Proposed Mechanical and Electrical Schedule of Works

Sainsburys Camden

17-21 Camden Road, London, NW1 9LJ.

Summary

Halsall Mechanical & Electrical were asked by Sainsburys Supermarkets Design Team to survey the car park ventilation system at Sainsburys Supermarket Camden.

The superstore is located in a Listed Building and consists of a sales area and Colleague facilities with an underground car park linked to the store via travellators and a stair core.

The initial survey of the ventilation system identified a dilapidated non functional smoke control system which incorporated a central extract facility and throughflow louvers and grade mounted turrets.

Our revised proposal puts the control system back in to operation to comply with Part B & Part F of building regulations and creates space at grade level through the omission of the turrets (subject to final design).

Halsall Mechanical & Electrical also took to opportunity to review the remainder of the car park area and its lighting installation, which requires bringing up to specification (LED) with effective lighting control.

Car Park Description

The car park is on a single level with a single entry/exit ramp with a single extract point and plantroom. Fresh air intake will be drawn into the car park via the entrance and via existing openings at the opposite end of the car park to the entrance ramp as shown on the drawing.

Basis of System Design

A fully mechanical ventilation system compliant with Approved Documents B & F of the current Building Regulations and designed in accordance with British Standard BS7346: Part 7: 2013 is to be installed. The system is to be designed to provide smoke dispersal in accordance with BS7346: Part 7: 2013 Clause 9 in the event of fire.

The following documents have been used in the preparation of the system design:

Drawings: -

WSP Drawing Number GUH_SK_MEP_003_Existing Services
Sainsbury's Drawing Number 17027 ASK033 Existing Basement

Car Park Statistics

Total Net Floor Area : 6,719m2
Slab to Soffit Height : 2.732m to 3.830m
Total Net Volume : 22,174m3

Airflow Rates

The airflow rate is to be in accordance with current building regulations in force in England & Wales, i.e., Building Regulations, Approved Documents B & F.
CO Control : Design flow for low level CO : 18.48m3/s
Design flow for high level CO : 36.96m3/s
Fire Condition : Design flow for Smoke : 61.59m3/s
Registered Office: WITT House, Shelf Mills, Wade House Road, Shelf, Halifax HX3 7BJ ENGLAND
Company Registration Number: 400 66 40

System Operation

Fresh air will be drawn into the car park as described above. Contaminated air will be extracted via single plantroom with three main extract fans mounted in parallel.

CO monitoring will be adopted to reduce energy consumption and to reduce the running costs for day to day ventilation by varying the rate of ventilation according to the level of traffic movement.

Daily Ventilation

Under “normal” ventilation conditions, air will be drawn through all parts of the car park at a rate equivalent to approximately 3 air changes per hour and selected impulse fans will operate at low speed.

CO pollution levels will be continually monitored. On detection of CO levels rising beyond 20ppm, all impulse fans will operate at low speed to mix and dilute the CO gases for extract via the main fans. Should the CO level continue to rise to 30ppm, the air change rate will increase to 6 per hour.

The main extract fans will vary in speed according the exhaust pollution levels within the car park, thereby providing the 3 to 6 air changes per hour.

Fire Condition

A fire signal will be received via a third-party smoke detection system supplied and fitted by others, with a fire signal/interface wired back to the PSB main control panel (by others).

On detection of fire, the main fans and the impulse fans, will operate at full speed, increasing the airflow to at least 10 air changes per hour creating effective dispersal of the smoke.

Control System

Control of the ventilation system will be via a master control panel located within a compartment separated from the main body of the car park. The control panel will incorporate all necessary starters, overloads and control functions necessary to ensure that the ventilation system responds appropriately to the conditions within the car park.

Control of the system will be achieved using a programmable logic control system on to which the detailed cause and effect for the ventilation system will be mapped. All functions in relation to daily ventilation and fire modes will be controlled from this panel.

The main panel will contain the following: -

 HMI & Idec PLC
 single socket service outlet protected by a 10A MCB
 Fire override (Run to destruct) where inverters are used.
 Any system fault will be visually indicated on the Panel and by a 22mm sounder/beacon, which will also indicate any service requirement.

Equipment Overview

A fireman's override switch will be installed to enable the attending fire service personnel to switch the system off if required. The fireman's switch will be wired back to the main control panel.

Cause & Effect Table

The following table provides a summary of the system function under various environmental and fire conditions within the car park.

Condition	System Function	Airflow Rate Air Changes Per Hour
CO < 20ppm	Main extract fans at low speed plus selected impulse fans at low speed	3
CO > 20ppm	Main extract fans at low speed plus additional impulse fans at low speed	3
CO > 30ppm	Main extract fans at mid speed plus impulse fans at low speed	6
Fire	Main extract fans at full speed plus impulse fans at full speed.	10

Equipment Rating

All main extract fans are rated to withstand a temperature of 3000C for a period of at least 60 minutes and the impulse fan 3000C for 120 minutes. All fans are tested in accordance with BS EN 12101-3 to verify compliance with the time/temperature criteria stated.

All attenuation and extract ductwork used within the system will be rated at least to the same time/temperature criteria as the extract fans and materials used in the construction and fitting of the equipment will have a melting point not less than 8000C

The main fans have been selected on a nominal pressure drop.

Electrical Supply

Power supplies are required meeting the requirements of current national and local Building Regulations, terminating within the PSB main control panel. (By HEL)

Specification

Fans

3no Main Extract Fans including extract grille
13no Ø400 Impulse Fans
1no Ø315 Impulse Fan
Attenuation to Main Extract Fans

We have included the following attenuation to the main extract fans:-

Intake: NR55 @ 3m when fans operating at mid speed (6 air changes per hour)
Discharge: 55dBA @ 3m when fans operating at mid speed (6 air changes per hour)

Main Control Panel

1no Form 1 main control panel with PLC logic and Fireman's switch, including auto changeover panel and all the required controls for the system

Approx Panel Size will be 2800W x 1900H x 400D

We will require a 200amp primary and secondary supply to our panel

CO monitoring system

17no Detectors, including all necessary fixing materials

Installation

1no Installation of all the above equipment

Carriage

1no Delivery of equipment to site within normal working hours

Commissioning

1no Commissioning will be undertaken in accordance with BS7346: Part 7: 2013 Clause 17 and will include:-

 Commissioning fan system
 Commissioning electrical panels
 Commissioning of the CO detection system
 Commissioning complete system

Commissioning has been allowed for based on being carried out in line with the normal working day as detailed under the terms and conditions of tender.

Detailed System Design

The ventilation system engineering design work will consist of the following

 Technical submission
 Impulse fan layout
 Main fan installation & builders work detail
 Cause & Effect chart
 CO sensor layout
 Control schematic & cabling selection

Completion of this work will qualify for payment of the 20% design fee as detailed under the terms and conditions of tender.

Approvals

Approvals test employing cold smoke generation to demonstrate the performance of the system witnessed by the appropriate regulatory authorities, specifiers and client representatives and completed to their satisfaction.

Cable Specification

Power cable to main fans Prysmian FP600 or equivalent
Power cable to impulse fans Prysmian FP400 or equivalent
Signal cable to CO detectors PVC Screened
We have included 3m Branch containment for our equipment only.

Other works

Electrical works associated with above project, containment & dual power supplies

Builderswork associated with the above proposal as drawings

Upgrade proposal to car park lighting

Attendances to sprinkler system

Decorations / making good

Please ensure that this scope of works is read in conjunction with our cost plan including contingency recommendations due to the time lapse. Our drawings produced detail builderswork, lighting proposals and contain.