

BIOTECH CORRIDOR AND B31 VENTILATION/REFURBISHMENT PROJECT SPECIFICATION

Introduction

The Medicines and Healthcare products Regulatory Agency is an Executive Agency of the Department of Health established on 1 April 2003. We have around 1,270 staff, with a total budget of approximately £150 million. We protect and improve the health of millions of people every day through the effective regulation of medicines and medical devices, underpinned by science and research.

Scope

National Institute for Biological Standards and Control (NIBSC)

The institute is a world leader in assuring the quality of biological medicines through product testing, developing standards and reference materials, and carrying out applied research. The Biotech building has two containment level 3 laboratories that supports research to achieve the objectives set out in NIBSC's Science Strategy and Agency's Corporate Strategy 2018 – 2023. The two containment laboratories are stand-alone containment level 3 laboratory, B20 and B31. B31 plays an important role as part of the site wide CL3 facilities and it is located at the far end of the Biotech building, on the north side. It is a single laboratory with a lobby, off the main corridor (B49). This project is set out to replace the aged air handling unit supporting the B31 CL3 laboratory and take the opportunity to bring B31 up to be compliant and meet containment level 3 ACDP standards. Also to introduce a new air handling system (AHU and Extract fans) to serve the Biotech building corridor (B49). The control of the pressure cascade within the building is carried out using the TREND BMS system. This project is part of the infrastructure –site updating portfolio approved, by SMT as part of the 21/22 capital program to address priority issues at the South Mimms site.

Specification

This project is ideally suitable for a contractor who understands the nitty gritty of utilising TREND BMS system to monitor and control various pressure cascade within a facility and particularly working with containment laboratories (CL3 & CL4) to ACDP standard and regulations. Access to the building will be via the road and pathways, or through a designated corridor and up the integral stairs to the laboratory and corridor, up to the next level provides access to the plant room which is only accessible to approved personnel using the access card to be provided. Within the Biotech building are containment level 3 laboratories which have a controlled negative pressure. Although the entire building pressure swings depending on the main corridor door being open and closed due to staff

entering or leaving the building. It is imperative that the CL3 labs do not go out of the regulated pressure regimes due to the risk of Biological hazards being released. The new air handling unit for B31 will operate on a run/standby protocol for both supply and extract fans (B31 extract fans currently run duty/duty). A single air handling unit must have the capacity to support the containment laboratory at any point in time in case of system failure. Similar protocol will apply to the biotech corridor in case of a system failure.

The ducted MSC's in B31 will need new ducting and fans to the stack and appropriate controls to compensate for either one or both MSC being used at any time. Supply air will be filtered by use of a G4 panel filter and an F8 bag filter and will be standard sizes used in NIBSC to be sourced from JASUN filters who currently supplies the filters to the site.

Other works included within the B31 project include:

- Replacement of two doors (from Corridor (B49) to B31 lobby; from B31 lobby into Lab)
- Replacement of windows within B31
- Resealing of B31 CL3 lab (Roxtec boxes, Autoclave SPF barrier which needs to be replaced and resealed etc)
- Vinyl flooring and ceiling to be replaced within B31 laboratory. All cracked joints on the vinyl to be resealed or replaced

The new Biotech corridor air handling unit should have supply and extract to all three sections of the corridor. This will allow the pressure control to be maintained if the corridor doors are either closed or opened. The new air handling unit will incorporate a DX unit to maintain temperature within the corridor (cooling during summer months and heating during winter). The biotech building has a number of scientific freezers located along the corridor and these generate a lot of heat. The corridor should be referenced to the same ambient position as the rest of the air handling units in the suite. (The only pressure references for laboratories in place at this time are to various points in the corridor (B49) and these are for B20, B29 and B31. There is also corridor to atmosphere and plant room to atmosphere sensing). This would allow the BMS to be programmed to maintain set pressures to all the rooms without the corridor affecting the balance. Currently the pressure in the suite changes when the doors are opened at the far end of the corridor (Pressures in individual rooms can also be affected by the operation of ducted MSC's in those rooms). The area at the end of the corridor would also need to be considered, what pressure is it at and how can it be matched to the main Biotech corridor to eliminate the impact when the doors are opened. This will impact how the other air handling units operate/react to changes in the building. The contractor should allow for associated works to other

air handling units in the form of adjusting the pressure or relocating pressure sensors within the ducts in their proposals.

The new Biotech corridor air handling unit will also be used to maintain temperature control and be filtered to meet the same standards, keeping the area clean. With the current energy requirements heat reclaim must be considered as the air handling unit is to be full fresh air. The existing louvres can be used for connecting to the new air handling unit fresh air inlet and extract duct connections, please review and consider the location for the extract, this should be on the opposite side to the fresh air intake. The original building is designed fresh air on one side and extract on the other side. This may not be the case currently but will prefer the new installation to follow this pattern. The ductwork must include the installation of new dampers – for balancing because existing dampers are in poor condition, at high risk of failure and are manually operated. The contractor shall consider the following dampers; for control – consider CV, VAV, Phoenix; fumigation (something that is serviceable, is preferable) and fire dampers (current ones are in floor slab and present risk to safety, containment and business criticality). Existing fire dampers have been tested and no issues reported. Any new fire dampers required must be fitted to the current standard.

Trend Controls

Trend controls and parts to be replaced, includes frost stat, frost, heating and cooling coil control valves and actuators (all cooling in biotech is DX as there is no CHW pipe work to the plant room); differential pressure switches; all temperature and pressure sensors (including room sensors); pressure alarm indicators, local alarm panels, digital pressure gauges, own dedicated control panel. The new panel should include a class one energy meter connected to the BMS for reporting. (This will involve splitting controls from 3 panels that control B20, B31 and fumigation). The Trend controllers will be IQ4 series controllers (ethernet connected). The contractor should allow for the provision of Cat7 ethernet cabling to the current spec of NIBSC IT dept. The contractor must be confident with working within an operational research facility with minimum disruption to operations during the execution stage of the project including pressure balancing. The new air handling units for the B31 and B20 containment laboratories will not shut down in the event of fire alarm to prevent the risk of biological hazards being released into the atmosphere.

The list of the mandatory requirements are shown below, kindly note that this list is not exhaustive and additional requirements that will improve the delivery of this project can be added but nothing can be SUBTRACTED from these requirements.

Mandatory

- Benchmarking - The air pressures and (airflows to/from individual grilles) around this area will fluctuate during normal working hours, so it is advised that any benchmarking is carried out, outside of normal working hours to monitor/test under steady state conditions. These figures could also be influenced by changing weather conditions and the operation of ducted MSC's within individual labs. The air flows and pressures must be validated before work commences within the building. The contractor should allow for this service within their tender return as non-compliance automatically disqualifies the contractor.
- All air handling unit fan motors to be used in all the new air handling units plant are to be high efficiency with inverter controls. Direct drive fan motors are our preferred. Any other energy saving measures must be included with pay back periods and justification. The new air handling unit must be manufactured off site, stripped down so that it can be taken into the plant room because of access restriction to the area.
- The cooling and heating coils need to be sized to suit the correct number of air changes to the room, corridor and any heat loss or heat gain.
- The new supply ductwork is to be galvanised and insulated material in the plant room up to the gas tight fumigation dampers, from the gas tight dampers the ductwork is to be PVC material and pressure tested, this side of the system will always be fumigated. All extract ductwork is to be PVC materials with the extract fans located as close as possible to the chimney as possible so that the duct is mainly under a suction pressure. All gas tight dampers are to be controlled via a fumigation panel; Phoenix gas tight dampers are our preferred manufacturer, but a similar product may be considered if it has been proven to have similar reliability within the industry. If Phoenix dampers are used they can also be the CV/VAV control dampers mentioned above. Provision must be made for the networking of the dampers to the Phoenix MOD bus/BACnet unit which will interface with the BMS
- The contractor shall ensure the containment laboratory is adequately sealed during the works and comply with the Institutes sealability process which will be made available to all contractors who attends the site visit.

- Extract terminal HEPA filters grade H14 (BSEN 1822) should be of a standard size used in NIBSC (usually 610x610x appropriate depth for air flow) and with a seal to match the terminal box (gel seal is preferred)
- The new DX unit must comply with the following: VSD controlled compressor(s) preferred.
- AHU DX coil to have electronic expansion valves.
- EC fans on condensing units, with head pressure controls.
- Energy meter also to take back to the BMS.
- Ensure that coefficient of performance (COP) or Seasonal Energy Performance Ratio (SEPR) are provided.
- The Fluorinated Greenhouse Gases (Amendment) Regulations 2018, 2019 and 2021.
- The preferred building management system is TREND BMS. This is because all the current infrastructure within the Institute are fitted with TREND system and replacing them with another BMS will be an expensive expenditure.

Additional Requirements

In addition to the requirements stated above, kindly take note of the details about the following activities that are integral to the project.

- The proposed route of delivery into Biotech plantroom identified after the site visit must be clearly detailed within your proposal in the tender return.
- Kindly note that all new ducts that passes into the Biotech corridor from the Biotech plantroom must have fire dampers fitted because the plant room and the building area are classed with different fire zones. Any holes drilled through the slab between the plantroom and room must have a fireproof sealant sealing the hole where duct or cable pass through.
- All redundant services are to be removed and the area left clean after the completion of the project. All plant and its subsidiary components must be easily accessible for routine servicing and maintenance. The new Installation should allow for a clear access route to and for maintaining the new plant. All spares must be easily obtainable with minimal lead times.
- It is thought that the pressures and air flows across the building are excessive and balancing the building correctly as well as reducing leakage paths and improving the control strategy across the CL2 areas can significantly reduce running costs. Contractors should propose options to address this in their tender returns.

O & M Manual

Electronic O and M manuals will be provided at the end of the works, showing as installed drawings, routine service parts and the frequency of maintenance. Electrical certificates along with information etc. on manufacturer's literature must also be included. Control panel drawings will include SET drawings for the Trend controllers.

Method of Installation

- The contractor must document the method statement that will be utilised for the execution of the project bearing in mind that the Biotech will not be vacated during the project works and minimal out of hours work will be encouraged.
- There will be a site visit organised for all the prospecting contractors for these works during the tendering period. The lead time for the design and manufacturing of the new air handling units must be included within the contractors tender return.
- The proposed site visit is scheduled for the 19th of August 2021. This is provisionally dependent on the Covid 19 rules governing the country at the point in time.