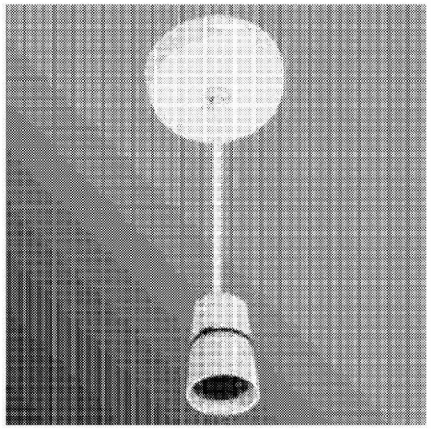


Figure 52 - Pendant Fitting

9 GENERIC 1 BEDROOM DWELLING

OVERVIEW

R(11) - Above Ground Drainage

Existing system to be retained.

Overflow from the existing "ELSON" unit to be capped off once "ELSON" is removed.

S(10) & S(11) – Cold and hot Water

This is as described in Section 01 Central Services.

S(32) - Natural Gas

Flats have an existing utility gas supply for cooking. This supply is not to be altered as part of this refurbishment.

T(31) - Heating System

LTHW will be supplied to the dwellings from the new central distribution as described in Section 01 Central Services.

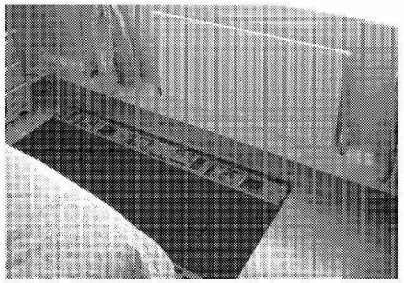


Figure 43 - Pendock pipe encasing skirting board

Heat Emitters
Radiators have been chosen as the preferred solution as they do not have any impact of the floor levels, are quick to respond to rapid heat requirement changes. Figure 444 shows the type of radiator that will be installed around the perimeter of the flat.

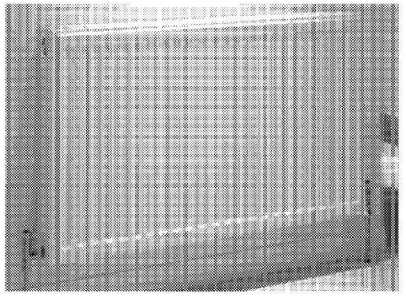


Figure 44 - Double Panel Radiator

A towel rail will be provided in the bathroom. This will either be a radiator with a towel rail above or a proprietary towel rail connected to the heating system. As space in the bathroom is very tight, the specification of the towel rail will be finalised in the next design stage.

Heating Control
Heating to be controlled via a wireless room thermostat/programmer located within the living room. The thermostat controls the HIU.

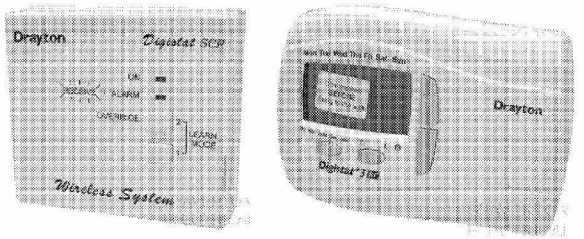


Figure 45 - Drayton Digistat 3RF Wireless Thermostat/Programmer

Local temperature control is to be via thermostatic radiator valves (TRVs) on each radiator. Dwelling balancing to be provided by lock shield valves on each radiator as shown in Figure 466.

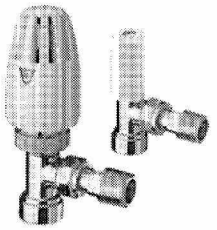


Figure 46 - Room Thermostatic Radiator Valve

U(10) – General Ventilation

Background Ventilation
Background ventilation is via acoustic trickle vents above the window heads of all windows. As the flats are refurbishments of existing dwellings there is no minimum level of background ventilation required. Due to the increased air-tightness of the dwellings due to the recladding of the façade and installation of new double-glazed window units it is recommended that the levels for new dwellings are followed.

Part F of the Building Regulations states that for a 1-bed dwelling of this size, a total of 35,000mm^2 equivalent area of background ventilation should be provided. This should be spread throughout the habitable rooms.

Purge Ventilation
Purge ventilation is via opening centre pivot windows and the purge panels located adjacent to opening windows. See Stage C report section 4.2 for further details.

Extract Ventilation
A kitchen extract fan is to be installed above the purge panel in the kitchen, see Figure 47.

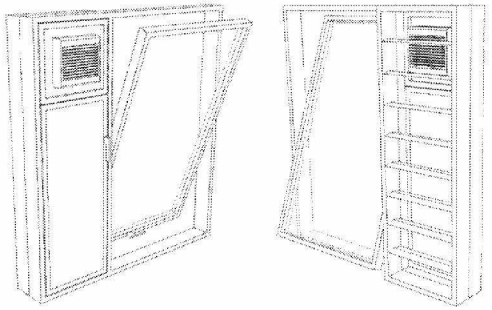


Figure 47 - vent Axia Extract fan mounted above purge ventilation panel in kitchen

MAX FORDHAM

MAX FORDHAM

V(20) - Low Voltage Distribution

Existing distribution retained.

V(21) – General Lighting

Existing lighting retained.

V(22) – GENERAL Low Voltage Power

Existing LV power retained.

W(50) - Fire Detection & Alarm

It is understood the existing flats are not connected to the central fire alarm system. In the 'void' flats where access was available, stand-alone fire detectors have been installed.

W(51) – Earthing and Bonding

Earthing and bonding to comply with BS 7671, no special earthing and bonding arrangements assumed necessary.

W(60) – Controls

See T(31) for information on heating controls.

10 GENERIC 2 BED DWELLING

See section "9 Generic 1 Bed Dwelling" for services descriptions.

MAX FORDHAM

APPENDIX A – HEATING AND WATER SYSTEMS PROPOSED SEQUENCING

The following appendix outlines one possible way of coordinating works to the heating and water systems that minimises the number of flat visits and interruptions to the heating and water services.

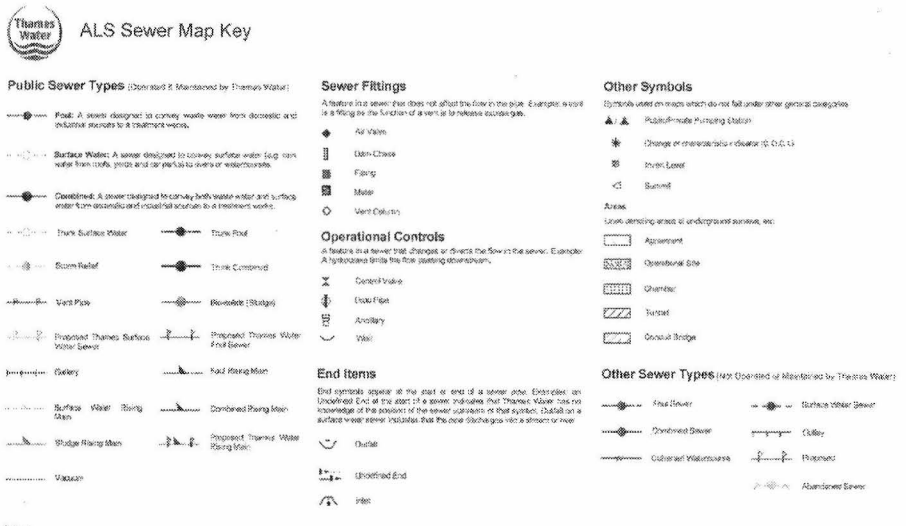
A contractor should be approached to comment on the proposed sequencing of the works in order to obtain a view from the installer's perspective.

Sequencing for Installation to Flats

- Survey each flat in order to identify any significant differences from the template 'void' flats.
- Carry out core drilling for new heating and cold water risers.
- Carry out any core drilling and any other buildrswork required within the dwellings. N.B. - Core drilling is likely to involve the use of cooling water, so there should be a strategy for dealing with this.
- Install the riser pipework and branches at each floor level, including the isolating valves for each flat.
- Install the heating and cold water pipework within the flat up to the point of connection to the new heat interface unit. Connect flat pipework to pipework in lift lobby area.
- Isolate existing heating and cold water branches to the flat and cap-off. N.B. - There may be instances where, due to their age, the existing valves are not serviceable and do not provide sufficient isolation. If possible, it would be prudent to check these when carrying out the flat survey.
- Strip-out the existing Elson unit.
- Strip-out the existing radiators and any visible heating pipework.
- Install the new heat interface unit
- Install new heating pipework and radiators.
- Connect new heating and existing domestic hot water pipework to the heat interface unit
- Connect the new cold water supply to the heat interface unit and to the existing cold water service in the flat.
- On completion of heating system, replace/renew any panels or framing required to conceal the new installation.

APPENDIX B – EXISTING SITE SERVICES

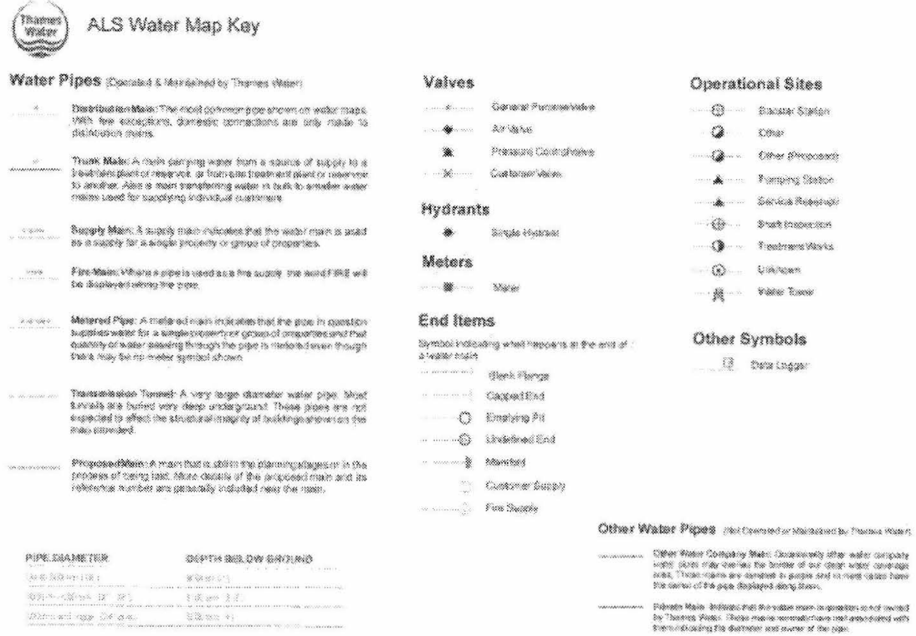
Drainage



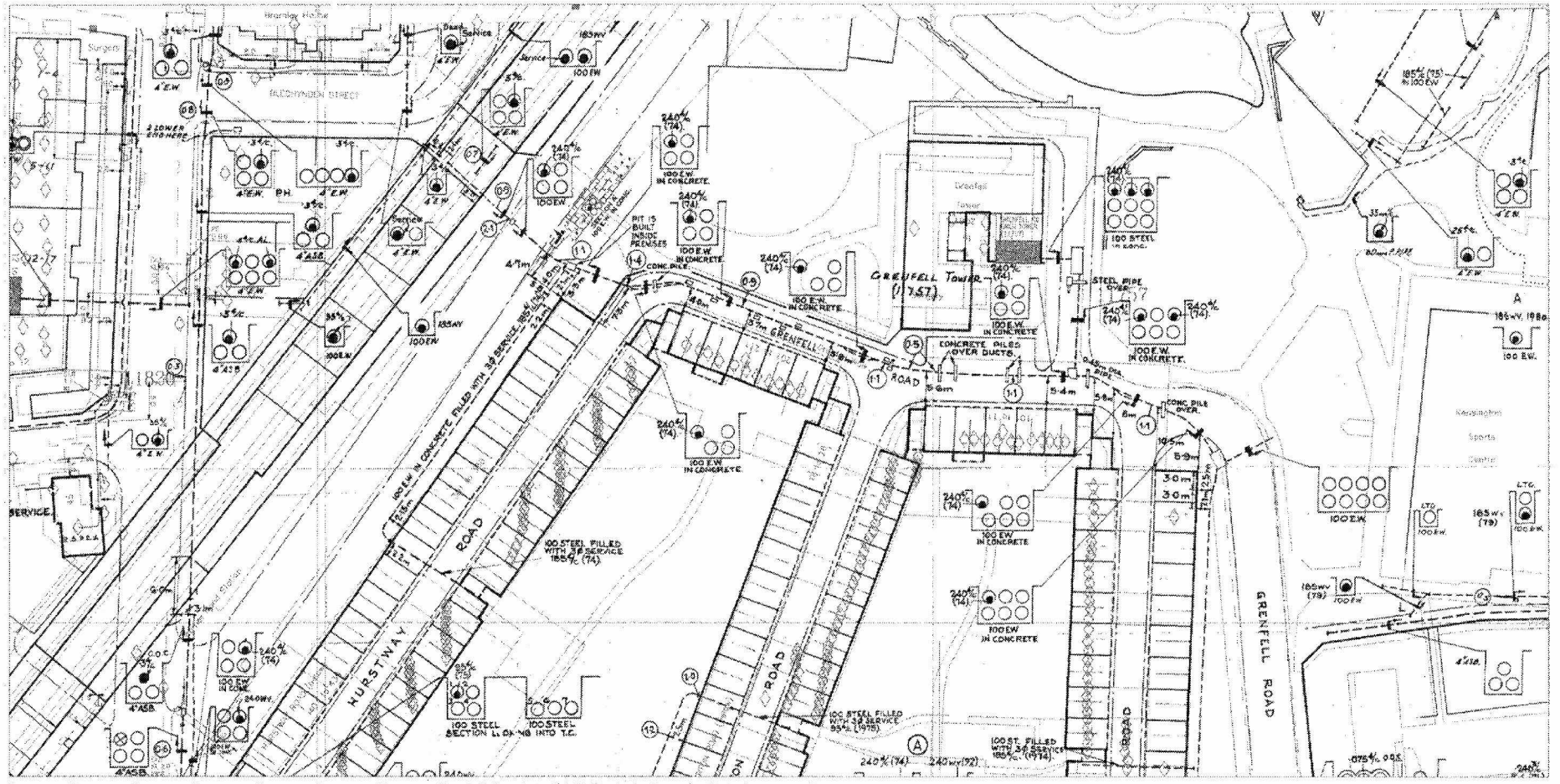
MAX FORDHAM

Water


Asset Location Search Water Map - ALS/ALS Standard/2011_2100166
TQ2380NE
Games Court
Car Park
Playground
Kensington Sports Centre
Treadgold House
GRENFELL ROAD
The width of the displayed area is 356m and the centre of the map is located at OS coordinates 523985,180860
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.
Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. WU298557 Crown Copyright Reserved.


Thames Water
ALS Water Map Key
Water Pipes
Valves
Operational Sites
Hydrants
Meters
End Items
Other Symbols
Other Water Pipes
PIPE DIAMETER
DEPTH BELOW GROUND

Electricity



Plotted On : 12/10/2011

Plotted By : Martin Johnson

Plot Description : Contents of plot menu line title_line_1

Contents of plot menu line title_line_2

Map Centre : TQ23806NE

UK Power Networks
Plan Provision
Fore Hamlet
IPSWICH
Suffolk
IP3 8AA
Tel [redacted]
Fax

For details of the symbology shown refer to http://www.ukpowernetworks.co.uk/safety-emergencies/for-the-workplace/understanding-safety-symbols.com

PRIMARY CABLES
EXTRA HIGH VOLTAGE CABLES (EHV) 22,000 TO 132,000 Volts

Depth normally 750mm cover in carriageway & 600mm cover in footway

Before digging within one metre of these cable routes Telephone 0800 056 5866, in order that the Company's apparatus may be located on site and any necessary protection works agreed.

N.B. THRUST BORERS OR MOLES MUST NOT BE USED WITHIN THE VICINITY OF ANY CABLES BELONGING TO UK POWER NETWORKS WITHOUT FIRST CONTACTING THIS COMPANY.

1. The position of the apparatus shown on this drawing is believed to be correct but the original landmarks may have been altered since the apparatus was installed.
2. The exact position of the apparatus should be verified – use approved cable avoidance tools prior to excavation using suitable hand tools.
3. It is essential that trial holes are carefully made avoiding the use of mechanical tools or picks until the exact location of all cables have been determined.
4. It must be assumed that there is a service cable into each property, lamp column and street sign, etc.
5. All cables must be treated as being live unless proved otherwise by UK Power Networks.
6. The information provided must be given to all people working near UK Power Networks' plant & equipment. Do not use plans more than 3 months after the issue date for excavation purposes.
7. Please be aware that electric cables/lines belonging to other owners of licensed electricity distribution systems may be present and it is your responsibility to identify their location.

1. UK Power Networks does not warrant that the information provided to you is correct. You rely upon it at your own risk.

2. UK Power Networks does not exclude or limit its liability if it causes the death of any person or causes personal injury to a person where such death or personal injury is caused by its negligence.

3. Subject to paragraph 2 UK Power Networks has no liability to you in contract, in tort (including negligence), for breach of statutory duty or otherwise howsoever for any loss, damage, costs, claims, demands or expenses that you or any third party may suffer or incur as a result of using the information provided whether for physical damage to property or for any economic loss (including without limitation loss of profit, loss of opportunity, loss of savings, loss of goodwill, loss of business, loss of use) or any special or consequential loss or damage whatsoever.

ADVICE TO CONTRACTORS ON AVOIDING DANGER FROM BURIED ELECTRICITY CABLES.

1) Do have cable drawings with you on site and check them before you start the excavation.
2) Do have a cable locator tool on site and use it to help you.
3) Mark out the location of electricity cables.
4) Do not use a mechanical excavator within 0.5m of electricity cables.
5) Use spades and shovels in preference to other tools.
6) Never disturb electricity cables and joints or their protective covers.

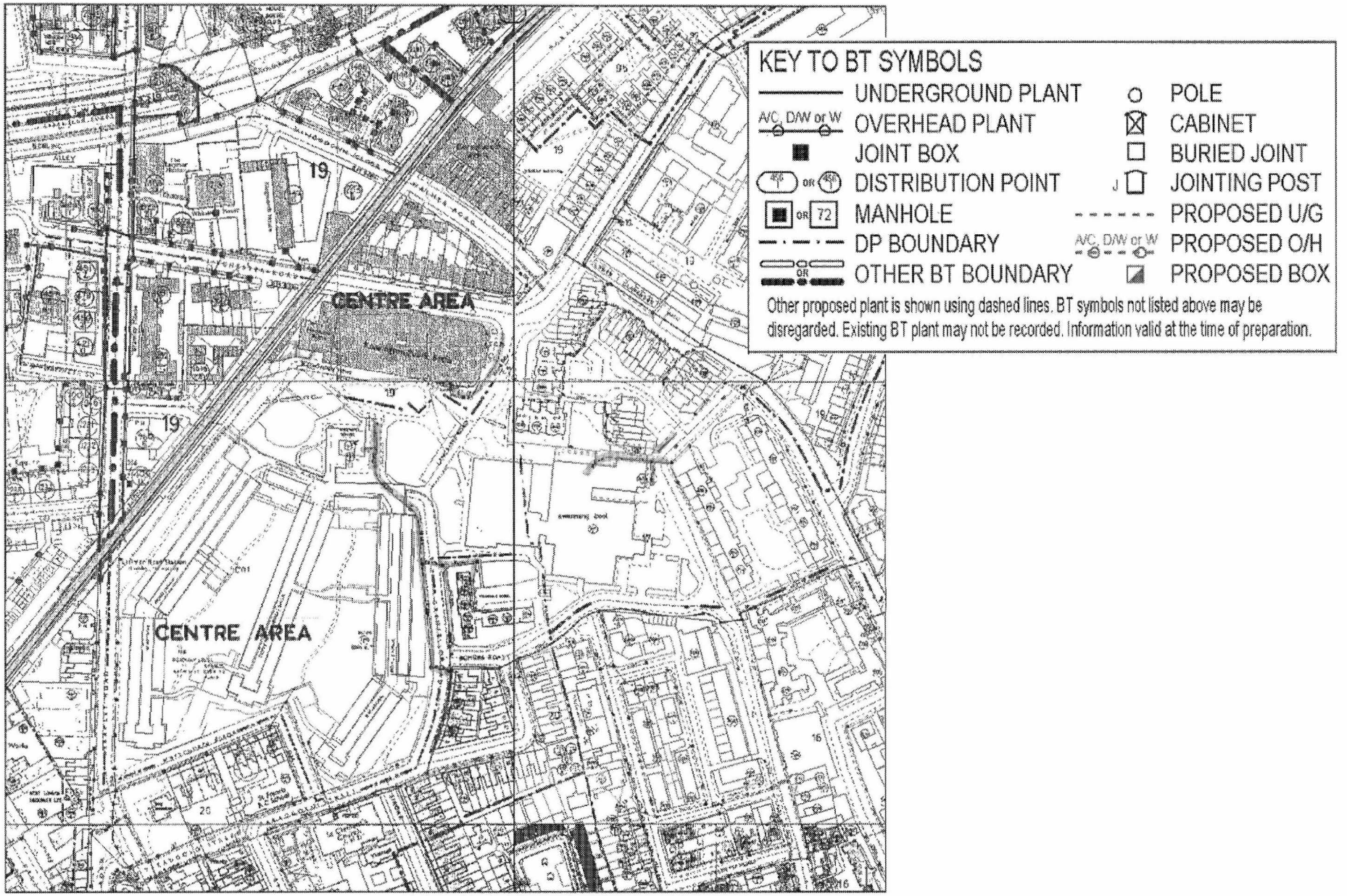
IF IN DOUBT – ASK! PHONE 0800 056 5866
EMERGENCY – if you damage a cable or line
Phone 0800 783 0780 (24hrs) URGENTLY

These basic safety precautions are explained in detail in the HSE booklet. HS(G)47 – Avoiding Danger from Underground Services, a copy of which may be obtained from your supervisor or HMSO.

Please be aware that electric lines belonging to other owners of licensed electricity distribution systems may be present and it is your responsibility to identify their location.

MAX FORDHAM

Telecoms



APPENDIX C - STAGE D DRAWING LIST

Drawings No	*Drawing Name*	*Scale*	*Size*
	TO BE COMPLETED		

MAX FORDHAM