

**10 TRINITY SQUARE
HOTEL AND APARTMENT DEVELOPMENT
LONDON EC3**

MEP SERVICES STRATEGY

PREPARED FOR:

THOMAS ENTERPRISES INC

PREPARED BY:



DSA ENGINEERING LTD

77-79 FARRINGDON ROAD

LONDON EC1M 3JU

TEL: (020) 7242 7272

FAX: (020) 7242 5636

Email: mail@dsaengineers.com

DATE	REMARKS	REVISION
13 AUGUST 2008	DRAFT ISSUE	-
23 SEPTEMBER 2008	DRAFT ISSUE	A
8 OCTOBER 2008	PLANNING ISSUE	P1

Contents

MEP SERVICES STRATEGY

1.0	INTRODUCTION.....	3
2.0	DESIGN OBJECTIVE.....	3
3.0	SUSTAINABILITY	3
4.0	PART L	3
5.0	DESIGN CRITERIA – BASE BUILDING.....	3
6.0	DESIGN CRITERIA – APARTMENTS	3
7.0	DESIGN CRITERIA – HOTEL	3
	APPENDIX 1 – DRAWINGS.....	3

1.0 INTRODUCTION

- 1.1 This document has been produced by DSA Engineering to outline the services in relation to the 10 Trinity Square building, EC3P 3AX. This document forms part of the planning applications and listed buildings consent for the conversion of the office building into a hotel.
- 1.2 This document is based on as-built drawings, site surveys and discussions with the Willis building maintenance engineers.

2.0 DESIGN OBJECTIVE

- 2.1 The design of the Mechanical and Electrical systems will take into account the fact that 10 Trinity Square is a Grade 2* listed building and aim to minimise the impact on the fabric of the building and those areas that have significant architectural value.
- 2.2 Particular attention will be paid in locating the majority of the plant in non-visible areas (i.e. basements, indoor plantrooms, etc) in accordance with English Heritage guidelines.
- 2.3 The distribution of the Mechanical and Electrical services will be in coordination with architectural building elements in order to minimise the impact on the historic aspects and value of the building.

3.0 SUSTAINABILITY

- 3.1 The design and operation of the mechanical and electrical systems will take into account sustainability concerns. DSA Engineering has performed the Energy Statement Report with a target to achieve a 20% carbon emissions reduction as per GLA's guidelines. The method of achieving the desired goal of 20% carbon emissions reduction can be a mixture of various methods available or choosing a single highly efficient system. For the 10 Trinity Square development, due to site limitations it is proposed that a Fuel Cell system be used operating on natural gas, with a changeover to hydrogen as soon as it is commercially available. The Fuel Cell will reduce the development's carbon emissions by 20% when being run on natural gas and exceed 20% when it is operated on hydrogen in the future.

The Energy Statement provides further information on sustainability issues.

4.0 PART L

- 4.1 The 10 Trinity Square development's listed and historic status imposes limitations on the ability to improve the thermal performance of the existing building façade. The Part L Building Regulations give sympathetic consideration within their scope and make provision for dealing with listed buildings that have significant architectural value.

The Part L Building Regulations allow for a relaxation of the current requirements when it comes to listed buildings.

In an effort to improve the energy efficiency of the system, the design will take into account the high thermal mass of the façade in reducing the peak energy demands as necessary.

5.0 DESIGN CRITERIA – BASE BUILDING

5.1 Mechanical Services

5.1.1 General

The Base Build Cooling system will be based on 4/no. air cooled chillers that would generate chilled water, which will be used to provide cooling to the hotel and apartment sections of the building via the use of fan coil units and air handling units as necessary. The chilled water will be distributed throughout the building by a number of primary and secondary pumps to the point of usage at the air handling units and fan coil units.

The building heat generation will be by gas fired hot water heating boilers located in the basement 4 plant-room. The water generated from the boilers will be distributed to the heater batteries in the air-handling units and fan coil units. The hot water will be distributed throughout the building by primary heating pumps and a system of distribution pipework, which will terminate at the air handling units or fan coil units.

The hotel rooms will be air conditioned and heated by high pressure four piped fan coil units located in central plantrooms on each floor and outside the rooms they serve. This will ease maintenance and minimise the need for access requirement to the rooms during repairs, etc. The plantrooms will be strategically located on each floor in coordination with the architecture in order to minimise the impact to the listed elements of the building.

The apartments will be treated as shell & core. Chilled and LPHW valved connections will be left within each apartment's demise for future extension by the apartment owner.

Fresh air supply to the building will be via fresh air plants located in the basement AHU room or other plantrooms within the building.

Mechanical Smoke Extract systems, stair case/fire fighting lift lobby pressurisation systems, will be provided where required as per the approved fire strategy report.

Toilet extract systems will be installed for the hotel toilet blocks and will be discharged to atmosphere via ductwork and twin, scrolled toilet exhaust fans.

The parking areas will be provided with a mechanical extract system, which will extract directly to atmosphere. Ventilation make-up air will be provided at the same rate as the extract air.

Hotel kitchens are to be provided with mechanical extract systems, which will extract directly to the atmosphere.

5.1.2 Summer Outdoor Design Criteria

- General Ambient Air: 29°C db / 20°C wb
- For Heat Rejection Equipment: 32°C db

5.1.3 Winter Outdoor Design Criteria

- -5°C db / 100% Sat.

5.1.4 Summer and Winter Indoor Design

Refer to Apartments and Hotel Sections 6.0 and 7.0 respectively.

5.1.5 Window Treatment

The assumed minimum performance criteria for the equivalent clear outer glazing elements are as follows:

Shading Coefficient	≤	0.40
Glass U-Value	≤	2.0
Daylight Transmittance	≥	59%

Wall Panel U-Value 0.35 (Guideline Only)

5.1.6 Outside Air Provision

Refer to Apartment and Hotel Sections 6.0 and 7.0 respectively.

5.1.7 Population Densities

Refer to Apartment and Hotel Sections 6.0 and 7.0 respectively.

5.1.8 Ventilation Rates

Service Rooms - 6 air changes per hour, 10 air changes per hour smoke extract.

Car Park- Mechanical - 10 air changes per hour.

5.1.9 Noise Criteria (under normal operating conditions)

Plantrooms - NR.90

Note: Noise levels attributable to operation of M&E plant only.

5.1.10 External Noise Level

External noise levels emanating from plant located within or on the building will not exceed those levels set down by the Environmental Health Officer.

5.2 Electrical Services

5.2.1 Electricity Supply

The building will be supplied from the Regional Electricity Company's (REC) 11,000V System. This will have two separate feeds from the network.

The REC's incoming HV switchpanel will be located in the basement B1 level plant area, with stairs giving direct access to the ground floor to allow direct statutory 24 hours access for the REC.

The Landlords Base Building HV/LV Sub-Stations and Switchrooms will comprise of HV switchgear, Power Distribution Transformers and Outgoing LV Switchboards.

5.2.2 Electrical Distribution

From the LV Switchboards, cable feeders will be provided for multiple supplies to the landlord's lighting and small power circuits, mechanical floor services, joint ancillary services and power distribution to the common areas and apartments. The Hotel feeds will generally be kept separate from the Landlord's and Apartment distribution.

5.2.3 Design Criteria

Space Type	Apartment Load (kW)	Diversity @ 0.75	Total kVA
2/3 Bedroom	10kw sp&n	7.5	10
1 Bedroom	7.5kw sp&n	6	7.5
Studios	11kw sp&n	8	10
large Apartments	To be Assessed		
Car Park / Loading Bay	5 W/m ²		
Landlords Areas	5 W/m ²		

5.2.4 Standby Generation

A Standby Emergency Generator will be required for the Life Safety System of the building – fireman's lifts, sprinkler pumps, smoke extract, emergency lighting and AOV back-up as a minimum. This will be provided by a generator, located at B1 Basement.

The generators will have 2 days fuel supply storage. The generator will not synchronise with the incoming REC mains.

5.2.5 Lighting – Common Areas

Details are subject to finalised interior designer's requirements

Entrance Halls	200 lux – Compact fluorescents
Corridors/Staircases	100 lux - Compact fluorescents
Car Park	150 lux – Linear fluorescent or low bay
Plantrooms	200 lux - Linear fluorescent
Lighting Control	
Entrance Halls	Locally switch operated
Corridors/Staircases	PIR switch operated
Internal Lobbies	PIR/24 hour illumination
Car Park	Reduced lighting levels via time clock with PIR override
Plantrooms	Local switching

5.2.6 Emergency Lighting

Emergency lighting will be provided in accordance with BS5266 and as required by the Local District Surveyor.

Dedicated luminaires and signage will be fitted with battery/inverter battery packs, which shall be backed-up by the emergency generator. Some luminaires may be fed from a centralized inverter unit.

5.2.7 External Lighting

Feature lighting will be provided to illuminate the external elements of the building and surrounding areas.

5.2.8 Lightning Protection

Lightning protection for the building will be provided in accordance with BS6651.

5.2.9 Earthing

Earthing systems will be provided in accordance with BS7430 and BS7671.

5.2.10 Fire Alarm and Detection System

The main fire alarm system for the building will be designed in accordance with BS5839 with a coverage type of L1, with voice evacuation, and shall completely interface with the residential apartments and hotel systems.

The fire alarm, will be linked to a voice alarm system. This will be zone controlled, to allow phased evacuation.

5.2.11 CCTV

A CCTV monitoring system will be provided in the form of an IP addressable camera and colour cameras on the exterior elements and within the building. This will be a mixture of fixed or PTZ cameras, with some in covert housing monitoring each main entrance.

Cameras will be linked back to Fire Control Centre (FCC) and hotel TV monitors.

5.2.12 Telecommunications

Provisions for telecommunication utilities will be made in the form of sleeves for primary and secondary service. There will be a dual entry position at basement level and riser/telephone cupboards will be provided. Hotel systems will be segregated from the other systems.

5.2.13 Miscellaneous Systems

Power, trunking, conduit and associated back boxes will be provided for the following systems.

- TV, radio and satellite systems
- Telephone and data system.

5.2.14 UPS Provision

Space only provision will be made for UPS equipment. Fire alarms and security etc. will have their own backup power.

5.3 Public Health and Fire Protection Services

5.3.1 Water Services

A large concrete water tank will be provided at the basement to provide the quantity of storage for the hotel and the apartments combined.

No separate storage requirement is made for drinking water. All drinking water is provided via the tank and the boosted cold water service.

5.3.2 Temperatures

Cold water	10°C
Drinking water	10°C

5.3.3 Pressure

Hot and cold water at point of use: Min 1.5 Bar - Max 3 Bar

5.3.4 Fire Protection System

Wet / dry riser systems shall conform to BS 5306 Part 1.

Sprinkler System to conform to BSEN12845 and BS5306, Part 2 1990 (including LPC Tech Bulletins), and BS 9251:2005, Ordinary Hazard I, spacing of sprinkler heads not to exceed 12 m².

6.0 DESIGN CRITERIA – APARTMENTS

6.1 Mechanical Services

6.1.1 Summer outdoor design criteria

- General Ambient Air: 29°C db / 20°C wb
- For Heat Rejection Equipment: 32°C db

Note: The apartments shall be handed over in a “Shell & Core” condition.

6.1.2 Winter outdoor design criteria

- -5°C db / 100% Sat.

6.1.3 Indoor design conditions

- Bedrooms

Standard Finished Apartments	Summer: 24°C db (No humidity control)
	Winter: 21°C

- Living Room Summer: 24°C db
Winter: 21°C
- Corridors Winter 20°C (heated only)
- Stairs Winter: 20°C (heated only)

- All indoor temperatures are subject to $\pm 1.5^\circ\text{C}$ db.
- Under “The Fuel and Electricity” (Heating Control Amendment) Order 1980 heating controls may have to be set at 19°Cdb.
- Design of curtain wall to ensure proper natural ventilation of apartments to prevent overheating and solar shading in compliance with CE 129, as well as Part L1, for all Apartments.

6.1.4 Outside Air Provision

Bedrooms/Living Rooms	28L/s/room
-----------------------	------------

6.1.5 Population Densities

Bedrooms/Living Room	2 person/bedroom
----------------------	------------------

6.1.6 Window Treatment

The assumed minimum performance criteria for the equivalent clear outer glazing elements are as follows:

Shading Coefficient	\leq	0.40
Glass U-Value	\leq	2.0
Daylight Transmittance	\geq	59%
Wall Panel U-Value		0.35 (guideline only)

6.1.7 Load Densities

Cooling load densities will be assumed as follows:

	<u>Lighting</u>	<u>Small Power</u>
Bedrooms/Living Room	10 W/m ²	1.0kW/Apartment
Corridors	10 W/m ²	-

6.1.8 Noise Criteria

The mechanical plant will be designed to achieve the following:

- Bedrooms/ Living Room NR-28
- Retail NR-40
- Common Areas (e.g. lobbies, corridors, etc.) NR-40
- Plantrooms NR-90
- External Noise No greater than 4db above existing external ambient.

6.1.9 Ventilation Rates

- General Toilets 10 air changes per hour extract
- Car Park/ Loading Bay 6 air changes per hour extract
10 air changes per hour smoke extract
- Store Room 4 air changes per hour supply and extract
10 air changes per hour smoke extract
- Basement Corridors 1 air change per hour supply and extract

- Refuse Area 10 air changes per hour smoke extract
15 air changes per hour extract, if applicable

6.1.10 Filtration

All filtration to European Standards:

- Bedroom/Living Room EU-5
- Other Spaces EU-5

6.1.11 Design Codes

General design principles for the mechanical systems will follow the Chartered Institute of Building Services Engineers design guides, British Standards and EC Directive statutory codes.

6.2 Electrical Services

The design of the electrical services shall take into account the relevant British Standards, European Norms, International Electro-technical Standards and Local Building Control requirements.

6.2.1 Means of Escape Lighting

Means of escape lighting will be provided in accordance with BSEN1838 and BS5266-1:2005 and as required by the Local Authority. The new LED Technologies will be used where possible to minimise maintenance.

6.2.2 Lighting

All areas forming part of the landlord's works, such as plantrooms, staircases, lobbies, toilets, entrance hall will be illuminated, generally using fluorescent luminaires.

6.2.3 Emergency Lighting

Emergency lighting will be provided in accordance with BS5266 and as required by the Local District Surveyor.

Dedicated luminaires and signage will be fitted with battery/inverter battery packs, which shall be backed-up by the emergency generator.

6.2.4 Fire Alarm System and Detection

The building will be designed to BS 5839 L1 as part of the main fire alarm system, and comprise of automatic detectors and voice evacuation speakers. This will be zoned to allow phased evacuation.

The hotel system will be separate from the Landlord's system. However the two systems will be linked.

The extent of the fire alarms within apartments will be agreed with the Local District Surveyor. Until apartments are fitted out, the areas will be provided with detection to L2 standard. This will protect the escape routes to occupied areas.

6.3 Public Health and Fire Protection Services

6.3.1 Storage

Cold water Storage will be based on 135 litres per bed space
Hot water Indirect electric unvented water heaters will be installed in each apartment.

6.3.2 Water Temperatures

Cold water 10°C
Drinking water 10°C
Hot water 60°C

6.3.3 Water Pressure

Hot and cold water at point of use: Min 1.5 Bar
Max 3.0 Bar

6.3.4 Rainwater System

A design rainfall intensity of 150 mm per hour will be used to size the rainwater system.

6.3.5 Dry / Wet riser Systems

A dry / wet riser system will be installed to serve the development to comply with BS 5306 Part 1.

6.3.6 Sprinkler System

Sprinkler system will be installed to conform to BSEN12845 and BS5306, Part 2 1990 (including LPC Tech Bulletins), and BS 9251:2005, Ordinary Hazard I, spacing of sprinkler heads not to exceed 12 m².

6.4 Vertical Transportation

6.4.1 Passenger Lift Criteria

- Lift Car Capacities 1,000 kg/13 persons
1,600kg/21 persons where possible to provide quality feel because of increased space within lift car.
- Max Car Occupancy <50% car nominal capacity
- Maximum Interval <25 seconds
- Handling Capacity Minimum 15% of population in 5 minutes in 2 way traffic

- Speed 1.6m/s

6.4.2 Goods Lift Criteria

- Capacity 1,600 to 2,000 kg
- Speed 1.0 – 1.6m/s

6.4.3 Fire Fighting Lift Criteria

- Capacity 630 kg/8 persons or 800 kg/10 persons. Subject to location and if to be used for disabled evacuation. If so, recommend minimum 17 person 1275kg.
- Speed 1.6m/s

6.4.4 Vehicle Lift Criteria

- Capacity 30,000kg to accommodate Waste Disposal Lorries as used by City of London Corporation
- Speed 0.3 m/s

The above information will need to be finalised once constraints of existing building fully understood in conjunction with other M&E Services

7.0 DESIGN CRITERIA – HOTEL

7.1 Mechanical Services

7.1.1 Summer outdoor design criteria:

- General Ambient Air: 29°C db / 20°C wb
- For Heat Rejection Equipment: 32°C db

7.1.2 Winter outdoor design criteria:

- -5°C db / 100% Sat.

7.1.3 Indoor design conditions:

- Guestrooms Summer: 24°C db (55 % relative humidity)
Winter: 22°C
- Pre-Function/Multi-Function Rooms Summer: 23°C db (55 % relative humidity)
Winter: 22°C
- Banqueting Room Summer: 23°C db (55 % relative humidity)
Winter: 22°C
- Meeting Rooms Summer: 23°C db (55 % relative humidity)
Winter: 22°C
- Restaurant Bar Summer: 23°C db (55 % relative humidity)
Winter: 22°C
- Main Lobby/Lobby Bar Summer: 23°C db (55 % relative humidity)
Winter: 22°C
- Health Club Summer: 23°C db (55 % relative humidity)
Winter: 22°C
- Offices Summer: 23°C db (55 % relative humidity)
Winter: 22°C
- Hotel Retail Summer: 23°C db (55 % relative humidity)
Winter: 22°C
- Employee Dining Room Summer: 23°C db (55 % relative humidity)
Winter: 22°C
- Computer & PABX Summer: 23°C db (55 % relative humidity)

- Rooms Winter: 22°C
- Kitchen & Laundry Summer: 28°C db maximum design
Winter: temperature
- Corridors Summer: 24°C db (No humidity control)
Winter: 22°C

- (i) All indoor temperatures are subject to $\pm 1.5^\circ\text{C db}$.
- (ii) Under "The Fuel and Electricity (Heating Control Amendment)" Order 1980 heating controls may have to be set at 19°Cdb.

7.1.4 Outside Air Provision

- Guestrooms 10 L/s per Person
- Pre-Function/Multi-Function Rooms 15 L/s per Person
- Banqueting Room 15 L/s per Person
- Meeting Rooms 15 L/s per Person
- Restaurant Bar 15 L/s per Person
- Main Lobby 10 L/s per Person
- Health Club 15 L/s per Person
- Offices 10 L/s per Person
- Hotel Retail 10 L/s per Person
- Employee Dining Room 15 L/s per Person
- Computer & PABX Rooms 10.0 L/s per Person
- Lobby Bar 20.0 L/s per Person
- Corridors 1.0 L/s per Person

7.1.5 Population Densities

- Guestrooms 2 persons per room
- Pre-Function/Multi-Function Rooms 1 person per 1.0m²
- Banqueting Room 1 person per 1.0m²
- Meeting Rooms 1 person per 5.0m²
- Restaurant Bar 1 person per 3.0m²
- Main Lobby 1 person per 10.0m²
- Health Club 1 person per 10.0m²
- Offices 1 person per 10.0m²
- Hotel Retail 1 person per 5.0m²
- Employee Dining Room 1 person per 3.0m²
- Computer & PABX Rooms 1 person per room
- Lobby Bar 1 person per 3.0m²
- Corridors Not Applicable
- Ball Room 450 people (Incl. staff)

7.1.6 Window Treatment

The assumed minimum performance criteria for the equivalent clear outer glazing elements are as follows:

Shading Coefficient	≤	0.4
Glass U-Value	≤	2.0
Daylight Transmittance	≥	59%
Wall Panel U-Value		0.35 (Guideline Only)

7.1.7 Load Densities

Cooling load densities will be assumed as follows:

<u>Space Type</u>	<u>Lighting</u>	<u>Small Power</u>
• Guestrooms	5 W/m ²	15 W/m ²
• Banqueting Room	20 W/m ²	10 W/m ²
• Pre-Function Room	20 W/m ²	10 W/m ²
• Restaurant Bar	20 W/m ²	15 W/m ²
• Public Spaces	20 W/m ²	10 W/m ²
• General Offices	12 W/m ²	25 W/m ²
• Corridors	5 W/m ²	5 W/m ²

7.1.8 Noise Criteria

The mechanical plant will be designed to achieve the following:

<u>Space Type</u>	<u>Noise Rating</u>
• Guestroom	NR-28
• Banqueting Room	NR-40
• Retail	NR-40
• Public Spaces	NR-40
• Offices	NR-38
• Restaurant/Bar	NR-38
• Common Areas (e.g. lobbies, corridors, etc.)	NR-40
• Plantrooms	NR-90
• External Noise	No greater than 4db above existing external ambient.

7.1.9 Ventilation Rates

<u>Space Type</u>	<u>Air Change Rate</u>
• Guestroom Toilets	10 air changes per hour extract or 24L/s per toilet
• Public Toilets	16 air changes per hour extract
• Store Room	4 air changes per hour supply and extract
• Housekeeping Workroom	12 air changes per hour extract

- Kitchen & Laundry 35 air changes per hour extract
- Locker Rooms 20 air changes per hour extract
- Refuge Room 20 air changes per hour extract
- Receiving Area 20 air changes per hour extract

7.1.10 Filtration

All filtration to European Standards:

- Guestroom EU-5
- Other Spaces EU-5
- Kitchens As per the kitchen consultant's recommendations. Kitchen extract hoods to be specified by kitchen consultant with UV filters

7.1.11 Design Codes

General design principles for the mechanical systems will follow the Chartered Institute of Building Services Engineers design guides, British Standards and EC Directive statutory codes.

7.2 Electrical Services

The design of the Electrical Services shall take into account the relevant British Standards, European Norms, International Electro-technical Standards and Local Building Control requirements.

7.2.1 Electrical Load Densities

<u>Space Type</u>	<u>Lighting</u>	<u>Small Power</u>
• Guestrooms		
• Banqueting Room	20 W/m ²	10W/m ²
• Pre-Function Room	20 W/m ²	10 W/m ²
• Restaurant Bar	20 W/m ²	15 W/m ²
• General Offices	12 W/m ²	25 W/m ²
• Corridors	15 W/ m ²	5 W/m ²

7.2.2 Means of Escape Lighting

Means of escape lighting will be provided in accordance with BSEN1838 and BS5266-1:2005 and as required by the Local Authority.

7.2.3 Lighting

All areas forming part of the landlord's works, such plantrooms, staircases, lobbies, toilets, entrance hall will be illuminated, generally using fluorescent luminaires.

The following levels of illuminance are to be achieved:

<u>Areas</u>	<u>Illuminance Levels (lux)</u>
• Guestrooms	50-100
• Banqueting Room	400
• Pre-Function Room	400
• Restaurant /Bar	200
• Meeting Rooms	400
• Main Lobby	300
• Offices	400
• Kitchens & Laundry	500
• Workshops	400
• Corridors & Lobbies	100
• Toilets & Locker rooms	150

7.2.4 Emergency Lighting

Emergency lighting will be provided in accordance with BS5266 and as required by the Local District Surveyor.

Dedicated luminaires and signage will be fitted with battery/inverter battery packs, which shall be backed-up by the emergency generator.

7.2.5 Fire Alarm and Detection System

The system will be designed in accordance to BS5839 L1 and shall completely interface with the main fire system for the building.

7.2.6 Earthing

Earthing systems will be provided in accordance with BS7430 and BS7671.

7.2.7 Miscellaneous Systems

Power trunking, conduit and associated back boxes will be provided for the following systems:

- CCTV / Intruder
- Voice / Data
- TV / radio / Satellite
- Guest door entry
- Conference / Meeting Rooms audio
- Induction Loops

7.2.8 Fire Alarm and Detection System

The building will be provided with a fire alarm system including all firemen's panels. The system will be sized to be able to handle the hotel and will be designed to BS5839 with a coverage type L1.

The system will comprise detection, evacuation, signalling, auxiliary functions, fire fighter's telephone system components and the fireman's fan and smoke damper control system.

Smoke detection shall be provided in every guestroom/suite and throughout all public areas.

Fire warning within the hotel will be via the voice evacuation system with loudspeakers installed in guestroom, corridors and all public/staff areas.

The fire alarm system will be provided with facilities that achieve the following requirements in the event of a fire alarm:

- Automatically evacuate the rooms/floors of incidence and the above floor.
- Instigate shutdown of all mechanical ventilation services control panels.
- Transmit a fire signal to the building control system.
- Provide manual override control of the following:
 - Smoke Exhaust systems.
 - Smoke extracts air dampers.

Mobility suites shall be provided with an additional flashing xenon beacon in the guestroom and wired into the system.

Fire doors generally shall be maintained in the open position during the day. All doors shall close in the event of fire and shall have a timed release for closing off the corridor fire doors at night.

7.3 Public Health and Fire Protection Services

7.3.1 Storage

Cold water	Storage will be based on 135 Litres per bed space
Hot water	45 litres per person (based on two people per room)

7.3.2 Water Temperatures

Cold water	10°C
Drinking water	10°C
Hot water	65°C

7.3.3 Water Pressure

Hot and cold water at point of use:	Min 1.5 Bar Max 3.0 Bar
-------------------------------------	----------------------------

7.3.4 Rainwater System

A design rainfall intensity of 150 mm per hour will be used to size the rainwater system.

7.3.5 Dry / Wet riser Systems

A dry / wet riser system will be installed to serve the development to comply with BS 5306 Part 1.

7.3.6 Sprinkler System

Sprinkler System to conform to BSEN12845 and BS5306, Part 2 1990 (including LPC Tech Bulletins), and BS 9251:2005, Ordinary Hazard I, spacing of sprinkler heads not to exceed 12 m².

7.4 Vertical Transportation

7.4.1 Passenger Lift Criteria

- Lift Car Capacities 1,000 kg/13 persons
1,600kg/21 persons where possible to provide quality feel because of increased space within lift car
- Max Car Occupancy <50% car nominal capacity
- Maximum Interval <25 seconds
- Handling Capacity Minimum 15% of population in 5 minutes in 2 way traffic
- Speed 1.6m/s

7.4.2 Goods Lift Criteria

- Capacity 1,600 to 2,000 kg
- Speed 1.0 – 1.6m/s

7.4.3 Fire Fighting Lift Criteria

- Capacity 630 kg/8 persons or 800 kg/10 persons. Subject to location and if it is to be used for disabled evacuation. If so, recommend minimum 17 person 1275kg.
- Speed 1.6m/s

The above information will need to be finalised once constraints of existing building fully understood in conjunction with other M&E Services

APPENDIX 1 – DRAWINGS