**ANNEX C: MEP Requirement**

**MINIMUM REQUIREMENTS FOR MEP (MECHANICAL ELECTRIAL AND PLUMBING)**

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**Building Services**

**1. General**

The Building Services elements of the Project, to be designed by Executive

Architect shall be summarized, but not be limited to the following:

• Air conditioning and Ventilation

• Lighting and Emergency Lighting

• Lightning protection

• Electrical and Power

• Plumbing

• Drainage

• Infrastructure Connections (Electricity, Water, and Drainage )

For the minimum requirements associated with the Building Services see the appropriate attachment.

Building Services design shall be carried out by a SUBCONTRACTORS who are approved by Engineer The SUBCONTRACTORS shall have qualified and experienced personnel and appropriate facilities for carrying out the design works required.

**2. Design Criteria**

**2.1 External Ambient Conditions**

The Building Services elements shall be designed based on using the following external environmental conditions;

Max temp : 320 C and Min Temp: 230C

It should be noted that equipment shall perform to their design parameters based on the above ambient condition, but it will not be expected to safety fail in conditions of 500 C db (dry bulb).

**2.2 Internal Design Conditions**

The Building Services elements shall be designed based on using the following internal environmental conditions;

Storage Areas - 24.50 C db (dry bulb)

- 50% rh (relative humidity)

Equipment rooms - 24.50 C db (dry bulb)

- 50% rh (relative humidity)

Battery rooms - 300 C db (dry bulb)

- 50% rh (relative humidity)

Offices/occupied Areas - 22.50 C db (dry bulb)

- 50% rh (relative humidity)

Locker/Storage - 24.50 C db (dry bulb)

- 50% rh (relative humidity)

Toilets/Pantry (indirect A/C) - 24.50 C db (dry humidity)

- 50% rh (relative humidity)

Humidity shall vary between 40% to 60% but not beyond the comfort zone as set by ASHRAE Standards.

**2.3 Lighting/Emergency Lighting & Small Power Installation**

Lighting/Emergency lighting and Small Power Installation shall be designed to match the building and equipment layouts.

Lighting/Emergency lighting system shall be designed to provide uniform intensities according to current C.I.B.S.E lighting code requirements for buildings.

**3. Building Elements**

**3.1 Roof**

The Heat Transmission (‘U’) value for the Roof shall not exceed 0.57 watts/m2 0C (0.1 Btu/f t2 . hr. 0F)

**3.2 Walls**

The Heat Transmission (‘U’) value for the External walls shall not exceed

0.741 watts/m2 0C (0.13 Btu/f t2 . hr. 0F).

**3.3 Windows**

All windows shall be single glazed and/or shall be fitted with solar reflecting glass.

**4.0 Building Load Factors**

**4.1 Equipment**

The actual heat gains from all the equipment, which shall be installed in different areas, shall be allowed when calculating the air conditioning load.

**4.2 Occupancy**

The occupancy levels shall suit the project/building layout.

**4.3 Ventilation**

Ventilation rates shall be per the C.I.B.S.E Guide Book (1970)

recommendations.

Extract rates for the battery rooms shall be 10 air changes per hour minimum i.e. to ensure that correct temperature and safe toxic levels are maintained.

Extract rates for the toilets, locker rooms and pantries shall be 10 air changes per hour minimum drawing air from a conditioned space if possible.

**4.4 Infiltration**

The design shall take into account infiltration due to windows and door frames taking into consideration the regional.

**5.0 Codes, Standards and Specifications**

All designs shall be carried out in accordance with good engineering practices and the latest revisions of National and International Codes of Practice and Standards