पनवेल महानगरपालिका
जाहीर निविदा दरपत्रक

आयुक्त, पनवेल महानगरपालिका हद्दीतील प्रभाग समिती 'क' प्रभाग क्र.१४ मधील भुखंड क्र.०४, सेक्टर – १६, नवीन पनवेल (प) या भूखंडावर पनवेल महानगरपालिकेचे "स्वराज्य" मुख्यालय इमारतीचे अंतर्गत सजावट व इतर अनुषंगीक कामे करणे. या कामाचे अंदाजपत्रक बनविण्याकरीता खाली नमूद केलेल्या बाबींकरीता खालील नमूण्यात दर मागविण्यात येत आहे.

अ.क्र.	कामाचे नाव	मुदत
१	पनवेल महानगरपालिका हद्दीतील प्रभाग समिती 'क' प्रभाग क्र.१४ मधील भुखंड क्र.०४, सेक्टर –१६, नवीन पनवेल (प) या भूखंडावर पनवेल महानगरपालिकेचे "स्वराज्य" मुख्यालय इमारतीचे अंतर्गत सजावट व इतर अनुषंगीक कामे करणे.	०४/१२/२०२३ ते १२/१२/२०२३ (७ दिवस)

CHILLER HI SIDE & AHU LOW SIDE WORK
Specification

Sr. No	DESCRIPTION	Quantity	Unit
	NOTE:- ALL ITEM RATES SHOULD BE FOR 3 YEARS DEFECT LIABILITY WARRANTY PERIOD		
	HIGH SIDE		
1.0	**WATER COOLED SCREW CHILLERS**		
1.1	**Water-cooled SCREW Chiller with VFD**		
	Supply,Installation, Testing and Commissioning Water-cooled Screw Chiller of 310 TR ,capacity water cooled Screw chillers as per the following design data;It should be IBMS Compatible to control and moniter data from IBMS system ,as per specification,or as directed etc. complete… Make:Carrier/ Trane/Hitachi-Jhonson control(York)	**2.00**	**NOS**
	(Note :- C.O.P of Chiller should be 6.0 or above at AHRI condition)		
	Compressors/ Motors/ Starters :		
	Type -Screw		
	Power : 400V/3 ph/50Hz		
	Type of starter- Soft starter		
	Insulation- Class F		
	Refrigerant- R134a/R123		
	Capacity control- Modulating inlet guide vanes		
	Capacity range- 25% to 100% without surging or hot gas bypass.		
	Evaporators		
	Chiller should be designed at 13 Deg Delta T		

	Chilled water entering temperatures 13.7^{o}C		
	Chilled water leaving temperatures 6.5^{o}C		
	Chilled water flow rate (US GPM)- …		
	Pressure drop (Mts of water column) - 6 (max)		
	Fouling factor (Metric Units)- 0.00025 (hr-sqft-F)/BTU		
	Tube material- Copper		
	Water velocity (m/s)- 2.4 (max)		
	Water box- Required		
	Condensers		
	Condenser water entering temperatures 31.3^{o}C		
	Condenser water leaving temperatures 35.3^{o}C		
	Condenser water flow rate (US GPM)….		
	Pressure drop (Mts of water column) - 6 (max)		
	Fouling factor (Metric Units)-0.00075 (hr-sqft-F)/BTU		
	Tube material- Copper		
	Water box- Required		
	Controls		
	Gauges, controls, control panels etc. whether specifically mentioned or not, microprocessor		
	based, compatible with Building Management System including protocol interface cards.		
	Microprocessor to control the following.		
	1) Chilled water temperature indicators and PIDT control		
	2) Fault diagnosis		
	3) Auto/manual on/off facility with timer		
	4) Recording of hours of operation, No. of start etc.		
	5) Automatic capacity control		
	Above Chillers With VFD Drive		
1.2	**Water-cooled SCREW Chiller with VFD**		
	Supply,Installation, Testing and Commissioning of Water-cooled Screw Chiller of 125 TR ,capacity water cooled Screw chillers as per the following design data;It should be IBMS Compatible to control and moniter data from IBMS system ,as per specification,or as directed etc. complete...	**1.00**	**NOS**

	Make:Carrier/ Trane/Hitachi-Jhonson control(York)		
	(Note :- C.O.P of Chiller should be 6.0 or above at AHRI condition)		
	Compressors/ Motors/ Starters :		
	Type - Screw		
	Power : 400V/3 ph/50Hz		
	Type of starter- Soft starter		
	Insulation- Class F		
	Refrigerant- R134a/R123		
	Capacity control- Modulating inlet guide vanes		
	Capacity range- 25% to 100% without surging or hot gas bypass.		
	Evaporators		
	Chiller should be designed at 13 Deg Delta T		
	Chilled water entering temperatures 13.7^{o}C		
	Chilled water leaving temperatures 6.5^{o}C		
	Chilled water flow rate (US GPM)- …		
	Pressure drop (Mts of water column) - 6 (max)		
	Fouling factor (Metric Units)- 0.00025 (hr-sqft-F)/BTU		
	Tube material- Copper		
	Water velocity (m/s)- 2.4 (max)		
	Water box- Required		
	Condensers		
	Condenser water entering temperatures 31.3^{o}C		
	Condenser water leaving temperatures 35.3^{o}C		
	Condenser water flow rate (US GPM)….		
	Pressure drop (Mts of water column) - 6 (max)		
	Fouling factor (Metric Units)-0.00075 (hr-sqft-F)/BTU		
	Tube material- Copper		
	Water box- Required		
	Controls		
	Gauges, controls, control panels etc. whether specifically		

	mentioned or not, microprocessor		
	based, compatible with Building Management System including protocol interface cards.		
	Microprocessor to control the following.		
	1) Chilled water temperature indicators and PIDT control		
	2) Fault diagnosis		
	3) Auto/manual on/off facility with timer		
	4) Recording of hours of operation, No. of start etc.		
	5) Automatic capacity control		
	Above Chillers With VFD Drive		
1.3	**Factory Testing**		
	Full load capacity test at factory at design operating conditions in confirmance with AHRI/Eurovent standards at 4 operating points.		
a	**310 TR WC Screw chiller (4 Point Testing Charges for any one No.Chiller) & 1 no. 125 TR WC Screw chiller (4 Point Testing Charges) inclusive of 5 person Travelling /Lodging Bording Charges (Person from Customer / Arch / Consultant and PMC Representatives)**	**1.00**	
1.4	**Loading unloading, Rigging and lowering to Ground lvl and placement on location. Installation, Testing and Commissioning of Water-cooled Screw Chiller of 3 Nos for (2Nos. 310 TR & 1 nos.125 TR)**	**3.00**	**NOS**
1.5	**Chiller Plant Manager**		
a	**Supply , installtion,testing and commissioning of plant manager for sequencing run of chillers ,pumps and cooling towers ,such that operation is on load of basis to ensure equal run time ,as per specification,or as directed etc. complete... For below Chiller plant Details.It should be IBMS Compatible to control and moniter data from IBMS system,,or as directed etc. complete.. For 2 Nos. Chiller 310 TR (2W) with Secondary pump (2W+1S) , Primary pump (2W+1S) & Condensor Pumps (2W+1S) + 1 Nos. Chiller 125 TR (1W) with Secondary pump (1W+1S) , Primary pump (1W+1S) & Condensor Pumps (1W+1S) , Make:Carrier/ Trane/Hitachi-Jhonson control(York)**	**1.00**	**NOS**
1.6	**Frame Work**		
	SITC of Necessary MS frame work including civil work at 1st Lvl Utility Block for installing 2 Nos 310 TR & 1 No 125 TR Screw Chillers , Frame work shall include I-beam supports between columns/RCC blocks and chucker plate for supporting the equipment. RCC blocks to be supplied by AC Contractor. 2 access ladders fixed to the frame work to be included in scope ,as per specification,or as directed etc. complete...MS for Frame and supports Make :-Tata / SAIL / Jindal /	**1.00**	**JOB**

	Nippon		
	LOW SIDE WORK		
2.0	**PUMPS**		
2.1	**Chilled Water Pumps**		
2.1.1	**Primary Chilled Water Pumps**		
	Supply, installation, testing & commissioning of Chilled water centrifugal pumps for air conditioning system complete with,TEFC IP 55 motor min IE3 rating, mechanical seal, GI gland drain, vibration isolators,insulation, necessary accessories and fitting as per specs.,or as directed etc. complete.. (Trimmed Impeller with Horizontal split case) (Starters In Main electrical Chiller Distribution panel) Make:Grundfos/ Xylem/ Armstrong		
2.1.1.1	**Flow Rate : 574 USGPM (Trimmed Impeller with Horizontal split case)**		
	Head : 28 MTRS (Subject to final design calculations)		
	Motor : HP (as per manufacturer's standards)		
	Pump RPM should be as per vender design		
	(2 W+ 1 S)	**3.00**	**NOS**
2.1.1.2	**Flow Rate : 245 USGPM (insulated End Suction centifugal)**		
	Head : 19 MTRS (Subject to final design calculations)		
	Pump RPM should be as per vender design		
	(1 W+ 1 S)	**2.00**	**NOS**
1. **2.2**	**Secondary Chilled Water Pumps**		
	Supply , installation, testing and commissioning of ,Chilled water centrifugal pumps for air conditioning system complete with TEFC IP 55 motor min IE3 rating, mechanical seal, GI gland drain, vibration isolators, insulation, necessary accessories and fitting as per specs.or as directed etc. complete.. (Horizantal split case) (By pass Starters for Secondary pump and VFD In Main electrical Chiller Distribution panel)		
	Flow Rate : 574 USGPM (Horizantal split case)		
	Head : 36 MTRS (Subject to final design calculations)		
1.	**Motor : HP (as per manufacturer's standards)**		
2.	**Pump RPM should be as per vender design**		
3.	**(2 W + 1 S)**	**3.00**	**NOS**

4. 2.2.2	**Flow Rate : 245 USGPM (insulated end Suction centifugal)**		
5.	**Head : 36 MTRS (Subject to final design calculations)**		
6.	**Motor : HP (as per manufacturer's standards)**		
7.	**Pump RPM should be as per vender design**		
8.	**(1W+ 1 S)**	**2.00**	**NOS**
9. 2.3	**Condenser Water Pumps**		
10.	**Supply, installation, testing & commissioning of uninsulated end suction centrifugal pumps for Condenser water circulation with TEFC motors min IE3 rating, baseplates, mounted on concrete inertia bocks of minimum 100mm thickness,and with outdoor type local push button station for each pump on terrace,with all other accessories,as per specifications or as directed etc. complete..(Pumps Starters In Main electrical Chiller Distribution panel) Make:Grundfos/ Xylem/ Armstrong**		
11. 2.3.1	**Flow Rate : 1240 USGPM**		
12.	**Head : 36 MTRS (Subject to final design calculations)**		
13.	**Motor : HP (as per manufacturer's standards)**		
14.	**Pump RPM should be as per vender design**		
15.	**(2 W+ 1 S)**	**3.00**	**NOS**
16. 2.3.2	**Flow Rate : 500 USGPM**		
17.	**Head : 36 MTRS (Subject to final design calculations)**		
18.	**Motor : HP (as per manufacturer's standards)**		
19.	**Pump RPM should be as per vender design**		
20.	**(1 W+ 1 S)**	**2.00**	**NOS**
21. 2.4	**Base Frame for above Pumps**		
22.	**MS for Frame and supports Make :-Tata / SAIL / Jindal / Nippon**		
23.	**Cushy foot Makes :-Dunlop (Cushy Foot), CORI, Resistoflex.**		
24. 2.4.1	**SITC of Pump base frame should be suitable to be mounted on cushy foot mounts, spring vibration isolators for Various pumps (5 Nos Primary + 5 Nos Secondary & 5 Nos Condensor)..Contractor shall include the inertia block including the concrete filling necessary foot mounts as mentioned in specification. Contractor to select the spring isolators for vibration free operation as per specification,or as directed etc. complete.. (Baseframe Concrete Block- Civil scope)**	**15.00**	**Nos.**
25. 3.0	**COOLING TOWERS**		
26.	**Cooling Tower Make:-Advance/ Mihir/ Paharpur/Bell/Delta**		
27.	**MS for Frame and supports**		

28. **3.1**	**Supply,Installation, Testing and Commissioning of Induced draft FRP Cooling Towers with PVC fills, nozzles, fans, with effenciency motors min. IE3 rating, ,with outdoor type local push button station for each Fan motor on terrace with all other accessories ,as per specifications or as directed etc. complete.(By pass Starters for Cooling tower Fan's and VFD In Main electrical Chiller Distribution panel) Make :-Tata / SAIL / Jindal / Nippon**		
29.	**Temperatures**		
30.	**Water In - 35.3 Deg.C.**		
31.	**Water Out - 31 .3 Deg.C**		
32.	**Wet Bulb - 28.3 Deg.C**		
33.	**Wet bulb approah = 3 Deg. Cent. Delta T**		
34.	**Design data**		
35. **3.1.1**	**Water Flow : 1550 US GPM (388 TR)**	**2.00**	**NOS**
36.	**Motor : 18/ 20 KW (or as per manufacturer's standards)**		
37.	**Design data**		
38. **3.1.2**	**Water Flow : 625 US GPM (157 TR)**	**1.00**	**NOS**
39.	**Motor : 7.5 / 9.3 KW (or as per manufacturer's standards)**		
40. **3.2**	**Frame Work for Cooling Tower**		
41. **3.2.1**	**SITC of Necessary MS frame work including civil work at Utility Block terrace for installing various cooling towers (310 TR X 2 Nos + 125 TR X 1Nos Cooling Towers) , Frame work shall include I-beam supports between columns / RCC blocks and chucker plate for supporting the equipment. RCC blocks to be supplied by AC Contractor. 2 access ladders fixed to the frame work to be included in scope.(Scope of Civil Contractor) MS for Frame and supports Make :-Tata / SAIL / Jindal / Nippon**	**3.00**	**JOB**
42. **4.0**	**AIR HANDLING UNITS/FAN COIL UNIT & PHI CELL**		
43. **4.1**	**AIR HANDLING UNIT**		
44.	**Supply and installation of AHU's Horizontal / Vertical Double Skin Floor Mounted / Ceiling Suspended Air Handling Units constructed of extruded aluminum hollow sections framework, pre-coated GS Sheets of 22G (outside) / 20G (inside) Plain GI with 43mm thick +/- 2mm thick double skin sandwitch panels having PUF insulation of density 48 kg/cum, consisting of fan section Plug/Forward/Back ward Curve , having IP 55 TEFC motors efficency min IE3 Rating ,1/2 fans DIDW type forward curved fans compitable with VFD (Variable Frequency Drives). Coil Section with 6 row-12 fpi Chilled Water cooling coil with Cu Tubes / Al.fin Bluefin Coating , Coil headers shall be of copper as specified. Drain tray shall be insulated sandwich type drain tray of SS (inside) / GI (outside) with liberal drain connections on either side shall be provided. The Double skin Sections shall include for Coil Section, Fire retardant double canvass connections, DP ports at each section, Volume Control Damper at AHU outlet, access doors with limit switch, maintenance lamp inside the fan section with Filters MERV 8 and MERV 13 with UVGI Lamp after Filter & Coil section ,PHI &**		

	vibration isolators, canvas connections, as per specifications or as directed etc. complete.. : AHU Make:-Zeco/ Edgetech/ VTS/ Nutech		
45.	**PHI (PhotoHydroIonization) Included with AHU**		
46.	**Supply, installation, testing & commissioning PhotoHydroIonization Cell (PHI) for killing the bacteria, virus, odor and other micro organisms & both airborne and surface borne microbes as well virus, VOC's and Odor, mold in the conditioned space. Photo hydro ionisation cell & occurs by exposing activated oxygen molecules to a hydrated catalyst containing four unique metals .The PHI units should be are easily mounted into air conditioning systems air AHU Supply air ducts / Plenum boxes . Detailed selection chart to be furnished indicating the model number for each unit. Cells Should be complete with Transformers, control cabling and Plug Top & necessary power cable. The power / control cabling between the units and the power source / controls shall be included in the cost as per specifications or as directed etc. complete. Make:-Zeco/ Ultrafresh/ ALFA**		
47.	**PhotoHydroIonization Cell (PHI) cell comprising of quad metallic compound target/ hydrated cataytic matrix cell duly enclosed by a poly casing tube, with the capability to produce friendly oxidizers like hydro peroxides. The tube should be duly encased in poly tube to prevent glass or mercury leakage into the atmosphere.The cell will have built in fiber optic device as remote indication of this operation. The equipment shall conform to UL 1598, CAN/ CSA 222, EN 60335-1, EN 60335-2-65, TUV, CSA, EU standards, certifications shall be submitted along with the technical submital. Refer technical specifiifcations for more details and complianceor as per specifications or as directed etc. complete. These shall be suitable for the following capacities**		
48.	**Note: Contractor shall Include Cost of MERV 8 & MERV 13 Filter & UVGI Lamp ,PHI with AHU Cost.**		
49.	**Note: Contractor shall design the chilled water coil according to the following conditions:**		
50.	**Coil air entering temperature 77.07 deg F DB/ 66.12 deg F WB at 60%RH**		
51.	**Coil air leaving temperature 56 deg F DB/ 55.10 deg F WB**		
52.	**Chilled water temperature entering 6.63 deg C/ 44 deg F**		
53.	**AHU Coil Deesign at 12 Deg F Delta T**		
54.	**Fan Outlet Velocity <1600 FPM**		
55.	**Coil face velocity 500 FPM**		
56.	**Filter velocity 500 FPM**		
57. **4.1.1**	**Floor Mounted Horizontal /Vertical AHU's (As per Site conditions)**		
58. **4.1.1.1**	**25000 CFM at 65 MM SP with 50 TR capacity and.. 22 HP IP 55 TEFC motor ,**		**NOS**

59. 4.1.1.2	**22000 CFM at 65 MM SP with 50 TR capacity and.. 22 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
60. 4.1.1.3	**20000 CFM at 65 MM SP with 50 TR capacity and.. 20 HP IP 55 TEFC motor ,**	**2.00**	**NOS**
61. 4.1.1.4	**20000 CFM at 65 MM SP with 45 TR capacity and.. 20 HP IP 55 TEFC motor ,**	**6.00**	**NOS**
62. 4.1.1.5	**18000 CFM at 65 MM SP with 45 TR capacity and.. 20 HP IP 55 TEFC motor ,**		**NOS**
63. 4.1.1.6	**15000 CFM at 65 MM SP with 35 TR capacity and..15 HP IP 55 TEFC motor ,**		**NOS**
64. 4.1.1.7	**14000 CFM at 65 MM SP with 34 TR capacity and..15 HP IP 55 TEFC motor ,**		**NOS**
65. 4.1.1.8	**12500 CFM at 65 MM SP with 30 TR capacity and....10 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
66. 4.1.1.9	**12000 CFM at 65 MM SP with 28 TR capacity and....10 HP IP 55 TEFC motor ,**	**3.00**	**NOS**
67. 4.1.1.10	**10000 CFM at 65 MM SP with 25 TR capacity and....10 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
68. 4.1.1.11	**9000 CFM at 65 MM SP with 20 TR capacity and....7.5 HP IP 55 TEFC motor ,**		**NOS**
69. 4.1.1.12	**7500 CFM at 65 MM SP with 16 TR capacity and....7.5 HP IP 55 TEFC motor ,**		**NOS**
70. 4.1.2	**Ceiling Suspended AHU's**		
71. 4.1.2.1	**7000 CFM at 62 SP with 18 TR capacity and …. 5.5 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
72. 4.1.2.2	**7000 CFM at 62 SP with 15 TR capacity and …. 5.5 HP IP 55 TEFC motor ,**		**NOS**
73. 4.1.2.3	**6000 CFM at 62 SP with 14 TR capacity and …. 5.5 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
74. 4.1.2.4	**5000 CFM at 62 SP with 12 TR capacity and ... 5.0 HP IP 55 TEFC motor,**	**6.00**	**NOS**
75. 4.1.2.5	**4500 CFM at 62 SP with 10 TR capacity and 3.0 HP IP 55 TEFC motor**		**NOS**
76. 4.1.2.6	**4000 CFM at 62 SP with 10.0 TR capacity and 3.0 HP IP 55 TEFC motor,**	**6.00**	**NOS**
77. 4.1.2.7	**3750 CFM at 62 SP with 8.0 TR capacity and 3.0 HP IP 55 TEFC motor,**		**NOS**
78. 4.1.2.8	**3500 CFM at 62 SP with 10.0 TR capacity and 3.0 HP IP 55 TEFC motor,**	**8.00**	**NOS**
79. 4.1.2.9	**3000 CFM at 62 SP with 7.5 TR capacity and 2.0 HP IP 55 TEFC motor,**	**10.00**	**NOS**
80. 4.1.2.10	**2000 CFM at 62 SP with 5 TR capacity and 2.0 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
81. 4.1.2.11	**1600 CFM at 55 SP with 4.0 TR capacity and 2.0 HP IP 55 TEFC**		**NOS**

	motor,		
82. **4.1.2.12**	**1400 CFM at 55 SP with 3.5 TR capacity and 2.0 HP IP 55 TEFC motor,**	**1.00**	**NOS**
83. **4.1.2.13**	**1200 CFM at 55 SP with 4 TR capacity and 2.0 HP IP 55 TEFC motor,**	**2.00**	**NOS**
84. **4.2**	**Treated fresh air unit with HRW (Heat Recovery Wheel),but w/o coil**		
85.	**Supply, installation, testing & commissioning of following size Treated fresh air unit with HRW (Heat Recovery Wheel with 3 armstrong dessicant pore size),but w/o coil ,Double skin type complete with casing, IP 55 TEFC motors with min IE3 rating,DIDW type backward curved fans, insulated drain pan, filters MERV 8 and MERV 13 ,filter on supply air , and Only MERV 8 filter on Exhuast air fan side, also UV lamp next to Heat Recovery wheel on BOTH Exhuast & supply air side, vibration isolators, canvas connections, with Bypass starter panel with VFD (Variable Frequency Drives for Both fans), all starters with sufficient Potential free ,NO/NC contacts ,relay contacts , to control /monitor from the IBMS system, as per specifications or as directed etc. complete.. : It should be IBMS Compatible to control and moniter data from IBMS system. HRW Make :- DRI Make**		
86.	**Rotor:- The Rotor/wheel,matrix shall have nearlyequal sensible latent recovery. The rotor honeycomb should be so wound & adhered as to make a structually very strong rigid media**		
87.	**Desiccant:- The desicant should be of Ecosorb 300 (3A) type belonging to molecular sieve family which should maximise moisture uptake & therefore maximise latent recovery.**		
88.	**Substrate Wheel :- The substrate or wheel matrix should be only of pure Aluminium foil. Maximum sensible heat recovery at relatively low rotational speed of 20 to 25 rpm**		
89. **4.2.1**	**5000 CFM @ 72 MM Static for Supply air fan and 60 mm static for Exhuast air fan (A WING)**	**2.00**	**NOS**
90. **4.2.2**	**4500 CFM @ 72 MM Static for Supply air fan and 60 mm static for Exhuast air fan B WING)**	**2.00**	**NOS**
91. **4.2.3**	**4000 CFM @ 72 MM Static for Supply air fan and 60 mm static for Exhuast air fan (C WING)**	**2.00**	**NOS**
92. **4.2.4**	**6000 CFM @ 72 MM Static for Supply air fan and 60 mm static for Exhuast air fan (D WING)**	**2.00**	**NOS**
93. **4.3**	**CHILLED WATER FAN COIL UNITS:**		
94.	**Supply, installation, testing and commissioning of FCU's complete with fan scroll, double blower section with split capacitor motor mounted on common shaft, synthetic filter with filter frame with easy removal facility and with return air plenum, drain pan with sandwich type thermocole/ Nitrile rubber insulation with both side drain and chilled water piping , With Cordless Remote Control Valve Sation, (Valve Sation with ball valves, Pressure independent balancing and control valve , Strainer) arrangement and finned 3/4 row coil along with**		

	supporting threaded rods, nuts, bolts,The unit shall have extended drain pan. as per specifications or as directed etc. complete. FCU MAKE :-Caryaire/Flaktwood/ Bluestar / Carrier Aircon / Zeco /Sinco/Midea		
95. **4.3.1**	**2.5 TR**	**0.00**	**NOS**
96. **4.3.2**	**2.0 TR**	**0.00**	**NOS**
97. **4.3.3**	**1.5 TR**	**0.00**	**NOS**
98. **4.3.4**	**1.0 TR**	**0.00**	**NOS**
99. **4.4**	**CHILLED WATER CASSETTE UNITS:**		
100.	**Supply, installation, testing and commissioning of Cassette's complete with fan,synthetic filter with filter frame with easy removal facility, drain pan with drain and chilled water piping, frame with easy removal facility and with return air plenum, drain pan with sandwich type thermocole/ Nitrile rubber insulation with both side drain and chilled water piping , With Cordless Remote Control Valve Sation, (Valve Sation with ball valves, Pressure independent balancing and control valve, Stainer) arrangement and finned 3/4 row coil along with supporting threaded rods, nuts, bolts etc.The unit shall have extended drain pan. as per specifications or as directed etc. complete. Make:-Caryaire/Flaktwood/ Bluestar / Carrier Aircon / Zeco /Sinco/Midea**		
101. **.4.1**	**4.0 TR**	**0.00**	**NOS**
102. **.4.2**	**3.0 TR**	**0.00**	**NOS**
103. **.4.3**	**2.5 TR**	**0.00**	**NOS**
104. **.4.4**	**2.0 TR**	**0.00**	**NOS**
105. **.4.5**	**1.5 TR**	**0.00**	**NOS**
106. **.4.6**	**1.0 TR**	**0.00**	**NOS**
107. **.5**	**CHILLED WATER HI-WALL UNITS:**		
108.	**Supply, installation, testing and commissioning of Hi-wall complete with fan,synthetic filter with filter frame with easy removal facility, drain pan with drain and chilled water piping, frame with easy removal facility and with return air plenum, drain pan with sandwich type thermocole/ Nitrile rubber insulation with both side drain and chilled water piping , With Cordless Remote Control Valve Sation, (Valve Sation with ball valves, Pressure independent balancing and control valve, Stainer) arrangement and finned 3/4 row coil along with supporting threaded rods, nuts, bolts etc.The unit shall have extended drain pan. as per specifications or as directed etc. complete. Make:-Caryaire/Flaktwood/ Bluestar / Carrier Aircon / Zeco /Sinco/Midea**		
109. **.5.1**	**2.0 TR**	**0.00**	**NOS**
110. **.5.2**	**1.5 TR**	**0.00**	**NOS**

111.5.3	**1.0 TR**	**0.00**	**NOS**
112.6	**Frame Work for Floor Mounted AHU's & HRW**		
113.	**Supply, fabrication and installation of MS base frame/platform for AHU / HRW supporting complete with Superx blocks,epoxy painting, vibration isolation pads, supports, hangers,railing, brackets, Civil work etc. Construction as approved by Architect/ Consultant. Apply 2coats of epoxy primer 2 coats of black paint. Finish painting to be as approved by Architect. as per specifications or as directed etc. complete. MS for Frame and supports Make :-Tata / SAIL / Jindal / Nippon**	**33.00**	**NOS**
114.7	**Precommissioning Filter**		
115.	**Supply and installation of Precommissioning filter with 90% Efficiency down to 10 micron (MERV 8) to be provided for all AHUs. On approval of client/ consultant, these filters have to be replaced with actual clean filters. Filters Makes:Zeco/ Ultrafresh/ ALFA/Airtech**		
116.7.1	**Floor Mounted Horizontal /Vertical AHU's (As per Site conditions)**		
117.7.1.1	**25000 CFM at 65 MM SP with 50 TR capacity and.. 22 HP IP 55 TEFC motor ,**		**NOS**
118.7.1.2	**22000 CFM at 65 MM SP with 50 TR capacity and.. 22 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
119.7.1.3	**20000 CFM at 65 MM SP with 50 TR capacity and.. 20 HP IP 55 TEFC motor ,**	**2.00**	**NOS**
120.7.1.4	**20000 CFM at 65 MM SP with 45 TR capacity and.. 20 HP IP 55 TEFC motor ,**	**6.00**	**NOS**
121.7.1.5	**18000 CFM at 65 MM SP with 45 TR capacity and.. 20 HP IP 55 TEFC motor ,**		**NOS**
122.7.1.6	**15000 CFM at 65 MM SP with 35 TR capacity and..15 HP IP 55 TEFC motor ,**		**NOS**
123.7.1.7	**14000 CFM at 65 MM SP with 34 TR capacity and..15 HP IP 55 TEFC motor ,**		**NOS**
124.7.1.8	**12500 CFM at 65 MM SP with 30 TR capacity and....10 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
125.7.1.9	**12000 CFM at 65 MM SP with 28 TR capacity and....10 HP IP 55 TEFC motor ,**	**3.00**	**NOS**
126.7.1.10	**10000 CFM at 65 MM SP with 25 TR capacity and....10 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
127.7.1.11	**9000 CFM at 65 MM SP with 20 TR capacity and....7.5 HP IP 55 TEFC motor ,**		**NOS**
128.7.1.12	**7500 CFM at 65 MM SP with 16 TR capacity and....7.5 HP IP 55 TEFC motor ,**		**NOS**
129.7.2	**Ceiling Suspended AHU's**		
130.7.2.1	**7000 CFM at 62 SP with 18 TR capacity and …. 5.5 HP IP 55 TEFC motor ,**	**1.00**	**NOS**

131.7.2.2	**7000 CFM at 62 SP with 15 TR capacity and …. 5.5 HP IP 55 TEFC motor ,**		**NOS**
132.7.2.3	**6000 CFM at 62 SP with 14 TR capacity and …. 5.5 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
133.7.2.4	**5000 CFM at 62 SP with 12 TR capacity and ... 5.0 HP IP 55 TEFC motor,**	**6.00**	**NOS**
134.7.2.5	**4500 CFM at 62 SP with 10 TR capacity and 3.0 HP IP 55 TEFC motor**		**NOS**
135.7.2.6	**4000 CFM at 62 SP with 10.0 TR capacity and 3.0 HP IP 55 TEFC motor,**	**6.00**	**NOS**
136.7.2.7	**3750 CFM at 62 SP with 8.0 TR capacity and 3.0 HP IP 55 TEFC motor,**		**NOS**
137.7.2.8	**3500 CFM at 62 SP with 10.0 TR capacity and 3.0 HP IP 55 TEFC motor,**	**8.00**	**NOS**
138.7.2.9	**3000 CFM at 62 SP with 7.5 TR capacity and 2.0 HP IP 55 TEFC motor,**	**10.00**	**NOS**
139.7.2.10	**2000 CFM at 62 SP with 5 TR capacity and 2.0 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
140.7.2.11	**1600 CFM at 55 SP with 4.0 TR capacity and 2.0 HP IP 55 TEFC motor,**		**NOS**
141.7.2.12	**1400 CFM at 55 SP with 3.5 TR capacity and 2.0 HP IP 55 TEFC motor,**	**1.00**	**NOS**
142.7.2.13	**1200 CFM at 55 SP with 4 TR capacity and 2.0 HP IP 55 TEFC motor,**	**2.00**	**NOS**
143.0	**CHILLED WATER PIPING AND ALL VALVES**		
144.1	**Chilled Water Pipes**		
145.	**Supply, installation, testing & commissioning of chilled water pipes Class 'C' M.S.black steel as per IS 1239 Part-I and II for pipes upto 150mm dia and as per IS 3589 for pipes 200mm and 250mm dia (5mm thick), 300mm dia (6mm thick), 350 mm dia. And above (8mm thick), within the building and in trenches, complete with bends,tees, elbows,flanges, bolts, nuts, seals, flow indicators, supports, hangers, vibration eliminators,PUF/wooden Gutti, painting etc. but without insulation. as per specifications or as directed etc. complete. Make:-JINDAL-HISSAR/TATA/ZENIT**		
146.1.1	**300mm dia.**	**0.00**	**RMTR**
147.1.2	**250mm dia.**	**200.00**	**RMTR**
148.1.3	**200mm dia.**	**60.00**	**RMTR**
149.1.4	**150mm dia.**	**160.00**	**RMTR**
150.1.5	**125mm dia.**	**100.00**	**RMTR**
151.1.6	**100mm dia.**	**140.00**	**RMTR**
152.1.7	**80mm dia.**	**336.00**	**RMTR**

153.1.8	**65mm dia.**	**348.00**	**RMTR**
154.1.9	**50mm dia.**	**384.00**	**RMTR**
155.1.10	**40mm dia.**	**60.00**	**RMTR**
156.1.11	**32mm dia.**	**204.00**	**RMTR**
157.1.12	**25mm dia.**	**120.00**	**RMTR**
158.1.13	**20mm dia.**	**98.00**	**RMTR**
159.2	**Condensor Water Pipes**		
160.	**Supply, installation, testing & commissioning of Uninsulated condenser water Class 'C' M.S. black steel pipes as per IS 3589 for pipes 200mm and 250mm dia (5mm thick), 300mm dia with bends,tees, elbows,flanges, bolts, nuts, seals, flow indicators, supports, hangers, vibration eliminators, painting,PUF/wooden Gutti etc. but without insulation. as per specifications or as directed etc. complete. Make:-JINDAL- HISSAR/TATA/ZENIT**		
161.	**Note :**		
162.	**1) For piping support, the Contractor should consider high support including anchor fastners, threaded rods, G.I. flanges etc. Conventional M.S. angle support will not be accepted.**		
163.	**2) Expansion bellows shall be provided for all exposed piping for expansion / contraction, without additional cost.or as directed etc. complete..**		
164.2.1	**450mm dia.**	**0.00**	**RMTR**
165.2.2	**400mm dia.**	**180.00**	**RMTR**
166.2.3	**350mm dia.**	**10.00**	**RMTR**
167.2.4	**300mm dia.**	**10.00**	**RMTR**
168.2.5	**250mm dia.**	**84.00**	**RMTR**
169.2.6	**200mm dia.**	**10.00**	**RMTR**
170.2.7	**150mm dia.**	**48.00**	**RMTR**
171.2.8	**125mm dia.**	**1.00**	**RMTR**
172.2.9	**100mm dia.**	**1.00**	**RMTR**
173.2.10	**80mm dia.**	**1.00**	**RMTR**
174.2.11	**65mm dia.**	**1.00**	**RMTR**
175.2.12	**50mm dia.**	**1.00**	**RMTR**
176.2.13	**25mm dia.**	**1.00**	**RMTR**
177.3	**Chilled Water Piping Insulation for indoor installation**		
178.	**Supply, installation, testing & commissioning of insulation for chilled water piping. as per specifications or as directed etc. complete. The insulation for the pipes should be complete as:-.**		

	Stick 32 MM thick Nitrile Rubber with Class 1 for BS476 Part 7 & Class O for Fire BS476 Part 6 for Fire for (ABOVE 150 MM DIA PIPE) , and 25 mm thick nitrile rubber (100 mm to 50 mm) and 19 mm thick nitrile rubber for (40 mm and below size) Nitrile rubber insulation Make:-Armaflex/Thermaflex/A-flex/K-flex/Superlon		
179.	**Insulation material shall be Closed Cell Elastomeric Nitrile Rubber with UV resistant metal finishing on one side. Thermal conductivity of insulation material shall not exceed 0.035 W/(m.K) at mean temperature of 0°C as per EN 12667. Moisture Diffusion Resistance Factor or 'μ' value of laminated insulation material shall be minimum ≥ 60,000 as per EN 12086. Water Absorption by Volume of insulation material shall be < 0.2% as per ASTM C 1763 / ASTM C 209. The base insulation material shall have fire performance such that it passes Class 1 as per BS476 Part 7 for surface spread of flame and also passes Fire Propagation requirement as per BS476 Part 6 to meet the Class 'O' Fire category as per 1991 Building Regulations (England & Wales) and the Building Standards (Scotland) Regulations 1990. Density of laminated insulation material shall be between 50 to 70 Kg/m3. Density of base foam insulation material shall be between 40 to 55 Kg/m3.**		
180.	**The insulation material shall be dust and fibre free. The insulation material shall be formaldehyde free. The insulation material shall be CFC & HCFC free. The insulation material shall withstand maximum surface temperature of +105 Deg.C and minimum surface temperature of 0 Deg.C as per EN 14706. The base insulation material shall have ODP (Ozone Depletion Potential) and GWP (Global Warming Potential) of Zero. System material is a double layer laminate of aluminium, coated with a special UV protection and a PVC backing. Covering material shall be non-metallic. Covering material shall provide mechanical resistance with an excellent aesthetic look. Covering material shall be glossy finish. The Covering material shall be of 230 microns thickness as per EN 22286 and weight shall be 340 gsm as per EN 22286.The insulation material shall be installed as per specifications or as directed etc. complete.**		
181. .3.1	**300mm dia.**	**2.00**	**RMTR**
182. .3.2	**250mm dia.**	**200.00**	**RMTR**
183. .3.3	**200mm dia.**	**60.00**	**RMTR**
184. .3.4	**150mm dia.**	**160.00**	**RMTR**
185. .3.5	**125mm dia.**	**100.00**	**RMTR**
186. .3.6	**100mm dia.**	**140.00**	**RMTR**
187. .3.7	**80mm dia.**	**336.00**	**RMTR**
188. .3.8	**65mm dia.**	**348.00**	**RMTR**
189. .3.9	**50mm dia.**	**384.00**	**RMTR**
190. .3.10	**40mm dia.**	**60.00**	**RMTR**

191. .3.11	**32mm dia.**	**204.00**	**RMTR**
192. .3.12	**25mm dia.**	**120.00**	**RMTR**
193. .3.13	**20 mm dia.**	**98.00**	**RMTR**
194. .4	**Chilled Water Piping Insulation for outdoor installation**		
195.	**Supply, installation, testing & commissioning of Insulation for chilled water piping as per specifications or as directed etc. complete. The insulation for the pipes should be complete as:-. Stick 32 MM thick Nitrile Rubber with Class 1 for BS476 Part 7 & Class O for Fire BS476 Part 6 for Fire for (ABOVE 150 MM DIA PIPE) , and 25 mm thick nitrile rubber (100 mm to 50 mm) and 19 mm thick nitrile rubber for (40 mm and below size) .or as directed etc. complete.. Nitrile rubber insulation Make:-Armaflex/Thermaflex/A-flex/K-flex/Superlon**		
196.	**Insulation material shall be Closed Cell Elastomeric Nitrile Rubber with treated woven glass cloth laminated on one side. (Glass Cloth) , Thermal conductivity of the base insulation material shall not exceed 0.035 W/(m.K) at mean temperature of 0°C as per EN 12667. Water Absorption by Volume of base insulation material shall be < 0.2% as per ASTM C 1763 / ASTM C 209. The base insulation material shall have fire performance such that it passes Class 1 as per BS476 Part 7 for surface spread of flame and also passes Fire Propagation requirement as per BS476 Part 6 to meet the Class 'O' Fire category . The insulation material shall be FM (Factory Mutual), USA Approved. Density of laminated insulation material shall be between 50 to 70 Kg/m3. Density of base insulation material shall be between 40 to 55 Kg/m3. The base insulation material shall be dust and fibre free.The base insulation material shall be CFC & HCFC free. The base insulation material shall withstand maximum surface temperature of +105 Deg.C and minimum surface temperature of 0 Deg.C as per EN 14706. Glass Cloth Treatment: Shall be treated water based acrylic binder to give crisp and non-piling property to the fabric, to help in easy installation, minimize fiber erosion, good aesthetics and resistance to abrasion. Glass Cloth : Weight shall be 205 +/- 10 grams per square meter, Tensile Strength shall be 275 +/- 25 Kg / 50 mm (minimum) and Thickness shall be 0.18 mm / 7 mil (180 Microns). Glass Cloth shall be UV resistance as per ISO 4892-2 Method A. The base material shall have ODP (Ozone Depletion Potential) . as per specifications or as directed etc. complete.**		
197. .4.1	**300 mm dia.**	**1.00**	**RMTR**
198. .4.2	**250mm dia.**	**120.00**	**RMTR**
199. .4.3	**200mm dia.**	**200.00**	**RMTR**
200. .4.4	**150mm dia.**	**150.00**	**RMTR**
201. .4.5	**125mm dia.**	**124.00**	**RMTR**
202. .4.6	**100mm dia.**	**1.00**	**RMTR**
203. .4.7	**80mm dia.**	**1.00**	**RMTR**

204.4.8	**65mm dia.**	**1.00**	**RMTR**
205.4.9	**50mm dia.**	**1.00**	**RMTR**
206.4.10	**40mm dia.**	**1.00**	**RMTR**
207.4.11	**32mm dia.**	**1.00**	**RMTR**
208.4.12	**25mm dia.**	**1.00**	**RMTR**
209.5	**Butterfly Valve**		
210.	**Butterfly Valve Make:-Audco / Advance / Zoloto/C&R/Sant/Lehri**		
211.	**Nitrile rubber insulation Make:-Armaflex/Thermaflex/A-flex/K-flex/Superlon**		
212.	**Supply, installation, testing & commissioning of following sizes of butterfly valve with lug type construction, bolts, supports etc.The valves should be PN 10 and insulated the insulation for should be complete as:-. Stick 32 MM thick Nitrile Rubber with Class 1 for BS476 Part 7 & Class O for Fire BS476 Part 6 for Fire for (ABOVE 150 MM DIA PIPE) , and 25 mm thick nitrile rubber (100 mm to 50 mm) and 19 mm thick nitrile rubber for (40 mm and below size) . as per specifications or as directed etc. complete.**		
213.5.1	**400mm dia. (gear operated) Uninsulated**	**4.00**	**NOS**
214.5.2	**350mm dia. (gear operated) Uninsulated**	**1.00**	**NOS**
215.5.3	**300mm dia. (gear operated) For Chilled water Header Line to Building from Plant room**	**1.00**	**NOS**
216.5.4	**250mm dia. (gear operated) For Cooling Tower & Condenser pump (uninsulated)**	**14.00**	**NOS**
217.5.5	**200mm dia. (gear operated)**	**1.00**	**NOS**
218.5.6	**150mm dia. (gear operated)**	**24.00**	**NOS**
219.5.7	**125mm dia. (lever operated)**	**4.00**	**NOS**
220.5.8	**100mm dia. (lever operated)**	**20.00**	**NOS**
221.5.9	**80mm dia. (lever operated)**	**50.00**	**NOS**
222.5.10	**65mm dia.(lever operated)**	**28.00**	**NOS**
223.5.11	**50mm dia.(ball valve)**	**24.00**	**NOS**
224.5.12	**40mm dia.(ball valve)**	**26.00**	**NOS**
225.5.13	**32mm dia.(ball valve)**	**28.00**	**NOS**
226.5.14	**25mm dia.(ball valve)**	**6.00**	**NOS**
227.5.15	**20mm dia.(ball valve)**	**2.00**	**NOS**
228.6	**Balancing Valve**		
229.	**Balancing Valve Make:-Advance / Danfoss / Flowcon / Zoloto /**		

	Belimo		
230.	**Nitrile rubber insulation Make:-Armaflex/Thermaflex/A-flex/K-flex/Superlon**		
231.	**Supply, installation, testing & commissioning of Balancing valve of following sizes with pressure ports with matching flanges, bolts, supports etc. The valves should be PN 10 and insulated The insulation for should be complete as:-. Stick 32 MM thick Nitrile Rubber with Class 1 for BS476 Part 7 & Class O for Fire BS476 Part 6 for Fire for (ABOVE 150 MM DIA PIPE) , and 25 mm thick nitrile rubber (100 mm to 50 mm) and 19 mm thick nitrile rubber for (40 mm and below size) .as per specifications or as directed etc. complete.**		
232. .6.1	**400mm dia.**	**1**	**1.00**
233. .6.2	**250mm dia. For Cooling Tower & Condenser (uninsulated)**	**7.00**	**NOS**
234. .6.3	**200mm dia.**	**1.00**	**NOS**
235. .6.4	**150mm dia. For Cooling Tower & Condenser (uninsulated)**	**6.00**	**NOS**
236. .6.5	**150mm dia. (Insulated)**	**6.00**	**NOS**
237. .6.6	**125mm dia. (Insulated)**	**1.00**	**NOS**
238. .6.7	**100mm dia. (Insulated)**	**9.00**	**NOS**
239. .6.8	**80mm dia.**	**11.00**	**NOS**
240. .6.9	**65mm dia.**	**5.00**	**NOS**
241. .6.10	**50mm dia.**	**4.00**	**NOS**
242. .6.11	**40mm dia.**	**12.00**	**NOS**
243. .6.12	**32mm dia.**	**13.00**	**NOS**
244. .6.13	**25mm dia.**	**3.00**	**NOS**
245. .6.14	**20mm dia.**	**1.00**	**NOS**
246. .7	**Check Valves /Non Return Valve**		
247.	**Check Valves /Non Return Valve Make:Leader / Advance /Audco / Zoloto**		
248.	**Nitrile rubber insulation Make:-Armaflex/Thermaflex/A-flex/K-flex/Superlon**		
249.	**Supply, installation, testing & commissioning of following sizes of check valves (dual plate)/non return valve with matching flanges, bolts, supports etc. The valves should be PN 10 and Insulated The insulation for should be complete as:-. Stick 32 MM thick Nitrile Rubber with Class 1 for BS476 Part 7 & Class O for Fire BS476 Part 6 for Fire for (ABOVE 150 MM DIA PIPE) , and 25 mm thick nitrile rubber (100 mm to 50 mm) and 19 mm thick nitrile rubber for (40 mm and below size) .applied as per specifications or as directed etc. complete..**		
250. .7.1	**250mm dia.**	**3.00**	**NOS**

251.7.2	**200mm dia.**	**1.00**	**NOS**
252.7.3	**150mm dia. Un Insulated**	**3.00**	**NOS**
253.7.4	**150mm dia. Insulated**	**5.00**	**NOS**
254.7.5	**125mm dia.**	**1.00**	**NOS**
255.7.6	**100mm dia. Insulated**	**4.00**	**NOS**
256.8	**Y- Strainer**		
257.	**Y- Strainer Make:-Emerald /Sant/Rapid cool/Leader**		
258.	**Nitrile rubber insulation Make:-Armaflex/Thermaflex/A-flex/K-flex/Superlon**		
259.	**Supply, installation, testing & commissioning of following sizes of Y strainer with matching flanges, bolts, supports, S.S. perforated Mesh etc. The strainer should be insulated.The insulation for should be complete as:-. Stick 32 MM thick Nitrile Rubber with Class 1 for BS476 Part 7 & Class O for Fire BS476 Part 6 for Fire for (ABOVE 150 MM DIA PIPE) , and 25 mm thick nitrile rubber (100 mm to 50 mm) and 19 mm thick nitrile rubber for (40 mm and below size) as per specifications or as directed etc. complete..**		
260.8.1	**250mm dia.**	**7.00**	**NOS**
261.8.2	**200mm dia.**	**1.00**	**NOS**
262.8.3	**150mm dia.**	**12.00**	**NOS**
263.8.4	**125mm dia.**	**1.00**	**NOS**
264.8.5	**100mm dia.**	**5.00**	**NOS**
265.8.6	**80mm dia.**	**11.00**	**NOS**
266.8.7	**65mm dia.**	**5.00**	**NOS**
267.8.8	**50mm dia.**	**4.00**	**NOS**
268.8.9	**40mm dia.**	**12.00**	**NOS**
269.8.10	**32mm dia**	**13.00**	**NOS**
270.8.11	**25mm dia**	**2.00**	**NOS**
271.8.12	**20mm dia**	**1.00**	**NOS**
272.9	**Pressure Independent Cum Control Valves**		
273.	**Pressure Independent Cum Control Valves Make:Honeywell / Danfoss / Flowcon /Belimo/ Anergy/Johnson control**		
274.	**Nitrile rubber insulation Make:-Armaflex/Thermaflex/A-flex/K-flex/Superlon**		
275.	**Supply, installation, testing & commissioning Pressure independent and control valve which shall be 2 way combined valve of PN 16 rating for flow limitation, controlling flow & controlling Delta P. Valve body upto 32mm shall be brass and**		

	cast iron above 32mm.Valve should be equipped with electronic modulating actuator for AHU which can accept either "4(0)-20 mA / 2(0)-10 V DC signals. Operating voltage for actuator shall be 24 V AC. The actuator should be connected to propotionate thermostat. Delta p controller should ensure 100% control valve authority always at all load conditions (part load and full load).Stepless balancing adjustments shall be in valve and control adjustments in actuator. The differential pressure function shall be a diaphragm and shall be out of the main flow to avoid valve blockages and other services issue. Valve alongwith actuator shall offer logarithmic control characterstics complete as per specification.or as directed etc. complete..Thermostat, actuator, matching flanges, bolts, supports etc and insulated The insulation for should be complete as:-. Stick 32 MM thick Nitrile Rubber with Class 1 for BS476 Part 7 & Class O for Fire BS476 Part 6 for Fire for (ABOVE 150 MM DIA PIPE) , and 25 mm thick nitrile rubber (100 mm to 50 mm) and 19 mm thick nitrile rubber for (40 mm and below size) .or as directed etc. complete..		
276. .9.1	**100mm dia.**	**1.00**	**NOS**
277. .9.2	**80mm dia.**	**11.00**	**NOS**
278. .9.3	**65mm dia.**	**8.00**	**NOS**
279. .9.4	**50mm dia.**	**4.00**	**NOS**
280. .9.5	**40mm dia.**	**12.00**	**NOS**
281. .9.6	**32mm dia.**	**13.00**	**NOS**
282. .9.7	**25mm dia.**	**3.00**	**NOS**
283. .9.8	**20mm dia.**	**2.00**	**NOS**
284. .10	**Gate valve**		
285.	**Gate valve Make:Audco / Advance / Zoloto/C&R/Sant/Lehri**		
286.	**Nitrile rubber insulation Make:-Armaflex/Thermaflex/A-flex/K-flex/Superlon**		
287.	**Supply, installation, testing & commissioning of following sizes of Gate valve with Thermostat, actuator, matching flanges, bolts, supports etc. The valves should be PN 10 and Insulated .The insulation for should be complete as:-. Stick 32 MM thick Nitrile Rubber with Class 1 for BS476 Part 7 & Class O for Fire BS476 Part 6 for Fire for (ABOVE 150 MM DIA PIPE) , and 25 mm thick nitrile rubber (100 mm to 50 mm) and 19 mm thick nitrile rubber for (40 mm and below size)as per specifications.or as directed etc. complete..**		
288. .10.1	**40mm dia.**	**6.00**	**NOS**
289. .10.2	**32mm dia.**	**6.00**	**NOS**
290. .10.3	**25mm dia.**	**28.00**	**NOS**
291. .11	**ON/OFF Motorised Valve**		

292.	**ON/OFF Motorised Valve Make:Belimo /Honeywell /Siemens/L&T**		
293.	**Nitrile rubber insulation Make:-Armaflex/Thermaflex/A-flex/K-flex/Superlon**		
294.	**Supply, installation, testing & commissioning of following sizes of ON/OFF motorised valve with actuator, matching flanges, bolts, supports etc.The valves should be PN 10 and insulated The insulation for should be complete as:-. Stick 32 MM thick Nitrile Rubber with Class 1 for BS476 Part 7 & Class O for Fire BS476 Part 6 for Fire for (ABOVE 150 MM DIA PIPE) , and 25 mm thick nitrile rubber (100 mm to 50 mm) and 19 mm thick nitrile rubber for (40 mm and below size)as per specifications.or as directed etc. complete..**		
295. .11.1	**300mm dia.**	**1.00**	**NOS**
296. .11.2	**250mm dia. For 310 TR Condenser side & Cooling Tower Inlet & outlet**	**11.00**	**NOS**
297. .11.3	**200mm dia.**	**1.00**	**NOS**
298. .11.4	**150mm dia. For 125 TR Condensor Pump at headear pipe line & Chiller Evaporater Inlet & outlet line at all Pump Inlet+125 Tr Cooling tower**	**16.00**	**NOS**
299. .11.5	**125mm dia.**	**1.00**	**NOS**
300. .11.6	**100mm dia. For 125 TR Chiller & Pumps at headear pipe line**	**6.00**	**NOS**
301. .11.7	**80mm dia.**	**1.00**	**NOS**
302. .12	**Auto Vent**		
303.	**Auto Vent Make:Honeywell / Johnson Control / Anergy**		
304.	**Nitrile rubber insulation Make:-Armaflex/Thermaflex/A-flex/K-flex/Superlon**		
305. .12. 1	**Supply, installation, testing & commissioning of Auto Vent with stop Valve & insulated with Nitrile Rubber with Class 1 for BS476 Part 7 per specifications.or as directed etc. complete..**	**55.00**	**NOS**
306. .13	**Flexible Bellows**		
307.	**Flexible Bellows Make:Cori & Other equivalent makes**		
308.	**Supply, installation, testing & commissioning of Vibration eliminators with Double Bellows, Tie rods and MS flanges as a part of vibration.as per specifications.or as directed etc. complete..**		
309. .13. 1	**250mm dia. For 2 nos Condenser , 3 nos. Pump, 2 nos. cooling towers- inlet & outlet**	**14.00**	**NOS**
310. .13. 2	**200mm dia.**	**0.00**	**NOS**
311. .13. 3	**150mm dia. For 310 TR 2 nos. chillers , 2 nos. primary pumps,2 nos. secondary pumps,1 nos. 125 tr chiller , 2 nos. condensor**	**22.00**	**NOS**

	pump + 2 nos. cooling towers inlet and outlets		
312.13.4	**125mm dia.**	**0.00**	**NOS**
313.13.5	**100mm dia. For 125 TR Chiller , 2 nos. primary , 2 nos. secondary Pump inlet & outlet**	**10.00**	**NOS**
314.13.6	**80mm dia.**	**0.00**	**NOS**
315.13.7	**65mm dia.**	**0.00**	**NOS**
316.13.8	**50mm dia.**	**0.00**	**NOS**
317.13.9	**40mm dia.**	**0.00**	**NOS**
318.13.10	**32mm dia.**	**0.00**	**NOS**
319.13.11	**25mm dia.**	**0.00**	**NOS**
320.14	**Pressure gauges with syphone cock**		
321.	**Pressure gauges with syphone cock Make:-H.Guru/ Fiebig/Emerald/Metzer/ Bestobell/ Star Scientific**		
322.	**Supply, installation, testing & commissioning of following types Pressure gauges with ball valve alongwith SS syphon & SS Needlevalve)as per specifications.or as directed etc. complete..**		
323.14.1	**Dial type 4" dial 0 to 6 Kg/Cm2**	**288.00**	**NOS**
324.15	**Thermometers**		
325.	**Thermometers Make:-H.Guru/ Fiebig/Emerald/Metzer/ Bestobell/ Star Scientific**		
326.	**Supply, installation,testing & commissioning of following types Thermometers with Thermowells as per specifications.or as directed etc. complete..**		
327.15.1	**Dial type (0 to 50 deg C)**	**258.00**	**NOS**
328.0	**DRAIN PIPING**		
329.	**DRAIN PIPING Make:Ashirwad/ Supreme/ Astral**		
330.1	**PVC DRAIN PIPING (with Insulation):**		
331.	**PVC DRAIN PIPING Make:Ashirwad/ Supreme/ Astral**		
332.	**Nitrile rubber insulation Make:-Armaflex/Thermaflex/A-flex/K-flex/Superlon**		
333.	**Supply, installation, testing & commissioning of following sizes insulated PVC / HDPE drain pipes from AHU drain pans to**		

	nearest floor drain and from CHW pump glands to the nearest drain complete with interconnection, flanges, elbows, tees, nuts, P-trap etc.as per specifications.or as directed etc. complete.. The pipes to be duly insulated with 19 mm thick Closed cell Nitrile rubber insulation finally Covering with UV Black Colour glass cloth. as per specifications.or as directed etc. complete..		
334. **.1.1**	**75 mm dia.**	**60.00**	**RMT**
335. **.1.2**	**50 mm dia.**	**200.00**	**RMT**
336. **.1.3**	**40 mm dia**	**240.00**	**RMT**
337. **.1.4**	**25 mm dia**	**120.00**	**RMT**
338. **.2**	**GI DRAIN PIPING (with Insulation):**		
339.	**Make:-JINDAL- HISSAR/TATA/ZENIT**		
340.	**Nitrile rubber insulation Make:-Armaflex/Thermaflex/A-flex/K-flex/Superlon**		
341.	**Supply, installation, testing & commissioning of following sizes insulated MS/ GI drain pipes Class C from AHU drain pans to nearest floor drain and from CHW pump glands to the nearest drain complete with interconnection, flanges, elbows, tees, nuts, P-trap etc. The pipes to be duly insulated with 19 mm thick Closed cell Nitrile rubber insulation finally Covering with UV Black Colour glass cloth.as per specifications.or as directed etc. complete..**		
342. **.2.1**	**75 mm dia.**	**10.00**	**RMT**
343. **.2.2**	**50 mm dia.**	**60.00**	**RMT**
344. **.2.3**	**40 mm dia**	**20.00**	**RMT**
345. **.2.4**	**25 mm dia**	**10.00**	**RMT**
346. **.0**	**PRESSURISED EXPANSION TANK , AIR SEPARATORS , ELECTRO-CHEMICAL TREATMENT & ANTI - FOULING CONDENSER SYSTEM/AUTOMATIC TUBE CLEANING SYSTEM**		
347. **.1**	**Pressurised Unit with closed Expansion Tank (1000 Litrs)**		
348.	**Supply, installation of insulated pressure type expansion tank of adequate size complete with integral heavy duty butyl rubber diaphragm, system pressure 125 psig and temperature difference 10 def F. with Auto Controls with Pressurisation pumps (1 working + 1 standby) water flow rate, suitable ... HP motor, relief valve, pressure gauge, control panel, pressure switch drain, pipes fittings valves etc. Pump should be sized to create required pressure in the system and complete with check valve, Y strainer, butterfly valves, flexible connections rubber pads etc.Provide pump panel with starters,all starters with sufficient Potential free ,NO/NC contacts ,relay contacts , to control /monitor from the IBMS system, electric alternator and controls for auto operation from pressure switch. Provide pressure switch.Automatic electrical cum control panel,IP 52 ,as per**	**1.00**	**NOS**

	specifications.or as directed etc. complete.. Pressurised Unit with closed Expansion Tank Make:- Anergy /Emerald /Rapid control/Reflex		
349. **.2**	**Air & Dirt Separators (With air release Valve)**		
350.	**Supply & Installation testing & commissioning of a common air separator on the return water line located at the pump suction and suitable for 1572 US GPM water flow, 250 MM dia inlet outlet. The separator should be complete with high capacity air vent, service valve, non return valve, butterfly valve connection for makeup water inlet, flanges etc.as per specifications.or as directed etc. complete.. Air & Dirt Separators Make:Anergy /Emerald /Rapid control/Reflex**	**1.00**	**NOS**
351. **.3**	**Cooling Tower Water Inteligent Treatment & Condensor auto Tube cleaning system**		
352.	**Cooling Tower Water Treatment system MAKES: ENERGEO/CQM/CET-ENVIRO/TAPROGGE/EVAPCO**		
353.	**Condensor Tube cleaning MAKES: ENERGEO/BALL TECH/CQM/CET-ENVIRO.**		
354.	**Supply, installation of insulated for Condensor Tube cleaning & Cooling Tower Water Treatment with pipes fittings valves etc as per below specs ,as per specifications.or as directed etc. complete..**		
355. **.3.1**	**SITC of Cooling Tower Water Treatment System : For Cooling Towers of capacity (2 Nos x 1550 USGPM & 1Nos 625 USGPM) SITC of Electro-Chemical Treatment System for Cooling Tower (Non-Chemical) for Cooling Tower/Makeup water Treatment. The system should be equipped with Automatic Self Cleaning Mechanism & Automatic Blowdown Control. The proposed system should be manufactured and complied with ISO 14001:2015, ISO 9001:2015. The system must be CE + RoHS compliant and in accordance with UL standards. The proposed system should minimize blow down water consumption up to 50%. No/Zero Chemicals uses for cooling tower circuit, technology must fall under green technology initiatives, the system must avoids algae and micro-bacterial formation in water or surface of Pipe/ CT/ fills. The system must have components like - Electrolytic Reactor, Automated Scrapper mechanism for reactor cleaning, Automatic Blowdown control, Side Screen Filter, Automatic Back wash Feature, Electrical Control Panel,all starters with sufficient Potential free ,NO/NC contacts ,relay contacts , to control /monitor from the IBMS system, Skid with Pumps & Valves. It should be IBMS Compatible to control and moniter data from IBMS system as per specifications.or as directed etc. complete..**	**1.00**	**LOT**
356. **.3.2**	**SITC of Condenser Auto Tube Cleaning System (For Chiller 2 Nos 310 TR & 1 No 125 TR). SITC of iNTELLIGENT ANTI FOULING CONDENSER SYSTEM/SMART AUTOMATIC TUBE CLEANING SYSTEM with Anti Fouling arrangement on chiller by automatic condenser cleaning Upto 4# Chillers Max, with a Common Skid for the required number of chillers in the plantroom. The system shall include IoT Ready, Industry 4.0**	**1.00**	**QTY**

	complaint device Complete with all starters with sufficient Potential free ,NO/NC contacts ,relay contacts , to control /monitor from the IBMS system, The Panel with minimum 7" Touch Screen Graphical HMI which will log the real time data related to chiller energy (KWH), capacity (TR), Chiller Capacity TR monitoring, Water Temperature profile on evaporator and condenser both and graphical representation of historic summary which shall be displayed on the Mobile Application with unlimited user access on cloud based system. The data can also be retrieved in XL or PDF Format. The system shall have one Injection/Collection pump, Motorized Valves ,(Energy Meter, BTU Meter, Temp. Sensors -In IBMS Scope)and complete with all accessories and Low side activities of piping connections of Ball traps & Ball collectors on the Chillers. The Common Skid piping, Ball Trap Size to suit chiller capacity requirement for the project. It should be IBMS Compatible to control and moniter data from IBMS system as per specifications.or as directed etc. complete..		
357.0	**SHEET METAL WORKS ,GRILL , DIFFUSER , DAMPERS ETC,**		
358.1	**GI Duct (Metal Ducts)**		
359.	**GI Sheet Make:-Tata / Jindal / Sail**		
360.	**FACTORY MADE GI Duct as per SMACNA STD'S**		
361.	**FACTORY MADE GI Duct as per SMACNA STD'S Make:-Asawa /Zeco /Rollastar /Nutech/DS Ductofab/bombai air product**		
362.	**Fabrication, supply, installation, testing & commissioning of Galvanised Iron (GI)shall conform IS: 227 – 1977 Sheet ducting complete with splitter dampers, turning vanes, access doors, supports etc. as per drawings and as per specifications.or as directed etc. complete..Supports for ducts at 2.4m distance apart upto 2250/1.2m distance part for larger ducts. Each Hangers and supports shall have minimum 2 vertical rods of 10mm/12mm diameter with 40 x 40 x 6 or 50 x 50 x 6 angles as approved by Consultant.as per specifications.or as directed etc. complete..All Duct joints should be Air tight joints & shall be fully sealed with Silicon Sealant for leak tight installation.for leak tight installation. Accessories such as splitter, vanes etc.Ducts should be with proper reinforcement/ strengthening if required. Adhesives, Tapes and sealants for Joints.The gasket used in case for all ducts shall be fire retardant type as per specifications.or as directed etc. complete..**		
363.	**<u>Note :</u> All exposed ventilation duct work should be painted with 2 coats of epoxy primer and 2 coats of epoxy paint.All the supports of the duct will be painted to match the ducting. Please note that the supports for ducting have to be taken from the ceiling slab only.**		
364.1.1	**Factory Fabricated**		
365.1.1.	**18 G Plenum**	**5600.00**	**SQFT**

1			
366.1.1.2	**20 G Ducting (upto 1500mm upto 2250mm any side)**	**3600.00**	**SQFT**
367.1.1.3	**22 G Ducting (above 750mm upto 1500mm anyside)**	**17000.00**	**SQFT**
368.1.1.4	**24 G Ducting (upto 750mm any side)**	**9000.00**	**SQFT**
369.1.1.5	**20 G Ducting (upto 1500mm upto 2250mm any side) (Flat Oval Ducting)**	**1500.00**	**SQFT**
370.1.1.6	**22 G Ducting (above 750mm upto 1500mm anyside) (Flat Oval Ducting)**	**3600.00**	**SQFT**
371.1.1.7	**24 G Ducting (upto 750mm any side) (Flat Oval Ducting)**	**2200.00**	**SQFT**
372.1.1.8	**22 G Ducting (Round Ducting)**	**1200.00**	**SQFT**
373.1.1.9	**24 G Ducting (Spiral Ducting)**	**900.00**	**SQFT**
374.1.2	**Site Fabricated**		
375.1.2.1	**18 G Plenum (Site Fabricated)**	**3000.00**	**SQFT**
376.1.2.2	**20 G Ducting (upto 1500mm upto 2250mm any side)(Site Fabricated)**	**800.00**	**SQFT**
377.1.2.3	**22 G Ducting (above 750mm upto 1500mm anyside)(Site Fabricated)**	**1200.00**	**SQFT**
378.1.2.4	**24 G Ducting (upto 750mm any side) (Site Fabricated)**	**2400.00**	**SQFT**
379.1.3	**Pre Insulated Ducts :**		
380.	**SITC of Pre-insulated aluminium ductwork made of aluminium sandwich panels, comprising an expanded polyurethane rigid foam board faced on both sides by aluminium foil with weatherproof protection layer. Rigid expanded polyurethane foam will be 48 kg/m3 density, CFC free with a thermal conductivity of not less than 0.022 W/mk.The duct material and the adhesive shall be of class 'O' fire rated, Fire retardent and UL723 certified. The sealant used shall be low VOC. as per specifications.or as directed etc. complete..The price quoted shall also include internal support / stiffner rods, duct joint system and MS supporting arrangement.as per specifications.or as directed etc. complete.. Pre Insulated Ducts Make:P3 /DS Ductofab/Easy Pre-insulated Duct/ UniGulf /Asawa**		
381.1.3.1	**20 mm thick preinsulated ducts**	**92600.00**	**SQFT**
382.2	**Flexible Duct**		
383.	**Supply, installation,testing and commissioning of following sizes of insulated flexible ducting with its matching supports and other accessories.Flexible Duct are made of flexible plastic over a**		

	metal wire coil to make round, with layer of fiberglass insulation covers the duct, and then a thin plastic layer protects the insulation. Make:Thermaflex / Owens corning / UP Twiga		
384. **.2.1**	**300mm dia.**	**120.00**	**RMT**
385. **.2.2**	**250mm dia.**	**90.00**	**RMT**
386. **.2.3**	**200mm dia.**	**70.00**	**RMT**
387. **.2.4**	**150mm dia.**	**150.00**	**RMT**
388. **.2.5**	**100mm dia.**	**20.00**	**RMT**
389. **.3**	**Continous Linear Grilles**		
390.	**Supply, installation,testing and commissioning of following sizes of Aluminium extruded powder coated continous grilles with 4 side flanges Note : If required Contractor should blank off the extra portion of grille without additional cost and provide deflection of 0 deg to 45 deg without extra cos,tas per specifications.or as directed etc. complete.. Make:Dynacraft/ Cosmos/ Airproducts/System air**		
391. **.3.1**	**200mm wide**	**120.00**	**SQFT**
392. **.3.2**	**150mm wide**	**240.00**	**SQFT**
393. **.3.3**	**100mm wide**	**700.00**	**SQFT**
394. **.3.4**	**Door Transfer grill for Toillet Main Door**	**260.00**	**SQFT**
395. **.4**	**Continous Linear Curved Grilles**		
396.	**Supply, installation,testing and commissioning of following sizes of Aluminium extruded powder coated continous Curved grilles with 4 side flanges.Note : If required Contractor should blank off the extra portion of grille without additional cost and provide deflection of 0 deg to 45 deg without extra cost ,as per specifications.or as directed etc. complete..Continous Linear Curved Grilles Make:Dynacraft/ Cosmos/ Airproducts/System air**		
397. **.4.1**	**200mm wide**	**40.00**	**SQFT**
398. **.4.2**	**150mm wide**	**70.00**	**SQFT**
399. **.4.3**	**100mm wide**	**1020.00**	**SQFT**
400. **.5**	**Supply Air Square Diffusers**		
401.	**Supply, installation,testing and commissioning of Al. extruded powder coated Supply Air diffuser with damper flush type and removable core construction. Provide damper arrangement. Damper should be aluminum powder coated, multiple flap type,as per specifications.or as directed etc. complete... Overall size given below. Supply Air Square Diffusers Make:Dynacraft/ Cosmos/ Airproducts/System air**		
402. **.5.1**	**If size is not Finalize**	**0.00**	**SQFT**

403. .5.2	**300 mm x 300mm (1' x 1')**	**80.00**	**NOS**
404. .5.3	**350 mm x 350mm (1' x 1')**	**0.00**	**NOS**
405. .5.4	**400 mm x 400mm (1' x 1')**	**0.00**	**NOS**
406. .5.5	**450 mm x 450 mm (1 1/2' x 1 1/2')**	**40.00**	**NOS**
407. .5.6	**525 mm x 525 mm (1 1/2' x 1 1/2')**	**0.00**	**NOS**
408. .5.7	**600 mm x 600 mm (2' x 2')**	**300.00**	**NOS**
409. .6	**Return Air Square Diffusers**		
410.	**Supply, installation,testing and commissioning of Al. extruded powder coated Supply Air diffuser without damper flush type and removable core construction,as per specifications.or as directed etc. complete... Overall size given below. Return Air Square Diffusers Make:Dynacraft/ Cosmos/ Airproducts/System air**		
411. .6.1	**If size is not Finalize**	**0.00**	**SQFT**
412. .6.2	**300 mm x 300mm (1' x 1')**	**80.00**	**NOS**
413. .6.3	**350 mm x 350mm (1' x 1')**	**0.00**	**NOS**
414. .6.4	**400 mm x 400mm (1' x 1')**	**0.00**	**NOS**
415. .6.5	**450 mm x 450 mm (1 1/2' x 1 1/2')**	**40.00**	**NOS**
416. .6.6	**525 mm x 525 mm (1 1/2' x 1 1/2')**	**0.00**	**NOS**
417. .6.7	**600 mm x 600 mm (2' x 2')**	**300.00**	**NOS**
418. .7	**Supply Air Round Diffusers**		
419.	**Supply, installation of Al. extruded powder coated round diffusers with removable core construction. Provide damper arrangement. Damper should be aluminum powder coated, multiple flap type. Supply Air diffuser with damper of following Overall size ,as per specifications.or as directed etc. complete.. Supply Air Round Diffusers Make:Dynacraft/ Cosmos/ Airproducts/System air**		
420. .7.1	**If size is not Finalize**	**0.00**	**SQFT**
421. .7.2	**225 mm dia (3/4')**	**0.00**	**NOS**
422. .7.3	**300 mm dia (1')**	**45.00**	**NOS**
423. .7.4	**375 mm dia (1 1/4')**	**0.00**	**NOS**
424. .7.5	**450 mm dia (1 1/2')**	**10.00**	**NOS**
425. .7.6	**525 mm dia (1 3/4')**	**0.00**	**NOS**
426. .8	**Return Air Round Diffusers**		
427.	**Supply, installation of Al. extruded powder coated round diffusers with removable core construction. Without damper arrangement. R. A. diffuser without damper of following Overall**		

	size ,as per specifications.or as directed etc. complete.. Return Air Round Diffusers Make:Dynacraft/ Cosmos/ Airproducts/System air		
428. **.8.1**	**If size is not Finalize**	**0.00**	**SQFT**
429. **.8.2**	**225 mm dia (3/4')**	**0.00**	**NOS**
430. **.8.3**	**300 mm dia (1')**	**30.00**	**NOS**
431. **.8.4**	**375 mm dia (1 1/4')**	**0.00**	**NOS**
432. **.8.5**	**450 mm dia (1 1/2')**	**15.00**	**NOS**
433. **.8.6**	**525 mm dia (1 3/4')**	**0.00**	**NOS**
434. **.9**	**Continuous Slot Diffuser**		
435.	**Supply, installation,testing and commissioning of following Overall sizes of Aluminium extruded powder coated continous Slot Diffuser with 4 side flanges.with insulated plenum box with Suitable for slot diffuser Gypsem ceiling / Modular Ceiling / Tech zone ceiling Provide damper arrangement. Damper should be aluminum powder coated, multiple flap type. as per specifications.or as directed etc. complete..Note : If required Contractor should blank off the extra portion of Slot Diffuser without additional cost.as per specifications.or as directed etc. complete.. Continuous Slot Diffuser Make:Dynacraft/ Cosmos/ Airproducts/System air**		
436. **.9.1**	**1 no. of slot with Overall size 59 mm.**	**30.00**	**RMT**
437. **.9.2**	**2 nos. of slots with Overall size 91 mm.**	**480.00**	**RMT**
438. **.9.3**	**3 nos. of slots with Overall size 123 mm.**	**90.00**	**RMT**
439. **.9.4**	**4 nos. of slots with Overall size 187 mm.**	**0.00**	**RMT**
440. **.9.5**	**5 nos. of slots with Overall size 219 mm.**	**0.00**	**RMT**
441. **.10**	**Jet Nozzles**		
442.	**Jet Nozzel Make:Dynacraft/ Cosmos/ Airproducts/System air**		
443.	**Supply & fixing of round type Jet Nozzles of Aluminium alloy extrusion adjustable type of following sizes.as per specifications.or as directed etc. complete..**		
444. **.10. 1**	**150 mm dia (6")**	**0.00**	**NOS**
445. **.10. 2**	**175 mm dia (7")**	**0.00**	**NOS**
446. **.10. 3**	**202 mm dia (8")**	**0.00**	**NOS**
447. **.10. 4**	**265 mm dia (10")**	**0.00**	**NOS**
448. **.10.**	**310 mm dia (1')**	**34.00**	**NOS**

5			
449.10.6	**380 mm dia (1 1/4')**	**0.00**	**NOS**
450.11	**Gravity louvers**		
451.	**Gravity Louvers Make:Dynacraft/ Cosmos/ Airproducts/System air**		
452.11.1	**Supply, installation, testing and commissioning of GI Gravity louvers ,as per specifications.or as directed etc. complete..**	**60.00**	**SQFT**
453.12	**Fire Dampers**		
454.	**SITC of Motorized fire damper UL555 with actuator Make:Cosmos with belimo controller / Ruskin Titus / Fire Damper & Belimo Actuators / Honey well /Caryaire**		
455.	**GI Fire damper UL 555 Make:Dynacraft/ Cosmos/ Airproducts/System air/Ruskin/Honeywell/Titus**		
456.	**Actuator for Damper Make:Belimo Actuators / Caryaire/ Servex/ Dynamic/Ruskin/Anergy**		
457.	**SITC of Fusibile Link For Fire Damper Make:Cosmos / Ruskin /Titus /Caryaire/System air**		
458.	**Supplying, installation, testing and commissioning of fire dampers, the blades and frame shall be min. 1.6 mm thick GI sheet and factory fitted in a sleeve made out of 1.6 mm thick GS Sheet of min. 400 mm long, as & where required, of required sizes including control wiring. The damper shall be motorized and spring return so as to close the damper in the event of power failure automatically and open the same in case of power being restored. The spring return action shall be inbuilt mechanism and not externally mounted. The damper shall also be closed in the event of fire signal. UL 555 CBRI tested and certified for 90 minute fire rating etc. as per specifications.or as directed etc. complete..Motorized actuator should be direct coupled spring return type, motorised, maintenance free direct coupled spring return type suitable to work on 24 V electric supply.The torque rating of the actuator shall exceed at least by 15% over torque required to open / close the damper. Should have manual over ride facility. The selection of actuator size shall be the responsibility of the manufacturer. Power on indicating lamps with 230 V / 24 V transformer,damper close & open indication, reset push button, push button for manual running of actuator for periodic inspection, auxiliary contacts 24V & 230 V, contact points to receive signal from smoke detector / fire alarm panel etc. should be provided. as per specifications.or as directed etc. complete..**		
459.12.1	**SITC of Fire dampers in supply air duct**	**450.00**	**SQFT**
460.12.2	**SITC of Fire damper in return air duct**	**380.00**	**SQFT**
461.12.3	**SITC of Motorized actuators rated for fire dampers and spring return type.**	**222.00**	**NOS**

462.12.4	**SITC of Fusible link as per specification UL 555 and CBRI approved. should be rated for 72 deg C. Each FSD shall be of multi leaf type, low leakage and shall be tested in the factory and will be certified by the manufacturer in form of the test certificate,as per specifications.or as directed etc. complete..**	**80.00**	**NOS**
463.12.5	**SITC of Control cabling ,2CX1.5 Sq mm Xlpe ,Copper armoured,,as per specifications.or as directed etc. complete..**	**750.00**	**RMT**
464.12.6	**SITC of Control Panel for Fire Damper,as per specifications.or as directed etc. complete..**	**210.00**	**NOS**
465.12.7	**SITC NRD (NON RETURN GI DAMPER),as per specifications.or as directed etc. complete..**	**200.00**	**SQFT**
466.13	**Volume Control Dampers for Duct**		
467.	**Volume Control Dampers Make:-Dynacraft/ Cosmos/ Airproducts / Dynamic / Servex**		
468.13.1	**Supply, installation, testing and commissioning of GI volume control dampers at Machine outlet and in Branch duct. (Gear Operated and Low Leakage),as per specifications.or as directed etc. complete..**	**540.00**	**SQFT**
469.14	**Volume Control Dampers for Supply Air Collars**		
470.	**Volume Control Dampers Make:-Dynacraft/ Cosmos/ Airproducts / Dynamic / Servex**		
471.14.1	**Supply and Installation of Black MS Box- Type Volume Control Dampers for Collar,as per specifications.or as directed etc. complete..**	**1250.00**	**SQFT**
472.15	**Volume Control Dampers for Round/ Spiral & Flat Oval Duct**		
473.	**Volume Control Dampers Make:-Dynacraft/ Cosmos/ Airproducts / Dynamic / Servex**		
474.15.1	**Supply, installation, testing and commissioning of GI volume control dampers FOR Machine outlet and in Branch duct. (Gear Operated and Low Leakage),as per specifications.or as directed etc. complete..**	**150.00**	**SQFT**
475.16	**Fire Retardant Canvass Connections**		
476.	**Make:-ARAR Impex/Mauli Fire Safety/Canvass emporium/Reputed ,or as directed.**		
477.16.1	**Supply, installation, testing and commissioning of Flexible double Canvas with Fire retardant for AHU, FCU & FAN,as per specifications.or as directed etc. complete..**	**150.00**	**NOS**
478.17	**Sound attenuators**		
479.	**Make:- Air flow/Air Master/Cosmos/Dynacraft**		
480.17.1	**Supply, installation, testing and commissioning of Sound attenuators as per the supply air duct sizes shown in the drawings,as per specifications.or as directed etc. complete..**	**1500.00**	**SQFT**
481.18	**Outdoor connection with rain protection louvers**		

482.	**Rain protection Louvers Make:-Dynacraft/ Cosmos/ Airproducts/System air**		
483. .18. 1	**Supply, installation, testing and commissioning of outdoor connection with Aluminium anodised rain protection louvers, GI wiremesh, cowl & dampers,as per specifications.or as directed etc. complete..**	**400.00**	**SQFT**
484. .0	**THERMAL & ACOUSTIC INSULATION**		
485. .1	**Thermal Insulation for Duct**		
486.	**Nitrile rubber insulation Make:-Armaflex/Thermaflex/A-flex/ K-flex/Superlon**		
487.	**Supply, installation, testing and commissioning of Duct insulation with following type fixed with adhesive as per specifications.or as directed etc. complete..**		
488. .1.1	**9 mm thick Closed cell Class O ,Nitrile Rubber , thermal Conductivity R Value 0.033 W/(M.K) & density 32 to 42 Kg/m3.(FOR DUCT IN RETURN AIR PATH)**	**9000.00**	**SQFT**
489. .1.2	**13 mm thick Closed cell Class O ,Nitrile Rubber , thermal Conductivity R Value 0.033 W/(M.K) & density 40 to 60 Kg/m3. (FOR DUCT IN NON RETURN AIR PATH)**	**18000.00**	**SQFT**
490. .1.3	**16 mm thick Closed cell class O ,Nitrile Rubber Covered with UV black color fiber glass cloth (FOR DUCT DIRECT EXPOSED TO SUN)**	**7000.00**	**SQFT**
491. .2	**Acoustic Insulation for Duct**		
492.	**Nitrile rubber insulation Make:-Armaflex/Thermaflex/A-flex/K-flex/Superlon**		
493. .2.1	**Supply, installation, testing and commissioning of Acoustic lining of duct work with following type fixed with adhesive as per specifications.or as directed etc. complete.. 15 mm thick Nitrile Rubber Open Cell Nitrile Rubber , thermal Conductivity 0.047 W/(M.K) & density 140 to 180 Kg/m3.**	**12000.00**	**SQFT**
494. .3	**Acoustic Insulation for Plant Room (AHU room)**		
495.	**Nitrile rubber insulation Make:-Armaflex/Thermaflex/A-flex/K-flex/Superlon**		
496.	**Fiber Glass Insulation:- UP Twiga/Owens corning**		
497.	**Supply, installation, testing and commissioning of Acoustic insulation for plant room using & fixed with adhesiveas as per specifications.or as directed etc. complete..**		
498. .3.1	**25 mm thick Accoustic Open cell (Armasound) Nitrile Rubber , Adheshive ,and Covered with 24 G Aluminium perforated sheet ,GI washer and screw on joints.as per specifications.or as directed etc. complete..**	**20000.00**	**SQFT**
499. .3.2	**15 mm thick Open cell Nitrile Rubber Insulation with density 140-180 kg/m3 (AHU Trap doors) with Ceiling Suspended AHU's as per specifications.or as directed etc. complete..**	**1200.00**	**SQFT**

500. .4	**Underdeck insulation**		
501.	**Make:P3 /DS Ductofab/Easy Pre-insulated Duct/ UniGulf /Asawa**		
502.	**Nitrile rubber insulation Make:-Armaflex/Thermaflex/A-flex/K-flex/Superlon**		
503. .4.1	**Supply, installation, testing and commissioning of Underdeck insulation with following type fixed with adhesive as per specifications.or as directed etc. complete.. (for 5th & 6th floor AC Area Roof Direct Open to Sun) 25 mm thick Pre Insulated Sheets with CFC free closed cell phenolic foam protected with 80 micron aluminum foil facing on both sides Rigid expanded polyurethane foam will be 48 kg/m3 density, CFC free with a thermal conductivity of not less than 0.0285 W/mk.The duct material and the adhesive shall be of class 'O' fire rated and NFPA 90A, UL 181 Standard. The sealant used shall be low VOC.**	**28000.00**	**SQFT**
504. .4.2	**25 mm thick Nitrile Rubber closed cell (For Hard / soft Roofing) a fixed with adhesive as per specifications.or as directed etc. complete..**	**200.00**	**SQFT**
505. 0.0	**VARIABLE AIR VOLUME BOXES & VARIABLE FREQUENCY DRIVE**		
506. 0.1. 1	**Pressure Independent Variable Air Volume Boxes**		
507.	**SITC Pressure Independent variable air volume boxes,with On/Off control (Damper should get fully closed during off position,so that no air flow during off position), consisting of a microprocessor DDC controller (UL Listed), damper actuator, low pressure velocity transducer and temperature sensor with room thermostat with sound attenuators for size 12 and above for the following CFM. Rate shall be on Air freight basis.The thermostat for the VAVs shall all be with Digital display and compatible with VAV controller and the BMS MODBUS COMPATIBLE.as per specifications.or as directed etc. complete..(Note : In individual cabins and encloser, VAV with manual operated thermostat and regulator are needed so that person occupying one particular room can control the room temperature of that room.(the VAV will operate on manual basis, but also connected to BMS and we can overwrite the manual operation over the BMS control. VAV's controlling peripheral areas will be controlled by BMS only.)as per specifications.or as directed etc. complete..CFM RANGE (MODEL) (The CFM selection of VAV box should be 20% more than the Dehumidified CFM required. Make:-Cosmos / Systemair / Airproduct /Jhonson control**		
508. 0.1.1 .1	**UPTO 230 CFM**	**1.00**	**NOS**
509. 0.1.1 .2	**70 - 360 CFM**	**23.00**	**NOS**
510. 0.1.1 .3	**100-520 CFM**	**39.00**	**NOS**

511. 0.1.1.4	**140-710 CFM**	**34.00**	**NOS**
512. 0.1.1.5	**185-925 CFM**	**40.00**	**NOS**
513. 0.1.1.6	**290-1450 CFM**	**39.00**	**NOS**
514. 0.1.1.7	**420-2100 CFM**	**8.00**	**NOS**
515. 0.1.1.8	**580-2900 CFM**	**13.00**	**NOS**
516. 0.1.1.9	**740-3700 CFM**	**10.00**	**NOS**
517. 0.1.1.10	**1420-7100 CFM**	**3.00**	**NOS**
518. 0.1.2	**Pressure Dependent Constant Air Volume Boxes (CAV)**		
519.	**SITC of Pressure Independent variable air volume boxes,with On/Off control (Damper should get closed during off position), consisting of a microprocessor DDC controller (UL Listed), damper actuator, low pressure velocity transducer and Pressure sensor with sound attenuators for size 12 and above for the following CFM. Rate shall be on Air freight basis.The thermostat for the VAVs shall all be with Digital display and compatible with VAV controller and the BMS,as per specifications.or as directed etc. complete..MODBUS COMPATIBLE.CFM RANGE (MODEL) (The CFM selection of VAV box should be 20% more than the Dehumidified CFM required.Make:-Cosmos / Systemair / Airproduct /Jhonson control**		
520. 0.1.2.1	**1000 CFM**	**0.00**	**NOS**
521. 0.1.2.2	**1500 CFM**	**0.00**	**NOS**
522. 0.1.2.3	**2000 CFM**	**0.00**	**NOS**
523. 0.1.2.4	**5000 CFM**	**0.00**	**NOS**
524. 0.1.2.5	**7000 CFM**	**0.00**	**NOS**
525. 1.0	**OTHER ACCESSORIES**		
526. 1.1	**Door Air Curtain**		
527.	**Supply, installation, testing and commissioning of air curtain complete with MS hanging supports, electrical cabling length suitable as per site condition, with velocity of 12-14 m/s.,as per specifications.or as directed etc. complete.. of following sizes .Make:-Mitzvah/ Russel/ Systemair**		
528. 1.1.3	**SITC of 1500 mm (5 FT') 1650 m3/HR , 12-14 mt/sec ,noise level < 60 DB for (Door Ht= Approx. 2.4 Meters)**	**0.00**	**NOS**

529. 1.1.5	**2100 mm (7' FT) 2100 m3/HR , 12-14 mt/sec, noise level < 60 DB for (Door Ht= Approx. 2.4 Meters)**	**0.00**	**NOS**
530. 1.2	**Drain Pump**		
531. 1.2.1	**Supply, installation, testing and commissioning of Drain Pump complete with supports, electrical cabling length suitable as per site condition and include all accessories for installation. Pump for FCU / Hiwall Units .(If Required if gravity slope of AC Condensate draigne line not feasibile to maintaned as per site condition)as per specifications.or as directed etc. complete.. Make:-Blue Diamond/Microdam/Refco**	**40.00**	**NOS**
532. 2.0	**VENTILATION FANS**		
533.	**Supply , installation,testing and commissioning of FANS with motor, with Starter panels/MCB , with potential free contacts for fire signal trip.cubicle type Local Control Panels with MCB/MCCB Single Phase Preventer/DP Switch Supply of Local Control Panels or Starter Panels In IP 52 construction all starters with sufficient Potential free ,NO/NC contacts ,relay contacts , to control /monitor from the IBMS system, each with MCB, Single Phase Preventer, over load protection ,Potential Free NO/NC contacts (for Fire signal trip ,run , trip , auto/manual) and 1 no. relay contact for on/off command , Local panal compatible with BMS.It should be IBMS Compatible to control and moniter data from IBMS system.,as per specifications.or as directed etc. complete..suitable for following: Make:-Airflow / Kruger / Nicotra / Carryaire/ Humidin/ Systemair**		
534.	**The inline fans & Cabinet fans shall be complete with Centrifugal fan, unit casing access door, electrical connections canopy fan shall be suitable for outdoor installation A/C contractor to include all accessories for installation of inline/ Cabinet fan with EC / IE3 motors , with Starter panels/MCB , with potential free contacts for fire signal trip.cubicle type Local Control Panels with MCB/MCCB Single Phase Preventer/DP Switch Supply of Local Control Panels or Starter Panels In IP 52 construction each with MCB, Single Phase Preventer, over load protection ,Potential Free NO/NC contacts (for Fire signal trip ,run , trip , auto/manual) and 1 no. relay contact for on/off command , provision of mounting the VFD , Local panal compatible with BMS.It should be IBMS Compatible to control and moniter data from IBMS system.,as per specifications.or as directed etc. complete, power cabling from power, sockets nearby. FRESH AIR Fan with 90% effiency down to 10 Micron Filter with frame & bird screen.**		
535.	**Note: Contractor shall Include Cost of Starter panels/MCB , with 5 nos. potential free contacts for fire signal trip and a relay contact for IBMS comptible. SITC cubicle type Local Control Panels / DOL StarterPanels with MCB Single Phase Preventer/DP Switch with Fans Price.**		
536. 2.1	**INLINE / CABINET FANS**		
537.	**Supply ,installation,testing and commissioning of inline fans shall be complete with centrifugal fan, unit casing access door,**		

	electrical connections canopy fan shall be suitable for outdoor installation A/C contractor to include motors, starters, all starters with sufficient Potential free ,NO/NC contacts ,relay contacts , to control /monitor from the IBMS system, Termination of power cabling , sockets nearby, all ther accessories complete in all respects.as per specifications.or as directed etc. complete.. Fresh air to have 6mm thick pad filter with frame. Make:-Airflow / Kruger / Nicotra / Carryaire/ Humidin/ Systemair		
538. **2.1.1**	**For Exhaust Air Fan**		
539. **2.1.1.1**	**15000 CFM @ 50 MM Static**	**0.00**	**NOS**
540. **2.1.1.2**	**8500 CFM @ 35 MM Static**	**0.00**	**NOS**
541. **2.1.1.3**	**6500 CFM @ 35 MM Static**	**0.00**	**NOS**
542. **2.1.1.4**	**5200 CFM @ 45 MM Static for 4th floor Compactor room**	**2.00**	**NOS**
543. **2.1.1.5**	**4400 CFM @ 45 MM Static for D wing M + F Toilet Exhaust (2nd , 3rd , 4th , 5th , 6th & Upper lvl + Terace)**	**1.00**	**NOS**
544. **2.1.1.6**	**4200 CFM @ 35 MM Static for STP Exhaust Fan (3W+1S)**	**4.00**	**NOS**
545. **2.1.1.7**	**4100 CFM @ 45 MM Static for A wing M+F Toilet Exhaust (2nd , 3rd , 4th , 5th , 6th+ Upper lvl &Terrace)**	**1.00**	**NOS**
546. **2.1.1.8**	**3200 CFM @ 35 MM Static For B & C wing M+ F Toilet Exhaust (2nd , 3rd , 4th , 5th , 6th & Upper lvl)**	**2.00**	**NOS**
547. **2.1.1.9**	**2900 CFM @ 35 MM Static for Fire Pump Exhaust Room**	**2.00**	**NOS**
548. **2.1.1.10**	**2000 CFM @ 35 MM Static**	**0.00**	**NOS**
549. **2.1.1.11**	**1700 CFM @ 35 MM Static for Toilet Exhausr air**	**0.00**	**NOS**
550. **2.1.1.12**	**1300 CFM @30 MM Static for Gr Floor Wing B & C + 1ST Floor Wing B (M+ F) Toilet Exhausr air**	**3.00**	**NOS**
551. **2.1.1.13**	**600 CFM @ 30 MM Static for Ground Floor 2 Nos Hand wash + Pot Wash area Exhausr air**	**5.00**	**NOS**
552. **2.1.1.14**	**460 CFM @25 MM Static For 1st Floor Battery Room Exhaust Fan (1W+1S)**	**2.00**	**NOS**
553. **2.1.1.15**	**450 CFM @25 MM Static For 2nd Floor Wing A Multipurpose Hall (M+F) Toilet Exhausr air**	**1.00**	**NOS**
554. **2.1.1.16**	**250 CFM @25 MM Static For Basement Driver Toilet Exhaust Fan**	**2.00**	**NOS**
555. **2.1.**	**For Fresh air Fan (FRESH AIR Fan with 90% effiency down to**		

2	**10 Micron Filter)**		
556. **2.1. 2.1**	**15000 CFM @ 45 MM Static**	**0.00**	**NOS**
557. **2.1. 2.2**	**8000 CFM @ 40 MM Static**	**0.00**	**NOS**
558. **2.1. 2.3**	**5500 CFM @ 40 MM Static**	**0.00**	**NOS**
559. **2.1. 2.4**	**5200 CFM @ 45 MM Static for 4th floor Compactor room**	**4.00**	**NOS**
560. **2.1. 2.5**	**4000 CFM @ 45 MM Static for STP Fresh air (3W+1S)**	**4.00**	**NOS**
561. **2.1. 2.6**	**3800 CFM @ 40 MM Static for D wing M+ F Toilet Fresh air (2nd , 3rd , 4th , 5th , 6th & Upper lvl + Terrace)**	**1.00**	**NOS**
562. **2.1. 2.7**	**3500 CFM @ 40 MM Static for A wing M+ F Toilet Fresh air (2nd , 3rd , 4th , 5th , 6th & Upper lvl + terrace)**	**1.00**	**NOS**
563. **2.1. 2.8**	**2800 CFM @40 MM Static For B & C wing M+ F Toilet fresh air (2nd , 3rd , 4th , 5th , 6th & Upper lvl)**	**2.00**	**NOS**
564. **2.1. 2.9**	**2500 CFM @40 MM Static for Fire Pump Fresh air room**	**2.00**	**NOS**
565. **2.1. 2.10**	**2000CFM @40 MM Static**	**0.00**	**NOS**
566. **2.1. 2.11**	**1200CFM @ 40 MM Static**	**0.00**	**NOS**
567. **2.1. 2.12**	**1000CFM @ 35 MM Static**	**0.00**	**NOS**
568. **2.1. 2.13**	**700CFM @ 35 MM Static**	**0.00**	**NOS**
569. **2.1. 2.14**	**600CFM @ 30 MM Static for Ground Floor Executive Dinning Fresh air**	**3.00**	**NOS**
570. **2.1. 2.15**	**400CFM @30 MM Static For 1st Floor Battery Room Fresh air Fan (1W+1S)**	**2.00**	**NOS**
571. **2.1. 2.16**	**300CFM @30 MM Static**	**1.00**	**NOS**
572. **2.1. 2.17**	**200CFM @30 MM Static**	**1.00**	**NOS**
573. **2.1. 3**	**Supply , installation , testing and comissioning of sequential control panel with timers for 2 nos. Ex fans (1W+1S) & 2 nos. Fresh air fans (1W+1S) of Battery Room to Run on Equal runtime .**	**2.00**	**NOS**
574. **2.1. 4**	**Supply , installation , testing and comissioning of sequential control panel with timers for 4 nos. Ex fans (3W+1S) & 4 nos. Fresh air fans (3W+1S) of STP Area on Equal runtime.**	**2.00**	**NOS**

575. 2.2	**Kitchen Exhaust fan**		
576.	**Supply and Installation of cabinet type centrifugal DIDW exhaust & Fresh air fan motors with IE3 Rating , starters, all starters with sufficient Potential free ,NO/NC contacts ,relay contacts , to control /monitor from the IBMS system, Termination of power cabling , sockets nearby, It should be IBMS Compatible to control and moniter data from IBMS system.,as per specifications.or as directed etc. complete.. all other accessories complete in all respects.with the following specs: Make:-Airflow / Kruger / Nicotra / Carryaire/ Humidin/ Systemair**		
577. 2.2.1	**4000 CFM @75 MM Static - For Ground Floor Kitchen Exhaust**	**2.00**	**NOS**
578. 2.2.2	**3500 CFM @ 40 MM Static with PreFilter with 90% effiency down to 10 Micron for Ground Floor Kitchen Fresh Air**	**2.00**	**NOS**
579. 2.3	**Electrostatic Precipitator (ESP) Dry Scrubber for Kitchen Exhaust**		
580.	**S.I.T.C. of Electrostatic type Kitchen Exhaust Air Cleaner (Dry Scrubber) complete with the following accessories, componenets etc making it completely functional dry scrubber suitable for kitchen Hood Exhaust . The component to be included are Casing shall be made of 0.8 mm galvanized pre plasticized / powder coated shhet on outside and 0.8 mm GI sheet inside with PUF foam of 42 kg/m3 density insulation in between sheets to make 25 mm thick panels. Pre Filter section with hineycombtype aluminium 50 mm thick filters for coarse particle removal. Elestrostatic Precipitator section Electrostatic section shall be made of 16 gauge galvanized sheet max 7 mm gap betwwn collecting plates high bake epoxy powder coated ss spiked ionizers to create highvoltage DC field Stainless steel collector plates which should be alternatively charged positive and negative with large collecting area with deep cell to work as magnet for charged smoke and oil particles average efficiency of 90 to 95% in single pass as per Ashrae / DOP test method. Electrostatic precipitator should be able to charge particles from 0.01 micron to 10 microns through soild state power supply collector cell should be of permanent type and incorporate slide out facility for easy removal for cleaning power supplies shall be 100% solid state.. Outdoor type fan section with DIDW Backward curved fan having suitable capacity @specified SP and should be complete with suitable TEFC induction motor (IE-3) and belt drive arrangements as required and as per specification. Fan should be complete with all accessories including canvas connection inside unit & for duct connection vibration isolator gravity lovers etc as specified in the specification suitable capacity of TP isolator wihin MS enclosure box ,with Starter panels/MCB , with potential free contacts for fire signal trip.cubicle type Local Control Panels with MCB/MCCB Single Phase Preventer/DP Switch Supply of Local Control Panels or Starter Panels In IP 52 construction each with MCB, Single Phase Preventer, over load protection ,Potential Free NO/NC contacts (for Fire signal trip ,run , trip , auto/manual) and 1 no. relay contact for on/off command , provision of mounting the VFD , Local panal compatible with**		

	BMS.It should be IBMS Compatible to control and moniter data from IBMS system.,as per specifications.or as directed etc. complete as required and as per specifications.It should be IBMS Compatible to control and moniter data from IBMS system.,as per specifications.or as directed etc. Make:-Humidin/ Edgetech/ Filtron		
581. **2.3.1**	**4000 CFM @ 75 mm Static Pressure For Kitchen Exhaust Fan.**	**2.00**	**NOS**
582. **2.4**	**TERRACE MUSEUM VENTILLATION FANS**		
583.	**Make:-Airflow / Kruger / Nicotra / Carryaire/ Humidin/ Systemair**		
584.	**Supply and Installation of cabinet type DIDW centrifugal exhaust air fan with the following specs: motors with IE3 Rating, starter Panel ,Termination of power cabling , sockets nearby, all other accessories complete in all respects. It should be IBMS Compatible to control and moniter data from IBMS system.,as per specifications.or as directed etc.**		
585. **2.4.1**	**5000 CFM WITH Static 30 mm For Exhaust Air**	**4.00**	**NOS**
586. **2.4.2**	**4500 CFM WITH Static 30 mm For Fresh Air**	**4.00**	**NOS**
587. **2.5**	**Stair Case & Lift well Pressurization Fans**		
588.	**Make:-Airflow / Kruger / Nicotra / Carryaire/ Humidin/ Systemair**		
589.	**Supply and Installation of cabinet type DIDW centrifugal fan with the following specs:motors with IE3 Rating, starter panel, Termination of power cabling, sockets nearby, with 90% efficency down to 10 microns Filter & all other accessories complete in all respects.It should be IBMS Compatible to control and moniter data from IBMS system.,as per specifications.or as directed etc.**		
590. **2.5.1**	**For Staircase Pressurization**		
591. **2.5.1.1**	**10,000 CFM @ 45 MM Static with VFD , Differential Presssure Sensor set @50 pasacal for Office (A, B C& D WING)**	**4.00**	**NOS**
592. **2.5.1.2**	**10,000 CFM @ 45 MM Static with VFD , Differential Presssure Sensor set @50 pasacal for Common corridor (A, B C& D WING)**	**4.00**	**NOS**
593. **2.5.2**	**For Lift well Pressurization**		
594. **2.5.2.1**	**7,500 CFM @ 45 MM Static with VFD , Differential Presssure Sensor set @50 pasacal for Common Lift (A, B C& D WING)**	**2.00**	**NOS**
595. **2.5.2.2**	**6,000 CFM @ 45 MM Static with VFD , Differential Presssure Sensor set @50 pasacal for Service Lift at (C& D WING)**	**1.00**	**NOS**
596. **2.6**	**Tube Axial Fan: (AS SMOKE EXTRACTION FAN) for**		

	Common corridor		
597.	**Supply, installation,testing and commissioning of Tube Axial Fan with Fire retardant Canvass connection,impeller having adjustable pitch angle blades and complete with suitable motor & drive assembly. Motor shall be high efficiency Class EEF1. Motor shall be suitable for 415 ± 10% V, 3 Phase, 4 Wire, 50 ± 3%Hz electrical supply. Fans shall be AMCA Certified. For Smoke spill exhuast fans,the complete fan assembly alongwith the motor & drive assembly shall be fire rated i.e. suitable to operate upto 250°C for 2 hours and meet the duty parameters. Axial exhaust air fan are required to be in compliance with the requirements of Class B performance, as defined in clause 9 of BS 7346:Part 2:1990. This requires the fan to be subjected to a rated temperature of 250C for a rated duration of 120 minutes. with M.S floating foundations, motors, and all other accessories whether specifically mentioned or not. Note: Fan motor rpm not to exceed 600. All 3-phase Unit shall be supplied along with starter panel all starters with sufficient Potential free ,NO/NC contacts ,relay contacts , to control /monitor from the IBMS system, and local push button station near the Fan location. Electrical power cabling from Starter to motor is in HVAC contractor's scope. (with NO/NC Relay contact with starter panel auto start on signal for fire alarm panel) It should be IBMS Compatible to control and moniter data from IBMS system.,as per specifications.or as directed etc. Make:-Airflow / Kruger / Nicotra / Carryaire/ Humidin/ Systemair**		
598. **2.6.1**	**15,000 CFM @ 15 MM ,SMOKE SPILL -Tube Axial Exhaust Air Fan with Sound attunator Total Static Ceiling Suspended For Fire Mode for (2nd , 3rd & 4th Floor)**	**12.00**	**NOS**
599. **2.6.2**	**10.000 CFM @ 15 MM ,SMOKE SPILL -Tube Axial Exhaust Air Fan with Sound attunator Total Static Ceiling Suspended For Fire Mode for (5th , 6th Floor)**	**8.00**	**NOS**
600. **2.6.3**	**11500 CFM @ 15 MM ,SMOKE SPILL -Tube Axial Exhaust Air Fan with Sound attunator Total Static Ceiling Suspended For Fire Mode for (6th Upper lvl Floor)**	**2.00**	**NOS**
12.6.4	**400 CFM @15 MM ,SMOKE SPILL -Tube Axial Exhaust Air Fan ,Total Static Ceiling Suspended For Fire Mode for (Each Electrical room on each floor lvl & wing)**	**20.00**	**NOS**
12.7	**Axial Flow Fans**		
	Supply, Installation testing & commissioning of Axial Flow Propeller Fans with Complete including Starter Panel ,all starters with sufficient Potential free ,NO/NC contacts ,relay contacts , to control /monitor from the IBMS system, & M.S floating foundations, motors, and all other accessories All other parameters as per specifications.or as directed etc. Make:-Airflow / Kruger / Nicotra / Carryaire/ Humidin/ Systemair		
12.7.1	**2100 CFM @ 15 MM Static For Substation Exhaust air**	**12.00**	**NOS**
12.7.2	**2100 CFM @ 15 MM Static For Chiller Plant room Exhaust air**	**8.00**	**NOS**

12.8	**Propeller Fan**		
	Supply,installation,testing and commissioning of propeller fans for toilet exhaust and fresh air shall be complete with speed control, louver shutter, rain protection louver, bird screen. Fans with EC motors to be ring mounted on suitable frame provided by AC Contractor. Power will be provided 5 ft away from fan and necessary wiring with plug will be provided by AC contractor,as per specifications.or as directed etc. Complete... Make:-Crompton/ Havells /GEC		
12.8.1	**9" dia. For Single Toilets**	**5.00**	**NOS**
12.8.2	**12" dia For Electrical & Store Room etc**	**5.00**	**NOS**
12.8.3	**15" dia**	**2.00**	**NOS**
12.8.4	**18" dia**	**0.00**	**NOS**
13.0	**ELECTRICAL WORK**		
	Make:-DB ELECTRICALS/VIVID ELECTROMECH/GOEL POWER/ADARSH ELECTRICAL		
	VFD Make:Danfoss/ Honeywell/ Seimens/L&T		
	Electrical Switch Gears:- Siemens/L&t/Schnieder		
	Supply ,installation,testing and commissioning, of Local Control Panels or Starter Panels In IP 52 construction each with MCB, Single Phase Preventer, over load protection ,Potential Free NO/NC contacts (for Fire signal trip ,run , trip , auto/manual) and 1 no. relay contact for on/off command , mounting the VFD , Local panal compatible with BMS.,as per specifications.or as directed etc. suitable for following:		
13.1	**Main Panel for Chiller , Pump & Cooling Tower Power distribution**		
	Supply, installation, testing and commissioning of cubicle type fully compartmentalized totally sheet steel enclosed LT panel ,IP 52,suitable for 415V, 50 Hz, 3 phase and 4 wire AC power supply with TPN tinned copper busbars and suitable for top cable entry, front access, dead back type and complete with feeders, metering and indications as per single line diagram and Automatic Fire suppression gas flooding system complete with Perfluoro Ketone (FK-5-1-12)/ HFC 227ea, DLP Assembly with automatic valve, push in connector for tube,Perfluoro Ketone (FK-5-1-12)/ HFC 227ea, mounting bracket, End of Line adopter and low pressure switch for monitoring system activation.Perfluoro Ketone (FK-5-1-12)/ HFC 227ea gas of suitable capacity , Heat detection tube as required and A/V alarm with all necessary installation to complete the system as per specifications.or as directed etc.		
a	**CHILLER PLANT PANEL:- Supply,installation, testing & commissioning- Type Of Construction Floor mounted cubicle type Panel Enclosure Fabricated from 14/16G CRCA ,IP52 sheet steel totally compartmentalized, treted for rust proofing. with separate busbarcamber & cable chambers Front/ back access for switchgears, connectors etc. Suitable for 430 V, 3 phase / 4**	**1.00**	**NOS**

	Wire System , 50 Hz supply ,all starters with sufficient Potential free ,NO/NC contacts ,relay contacts , to control /monitor from the IBMS system, and Automatic Fire suppression gas flooding system complete with Perfluoro Ketone (FK-5-1-12)/ HFC 227ea, DLP Assembly with automatic valve, push in connector for tube,Perfluoro Ketone (FK-5-1-12)/ HFC 227ea, mounting bracket, End of Line adopter and low pressure switch for monitoring system activation.Perfluoro Ketone (FK-5-1-12)/ HFC 227ea gas of suitable capacity , Heat detection tube as required and A/V alarm with all necessary installation to complete the system as per specifications.or as directed etc. **Main Source Control Unit/ Incomer- 1 No. - 1600A EDO ACB, 36kA, FP /MP with O/C,S/C,E/F,U/V, E/L and Shunt coils etc. LED Based Phase indicating lamps, control MCBs , CTs, etc Set - ON/OFF/ TRIP lamps with control MCBs Set - ON/OFF/ TRIP lamps with control MCBs CT-1250/5A,15 VA BURDEN,CLASS- 1 WITH LOAD MANAGER MAIN.Potential Bus/Busbar 1 set - 1600A TPN+E ,36 KA ,Tinned Aluminium busbar,Insulated with heat shrinkable sleeves .** **Feeder section/Outgoing : - For 2 Nos. 310 TR Chiller :-2 NOS. OF 630A TPN 36KA MP MCCB WITH BMS COMPATIBLE ENERGY METER(KWH). WITH RS 232/485PORT ,** **For 1 no. 125 Tr chiller:-1 NOS. OF 200A TPN 36KA MP MCCB WITH BMS COMPATIBLE ENERGY METER(KWH) WITH RS 232/485PORT ,** **For 3 Nos. PRIMARY CHILLED WATER PUMPS:- 3 NOS. OF 63A TPN 36KA TM MCCB WITH STAR DELTA STARTER,** **For 2 Nos. OF Primary Chilled Water Pumps :-2 NOS. OF 63A TPN 16KA TM MCCB WITH STARDELTA STARTER ,** **For 3 Nos. of Secondary Chilled Water Pumps :-3 NOS. OF 63A TPN 36KA TM MCCB WITH BYPASS STARDELTA STARTER WITH VFD ,** **For 2 Nos. OF Secondary Chilled Water Pump:- 2 NOS. OF 63A TPN 36KA TM MCCB ,WITH BYPASS STARDELTA STARTER WITH VFD ,** **For 3 Nos. OF Condenser Water Pumps:- 3 NOS. OF 100A 36KA TM MCCB WITH STAR DELTA STARTER** **For 2 Nos. OF Condenser Water Pumps:- 2 NOS. OF 63A 36 KA TM MCCB WITH STAR DELTA STARTER** **For 2 Nos.of Cooling Tower Fan :- 2 Nos. of 63A 36 KA TM MCCB WITH By pass start delta starter with VFD** **For 1 no. Cooling Tower Fan :-40A 36 KA TM MCCB , WITH Bypass star delta starter with VFD** **For PRESSURIZATION STATION -1 No. OF 32A TPN 36KA TM MCCB** **For CONDENSOR AUTO TUBE CLEANING:-1 NOS. OF 63A TPN 36KA TM MCCB (3 KW)** **FOR COOLING TOWER WATER TREATMENT SYSTEM:- 1 NOS. OF 63A TPN 36KA TM MCCB (20 KW)** **SPARES- 1 NOS. OF 40A TPN 36KA MP MCCB,2 NOS. OF 63A TPN 36KA TM MCCB,** **1 NOS. OF 200A TPN 36KA MP MCCB WITH BMS COMPATIBLE ENERGY METER(KWH). WITH RS 232/485PORT,** **1 NOS. OF 630A TPN 36KA MP MCCB WITH BMS COMPATIBLE ENERGY METER(KWH). WITH RS 232/485PORT,** **as per specifications.or as directed etc.**		

	Note: For Chiller Plant Room Electrical Panel , Refere Electrical SLD		
13.2	**By pass Starter Panel with VFD (Variable frequency drive) for AHU's**		
	Make:-DB ELECTRICALS/VIVID ELECTROMECH/GOEL POWER/ADARSH ELECTRICAL		
	VFD Make:Danfoss/ Honeywell/ Seimens/L&T		
	Electrical Switch Gears:- Siemens/L&t/Schnieder		
	Supply, installation, testing and commissioning of cubicle type Local Control Panels or Starter Panels all starters with sufficient Potential free ,NO/NC contacts ,relay contacts , to control /monitor from the IBMS system, with MCB Single Phase Preventer, as per specifications.or as directed etc. suitable for following:		
13.2.1	**Floor Mounted Horizontal /Vertical AHU's (As per Site conditions)**		
13.2.1.1	**25000 CFM at 65 MM SP with 50 TR capacity and.. 22 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
13.2.1.2	**22000 CFM at 65 MM SP with 50 TR capacity and.. 22 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
13.2.1.3	**20000 CFM at 65 MM SP with 50 TR capacity and.. 20 HP IP 55 TEFC motor ,**	**2.00**	**NOS**
13.2.1.4	**20000 CFM at 65 MM SP with 45 TR capacity and.. 20 HP IP 55 TEFC motor ,**	**6.00**	**NOS**
13.2.1.5	**15000 CFM at 65 MM SP with 35 TR capacity and..15 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
13.2.1.6	**12500 CFM at 65 MM SP with 30 TR capacity and....10 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
13.2.1.7	**12000 CFM at 65 MM SP with 28 TR capacity and....10 HP IP 55 TEFC motor ,**	**3.00**	**NOS**
13.2.1.8	**10000 CFM at 65 MM SP with 25 TR capacity and....10 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
13.2.1.9	**7500 CFM at 65 MM SP with 16 TR capacity and....7.5 HP IP 55 TEFC motor ,**	**1.00**	**NOS**
13.2.2	**Ceiling Suspended AHU's**		
13.2.2.1	**7000 CFM at 62 SP with 18 TR capacity and …. 5.5 HP IP 55 TEFC motor ,**	**1.00**	**NOS**

13.2.2.2	6000 CFM at 62 SP with 14 TR capacity and …. 5.5 HP IP 55 TEFC motor ,	1.00	NOS
13.2.2.3	5000 CFM at 62 SP with 12 TR capacity and ... 5.0 HP IP 55 TEFC motor,	6.00	NOS
13.2.2.4	4000 CFM at 62 SP with 10.0 TR capacity and 3.0 HP IP 55 TEFC motor,	6.00	NOS
13.2.2.5	3500 CFM at 62 SP with 10.0 TR capacity and 3.0 HP IP 55 TEFC motor,	8.00	NOS
13.2.2.6	3000 CFM at 62 SP with 7.5 TR capacity and 2.0 HP IP 55 TEFC motor,	10.00	NOS
13.2.2.7	2000 CFM at 62 SP with 5 TR capacity and 2.0 HP IP 55 TEFC motor ,	1.00	NOS
13.2.2.8	1600 CFM at 55 SP with 4.0 TR capacity and 2.0 HP IP 55 TEFC motor,	1.00	NOS
13.2.2.9	1400 CFM at 55 SP with 3.5 TR capacity and 2.0 HP IP 55 TEFC motor,	1.00	NOS
13.2.2.10	1200 CFM at 55 SP with 4 TR capacity and 2.0 HP IP 55 TEFC motor,	2.00	NOS
13.3	Cable		
	Supply, laying, dressing, testing and commissioning of 1100V grade, aluminum/copper conductor, galvanized steel wire/strip armoured, PVC sheathed power and control cables of following sizes to be laid on trays/ wall/racks including clamping etc., as per specifications.or as directed etc. as below: Make:-Finolex / Havells / RR Kabel/ CCI / Gloster/Polycab		
13.3.1	SITC of 4c x 2.5 sqmm CU cable	240.00	RMTR
13.3.2	SITC of 4c x 1.5 sqmm CU cable	700.00	RMTR
13.4	Termination		
	Make Cable gland:Commet / Gripwel / Dowell / Raychem		
	Make Cable Lugs:Dowell / Schneider Electric / Jainsons		
13.4.9	Supplying & erecting single compression type brass cable glands for 2 to 4 core 1.5 sq mm XLPE armoured cable as per specification	340.00	NOS
13.5	Cable Trays		
	Make:-Gewiess / Legrand /AEON /AKG/Pilco/ MDM chennai/profab/ OBO		
14.0	CIVIL WORK		
14.1	Chasing of wall .Finishing the same. Breaking and making opening in consultation with Architects for routing pipes, cables, fresh air etc.Scaffolding etc or any other civil work for carrying out Ac work. (Scope of Civil contractor)as per specifications.or as directed etc. complete..of following sizes:	1.00	LOT

	TOTAL CHILLER HI SIDE & AHU LOW SIDE WORK - GST EXTRA		
	GST EXTRA AS APPLICABLE		

वर नमूद सुचित दर्शविलेल्या बाबींचे पुरवठा करणारे पुरवठादार/दुकानदार/उत्पादक/विक्रेते यांनी नमूद केलेल्या बाबींकरीता असलेले दर स्वत:च्या लेटरहेडवर महापालिकेच्या कार्यालयात अथवा ई-मेल द्वारे pmcbandhkamdept01@gmail.com यावर दिनांक 12/12/23 पर्यंत पाठवावे ही विनंती, सदर दर हे अंदाजपत्रक तयार करणेसाठी गृहित धरणेत येणार आहेत.

कार्यकारी अभियंता (प्रकल्प)
पनवेल महानगरपलिका

जा.क्र पमपा/बांधकाम/2321 /प्र.क्र.03 /४१९(४)/२०२३
दि. 9 /12/२०२३

प्रत माहितीस्तव –

१. प्रसिध्दीकरीता
२. माहिती फलक करीता