Powertechnix

Environmental Statement

REPLACEMENT GENERATOR
AT THE ZENITH BUILDING
MANCHESTER

1 Document Revision History

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Document Team		
Name	**Job Title**	**Role**
David Lane	Data Centre Infrastructure Architect	Author

Distribution List		
Name	**Role**	**Company/Department**
David Lane	Data Centre Infrastructure Architect	Powertechnix
Trevor Latala	Engineering Manager	bet365
Yuksel Adkins	Head of Property Development	bet365
Glenn Ombler	Architect	OI Architects

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3 Introduction

The applicant wishes to upgrade the power capacity of the existing standby generator which supports the critical services in the Zenith Building.

This will require the procurement and installation of a new 728kVA Diesel Engine Generator set which will be installed in the basement loading area of the building and will be connected into the existing electrical infrastructure of the building together with a new power supply from the DNO (Electricity Northwest Ltd, ENWL) of 920kVA.

The proposed generator is fuel and emissions optimised to ensure that it is both as efficient, and as environmentally friendly as possible.

The generator will be housed within a new purpose-built fire-resistant generator room which will also house a new 24-hour double skinned fuel tank of 2500 Litres.

Associated with this is the installation of a new insulated Generator exhaust (flue) which will route through the basement loading area, through two levels of Zenith House and discharge vertically above the lower roof level above the height of the adjacent wall.

Acoustic Noise from the Standby Generator will be reduced to 75dBA at 1M / 68dBA at 5M by attenuators and exhaust silencers.

The generator room will be fitted with appropriate fire detection and alarm systems, lighting and emergency lighting and electrical protection and control systems in accordance with current regulations and best practices.

4 Generator System

4.1 Proposed Operation

The proposed generator will provide Standby Power in the event of a mains power outage to the Zenith Building, off Spring Gardens, Manchester.

This generator is not intended to run continuously. The anticipated annual operation will be approx. 30 hours which will be mostly monthly or bi-monthly test runs of 2 hours.

4.2 Replacement Power Unit

The proposed replacement generator will be a diesel powered MTU engine power unit of 728kVA which is enough to supply the existing critical loads in Zenith House.

This replaces the smaller set currently installed in the basement plant area which is too small.

5 Environmental

5.1 Exhaust Emissions

The new generator will be highly efficient and will be fitted with the latest, upgraded 'Low Emission Technology' to reduce exhaust emissions.

This is based on the NEA Singapore for ORDE standard one of the most stringent in the world and more stringent than the UK requirements for Standby Generators.

An Emissions statement EDS 1600 0133 from MTU Friedrichshafen GmBH, the manufacturer of the generator, is attached for your information.

5.2 Ventilation and Combustion Air

This is a Standby Generator set. As such it is not normally running. Noise will only be produced during a power failure or during a Generator test run.

Cooling and combustion air will be drawn over the Generator from the general air mass within the Basement which is open to atmosphere via the main access ramp roller door which is has approx. 80% free air transfer.

Air will be discharged via the existing ventilation discharge louvres in the lower section of the wall on Marriott's Court. This does not contain exhaust gasses.

The inlet and outlet air will be attenuated to reduce noise to a level of 75dBA at 1M / 68dBA at 5M.

5.3 Exhaust System

The new generator will require a new exhaust system which will run from the new generator room in the basement loading area to the lower roof level which is 2 floors above the basement level.

The exhaust tip will extend 2M above the parapet of the adjacent wall in accordance with the clean air act.

This will protect any persons on the roof of that building being subjected to emissions being expelled flues when the gen-sets fire.

The exit velocity of the flue gases will be approx. 25m/s.

Exhaust silencers will be fitted to the Generator to reduce exhaust noise. The exhaust is approx. 50M in length and is being designed by a specialist to achieve the performance demands of the MTU engine and to expel the exhaust gasses without nuisance.

The noise at the exhaust tip is designed to achieve a noise level of 75dBA at 1M / 69dBA at 5M.

The exhaust will be formed from a standard twin wall flue / exhaust system of approx. 400mm in external diameter. This will keep the external skin cool and reduce noise. The twin wall flue system will extend from the generator to the tip of the exhaust where it will terminate in a rain / weather flap.

The tip of the exhaust where it is outside the building on the lower roof level will be powder coated to complement the existing slate blue brick wall.

The proposed colour is RAL 7037 ‘Zinc’.

The outer end of the exhaust will be sited to prevent touch.

5.4 Vibration

The generator room will provide noise insulation and will be supplemented by acoustic treatments to the walls of the proposed room. Vibration will be reduced using vibration damping mounts on the base frame of the generator.

6 Fuel System

The generator is diesel powered and will be provided with a single diesel fuel tank which will provide constant running in the event of power failure.

6.1 Fuel Tank

The diesel fuel will be drawn from a 2500 Litre double skinned fuel tank located within the new Generator Room.

The new fuel tank will be constructed of heavy gauge steel and will be double skinned (bunded) to afford environmental protection from leaks and spillage. The bund volume will be at least 110% of the tank capacity.

The bund area of the tank will be fitted with a Liquid Leak Detection device which will annunciate to the building manager should any liquid be present within the bund.

6.2 Fuel Filling Pipework

The new fuel tank will be connected to an industry standard Hytek remote diesel fuel fill point located to the left of the main vehicle entrance off Brown Street.

The link pipe will be a Brugg ‘Pipe in Pipe’ Double Walled system with a liquid leak detection cable within the outer space.

7 Safety

7.1 Fire Resistance and Construction

The proposed generator room will be constructed to provide 2-hour resistance to fire.

7.2 Fire Alarm

The generator room will be provided with fire detection and alarm systems linked to the building fire alarm. The room will be provided with heat and smoke detectors and fire annunciation will be by Audible and Visual Alarm units.

7.3 Access Control Interface

Access Control systems will release the doors from the generator room in the event of a fire being detected.

7.4 Emergency Lighting

3-hour emergency lighting units will be installed in the generator room and outside to illuminate the exit routes.

7.5 Emergency Generator Shutdown

The Generator will be linked to the fire alarm and will be designed to shut down in the event of a fire being detected whilst it is running. This will be supplemented by a fireman's shutdown switch in the Entrance Foyer to Zenith Building which can also be used to stop the generator in the event of an emergency.

7.6 Emergency Fuel Shut Off

A gravity operated fuel shut off valve will be installed at the output from the fuel tank which will be activated by a fusible link over the diesel engine set to break and shut off the diesel supply should a fire occur in the new generator room.

8 Access Statement

Following installation, it is anticipated that the standby generator will be serviced and refilled once per annum by specialist service and diesel fuel supply companies.

8.1 Installation Works

Access for the installation of the new generator will be via the main access ramp into the Zenith Building off Brown Street.

It is not anticipated that a road closure will be required but this will be considered during project planning.

Deliveries are scheduled to take place outside of normal working hours.

8.2 Service and Maintenance

Access to the generator for service and maintenance will be from within the proposed generator room via a double and a single personnel door. This is expected to occur annually.

External access will be provided by prior arrangement with the Building Manager and will generally be via the basement loading area and an allocated parking bay for a small van or car.

8.3 Diesel Fuel Filling

Filling of the tank will be from the basement loading area entrance off Brown Street, Manchester.

An industry standard ‘Hytek remote diesel fill point’ will be installed to the left-hand side of the basement loading area roller shutter door off Brown Street which will allow the diesel fuel tanker to connect to the fuel tank.

This fuel filling point provides the fuelling tanker operator with a an easily accessible fuel fill point with a fuel gauge and drip tray without the tanker having to enter the Zenith Building.

It is anticipated that the fuel tank will be refilled once per annum.

9 Appendix A Emissions Data

MTU Emissions Data Sheet EDS 1600 0133 Attached.



Prepared by

David Lane
Data Centre Infrastructure Architect

david.lane@powertechnix.co.uk

T: 01270 820324
M: 07792 573625