



11. Mechanical and electrical services strategy



**Mechanical and Electrical Services
Strategy for**

Camden Goods Yard

On behalf of One Housing Group

7th September 2017

17078-M&E SERVICES STRATEGY



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CAMDEN GOODS YARD

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CAMDEN GOODS YARD

MECHANICAL AND ELECTRICAL SERVICES STRATEGY

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CAMDEN GOODS YARD

MECHANICAL AND ELECTRICAL SERVICES STRATEGY

1.0 Description of Site

- Option 1 No change – No impact M&E
- Option 2 Open space improvement - Impact M&E
- Option 3 Refurbishment – Replacement of existing individual services to dwellings.
- Option 4 Infill – New dwellings with individual services
- Option 5 Partial Redevelopment – Individually served dwellings
- Option 6 Full Redevelopment – New energy centres etc. Details contained in following report.

2.0 Description of Site

Camden Goods Yard is split into two sites, Gilbeys Yard and Juniper Crescent.

Juniper Crescent consists of 3 Blocks, A, B & C, 461 dwellings in total.

Gilbeys Yard has 181 dwellings within 3 Blocks – D, E & F.

3.0 Water Services

Each residential unit shall be provided with a dedicated water supply. In addition, Landlord supplies are required for each core to all cleaner cupboards, bin stores and any other irrigation supplies as required.

The Water Authority will only guarantee 1 bar pressure at the site boundary which would be insufficient to serve the flats.

It is therefore proposed to provide a water tank and cold water booster set to serve all cores within a water tank room at ground floor level. Landlord supplies to bin stores shall have a DC interrupter directly outside store with a lockable tap.

The tank size is based on 15 minute pumping time (domestic) and an additional 4,500 litres for sprinklers (Fire Consultants to confirm strategy).

Outline Duties – Juniper Crescent – Maximum Height 11 Storeys

- Pump set - 14.0 l/s @ 8.6 bar
- Tank size - 22,800 litres nominal sectional tank capacity
- 17,100 litres actual capacity

The cold water storage tank should be provided in three sections with three ball valves. The tank proposed shall be totally internally flanged to aid spatial sizing.

Plant space required for tank and pumps at an assumed height of 3m (minimum) shall be 6.0m x 5m = 27.5m².

Outline Duties – Gilbeys Yard

- Pump set - 9.0 l/s @ 8 bar
- Tank size - 17,000 litres nominal sectional tank capacity
- 12,600 litres actual capacity

The cold water storage tank should be provided in two sections with two ball valves. The tank proposed shall be totally internally flanged to aid spatial sizing.

Plant space required for tank and pumps at an assumed height of 3m (minimum) shall be 5.5m x 5m = 27.5m².

This plant space shall allow for maintenance access, pump sets, tanks and a water conditioner.

Cold Water Distribution

The boosted cold water shall rise through dedicated risers to each floor level with individual water meters contained within riser cupboards.

Once into the communal corridors at each floor level, the water services pipework shall distribute along one side of the ceiling void with heating pipework along the other. The electrical services shall then distribute centrally within the ceiling void.

Location of Meters

The residential water meters shall be located within the risers at each floor level. The water meters shall be served via manifolds which are fed directly off the rising main. Houses will be located and served via a manifold externally with locations TBC.

Riser Space Required

Using the maximum number of units served at each floor level, the riser space required for water services has been estimated within section 18.0

The above riser sizes allow for the meter manifold to be double stacked.

4.0 Heating

The development will require two separate energy centres, one in Gilbeys Yard the second serving Juniper Crescent.

Juniper Crescent

This would require approximately 3.0mw of boiler power and a separate CHP to offset the carbon output.

The space required for the energy centre to house boilers, CHP buffer vessel and ancillary equipment would be 250m² and minimum of 4.5m high.

Gilbeys Yard

This smaller energy centre would require a space of 200m² and 4.5m high. This would house 1.2mw of boiler power, CHP, buffer vessels etc.

Distribution

District Heating distribution flow and return will run to each building riser either directly from the energy centre or external distribution.

Within the cores, the district heating pipework shall distribute through the core risers before serving each floor level in turn. The heating pipework shall distribute along one side of the corridor with the water services along the other to reduce heat transfer.

The heating pipework shall distribute to each apartment to serve the heat interface unit (HIU) located within the services cupboard.

All district heating pipework shall be heavy grade steel due to the high working pressure within the system.

All equipment to be selected to be rated to min 12 bar working pressure.

If district heating pipes are positioned in public footpaths / highways a section 50 agreement may be required.

Evaluation of Riser Space

Within each apartment the HIU shall be provided with a heat meter which in turn shall be connected to the energy metering software.

All heating pipework shall be insulated along its length and be provided with an appropriate level of protection and in accordance with London heat network requirements.

Riser Sizes at Each Core and at Every Level

Riser sizes are noted within section 18.0 and to include valve arrangements, insulation and maintenance access.

Protection Against Heat Build Up

The energy centre walls and soffit shall be insulated to avoid excessive heat transmittance to adjoining areas. This insulation should also reduce the transmission of sound although this will need to be verified by the Acoustic Consultant.

The heating pipework riser should be ventilated to the external at the head of riser and supply air at low level. The distribution of heat from floor to floor inside the riser also needs to be allowed for via a Durotread or similar support system.

Heat build up within the communal corridors shall be treated via the AOV or natural vents operating via wall mounted thermostats with Mechanical fire rated damper linked to AOV system above staircase doors connecting corridors to the staircases. The environmental control of temperature within these areas should also be subject of a dedicated overheating assessment.

5.0 Gas

The supply of natural gas shall be provided to the energy centre's only to service the CHP and the modular boilers.

A dedicated gas meter room shall be approximately 2.5m x 2.5m with high and low level ventilation direct to external.

6.0 Car Park Ventilation (if applicable)

It will be necessary for the car park to be ventilated either mechanically or via natural means. The regulations state the following:-

Natural Ventilation

Approved document Part F and Part B state that two sided ventilation will be required if done naturally.

- Part F states that 1/20th of the floor area should be naturally ventilated of which a minimum of half needs to be on two opposing sides.

Mechanical Ventilation

- Part F states that 1/40th of the floor area should be naturally ventilated of which half needs to be on two opposing sides and a mechanical ventilation system capable of at least 3 air changes per hour or the whole car park shall be provided with a mechanical ventilation system capable of at least 6 air changes per hour.

AND

For exits and ramps and areas where cars queue a local ventilation system capable of at least 10 air changes per hour.

- Part B states that in car parks which are unable to provide the minimum amount of natural ventilation, a mechanical ventilation system shall be provided capable of at least 10 air changes per hour. The system shall operate in 2 parts, with each part capable of 50% of the duty. Each part shall have an independent power supply and all fans rated at 300°C for 60 minutes.

The mechanical ventilation system shall comprise of the following:-

- Intake air via the entrance in (assume 70% free area)

- Impulse fans located within the car park area
- Extract (run and standby) fans to discharge the air to atmosphere
- Discharge air terminal of 1.5m will be required.

A specialist will be required to determine the sizes and systems to comply with the regulations.

7.0 Dry and Wet Risers

Dependant on the fire strategy each core will require a dry riser.

Each dry riser shall comprise of a twin inlet box, distribution pipework and a single outlet box with a valved connection.

The location of the inlet box shall be co-ordinated and agreed with the Architect including the route of the distribution pipework.

No allowance for wet risers has been made. Confirmation to be provided by the fire strategy consultants.

8.0 Lobby Ventilation

The lobby, if opening to the car park area, will require 0.4m² free area duct routed to atmosphere.

If bin stores are accessed from the central cores, these will need to be lobbied and 0.4m² free area duct routed to atmosphere provided.

The bin stores doors should be fully louvred direct to external air to mitigate build-up of foul smells. Where possible, cross flow ventilation should be provided.

9.0 Electricity

Juniper Crescent

Energy Centre = 80.0kVA

Block A1

74 No 1 Bed @ 1.2 kVA = 88.8 kVA

36 No 2 Bed @ 1.5 kVA = 54.0 kVA

8 No 3 Bed @ 2.0 kVA = 16.0 kVA

Sub Total = 158.8 kVA

Landlords = 40.0 kVA

Total = 198.8 kVA

Block A2

35 No 1 Bed @ 1.2 kVA = 42.0 kVA

19 No 2 Bed @ 1.5 kVA = 28.5 kVA

Sub Total = 70.5 kVA

Landlords = 40.0 kVA

Total = 110.5 kVA

Block B1

31 No 1 Bed @ 1.2 kVA = 37.2 kVA

54 No 2 Bed @ 1.5 kVA = 81.0 kVA

31 No 3 Bed @ 2.0 kVA = 62.0 kVA

17 No 4 Bed @ 2.5 kVA = 42.5 kVA

Sub Total = 222.7 kVA

Landlords = 40.0 kVA

Total = 262.7 kVA

Block C1

92 No 1 Bed @ 1.2 kVA = 110.4 kVA

46 No 2 Bed @ 1.5 kVA = 69.0 kVA

19 No 3 Bed @ 2.0 kVA = 38.0 kVA

Sub Total = 217.4 kVA

Landlords = 40.0 kVA

Total = 257.4 kVA

Car Charging

Assume 16 no. 32A @ 512A = 140kVA

car charging

points.

Number TBC

by Planners.

Total Site Load	=	1,049.4 kVA
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There is one existing sub-station on the site but it is unlikely it will have enough capacity for the new loads. We would estimate that two new sub-stations would be required of 800kVA each,

Gilbeys Yard

Energy Centre 80.0 kVA

Block D1

7 No 1 Bed @ 1.2 kVA = 8.4 kVA

10 No 2 Bed @ 1.5 kVA = 15.0 kVA

10 No 4 Bed @ 2.5 kVA = 25.0 kVA

Sub Total = 48.8 kVA

Landlords = 40.0 kVA

Total = 88.4 kVA

Block D2

26 No 1 Bed @ 1.2 kVA = 31.2 kVA

6 No 2 Bed @ 1.5 kVA = 9.0 kVA

Sub Total = 40.2 kVA

Landlords = 40.0 kVA

Total = 80.2 kVA

Block D3

32 No 1 Bed @ 1.2 kVA = 38.4 kVA

21 No 2 Bed @ 1.5 kVA = 31.5 kVA

Sub Total = 69.9 kVA

Landlords = 40.0 kVA

Total = 109.9 kVA

Block E1

7 No 3 Bed @ 2.0 kVA = 14.0 kVA

8 No 4 Bed @ 2.5 kVA = 20.0 kVA

Sub Total = 34.0 kVA

Landlords = 40.0 kVA

Total = 74.0 kVA

<u>Block F</u>					
41 No	1 Bed	@	1.2 kVA	=	49.2 kVA
4 No	2 Bed	@	1.5 kVA	=	6.0 kVA
8 No	3 Bed	@	2.0 kVA	=	20.0 kVA
			Sub Total	=	75.2 kVA
Landlords				=	40.0 kVA
			Total	=	115.2 kVA

Car Charging

Assume 16 no. 32A @ 512A = 140kVA

Car Charging

points.

Number TBC

by Planners.

Total Building Load	=	687.5 kVA
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Therefore a single 800kVA substation would be required.

10.0 AOV System

It is assumed the common staircases will require an AOV system and they shall be defined by the fire strategy.

Any corridor venting shall require smoke shafts to be incorporated into the architectural design.

11.0 Door Entry/Access Control/CCTV

Each apartment will be provided with a video/audio door entry handset to open core front entrance.

All cores shall have a main door entry access control panel at ground floor. These shall be provided with fireman override switches. All other external exits, including those into the car park, shall be provided with fob access for resident only access.

The main car park entrance shall be controlled via long range fob sensors.

All installation works and materials to be provided by Access Control Specialist.

Refuse and cycle stores are assumed to have a standard mechanical keypad.

12.0 TV Installation

Each apartment will be provided with a TV position as defined by the client's ER's.

13.0 Telecoms

Each apartment shall be provided with a BT master point typically in the hall cupboard together with secondary outlets in the lounge and master bedroom.

14.0 Alternative Cable/TV Provider

Virgin is in vicinity and can be installed to site if required.

Each apartment would be provided with a master outlet in the cupboard.

15.0 Flat Services Cupboards

The total cupboard size required in each flat is to be 1850mm x 850mm deep. This will house the washing machine, HIU unit, electrical consumer unit, meter board, whole house ventilation system, etc. The utility cupboard is to be lined with ply to allow fixing of plant to all walls.

16.0 Internal Flat MEP Services

Mechanical

The Flats shall be provided with a twin plate heat interface unit (HIU) that in turn will serve both the domestic hot water and heating systems. The internal heating system, shall be panel radiators.

All domestic hot and cold water services within the flat shall distribute in copper pipework and serve all sanitary ware complete with isolating valves.

The flats shall be provided with a MVHR (Whole house) ventilation system if required by the energy statement with attenuation and possibly No2 filters, which will remove air from bathroom's/WC's/kitchen and supply external air into occupied spaces (lounge/bedrooms). This system shall comprise of plastic flat ducts distributing within the ceiling void and connecting to a fan intake and discharge to atmosphere. The MVHR fan unit shall be located within the service cupboard in the flat.

17.0 Ceiling Zones Required

Communal Areas

Car park area - A minimum services zone of 450mm will be required. This is to facilitate the crossovers of the main services, ie pipes under svp transfers. This will be unavoidable. If the zone is not provided the services will need to be carefully routed and crossovers occurring at locations where it is not essential to maintain the clear height within the care park area, ie close to the edge of walls/plant room cupboard areas.

- All other areas - A minimum services zone of 250mm will be required. This will facilitate crossovers of main services within the communal corridors emanating out of the risers and into the flats.

Flats

- Hallway/bathrooms - A minimum clear service zone of 250mm will be required in the unit hallways and bathrooms. This will facilitate the crossovers required for the ventilation ducts and mains services.
- Utility cupboard - A minimum clear services zone of 300mm will be required within the utility cupboard. This will facilitate crossovers of all the services.
- All other areas - A minimum clear services zone of 150mm will be required. This will facilitate crossovers of domestic pipework and ventilation ducts. Routes will need to be carefully determined to avoid clashes with downlights or alternatively a 200mm zone is too be provided.

Please note the depth is clear from the top of the MF frame, not including it. It should be noted that where SVP's have to offset above dwellings, the ceiling void depths may increase to accommodate the long radius bend.

18.0 Riser Shaft Sizes Summary

Mechanical

Water services - 1000 W x 450 D

The Above riser space allows for sprinkler connections at each core and every floor level.

Heating services - 600 W x 450 D

Dry riser - 550 W x 600 D (outlet box/valve and pipe)

Flue riser - 1750 W x 400 D (Riser allocation to side of lift shaft to avoid head height restriction with car park)

Electrical

Ground floor - Meters in riser - 3000 W x 450 D

Other floors - Meters in riser - 2500 W x 450 D

Flat Services Cupboards

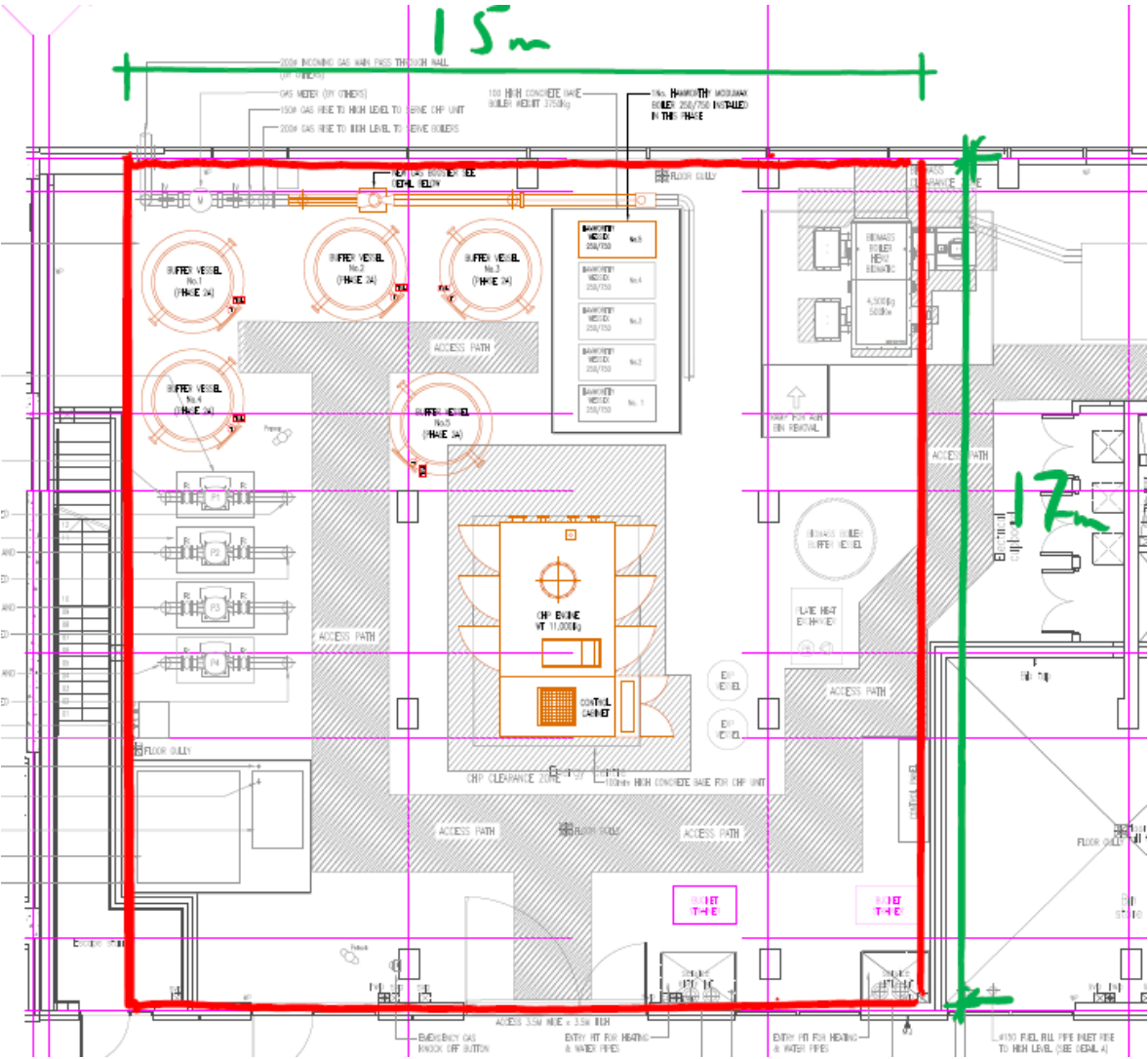
Minimum clear internal - 1850 W x 850 D

Note:

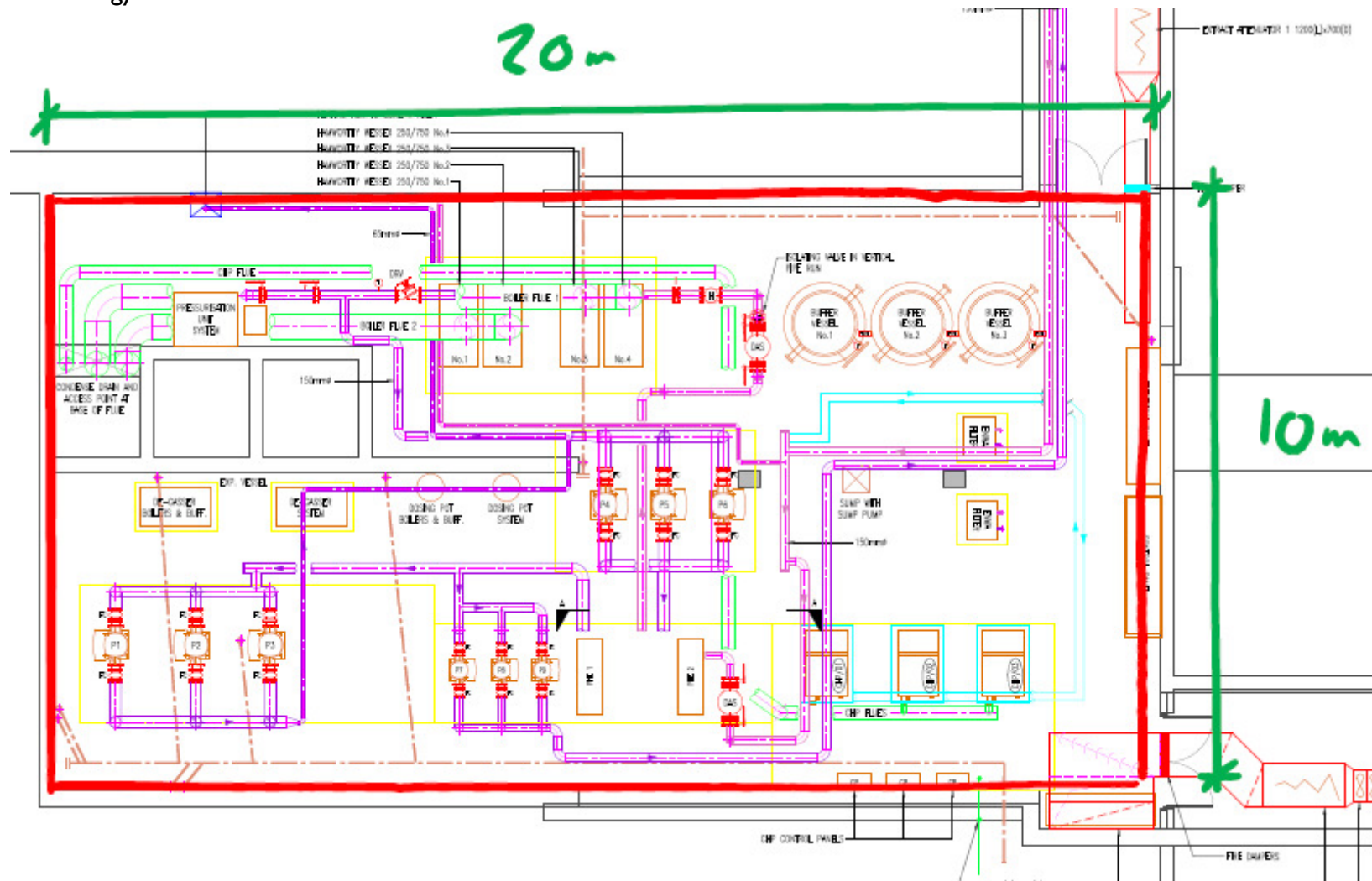
Risers have not been sized for M&E services with no allocation for any additional services such as RWP or Commercial area ductwork. Any additional services within the above may require risers to be resized.

19.0 Typical details for Energy Centres, Boosted Cold Water Rooms & Dry Risers

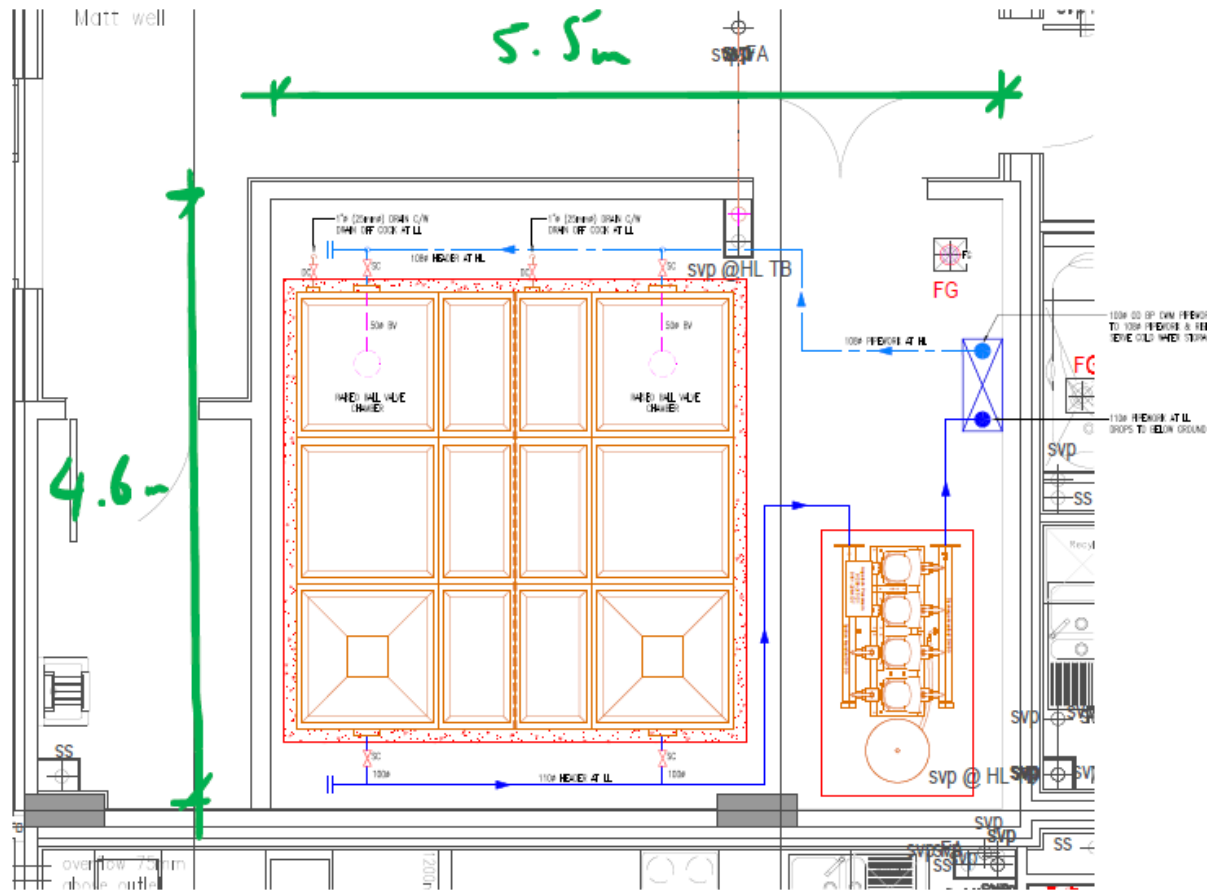
Juniper Crescent Energy Centre



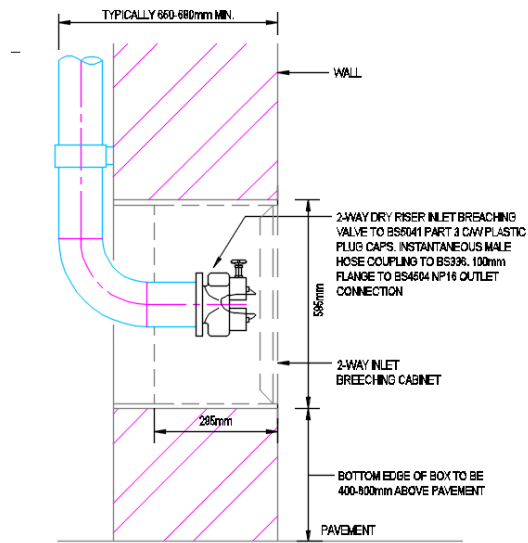
Gilbeys Yard Energy Centre



Typical Cold Water Booster Room

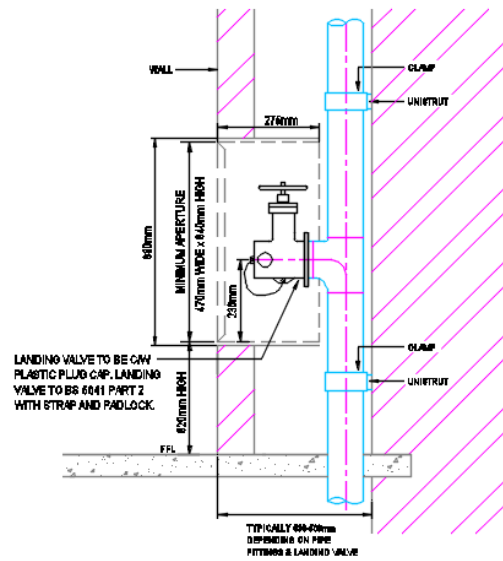


Typical Dry Riser Details



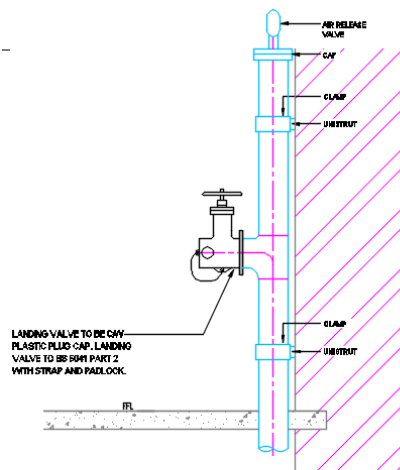
DRY RISER INLET CABINET DETAIL

(NTS)



DRY RISER LANDING VALVE & CABINET TYPICAL DETAIL

(NTS)



DRY RISER OUTLET AT TOP FLOOR LEVEL

(NTS)