



**Electrical, Telecoms  
& Security Design  
Consultancy**

## CASE STUDY - HEALTH

**Project:** HV / LV infrastructure Replacement  
Phase 1 & 2 Case Study RAH

**Client:** NHS

**Date:** July 2020 - Jan 2022

**Value:** £3m



### Project Overview:

The existing HV infrastructure was past its useful life and had operational restrictions within its switching capacity. The existing ring Main units on the HV network could not be switched live, meaning the HV Network would need to be fully isolated to allow faulty sections to be switched. This action would result in the loss of critical supplies across the estate as not all loads were covered by LV back up generation.

The LV infrastructure at Maternity and Industrial areas had many single points of failure. The LV infrastructure was at capacity and past its useful life.

The above issues meant that both the HV and LV systems could not be properly maintained and carried the risk of power outages affecting potential critical procedures.

The purpose of the Upgrade Project was to address these issues and replace the existing HV infrastructure at the South, Maternity, and Industrial Substations. The project would then replace the LV infrastructure at Maternity and Industrial Substations.

It was recognised early that the project would be extremely challenging in a critical environment with the replacement of all systems being carried out with managed interruption of the supplies

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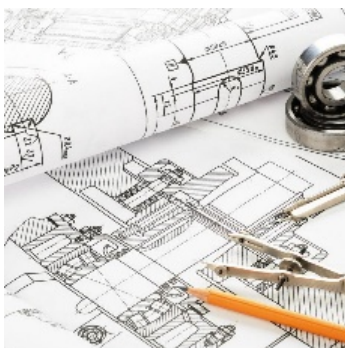
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### Project Design Scope:

ESD prepared feasibility reports and tender documents on behalf of the NHS GGC. The tender documents included the following:

- Specification HV Switchgear
- Specification LV Switchgear
- Specification Transformers
- Specification ATS
- Tripping Battery and Chargers
- Remote Switching panels
- Cabling and containment
- HV / LV protection study
- Detailed Changeover plans for all loads
- Future proof for SCADA controls

Consultation was required with all NHS stakeholders and estates teams on what would be possible in terms of shutdowns / interruptions to supplies and timescales.

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### **Project Design Scope:**

ESD supported NHS from project conception to project delivery including management of all site works, equipment approvals, drawing approvals, site commissioning and site handback.

Approval of all design drawings required for the project this included:

- Layout drawings of each substation. HV Switchgear, LV Switchgear, Transformer, Tripping batters, ASCO switches Containment layouts and fire stopping

Approval of the following contract documents:

- Health and safety plan
- HV / LV protection study
- RAMS for all site works.
- Approval of testing procedures with NHS AE and NHS HV AP's
- Attendance at FAT Testing of all equipment, issue of snagging lists and comments on design panels offered.
- Testing all earthing systems at each substation ahead of the changeover processes.

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