

Generator Installation

Case Study

Royal Marsden NHS Foundation Trust

Chelsea

London



Royal Marsden NHS Foundation Trust

As one of the UK's leading centres in research and the treatment of cancer, The Royal Marsden NHS Foundation Trust continues to expand the range and nature of its specialist services. On going refurbishment and development of the site over recent years has resulted in a significant growth in energy consumption; this growth precipitated the requirement for additional standby power. Power Electrics has recently completed the installation of 2 x FG Wilson prime rated 1500kVA diesel generators into the Trusts of Chelsea site in West London.

When the hospital was constructed in the early 1860's it was in a "green field part of London: today the area in and around the hospital site is largely residential presenting many issues to both the Trust and the local building control team.

The standby generator up grade covered the hospital's Wallace and Chelsea Wings. Working closely with the Trust, the Trust's consultant, the Trust's project management team and the planning and building control authorities, Power Electrics was able to successfully deliver both complex generator installation projects on time and within budget.

Both generating sets were extensively tested at Power Electrics extensive Bristol facilities and at site prior to be putting into full time service.

Wallace Wing

With space at a premium on this congested West London site the only available space for a new and larger generator for the wing of the hospital was the roof. This older part of the hospital presented many constraints some of which included:-

- Weight bearing capacity of the roof area
- Limited foot print available on the roof
- Noise (limited to 65 dBA @ 1 m)

- Maximum lift capacity of the crane due to vaulted road way
- Listed building status of the building



With both patients and an adjacent residential area building control determined that the maximum noise level of the generator should not exceed 65 dBA @ 1 m. It was deemed that the new roof level installation should not be visible from road level limiting the height of any enclosure. With a limited space available for the main enclosure limiting space for attenuation options and a maximum weight limit for this area of 32,000 kg's it was decided to opt for a remote cooled solution. The remote cooling solution reducing by up to 50% the amount of air required to flow across the generating set. With Victorian vaults below the road and pathway a limit a crane to a maximum lift of six tons the generator package was designed from the outset to be one suitable for lifting in sections and assembly on site.

Space limitations on the roof determined that the remote radiator could only be located in relatively close proximity to the enclosure air inlet necessitating the installation of carefully constructed screen to ensure minimal mixing of air.



There was also limited space for the bulk fuel store which was constructed from five separate bunded tanks located in five vaults underneath the pavement and road. The fuel system was completed with the installation of a road level fuel fill point cabinet, fill and dump line installed within a Victoria down pipe, roof mounted day tank and dump tank again within the basement vaults.

Chelsea Wing

The only location available for the installation of a new generator for Chelsea wing was in an area adjacent to an operating theatre, and underneath three arches of one of the site's original buildings. The very limited space available for this installation required close collaboration with all of the parties involved to ensure that the installation was capable of working under all foreseeable conditions. One key parameter of the design brief was that the generator enclosure which was rated at a 60 dBA @ 1m noise level should provide sufficient air to enable the generator to run at full load even with an ambient temperature of 40 degrees.

Due to the proximity of the generator to one of the hospital's operating theatre suites the exhaust flue was constructed to run some 35m up and across the Chelsea Wing reducing to a minimum the possibility of exhaust gas ingress into the operating theatre areas.



The narrow path access into the work area required the engine and alternator to be removed from the bed frame; the bed frame was split to facilitate entry into the site area, the reassembled once into its final location. Due to the restricted space available at the working area the custom designed generator enclosure was manufactured to be assembled on site; many of the closing sections were fabricated at site.



The limited space available on the site meant that the dual 13000ltr bunded bulk fuel tanks were located some 60m from the generator. Dual redundant fuel pumps send fuel to the generator day tank via a double skin fuel pipe system carefully installed and protected to avoid any possibility of damage through what is a very busy area of the hospital.

The generating set was fully load tested at site in line with htm 06 and additional Trust requirements using Power Electrics inductive load bank.