

**BUILDING SERVICES REPORT  
GREENBANK SYNAGOGUE  
LIVERPOOL  
NC HOMES  
BS-19856-16-42  
MARCH 2016**



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Current Document Details

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**Document Revisions**

Rev	Date	Author	Checked	Approved
0	03/03/2016	DM/RDP	CL	CL
1	09/03/2016	DM/RDP	CL	CL

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Report issued from

MANCHESTER No. 1 St Ann Street, Manchester. M2 7LR Tel: 01613 020 950



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## SECTION 1 INTRODUCTION

The purpose of this report is to describe the building services strategies proposed for the Greenbank Synagogue, in Liverpool.

Once complete, the building will comprise 22 apartments, public access areas and a café. Due to the building's change in use, a multitude of servicing strategies will be required to make the building habitable.

The strategies described in this report have been developed with consideration to the building's grade II\* listed status, and, therefore, minimise disruption to the existing building where possible.

## SECTION 2 INCOMING SERVICES

### Water

A utility application will need to be completed for an upgraded water connection, as it is unlikely that the existing supply would be sufficient to meet the building's future intended use. In order to complete this application a detailed load assessment will need to be completed, and a new boundary meter installed. The new boundary meter is to also accommodate the new residential building within the site boundary, which is to comprise of 36No. apartments. If the new building is to have its own boundary line, then a second boundary meter would be required. All meters installed are to be of pulsed output type. Once available, the new mains water supply will enter a dedicated plant room on the ground floor, which is where the building's primary water meter will be installed.

### Gas

The Synagogue will have no gas requirements. All heating and domestic hot water requirements will be electrically supplied. However, gas may be required to serve the new residential building if heated from a central plant room. Therefore, a new gas connection to the site should be considered. This will require a new statutory main to be provided to the site, and a pulsed output meter to be installed within an externally located gas kiosk.

### Electricity

A preliminary load assessment for the services outlined in this report indicates that the existing sub-station north of the site boundary is inadequate. This has been confirmed by Scottish Power. Therefore, a new sub-station will be required to serve the synagogue and the new residential building. Careful consideration will need to be given when sizing the transformer, as it may dictate the potential of any further developments within the site boundary.



### SECTION 3 M&E SERVICES STRATEGY

#### Domestic Cold Water

The new mains incoming water supply will terminate into a tank and booster set in the basement plantroom. It is proposed to install 2 No. water service risers towards the Eastern elevation, adjacent the stairwells. At each floor level the rising water services will terminate into a manifold, where each apartment will be separately supplied and metered.

#### Domestic Hot Water

To maximise the available floor area within each apartment, the domestic hot water supply will be provided by instantaneous water heaters. The kitchen will be served by an independent under-sink unit, whereas the bathroom will be supplied by a wall mounted unit located behind the IPS. All domestic hot water requirements will be blended to a desired temperature by the instantaneous water heaters. Therefore, no additional blending valves will be required. The routing of all domestic hot water pipework will be minimised where possible to ensure adequate response times and reduce dead legs.

#### Ventilation

To avoid interfering with the existing façade and glazing, it is proposed that ventilation will be supplied via a mechanical system. To provide this, dedicated supply and extract fans will be located on the flat roofs above the Easterly façade, as indicated on the drawings. The supply fan will be complete with summer bypass, heater battery and cooling coil, which will temper the air in summer and winter. The system will operate as a Variable Volume Constant Pressure system. This will allow each occupant/ apartment to boost supply and extract ventilation rates via volume control dampers (VCD's). Each apartment will be assigned dedicated VCD's to ensure independent operation. During normal occupied and un-occupied hours the system will operate at constant trickle ventilation rates.

#### Heating

Heating will be supplied by wall mounted electrical panel heaters located in each apartment and in the communal areas.

#### Smoke Ventilation Landlords Area

To maintain clear exit routes, the building will be split into two different system types, natural and mechanical. The natural smoke clearance system will protect the ground and first floor landlord areas, whereas the mechanical system will protect the basement only. The proposed natural system requires automatic opening vents (AOV's) to be installed on the top of each stairwell, and the existing arched windows to be replaced with bespoke ventilators. These ventilators are to be made of clear glass for the provision on natural light on a day-to-day basis. The



proposed mechanical system serving the basement will be provided via smoke extract fan. This fan will be located on the flat roof above the Western elevation where it will be connected to a 0.6 m<sup>2</sup> (minimum) smoke extract shaft. The smoke extract shaft will be routed to basement level for smoke extraction. The final strategy will be subject to a fire engineer consultation and building control approval.

#### Dry Riser

A dry riser inlet position and landing valves are to be incorporated into the layouts, if required by building control.

#### Fire Hydrants

The requirement for external hydrants needs to be defined and locations determined, if required.

#### Lighting

Recessed LED light fittings will be used throughout the development. The communal areas will have PIR sensors to reduce energy consumption.

#### Lightning Protection

There may be lightning protection already installed. This will have to be determined via a condition survey. Any lightning protection found to be present would likely need to be upgraded due to the building's change in use.

#### Vertical Transportation (Lifts)

Following a review of Document B, it has been established that no firefighting lift will be required for this building.

#### Electrical Metering

All electrical metering for the apartments will be centrally located at basement level within a dedicated meter room.

#### Life Safety Systems

The building's smoke extract fan will be protected by a UPS power system. The UPS will comprise a primary UPS stack and 2 No. battery racks, which will be located on the first floor behind the lift.

If the requirements of the UPS system go above 80 A, the back-up generation method will need to be redefined. In this instance, it is likely that an external diesel generator will be required.







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