SECTION 2 - EQUIPMENT

2-01 GENERAL

All equipment shall be of such overall dimensions, operating weights, service area requirements and configuration that it can be located where shown on the plans without any adverse effect on its performance and clearance requirements. Any change in other trades work, anticipated by offering alternate equipment, shall be estimated by the Contractor and its cost shall be included in the quoted price for HVAC Works.

Provision for clearance and service spaces shall be made around all mechanical equipment as recommended by equipment manufacturers.

All equipment supplied under this section shall be brand new factory manufactured and factory assembled (unless otherwise specified) and complete in all respects. The type, characteristics, capacity ratings, component sections of all equipment shall be as specified/scheduled. All equipment shall be tested at factory for performance before shipment.

All equipment furnished by the Contractor shall include vibration isolation mounting pads, anchor bolts, frames or any other mounting or supporting accessories.

All equipment shall be complete with all accessories necessary to serve the intended purpose, whether specified or not.

All equipment shall be rated and tested according to the various standards listed in ASHRAE Handbooks (Latest Edition) or approved equal.

2-02 DX - SPLIT AIR-CONDITIONING UNITS

i) Air Cooled Condensing Units (CU-Units)

The condensing unit shall be of the vertical/horizontal discharge, air cooled type, suitable for outdoor installation and sized to deliver the required capacity matched to relevant DX-type indoor unit at specified ambient temperature. The condensing unit shall be of same manufacturer as the Indoor A.C. Unit.

The unit casing shall be constructed from galvanized sheet steel, zincphosphated and with a stoved enamel finish. All access panels and the unit casing shall be provided with thermal and acoustic insulation. All moving components such as compressors and condenser fan motors shall be anti-vibration mounted to minimize the transmission of vibration and noise. The Condensing unit shall be of same manufacturer as the Indoor A.C. unit.

Condenser coils shall be made of seamless copper tubes mechanically expanded into aluminum fins and additionally protected with acrylic/epoxy coating.

Condenser fans shall be of direct drive, statically and dynamically balanced propeller type. Weatherproof fan motors suitable for outdoor use, permanently lubricated and provided with built-in thermal overload protection shall be used. Fans shall be mounted on rubber vibration dampers. All condensing units shall be weatherproof and capable of operating satisfactorily at high and low outdoor temperatures at full load.

Hermetically sealed reciprocating / scroll compressors shall be fitted with internal and external shock absorbers to minimize vibration and noise transmission. The compressor shall be fitted with a discharge line silencer and charged with the required quantity of oil for adequate lubrication circulated by means of an internal oil pump. Shut-off valves at supply and return connections on compressor shall be provided.

Internal overload protection located in the motor windings shall be provided.

The units shall be complete with refrigerant piping consisting of insulated copper pipes and all necessary valves and filterdriers from the unit to the air cooler. Suction and discharge pipes shall be equipped with pipe vibration dampers. Condensing units shall be factory pressure tested, evacuated and dehydrated.

The units shall be installed on steel brackets of adequate strength fixed to the walls with expansion bolts.

ii) Indoor Unit (AC-Units).

The DX-type Indoor units shall be elegant, decorative type, cassette/wall/ceiling/floor mounted. Fresh-air connection shall be provided on side or rear of the units, as specified or approved by the Engineer. All component parts shall be selected, manufactured and assembled by the same manufacturer as for outdoor Condensing unit.

Each unit shall be constructed so as to prevent drumming, distortion and vibration and shall enable ease of handling and replacement of sections.

The units shall include the following sections:

- Washable filters
- DX-type cooling coil
- Supply air fan and motor
- Thermostat microprocessor type with digital display and set point adjustment
- Automatic air swing mechanism
- Supply air plenum with adjustable grille
- Condensate drain pump (for cassette type units) with float switch

- Fresh-air intake duct (for cassette type units)

The casing frame shall comprise of galvanized sheet steel, zincphosphated, with a stoved enamel finish and shall be provided with decorative cover with supply and return air grilles. The decorative cover and grille shall be of ABS thermoplastic polymer with smooth finish in approved colour.

Fan shall be statically and dynamically balanced centrifugal type to suit the pressure and operating characteristics specified.

Fan housings shall be constructed from galvanized steel sheet. The casing shall be constructed to a truly volute form.

Shafts shall be cold finished, turned, and polished steel. Bearings shall be self aligning, permanently lubricated ball bearings.

All parts of fans and motors liable to deterioration shall be protected by paint or grease before delivery to site.

Filters with dust arrestance of 85% as per ASHRAE standards shall be provided. The filter media shall be washable, cleanable, reusable, chemical and moisture resistant, non-perishable, and flame resistant.

Cooling coils shall be manufactured from solid drawn seamless copper tube staggered in the direction of airflow. Tube return bends shall be copper and brazed to tube ends.
Fins shall be of continuous aluminum protected with acrylic / epoxy coating having extended collars for spacing and bonding mechanically to the tube.

Coils shall be air pressure tested to 20.6 bar while immersing the coil in a tank of water after completion.

Tubes shall be expanded onto the fin collar by hydraulic pressure only.

No part of the coil tube ends or headers shall be external to the section. Coils shall be suitably sealed with grommets where connections pass through the unit casing.

The air-cooler shall incorporate a galvanized drain pan with intergral insulation. The pan shall be fitted with galvanized drain socket connections for attachment to drain points. A manometric trap should be supplied and installed by the installing contractor.

The coil shall be easily removable from the unit for maintenance and cleaning purposes.

The coil shall include a thermostatically controlled expansion valve.

Micro-processor based thermostat with integral 3 speed fan selector shall

be supplied as part of the unit for floor standing type and wall mounted type for ceiling/wall type units.

2-03 MEASUREMENT AND PAYMENT

Measurement:

Measurement of acceptably completed works of these items and associated accessories will be made on the basis of actual number provided and work acceptably furnished, installed, tested and commissioned.

Payment

Payment will be made for acceptable measured number of respective items on the basis of rate per number quoted in the Bill of Quantities.