Government of the People's Republic of Bangladesh

Prime Minister's Office

Bangladesh Economic Zones Authority (BEZA)

Bangladesh Economic Zones Development Project (Phase-1) Monem Business District (level-12), 111, Bir Uttam, C.R Dutta Road, Dhaka-1205

No. 03.07.0000.007.29.229.2020-2663

Date: 17.08.2020

Subject: Clarification of Pre-bid meeting and Replacement of Pages of bidding document for Interior works and HVAC system installation for BEZA in Administrative Building in BSMSN, BEZA WD-

1802B.

A Pre-bid meeting of Bangladesh Economic Zones Development Project (Phase-1) was held on

12 July 2020 at 11:00 hours Dhaka Local Time in the conference room of Bangladesh Economic Zones

Authority for Interior works and HVAC system installation for BEZA in Administrative Building in

BSMSN (Package No.: BEZA WD-1802B). The queries discussed and clarified, have been consolidated

and shown in attachment (Clarifications). Some pages will be replaced which are also attached

herewith. These Clarifications and Replaced pages shall be the integral part of the bidding document.

Therefore, you are requested to submit bidding document taking considerations of Clarifications and

Replaced pages attached herewith.

Attachment: Clarification;

Replaced page (16 pages).

Thanking You Faithfully Yours

(Abdullah Al Mahmud Faruk)

Project Director (Joint Secretary)

Bangladesh Economic Zones Development

Project (Phase-1)

Distribution:

All bidders who have purchased bidding document yet.

Attendees in Pre-bid meeting.

Clarification for Interior works and HVAC system installation for BEZA in Administrative Building in BSMSN, BEZA WD-1802 B

Queries from Bidder	Reply
Brand name is specified for HVAC system	There is no requirement. Bidders need to
but country of origin is not mentioned. Is it necessary to specify the country of origin?	declare the country of origin.
How many % of VAT will be deducted from bill?	As per applicable law(s) of Bangladesh.
Quantity miss match between item no. 43.1, 43.2.	Quantity is being Corrected.
Twin screw compressor is specified. Is there any possibility of adding Single screw system compressor?	Yes.

Replacement of Pages:

Page No. 102, 103, 110, 111, 128, 129, 142, 143, 158, 159, 164, 165, 176, 177, 186 & 187 are replaced by same revised attached pages.

General Notes for Bidder:

01. All outdoor metallic installations including Chillers, Split AC must have salt protective coating.

02. For Chiller, Fire Pumps and Fire Alarm Control Panel, the Bidder must have to submit manufacturer's authorization.



Item	Description of Item		Quantity	Unit Rate (BDT) Quantity		Amount (BDT)		
No.		Unit			In words	In figures	In words	
1	2	3	4	figures 5	6=5	7=4x5	8=7	
(fight)) strowed Tath	mm Dia. & 1.5 mm wall thickness complete with 18 SWG GP sheet / PVC switch board & pull box with 3mm thick ebonite sheet cover, without switch, fixing materials etc.(without switch) as required including mending the damages good. All electrical contacts shall be of brass / copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC / BDS / BS / VDE standards and as per detailed specification mentioned in Annexure-1. The work shall be carried out as per direction & approval of the Engineer. Cables manufactured by govt. of BANGLADESH owned / shared	1 1	in care Social 2014 2016 Control 2017 Social So	or lean. wring wring and and as and and as and pull be a complex and pull be and pull and	Solution of the second of the	deligence (getterolle (getterolle (selence) (textelese (selence) (selen		
	company ltd. (Eastern cables) approved by the Engineer. Light/ exhaust or wall bracket fan point		ed get return toursen	odi ade matre bez odi 1, 1 u 199	er bos ba Ge lide Ge lide	Described to objects I have been obserbated		
	Surface conduit wiring with the following PVC insulated and sheathed cable (BYM) & Green / White colour PVC insulated ECC wire (BYA) through PVC conduit of reputed manufacturer complete with 18 SWG GP sheet pull box with 3 mm thick ebonite sheet cover, fixing materials, other accessories etc. as required including mending the damages good. All electrical contacts shall be of brass	meter	16400	too beigned and to the second and too the second and to the second and t	ettlerk in rejs. A lange velde	most on the most on the later of the later o		
28	/ copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC / BDS / BS / VDE standards and as per detailed specification mentioned in Annexure-1. The work shall be carried out as per direction & approval of the Engineer.		ico tes oldans politos virtual virtual testica aliquia creati	othermal redecon consellation of the sella- ter tempe the RP at the control of the control	discouled congress of the second congress of	a Indiana To any so The con The con Th		
	Cables manufactured by govt. of BANGLADESH owned / shared company ltd. (Eastern cables) approved by the Engineer. 1C-2x2.5sqmm (BYM) cable with 2.5		telon. telon. telon. telon. telon	Har 1 Vetst Har dire unite organization TOTO, Aug.	uan mil	a B 16 HC 10 map h 10 map h 10 map h 10 map h 10 map h 10 map h		
	sqmm (BYA) ECC wire through PVC pipe of minimum inner Dia. 25 mm having wall thickness of 1.5 mm		,10 mc	Cing by	HO VIV			

Item	Description of Item	Unit	Quantity	Unit Rat	e (BDT)	Amou	nt (BDT)
No.	1903		In figures	In words	In figures	In words	
1	2	3	4	5	6=5	7=4x5	8=7
						(dativ)	
29	Concealed conduit wiring with following PVC insulated and sheathed stranded cable (BYM) & PVC insulated Green / White coloured ECC wire (BYA) through PVC conduit of reputed manufacturer complete with 18 SWG GP sheet and pull box with 3mm thick ebonite sheet cover, fixing materials etc. as required including mending the damages good. All electrical contacts shall be of brass / copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC / BDS / BS / VDE standards and as per detailed specification mentioned in Annexure-1. The work shall be carried out as per direction & approval of the Engineer.Cables manufactured by govt. of BANGLADESH owned / shared company ltd. (Eastern cables) approved by the Engineer. 1C-2x10sqmm (BYM) cable with 10 sqmm (BYA) ECC wire through PVC pipe of minimum inner Dia. 25 mm having wall thickness of 1.5 mm	meter	2250	The solution of the solution o	and the second s	Topical and the property of th	
30	Providing & fixing the chandelier light fitting of following manufacturers model & catalogue number suitable for use CFL / LED lamp, brass holder, cylindrical brass carrier suitable for use with earth terminal, necessary wiring with 2 x 0.4 sq.mm stranded PVC insulated flexible FR cable etc. complete (except lamp) as per sample accepted / approved by the Engineer. Air Cooled Water Chiller (VFD Driven)	each	4.00	ing (no ing	ents tables re up (Luces to true be to y at the branch to branch t		258
31	CH-01 & 02 Water Chiller complete with twin Screw Compressor/Single Screw Compressor with motor, Built-in starter panel with VFD, Air Cooled Condenser, insulated Evaporator, temperature and pressure indicator, microprocessor control panel, Flow switch, Standard safety devices, spring mounted vibration isolators, charged compressor oil and other accessories. The units Control Panel shall be factory wired and tested. The unit	SCIS	Latin to lating the lating to	ed by enders of the Person Per	installment of the control of the co	III Section (III S	Tomett littl





Item No.	Description of Item	Unit	Quantity	Unit Rat	e (BDT)	Amount	(BDT)
				In figures	In words	In figures	In words
1	2	3	4	5	6=5	7=4x5	8=7
[PUM)	the insulation shall be plastered with neat finish over G.I wire-mesh.	ij ia		etail la i	edayl stand		ok mat
41.0	Pre-insulated Pipe Pipe: Black steel schedule 40(s) ASTM-A- 53 Grade B. BS 1387 grade C Heavy duty Insulation: Poly Urethene, density: 45 kg.m3 minimum, Insulation Thermal conductivity: 0.022 w/mK at 20 C mean temp. Jacketing: 0.5mm GP Sheet, spiral wound The works shall be complete with factory fabricated bends, tees, elbows, reducers, socket, union, nipple, flange, etc. as per requirement, drawing and direction. Pipe work shall be complete with pipe hangers, supports, vibration isolator brackets, etc.		Proposed visit 1-14 horse real that the second	redictors bind for might and diverse all control for control for charge and file charge and file files for files f	Separation of the separate of	attaliand at hel docto on both no not bed attaction only to help one to help the doctors	1
41.1	Dia 200 mm (thick 50mm)	m	150			engli dess	
41.2	Dia 150 mm (thick 38mm)	m	50	that there are	estası m in	en ed tade	
41.3	Dia 100 mm (thick 38mm)	m	100	19 10 15 11	a de la lance	Last Jacob	
41.4	Dia 80 mm (thick 38mm)	m	50	Party Robert	insuff Innti	See in Sea	
41.5	Dia 65 mm (thick 38mm)	m	100	per GR ex	a while the	Marian and	
41.6	Dia 50 mm (thick 38mm)	m	200				
41.7	Dia 40 mm (thick 38mm)	m	250	on Aside I	esaper la	maken en	
41.8	Dia 32 mm (thick 38mm)	m	150	nat were	Car and and	R-A HE	
41.9	Dia 25 mm (thick 32mm)	m	350		alai San	All lasts	
41.10	Dia 20 mm (thick 32mm)	m	450	es constitut	rogav (la)	ministrations.	
42.0	Chilled Water Pipe Insulation (Joining between Preinsulated pipe or in case of shortage of imported items) Chilled Water Pipe Insulation with Poly Urethene and Jacketing with GP Sheet of 26 SWG.	98 99		Sense Sense		shere tadi	(1) (3)
42.1	Dia 200 mm (thick 50mm)	m	1				
42.2	Dia 150 mm (thick 38mm)	m	1	sh salah m	least ad of	ere a limb	
42.3	Dia 100 mm (thick 38mm)	m	1			1917 15	
42.4	Dia 80 mm (thick 38mm)	m	1				124
42.5	Dia 65 mm (thick 38mm)	m	1	Endly-oranies U	and the same	ment reda	
42.6	Dia 50 mm (thick 38mm)	m	1				
42.7	Dia 40 mm (thick 38mm)	m	1				
42.8	Dia 32 mm (thick 38mm)	m	1				
42.9	Dia 25 mm (thick 32mm)	m	1	da obsan		100 E 100	
42.10	Dia 20 mm (thick 32mm)	m	1	Hermitals.	mie Alber		
43.0	Duct Work (Pre-insulated) Supply, fabrication and installation of galvanized sheet steel duct work complete with bends, Tees, reducers, branch takeoffs, air chamber etc. as per direction and drawing. Hangers,		12 13 14 15 14 15 15 15 15 15 15 15 15 15 15 15 15 15	o tree sides sides o to do se obtain entid	og synt pink strongorn skrit utbo	ore ground to super service or to i for really	

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Item No.	Description of Item	Unit	Quantity		Unit Ra	te (BDT)	Amount (BDT)	
				19/5 A-MT2	In figures	In words	In figures	In words
1	2	3		4	5	6=5	7=4x5	8=7
	brackets, stiffeners and isolator boxes shall be fabricated with M.S. angle/F.I. bar or rod as per drawing and direction and shall be galvanized. Duct shall be constructed with best-bloomed galvanized sheet steel. Before installation of duct, inside and outside shall be cleaned from any dust. Between flanges, for flanged end duct, approved type of gasket shall be used. Approved type of sealing compound shall be used to make the duct work leak-proof. Duct shall be hanged or supported at an interval of not more than 1.8 meter.		fil.	A CONTROL OF THE CONT	Action bears Meant 2 Action 2 Act	Problems Sta St St result st of lead st of lead sta	maranian (ver ESSA) gairsanas arises est beenarides ma ancios sans suppor lang arises ma fest als ma 92,1 sus san 92,1 sus san 92,1 sus	£
43.1	Galvanised Steel Sheet metal duct Pre-insulated ducts up to 300 mm width shall be fabricated with steel and drive S- slip joint shall be used and fixing of duct insulation of required thick glass wool with K value of not more than 0.027 Kcal/hr./sqm/0C/mm at 200C. Insulation shall be complete with reinforced aluminum foil vapor barrier, adhesive, aluminum tape, fixing pin @ 250 mm c/c.		18 10 10 10 10 10 10 10 10 10 10 10 10 10				ten to all the ball to all the total total to all the total	\$ 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
43.1.1	Duct made of 22 SWG sheet	sqm	20	lu stiry	ni se supe	ter in the entire	d months	
43.1.2	Duct made of 24 SWG sheet	sqm	600	(assens)		II to		
43.2	Pre-insulated Duct Duct made of pre-insulated non-metallic duct, It includes Tees, Bends, Elbows, Reducers, Offsets, etc. Approved sealant shall have to be used to make duct leak proof. Foam density: Minimum 48 kg/m3 Thermal conductivity: 0.035 kg/m. K Aluminum Thickness: 80micro-meter Duct thickness 25mm		00 00 00 00 00 00	M ba n	ede up dans fe fe	f Jacksoning (etack Steer (thick Steer (thick Steer thick Steer (thick Steer	o sandimit Olar Ing GO. u.c. Ing GO. u.c. Ing GO. gig Ing GO. gig Ing GO. gig Ing GO. gig	3.2 6.3 6.5 6.5
43.2.1	Pre-insulated Duct made of 24 SWG sheet	sqm	600				and the same	
43.2.2	Pre-insulated Duct made of 22 SWG sheet	sqm .	100				martin mil	
44.0	Duct Acoustic Lining Duct accoustic lining made of nitrile rubber base with open elastomeric foam, specially prepared for duct accoustic. Lining shall have peelable self adhesive tape for fixing with ductOperating temperature: -20 C to 85 C -Thermal Conductivity: Max 0.047 W/mK 20 C -Fire: Class 1 -Density: Min 140 kg/m3 -Tensile Strength: Minimum 100kPa -Thickness: 15mm	sqm	9.5	Questates to assistant and a strend a	apert) abuse in those said dayed are though reig	Anna Carent Anna Aire Party and Aire and and Aire and an Aire an	man C2 avid map n5 mil the st stages stages during damas at spanning	10.1
45.0	Air Terminals Air terminals shall be constructed					a tost-d	er axise in	id Daxun

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Item No.		Description of Item	T.	Init	Quantity	Unit Rate (BDT)		Amount (BDT)	
nt I	el.	n s				In figures	In words	In figures	In words
1		2		3	4	5	6=5	7=4x5	8=7
	the syste the sa Submit Operation The wo Owner's	Af commissioning and em shall run for seven atisfaction of the advance copy of Ir on and maintenance ork includes training representative at site	days up to Owner. astallation, manuals.		to publication of the control of the	d miles o control of the control of			
78.0	Address: Panel coptions. CPU sha Voice a Telephon Annuncia with into Control Signaling Alarm Conon-code based wi appliance devices. alarm an shall be indicatin device. individua calibratic condition for sens determin by comp stored Compens a moving chamber compens condition operation Photoelee various s (±) 0.2% monitore Testing R sensor /internat calibrate The repo Display of and log	on, sensitivity, and and shall individual itivity. The control of the the condition of east aring the sensor values. Enviruation: The FACP shall average of the sensor value to auto atte for dust, dirt, and its that could affect ans. Programmable Sensitivity levels rangup to 3.7%, program d from the FACP. State of the sensor sensitivity levels rangup to 3.7%, program d from the FACP shareports: The FACP shareports: The FACP shareports that mee ionally accepted it test method requires shall be viewed our printed for annual in the shall	in Control ing basic seembly / ort to add e Fighter / Remote be comply standard. Protective able Fire complete, processor otification and control ration of an devices he FACP type of P shall fors for d alarm lly adjust unit shall ch sensor ue to the commental maintain r's smoke commental maintain r's smoke commental maintain r's smoke commental maintain the commental maintain r's smoke commental r	Set	Total and a services of the se	the body or a standard or a st	Present a color crists and forces and and forces and and to transport and forces and forces and forces and forces and force an	mblergrag In These Joidstent Determine Set tone Set	

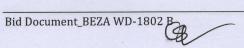


Item No.	Description of Item	Unit	Quantity	Unit Rat	Unit Rate (BDT)		Amount (BDT)	
Manual	enteria de			In figures	In words	In figures	In words	
1	2	3	4	5	6=5	7=4x5	8=7	
	system shall provide a means to indicate that a sensor requires cleaning. When a sensor's average value reaches a predetermined value, (3) progressive levels of reporting are provided. The first level shall indicate that a sensor is close to a trouble reporting condition and will be indicated on the FACP as "ALMOST DIRTY." This condition		gni anata or que en conseilo siconomi alconomi anto al	ball gove o never and be the the properties of the con-	control of the contro	deposition of the sale of the		
	provides a means to alert maintenance staff of a dirty sensor without creating a trouble in the system. If this indicator is ignored, a second level "DIRTY SENSOR" condition shall be indicated at the FACP and subsequently a system trouble is reported [to the Central Monitoring Station]. The sensor base LED shall glow steady giving a visible indication at the sensor location. The "DIRTY SENSOR" condition shall not affect the sensitivity level required to alarm the sensor. If a "DIRTY SENSOR" is left unattended, and its average value increases to a third predetermined value, an "EXCESSIVELY DIRTY SENSOR" trouble condition shall be indicated at the control unit. The FACP shall continuously perform an automatic self-test on each sensor which will check sensor electronics and ensure the accuracy of the values being transmitted. Any sensor that fails this		icentral attent at y glores blue at a servigit sommet viruser deple con anti-servi anti-	in 18th and in 18t	MAA.14 separation of the property of the prop	2.8 cm secretaria. Secretaria de la constanta		
	test shall indicate a "SELF TEST ABNORMAL" trouble condition. Options at FACP: The control panel operator shall be able to make announcements via the push-to-talk paging microphone over the pre-selected speakers. Soft touch keypad, LED indications, LCD Display. Facility for total building paging shall be accomplished by the means of an "All Call" switch. Firefighter's phone (Optional): Provide a supervised, two-way communication system between the Command Center/main fire alarm control panel and emergency phones. The firefighter's phone system shall be capable of handling single or simultaneous conversations with all phones connected into the system. As many as seven (7) phones shall be able to be connected into the active conversation. The phone system circuits shall be designed to prevent		the sign of the si	designation of the control of the co	and been and a control of the contro	interest of the control of the contr		





Item No.	Description of Item	Unit Quanti	Quantity	Unit Rat	e (BDT)	Amo	unt (BDT)
			In In figures words		In In wo		
1	2	3	4	5	6=5	7=4x5	8=7
agil mga	sizes PVC insulated & sheathed twisted pair telecommunication cables having Dia. of each core is 0.6 mm through prelaid pipes. Cable manufacturer(s) must have valid test certificate from internationally	diselect (et velusion (et velusion (et velusion (et velusion)	Ajas (G				Ant A
n il uviny	accredited laboratory (like CPRI, KEMA etc.) approved / accepted by the Engineer.	Of sec.	manua?			70.0	old genit
SECTION Y	1C-4x0.282 sqmm (2 pair)	Rm	200		IN SIGIR	T. Tullania	
PEOPL C	SHOP DRAWING & DOCUMENTATION: Preparation of detail Shop drawing including, layout drawing, section details, schematic drawing, etc. Get approval of shop drawing before any fabrication or installation works. Shop drawing must be coordinated with other services likely Electrical cabling, Light Fixtures,	Job	1 man mall relaceupe il mosable delucidi sensiti		taons0	Valve solation / I susera Che suggi	Vibration Vibration Water Tee
97.0	False Ceiling and Interior design. The work also includes: a)Show actual dimension of Equipment. b) Submit actual Wattage rating of all equipment c) Reconfirm Electrical cable sizing d) Submit Electrical connection diagram of Electric Panels e) Submit General arrangement of Electric Panels f) Submit advance copy of Installation, Operation and maintenance manuals.	A Value A Polygia A Vale Pelycell A Seto	inclined inc	(fuo	ignal) // Olass w // Olass w	1) vareld w nowskip fil mid 1 (1997) (1997) million telli faque	to being to be the state of the
98.0	AS-BUILT DRAWING: Preparation and submission of As-built drawing in following forms: One set in tracing paper, size A1 Two sets print out in A1 Paper Soft Copy in CD in AutoCAD Version 2010 Soft Copy in PDF Version	Job	1 married married			Controls a th	Antonius Flow Sent V Johnson
99.0	TESTING, COMMISSIONING & BALANCING : After proper installation and certification the system shall be tested, commissioned and balanced as per direction and recommendation by the Manufacturer as well as Designer.	Job	1		3/17		Dienessi Varaba i
100.0	TAGGING, IDENTIFICATION & SIGNAGE INDICATION : As per NFPA Code.	Job	1	mala	1917		romin nA
101	Engineer's site office of minimum & Labour Shed for labour accomodation	Each	1			st da	o sinan
102	Environmental Management Plan as per Bid Document Total	LS	1				anger out
	Total						





LIST OF RECOMMENDED MANUFACTURERS

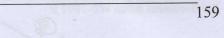
Water Chiller	Carrier/Trane/Dunham Bush/Daikin/Rhoss/AERMEC/Equivalent
Fan Coil Unit	Carrier/Trane/Dunham Bush/Daikin/Rhoss/AERMEC/Equivalent
Fans	Nicotra / Fantech / S&P / Chicago / Rhoss/ GEC-Woods / Kruger / Systemair/ Sodeca / Casals/ Blauberg or equivalent.
Pumps	Ajax / Grundfos / Monoflo / Bell & Gosset / Rhoss/ Paco / Paragon / Calpeda / Armstrong / Wilo / Ebitt/General or equivalent.
Pump Motor	Siemens / Teco / GEC / ABB / Toshiba / Calpeda / EMM or equivalent.
Valves, Y-Strainer, Flexible Pipe Connection	Crane / Kitz / Nibco / Tozen / Toyo / Maple/ Metraflex / AFA / Birflex / Ekoval / TECOFI / Caleffi or equivalent.
Balancing Valve	Tour and Anderson / Crane / Combi / FlowCon / Oventrop/ TECOFI/ Caleffi or equivalent.
Vibration Isolation / Silencer	Mason Industries / Kinetics or equivalent.
Water Treatment Chemicals	Ecolab / Water Services UOP / Mazer Chemicals/Petaling or equivalent.
Pressure Gauge Pipe Thermometer	Hunter / Weksler / Brannan / Metraflex / Clayton / Singer / Taylor /Maple/Tozen / Caleffi or equivalent.
Water Flow Meter (Digital)	Data Industrial/Asahi/Aichie Tokei/Blue White/Calffi or equivalent.
Insulation (Rockwool / Glass wool)	Bradford / Polyglass / Foster / Byuksan /Polywool or equivalent.
Insulation (PEF / Nitrile Rubber)	Superlon / Wide / Armaflex / Armacell / Aerocell/ ALP Aeroflex or equivalent.
Duct Insulation (PE insulation)	Jumboo / Polycell or equivalent.
Flexible round duct	Thermaflex / Aeroduct / Civa Flex / Ruskin / Titus or equivalent.
Air Terminals, Variable Air Volume	Titus / Price / Connols-Aire / Trox / System Aire / Halton / Ruskin / Bavcol Air Acutherm /Belimo or equivalent.
Automatic Controls system	Johnson Controls/Honeywell / Siemens / Delta/ Regin or equivalent.
Flow Switch	Johnson Controls/Honeywell / Siemens / Delta or equivalent.
Control Valve	Johnson Controls/Honeywell / Siemens/ Belimo/Regin or equivalent.
Expansion Tank (Closed type)	Automatic Heating Appliances / Pneumatex / Monoflo / Emtrol/Reflix or equivalent.
Electrical Components	AEG / Siemens / Telemeçanique / GE / ABB / Dorman smith / MEM / Merlin Gerin or equivalent.
Variable Frequency Drive	Siemens / Danfoss / Telemechanique /ABB/Yaskawa or equivalent.
Modulating Control Valve	Siemens, Johnson controls, Belimo, Honeywell or equivalent.
Air Filter / Safe Change Filter (BIBO)	Camfil / Flanders / AAF / Air Guard / Faar / Trox or equivalent.
Electric Cable	Paradise / BRB / BBS or equivalent.
Fire Damper	Trox/Connols Aire/Ruskin or equivalent.
Pre-insulated pipe	SeAH/ Ricwil/ Husteel/ Glensule or equivalent.

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1 Igrania sala 208 (c	2
() BCC wire derough	
	which they follow) gang switch
26	One gang switch & one 5 amps. 2-pin socket combined
and the second of the second o	Concealed conduit wiring for following point looping at the switch board with earth terminal with 1C-2x1.5 sqmm PVC insulated and sheathed stranded cable (BYM) & same size PVC insulated ECC (BYA) (Green / White color) including circuit wiring with IC-2x2.5 sqmm PV insulated and sheathed stranded cable (BYM) & same size PVC insulate ECC (BYA) Green / White color through PVC conduit (one conduit from switch board to common point on ceiling is considered to draw 3 pair cable) of reputed manufacturer of minimum 25 mm Dia. & 1.5 mm was thickness complete with 18 SWG GP sheet / PVC switch board & put box with 3mm thick ebonite sheet cover, without switch, fixing materials etc. (without switch) as required including mending the damages good. All electrical contacts shall be of brass / copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC / BDS / BS / VDE standards and as per detailed specification mentioned in Annexure-1. The work shall be carried out a per direction & approval of the Engineer. Cables manufactured by govt. of BANGLADESH owned / shared company ltd. (Eastern cables) approved by the Engineer. Light exhaust or wall bracket fan point
th VPD, Air Contect pressure indicator fard safety devices where devices devices as specified and restand Aluminum Pine of Refrigeration) 35 C / 6 C (420 US GPM)	Surface conduit wiring with the following PVC insulated and sheather cable (BYM) & Green / White colour PVC insulated ECC wire (BYM) through PVC conduit of reputed manufacturer complete with 18 SW GP sheet pull box with 3 mm thick ebonite sheet cover, fixing material other accessories etc. as required including mending the damages goo All electrical contacts shall be of brass / copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC / BDS / BS / VE
28	standards and as per detailed specification mentioned in Annexure- The work shall be carried out as per direction & approval of the Engineer. Cables manufactured by govt. of BANGLADESH owned / share company ltd. (Eastern cables) approved by the Engineer

Item No.	Description of Item
1	2
Four-	1C-2x2.5sqmm (BYM) cable with 2.5 sqmm (BYA) ECC wire through PVC pipe of minimum inner Dia. 25 mm having wall thickness of 1.5 mm
30	Concealed conduit wiring with following PVC insulated and sheathed stranded cable (BYM) & PVC insulated Green / White coloured ECC wire (BYA) through PVC conduit of reputed manufacturer complete with 18 SWG GP sheet and pull box with 3mm thick ebonite sheet cover, fixing materials etc. as required including mending the damages good. All electrical contacts shall be of brass / copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC / BDS / BS / VDE standards and as per detailed specification mentioned in Annexure-1. The work shall be carried out as per direction & approval of the Engineer.Cables manufactured by govt. of BANGLADESH owned / shared company ltd. (Eastern cables) approved by the Engineer. 1C-2x10sqmm (BYM) cable with 10 sqmm (BYA) ECC wire through PVC pipe of minimum inner Dia. 25 mm having wall thickness of 1.5 mm Providing & fixing the chandelier light fitting of following manufacturers model & catalogue number suitable for use CFL / LED lamp, brass holder, cylindrical brass carrier suitable for use with earth terminal, necessary wiring with 2 x 0.4 sq.mm stranded PVC insulated flexible FR cable etc. complete (except lamp) as per sample accepted / approved by the Engineer.
bedded has been to the control of th	Air Cooled Water Chiller (VFD Driven) CH-01 & 02 Water Chiller complete with twin Screw Compressor/Single Screw Compressor with motor, Built-in starter panel with VFD, Air Cooled Condenser, insulated Evaporator, temperature and pressure indicator, microprocessor control panel, Flow switch, Standard safety devices, spring mounted vibration isolators, charged compressor oil and other accessories. The units Control Panel shall be factory wired and tested. The unit shall be complete with Safety and Control devices as specified in Technical Specifications: -Condenser material: Copper Coil with Aluminum Fins -Cooling capacity: 615 kW (175 Ton of Refrigeration) -Chilled water inlet/outlet Temp : 11.56 C / 6 C -Chilled water flow rate: 1589.7 l/min (420 US GPM) -Condenser air inlet temperature: 35 C -Fouling factor for Evaporator: 1.8x10-5 m2.0C/W -Minimum Number of Compressor: 2 -Min Number of Refrigerant Circuit with Gas Locking devices: 2 -IPLV rate: Min 4.5 -Capacity control: Stepless



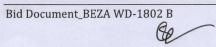


Balanced turbine fan with curved be Capacitor operated motor with Class E insula Spring clip on front cover for easily removers 150 power supply: 220V, 1 ph, 50 powers power supply: Max 40 dBA at 3 powers p	Item No.	Description of Item						
Balanced turbine fan with curved be Capacitor operated motor with Class E insula Spring clip on front cover for easily removers for easily removers for supply: 220V, 1 ph, 50 sound rating: Max 40 dBA at 3 shift ow rate: 50 CFM Closed Type Expansion Tank with Auto Refil Programment of the Closed type Expansion Tank with Auto Refil Programment of mild steel. The tank shall be pair Accessories: Auto Refil pump (pressure actuated with Pr. Sent Isolating Check Pressure relief Programment (2 to 3 Bar, adjustable). Constructed of mild steel. The tank shall be pair Accessories: Auto Refil pump (pressure actuated with Pr. Sent Isolating Check Pressure relief Programment (2 to 3 Bar, adjustable). The outside surface of the tank shall be insulated with 38mm. This fire retardant type closed cell insulation. The tank shall be installed R.C.C column after proper clipping of the roof. All the accessories of tank shall be properly cleaned, painted over the primer. The office wire-mesh. Pre-insulated Pipe Black steel schedule 40(s) ASTM-A-53 Grade B. BS 1387 grades and the proper schedule and the proper schedule sc	1	2						
-Capacitor operated motor with Class E insula -Spring clip on front cover for easily remover ESP: -ESP: -Sound rating: Max 40 dBA at 3 -Air flow rate: 50 CFM Closed Type Expansion Tank with Auto Refil Proceedings of the complete with Automatic Unit based on system pressure requirement (2 to 3 Bar, adjustable). Constructed of mild steel. The tank shall be pair Accessories: -Auto Refil pump (pressure actuated with Pr. Sensolating -Check - Vertical Proceedings of the constitution of the complete with Automatic Unit based on system pressure requirement (2 to 3 Bar, adjustable). Constructed of mild steel. The tank shall be pair Accessories: -Auto Refil pump (pressure actuated with Pr. Sensolating -Check - Vertical Proceedings of the Constructed of	Jumail hatmani	-Non-return flaf to prevent back flow						
-Spring clip on front cover for easily remov -ESP: -Power supply: 220V, 1 ph, 50 -Sound rating: Max 40 dBA at 3 -Air flow rate: 50 CFM Closed Type Expansion Tank with Auto Refil Pt The closed type Expansion Tank shall be complete with Automatic I Unit based on system pressure requirement (2 to 3 Bar, adjustable). constructed of mild steel. The tank shall be pair Accessories: -Auto Refil pump (pressure actuated with Pr. Sen -Isolating -Check -Pressure relief -Air -Starter -Capacity: 1500 -The outside surface of the tank shall be insulated with 38mm. This fire retardant type closed cell insulation. The tank shall be installe R.C.C colum after proper clipping of the roof. All the accessories of tank shall be properly cleaned, painted over the primer. The osurface of the insulation shall be plastered with neat finish ove wire-mesh. Pre-insulated Pipe Black steel schedule 40(s) ASTM-A-53 Grade B. BS 1387 gradeleavy Insulation: Poly Urethene, density: 45 kg.m3 minimum, Insulation: Poly Urethene, density: 45 k		-Balanced turbine fan with curved blade						
-ESP: 50 -Power supply: 220V, 1 ph, 50 -Sound rating: Max 40 dBA at 3 -Air flow rate: 50 CFM Closed Type Expansion Tank with Auto Refil Pt The closed type Expansion Tank shall be complete with Automatic I Unit based on system pressure requirement (2 to 3 Bar, adjustable). constructed of mild steel. The tank shall be pair Accessories: -Auto Refil pump (pressure actuated with Pr. Sen -Isolating -Check -Pressure relief -Air -Starter -Capacity: 1500 The outside surface of the tank shall be insulated with 38mm. This fire retardant type closed cell insulation. The tank shall be installe R.C.C colum after proper clipping of the roof. All the accessories of tank shall be properly cleaned, painted over the primer. The of surface of the insulation shall be plastered with neat finish over wire-mesh. Pre-insulated Pipe Black steel schedule 40(s) ASTM-A-53 Grade B. BS 1387 grad Heavy Insulation: Poly Urethene, density: 45 kg.m3 minimum, Insulat Thermal conductivity: 0.022 w/mK at 20 C mean to Jacketing: 0.5mm GP Sheet, spiral wo The works shall be complete with factory fabricated bends, tees, elb reducers, socket, union, nipple, flange, etc. as per requirement, drat and direction. Pipe work shall be complete with pipe hangers, supp vibration isolator brackets, etc 41.1 Dia 200 mm (thick 50mm) 41.2 Dia 150 mm (thick 38mm) 41.3 Dia 100 mm (thick 38mm) 41.5 Dia 65 mm (thick 38mm)		-Capacitor operated motor with Class E insulation						
-Power supply: 220V, 1 ph, 50 -Sound rating: Max 40 dBA at 3 -Air flow rate: 50 CFM Closed Type Expansion Tank with Auto Refil Pt The closed type Expansion Tank shall be complete with Automatic I Unit based on system pressure requirement (2 to 3 Bar, adjustable). constructed of mild steel. The tank shall be pair Accessories: -Auto Refil pump (pressure actuated with Pr. Sen -Isolating -Check -Pressure relief V -Air -Starter -Capacity: 1500 The outside surface of the tank shall be insulated with 38mm. This fire retardant type closed cell insulation. The tank shall be installe R.C.C colum after proper clipping of the roof. All the accessories of tank shall be properly cleaned, painted over the primer. The o surface of the insulation shall be plastered with neat finish over wire-mesh. Pre-insulated Pipe Black steel schedule 40(s) ASTM-A-53 Grade B. BS 1387 grad Heavy Insulation: Poly Urethene, density: 45 kg.m3 minimum, Insulat Thermal conductivity: 0.022 w/mK at 20 C mean to Jacketing: 0.5mm GP Sheet, spiral wo The works shall be complete with factory fabricated bends, tees, elb reducers, socket, union, nipple, flange, etc. as per requirement, draw and direction. Pipe work shall be complete with pipe hangers, supp vibration isolator brackets, etc 41.1 Dia 200 mm (thick 50mm) Dia 150 mm (thick 38mm) Dia 100 mm (thick 38mm) Dia 65 mm (thick 38mm) Dia 65 mm (thick 38mm)								
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Closed Type Expansion Tank with Auto Refil Pt The closed type Expansion Tank shall be complete with Automatical Unit based on system pressure requirement (2 to 3 Bar, adjustable). constructed of mild steel. The tank shall be pair Accessories: - Auto Refil pump (pressure actuated with Pr. Sen - Isolating		Journal Tuting.						
The closed type Expansion Tank shall be complete with Automatic Unit based on system pressure requirement (2 to 3 Bar, adjustable). constructed of mild steel. The tank shall be pair Accessories: -Auto Refil pump (pressure actuated with Pr. Sen -Isolating								
Unit based on system pressure requirement (2 to 3 Bar, adjustable). constructed of mild steel. The tank shall be pair Accessories: -Auto Refil pump (pressure actuated with Pr. Sen-Isolating V. Pressure relief V. V. Pressure relief V. V. Pressure relief P. Pu. Starter P. Capacity: 1500 In The outside surface of the tank shall be insulated with 38mm. This fire retardant type closed cell insulation. The tank shall be installed R.C.C colum after proper clipping of the roof. All the accessories of tank shall be properly cleaned, painted over the primer. The osurface of the insulation shall be plastered with neat finish over wire-mesh. Pre-insulated Pipe Black steel schedule 40(s) ASTM-A-53 Grade B. BS 1387 grad Heavy Insulation: Poly Urethene, density: 45 kg.m3 minimum, Insulation: Poly Urethene,		diobota 1/pt						
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-Isolating -Check -Pressure -Pressure -Air -Air -Starter -Capacity: The outside surface of the tank shall be insulated with 38mm. This fire retardant type closed cell insulation. The tank shall be installed R.C.C colum after proper clipping of the roof. All the accessories of tank shall be properly cleaned, painted over the primer. The osurface of the insulation shall be plastered with neat finish over wire-mesh. Pre-insulated Pipe Black steel schedule 40(s) ASTM-A-53 Grade B. BS 1387 grade Heavy Insulation: Poly Urethene, density: 45 kg.m3 minimum, Insulation: Poly Urethene, dens		이 사람이 살아가 가게 하는데						
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-Pressure relief V -Air Pu -Air 1500 The outside surface of the tank shall be insulated with 38mm. This fire retardant type closed cell insulation. The tank shall be installed R.C.C colum after proper clipping of the roof. All the accessories of tank shall be properly cleaned, painted over the primer. The osurface of the insulation shall be plastered with neat finish over wire-mesh. Pre-insulated Pipe Black steel schedule 40(s) ASTM-A-53 Grade B. BS 1387 graded Heavy Insulation: Poly Urethene, density: 45 kg.m3 minimum, Insulated Thermal conductivity: 0.022 w/mK at 20 C mean to Jacketing: 0.5mm GP Sheet, spiral works shall be complete with factory fabricated bends, tees, elb reducers, socket, union, nipple, flange, etc. as per requirement, draw and direction. Pipe work shall be complete with pipe hangers, supply vibration isolator brackets, etc. 41.1 Dia 200 mm (thick 50mm) 41.2 Dia 150 mm (thick 38mm) 41.4 Dia 80 mm (thick 38mm) Dia 65 mm (thick 38mm) Dia 65 mm (thick 38mm)		-isolating						
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tank shall be properly cleaned, painted over the primer. The of surface of the insulation shall be plastered with neat finish over wire-mesh. Pre-insulated Pipe Black steel schedule 40(s) ASTM-A-53 Grade B. BS 1387 grade Heavy Insulation: Poly Urethene, density: 45 kg.m3 minimum, Insulation: Poly Urethene, density: 45 kg.m3 minimum, Insulation: O.5mm GP Sheet, spiral wood The works shall be complete with factory fabricated bends, tees, elboreducers, socket, union, nipple, flange, etc. as per requirement, draw and direction. Pipe work shall be complete with pipe hangers, supposition isolator brackets, etc. 41.1 Dia 200 mm (thick 50mm) 41.2 Dia 150 mm (thick 38mm) 41.3 Dia 80 mm (thick 38mm) 41.5 Dia 65 mm (thick 38mm)		The retardant type closed cell insulation. The talk shall be installed on						
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Pre-insulated Pipe Black steel schedule 40(s) ASTM-A-53 Grade B. BS 1387 grade Heavy Insulation: Poly Urethene, density: 45 kg.m3 minimum, Insulations Thermal conductivity: 0.022 w/mK at 20 C mean to Jacketing: 0.5mm GP Sheet, spiral wow The works shall be complete with factory fabricated bends, tees, elboured in the reducers, socket, union, nipple, flange, etc. as per requirement, draw and direction. Pipe work shall be complete with pipe hangers, supposition isolator brackets, etc. 41.1 Dia 200 mm (thick 50mm) 41.2 Dia 150 mm (thick 38mm) 41.3 Dia 80 mm (thick 38mm) 41.4 Dia 80 mm (thick 38mm)								
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and direction. Pipe work shall be complete with pipe hangers, supp vibration isolator brackets, etc 41.1 Dia 200 mm (thick 50mm) 41.2 Dia 150 mm (thick 38mm) 41.3 Dia 100 mm (thick 38mm) 41.4 Dia 80 mm (thick 38mm) 41.5 Dia 65 mm (thick 38mm)		The works shall be complete with factory fabricated bends, tees, elbows						
vibration isolator brackets, etc 41.1 Dia 200 mm (thick 50mm) 41.2 Dia 150 mm (thick 38mm) 41.3 Dia 100 mm (thick 38mm) 41.4 Dia 80 mm (thick 38mm) 41.5 Dia 65 mm (thick 38mm)		reducers, socket, union, nipple, flange, etc. as per requirement, drawing						
41.1 Dia 200 mm (thick 50mm) 41.2 Dia 150 mm (thick 38mm) 41.3 Dia 100 mm (thick 38mm) 41.4 Dia 80 mm (thick 38mm) 41.5 Dia 65 mm (thick 38mm)								
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41.3 Dia 100 mm (thick 38mm) 41.4 Dia 80 mm (thick 38mm) 41.5 Dia 65 mm (thick 38mm)	41.1							
41.4 Dia 80 mm (thick 38mm) 41.5 Dia 65 mm (thick 38mm)	41.2							
41.5 Dia 65 mm (thick 38mm)	41.3	Dia 100 mm (thick 38mm)						
	41.4	Dia 80 mm (thick 38mm)						
41.6 Dia 50 mm (thick 38mm)	41.5	Dia 65 mm (thick 38mm)						
41.0 Dia 30 min (tinek 30 min)	41.6	Dia 50 mm (thick 38mm)						
41.7 Dia 40 mm (thick 38mm)		Dia 40 mm (thick 38mm)						
41.8 Dia 32 mm (thick 38mm)		Dia 32 mm (thick 38mm)						
41.9 Dia 25 mm (thick 32mm)								
41.10 Dia 20 mm (thick 32mm)								
		Chilled Water Pipe Insulation (Joining between Preinsulated pipe						





Item No.	Description of Item	
1	2	
Wall Make	or in case of shortage of imported items)	
shaid beran	Chilled Water Pipe Insulation with Poly Urethene and Jacketing with	
10.1	Sheet of 26 SWG.	
42.1	Dia 200 mm (thick 50mm)	
42.2	Dia 150 mm (thick 38mm)	
42.3	Dia 100 mm (thick 38mm)	
42.4	Dia 80 mm (thick 38mm)	
42.5	Dia 65 mm (thick 38mm)	
42.6	Dia 50 mm (thick 38mm)	
42.7	Dia 40 mm (thick 38mm)	
42.8	Dia 32 mm (thick 38mm)	
42.9	Dia 25 mm (thick 32mm)	
42.10	Dia 20 mm (thick 32mm)	
syluy	Duct Work (Pre-insulated)	
4 day	Supply, fabrication and installation of galvanized sheet steel duct work	
awis V	complete with bends, Tees, reducers, branch takeoffs, air chamber etc. as	
Pureir	per direction and drawing. Hangers, brackets, stiffeners and isolator boxes	
8.019	shall be fabricated with M.S. angle/F.I. bar or rod as per drawing and	
43.0	direction and shall be galvanized. Duct shall be constructed with best-	
	bloomed galvanized sheet steel. Before installation of duct, inside and	
k shall be installed be	outside shall be cleaned from any dust. Between flanges, for flanged end duct, approved type of gasket shall be used. Approved type of sealing	
the accessories of the	compound shall be used to make the duct work leak-proof. Duct shall be	
he primer. The outer	hanged or supported at an interval of not more than 1.8 meter.	
AD seve tisted man d	Galvanised Steel Sheet metal duct	
	Pre-insulated ducts up to 300 mm width shall be fabricated with steel and	
	drive S-slip joint shall be used and fixing of duct insulation of required thick	
43.1	glass wool with K value of not more than 0.027 Kcal/hr./sqm/0C/mm at	
	200C. Insulation shall be complete with reinforced aluminum foil vapor	
minimum, insulation	barrier, adhesive, aluminum tape, fixing pin @ 250 mm c/c.	
43.1.1	Duct made of 22 SWG sheet	
43.1.2	Duct made of 24 SWG sheet	
	Pre-insulated Duct	
	Duct made of pre-insulated non-metallic duct, It includes Tees, Bends, Elbows	
	Reducers, Offsets, etc. Approved sealant shall have to be used to make duct leak	
43.2	proof. Foam density: Minimum 48 kg/m3	
	Thermal conductivity: 0.035 kg/m. K	
	Aluminum Thickness: 80micro-meter	
	Duct thickness 25mm	
43.2.1	Pre-insulated Duct made of 24 SWG sheet	
43.2.2	Pre-insulated Duct made of 22 SWG sheet	
	Duct Acoustic Lining Duct accoustic	
	lining made of nitrile rubber base with open elastomeric foam, specially	
	prepared for duct accoustic. Lining shall have peelable self adhesive tape for	
44.0	fixing with duct.	
	-Operating temperature: -20 C to 85 C	
	-Thermal Conductivity: Max 0.047 W/mK @ 20 C -Fire: Class 1	
	Tile. Class	





Item No.	Description of Item	
1	2	
RALAMCING acced as per diperior at 16 a first proper After proper at 16 a that rain for seven 1 and maintenance at 16 and maintenance and maintenance and maintenance and maintenance and maintenance at 16 and a the Owner's	tested in accordance with relevant IEC/VDE/NEMA/BS/JIS standard having following breaking capacity with thermal over current and instantaneous electromagnetic short ckt. release, necessary arrangement for fixing of above CBs including stove enamel/gray hammer painting of board etc Incoming 250 Amps TP MCCB (36 kA) with following accessories: Busbars 300 amps TPN +E, copper busbars with color coded heat shrinkable insulation sleeve. Outgoings 1 No. 250A, TP MCCB (36 kA) 1 No. 20A, SP MCB (6 kA) 1 No. 16A, TP MCB (6 kA) Spare	
73.2	Electrical Cabling (through PVC conduit), Fire Rated Surface conduit wiring with the following PVC insulated and sheathed stranded cable (NYY) / XLPE insulated and PVC sheathed stranded cable (2XY) & PVC insulated Green / White colour ECC wire (BYA) through PVC conduit of reputed manufacturer complete with fixing materials, other accessories etc. as required including mending the damages good. All electrical contacts shall be of brass / copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC / BDS / BS / VDE standards.	
73.2.1	FSDB to Pumps Controller (Electric Pump) 1C-4x95sqmm (NYY) with 50 sqmm (BYA) ECC wire through PVC pipe of minimum inner Dia. 75 mm having wall thickness of 3 mm	
73.2.2	FSDB to Pumps Controller (Jockey Pump) 1C-4x4 sqmm (NYY) (FR) with 4 sqmm (BYA) (FR) ECC wire through PVC pipe of minimum inner dia. 30 mm having wall thickness of 1.5 mm	
73.2.3	FSDB to Pumps Controller (For Diesel Pump) 1C-2x4 sqmm (FR) cable with 4 sqmm (FR) ECC wire through PVC pipe of minimum inner dia. 25 mm having wall thickness of 1.5 mm	
74.0	SHOP DRAWING: Preparation of detail Shop drawing including, layout drawing, section details, schematic drawing, etc coordinating with different installations of existing factory. Get approval of shop drawing before any fabrication or installation works. The work also includes: dimension of Equipment rating of all equipment sizing d) Reconfirm Electrical cable of Reconding Ampere ratings of electric components conn diagram of Electric Panels Submit General g) Submit Plinth drawing for equipment and Pipe supports	
75.0	AS-BUILT DRAWING Preparation and submission of As-built drawing in following forms: One set in tracing paper, size A1 Two sets print out in A1 Paper Soft Copy in CD in AutoCAD Version 2010 Soft Copy in PDF Version	
76.0	TAGGING, IDENTIFICATION & SIGNAGED INDICATION:	





Item No.	Description of Item	
1	2	
Mary 191 Mary	As per NFPA Code	
An ander Sucream Pill	TESTING, COMMISSIONING AND BALANCING	
allentamo taein Tante	The system shall be tested, commissioned and balanced as per direction	
BEST STORE TO BUILDING	and recommendation. Pipe work shall be tested at a test pressure of 15	
British 103 British H	kg/cm ² for 24 hours without any leak. After proper	
77.0	testing, commissioning and balancing the system shall run for seven	
	days up to the satisfaction of the Owner.	
I Marian Branch	Submit advance copy of Installation, Operation and maintenance	
TAX ALATIM 92 AGE W	manuals. The work includes training to the Owner's	
1/24 12/20 20 12/20 20 20 20 20 20 20 20 20 20 20 20 20 2	representative at site	
hatel and him	FIRE ALARM CONTROL PANEL: Addressable type Fire	
bartands have beduland	Alarm Control Panel complete with following basic options. Master	
beling the best said. It	Controller Assembly / CPU shall be suitable with port to add Voice	
TAYED BEING DIFF THESE	alarm system / Fire Fighter Telephone system / Printer / Remote	
complete with thring	Annunciator etc. FACP must be comply with internationally accepted	
eduding mending the	standard. Control units for Fire -Protective Signaling Systems" Addressable Fire Alarm Control Panel shall be complete, non-coded,	
respons I have be s	Addressable, microprocessor based with initiating devices, notification	
ed their patieties on	appliances, and monitoring and control devices. Annunciation:	
in gadrona hand b	Operation of alarm and supervisory initiating devices shall be	
	annunciated at the FACP indicating the location and type of device.	
to Passus Controller	Monitoring: FACP shall individually monitor sensors for calibration,	
summer (STA) Fift wire	sensitivity, and alarm condition, and shall individually adjust for	
ureat Suit Sow universit	sensitivity. The control unit shall determine the condition of each	
	sensor by comparing the sensor value to the stored values.	
TVVIII) was an bulk he	Environmental Compensation: The FACP shall maintain a moving	
Security in sects 700	average of the sensor's smoke chamber value to automatically	
	compensate for dust, dirt, and other conditions that could affect	
78.0	detection operations. Programmable Sensitivity: Photoelectric Smoke	
tial) marpa Exactl (n	Sensors shall have various sensitivity levels ranging from (±) 0.2% up to	
254431 IBANGSTHA TO SOM	3.7%, programmed and monitored from the FACP. Sensitivity Testing	
	Reports: The FACP shall provide sensor reports that meet NFPA	
	/internationally accepted standard calibrated test method	
point on quill light to	requirements. The reports shall be viewed on a CRT Display or printed for annual recording and logging of the calibration maintenance	
homatic drawing, etc.	schedule. The FACP shall automatically indicate when an individual	
ig factory. Get approval	sensor needs cleaning. The system shall provide a means to indicate	
learns world to	that a sensor requires cleaning. When a sensor's average value reaches	
Walleman the Spirit	a predetermined value, (3) progressive levels of reporting are provided.	
widen feutrolf multipe	The first level shall indicate that a sensor is close to a trouble reporting	
to cander a recomA mult	condition and will be indicated on the FACP as "ALMOST DIRTY." This	
leshtheid signal file	condition provides a means to alert maintenance staff of a dirty sensor	
1	without creating a trouble in the system. If this indicator is ignored, a	
Sherric Provis	second level "DIRTY SENSOR" condition shall be indicated at the FACP	
No of the latest and	and subsequently a system trouble is reported [to the Central	
	Monitoring Station]. The sensor base LED shall glow steady giving a	
tillide and a north residence has	visible indication at the sensor location. The "DIRTY SENSOR" condition	
	shall not affect the sensitivity level required to alarm the sensor. If a	



Item No.	Description of Item	
1	2	
	manufacturer(s) must have valid test certificate from internationally accredited laboratory (like CPRI, KEMA etc.) approved / accepted by the	
	Engineer.	
	1C-4x0.282 sqmm (2 pair)	
	SHOP DRAWING & DOCUMENTATION: Preparation of detail Shop	
Justantique to Illadiçat	drawing including, layout drawing, section details, schematic drawing,	
pullerings in language	etc. Get approval of shop drawing before any fabrication or installation	
	works. Shop drawing must be coordinated with other services likely	
to and that All March	Electrical cabling, Light Fixtures, False Ceiling and Interior design. The	
97.0	work also includes: a)Show actual dimension of	
	Equipment. b) Submit actual Wattage rating of all equipment c) Reconfirm Electrical cable sizing d) Submit Electrical	
	connection diagram of Electric Panels	
and and the selection of the	e) Submit General arrangement of Electric Panels f) Submit advance	
James Income Calif	copy of Installation, Operation and maintenance manuals.	
	AS-BUILT DRAWING: Preparation and submission of As-	
JUNEAU BERT TO BE SAN THE	built drawing in following forms: One set in	
98.0	tracing paper, size A1 Two sets print out in A1 Paper	
	Soft Copy in CD in AutoCAD Version 2010 Soft Copy in PDF Version	
	TESTING, COMMISSIONING & BALANCING :	
99.0	After proper installation and certification the system shall be tested,	
	commissioned and balanced as per direction and recommendation by	
Miles & dama compand	the Manufacturer as well as Designer.	
1000	TAGGING, IDENTIFICATION & SIGNAGE INDICATION:	
100.0	As per NFPA Code.	

LIST OF RECOMMENDED MANUFACTURERS

Water Chiller	Carrier/Trane/Dunham Bush/Daikin/Rhoss/AERMEC/Equivalent
Jeale Public to Pus	Pre-insected papers (SetAl/Riccel/Numer/Me
Fan Coil Unit	Carrier/Trane/Dunham Bush/Daikin/Rhoss/AERMEC/Equivalent
Fans	Nicotra / Fantech / S&P / Chicago / Rhoss/ GEC-Woods / Kruger / Systemair/ Sodeca / Casals/ Blauberg or equivalent.
Pumps COMANN VIOLEN	Ajax / Grundfos / Monoflo / Bell & Gosset / Rhoss/ Paco / Paragon / Calpeda /Armstrong / Wilo / Ebitt/General or equivalent.
Pump Motor	Siemens / Teco / GEC / ABB / Toshiba / Calpeda / EMM or equivalent.
Valves, Y-Strainer, Flexible Pipe Connection	Crane / Kitz / Nibco / Tozen / Toyo / Maple/ Metraflex / AFA / Birflex / Ekoval / TECOFI / Caleffi or equivalent.
Balancing Valve	Tour and Anderson / Crane / Combi / FlowCon / Oventrop/ TECOFI/ Caleffi or equivalent.
Vibration Isolation / Silencer	Mason Industries / Kinetics or equivalent.
Water Treatment Chemicals	Ecolab / Water Services UOP / Mazer Chemicals/Petaling or equivalent.

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Pressure Gauge Pipe Thermometer	Hunter / Weksler / Brannan / Metraflex / Clayton / Singer / Taylor / Maple/Tozen / Caleffi or equivalent.
Water Flow Meter (Digital)	Data Industrial/Asahi/Aichie Tokei/Blue White/Calffi or equivalent.
Insulation (Rockwool / Glass wool)	Bradford / Polyglass / Foster / Byuksan /Polywool or equivalent.
Insulation (PEF / Nitrile Rubber)	Superlon / Wide / Armaflex / Armacell / Aerocell/ ALP Aeroflex or equivalent.
Duct Insulation (PE insulation)	Jumboo / Polycell or equivalent.
Flexible round duct	Thermaflex / Aeroduct / Civa Flex / Ruskin / Titus or equivalent.
Air Terminals, Variable Air Volume	Titus / Price / Connols-Aire / Trox / System Aire / Halton / Ruskin / Bavcol Air/ Acutherm /Belimo or equivalent.
Automatic Controls system	Johnson Controls/Honeywell / Siemens / Delta/ Regin or equivalent.
Flow Switch	Johnson Controls/Honeywell / Siemens / Delta or equivalent.
Control Valve	Johnson Controls/Honeywell / Siemens/ Belimo/Regin or equivalent.
Expansion Tank (Closed type)	Automatic Heating Appliances / Pneumatex / Monoflo / Emtrol/Reflix or equivalent.
Electrical Components	AEG / Siemens / Telemecanique / GE / ABB / Dorman smith / MEM / Merlin Gerin or equivalent.
Variable Frequency Drive	Siemens / Danfoss / Telemechanique /ABB/Yaskawa or equivalent.
Modulating Control Valve	Siemens, Johnson controls, Belimo, Honeywell or equivalent.
Air Filter / Safe Change Filter (BIBO)	Camfil / Flanders / AAF / Air Guard / Faar / Trox or equivalent.
Electric Cable	Paradise / BRB / BBS or equivalent.
Fire Damper	Trox/Connols Aire/Ruskin or equivalent.
Pre-insulated pipe	SeAH/ Ricwil/ Husteel/ Glensule or equivalent.

RECOMMENDED LIST OF MATERIALS AND MANUFACTURERS

Equipment	Manufacturer
Fire Pumps and Accessories	TI BIAN III
Fire Pump and Jockey Pump	
ecol OEC / ABB / Toxhiba / Calgeda / EM	Xylem, USA/ SFFECU,
	Lifeco, UAE/ Ebitt,
uterson / Crenc / Combi / FlowCon / Oveni puvaleni.	Turkey/ Wilo, Germany/ NM Fire, France/ Lifeco, UAE/
sides / Koetics or aquivalent.	Or equivalent

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