

HVAC-AJ

| AJ KITCHEN @ T3, LUCKNOW AIRPORT | | | | | | | | | |
|----------------------------------|--|-----------------------|-------------------|--------------------|--------------------|---|-----|-----|--------|
| HVAC BOQ | | | | | | | | | |
| Sr. No. | Description Items | Unit | Qty | L | B | H | Nos | QTY | REMARK |
| Note: | Prices shall be based on supply, installation, testing & commissioning (SITC) at site including all taxes, duties, transportation & insurance etc. | | | | | | | | |
| 1 | CHILLED WATER TYPE CEILING SUSPENDE AHU (AIR HANDLING UNIT) : | | | | | | | | |
| 1.1 | CEILING SUSPENDE AHU : | | | | | | | | |
| | Supply and assembly of Ceiling Suspended Double skin cabinet type AHU Integrated (Air handling units) of following specifications: | | | | | | | | |
| | Frame Structure: It shall consist of 48mm Extruded Aluminium with thermal break profile. | | | | | | | | |
| | Panel: 45mm +/- 2mm thick double skin sandwich panels with rockwool insulation of density 64 kg/m ³ or PUF insulation of 48 kg/m ³ , The sheet thickness shall be minimum 0.6 mm for the outer skin pre-coated and 0.8 mm thickness for the inner skin of plain GI. | | | | | | | | |
| | Filtration Section: It shall be provided with single stage washable type of prefilter 'MERV 8' first stage which shall be placed before coil section. | | | | | | | | |
| | Coil Section: Chilled water coil Multi row deep constructed with Aluminium fins of min 0.11mm thick 12 Fins per inch, and copper tubes of min 27 Gauge thickness HYRDOPHYLLIC coated fins. Copper tube shall be min 12.5mm diameter. AHRI certified coil. The coil face area velocity shall not exceed 2.5m/sec (500 fpm). | | | | | | | | |
| | Drain Pan: Condensate drain pan shall be fabricated from 18G SS 304 powder coated, insulated with 13 mm thick closed cell elastomeric(nitrile rubber) insulation. | | | | | | | | |
| | Fan Section: SISW / DIDW Direct drive backward curved fan. The fan section shall be provided with limit switch for safety to shut off fan during Opening of access door. Fan outlet velocity not to exceed 1600 FPM. The sound level shall not be exceed more than 60dB @ 1m from the source. Vibration isolators, Door Limit switch, UV Lamp as per Technical Specifications, AHU Summary Sheet and drawings. Total static pressure has to be calculated by Contractor as per the configuration. | | | | | | | | |
| | Other Details : AHU to house control box/ terminal box with Auto-Manual switch and incomer power terminal, with SPP, Over/ Undervoltage protection, shortcircuit protection and with no-nc contacts (potential free contact) to be provided for tripping on signal from Fire Dampers / Fire Alarm Panel. Power cable from Terminal box to motor & control cabling of required size upto the thermostat / sensor etc. to be provided. Internal electrical and control wiring of AHU to be provided as factory fitted from AHU supplier. The cost shall include all necessary supports & accessories required for installation. | | | | | | | | |
| | Contractor shall design the chilled water coil according to the following conditions: | | | | | | | | |
| | a. Coil air entering temperature - 75.4°F DB | | | | | | | | |
| | b. Coil air leaving temperature - 54 deg. F DB/ 52.99 deg. F WB | | | | | | | | |
| | c. Chilled water temperature entering - 6.0 deg. C/ 42.8 deg. F | | | | | | | | |
| | d. Chilled water temperature leaving - 13.3 deg. C/ 55.9 deg. F | | | | | | | | |
| | Make : VTS / Zeco / Citizen | | | | | | | | |
| | Type | Capacity (Cfm) | Tonnage TR | ESP (mm WG) | No. of Rows | | | | |
| a | CS AHU | 3400 | 8.5 | 25 | 4/6 | | | | |
| | GENERAL NOTES: | | | | | | | | |
| a. | LHS & RHS VALVE station location to be confirmed. | | | | | | | | |
| b. | Fan outlet velocity - 1600 FPM | | | | | | | | |
| c. | Contractor shall submit static pressure calculation for all above units to Client/Consultant. | | | | | | | | |
| d. | Any change in motor HP shall be made at no extra cost to client. | | | | | | | | |
| e. | Fan efficiency shall be minimum 75% | | | | | | | | |
| f. | The cost shall be included lifting & shifting of each equipment / material with all necessary arrangement. Also, it shall be included the cost of scaffolding required for installation of such material / equipment. | | | | | | | | |
| | SUB-TOTAL | | | | | | | | |
| 2 | CHILLED WATER PIPING WITH INSULATION: | | | | | | | | |
| 2.1 | CHW PIPE | | | | | | | | |

Divesh Tsipathi
30/05/24

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| | SITC of MS Heavy duty class 'C' ERW Chilled Water pipe conforming to IS 1239 - 2004 primer painted including bends, tees, MS supports, PUFF saddles, anchor fasteners, steel angles and any other material required to complete the work. The piping flange connection bolts, washers and nuts should be hot dipped galvanized. Flourscent Plastic Sticker/ paint shall be applied to indicate Water flow directions. Only End flanges to be used for capping of pipes. "Table E" of BS code for flange thickness to be adhered. | | | | | | | | |
| | Make: Jindal Hissar / TATA | | | | | | | | |
| | Ø 40 mm | Rmt | 40 | | | | | | |
| a | Tap off point to CSU | | | | | | | | - |
| | Pipe- 1 | | 3.3 | | | | 2 | | 7 |
| | Pipe- 1 | | 3.3 | | | | 2 | | 7 |
| | Pipe- 2 | | 6 | | | | 2 | | 12 |
| | Pipe- 2 | | 6 | | | | 2 | | 12 |
| | Total Qty | | | | | Total | | | 37.2 |
| | Previous Bill | | | | | | | | 13.2 |
| | Present Bill | | | | | | | | 24 |
| 2.2 | CHILLED WATER PIPING INSULATION - INTERNAL USE | | | | | | | | |
| | SITC of insulation for chilled water. piping. For internal pipe - Stick 25mm thick Nitrile rubber class "O" Closed cell nitrile rubber with anti-microbial coating on it. Insulation shall have Thermal conductivity of 0.033 W/(m.K) and water vapor permeance of 0.10. Joints should be sealed with 50 mm wide 3 mm thick self adhesive tape and putting PVC bands at all supports. | | | | | | | | |
| | Make: Armaflex & K-flex | | | | | | | | |
| | Ø 40 mm | Rmt | 40 | | | | | | |
| a | Tap off point to CSU | | | | | | | | |
| | Pipe- 1 | | 3.3 | | | | 2 | | 7 |
| | Pipe- 1 | | 3.3 | | | | 2 | | 7 |
| | Pipe- 2 | | 6 | | | | 2 | | 12 |
| | Pipe- 2 | | 6 | | | | 2 | | 12 |
| | Total Qty | | | | | Total | | | 37 |
| | Previous Bill | | | | | | | | 13.2 |
| | Present Bill | | | | | | | | 24 |
| 2.3 | BALL VALVE | | | | | | | | |
| | SITC of following sizes of Ball Valve consist of Cap, Brass Body, Rated for 150 psi SWP, 600 psi WOG Pressure: Two-piece construction; with brass body, regular port, B-16 chrome-plated ball and stem, replaceable "Teflon" or "TFE" seats and seals, blowout-proof stem, vinyl covered steel handle, threaded or soldered ends and extended stem for insulated piping. Same valve shall be used as a Drain valve. | | | | | | | | |
| | Make: Zoloto / Audco / Kitz | | | | | | | | |
| a | Ø 40 mm | Nos. | 4 | | | | | | |
| a | Ball valve | | | | | | 4 | | 4 |
| | Total Qty | | | | | Total | | | 4 |
| | Previous Bill | | | | | | | | 2 |
| | Present Bill | | | | | | | | 2 |
| 2.4 | BALL VALVE WITH Y-STRAINER | | | | | | | | |
| | SITC of following sizes of Brass Ball Valve with Y-Strainer consist of Cap, Brass Body, Rated for 150 psi SWP, 600 psi WOG Pressure: Two-piece construction; with brass body, regular port, B-16 chrome-plated ball and stem, replaceable "Teflon" or "TFE" seats and seals, blowout-proof stem, vinyl covered steel handle, threaded or soldered ends and extended stem for insulated piping. Filter element shall be of non magnetic SS sheet with perforation. | | | | | | | | |
| | Make: Zoloto / Audco / Kitz | | | | | | | | |
| a | Ø 40 mm | No. | 1 | | | | | | |
| a | BALL VALVE WITH Y-STRAINER | | | | | | 1 | | 1 |
| | Total Qty | | | | | Total | | | 1 |
| | Previous Bill | | | | | | | | 1 |
| | Present Bill | | | | | | | | 0 |
| 2.5 | PIBCV VALVES | | | | | | | | |

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30/05/24

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| | SITC of Pressure Independent Balancing cum Control Valves (PIBCV) including integrated motorised control valve and balancing device for combined flow and water balancing requirement. Valve body to be rated for PN 16. The valve design flow rate should be factory calibrated with +/- 5% flow accuracy. Valve shall have necessary measuring ports, drain port, flanges etc., Valve shall also provide temperature sensor with necessary cabling (min 2mtr length to be considered with each valve). The balancing to be done through microprocessor based hand held terminal / POT and the same results shall be furnished in the water balancing report as part of commissioning report and handing over manual. | | | | | | | | |
| | Make: Oventrop / Siemens / Danfoss | | | | | | | | |
| a | Ø 40 mm | No. | 1 | | | | | | 1 |
| a | PIBCV VALVES | | | | | | | | |
| | Total Qty | | | | | | Total | | 1 |
| | Previous Bill | | | | | | | | 0 |
| | Present Bill | | | | | | | | 1 |
| 2.6 | Auto Air Vent Valves | | | | | | | | |
| | Make: Anergy / Flamco | | | | | | | | |
| | Providing and fitting Auto Vent Valves. | | | | | | | | |
| a | SITC of Auto air vent in each risers & common headers & AHU. 3/4" auto vent valves at each coil / riser/ header. | Nos. | 2 | | | | | | 2 |
| a | Auto Air Vent Valves | | | | | | | | |
| | Total Qty | | | | | | Total | | 2 |
| | Previous Bill | | | | | | | | 0 |
| | Present Bill | | | | | | | | 2 |
| 2.7 | SITC of Pressure gauges & Thermometers | | | | | | | | |
| | Make: H Guru / Waree | | | | | | | | |
| | Necessary pressure gauges and thermometers 4" Dial type. | | | | | | | | |
| a | Water Pressure gauges 150mm dial complete with gauge valves, mounting, fittings and copper tubing extension wherever required. Pressure gauges Range 0-10 Kg/CM2 | Nos. | 2 | | | | | | 2 |
| a | SITC of Pressure gauges & Thermometers | | | | | | | | |
| | Total Qty | | | | | | Total | | 2 |
| | Previous Bill | | | | | | | | 0 |
| | Present Bill | | | | | | | | 2 |
| b | Thermometers of the mercury in glass stem type and copper separable well complete with guard etc., of industrial grade mounting on water lines. Length 9/12 inches, Thermometer, Range 0-50 deg C | Nos. | 2 | | | | | | 2 |
| a | Thermometers of the mercury in glass stem | | | | | | | | |
| | Total Qty | | | | | | Total | | 2 |
| | Previous Bill | | | | | | | | 0 |
| | Present Bill | | | | | | | | 2 |
| c | Thermowells | Nos. | 4 | | | | | | 4 |
| | Total Qty | | | | | | Total | | 4 |
| | Previous Bill | | | | | | | | 0 |
| | Present Bill | | | | | | | | 4 |
| d | SITC of Brass Test Plug of industrial grade mounting on water | Nos. | RO | | | | | | |
| 2.8 | INSULATED CONDENSATE DRAIN PIPE | | | | | | | | |
| | SITC of UPVC pipes of following sizes for drain with necessary supports and fittings such as elbows, tees & reducers etc. The insulation line to be insulated with nitrile rubber insulation of thickness 9mm and wrapped by weather proof protection tape. The Pipe wherever concealed should also have a parallel line as a standby arrangement in case of block of primary pipe. | | | | | | | | |
| | Make: Supreme, Prince, Astral | | | | | | | | |
| a | Ø 25 mm | Rmt | RO | | | | | | |
| b | Ø 32 mm | Rmt | 10 | | | | | | |

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30/05/24

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| a | Drain insulation | | | | 8 | | | - | 8 |
| | | | | | | | | | |
| | Total Qty | | | | | | | Total | 8 |
| | Previous Bill | | | | | | | | 0 |
| | Present Bill | | | | | | | | 8 |
| | NOTES FOR PIPING: | | | | | | | | |
| a | Cover all open pipe ends with muslin cloth during construction | | | | | | | | |
| b | Pipe cleaning & chemical treatment as per specs shall be included in the piping cost. | | | | | | | | |
| c | Unit rates for all indicated sizes of pipes & valves shall be furnished. | | | | | | | | |
| d | Cleaning/Painting of pipe before insulation shall be included in piping cost. | | | | | | | | |
| e | The piping support should be as per tender specification and additional supports are to be provided Contractor as decided by Consultant. | | | | | | | | |
| f | All the valves shall be insulated with the same material as that of Chilled water piping and cost of insulation for valves shall be considered. | | | | | | | | |
| | SUB-TOTAL | | | | | | | | |
| 3 | VENTILATION SYSTEM | | | | | | | | |
| 3.1 | KITCHEN DRY SCRUBBER | | | | | | | | |
| | SITC of Dry scrubber – Electrostatic Air cleaner with starter panel as per specifications, suitable for following capacities, including electrical starter panel . The Air filtration efficiency should be between 90 to 95% & units shall be staked one above other or side by side as per site requirement, if vendor will propose multiple units. | | | | | | | | |
| | Finishing - Power coated, Dark Blue | | | | | | | | |
| | Operating voltage - 220 Vac+/-10%, 50 Hz (Single phase) | | | | | | | | |
| | Features - Short circuit, arc protection and auto restore power supply, BMS (Building Management System) terminals provided, Auto power cut-off when door is opened, Indicator LEDs for normal or wash indicator, Set of Terminals for remote LED normal or wash indicator | | | | | | | | |
| | Efficiency - Upto 95%, meets NIOSH 5026 Oil Mist Test | | | | | | | | |
| | Particle Size - Collects particles as small as 0.01 microns | | | | | | | | |
| | Motor - Sealed ball bearings UL, single phase. | | | | | | | | |
| | Cell - Ionizing voltage - 12 KVdc | | | | | | | | |
| | Collector voltage - 6 KVdc | | | | | | | | |
| | One cell comprising of 9 ionizing wires and 25 collection plates | | | | | | | | |
| | Controls - Auto cut-off when door is opened. Indicator lights for fault, normal or wash function. | | | | | | | | |
| | Pre-filter - Aluminium mesh, washable Dry contact for BMS. | | | | | | | | |
| | Make: Rydair / Espair | | | | | | | | |
| | CFM - 3000 | No. | 1 | | | | | | 1 |
| | | | | | | | | | |
| | | | | | | | | | |
| | Total Qty | | | | | | | Total | 1 |
| | Previous Bill | | | | | | | | 0 |
| | Present Bill | | | | | | | | 1 |
| | SUB-TOTAL | | | | | | | | |
| 4 | SHEET METAL WORKS: | | | | | | | | |
| 4.1 | FACTORY FABRICATED G.I RECTANGULAR DUCT | | | | | | | | |
| | Supply, Fabrication, Testing, and Commissioning of Factory Fabricated GI Sheet Metal 120GSM Rectangular boxed ducting, Plenums, Cowls, Elbows with turning vanes, Splitters, Reducers, Flanges, Collars etc as per IS and Installation as per SMACNA standards, The complete ducting shall be provided with MS Supports, Rods, Angles, Flanges, Bracing, Rubber Gaskets, Wooden frames, Canvas Connections, etc. as per drawings and specifications. | | | | | | | | |
| | GI Sheet Makes : Tata, Jindal, SAIL, Ispat | | | | | | | | |
| | Make: Rola Star, Zeco & Ductofab | | | | | | | | |
| a | 18 Gauge GI Sheet Metal Duct (Above 2251mm & Plenum) | Sq.mtr | RO | | | | | | |
| b | 20 Gauge GI Sheet Metal Duct (1501-2250mm) & For Kitchen Works | Sq.mtr | 30 | | | | | | |
| | | | | | | | | | |
| a | Duct-1 (650x400) | | 0 | 3.0 | 0.6 | | | 4 | 7.20 |
| | | | | 3.0 | 0.4 | | | 4 | 4.80 |
| b | Duct-2 (650x400) | | 0 | 4.0 | 0.8 | | | 4 | 12.00 |

Divesh Tripathi
30/05/24

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| | SITC of opposed blade aerofoil type 1.2 mm thick Anodized Aluminium volume control dampers for ducts shall be provided with concealed gears, plastic operator and quadrants for manual control of volume of air flow and for proper balancing of the air distribution system as per the approved shop drawings and specifications. | Sq.mtr | 1.5 | | | | | 1.5 |
| | Make: Cosmos, Air Master & System Air | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Total Qty | | | | | | Total | 1.50 |
| | Previous Bill | | | | | | | 0 |
| | Present Bill | | | | | | | 1.5 |
| 4.5 | OPPOSED BLADE DAMPER | | | | | | | |
| | SITC of Aluminium Opposed blade dampers black powder coated vertical blades type for supply air collar. The damper should be gear operated type. | Sq.mtr | 1 | | | | | 1 |
| | | | | | | | | |
| | | | | | | | | |
| | Total Qty | | | | | | Total | 1.00 |
| | Previous Bill | | | | | | | 0 |
| | Present Bill | | | | | | | 1 |
| 4.6 | CANVAS CONNECTION | | | | | | | |
| | SITC of Flexible connections between mouth piece of Fan and initial piece of ducting with inspection zip. Flexible connections shall be double thickness non-flammable material (Fire retardant type). | | | | | | | |
| a | For AHU | No | 1 | | | | 1 | 1 |
| | | | | | | | | |
| | | | | | | | | |
| | Total Qty | | | | | | Total | 1.00 |
| | Previous Bill | | | | | | | 0 |
| | Present Bill | | | | | | | 1 |
| b | For Kitchen Ventilation Fan | Nos. | RO | | | | | |
| 4.7 | CURTAIN TYPE FIRE DAMPER | | | | | | | |
| | SITC of fire dampers consist of 16G GI frame, 20G GI interlocking blades secured with SS springs, blades outside airstream clamped with fusible link UL-555 listed with melting point 165 / 225°F, etc; as per the approved shop drawings and specifications. | | | | | | | |
| | Make: Carryaire / System Air / Dynacraft / Air Master | | | | | | | |
| a | Bare fire dampers | Sq.mtr | 1 | | | | | - |
| | | | | | | | | |
| | | | | | | | | |
| | Total Qty | | | | | | Total | - |
| | Previous Bill | | | | | | | 0 |
| | Present Bill | | | | | | | 0 |
| b | Fusible link as per specification UL 555 | No | 1 | | | | | 0 |
| | | | | | | | | 0 |
| | | | | | | | | |
| | Total Qty | | | | | | Total | - |
| | Previous Bill | | | | | | | 0 |
| | Present Bill | | | | | | | 0 |
| | NOTES: | | | | | | | |
| | The ducting support should be as per tender specification and additional supports are to be provided by Contractor as decided by Consultant. | | | | | | | |
| | Muslin cloth cover for all air outlets during construction. | | | | | | | |
| | Pressure testing of complete duct work as per DW/ SMACNA standard. | | | | | | | |
| | Silicon sealant for longitudinal & transverse joints as per specification. | | | | | | | |
| | Diffusers & grilles shall be powder coated as per color approved by Architect. | | | | | | | |
| | SUB-TOTAL | | | | | | | |
| 5 | THERMAL & ACOUSTIC INSULATION: | | | | | | | |

Divesh Toibathi
30/05/24

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| 5.1 | THERMAL INSULATION | | | | | | | | |
| | Supply & fixing of Thermal insulation for supply air duct using 13mm thick class "O" Closed cell nitrile rubber with anti-microbial coating on it. Insulation shall have Thermal conductivity of 0.033 W/(m.K) and water vapor permeance of 0.10. Joints should be sealed with 50 mm wide 3 mm thick self adhesive tape. The duct shall be stick with recommended adhesive. | Sq.mtr | 65 | | | | | | |
| | Make: Armaflex & K-flex | | | | | | | | |
| a | Duct-1 (650x400) | | 0 | 3.6 | 0.7 | | 4 | 9.36 | |
| | | | | 3.6 | 0.4 | | 4 | 5.76 | |
| b | Duct-2 (650x400) | | 0 | 0.8 | 0.7 | | 4 | 2.08 | |
| | | | | 0.8 | 0.4 | | 4 | 1.28 | |
| c | Duct-3 (400x400) | | 0 | 2.6 | 0.4 | | 4 | 4.16 | |
| | | | | 2.6 | 0.4 | | 4 | 4.16 | |
| d | Duct-4 (400x400) | | | 1.3 | 0.4 | | 4 | 2.08 | |
| | | | | 1.3 | 0.4 | | 4 | 2.08 | |
| e | Duct-5 (400x400) | | | 2.5 | 0.4 | | 4 | 4.00 | |
| | | | | 2.5 | 0.4 | | 4 | 4.00 | |
| f | Duct-6 (350X200) | | | 3.4 | 0.4 | | 4 | 4.76 | |
| | | | | 3.4 | 0.2 | | 4 | 2.72 | |
| g | Duct-7 (200X350) | | | 12.0 | 0.2 | | 4 | 9.60 | |
| | | | | 12.0 | 0.4 | | 4 | 16.80 | |
| | Total Qty | | | | | | Total | 72.84 | |
| | Previous Bill | | | | | | | 36.42 | |
| | Present Bill | | | | | | | 36.42 | ✓ |
| 5.2 | ACOUSTIC INSULATION | | | | | | | | |
| | Supply & fixing acoustic insulation for ducting using Class "1" closed cell elastomeric insulation of 10mm thick Nitrile rubber insulation adhesive, longitudinal & transverse joints sealed with adhesive in neat & clean manner. Material shall be processed Nitrile Rubber foam with anti-microbial protection. Insulation shall have thermal conductivity of 0.047 W/(m.K) and density of 140 - 180 kg/m ³ . | Sq.mtr | 10 | | | | | | |
| | Make: Armaflex & K-flex | | | | | | | | |
| a | Duct-1 (650x400) | | 0 | 1.0 | 0.7 | | 4 | 2.60 | |
| b | Duct-2 (650x400) | | 0 | 1.0 | 0.5 | | 4 | 1.80 | |
| | | | | | | | | | |
| | Total Qty | | | | | | Total | 4.40 | |
| | Previous Bill | | | | | | | 2.2 | |
| | Present Bill | | | | | | | 2.2 | ✓ |
| 5.3 | THERMAL INSULATION FOR KITCHEN VENTILATION DUCTS | | | | | | | | |
| | SITC of Glass Fibre Blanket Insulation material bonded with Thrmosetting Resin, with factory applied laminated aluminium foil of 22 micrns with fibre glass backing. Further, wire mesh along with 7 mil cloth shall be applied on above the insulation with proper adhesivse. Nominal density : 32 Kg/CuM. Thermal conductivity, < 0.033 W/m.K at 24 degreeC. All Insuation material and adhesives shall be as per Class I for surface spread and in accordance with BS 476, & Class O for non-combustible grade. | Sq.mtr | 55 | | | | | | |
| | Make: Armaflex & K-flex | | | | | | | | |
| a | Duct-1 (650x400) | | 0 | 1.0 | 0.7 | | 4 | 2.60 | |
| b | Duct-2 (650x400) | | 0 | 1.0 | 0.5 | | 4 | 1.80 | |
| | | | | | | | | | |
| | Total Qty | | | | | | Total | 4.40 | |
| | Previous Bill | | | | | | | 2.2 | |
| | Present Bill | | | | | | | 2.2 | ✓ |
| | Note: | | | | | | | | |
| a. | Insulation work to be coordinated with other agencies and repair to be included by contractor as per site requirement. | | | | | | | | |
| b. | Vendors to take care of the installation, if any damages takes place the vendor to repair or replace and hand over to clients in good and acceptable condition. | | | | | | | | |
| c. | Thermal insulation shall be internal for Elliptical / Exposed ducting. | | | | | | | | |
| | SUB-TOTAL | | | | | | | | |

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30/05/24

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| 6 | ELECTRICAL WORKS: | | | | | | | | |
| 6.1 | STARTER PANEL | | | | | | | | |
| | SITC of indoor / outdoor, wall mounting type 3PH, 415VAC MOTOR STARTERS IN CRCA SHEET STEEL ENCLOSURE with necessary supporting brackets and required accessories, etc., The Enclosure shall be provided with knockouts suitable for cable termination at TOP & BOTTOM for incoming and outgoing power cables of A2XFY type and size specified. The starters shall be complete with suitable MPCB/MCCB, Contactor, Bi-metal O/L relay with SPP, ON/OFF Push buttons, on / off / trip indication Lamp, on off push button, & phase indication Lamp. Selection of relay, contractor, MPCB/MCCB etc. as per Type-2 Coordination. Panel shall have provision to connect with BMS. | | | | | | | | |
| a | Suitable for 3400 CFM AHU, DOL Starter Panel | No. | 1 | | | | 1 | 1 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | Total Qty | | | | | Total | | 1.00 | |
| | Previous Bill | | | | | | | 1 | |
| | Present Bill | | | | | | | 0 | |
| 6.2 | POWER CABLING | | | | | | | | |

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| | | | | | | | | | | |
|---------------|--|------|----|--|--|--|--|-------|-------|--|
| | Supply, handling, laying effecting proper connections testing and commissioning of following sizes of 1.1 KV grade XLPE insulated FRLS Aluminium /Copper conductor cables laid over MS supports cable racks or fixing on walls including clamping the cable to supports in an approved manner as required complete with Copper earthing as specified for continuous earthing along with cable. All complete as required and as per final instruction as given by Owners/ Consultants and as per Technical specifications. Earthing shall be measured separately and shall be connected in two runs. Power to ELCB to be provided near each ODU by electrical contractor. | | | | | | | | | |
| a | Suitable Power Cable: | | | | | | | | | |
| | Suitable for 3400 CFM AHU, DOL Starter Panel | Rmt | 10 | | | | | 9 | 9 | |
| | | | | | | | | | | |
| | | | | | | | | Total | 9.00 | |
| | | | | | | | | | 9 | |
| Previous Bill | | | | | | | | | | |
| | | | | | | | | | 0 | |
| Present Bill | | | | | | | | | | |
| | Suitable for 3000 CFM Dry Scrubber, 1 ph | Rmt | 10 | | | | | 10 | 10 | |
| | | | | | | | | | | |
| | | | | | | | | Total | 10.00 | |
| | | | | | | | | | 10 | |
| Previous Bill | | | | | | | | | | |
| | | | | | | | | | 0 | |
| Present Bill | | | | | | | | | | |
| b | Earthing: | Rmt | 40 | | | | | 35 | 35 | |
| | 8 SWG | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | Total | 35.00 | |
| | | | | | | | | | 35 | |
| Previous Bill | | | | | | | | | | |
| | | | | | | | | | 0 | |
| Present Bill | | | | | | | | | | |
| 6.3 | BTU METER | | | | | | | | | |
| | Supply,fixing and testing of inline Btu meter for the flow rate & temperature measurement consisting mainly of following 3 parts | | | | | | | | | |
| | a) Ultrasonic Flow Meter | | | | | | | | | |
| | b) Matched pair of temp sensor | | | | | | | | | |
| | c) Flowcell Sensor | | | | | | | | | |
| | c) BTU Meter - 4 - 20mA DC from flowmeter | | | | | | | | | |
| | Insertion type flowmeter shall be suitable for chilled water application for temp. Ranging from 0 to 50 deg C. Power supply shall be 240V AC (+/-) 15 %. Display shall have 16 characters LCD display with Back light, flow rate, Velocity, totaliser etc. Output shall be BMS Modbus compatible & shall have keypad lockout security option. It also should be able to show various units such as gallons, ft^3, lbs, liters, m^3, kg etc | | | | | | | | | |
| | Make: Honeywell / Danfoss / Siemens | | | | | | | | | |
| a | Dia 40 mm | No. | 1 | | | | | | 1 | |
| | | | | | | | | | | |
| | | | | | | | | Total | 1.00 | |
| | | | | | | | | | 0 | |
| Previous Bill | | | | | | | | | | |
| | | | | | | | | | 1 | |
| Present Bill | | | | | | | | | | |
| 6.4 | CABLE TERMINATION : | | | | | | | | | |
| | Supply & Making of Cable termination of armoured / unarmoured cables 1.1 KV grade including installation of cable glands, cable lugs (Aluminium for A2XFY & copper for 2XFY & YY Double compression type), heat shrinkable sleeves on long ends, crimping paste etc. The work includes testing & commissioning of cables, meggering values & submitting reports of tests. (One set includes termination of all cores of one end only). All crimping tools & dies shall be arranged by contractor. | | | | | | | | | |
| a | Suitable for 2700 CFM AHU | Nos. | 2 | | | | | | 2 | |
| | | | | | | | | | | |
| | | | | | | | | Total | 2.00 | |
| | | | | | | | | | 0 | |
| Previous Bill | | | | | | | | | | |

Divesh Tripathi
30/05/24

| | | | | | | | | | | | |
|-----|---|-----|---|--|--|--|--|-------|--|--|------|
| | Present Bill | | | | | | | | | | 2 |
| 6.5 | CABLE TRAYS | | | | | | | | | | |
| | Supplying & Fixing of following sizes of GI cable tray duly painted perforated type of height 50mm along with necessary bends, reducers etc. anchored along the wall / suspended from the ceiling with necessary MS supports. | | | | | | | | | | |
| a | 50mm wide | Rmt | 5 | | | | | | | | 5 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | Total Qty | | | | | | | Total | | | 5.00 |
| | Previous Bill | | | | | | | | | | 0 |
| | Present Bill | | | | | | | | | | 5 |
| | SUB-TOTAL | | | | | | | | | | |
| | | | | | | | | | | | |
| | GRAND TOTAL | | | | | | | | | | |

Divesh Tatyathi

30/05/24

30/05/24