1.0 Purpose

The purpose of this document is to provide a safe working assessment of the activities to be undertaken for the provision of the door fan integrity room test(s) at ----. The associated risks will also be assessed and controls implemented such that these activities can be carried out with minimal risk to personnel employed, members of the public and the general environment.

2.0 Application - This method statement applies the mandatory conditions of:-

Health & Safety at Work Act 1974

Safety Document

site conditions

3.0 **Introduction**

3.1 Structure

This method statement is a comprehensive step-by-step account of how the works will be completed. The method statement will identify,

Potential health, safety and environmental hazards and risks to which personnel employed on this contract, or members of the public could be exposed during the completion of the works.

Difficulties that may be encountered in carrying out the works.

Special plant or procedures needed.

How the work is to be expedited in order to remove or minimise hazards, risks and difficulties.

How site supervisors will ensure that the works are carried out as intended.

3.2 Approvals Process

Upon submission, staff will review the method statement. If the method statement meets the client's requirements, then the appropriate authority will formally accept it and sign the method statement front sheet.

4.0 Responsibilities

4.1 General

We are committed to achieving the highest standards of Health and Safety at all operational sites; this commitment being made in the Company Health and Safety Policy. It is the responsibility of all personnel working on this project to support the organisational objectives of reducing the level of accidents and supporting the safe completion of this project.

The Manager is responsible for:

Preparing the method statement for these works

Revising the method statement as necessary to cover changes in the scope or method of the works and ensuring that no work is started before receipt of the client's written acceptance of the method statement.

Making readily available copies of this method statement for use by the personnel engaged in these activities.

Preparation of a risk assessment of any potential hazards and their associated controls.

The Client is responsible for:

Advising any health, safety, environmental requirements, permits or licences required.

Accepting the method statement before the works begin.

Ensuring that systems are in place to prevent the works commencing without an accepted method statement.

Ensuring that hazards and risks associated to the works scope are assessed, the method statement prepared accordingly, and subsequently accepting it.

Ensuring that a plain summary of the method statement is produced and accepted and is capable of being understood and acted upon by project supervisors.

This summary identifying:

1. The intended progress of the works.
2. Critical stages for which supervision or attendance by an engineer is required.
3. The process for supervisors to take up any concerns during the project.

4.2 Site Foreman/Supervisor/Competent Person

The above is responsible for:

a) Site supervision to identify and prevent deviations from the accepted method statement.

b) Keeping a copy of, or having ready access to, the accepted method statement while carrying out the works.

c) Ensuring that the site team members are suitably briefed on the requirements of the accepted method statement, before work commences and that all work is carried out in accordance with this method statement, including any accepted revisions.

d) Briefing of the supervisor on the method of work before the activities commence.

e) Determining what other works are being undertaken on the site, if any and whether they will impact on these works. If an unacceptable interface with other works is expected advice must be sought.

5.0 Procedure

5.1 General

01. Report to contact name on site and sign visitor/contractor book.
02. Read and observe site Health & Safety information / attend Induction if required.
03. Obtain a permit to work if required.
04. Obtain details of Risk Area that is fitted with the Fire Suppression Installation.
05. Observe all security and safety issues related to the "working in this enclosure"
06. Request all devices incorporated within the system be put into the state observed in event of a discharge.
07. Close all apertures leading too and from protected Zone
08. Ensure Zone will be free from operatives for the test duration and that this is convenient to all.
09. Arrange for the use of a suitable non disruptive power supply (240 V)
10. Ensure there is an adequate relief path from the risk area either to atmosphere or the surrounding areas
11. Open all internal doors and close all doors on the perimeter of the protected zone.
12. Conduct the Room Integrity Test and obtain test results.
13. Inform relevant Personnel of test Results making any recommendations applicable
14. Remove all Equipment and any Materials from site.
15. Ensure enclosure and systems are all re-instated to normal operation.
16. Sign out of visitor/contractor book as to inform customer that you are no longer on their premises.

5.2 Labour Force

The nominated personnel involved in this operation together with their area of responsibilities are as follows Foreman/Competent Person/Test Engineer

Liaise on all aspects of works brief Foremen / staff on works. If possible, implement Method Statement and Associated procedures liaise with Site Agent/Supervisors Provide induction & work briefing.

5.3 Training (if required)

All personnel will attend the appropriate site induction.

Toolbox talks and on-the-job training will be provided, as required before and during the works, trained and competent personnel will give these training talks.

All operatives engaged in this exercise will be briefed in the safety procedures & controls in place for this activity.

The site induction is to highlight any specific site rules, hazards and emergency procedures.

5.4 Lifting Equipment (N/A)

5.5 Portable Tools

Integrity Test Kit
Power Lead 110 / 240 V
Portable Fan
Expanding Door Panels
Pressure Gauge Console
Measuring Device / s
Tape Measure
Torch

5.6 Mechanical Plant (N/A)

5.7 Protection of Client Assets

Care to be taken of all equipment within the work area and where necessary suitable protection provided.

5.8 Materials (N/A)

5.9 Storage & Handling of Hazardous Substances & Materials (N/A)

5.10 Temporary Structures / False Work (N/A)

5.11 Working at Heights (N/A)

5.12 Suitable scaffold tower to be used; (PASMA) – (N/A).

5.13 Work Permits & Licences

Work permits must be in place prior to starting.

5.14 Control of Work with Hazardous Substances & Processes (N/A)

5.15 First Aid

All such facilities will be maintained in accordance with the relevant Regulations.

5.16 Fire

All personnel will be made aware of the emergency Evacuation Plan and will be told how to recognise the alarm signal, the location of the assembly point for the work location and the evacuation route to the assembly point. Details of the emergency plan will be advised.

5.17 Excavation (N/A)

5.18 Personal Protective Equipment (PPE)

The following Personal Protective Equipment (PPE) will be used by all operatives involved in these activities:

Hard Hat- At all times when necessary

Safety Footwear- At all times

Hi Vis (to BS-EN-471:1994) - At all times when necessary

Gloves –. At all times when necessary

Eye Protection – At all times when necessary

PPE to be inspected with any defective equipment will be replaced immediately. Suitable personnel protective equipment will be worn when ever practical when expediting operational activities.

5.19 Incidents & Reporting of Injuries, Diseases & Dangerous Occurrences (RIDDOR)

In the event of a serious accident or incident work shall cease immediately and if necessary all personnel will evacuate the works area.

The Site Foreman will notify the Site Agent/supervisor together with the appropriate emergency services.

The Site Foreman will investigate all incidents.

Any accidents and incidents will be reported to site and our offices.

5.20 Housekeeping

Working areas are to be kept tidy and clear of obstructions at all times.

Hazardous materials will be disposed of in accordance with instructions on the COSHH assessments.

The works area will be monitored.

5.21 Access and Egress to Authorised Personnel

Access to the works area will be by approved access routes.

All personnel will be monitored in and out of the site.

All restricted access areas will only be entered with prior arrangement

5.22 Emergency Procedure (TBA)

5.23 Transportation

All equipment and materials deliveries will be via the main access gate unless otherwise instructed.

All personnel must sign in with security when entering the site. Parking to be agreed on site.

5.24 Systems / Codes of Practice

The Health & Safety policy.

Clients safety document

Relevant British Standards, Codes Of Practice, and HSE Guidance Notes

Good working practices.

5.25 Statutory Records

The following statutory records are held at our offices:

Certificates of Employers Liability Insurance.

Company Health and Safety Policy Statement.

Procedure for reporting accidents.

Personnel records.

Accident and dangerous occurrence reports.

BS 510 Accident book.

5.26 Noise & Vibration

Potential noise from other site operatives carrying out works not associated to those specified.

5.27 Air Quality & Dust (N/A)

5.28 Waste Management

All waste to be removed from work area and put in the appropriate site supplied containers/skips

5.29 Protection of Water Quality (N/A)

5.30 Archaeology (N/A)

5.31 Nature Protection (N/A)

5.32 Management of Pest and Weeds (N/A)

5.33 Traffic Management (N/A)

5.34 Contaminated Land (N/A)

5.35 Inspection & Environmental Auditing (N/A)

5.36 Records & Documentation

Inspection and test plan(s)

6.0 Contractors Risk Assessment

Risk assessment document – as attached below

7.0 Testing Procedure

Objective

The purpose is to determine the predicted retention time of an extinguishant / air mixture by equating it to measured enclosure leakage and theoretical worst-case leakage.

The procedures are detailed as appendices to several national standards and determine the predicted hold time for the extinguishant: basically the ability of the enclosure to retain the extinguishing agent and the time for which it does so – satisfactorily.

As part of the ISO 14520 - EN, NFPA and BFPSA Codes of Practice for Gaseous Fire Fighting Systems, Integrity Testing **should** be undertaken at the onset and on an **annual** basis to a protected area to determine whether any changes have occurred that could affect its rate of leakage and / or extinguishant performance.

A test should be conducted at the commissioning stage to determine the ability of an enclosure to retain an extinguishant and therefore establish the systems ability to effectively extinguish a fire (and prevent re-ignition), by establishing possible leakage paths for both the ingress of smoke (etc) and egress of extinguishant, both of which are detrimental.

Leakage and smoke ingress are detrimental to an installations fire fighting capabilities and can impact upon the ability to operate as intended, prevent fire or provide effective extinguishant.

Principle

The fan equipment is installed in a suitable opening (door) and used to create a small dynamic pressure differential between the enclosure and its adjacent surroundings, this pressure is usually equivalent to that created by the weight of the extinguishant adopted when discharged. Pressure and airflow measurements are made, from which the **e**quivalent **l**eakage **a**rea of the enclosure is established. The predicted retention time is calculated from the leakage area and the enclosure and extinguishing system data via a specific program.

Apparatus

A Calibrated variable speed fan with orifice plates; an-adjustable support frame (that fits most door openings); calibrated pressure / flow gauges; chemical smoke pencils; portable computer and printer, measuring devices; sundries.

Procedure

Attend site and report to Security / authorised organization. Obtain security passes and, if required, work permits, determine what specific site requirements may apply / be needed. Prepare or obtain a sketch plan of the enclosure / compartment, showing: walls / perimeter boundaries; the location of door openings and door fan equipment; air handling equipment; ducts and dampers; and the location of the extinguishing cylinders. The status of dampers in the event of system discharge (i.e. open or closed) is shown

The enclosure is measured and the following data recorded:
The overall height of the enclosure;
The overall height of the highest hazard in the enclosure;
The gross volume of the enclosure (Nett Volume is noted for H & S Purposes relating to concentration);
The type and quantity of extinguishant installed.
The Static / Bias pressure observed in the enclosure is measured.

Prior to commencing work it is important that all possible causes of false discharges and alarms are prevented, the fire suppression systems are to be isolated at all times when the enclosures are being sealed or tested. To prevent the possible occurrence of false alarms the detection systems are to be treated in the same manner.

It is essential that the system/s are left fully operational when the enclosure is not occupied, therefore each system must be reinstated when the enclosure is vacated both in the evenings and when completed.

All air handling equipment and extinguishant extract systems are set to the state they would be in upon discharge (Normally shut down). This may require attendance of personnel from other companies to operate and reset the plant. The test measurements do not take very long so it is unlikely that the room temperature will exceed operational limits, ensure this is the case. Doors within the enclosure (not on a boundary wall) are wedged open and a few tiles are removed from the false floor and ceiling (if present and within the parameters of protection) so that the protected enclosure is tested as one space.

False ceiling tiles are **not** removed **if** the ceiling void is not protected by the extinguishing system. Doors into rooms adjacent to the enclosure are wedged open to provide a return air path from any leakage.

The door fan equipment is set up in the doorway identified: the door does not need to be removed. Where there are other doors into the enclosure personnel access need not be impeded, except when the test measurements are being taken.

The extinguishing system and enclosure data is entered onto the computer. This calculates the column pressure that would be exerted by the extinguishant / air mixture after discharge (typically 10 – 25 Pascals).

The door fan is used to depressurise and then pressurise the enclosure to the column pressure (for NFPA) or a number of pressures (BS). The data is entered onto the computer that calculates the total leakage area for the enclosure and the predicted retention time at the adopted risk height.

The *Authority Having Jurisdiction* will decide whether the predicted retention time is sufficient for the application. Normally a minimum of 10 minutes is required (or 20 minutes for CO_2 deep-seated fire risks).

Failure

Should the retention time established via the test be too short, a leak location search is made with the aid of the door fan and a chemical smoke pencil (for larger leakages / enclosure a smoke generator may be used / required), and the details noted on a plan. Should the search identify that the distribution of leakage is other than the worst case situation, the AHJ **may** allow a subjective assessment to be entered into the computer and a revised retention time to be calculated. Should the new retention time in this case be acceptable, the room is then deemed to have passed the test, although remedial sealing of some leakage would still be expedient?

Results

A test report is produced on-site for all interested parties. If the room has failed the test a sketch showing the leakage paths is produced so that remedial work can be undertaken and the room retested at a future date.

Completion

Once the tests have been successfully completed it is important that all systems are re-instated to their normal operating conditions. As part of the requirements it is essential that all materials utilised are tidied up and removed from site when the works are finished.

Authority Having Jurisdiction, the calculated retention time may be revised to include an addition for the expansion period and part of the discharge time. Enclosure Integrity testing is not intended to verify other aspects of system reliability, e.g. hardware operability, agent mixing, flow calculations, piping integrity.

The loss of extinguishant from an enclosure is governed by one of two mechanisms, known as either the "***descending interface***" or "***mechanical mixing***". It is normally the preference of the AHJ's that all air moving equipment is shut down after extinguishant discharge. This will result in still air conditions where the extinguishant / air mix is lost through low level leaks and fresh air is drawn in through high level leaks.

A ***descending interface*** will form between the two, with the rate of descent being controlled by the total leakage area. Therefore the height of the equipment requiring extended protection from re-ignition of fire compared with the overall height of the enclosure will be part of the predicted retention time calculation.

If, however, significant air movement will occur after discharge, the fresh air drawn in will be mixed with the remaining extinguishant. This will result in a gradual reduction in the extinguishant concentration (***mechanical mixing***), and the predicted retention time will be the time for the concentration to drop to a minimum acceptable extinguishing concentration as agreed with the AHJ. Where tall equipment heights (required protected heights) are observed mechanical mixing may NEED to apply

Note: it has been proved through testing that, due to the amount of cabinets within Enclosures that have cooling fans, even though the air conditioning may shut down there could still be mixing during retention.

The chemical smoke used to identify leakage paths is used in very small quantities, and normally with the room under positive pressure so that the smoke is ejected from the enclosure. In particularly sensitive areas it is possible to use a negative pressure in the room and identify leakage paths by feeling for the airflow with one's hand and therefore not require the use of chemical smoke.

The worst case assumption of leakage distribution is 50% at high level and 50% at low level. Experience has shown that typically the low level leaks may make up less than half the total and, with the acceptance of the AHJ, a lower percentage **may** be used in calculations, this will need to be justifiable. This results in an improved retention time because fresh air cannot be drawn in faster than the heavier extinguishant leaks out.