

## **GENERAL SPECIFICATIONS**

### **B M & E WORKS**

#### **1.1 FIRE PROTECTION REQUIREMENTS**

##### **1.1.1 GENERAL**

The following Fire Protection Systems as required by the Local Fire Authority Department and other relevant codes and shall be installed but not limited to the following:

- a. Automatic Sprinkler System
- b. Dry or Wet Riser system
- c. Hose Reel System
- d. Automatic Gas Extinguishing System (CO<sub>2</sub>, Clean Agent, FM200 and Wet Chemical)
- e. Portable Hand Extinguishers (CO<sub>2</sub> and Dry Powder)
- e. Analogue Addressable Fire Detection and Alarm Systems
- f. Public Address and Fireman Communication System
- g. Any other systems required by Local Authority.

##### **1.1.2 CODES AND STANDARDS**

- Local Fire Authority Rules and Regulations
- Construction of Building codes
- National Fire Protection Association (NFPA)
- British Standards (BS)

##### **1.1.3 AUTOMATIC SPRINKLER SYSTEM**

Automatic sprinkler system shall comply with Local Fire Authority Rules and Regulations and National Fire Protection Association (NFPA).

Automatic sprinkler system to be designed in accordance with Local Fire Authority Rules. The sprinkler protection covers all retails and covered public area, car park area, etc.

The system shall consist one (1) number of sufficient effective capacities G.I storage tank (compartmented) and one set of sprinkler pumps located at pump room. All duty, standby and jockey pumps are to be driven by electric motors and back up with standby power from the generator set.

This system comprises a firemen's breeching inlet at the fire access level.

The sprinkler point/ head spacing and location shall be in accordance with Local Fire Authority Rules and regulations.

## **GENERAL SPECIFICATIONS**

### **B M & E WORKS (Cont'd)**

#### **1.1 FIRE PROTECTION REQUIREMENTS (cont'd)**

##### **1.1.4 DRY OR WET RISER SYSTEM**

To comply with British Standard B.S.5306 Part 1 and Local Authority requirement.

This system comprises a firemen's breeching inlet at the fire access level, a vertical riser and outlets at each floor together with fire hoses.

As for wet riser system (if applicable), the system is always charged with water under pressure. The pressure is always maintained by jockey pump. If the jockey pump fails to maintain the pressure, the wet riser pump (a standby pump, in the event of failure of the duty pump), shall be started up automatically when the pressure switches sensed a fall in pressure to below the pre-set value.

##### **1.1.5 HOSE REEL SYSTEM**

To comply with British Standard B.S.5306 Part 1 and Local Authority requirement.

The incoming water for hose reel system shall be independent from the other fire system.

All hose reel drum shall be box-up to Employer requirement.

##### **1.1.6 AUTOMATIC GAS EXTINGUISHING SYSTEM (CO<sub>2</sub>, CLEAN AGENT AND FM200 SYSTEM, WET CHEMICAL SYSTEM)**

The design of automatic CO<sub>2</sub>, clean agent and FM200 extinguishing system shall be accordance with NFPA 12, NFPA 2001, NFPA 17 and relevant standard and approval. TNB sub-station shall be equipped with clean agent extinguishing system (NAF-S III) and all electrical rooms shall be provided with CO<sub>2</sub> extinguishing system and FM200 system at UPS and EDS rooms. Each room shall be provided with appropriate size of storage cylinders, piping, nozzles and control panel and will be monitored in the main fire control room. The design of the piping shall be pre-engineered and in accordance with manufacturer's standards.

##### **1.1.7 PORTABLE HAND EXTINGUISHERS**

The location of portable extinguishers shall comply with Local Fire Authority requirement and in accordance with British standards in which maximum travel distance to reach the portable extinguishers should not exceed 20 meters. Portable hand extinguishers shall be 9kg ABC dry-powder (multi-purpose use) and 2.25 kg carbon-dioxide (electrical fire).

## **GENERAL SPECIFICATIONS**

### **B M & E WORKS (Cont'd)**

#### **1.1 FIRE PROTECTION REQUIREMENTS (cont'd)**

##### **1.1.8 ANALOGUE ADDRESSABLE FIRE DETECTION AND ALARM SYSTEM**

The system consists of a master fire alarm panel of addressable type located at the Fire Control Room with breakglass, call point alarms, detectors, electromagnetic door holders and sensing devices for doors at the entire premises.

Breakglass call point alarms are also to be installed near to entrances to the above mentioned areas.

Electromagnetic door holders and contacts shall be provided to locations where uniflow doors are coincide with fire rated doors.

Heat and smoke detectors shall be installed at the entire premises.

The analogue addressable fire alarm and control system monitor the status of fire protection sensors (smoke and heat detectors) and fighting equipment (sprinkler, dry/wet riser, hosereel, CO2 system, etc.) and mechanical ventilation system, where to comply with Local Authority requirement. It initiates fire fighting operations such as announcing of fire alarm, signal to start smoke spill fan and fresh air fans, shut down air conditioning unit and fans, activate smoke curtains and fire shutters, signal transmission to fire station via CMS, alarm bell/visual siren lights continuous ringing in affected zones and fire control room etc..

The ionization smoke detectors shall be suitable for detecting invisible products combustion as well as visible smoke and be of the dual sound type to provide good stability in charging environment conditions.

## **GENERAL SPECIFICATIONS**

### **B M & E WORKS (Cont'd)**

#### **1.1 FIRE PROTECTION REQUIREMENTS (cont'd)**

##### **1.1.9 FIRE COMMUNICATION SYSTEM**

###### **A. Fireman Intercom – 3 Ways Type**

The system consists of a master handset located at the Fire Control Room with slave handsets located at all plant rooms, gen-set room, lift motor rooms, staircases, lobbies, retail area etc. to facilitate communication amongst fireman during fire.

###### **B. Public Address System**

The combined of PA system consists of a equipment rack located at the Complex/Jusco Office with speakers located at public areas, carpark, lobbies, corridors, Jusco areas, etc. to facilitate announcement during fire evacuation. The quantity of PA system and zoning shall meet Local Authority requirement and Employer requirement.

- a. The PA system shall consist of channels provided with radio/background piped-in-music. The act of using of Fireman Microphone or the switching on of the automatic announcement machine or the switching on of the non-panic „Gong“ Alarm input shall automatically cut-off music or normal paging. The descending orders of priority shall be Fireman Announcement, Announcement from Automatic Machine, „Gong“ Alarm Sounding and Music.
- b. The level of loudness of music in each zone shall be fully adjustable by means of heavy duty-transformer or volume type controls which are incorporated with relays for restoration in full volume paging and/or announcement.
- c. The PA system shall be provided throughout the building to cater for public announcements and the like or music. However, the system shall essentially be designed to cater for the requirements of the Fire Department. The System shall be provided with zones so that announcements can be made throughout the building or within zones. Where private systems are installed, say within function rooms, there shall be an over-riding feature to take over for emergency announcements.
- d. PA microphone shall be located at:
  - i) AEON Management office
  - ii) Fire Control Room
  - iii) GMS J-card counter
  - iv) Information counter (centre court)
  - v) Complex Management office
- e. Zoning area of PA system shall not be more than 1,500m<sup>2</sup> per zone. Zoning as follows:
  - i) General sales area
  - ii) Shopping complex common area
  - iii) Carpark

## **GENERAL SPECIFICATIONS**

### **B M & E WORKS (Cont'd)**

#### **1.2 PLUMBING SERVICES**

##### 1.2.1 GENERAL

The following Plumbing Services shall be installed for this project but not limited to the followings:

- a. Domestic Cold-Water system for food court, restaurant, public toilets, AHU rooms, all tenants, etc.
- b. Soil and Waste System for entire complex.

##### 1.2.2 REFERENCES AND DESIGN CRITERIA

###### a. CODES AND REGULATIONS

- i. Local Authorities Requirements
- ii. Design Criteria and Standards for Water Supply Systems or Local Authority
- iii. HACCP Requirement
- iv. Public Utilities Board (PUB) Water Department guidelines.

###### c. SOIL AND WASTE SYSTEM

- i. A set of multiple vertical pipes with offset fully vented system within the installation shall be designed for the entire building.
- ii. The multiple vertical stack system was adopted to avoid cross over of structure and contribute towards lower clear height within the floors.

###### d. COLD WATER AND SANITARY PLUMBING SYSTEM

- i. All material used shall comply and approved by Local Authority.
- ii. The domestic water shall be obtained from internal water reticulation pipe.
- iii. Water tank capacity (compartment) shall be 1½ day storage. Separate water tank for drinking and toilet shall be provided complete with pneumatic pump sets.
- iv. Water from the suction tank to be pumped via cold water transfer pumps.
- v. Cold water shall be fed to kitchen sink/pantry and other sanitary fixtures respectively in accordance with local Authority requirements and HACCP requirement.
- vi. Approval type of greases traps / oil interceptor to be installed for sinks at all kitchen, food court, car wash area, etc. but excluded with automatic chemical dosing system.
- vii. External double grease trap or sewerage treatment plant to be installed before discharge to the external manhole to comply with LOCAL requirement

## **GENERAL SPECIFICATIONS**

### **B M & E WORKS (Cont'd)**

#### **1.3 LPG SYSTEM**

Cylinder LPG Gas Station should be install and be located in accordance with the codes of practice and TCVN. The design of the LPG systems shall be based upon the requirements of the Building Construction Authority and the Vietnamese Standards related.

- a. The supply of LPG for this project shall be from local
- b. There shall be a regulating station in the premises of which LPG is piped from regulating station to various kitchen equipment.
- c. The design shall be independent between AEON and tenants area. Any unexpected emergency occurred to tenant shall not affect each other.
- d. A system of individual and Cylinder meter to enable readings to be carried out for verifying usage of individual user.
- e. LPG supply system shall feed to kitchens, food courts, tenants F&B areas, etc.
- f. Outgoing LPG piping connection for gas appliances at AEON sales floor and backyard.

#### **1.4 LIFTS, ESCALATORS AND TRAVELLATORS SERVICES**

1.4.1 SCOPE OF WORKS but not limited to the following:

- a. Customer (Passenger) Lifts
- b. Services Lifts
- c. Escalators.
- d. Travellators. (If applicable)

1.4.2 REGULATIONS AND DESIGN CRITERIA

a. Regulations

- Construction of Building
- Local Authorities Requirements
- The Fire Department

b. Design Criteria

Average Waiting Interval : To comply with authority and AEON requirement

5 Minutes Handling Capacity: To comply with authority and AEON requirement

Door Clear Width and Height: To comply with authority and AEON requirement

## **GENERAL SPECIFICATIONS**

### **B M & E WORKS (Cont'd)**

#### **1.4 LIFTS, ESCALATORS AND TRAVELLATORS SERVICES (cont'd)**

##### 1.4.3 DESCRIPTION

###### a. Customer (Passenger) Lifts - (24 persons)

- Up-market electronic control ACVVVF type
- Up-market finished for lift interior.
- Access control incorporated in lifts.
- Handicapped car operation panels.
- To comply with Jusco specification.

###### b. Services Lifts – (2,500kg)

- Dimension – refer to detail M&E specification.
- To comply with AEON specification.

###### c. Escalators

- Inclination angle shall be at 30 degrees.
- Dimension – refer to detail M&E specification.
- To comply with AEON specification.

###### d. Travellators (if applicable)

- Inclination angle shall be at 12 degrees.
- Dimension – refer to detail M&E specification.
- To comply with AEON specification.

##### 1.4.4 FIRE EMERGENCY OPERATION

All lifts shall be included for operation under emergency conditions inclusive of Automatic Rescue Device (ARD).

In case of a Fire Alarm or any other Emergency by operation of the key switches in the control panels, all lifts are immediately required to ignore car and landing calls and return non-stop in sequence to the lobby floor and open their doors.

The Fireman's switch shall also be provided at the lobby floor and it cannot be easily interfered with by unauthorized persons. It shall be completed with a metal rimmed breakable glass cover. The cover shall be engraved "Fire Switch" in red lettering. This operation must comply with the requirements of Local Fire Services Department.

##### 1.4.5 MAIN POWER FAILURE OPERATION

Loss of main electrical power which shall start up the standby emergency power generator shall initiate the return of the lifts to the next nearest landing floor and open its doors to discharge all passengers. All lifts and travellators shall continue operation under standby generator set power supply.

## **GENERAL SPECIFICATIONS**

### **B M & E WORKS (Cont'd)**

#### **1.5 HV & LV ELECTRICAL, LIGHTING, LIGHTNING PROTECTION AND EARTHING**

1.5.1 SCOPE OF WORK but not limited to the followings:

- a. High Voltage Switchgear and Related Transformers
- b. Low Voltage Main Switchboard (MSB), Sub-Switchboard (SSB), Distribution Board (DB) and Distribution system.
- c. Standby Power Generators Sets
- d. Light Fittings
- e. Lightning Protection and Earthing

1.5.2 REGULATIONS AND DESIGN CRITERIA

a. Regulations

- Department Of Natural Resources and Environmental (DONRE)
- Power company Authority Rules and Regulations
- TCVN requirements

b. Design Criteria

- Two incoming 22kV, 3 phase, 50Hz (or subject to TCVN requirement)
- LV distribution at 380V, 4-Wire, 3 phase, 50Hz
- Emergency supply at 380V, 4-Wire, 3 phase, 50Hz from standby diesel Generating set
- Diversity Factor : 0.85
- Voltage Drop : < 5%

## **GENERAL SPECIFICATIONS**

### **B M & E WORKS (Cont'd)**

#### **1.5 HV & LV ELECTRICAL, LIGHTING, LIGHTNING PROTECTION AND EARTHING(cont'd)**

##### 1.5.3 DESCRIPTION

###### 1.5.3.1 ELECTRICAL SYSTEM

###### a. HIGH VOLTAGE (HV) SYSTEM

Two incoming independent electrical source received from **Binh Tan** Power Company shall be at 22kV. Stepdown equipments i.e. **15-22/0,4kv** transformers shall be provided.

The electrical supply shall then be fed to various consumer LV switch rooms at usable level of 380V.

###### b. LOW VOLTAGE (LV) SYSTEM

The Main Switch Board (MSB) that consists of essential and non-essential portions Sub-mains cable on trays and bus ducts will be installed above ceiling spaces and within risers. The DB, MP and EDB will tap off from the sub-main cables and bus ducts within the riser. Two separate MSB shall be provided (MSB AEON and MSB Complex & Tenants). Separate essential MSB to serve AEON and Common area respectively.

c. The power points within common areas shall be provided at strategic location for general purpose use to comply with AEON requirement.

d. The protection of Main Switchboards, Sub-switchboards and Distribution Boards are by means of over current/earth fault and earth leakage circuit breakers respectively.

e. Lightning protection system comprises a non-radioactive dome mounted on a mast at highest point of the building and the covering radius (including open car park areas) shall comply to authority requirements or approved by the Engineer. The connection of the dome to the earthing point is via a lightning carrier insulated cable within the electrical riser.

###### 1.5.3.2 LIGHTING

Emergency lights and exit lighted signs will be provided in accordance to Fire Department requirements. The type of lighting for covered car park and plant rooms etc. will be fluorescent fixtures.

The fluorescent light fitting to be use conventional low loss ballast and other type of lighting shall refer to detail M&E specification and to comply with AEON requirement.

Lighting in general must following JIS / BS standard and complies with IEC, the recommended of product is same as Philips or equal.

## **GENERAL SPECIFICATIONS**

### **B M & E WORKS (Cont'd)**

#### **1.5 HV & LV ELECTRICAL, LIGHTING, LIGHTNING PROTECTION AND EARTHING(cont'd)**

##### 1.5.3.3 STANDBY GENERATOR SETS SYSTEM

Sufficient capacity, diesel driven, air-cooled generator to be provided. The rooms where the generator are housed shall be provided with acoustic doors and silencers to meet DONRE"s requirement.

The electrical power generated by the standby generator system will be supplied but not limited to the following:-

- Fire fighting system and equipments
- All lifts
- Escalator and Travellators
- Pressurization/Smoke spill fans
- PABX
- All IT Equipment
- Domestic water equipment
- Sewerage/Sump pumps
- 30% lighting in common and Jusco areas
- Major of lighting, socket outlets, FCU"s for MDF room
- Security and alarm system
- AEON cold room and showcase

#### **1.6 TELECOMMUNICATION SERVICES**

##### 1.6.1 SCOPE OF WORK

- a. Voice
- b. Data
- c. Images
- d. Private Automatic Exchange (PABX) System

##### 1.6.2 REGULATIONS

- Local Authority Rules and Regulations
- Construction of building Codes

## **GENERAL SPECIFICATIONS**

### **B M & E WORKS (Cont'd)**

#### **1.6 TELECOMMUNICATION SERVICES (cont'd)**

##### **1.6.3 DESIGN CRITERIA**

- Each tenant lot is to be provided with at least four (4) points for telecommunication and to comply with Jusco requirement.
- Sufficient flexibility for provision of telecommunication points for departmental store, supermarket and general area. Sufficient telephone points shall be provided for public phone booths.

##### **1.6.4 DESCRIPTION**

- a. The overall telecommunication Services to the building is being planned in conjunction with Local telephone services provider and other telecommunication companies. The incoming lines will terminate at a Subscriber's Main Distribution Frame (MDF) from where cable risers to the Complex will be run. A provision of one (1) room for use as MDF room to receive the incoming to be provided at ground floor. A system of cable trunking in ceiling space and risers, underfloor trunking with junction boxes being located within the corridors shall be used for the entire premises.
- b. The incoming data lines to the building are also being planned in conjunction with Local data provider and other telecommunication companies up to Subscriber's Main Distribution Frame (SDF).
- c. Distribution Point Box (DP) and patch panels, etc. shall be installed at the suitable location on each floor. These boxes and panels are from which cabling shall be drawn to the points located for the entire premises.

##### **1.6.5 PABX SYSTEM**

A room shall be provided for PABX equipment. This room will provide with 24 hours air-conditioning, small power, fire protection, etc. The proposed PABX is of digital type having the following base features. However, the final list of features is subject to discussion with Operators of Building Management :-

1. Touch-tone calling
2. Message waiting services with lights on the telephone
3. Message registration with hard copy printout
4. Dial access to separate trunk groups
5. Classes of services (deny of allow access to any or all trunk groups and features)
6. I/O data support
7. Station initiated call transfer
8. Auto wake-up
9. Remote maintenance
10. Internal music-on-hold
11. Call accounting

## **GENERAL SPECIFICATIONS**

### **B M & E WORKS (Cont'd)**

#### **1.7 CABLE TV SYSTEM (CATV)**

##### 1.7.1. SCOPE OF WORK

- TV Network
- Other TV Network
- Radio Network

##### 1.7.2 REGULATION

- Local Authority Rules and Regulations
- Construction of building Codes

##### 1.7.3 DESIGN CRITERIA

- The departmental store to be provided with TV socket outlets at electrical sales department.
- Each TV socket outlet to be cabled back to interfacing panels that shall be linked to antenna system.

#### **1.8 CCTV SYSTEM**

- The system shall be 72 hours real time P.C. based recording
- The system cabling and equipment for complex zone and Jusco zone shall be combine into one system within the same room.
- Camera and monitor shall be colour type
- Equipment specification shall refer to M&E specifications
- Inclusive but not limited to Jusco and common areas, lift and escalator lobbies, Staircases and indoor/outdoor car parks.

#### **1.9 PA SYSTEM**

- The system shall be provide Public announcement and Bach ground music (PA/BGM) to all are in the project
- The system cabling and equipment for complex zone and Jusco zone shall be combine into one system within the same room.
- The system will be completer with amplifiers, CD players, microphone amplifier module, programmed timer, mixer microphone volume control module, etc
- PA/BGM will be interfaced with Fire alarm system.
- Equipment specification shall refer to M&E specifications

## **GENERAL SPECIFICATIONS**

### **B M&E WORKS (Cont'd)**

#### **1.9 AIR CONDITIONING AND MECHANICAL VENTILATION SYSTEM**

##### **1.9.1 Air Conditioning System**

The air conditioning system shall be as stated below but not limited to the following:

Chilled water is produced by central water-cooled chiller system located at roof level (R134a) (microprocessor type) and distributed to each AHU and FCU.

AHU provides cooling air to Aeon area ie. Aeon GM, Aeon SSM, Restaurant, tenants, complex area and etc.

Air Cooled Split Unit to be provided at AEON kitchen area and food court, office and management rooms, Control room, wet refuse centers, etc.

Chillers, chilled and condenser water pumps and cooling towers shall automatically sequence-operated according to the cooling load. AHU and FCU are automatically operated by 2 way valve in respond to thermostat and automatic balancing valves to balance chilled water distribution.

BTU meters shall be provided at all Complex zoning and F&B tenants.

##### **1.9.2 Mechanical Ventilation and Kitchen Exhaust System**

The mechanical ventilation system shall be as stated below but not limited to the following:

Exhaust and fresh air fan to be provided for toilets, back yards, machine rooms such as plant room, generator room, substation, HT consumer room, Battery & Metering room, Pump room, M & E rooms and etc.

Multiple centralized exhaust system (mild steel sheet welded joint type) and fresh air system to be provided for kitchens, Restaurant and others restaurant as per AEON requirement.

##### **1.9.3 Smoke Spill System**

Smoke Spill System and fresh air system to be provided to all areas, sub tenant, public area, corridor and etc. and to be operated by the emergency power supply from generator. System shall comply with Local Authority requirement and approval.

- End -