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Attn: Mr S. Ferlin.

16th April 2015

Updated Report on the proposal of the Installation of Services
For the Sterling Manufacturing Facility in Hal Far

Further to our report of the 6th March 2010 and the updated plans as received from the Architect in charge, please find the following updated fire safety report pertaining to the general MEP Building Services for your perusal.

Although the report does not cater for the process equipment that has / shall be installed, due notice has been taken of special requirements for the building services such as the introduction of intrinsically safe fire detection systems and explosion proof light fittings and power outlets in the areas so indicated by the client's Process Engineers.

This report covers the building in its shell form, and whilst the process itself including all raw materials and finished products as well as all process plant do not form part of this report, these are to be monitored and regulated in an on-going manner by the clients health and safety Engineer using the SOP's for this type of manufacturing facility.

1.0 Ventilation

1.1 Car Park Level

With reference to the ventilation requirements for the above captioned project and drawing 15.011.STL.-1.VNT.01 plan view of basement level -1, please find our considerations as follows:

1.1.1 Ventilation Openings Location

The car park at this level is furnished with:

1. Extractor fans type EF 01 and EF 02 drawing air from the garage driveway and discharging it to the outside of the building via galvanised ductwork.
2. Ramp R which shall allow the infiltration of fresh air from the outside of the building into the driveway.

1.1.2 Principles of Operation

From the above considerations it may be observed that fresh air shall enter the garage driveway via the ramp, and be extracted by the extractor fans EF 01 and EF 02 discharging it to the outside of the building. From the drawings it can also be observed that the fresh air entrance locations and extraction points are at opposite ends of the driveway generating a cross ventilation process. It should be noted that in this way the garage driveway shall be liberated from any noxious products of combustion.

The extractor fans are rated such that it shall furnish the driveway with a minimum of 10 air changes per hour which are required for smoke venting purposes

1.1.3 Conformity to International Requirements

From the above it may be concluded that the driveway is furnished with a forced ventilation system which is suitable to cater for both the normal 6 air changes per hour as well as for the 10 air changes required for smoke venting in the event of a fire in accordance with international recommendations.

1.1.4 Conclusion

From the above it may be concluded that the garage driveway is furnished with a forced ventilation system which is suitable to cater for both the normal 6 air changes per hour as well as for the 10 air changes required in the driveway for smoke venting in the event of a fire.

1.2 Offices

With reference to drawings 15.011.STL.0.VNT.01, 15.011.STL.1.VNT.01 and 15.011.STL.2.VNT.01 , it may be observed that the office areas shall be furnished with a forced fresh air system whilst the bathrooms shall be fitted with extractor fans

1.2.1 Fresh air installation

Fresh air shall be drawn from the outside of the building, passed through a filter and ducted into the offices via grills as may be seen in the drawing. The grills shall be furnished with a volume control damper that shall be set during the commissioning stages of the works. The filters shall be furnished with a visual and audible alarm that shall sound when this fouled. The ventilation system shall be designed on a minimum flow rate of 8l/s/person as per international recommendations

1.2.2 Extraction

The forced extraction shall occur from the bathrooms. An extraction grill is located above each WC through which air shall be drawn by means of the negative pressure generated by an extractor fan. The grills in the bathrooms are also furnished with dampers such that these can be set during the commissioning stages of the project. A supplementary extraction system shall also be installed in the Lab area as may be seen from the drawings

2.0 Fire fighting installation

The fire fighting installation shall be comprised mainly of a sprinkler system as indicated in the drawings 15.011.STL.-1.SPS.01, 15.011.STL.0.SPS.01 15.011.STL.1.SPS.01 and 15.011.STL.2.SPS.01. The system shall cover both car park and office levels and shall be designed and certified in accordance with international recommendations. Fire extinguishers shall also be installed in selected areas throughout the building.

In addition a fire fighting wet system has also been installed with cabinets located immediately outside the emergency escape routes as may be seen from drawings 15.011.STL.-1.FF.01, 15.011.STL.0.FF.01, 15.011.STL.1.FF.01 and 15.011.STL.2.FF.01. The location of the cabinets has been established in accordance with the requirements of the client who shall be using trolley mounted extinguishers in the shop floor due to the nature of the products being manufactured.

Both the sprinkler system and the wet riser system draw water from a dedicated water reserve located at the rear of the building. The fire pump sets are located adjacent to this reservoir and are of the flooded suction type.

2.1 Fire extinguishers.

The fire extinguishers shall be of various types including the dry powder type which are suitable for all types of fires including:

- Type A (Paper, wood, textile, fabric)
- Type B (Flammable liquids)

Type C (Flammable gases)
Electrical hazards
Vehicle protection.

AFFF type which are very effective on many classes of fires but is not recommended for use on electrical fires

CO2 type which are effective on electrical fires

Trolley mounted extinguishers shall be used in the shop floor areas

2.2 Fire blankets

The fire blankets are particularly suited for the extinguishing of fires in their early stages by smothering the flames.

2.3 Fire compartmentalisation

This shall be as indicated in the submittals of March 2010

2.4 Conclusion

From the above, it may be observed that the building shall be furnished with adequate fire fighting measures.

3.0 Fire detection installation.

The premises shall be furnished with a fire detection installation comprising of fire alarm panel, rate of rise heat detectors, smoke detectors, manual call points and fire alarm sounders as may be seen from drawings 15.011.STL.-1.FD.01, 15.011.STL.0.FD.01, 15.011.STL.1.FD.01 and 15.011.STL.2.FD.01. It should be noted that where volatile compounds may be present, all the installation shall be carried out using intrinsically safe equipment.

3.01 Fire alarm panel

The fire alarm panel shall be located near the entrances to premises and shall have clear zoning indications such that in the event of a fire, the location of the detector triggered can easily and accurately be located. In addition, besides being connected to the essential power supply, the panel shall have a battery backup with 72 hours autonomy such that the system would remain operative for three days despite a

power failure. The panel can be connected to the fire brigade by means of an auto dialler which shall be programmed to dial up selected numbers in the event of the fire alarm being triggered.

3.02 Rate of Rise Heat detectors.

The garage driveway and other locations where vapour could be present, shall be furnished with rate of rise heat detectors installed as indicated in the drawings. These shall have dual sensing facilities in that they are triggered both by a sudden rise in temperature as well as a fixed temperature mechanism set at 60°C. This combination makes them suitable to be installed where reliable performance and early warning capabilities are essential.

3.03 Break glass manual call points

These shall be located at strategic locations around the premises, essentially next to each exit such that in the event of someone noticing a fire in its conception stages prior to the heat detectors triggering, can sound the alarm by pressing the call point.

3.04 Fire alarm sounders

These shall be of the electronic sounder type rated at a minimum of 105dB at 1m. These shall be positioned as indicated in the drawing to ensure a minimum sounder level of 70dB at any location within the area.

3.05 Smoke detectors

Smoke detectors shall be used in most areas to detect a fire by the sensing of smoke. They shall be of the ionisation type or optical type as required in the particular area. The spacing of the detectors shall be according to British Standards and the sensitivity of the detectors.

3.06 Conclusion

From the above, it may be concluded that the premises shall be furnished with adequate fire detection measures.

4.0 Lighting Installation

The premises shall also be furnished with Emergency lighting which will illuminate in the event of a utility failure and will hence enable the safe entry / exit of vehicles and pedestrians.

The emergency lights shall fall into three main categories namely

- Non maintained emergency lights which shall operate in the event of a utility failure. These are the most common type
- Maintained emergency lights which shall remain illuminated at all times. These shall be installed primarily in the staircases.
- Illuminated exit signs. These shall of the maintained type and shall hence remain illuminated at all times. These shall be complete with a visual indication to clearly denote exit routes.

In certain areas photo luminescent exit signs shall also be installed as necessary in order identify the emergency escape routes

5.0 Noise emission of MEP installations

All MEP plant selected shall be of the low noise type and shall be located in designated areas such that if required, it can be adequately soundproofed

Ventilation fans shall in general be fitted with sound attenuators on both sides of the fan in order to reduce the noise emissions both inside as well as outside the building.

We trust that the above meet your requirements



Ing J. Bonett