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18 December 1989

To: Authorised Persons/Resident Site Engineers
Registered Ventilation Contractors
Electrical & Mechanical Consultants
Fire Insurance Association of H.K.
Power Companies
Petroleum Companies
The H.K. & China Gas Co. Ltd.
Principal Government Building Surveyor, B.L.D.
Hong Kong Telephone Company Ltd.
Director of Architectural Services
Director of Buildings and Lands
Hong Kong Construction Association

Dear Sirs,

F.S.D. Circular Letters (Ventilation)/89

On 23 May 1983, a set of Ventilation Circular letters, V1 to V6 inclusive, were issued detailing certain precautions and requirements with regard to fire safety in mechanical ventilating systems.

Since that date requests have been received concerning clarification, interpretation, introduction of new methods/materials, items not previously covered etc. Recently a number of these additional items have been discussed and agreed with the industry in the F.S.D./B.S. Liaison Group and it is now an opportune moment to issue an updated set of these circulars.

I am therefore pleased to enclose F.S.D. Circular Letters Nos. 1(Vent)/89 to 9(Vent)/89 inclusive which will apply to mechanical ventilating systems falling within the scope of the Legislation and will take effect on 1 February 1990.

These supercede Ventilation Circular Letters V1 to V6 inclusive.

Yours faithfully,

(LI Kwok-choi)
Chief Fire Officer (Protection)
for Director of Fire Services

LKC/ISM/t1

F.S.D. Circular Letter No. 1 (Vent)/89

Electric Heating Elements Used in Mechanical Ventilating Systems

1. Electric Heating Element Assemblies

1.1 Electric heating elements shall be evenly spaced across the sectional area of the duct at the plane where the heating elements are installed.

1.2 Heating elements shall be sheathed and of 'black' heat type with 'cold' extensions for cable connections. Heating elements shall be secured to fixtures constructed from fire resistant materials. End supports shall be provided for heating elements exceeding 800 mm in length.

1.3 An external terminal box shall be provided for all connections. Warning notice in both English and Chinese 'DANGER - LIVE TERMINALS' shall be marked on the front cover of the external terminal box.

1.4 Internal wiring shall be of heat resistant type and of rating compatible to the normal working temperature of the heating elements.

1.5 Duct internal insulation for either acoustic or thermal purposes shall not be installed within 1 metre of the heating element assembly.

1.6 Access door(s) shall be provided for the heating element assembly for maintenance and cleaning purposes. A small hole for inserting a testing thermometer shall be provided for the air duct and approximately at 150 mm on top of the elements.

2. Control and Sequence Interlocking

2.1 The fan motor shall be controlled by an electromagnetic type contactor complete with thermal overload protection device; manual reset on/off push buttons; main and auxiliary contacts for sequence interlocking control with the electric heating elements and a time delay device of heavy duty type having an operational time setting of three minutes minimum for the fan motors stop control.

2.2 The heating element assembly shall be controlled by contactor(s) and if required, step controller and interlocked with the fan motor in the manner as described in 2.3 to 2.10 below.

2.3 A sequence interlocking control shall be provided that the heating elements shall not be energised before the fan motor.

2.4 A sail switch/differential pressure switch with fail-safe feature shall be provided to de-energize the heating elements in case of air flow failure inside the duct.

2.5 A duct type overheat thermostat, with fail-safe feature and manual reset, shall be provided at a distance of 600 mm maximum from the heating element to switch off the elements when the mean temperature inside the air duct exceeds 50 deg. C ± 10% and within 90 seconds of reaching this temperature.

/P.2 ....

2.6 For the purpose of 2.4 and 2.5, 'fail-safe' refers to the ability of the sail switch/differential pressure switch/overheat thermostat to switch off the heating elements at 'no power' state, i.e. when the power supply to the sail switch/differential pressure switch/overheat thermostat is 'off'.

2.7 The time delay device shall be so arranged that on switching off the fan motor, the power supply to the heating elements shall be cut off instantly but the fan shall be allowed to run continuously for a minimum of three minutes to dissipate the residual heat inside the duct system.

2.8 An emergency stop push button for the fan motor shall be provided and located adjacent to the fan motor and the circuit shall be designed to override the time delay device to enble the fan motor to be switched off instantly once this button is pressed. This emergency stop push button shall be of mushroom head with manual reset type.

2.9 If a summer/winter switching arrangement is provided, the timer delay control for fan motor shall remain functional when heating or reheating facilities are provided in the summer mode.

2.10 Control circuit voltages shall not exceed 220 volts.

3. Fan Coil Unit Installations

3.1 Fan coil units with electric heating elements at a total rating not exceeding 2 kW may be exempted from the requirements of paragraphs 2.4, 2.7, 2.8 and 2.9. Sequence interlocking and overheat thermostat control shall be provided in accordance with paragraphs 2.3 and 2.5.

4. Proprietary made Electric Duct Heaters

4.1 The use of proprietary made factory-assembled electric duct heaters shall be permitted but only if this has been submitted and included in F.S.D.'s list of acceptable items prior to installation.

(LI Kwok-choi)
for Director of Fire Services

Date: 6th January 1975

Amended: 23rd May 1983

Amended: 18th December 1989

F.S.D. Circular Letter No. 2 (Vent)/89

Fire Dampers

This Circular Letter details the manufacturing standards and installation requirements of fire dampers for mechanical ventilating/air conditioning systems which are subject to the provisions of either the Building (Ventilating Systems) Regulations or the Ventilation of Scheduled Premises (Urban Council/Regional Council) By-laws. Section A covers locally made blade type fire dampers, Section B covers proprietary made fire dampers, Section C covers general requirements for all fire dampers, and Section D covers air transfer openings which breach F.R.P. enclosures.

A. Locally Made, Blade Type Fire Dampers

1. For any air duct passing through any floor or ceiling requiring the provision of a fire damper, the fire damper blades shall be constructed from mild steel plate of 6 mm thickness. The associated casing shall also be constructed to this standard.

2. For any air duct passing through any wall requiring the provision of a fire damper, the fire damper shall be constructed from :

   2.1 mild steel plate of 3 mm thickness when the wall in which the fire damper is mounted has a F.R.P. value less than 2 hours;

   2.2 mild steel plate of 6 mm thickness when the wall in which the fire damper is mounted has a F.R.P. value of 2 hours or more.

   The associated casing shall also be constructed to this standard.

3. Angle section steel or similar structural members shall be employed in the construction of the fire damper casing framework to provide structural rigidity, i.e. to prevent deforming of the damper casing and to maintain clearance in all operating conditions between fixed and moving parts.

4. The lateral clearance between the moving blades and the damper casing shall not exceed 1.5 mm. For multiple-blade fire dampers each blade shall be arranged to come into contact and overlap the adjacent ones by a minimum of 5 mm when the damper is in the closed position. Suitable stops shall be provided at the casing to maintain the damper blades in a stable position when the damper is closed.

5. Bushes made from brass or similar bearing materials shall be provided for all the blade spindles of the fire damper.

6. The closing action of the fire damper shall be achieved solely by the weight of the damper blade(s). Closing action powered by springs or other dead weight shall not be allowed.

7. To avoid sagging of the damper blade under its own weight, the length of each damper blade shall not exceed 600 mm. Structural opening with width exceeding this dimension shall be protected by multiple fire damper units. In special cases where it is not possible to keep within this limit of 600 mm, a slight extension beyond this shall be allowed but it must be demonstrated to the Director of Fire Services that the smooth operation and the function of the fire damper will not be impaired.

/P.2 ....

B. Proprietary Made Fire Dampers

8. As an alternative to the locally-made fire damper as specified in Section A, proprietary made fire dampers, with construction and mounting method approved by a recognised testing authority, may be used, provided the fire damper possesses a rating equivalent to the fire resistance of the structure it protects. Acceptable national or international standards include:

14.1 B.S. 476 Part 20 for Integrity only (i.e. Excluding Insulation & Loadbearing Capacity Performance Criteria)
14.2 Underwriters Laboratories Inc. (UL) 555.

C. General Requirements

9. The location of the fusible link shall be so arranged that it will not impede the closing action of the fire damper.

10. Fire dampers shall be installed in such a manner that the air flow will not impede the closure of the fire damper.

11. Fire dampers shall be securely installed in the plane of the fire separation so as to stay in place should the duct be dislodged during a fire.

12. An adequately sized and properly located inspection door or panel shall be provided to facilitate maintenance of each fire damper.

13. Air duct internal lining shall not be installed within 1000 mm of the fire damper. (The reason for this requirement is that in a fire situation the damper, although closed, will be at an elevated temperature and may cause flame spread along the internal lining inside the duct in the adjoining compartments).

14. The length of the fire damper casing shall exceed that of the fire damper assembly by not less than 30 mm when the fire damper is in the open position, i.e. not less than 15 mm at either end.

15. In no case shall the temperature rating of the fusible link exceed 69°C.

D. Air Transfer Openings Breaching F.R.P. Enclosures

16. All air transfer openings breaching the walls, floor or ceiling of a F.R.P. enclosure, shall be protected by fire dampers to the same construction standard as required by this Circular Letter.

(LI Kwok-choi)
for Director of Fire Services

Date : 6th January 1975

Amended: 23rd May 1983
Amended: 14th April 1984
Amended: 18th December 1989

F.S.D. Circular Letter No. 3 (Vent)/89

The Use of False Ceilings and Elevated Floors as Air Ducts (Excluding Computer Room Installations)

1. The voids created between a false ceiling and the building structure, or between the building structure and an elevated floor, shall only be used as an air duct associated with a meachanical ventilating system if the conditions as laid down in para. 2 are satisfied. Note. Naturally ventilated spaces are exempted so long as fire separation between compartments is maintained.

2. Specially and purposely designed non-combustible false ceilings or ventilated ceilings or elevated floors can be used as a means for conveying air subject to the following conditions:-

   2.1 The materials used in the construction of the false ceiling or ventilated ceiling or elevated floor shall be in compliance with B.S. 476 : Part 4 : 1970 or equivalent national or international standards, and approved by recognized testing authorities.

   2.2 Compartmentation shall be maintained by provision of fire and smoke dampers which should be operated by a smoke detector system (Probe Type).

   2.3 All electrical mains distribution and control wiring in the voids must be contained in heavy gauge metal cable ducts and/or screwed metal conduits terminated in accordance with the relevant British Standard Specifications and are to comply with I.E.E. Regulations (current edition).

   2.4 All pipes within the void shall be metallic. All insulation within the void shall comply with the requirements as stipulated in FSD Circular Letter No. 4 (Vent)/89.

   2.5 Pneumatic control lines for air conditioning systems within the void shall be of copper. Flexible tubes will be allowed only at the final connections from the copper pneumatic lines to the air conditioning terminals. The flexible tubes shall not exceed 300 mm in length and each shall be of an approved flame retardant type.

   2.6 The false ceiling, ventilated ceiling or elevated floor shall not be used to contain any services other than essential services and services exclusively for the area.

   2.7 Access to the void shall be provided for cleaning and inspection.

(LI Kwok-choi)
for Director of Fire Services

Date: 23rd November 1982
Amended: 23rd May 1983
Amended: 18th December 1989

F.S.D. Circular Letter No. 4 (Vent)/89

Insulation for use with Ductwork or Pipework

1 Definitions

For the purpose of this Circular Letter the following terms are defined

1.1 "Ductwork", means all types of ductwork for conveying air;

1.2 "Pipework", means all types of pipework.

2. Application

2.1 This F.S.D. Circular Letter is in addition to the requirements previously issued under FSD Circular Letter No. 11/88 on the requirements for acoustic and thermal insulation for ductwork and pipework.

3. Internal Insulation for Ductwork

3.1 The fire property requirement for internal insulation for ductwork is that the insulation material, including the associated fasteners, adhesives, tapes etc. shall comply with B.S. 476 : Part 6 : 1981 with the index of overall performance ("I") not exceeding 12, of which not more than 6, index ("i1") shall derive from the initial period of the test. Equivalent national or international standards shall also be accepted.

4. External Insulation for Ductwork and Pipework

4.1 The fire property requirement for external insulation for ductwork and pipework is that the insulation material, including the associated fasteners, adhesives, tapes etc. shall comply with B.S. 476 : Part 7 : 1971 (revised 1987) or equivalent national or international standard, or be brought up to that standard by use of an approved flame retardant product.

4.2 For the purpose of paragraph 4.1, "approved flame retardant product" refers to any one of the following:-

(a) Aluminium foil vapour barrier (for mineral wool and fibre-glass insulating materials only);

(b) Plastering of minimum thickness 12 mm;

(c) Metal (aluminium, galvanized steel etc.) cladding.

5. External Insulation for Ductwork and Pipework at Points of Penetration through Compartment Walls, Floors or Ceilings

5.1 Where ductwork passes through a structure and is provided with a fire damper, the external insulation shall not be allowed to pass through the structure and is required to stop at a suitable fire barrier securely fixed to the external casing of the fire damper and the structure.

/P.2 ....

5.2 Insulation for pipework passing through a structure shall also be required to stop at a suitable fire barrier securely fixed to the pipe external surface and the structure.

5.3 For the purpose of paragraphs 5.1 & 5.2, the fire barrier shall have the same Fire Resisting Period as the structure through which the ductwork or pipework passes. It should be noted that the authority in respect of fire resistance is the Building Authority.

(LI Kwok-choi)
for Director of Fire Services

Date: 6th January 1975
Amended: 23rd March 1983
Amended: 18th December 1989

F.S.D. Circular Letter No. 5 (Vent)/89

Protected Areas in Buildings

Protection Requirements against Fire and Smoke

1. Protected areas in buildings are essentially those which are required to be separate compartments relative to the usable area of the premises and for the purpose of this Circular Letter are areas designated to be free from both fire and smoke. These areas include staircases, staircase approach lobbies and fireman's lift lobbies.

2. These areas are provided for the occupants as means of safe egress from the building and also allow Fire Services personnel safe access to all floors of the building in the event of fire.

3. Services such as air ducts, drainage/fresh water pipes, chilled water pipes, gas pipes and electrical cables/switchgears etc. are not allowed to be installed in the protected areas. Any of these services found installed inside the protected areas shall be removed either by physical removal; or be encased in an F.R.P. enclosure having an F.R.P. value equivalent to the structural F.R.P. of the protected area inside which the services are installed. It should be noted that the F.R.P. enclosure for this purpose shall not reduce the effective dimensions of the protected area and consequently cause obstruction to safe egress. The arrangement shall be acceptable to the Building Authority.

4. Exceptions to paragraph 3 above are those services serving exclusively the protected areas such as luminaires and the associated power line, fire service pipes and hydrants/sprinklers. Other items for security/surveillance purposes (CCTV, intercom, public address system etc.) shall require permission from the Director of Fire Services prior to installation.

5. Ventilation/air conditioning (excluding staircase pressurization) to the protected areas can be provided subject to the following conditions :-

   5.1 All ventilation openings, either supply or exhaust (except direct to open air) shall be protected by fire and smoke dampers actuated by smoke detectors located at the protected area and adjoining compartments which communicate on the air-side with the protected area.

   5.2 Fire and Smoke dampers installed for the purpose of paragraph 5.1 shall comply with UL 555 and UL555S or the equivalent national or international standards.

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5.3 Self contained fan coil units serving only the protected area and are wholly situated within the structural FRP can be installed provided that:-

5.3.1 The fan coil volute casing, fan blades, fan coil enclosure etc. shall be all constructed from non-combustible materials. (i.e. in compliance with B.S. 476: Part 4).

5.3.2 All electrical wiring shall be within metal conduits and/or enclosures.

5.3.3 Insulating materials for the fan coil and the associated pipework shall meet the requirements as stipulated in FSD Circular Letter No. 4(Vent)/89.

6. All ventilation/air conditioning systems in rooms with direct access from a staircase, staircase approach lobby or Fireman's Lift lobby shall comply with requirements of para. 5 as long as fire doors of appropriate FRP are installed, or requirements of paras. 3 and 4 if no fire doors of appropriate FRP are provided.

(Li Kwok-choi)
for Director of Fire Services

Date: 18th December 1989

F.S.D. Circular Letter No. 6 (Vent)/89

Filters Used in Mechanical Ventilating Systems

1. Air Filter Cells

1.1 Air filters cells (i.e. media plus media enclosure) shall be constructed from materials which conform to the fire property requirements of one of the following standards:-

a) B.S. 476:Pt. 4 - Non-combustibility Test for Materials;

b) B.S. 476:Pt. 5 - Method of test for Ignitability, index 'P' together with the requirements of B.S. 476:Pt. 6 - Method of Test for Fire Propagation for products with indices "I" $\leq$ 12 and "i_1" $\leq$ 6;

c) Underwriters Laboratories Inc. UL900 - Test Performance of Filter Units, Class 1 or Class 2;

d) B.S. 3119 - Method of Test for Flameproof Materials and B.S. 3120 - Performance Requirements of Materials for Flameproof Clothing.

e) DIN 53438:Pt. 3 - Response to Ignition by a Small Flame, Surface Ignition, Class F1.

2. Filter Cell Support Framework

2.1 Filter cell support framework for individual and multiple cell installations shall be constructed from non-combustible materials conforming to BS 476 Part 4 and have a mechanical strength equivalent to 1 mm thick galvanised sheet steel.

2.2 All gaskets, seals, etc. between the air filter cells and the filter cell(s) support framework shall have the same fire property requirements as the air filter cells, as detailed in paragraph 1 of this F.S.D. Circular Letter.

3. Metallic Filter Cells

3.1 Filter cells fully constructed in metal shall not be subject to the requirements of this F.S.D. Circular Letter i.e. where the filter media is formed from a grid or mesh of metal such as, stainless steel, aluminium, etc.

Note : Steel wool is not permitted (see 4(1)(g) of Building (Ventilating Systems) Regulations)

3.2 If however the metallic media is coated with combustible substance, it shall be regarded as a special filter and be subject to paragraph 4 of this letter.

4. Special Filter Installations

4.1 For special filter applications such as the removal of smell by activated carbon filters, submissions should be made to the Director of Fire Services for relaxation of the requirements of this F.S.D. Circular Letter and for clarification on any specific additional fire safety precautions that may be necessary.

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5. Filter Identification

5.1 All filter cells shall, at the place of manufacture, have the following information clearly marked or stamped in a readily accessible location:-

a) Manufacturer's Name;

b) Place of Manufacture;

c) Filter type and model number;

d) The standard to which the filter has been type-tested.

5.2 The Director of Fire Services may require a copy of the "Certificate of Type Test" for the filter cell, issued by a recognised independent testing authority, to be submitted. Failure to produce the certificate will result in rejection of the filter installation.

(LI Kwok-choi)
for Director of Fire Services

Date : 18th December 1989

F.S.D. Circular Letter No. 7 (Vent)/89

Flexible Ducts Used in Mecnanical Ventilating Systems

1. The flexible duct used in mechanical ventilating systems shall comply fully with :-

1.1 UL 181, Class 1;

Note : Where ducts, tested to U.L. 181 Class 1, are constructed of composite layers of materials, these materials shall be permanently bonded, one to the other. Where these materials are not bonded each material shall be separately tested for flame spead and smoke developed, and each shall comply to U.L. 181 Class 1. Also the internal lining must pass the puncture test as described in para. 1.2 below.

or

1.2 the fire test as per BS 476 : Part 6 with indices of performance $I \leqslant 12$; $i_1 \leqslant 6$ and pass the following puncture test : -

1.2.1 Principles of the Puncture Test

This puncture test shall be carried out using testing equipment employing the principle of the free fall of a plunger on to the surface of the sample flexible duct. If the flexible duct is provided with an external removable insulation layer, the test shall be carried out on the duct surface with this insulation layer removed. If the flexible duct comes with a spiral wire, the impact position of the plunger shall be on the duct pitch surface between 2 consecutive wires.

1.2.2 Details of the Puncture Test

The plunger shall consist of a 10 mm diameter steel rod having a steel head of 15 mm diameter with a flat impact end with rounded edges. The length of the plunger assembly shall be sufficient to provide a 1 kg. weight. The surface of the rod and head shall be smooth.

Guides shall be provided and arranged to allow for an essentially frictionless fall of the plunger. A means for measuring the height of fall shall also be provided.

Two(2) samples of duct of 600 mm in length when fully stretched shall be subjected to this test. The sample shall be provided with a firm support below and throughout its complete length. The sample shall also be secured at both ends to maintain the duct in a fully stretched position throughout the test. Each sample shall be puncture tested at 3 equally spaced points on the duct periphery by rotation through 120° after each test.

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1.2.3 Acceptance/Failure Criterion for the Puncture Test

The flexible duct sample shall prevent the complete penetration through the surface of the duct by the plunger head when the plunger head has fallen through a distance of not less than 500 mm as measured to the top surface of the sample. Complete penetration of the plunger at any one of the 6 test points shall indicate failure of the duct samples.

1.2.4 Recognised Testing Authorities for the Puncture Test

(This list of recognised testing authorities will be published soon).

2. In addition to paragraph 1 above, all flexible ducts used in mechanical ventilating systems shall not exceed 4 m in length for each connection or final connection from the rigid duct to the outlet grilles, VAV boxes etc. In special cases where it is impossible to keep within this limit of 4 m, due to engineering or building constraints, a slight extension beyond this shall be allowed but only with the agreement of the Director of Fire Services and this shall be obtained before installation.

3. Flexible ducts shall not be permitted for use as main air distribution ducts.

4. Flexible ducts shall not be allowed to penetrate through fire resisting walls, fire resisting floors, fire resisting ceilings and fire resisting partitions.

(LI Kwok-choi)
for Director of Fire Services

Date: 18th December 1989

F.S.D. Circular Letter No. 8 (Vent)/89

Battery Rooms Mechanical Ventilation Requirements

1. Purpose

1.1 The purpose of providing mechanical ventilation to battery rooms is to maintain the average concentration of hydrogen gas, which may evolve during a recharge of the battery, within safe limits in the battery rooms.

1.2 For the purpose of this F.S.D. Circular Letter, the safety limit of hydrogen gas concentration inside the battery room is 1% by volume maximum.

2. Design Calculation

2.1 Designers shall ensure that adequate mechanical ventilation shall be provided to battery rooms to keep the hydrogen concentration within the safety limit. The design of the mechanical ventilating system for this purpose shall follow the guidelines in B.S. 6133:1985. In accepting battery room mechanical ventilating systems the Director of Fire Services may require a set of design calculations to be submitted to substantiate that the mechanical ventilating system has been properly designed to meet the above requirement.

3. Mechanical Ventilating System Technical Requirements

3.1 The ventilating fan shall be in the extraction mode and the fan motor shall be of totally enclosed fan cooled (TEFC) type.

3.2 The mechanical ventilating system for the battery room shall be independent to all other systems in the building.

3.3 Extraction points shall be located at the highest level of the room while air inlets shall be at low level. Extraction points and air inlets shall be so arranged that a "cross-flow" effect shall occur in all areas within the room.

3.4 The ventilating fan motor shall be electrically interlocked with the battery charger so that the charger cannot be in operation when the ventilating fan is not running. Electricity supply for the ventilating fan(s) shall be from an independent circuit other than that of the battery charger, and the interlock control relay shall be protected by an independent fuse.

3.5 If due to the functional requirement of the batteries, the condition in 3.4 cannot be met, alternative safety measures may be accepted but these must be agreed by the Director of Fire Services before installation.

3.6 All components of the mechanical ventilating systems shall be made of corrosion resistant materials.

4. Requirements for Separate Battery Room

4.1 All open type batteries regardless of size shall be accommodated in separate battery rooms meeting the conditions in paragraphs 1, 2 and 3 above;

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4.2 For enclosed type batteries constructed to B.S. 6133:1985 with capacities above 400 Amp-hours, separate battery rooms meeting the conditions in paragraph 1, 2 & 3 above, are required;

4.3 For enclosed type batteries constructed to B.S. 6133:1985 with capacities from 15 to 400 Amp-hours, separate battery rooms are not required provided the safety requirements of B.S. 6133:1985 are followed;

4.4 For valve regulated sealed batteries to B.S. 6290:Part 4:1987, separate battery rooms are <u>not</u> required for all battery sizes.

(LI Kwok-choi)
for Director of Fire Services

Date: 18th December 1989

F.S.D. Circular Letter No. 9 (Vent)/89

Ventilation of Cat. 5 Dangerous Goods Areas

1. Cat. 5 Dangerous Goods (D.G.) areas are areas where Cat. 5 flammable liquids are manufactured, stored and/or conveyed.

2. All enclosed Cat. 5 D.G. areas shall be provided with a mechanical ventilating system capable of providing a minimum ventilation rate of 5 l/s per m^2 of D.G. floor area.

3. The arrangement of the mechanical ventilating system ductwork shall provide a "cross-flow" effect to eliminate stagnant points within the area.

4. The points of extraction/supply shall be arranged such that the flammable vapours are extracted at locations where they usually accumulate, e.g. for flammable vapours heavier than air the extraction points shall be at low level.

5. The electrical installations for the mechanical ventilating system shall be of flameproof type conforming to the requirements of BS 5345.

(LI Kwok-choi)
for Director of Fire Services

Date : 18th December 1989