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Wentwood Building, Manchester
M&E Services Remedial Works
Design Report

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ISSUE STATUS

Revision	Date	Description	Completed by	Checked By
P01	07/05/2020	Design Report	AS / ST	DRS

Wentwood Basement M&E Services Remedial Works

The following narrative describes the mechanical and electrical services design proposals:

Introduction

BMS consulting were appointed by Chris Green of Larnook, acting as agent for the ultimate client, to provide mechanical and electrical services design proposals to the basement void area of an apartment block on Newton street in the centre of Manchester, called Wentwood.

The basement void area is a large cavernous basement at circa 4.5m deep located under an old warehouse type building that has been converted into apartments.

The area of basement in question only appears to tie up with a proportion of the whole buildings footprint, as such there may well be other basement sections under the building, but these do not form part of the works.

No existing drawings of the building or the M&E services have been provided by the client.



The current access into the basement area is via a temporary scaffold located in an apartment that is being refurbished.

Following an incident in one of the apartments that resulted in access to the basement being gained, it was found that the basement area was flooded by a water well overflowing.

In light of this an M&E design team were sought in-order to propose M&E services designs to: mitigate future flooding, promote ventilation, provide lighting and fire detection and provide a level of power facilities.

The M&E services designs requested to be covered were as follows:

- A sump pump drainage design to an existing well in the basement.
- A ventilation design to the basement area.
- A lighting design to the basement area.
- An emergency lighting design to the basement area.
- A fire detection system by way of extension of the landlords fire alarm system to create a loop within the basement area.

Note: It should be noted that by introducing the above M&E services that permanent safe access should be provided to the basement area as there are ongoing maintenance requirements needed a number of times per year to check functionality and operation of systems, especially with the fire alarm system which is classed as a life safety system. This access must be provided as part of the apartment refurbishment works with agreements put in place with any future tenants in order to allow the landlord to access the basement area in an emergency or as part of a regular maintenance regime.

Drainage

Following a site visit on Friday 1st May it was discovered that in addition to the water well in the basement there were also 2 no additional below slab ducts that appeared to be flooded and full of water.



The well had an existing sump pump positioned close to it that appeared well worn and none functional.

The additional ducts had temporary plastic piping routed to high level to connect to the existing soil pipe in the flat to be refurbished and a portable sump pump positioned next to one of the ducts. We assume these ducts had therefore been pumped clear of water in the recent past.



Following discussion with the site contractor carrying out strip out/remedial works to the fabric of the basement area, he verbally confirmed that the basement had flooded to circa 750mm deep. He also confirmed that the well was pumped out to approximately its full depth of 6 meters and that there was a 2nd well chamber connected to the well at around 3 meters down.

At the date of our visit the well was full of water and as such had filled since the time it was pumped out, which we understand was within the last 3 months.

Our design proposals to counter future flooding of the basement area would be to install new sump pumps with integral float to the well and each of the below slab ducts.

The new sump pumps would be permanently connected to an electrical power supply positioned at an above flood height position above basement slab level. The power would be fed from a new landlords basement distribution board and the sump pump feed would be in the form of a suitable IP protected isolator and plug connector.

A suitable corrosion resistant bracket arrangement shall support the pumps in the well and the ducts such that should the water level come within 300mm of the top of the basement slab then the float on the sump pump shall initiate the sump pump to pump out excess water. The support bracket shall allow ease of removal of the sump pumps for inspection and maintenance.

Plastic ABS pipework shall then be routed from each of the sump pumps along the basement floor to the nearest basement wall, where it shall rise to high level and be routed to the nearest existing foul soil pipe for connection to. A non-return valve shall be located at low level on each of sump pump pipe runs. All pipework shall be suitably bracketed along its run along the basement floor, walls and ceiling at minimum spacings of 1500mm. Note a line size suitable length of flexible pipe section shall be installed from the sump pump to the solid ABS pipework to aid removal of the pump from the well/duct and allow it to sit on the basement slab adjacent the well/duct for inspection/maintenance purposes.

Connection to the existing foul drainage pipes shall be made on the top of the existing drain pipe by way of a glued strap on boss and an inline waterless trap as per the hepVO or equal.

Note there is no apparent existing surface water drain within the basement hence the proposal to connect to the foul drainage with suitable trap arrangement.

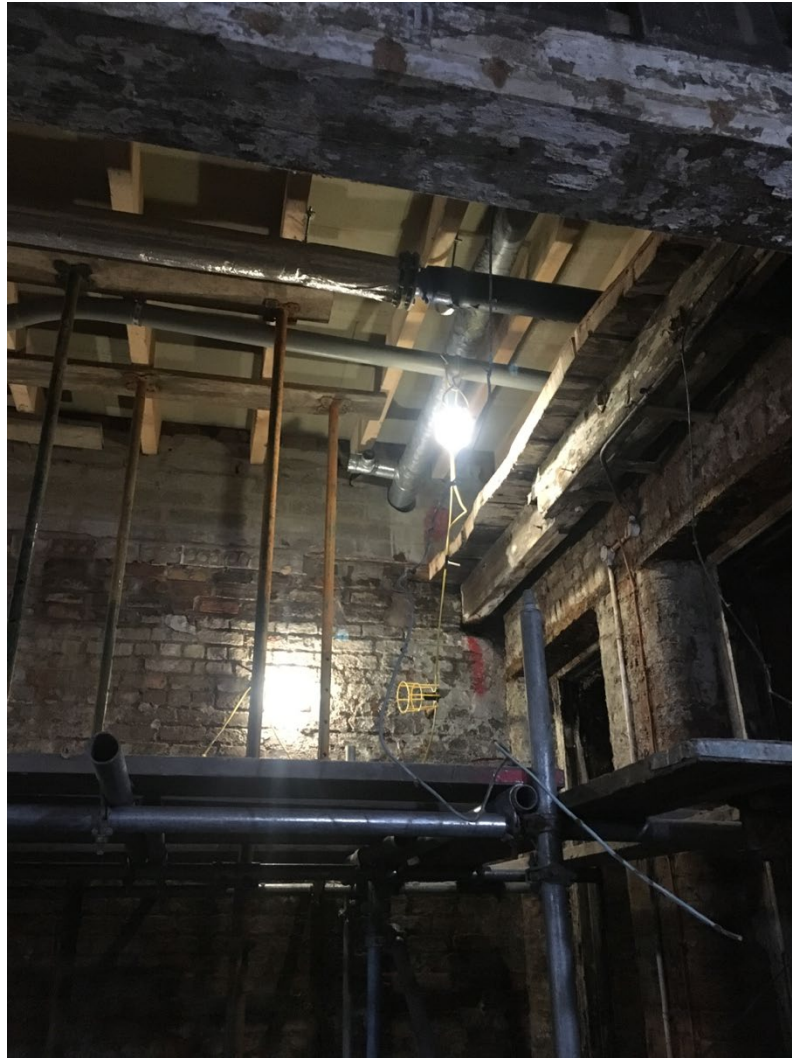
Note any connection into the existing drainage needs to be agreed with the landlord in order that a down time of use can be arranged with tenants affected.



Ventilation

Following a site visit on Friday 1st May it was discovered that there is an existing ventilation system provided to the basement. We assume this is extract ventilation.

The ductwork exits the basement to connect to what we assume will be a fan thus providing forced ventilation rather than a wall grille providing only passive ventilation.



The fan / external termination could not be found as such it is requested that the landlord provide suitable as fitted drawings or O&M manuals from when the building was converted into apartments such that the fan/termination can be identified.

The existing ventilation system consists of a mixture of high level solid spiral wound ductwork and flexible ductwork routed around the basement perimeter with branch terminations provided to the basement rooms. Much of the ductwork is flexible ductwork that has become disconnected from the minimal solid sections. In addition, much of the ductwork routing is in flexible 100mm dia sections which would create excessive resistance and affect the performance of the ventilation extraction rate. There is no evidence of any ventilation through put within the duct work.

Our design proposals are to reuse this existing ventilation system and upgrade it.

All existing flexible ductwork is to be removed and replaced with solid spiral wound ductwork to reduce system resistance. A large section of 100mm ductwork is to be replaced with 150mm dia duct work, refer to drawings for details.



The existing fan/termination is to be traced with landlords help and reset to operate continuously. If the fan is faulty or there is no fan then a new fan shall be installed in the old fans location or a new fan shall be installed within the basement area and termination ductwork traced or modified to be routed through the planned refurbished apartment to ensure connection to outside.

Once the old fan is reset to operate or new fan is installed the system is to be balanced using the existing termination VCDs to ensure equal extraction to each of the basement areas. Air flow results are to be recorded and formally issued to the client as a typed commissioning record.

Lighting

During the site visit, it was established that the existing lighting installation has failed and is completely inappropriate for the application.

The existing lighting installation should be removed in its entirety.

Our design proposal is to install a series of vapour proof LED strip light fittings, installed on soffit of each divided area of the basement space.



Fittings should be either suspended from or fitted directly to the soffit. Alternatively, fittings should be fixed to vertical walls, where appropriate.

Each defined compartment should be provided with a light switch, wired on a two-way basis allowing local switching or common ‘last man out’ provision from the basement access point.

Light fittings should be wired in either LSF single cables, contained within continuous PVC conduit with fire rated saddles or XLPE/SWA cable cleated at regular intervals to the building fabric.

The lighting installation should achieve an illuminance of 100 lux at 1.2m AFFL.

Refer to drawing BP20203-DR-03 for details of the proposed lighting layout.

Emergency lighting

A series of maintained emergency light fittings should be provided in accordance with the requirements of BS 5266-1:2016

The compartmented nature of the basement space dictates the fittings will be required within each sectioned space.

Proposed emergency light fitting locations are indicated on drawing BP20203-DR-03.

We have indicated a ‘running man’ sign in the location which we assume will be the egress point from the basement area. The location of the directional escape light will be subject to change if access / egress is provided elsewhere.



Small power

The existing electrical installation shall be removed in its entirety and replaced with a modern, compliant system.

A new, 8-way metal clad consumer unit is to be installed within the basement area to serve the new electrical installation.

The electrical supply for the new consumer unit should be derived from a nearby switch board with sufficient spare capacity to supply the maximum load of the new installation.

The consumer unit will feed each of the new sump pump installations via a switched fused spur mounted local to each unit. Radial circuits should be used to feed each sump pump.

A ring main circuit shall be provided to serve a series of switched double socket outlets, as indicated in drawing BP20203-DR-03

All aspects of the electrical installation must be installed in accordance with the IET 18th Edition wiring regulations – BS 7671:2018

All electrical outlets should be wired in either LSF single cables, contained within continuous PVC conduit with fire rated saddles or XLPE/SWA cable cleated at regular intervals to the building fabric.

All electrical accessories should be of a suitable IP rating for the environment.

Fire detection

There is currently no provision of a fire detection system within the basement area subject to remedial works.

Our design proposal is to provide a fire detection system in accordance with BS 5839 Part 1 on the basis that electrical equipment is to be installed within the area.

The compartmented nature of the basement area dictates provision of a smoke detection device within each area separated by a doorway opening. The density of coverage within the basement effectively informs provision of an L2/P2 installation.

A single visual / audible indication device should be installed within the basement area to alert a detection event in either the local area or elsewhere within the building.

The existing building fire alarm system should be modified to incorporate the additional detection and indication devices.

We assume that the existing system has the capacity within a nearby loop to accommodate expansion to cover the basement area. A detailed review of the existing fire alarm system should be undertaken by a specialist fire alarm contractor to determine capacity.

If there is no capacity on the existing fire alarm loop, a new dedicated loop shall be provided.

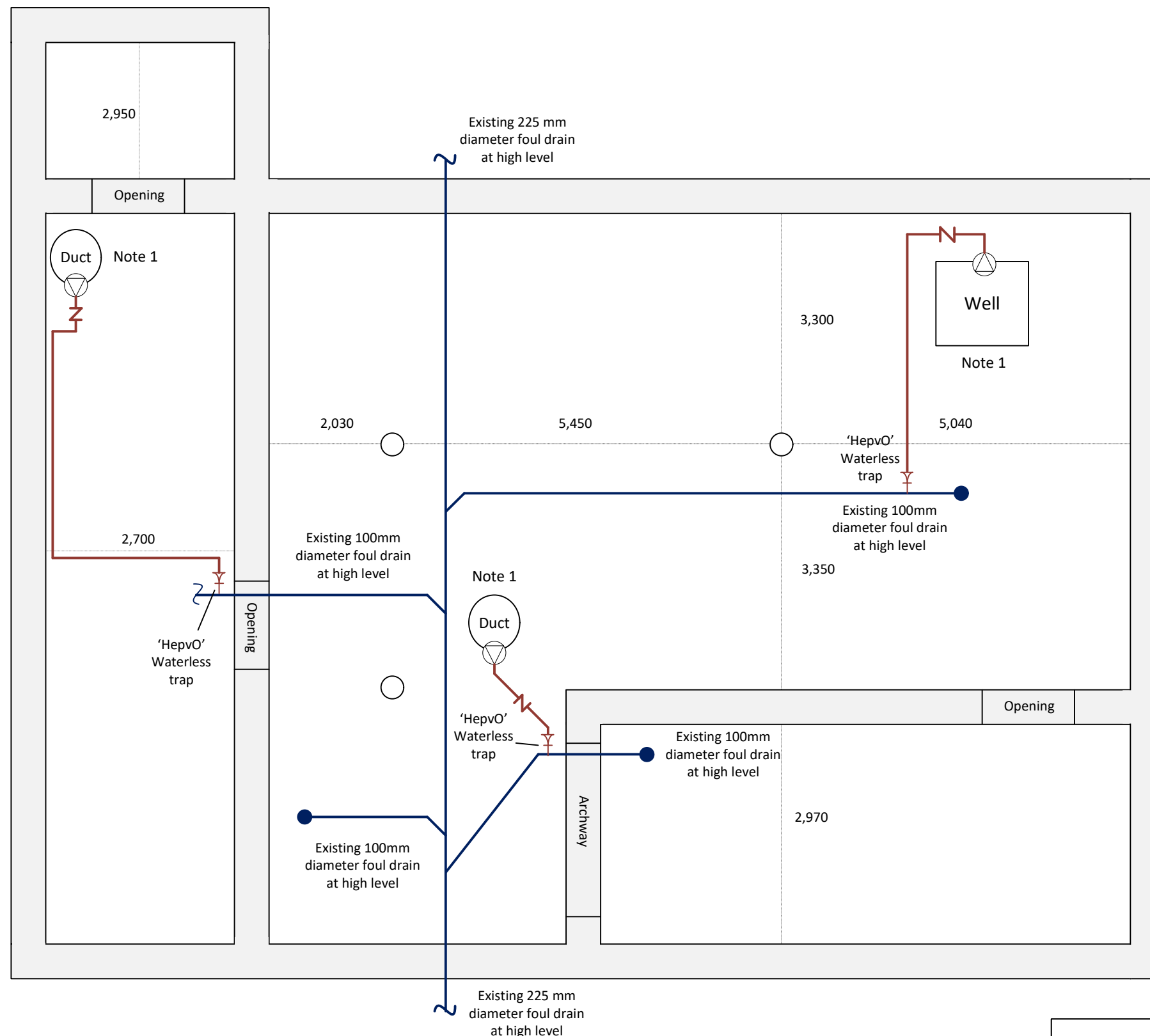
If the existing fire alarm system cannot be extended or modified to accommodate the additional detection devices, a new fire alarm panel should be installed to monitor the basement area. However, the new alarm panel must be interfaced with the existing system to initiate an investigation, alert or evacuation in accordance with the existing fire management strategy.

In either instance, the basement area must be configured as a separate detection zone.

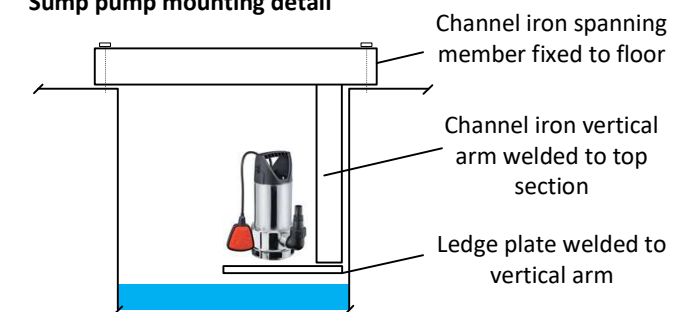
The extended fire alarm system should be installed in suitably fire rated cabling, clipped to the building fabric at regular intervals.

The building operator / owner must review the existing fire risk assessment on completion of the remedial works in accordance with obligations under The Regulatory Reform (Fire Safety) Order 2005.

Drawings



Sump pump mounting detail



Note: all steel members to be painted with suitable waterproof coating

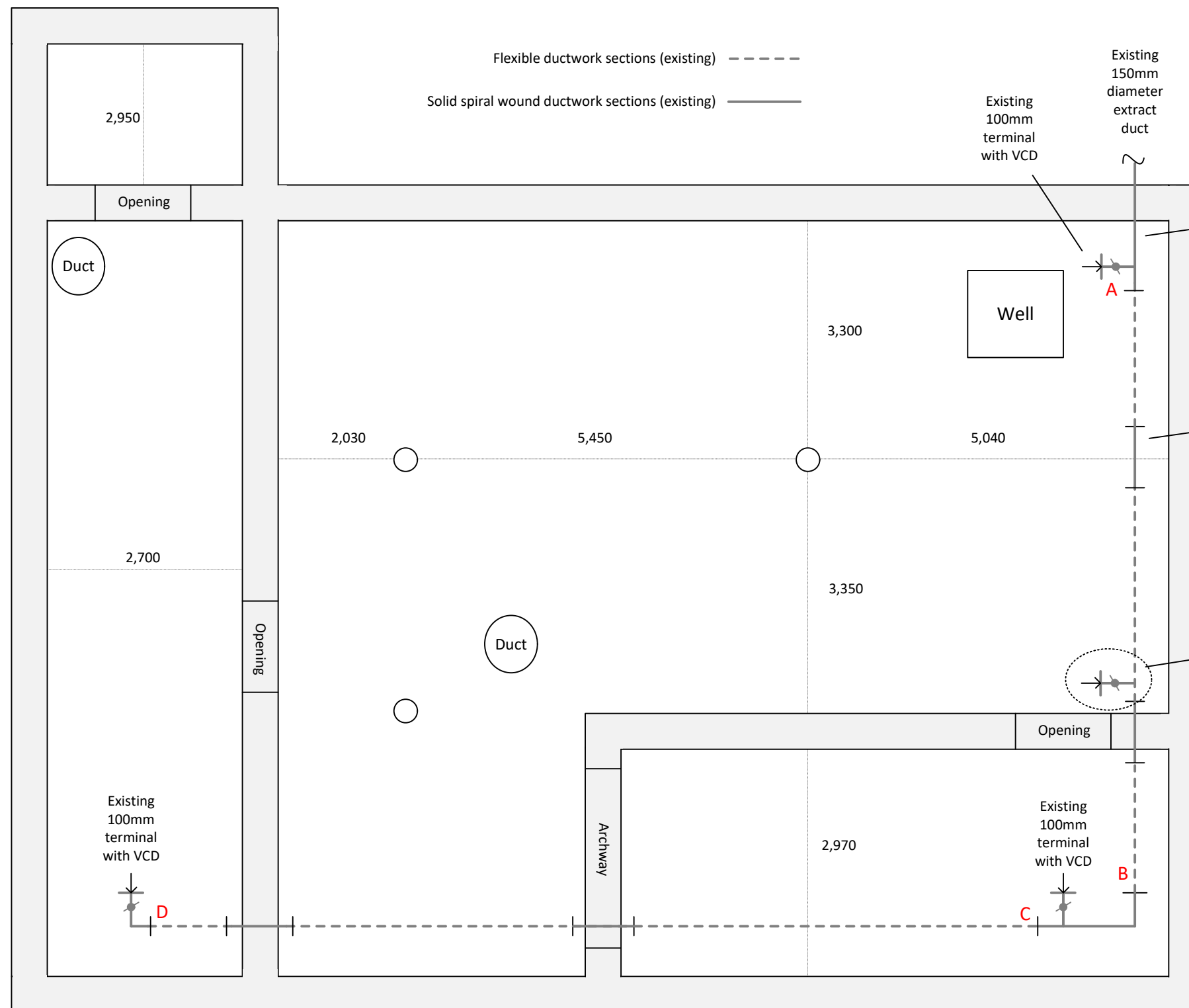
Note 1

New 40mm plastic pipework routed from each sump pump in well to rear wall at low level where it rises to high level and runs to connect to existing foul drain at high level.

New sump pump with integral float to be installed in existing well on purpose made bracket. Pump to be mounted 300mm below top of well.

New 40mm sump pump discharge pipework to connect to top of existing drain pipe via a strap-on boss. Note: an inline, waterless trap, as per 'HepvO', self sealing waste valve (40mm) is to be provided prior to connecting to the existing drainage pipe.

		Wentwood Building - Manchester			
		Basement Layout – Drainage Modifications			
BMS Consulting		SIZE	Project No.	DWG No.	REV
Adamson House, The Towers, Didsbury, Manchester, M20 2YY		n/a	BP2023	BP2023-DR-01	R01
SCALE		NTS	Drawn	AGS	SHEET
					1 of 1



Existing flexible 100 diameter ductwork to be replaced with solid section spiral wound ductwork between points C & D

Existing extract fan beyond boundary of basement wall to be traced and set to operate continuously. Fan to be replaced if found to be faulty or of insufficient capacity for application.

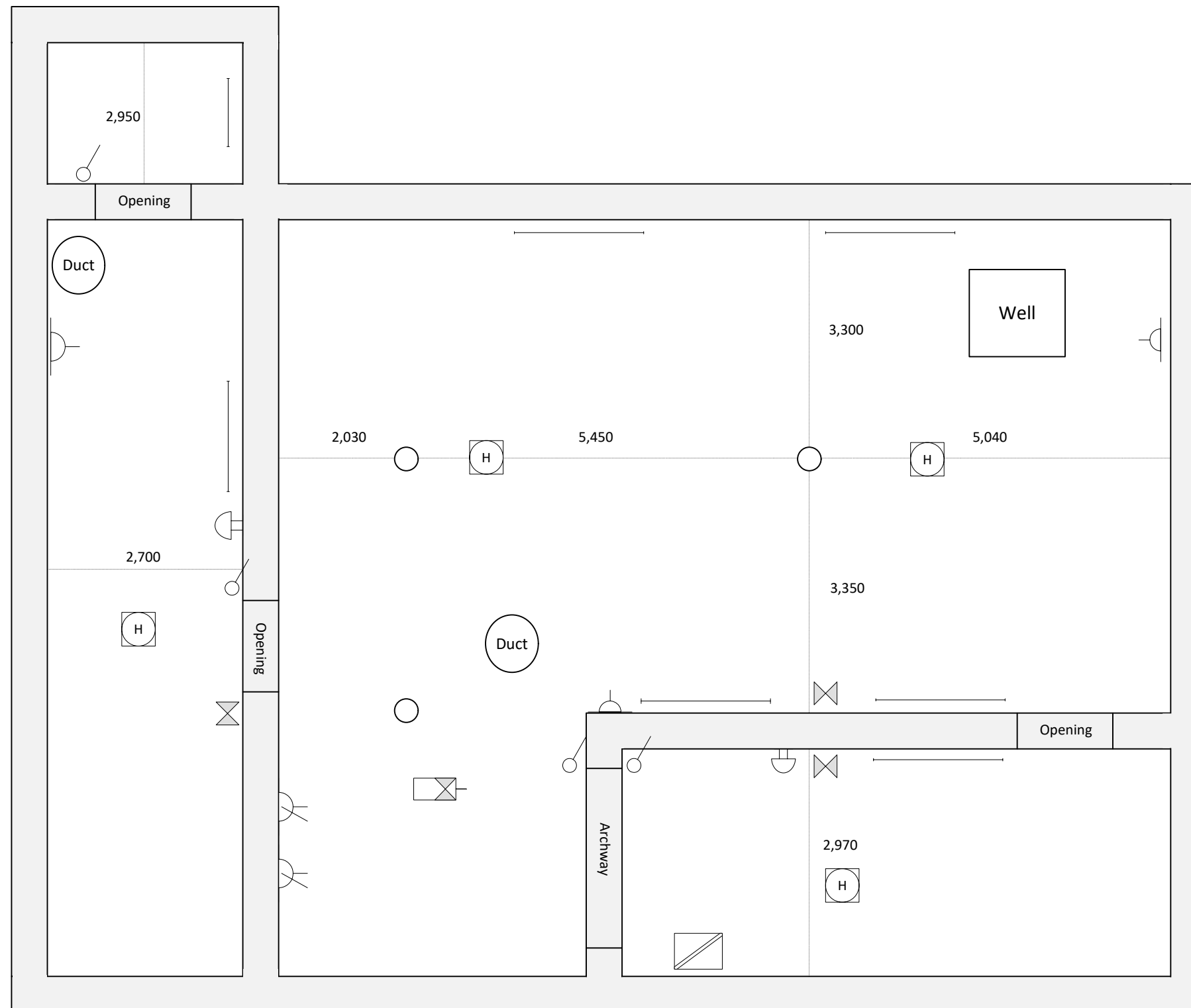
Ductwork to be traced and fan surveyed with assistance of landlord

Existing 100mm diameter flex and solid ductwork sections to be replaced with 150mm diameter solid section spiral wound ductwork between points A & B

New 100mm diameter terminal with VCD

General note:
Existing terminals to be re-balanced using VCD to ensure equal air extraction rates. Records of balance to be submitted to client on completion.

		Wentwood Building - Manchester			
		Basement Layout – Extract Ventilation			
BMS Consulting		SIZE	Project No.	DWG No.	REV
Adamson House, The Towers, Didsbury, Manchester, M20 2YY		n/a	BP2023	BP2023-DR-02	R01
SCALE		NTS	Drawn	AGS	SHEET 1 of 1



We have assumed that ladder / stair access will be provided in this vicinity. Emergency exit and light switch location to be varied if access is to be provided elsewhere

Notes:

Existing building fire alarm loop to be extended to pick up new smoke detectors and sounder.

New building fire alarm system cannot be extended, new fire alarm system to be installed to BS 5839 – Part 1 – L2

New electrical lighting and small power installation to be installed in accordance with IEE 18th Edition Electrical Regulations

LV power supply for local distribution system to be derived from suitable source on landlords main electrical switchboard.

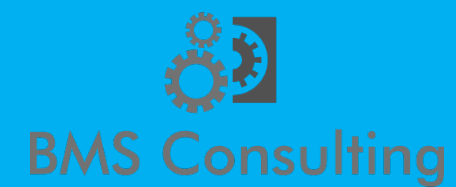
As-fitted records to be updated and all test sheets to be submitted / registered

Equipment schedule

	5ft - Vapour proof LED – 7 No.
	Emergency light – 4 No.
	Switched fused spur – Metal clad or IP 54 rated socket to allow disconnection – 3 No.
	Emergency 'Running man' sign – 1 No.
	Fire alarm sounder – 1 No.
	Smoke detector – 4 No.
	8 way – metal clad consumer unit – 1 No.
	Light Switch – 4 No.
	IP 54 rated double socket – 2 No.

	Wentwood Building - Manchester			
	Basement Layout – Electrical Layout			
BMS Consulting	SIZE	Project No.	DWG No.	REV
Adamson House, The Towers, Didsbury, Manchester, M20 2YY	n/a	BP2023	BP2023-DR-03	R01
SCALE	NTS	Drawn	AGS	SHEET
				1 of 1

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