SECTION 3 TECHNICAL SPECIFICATION

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3.5 WET CHEMICAL FIRE SUPPRESSION SYSTEM

3.5 WET CHEMICAL FIRE SUPPRESSION SYSTEM

3.5.1 STANDARDS AND CODES OF PRACTICE APPLICABLE

The following publications of the issues listed below, but referred to thereafter by designation only, form a part of this specification to the extent indicated by the reference thereto (latest edition):

a) NFPA 17A: Standard on Wet Chemical Extinguishing System.

b) NFPA 96: Standard for the installation of equipment for the Removal of Smoke and Grease Laden Vapors from Commercial Cooking Equipment.

c) Underwriters Laboratories, Inc.(UL): Fire Protection Equipment Directory.

3.5.2 TECHNICAL SPECIFICATION (DESIGN REQUIREMENTS)

a) Manufacturer: Company specializing in the design and manufacture of wet chemical kitchen hood fire suppression systems.

Installer : Company authorized and trained by the manufacturer to design, install and maintain wet chemical kitchen hood fire suppression systems.

b) Regulatory Requirement: -

Conform to building code for requirements applicable to the work specified herein.

Codes and Permits: Conform to the local code requirements applicable to this section. Obtain and pay any necessary permits prior to beginning work involved in this section.

All system components must be UL listed as part of the manufacturer's total system.

c) After Sales Service and Guarantee
The principal (or authorised agent) of the wet chemical system shall have agents at the regional level in Peninsular Malaysia to provide quick back-up service for the system. Upon completion of the installation, the tenderer must guarantee the performance of the system for a period of 12 months.

3.5.3 SYSTEM DESCRIPTION

a) General
The Wet Chemical Kitchen Hood Fire Suppression system shall be a pre-engineered, wet chemical, cartridge operated, regulated pressure type with a fixed nozzle agent distribution network. Listed with Underwriters Laboratories, Inc (UL).

The system shall be capable of automatic detection and actuation and/or remote manual actuation.

The system shall have Fire Suppression capabilities for the following restaurant hazard areas : ventilating structures including hoods, ducts, plenums and filters; deep fat fryers; griddles and range tops; upright, natural charcoal or chain- type boilers; electric, lava rock, mesquite or gas radiant charboilers.

b) Mode of Operations
The detection portion of the kitchen hood fire suppression system shall be of mechanical type and shall allow for automatic detection by means of specific rated fusible links, which, when the temperature reaches the rating of the link, the link separates, allowing the regulated release to actuate.

3.5.4 MATERIAL AND EQUIPMENT SPECIFICATIONS

a) General
The basic system consists of regulated release assembly which includes a regulated release mechanism and a wet chemical storage tank housed within a single enclosure. Nozzles, blow off caps, detectors, cartridges, agent, fusible links, and pulley elbows shall be supplied in separate packages in the quantities needed for fire suppression system arrangements.

Additional equipment includes: remote manual pull station, mechanical and electrical gas valves, pressure switches and electrical switches for automatic equipment and gas line shut off. Accessories such as alarms, warning lights, etc.., to installations where required shall be priced for by the contractor.

i. Tank can be used in multiple arrangements to allow for larger hazard coverage. Each tank is limited to a listed maximum amount of flow numbers.

ii. To ascertain high standard of safety and reliability of the system, major component shall be produced by a single manufacturer. Alternates shall not be accepted.

iii. To substantiate the origin of major components and to facilitate, in case of any warranty claims to the manufacturer, the major equipments shall be supplied with an original copy of letter of origin by the manufacturer and certified by the local agent.

b) Wet Chemical Agent
The extinguishing agent shall be a potassium carbonate, potassium acetate-base formulation designed for flame knockdown and securement of grease related fires. The agent shall be available in plastic container, labelled with handling and usage instructions.

c) Agent Tank
The agent tank shall be installed in a (stainless steel enclosure c/w bracket). The tank shall be constructed of deep drawn carbon steel, finished in red enamel, (1.5gallon (5.7L)) (3.0gallon (11.4L) in size. Tanks shall have 100 psi (690 kPa) working pressure, 300 psi (2069 kPa) test pressure and 600 psi (4137 kPa) minimum burst pressure.

d) Tank adaptor
Tank adaptor assembly shall be chrome plated steel with a 1/4" NPT female inlet and a 3/4" NPT male outlet.

e) Regulated Release Mechanism
The regulated release mechanism shall be spring loaded, mechanical/pneumatic type capable of providing the expellant gas supply to one or two agent tanks, depending on the capacity of the N2 cartridge used. It shall contains a factory installed regulator deadset at 100 psi (690 kPa) with an internal relief of approximately 145 psi (1000kPa)

It shall have the following actuation capabilities; automatic actuation by a fusible link detection system and remote manual actuation by a mechanical pull station.

The regulated release mechanism shall contain a release assembly, regulator, expellant gas hose and agent storage tank housed in a stainless steel enclosure with cover. The enclosure contains knock outs for 1/2" conduit. The cover shall contain an opening for a visual status indicator. It shall be compatible with mechanical gas shut off devices; or when equipped with a field or factory installed switch, it is compatible with electric gas line or appliance shut-off devices.

f) Regulated Actuator Assembly
When more than two agent's tanks are required, the regulated actuator shall provide expellant gas for additional tanks. It shall contain a factory installed regulator deadset at 100 psi (690 kPa).

The regulated actuator assembly shall contain a regulated actuator, regulator, expellant gas hose and agent tank housed in a stainless steel enclosure with cover. The enclosure contains knockouts to permit installation of the expellant gas line.

g) Discharge Nozzle
Each discharge nozzles shall be tested and listed with the R102 system for a specific application. Nozzles shall be stamped with the flow number designation (1/2, 1, 2 and 3) and the tip part number. Each nozzle must have a metal or rubber blow off cap to keep the nozzle tip orifice free of cooking grease build up.

h) Piping

i. System piping shall be of non combustible material having physical and chemical characteristic such that its integrity under stress can be predicted with reliability.

ii. Distribution piping: Schedule 40 black steel pipe and fittings. All piping shall be sealed with pipe tape.

iii. Actuation and Expellant Gas Piping: Schedule 40, black steel pipe and fittings. All piping shall be sealed with pipe tape.

iv. All piping shall comply with NFPA 2001.

v. Piping shall be installed in accordance with good commercial practice to the appropriate codes, securely supported with hangers and arrange with close attention to the design layout since deviations may alter the design flow performance as calculated.

vi. All piping shall be reamed, blown clear and swabbed with appropriate solvent to remove mill varnish and cutting oils before assembly.

vii. Assembly of all joints shall confirm to the appropriate standards. Threaded pipe joints shall utilize Teflon tape applied to the male threads only.

i) Alarms
Audible fire alarm bell of 150mm dia., strident tone type shall be supplied and installed and, the number and location as indicated in the tender drawings or otherwise to be decided on site. The minimum sound level shall be either 65 dB(A) or 5 dB above any background noise, which ever greater, if the noise persist more than 30 seconds.

An alarm indicating failure of supervised devices or equipment shall give prompt and positive indication of any failure and shall be distinctive from alarms indicating operation or hazardous condition.

j) Manual Operation
A remote manual mechanical pull handle with labelling for **OFF/DISCHARGE** shall be provided as indicated in the tender drawing for manual actuation of the Wet chemical agent.

k) Painting
The tenderer shall include the cost of painting of all equipment included in this tender. The colour of the paint shall be approved by the local fire services department and shall consist of 1 primer coat, 1 under coat and 2 top coats hard matte finish paint. Before any painting is carried out, the contractor shall ensure that the surface is clean, free from grease and rust. If necessary, degreasing and derusting procedures shall be carried out. Each coat of paint shall be applied by brush and when thoroughly dry, smoothed with suitable paper or cloth before the next coat is applied.

l) Inspection, Testing & Commissioning.

i. General
The supply of all instruments, equipment and labour for conducting inspection, tests and demonstration shall be provided in this contract and the cost thereof shall be deemed included in the tender amount.

ii. Inspection.
a. The completed installation shall be instructed by factory authorized and trained personnel.
b. The inspection shall include a full operational test of all components as per equipment manufacturer's recommendations.
c. Inspection shall be performed in the presence of the JKR mechanical engineer or his representative.
d. All mechanical and electrical components shall be tested according to the manufacturer's recommended procedure to verify system integrity.
e. Inspections shall include a complete checkout of the detection / control system and certification of cylinder pressure. A written report shall be filed with the JKR.
f. The quantity of agent shall reflect the actual design quantity of Wet Chemical agent.
g. The system shall be tested according to the designed mode of operation in the presence of JKR mechanical engineer or his representative.

m) Test of the Detection System
The contractor shall carry out simulation test as instructed and with the presence of JKR mechanical engineer or his representative. The contractor shall priced in his tender for all consumables such as fusible links etc. used in the test.

3.5.5 SUBMITTALS

A system owner's manual shall be submitted containing basic information pertaining to system operation and maintenance.

A detailed technical manual shall also be submitted including system description, design, installation, recharge and maintenance procedures, plus additional equipment installation and resetting instructions.

3.5.6 GUARANTEE AND MAINTENANCE

a) Upon handing over of the installation to JKR, the contractor must guarantee the performance of the system for a period of 12 months. Within this period the contractor shall carry out inspection and maintenance every three (3) months. A written report certified by the owner of the premise shall be submitted to JKR after each inspection and maintenance being done.

b) Agent tanks shall be examined for evidence of corrosion or mechanical damage. The pressure must be checked every month. If a cylinder shows a loss in pressure (adjusted for pressure) of more than 10 %, it shall be replaced.

c) Distribution piping shall be examined of corrosion. Pipe hangers, brackets and fittings should be examined to ensure that the pipes are firmly secured. Should there be any discrepancy found, the contractor are to inform the owner.

d) Discharge nozzles shall be checked to determine that the orifice is clear, unobstructed and firmly secured.

e) The detection System shall be checked at once every 3 months. The Detection System shall be checked to determine that they are in satisfactory condition. The methods and procedures for this inspection shall be in accordance with the manufacturer’s recommendation.