



**NAYA RAIPUR DEVELOPMENT AUTHORITY**

**Tender Document for Supply, Installation, Testing and Commissioning of Fire alarm system, Public address system , CCTV , IBMS for Retail building and IBMS for Commercial Office Complex building on plot no. CO3 at sector-21 of Naya Raipur**

**(Following Three-Envelope Tender Procedure)**

**Schedule – A  
Price Tender  
To be submitted in ENVELOPE-3**

**NIT No: 159/FA-PS-IBMS/VB/ELECT /CE(E)/NRDA/2016-17 Naya raipur**

**Dated: 27.01.2017**

**Issued by:** Chief Executive Officer,  
Naya Raipur Development Authority (NRDA)  
Paryavas bhawan, North block, Sector- 19,  
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## Tender Document Contains

- (a) Only schedule "A" and Section-I of schedule "D" are to be filled & signed by the tenderer
- (b) All the certificates as per pre qualification criteria shall be appended with relevant forms of schedule "D"

### 1. PART ONE (NRDA F-1)-(Attached herewith, to be submit along the tender)

#### Part (A)

- a) Press Notice
- b) Detailed NIT

#### Part (B)

- a) Schedule-A
  - (i) Cost Abstract
  - (ii) Bill of Quantities

- b) Schedule-B-NIL
- c) Schedule-C-NIL
- d) Schedule-D

#### Section-I..... Technical tender forms

- (i) Letter of Technical Tender
- (ii) Tenderer's Information Sheet
- (iii) Annual Turnover
- (iv) Specific Construction Experience
- (v) Declaration
- (vi) Check list for Technical tender evaluation

#### Section -II .....Scope of work

#### Section -III..... Technical specifications of work

#### Section -IV ..... Special Conditions of Contract

#### Section -V ..... List of approved makes

#### Section -VI..... Drawings

- e) Schedule-E
- f) Schedule-F

### 2. PART TWO (NRDA F-2/3 )-Standard form (Not Attached herewith, and not to be submitted along the tender)

Important note: - Link site <http://nayaipur.com/documents/gcc.pdf>

1. General Guidelines
2. Tender
3. General rules and directions
4. Conditions of contract
5. Clauses of contract
6. Model rules relating to labour, water supply and sanitation in labour camps safety code
7. Contract forms
  - (a) Draft Format for Performance Security
  - (b) Earnest Money Deposit Form (Bank Guarantee)
  - (c) Format of Contract Agreement
  - (d) Draft Format for Performance Guarantee for Water Proofing and Anti-termite Works
  - (e) Indemnity Bond
  - (f) Indenture Bond
  - (g) Notice for Appointment of Arbitrator
8. Proforma of schedules (Schedule 'A' to Schedule 'F')

Signature of Contractor.....

Signature of NRDA.....

## Naya Raipur Development Authority (NRDA) Raipur, Chhattisgarh

### Document details

**Name of work :** “Supply, Installation, Testing and Commissioning of Fire alarm system, Public address system , CCTV , IBMS for Retail building and IBMS for Commercial Office Complex building on plot no. CO3 at sector-21 of Naya Raipur”.

**Name of Tenderer:**

### Details

- a) Cost of Tender Document : Rs
- b) EMD : Rs

Signature of Tenderer

Date:\_\_\_\_\_

**Cost Abstract**

**Supply, Installation, Testing and Commissioning of Fire alarm system, Public address system , CCTV , IBMS for Retail building and IBMS for Commercial Office Complex building on plot no. CO3 at sector-21 of Naya Raipur**

<b>SR. NO.</b>	<b>DESCRIPTION</b>	<b>AMOUNT (In INR) (In Figure)</b>	<b>AMOUNT(In INR) (In Words)</b>
1	FIRE ALARM SYSTEM	Rs. -	
2	PUBLIC ADDRESS SYSTEM	Rs. -	
3	UPS SYSTEM	Rs. -	
4	IBMS FOR RETAIL BUILDING	Rs. -	
5	IBMS for Commercial Office Complex building	Rs. -	
6	CCTV	Rs. -	
	<b>GRAND TOTAL</b>	<b>Rs. -</b>	

Note: Materials to be ordered only after approval of shop drawings by Client/ Client appointed PMC/Consultant/ Architect

<p style="text-align: center;"><b>Bill of quantity</b>  <b>Supply, Installation, Testing and Commissioning of Fire alarm system, Public address system , CCTV , IBMS for Retail building and IBMS for Commercial Office Complex building on plot no. CO3 at sector-21 of Naya Raipur</b></p>						
Sr. No.	Item Description	Unit	Qty	Rate(In INR) (In Figure)	Rate(In INR) (In Words)	Amount
<b>1</b>	<b>FIRE ALARM SYSTEM</b>					
1.1	Supply, installation, testing & commissioning of Networkable Intelligent Addressable Fire Alarm Control Panel (VDS/EN/UL-FM Approved) having provision of 12 loops expandable upto 18 loop , each loop capable of connecting upto 125 detector/devices , with 5.7" touch screen display , multiple access levels, event history file in non-volatile memory (EEPROM) to store 20000 events, including network card, Network communication module for peer to peer networking of more panels ,repeater interface ,USB Port hot redundant microprocessor CPU & with in built redundant power supply and <b>in-built</b> battery backup for 72 hrs in standby mode & 30 min in alarm condition mode in ABS enclosure and other required accessories.NO proprietary software and dongle required	Each	2			Rs. -
1.2	Supply, installation, testing & commissioning of DS/EN/UL-FM Approved Networkable Intelligent Analogue Addressable Fire Alarm Active Repeater Panel with 40 characters LCD display ABS enclosure & required accessories.	Each	2			Rs. -
1.3	Supply, installation, testing & commissioning of following type soft Addressable detectors (VDS/EN/UL-FM approved) with detector mounting base and other required accessories.					
1.3.1	Multi-Sensor combined (Photo + Thermal) detectors with in built fault isolator	Each	700			Rs. -
1.3.2	Supply, installation, testing & commissioning of Soft Addressable BEAM TYPE FIRE detectors suitable for minimum 30m span with detector mounting base & required accessories.	Each	4			Rs. -
1.3.3	Soft addressable intelligent micro processor based Smoke detectors Above/Below False ceiling with in built falut isolator with operating temperature range from - 20° C to + 50°C	Each	416			Rs. -

Sr. No.	Item Description	Unit	Qty	Rate(In INR) (In Figure)	Rate(In INR) (In Words)	Amount
1.3.4	Soft addressable intelligent micro processor based Rate of Rise Thermal (Heat) detectors with in built falut isolator with operating temp range from - 20° C to + 50°C	Each	266			Rs. -
1.4	Supply, installation, testing & commissioning of following Addressable devices (VDS/EN/UL-FM approved) with mounting base and other required accessories.					
1.4.1	Break Glass /Resettable element type soft addressable Manual Call Points	Each	111			Rs. -
1.4.2	Soft addressable Monitor Module for the montiroing of single potential free input .( For flow switches ,pressure switches,CO Sensors ,deluge valves ,integration of third party fire alarm systems , PSU fault integrations etc)	Each	216			Rs. -
1.4.3	Soft addressable Control Module to provide single potential free contact ( for integration of AHU Pressurisation fans lift smoke extraction fans ,fire dampers ,VFD INTEGRATIONS ,hooter cum strobes and fire telephone jacks etc)	Each	250			Rs. -
1.4.4	Response indicator	Each	107			Rs. -
1.5	Supply, installation, testing & commissioning of VDS/UL-FM/EN Approved Strobe cum Sounder driving power from the main FACP in ABS plastic body having sound adjustable Db level upto 90 dBs and a multi tone facility and light adjustable to 110 candelas complete with mounting base, enclosure & required accessories.	Each	111			Rs. -
1.6	Supplying and layide of following grade with copper conductor armoured FIRE SURVIVAL CABLE with ( EPR) Ethylene Propylene roubber insulation/XLPE ae per BS 7846: 2009 and IEC -60502 : 2004 part -1 ( armoured ,retain circuit intergrity as per BS 6387 C.W.Z ( armoured ,BS 8491;2008 BS 8434 -2 : 2009 ( ARMORED ),( Resistance to fire at 950° c for 3 hours) as per specification in cable tray ,clamped including anchor fastner to wall with suitable clamps , saddles fixing bolt ,2 cable glands for each dectector back box , complete in all respect as required as per specification .( RED colour)					

Sr. No.	Item Description	Unit	Qty	Rate(In INR) (In Figure)	Rate(In INR) (In Words)	Amount
1.6.1	2 core x1.5 sqmm	Rmt	32000			Rs. -
<b>Sub Total of FIRE ALARM SYSTEM</b>						Rs. -
<b>2</b>	<b>PUBLIC ADDRESS SYSTEM</b>					
	Supply Installation testing & commissioning of Public Address System considering the following items required for the system					
2.1	10 Watt Wall/Column Mounted Public Address speaker	Each	43			Rs. -
2.2	480 Watt amplifier	Each	4			Rs. -
2.3	6 Watt ceiling speaker metal grill with multiple tapping at 6 W/ 3W/1.5W	Each	233			Rs. -
2.4	8 Zone voice alarm controller with 8 zone paging station . Integation with fire alarm panel for EVAC/alert pre recorded messages. Built in loud speaker for board cast monitoring ,with in built USB/MP3/AM/FM Player	Each	2			Rs. -
2.5	42U Floor Mount Rack (Dimension- DxWXH - 800X600X1600 mm)	Each	3			Rs. -
2.6	Wiring for speakers & volume control units with 2 core 1.5 sq.mm armoured twisted pair shielded FRLS copper conductor cable in the existing surface/ concealed, steel/ PVC conduit/ PVC casing capping as required.	Rmt	1500			Rs. -

Sr. No.	Item Description	Unit	Qty	Rate(In INR) (In Figure)	Rate(In INR) (In Words)	Amount
	<b>Sub Total of PUBLIC ADDRESS SYSTEM</b>					Rs. -
<b>3</b>	<b>UPS SYSTEM</b>					
	Design, manufacture, supply & installation of following UPS's (Input - three phase and Output -three phase) unit as per specifications, Cost to be inclusive of wires, Cables, Jointing and termination of wires and cables and all related accessories required to complete the installation to satisfaction of Engineer incharge					
<b>3.1</b>	15 KVA/12KW UPS including battery bank with 30 Minutes Battery Backup And Rack As per requirement ( For Surveillance Purpose & Corridor Emergency Lighting)	Each	5			Rs. -
<b>3.2</b>	5 KVA/4 KW UPS (1 Phase in , 1 Phase out ) including battery bank with 30 Minutes Battery Backup and Rack As per Requirement ( For Surveillance Purpose & Corridor Emergency Lighting)	Each	1			Rs. -
	<b>Sub Total of UPS SYSTEM</b>					Rs. -



**Bill of quantity**  
**Supply, Installation, Testing and Commissioning of Fire alarm system, Public address system , CCTV , IBMS for Retail building and IBMS for Commercial Office Complex building on plot no. CO3 at sector-21 of Naya Raipur**

**Intergated Building Management System**

Sr.No	Item Description	UNIT	Quantity	Rate(In INR) (In Figure)	Rate(In INR) (In Words)	Amount (INR)
	Supply, Fabrication, Installation, Testing, Balancing and Commissioning of the following all IBMS equipment and materials in accordance with Specifications and Tender and inclusive of taxes, duties, transportation, scaffolding etc.					
1	<p><b>BMS System Software</b> : Web Based Graphical Software for the building management system. The provided / quoted software includes the operation and the programming / engineering and logic preparation license also. . There shpuld not not additiona cost for the further expension or in case any hardware points increases. Software should be with customised vector graphics. The contrcator should take the approval of the graphics form the consultant before executing the graphics works and it should animate the Graphics, Navigation between pages, display of logs, changing the time zones, popup alarms, configurable password protection for Building Mgmt System as per Specifications. Same software can be utilized as programming / commissioning software of DDC, NAC etc and Supervisory Software with the below mentioned capabilities</p> <ol style="list-style-type: none"> <li>1. Supports unlimited users over internet/intranet.</li> <li>2. Optional enterprise level data archiving using SQL,MYSQL,CSV,Oracle,DB2 database.</li> <li>3. Audit Trail for all system function such as database backup, scheduling,energy management routines.</li> <li>4. Alarm Processing and routing including email alarm.</li> <li>5. Intergration wtih 3rd party system via ethernet based driver such as BACNET/IP, OPC, MODBUS,LON,SNMP.</li> <li>6. Should be having built in tools for Graphics, Data management , controller configurations, user level managements, system configurations , alarm configurations etc.</li> <li>7.A high level an app should have customized reports, Real-time usage for respective utilities, Helpdesk, Alerts &amp; Notifications and a payment gateway for making payment towards utilities</li> </ol>	Set	1			Rs. -
2	Supply Installation, Testing & Commissioning of SMS alarm notification module	Set	1			Rs. -
3	Supply Installation, Testing & Commissioning of BMS Server Processor – Intel i7 4770K/ 2.70 GHz,Memory – Minimum 4 GB RAM ,Hard disks – 2TB SATA at 7200 rpms,OS- Windows 7, Ultimate edition 64bit,Network Card – 1Gbit/s network card,Graphic card of minimum 1 GB memory.	Set	1			Rs. -

Sr.No	Item Description	UNIT	Quantity	Rate(In INR) (In Figure)	Rate(In INR) (In Words)	Amount (INR)
4	Supply Installation, Testing & Commissioning of Client Workstation Processor – Intel i3 4770K/ 1.70 GHz,2GB RAM Hard disks – 1 TB SATA at 7200 rpms,OS- Windows 7, Ultimate edition 64bit,Network Card – 1Gbit/s network card,Graphic card of minimum 1 GB memory.32" LCD,Keyboard,Mouse,	Set	1			Rs. -
5	Supply Installation, Testing & Commissioning of 9 Inch Five Points Multi Touch Capacitive Screen (800x480 pixel,16:9),RAM: DDR3 512MB Nand Flash: 4GB ,Google Android 4.0.3, Support Flash 11.1 based Portable Hand Held terminal along with mounting accessories to mount on DDC Panel if required.	No	2			Rs. -
6	Energy Software : Graphical Software for the Energy management. The Software should able to tag the graphics and should able tp collect the data either from the BMS Softawre or from the energy meters. The ES system either part of the BMS Software with the customised graphics and data or the seprate software. It should have mullti level password protection.	No	1			Rs. -
7	Supply of Dongle / HARDWARE LICENSE for BMS Controller Commissioning. (If Required)	No	1			Rs. -

Sr.No	Item Description	UNIT	Quantity	Rate(In INR) (In Figure)	Rate(In INR) (In Words)	Amount (INR)
8	<b>DDC Controllers</b>					
8.1	Supply Installation, Testing & Commissioning of Supervisory controller with the following capabilities : 1. IP based , 10/100 Ethernet Port 1. Embedded power PC platform. 3. Web user interface serving graphical browser presentations. 4. Should support optional 16 and 34 point IO module. 2. Battery back real time clock. 3. 128 MB DDR RAM expandable to 256 MB. 4. 10/100 BaseT fast Ethernet PORT. 5. Supports 2 optional communication boards for integrating 3rd party devices via RS 232 and Rs 485 supporting MODBUS/BACNET/LON/Mbus protocol. 6. UL Listed ,CE Approved, FCC Approved and RoHS complaint.					
8.1.1	Energy Meters(710*16 Soft Points)	Set	1			Rs. -
8.1.2	FAS	Set	1			Rs. -
8.1.3	AHU with VFD	Set	1			Rs. -
8.1.4	DG, HT Panels, Lifts	Set	1			Rs. -
8.1.5	Transformers	Set	1			Rs. -
8.1.6	DDC for VFD based AHU	Set	1			Rs. -
8.1.7	DDC for CHILLER PLANT	Set	1			Rs. -

Sr.No	Item Description	UNIT	Quantity	Rate(In INR) (In Figure)	Rate(In INR) (In Words)	Amount (INR)
8.1.8	DDC for Lift Pressurisation Fans	Set	1			Rs. -
8.1.9	DDC for Basement FAN	Set	1			Rs. -
8.1.10	DDC for Lifts	Set	1			Rs. -
8.1.11	DDC for Pumps (All Pumps)	Set	1			Rs. -
8.1.12	DDC for HT Panel/LT Panel	Set	1			Rs. -
9	Supply Installation, Testing & Commissioning of following					
9.1	SITC of Field Sensors(Refer IO Summary)	Lot	1			Rs. -
10	Supply Installation, Testing & Commissioning of Cabling for instrument, controls to DDCs and communication cabling from DDC to central equipment complete with earthing, supports etc complete. All Cables shall be ferruled and tagged, and shall use lugs for termination at both ends.					
10.1	Supply & Laying of 2 Core x 1 sq mm FRLS Screened with drain wire, Armoured Cable for control cabling, Mylan Shielded	Mtr.	7000			Rs. -
10.2	Supply & Laying of 4 Core x 1 sq mm FRLS Screened with drain wire, Armoured Cable for control cabling, Mylan Shilded	Mtr.	5000			Rs. -

Sr.No	Item Description	UNIT	Quantity	Rate(In INR) (In Figure)	Rate(In INR) (In Words)	Amount (INR)
10.3	Supply & Laying of Armoured, Cat-6 cable, laid on Surface with GI Saddle- Spacers , or in cable trays, as per site requirements, with required terminations as required with Cable tie`s & Tags.	Mtr.	3000			Rs. -
11	Supply, Installation, Testing & Commissioning of 1) 24 port 10/100 Mbps switches 3) Data-driven IGMP support 4) Minimum 2 nos. 1000baseT 5) Vendor shall furnish all necessary accessories of networking required for IP BMS 6) All necessary approvals as required at the discretion & final directions of Consultants.	No.	10			Rs. -
12	Flexible PVC Flexible conduit for termination in the DDC Pannels	mtr	2000			Rs. -
<b>SUB TOTAL OF INTERGARTED BUILDING MANAGEMENT SYSTEM</b>						Rs. -

## NRDA IBMS TENDER

Name of the Project: NRDA E9,E10 &amp; E4

Project Code :

Subject: IBMS I/ O SUMMARY

Sl.no.	Description	Qty	AI	AO	DI	DO	Soft Points	Monitor	Control	Alarm
<b>I</b>	<b>CHILLER PLANT</b>									
<b>A1</b>	<b>Air Cooled</b>	<b>6</b>								
1	Chiller ON/OFF status.				6			X		
2	Chiller trip status.				6			X		X
3	Supply & return temperature of Individual chillers.		6					X		X
5	Chiller isolation Mortised valves ON/OFF command & status.				6	6		X	X	
6	Chiller soft integration	<b>6</b>					X			
	Chiller Run Hours						X			
	Start inhibit						X			
	Cooler – low pressure						X			
	Cooler – transducer or leaving liquid probe						X			
	Cooler – transducer or temperature sensor						X			
	Condenser – high pressure						X			
	Condenser – pressure transducer out of range						X			
	Discharge – high temperature						X			
	Discharge – low temperature						X			
	Oil – high temperature						X			
	Oil – low differential pressure						X			
	Oil – low differential seal pressure						X			
	Oil or condenser transducer error						X			
	Oil – clogged filter						X			
	Oil – high pressure						X			
	Oil – separator – low level						X			
	Oil – separator – low level						X			



Sl.no.	Description	Qty	AI	AO	DI	DO	Soft Points	Monitor	Control	Alarm
	<b>Location Of DDC: Respective AHU Rooms.</b>									
1	AHU ON/OFF Command.					14			X	
2	AHU ON/OFF Status.				14			X		
3	AHU Auto / Manual / Bypass status				14			X		
4	Filter status.				14			X		
5	Return air Temperature sensor.		14					X		
6	CHW 2-Way Valve Control & position feedback		14	14				X	X	X
7	Duct static pressure sensor.		14					X		
10	Fire damper status				90			X		
11	Co2 monitoring		14					X		
12	Fresh air damper control			14					X	
13	Integration of VAV boxes (11 nos.)	<b>0</b>								
	Room air temp measurement						X			X
	Damper Control CMD						X			
	Damper status						X			
	Air flow measurement						X			
	Air flow set point						X			X
	Cooling load %age						X			
	Room air temperature set point						X			X
	<b>TOTAL IO WITHOUT SPARE</b>		<b>107</b>	<b>51</b>	<b>206</b>	<b>58</b>				
	<b>IO PER DDC</b>		<b>21</b>	<b>10</b>	<b>41</b>	<b>12</b>				
	<b>SPARE IO (Universal IO)</b>	15%	<b>3</b>	<b>2</b>	<b>6</b>	<b>2</b>				
	<b>IO PER AHU DDC</b>		<b>25</b>	<b>12</b>	<b>47</b>	<b>13</b>				
<b>III</b>	<b>CSU</b>	<b>2</b>								
	on/off command					2				
	on/off status				2					
	aut/annual status monitoring				2					
	trip status monitoring				2					
	filter status mon				2					
	CHW 2 Way valve control			2						
	CHW 2 Way valve feedback		2							
	supply air temp monit		2							
	<b>IO PER DDC</b>		<b>4</b>	<b>2</b>	<b>8</b>	<b>2</b>				
	<b>SPARE IO (Universal IO)</b>	30%	<b>1.2</b>	<b>0.6</b>	<b>2.4</b>	<b>0.6</b>				



Sl.no.	Description	Qty	AI	AO	DI	DO	Soft Points	Monitor	Control	Alarm
	<b>IO PER CSU DDC</b>		<b>5</b>	<b>3</b>	<b>10</b>	<b>3</b>				
<b>IV</b>	<b>Car park exhaust fan for basements</b>	<b>24</b>								
	Exhaust air fans (Axial)									
1	Exhaust air fan ON / OFF command.					24			X	
2	Exhaust air fan ON / OFF Status.				24			X		
3	Exhaust air fan A/M Status.				24			X		
	<b>TOTAL IO WITHOUT SPARE</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
	<b>IO PER DDC</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
	<b>SPARE IO (Universal IO)</b>	30%	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
	<b>IO PER BASEMENT FAN DDC</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
<b>V</b>	<b>Smoke extract fans for Basement</b>	<b>24</b>								
1	Smoke Fan ON / OFF Status.				24			X		
	<b>TOTAL IO WITHOUT SPARE</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
	<b>IO PER DDC</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
	<b>SPARE IO (Universal IO)</b>	30%	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
	<b>IO PER SMOKE EXTRACT FAN DDC</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
<b>VI</b>	<b>Staircase Pressurisation Fans</b>	<b>0</b>								
1	Pressurisation FanON / OFF Status.				0			X		
<b>VII</b>	<b>Liftwell Pressurisation Fans</b>	<b>8</b>								
2	Pressurisation FanON / OFF Status.				8			X		
	<b>Pump Room Fan</b>	<b>6</b>								
	Pressurisation FanON / OFF Status.				6			X		
	<b>TOTAL IO WITHOUT SPARE</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
	<b>IO PER DDC</b>		<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>				
	<b>SPARE IO (Universal IO)</b>	30%	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>				
	<b>IO PER PRESSURISATION FAN DDC</b>		<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>				
<b>VIII</b>	<b>Fresh Air Fans</b>	<b>14</b>								
1	Fresh Air Fan ON / OFF Command.					14			X	
2	Fresh Air FanON / OFF Status.				14			X		
3	Fresh Air Fan A/M Status.				14			X		
4	Filter status.				14			X		
5	Supply air temperature monitoring		14					X		
	<b>TOTAL IO WITHOUT SPARE</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
	<b>IO PER DDC</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				

Sl.no.	Description	Qty	AI	AO	DI	DO	Soft Points	Monitor	Control	Alarm
	<b>SPARE IO (Universal IO)</b>	15%	0	0	0	0				
	<b>IO PER FRESH AIR FAN DDC</b>		0	0	0	0				
X	AHU VFD integration	14					X			
	VFD speed control			14			X			
	VFD trip status				14		X			X
	VFD On/Off status		14				X			X
	Power						X			
	Frequency						X			
	Common fault						X			
	Torque						X			
	Motor current						X			
	Motor voltage						X			
	<b>TOTAL IO WITHOUT SPARE</b>		0	0	4	0				
	<b>IO PER DDC</b>		0	0	4	0				
	<b>SPARE IO (Universal IO)</b>	30%	0	0	1	0				
	<b>IO PER PAC DDC</b>		0	0	5	0				
XII	<b>Fire Alarm Panel</b>	3								
	Fire Status from Panel				3					
XIII	<b>UPS SYSTEM</b>	6								
	<b>Control and Data Acquisition (18 data points per UPS assumed)</b>		0							
	Inverter failure		0				X			
	Low Battery		0				X			
	Battery circuit breaker open		0				X			
	Load on Battery		0				X			
	Mains Failure		0				X			
	Rectifier failed or off		0				X			
	Load on by Pass		0				X			
	Output Voltage RY		0				X			
	Output Voltage YB		0				X			
	Output Voltage BR		0				X			
	Output Current R		0				X			

Sl.no.	Description	Qty	AI	AO	DI	DO	Soft Points	Monitor	Control	Alarm
	Output Current Y		0				X			
	Output Current B		0				X			
	Output Power R in KW / KVA		0				X			
	Output Power Y in KW / KVA		0				X			
	Output Power B in KW / KVA		0				X			
	Battery Voltage		0				X			
	Battery Current		0				X			
			0							
	UPS Output Breaker Close/Open Status		0		6					
	UPS Output Breaker Trip Status		0		6					
	<b>IO PER DDC</b>		0	0	12	0				
	<b>SPARE IO (Universal IO)</b>	30%	0	0	4	0				
	<b>IO PER PAC DDC</b>		0	0	16	0				
<b>XIV</b>	<b>Energy Meter soft integration</b>	<b>479</b>	479				X			
	Total Real Power						X			
	Total Apparent Power						X			
	Total Reactive Power						X			
	Total Power Factor						X			
	Frequency (derived from Phase A)						X			
	Current, Present Demand, Phase A						X			
	Current, Present Demand, Phase B						X			
	Current, Present Demand, Phase C						X			
	Voltage, Phase A-B						X			
	Voltage, Phase B-C						X			
	Voltage, Phase A-C						X			
	Voltage, Phase A-N						X			
	Voltage, Phase B-N						X			
	Voltage, Phase C-N						X			
	Demand Neutral						X			
	<b>Water Meter</b>	<b>2</b>					X			
	<b>IO PER DDC</b>		0	0	0	0				
	<b>SPARE IO (Universal IO)</b>	30%	0	0	0	0				
	<b>IO PER PAC DDC</b>		0	0	0	0				
<b>XVI</b>	<b>Fire Fighting System (Basement pump room)</b>									
	Hydrant pump status (5)				6	6		X		
	Sprinkler pump status (5)				6	6		X		
	Diesel pump status (1+1)				6	6		X		
	Jockey pump (Hydrant) status (5)				6	6		X		

Sl.no.	Description	Qty	AI	AO	DI	DO	Soft Points	Monitor	Control	Alarm
	Jockey pump (Sprinkler) status (5)				6	6		X		
	Booster Pumps (1+1)				10	10				
	Flushing Pump (10+5)				15	15				
	Domestic Pump (10+5)				15	15				
	Sprinkler line pressure		5					X		
	Hydrant line pressure		5					X		
	<b>IO PER DDC</b>		<b>10</b>	<b>0</b>	<b>70</b>	<b>70</b>				
	<b>SPARE IO (Universal IO)</b>	15%	<b>2</b>	<b>0</b>	<b>11</b>	<b>11</b>				
	<b>IO PER PAC DDC</b>		<b>12</b>	<b>0</b>	<b>81</b>	<b>81</b>				
<b>XVII</b>	<b>Lifts / Escalators Integration</b>	<b>16/12</b>								
	Floor Status		16/12	16/12						
	Alarm Status		16/12							
	<b>IO PER DDC</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
	<b>SPARE IO (Universal IO)</b>	15%	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
	<b>IO PER PAC DDC</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
	Oil temperature Indicator Alarm									
<b>XVIII</b>	<b>LT Panel (1 incoming and 2 Outgoing)</b>	<b>4</b>								
	Incoming Breaker On/Off Status				4					
	Incoming Breaker TRIP Status				4					
	Incomer Energy meter									
	APFC Breaker On/Off Status				4					
	Incomer Energy meter for APFC Breaker									
	CHILLER Breaker On/Off Status				4					
	CHILLER Breaker TRIP Status				4					
	Incomer Energy meter for CHILLER Breaker									
	UPS-1 Breaker On/Off Status				4					
	UPS-1 Breaker TRIP Status				4					
	Incomer Energy meter for UPS-1 CHILLER Breaker									
	UPS-2 Breaker On/Off Status				4					
	UPS-2 Breaker TRIP Status				4					
	Incomer Energy meter for UPS-2 CHILLER Breaker									
	UPS-3 Breaker On/Off Status					4				
	UPS-3 Breaker TRIP Status					4				
	Incomer Energy meter for UPS-3 CHILLER Breaker									
	<b>IO PER DDC</b>		<b>0</b>	<b>0</b>	<b>44</b>	<b>0</b>				
	<b>SPARE IO (Universal IO)</b>	15%	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>				
	<b>IO PER PAC DDC</b>		<b>0</b>	<b>0</b>	<b>51</b>	<b>0</b>				

Sl.no.	Description	Qty	AI	AO	DI	DO	Soft Points	Monitor	Control	Alarm
XIX	<b>DIESEL GENERATORS</b>	<b>2</b>								
	Diesel Day tank level monitoring through level switches with alarm notification				6			X		
	Battery charger Failed				2			X		
	Fail to Start				2			X		
	High Engine Temp				2			X		
	Engine Overload				2			X		X
	DG Soft integration									
	DG FUEL HI/LO STATUS						X			
	EMERGENCY STOP						X			
	Genset - On Load/Off Load						X			
	General Under voltage						X			X
	General over voltage						X			
	General under frequency						X			
	General over frequency						X			
	General over current						X			
	Battery under voltage fault						X			
	Low Oil pressure shut down						X			
	Low oil pressure warning						X			
	Hot water temp shut down						X			
	Low water level warning						X			
	Fuel Level Monitor						X			
	Starting failure						X			
	Engine run time hours						X			
	R, Y,B Voltage						X			
	R, Y, B Current						X			
	Frequency						X			
	General Total KW - active power						X			
	Engine RPM						X			
	<b>IO PER DDC</b>		<b>0</b>	<b>0</b>	<b>71</b>	<b>0</b>				
	<b>SPARE IO (Universal IO)</b>	<b>15%</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>				
	<b>IO PER PAC DDC</b>		<b>0</b>	<b>0</b>	<b>82</b>	<b>0</b>				
XX	<b>BTU Meters</b>	<b>268</b>								
	<b>IO PER DDC</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
	<b>SPARE IO (Universal IO)</b>	<b>15%</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	X			
	<b>IO PER PAC DDC</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>				
XXI	<b>Transformers</b>	<b>4</b>								
	ACB-1 ON/OFF Status (Transformer-1)				4					
	ACB-1 Trip Status (Transformer-1)				4					



Bill of quantity Supply, Installation, Testing and Commissioning of Fire alarm system, Public address system, CCTV, IBMS for Retail building and IBMS for Commercial Office Complex building on plot no. CO3 at sector-21 of Naya Raipur						
Sr. No.	Item Description	Unit	Qty	Rate(In INR) (In Figure)	Rate(In INR) (In Words)	Amount
1	<b>Closed Circuit Television (CCTV)</b>					
1.1	Supply, installation, testing & commissioning 1080P IP IR Bullet Camera ,1/2.9" progressive scan CMOS ,H.264 High - profile ,2.8-12mm.TDN WRD ONVIF Profile S ,TF Card support ,PoE , 24VAC/12VDC,30-40m IR distance IP66 as required for completeness and direction of EIC.	Nos	12			Rs. -
1.2	Supply, installation, testing & commissioning 1080P IP IR Dome Camera ,1/2.9" progressive scan CMOS ,H.264 High - profile ,2.8-12mm.TDN WRD ONVIF Profile S ,TF Card support ,PoE , 24VAC/12VDC,10-15 m IR distance IP66 as required for completeness and direction of EIC. .	Each	55			Rs. -
1.3	Network video Recorder : Include storage server windows server standard SQL Server Express ,HUS software ,License covers 128 video channels and 5 user clients.Support 16 hot swappable hard disk direct attached and up to total 48 disks expansion as required for completeness and direction of EIC.	Each	1			Rs. -
1.4	Supply, installation, testing & commissioning of CCTV workstation with video Management Software's for the client based license .The workstation shall have the following specification :- Processor intel i7 with internal memory of 4GB RAM .Operating system & client software for cameras viewing included ,All software's must be original and with Likens as required for completeness and direction of EIC.	Each	1			Rs. -
1.5	Supply, installation, testing & commissioning of 4TB hard disk	Each	10			Rs. -
1.6	Supply, installation, testing & commissioning of 32" Flat Screen VGA Colour LCD Monitoras required for completeness and direction of EIC.	Each	3			Rs. -

Sr. No.	Item Description	Unit	Qty	Rate(In INR) (In Figure)	Rate(In INR) (In Words)	Amount
1.7	Supply, installation, testing & commissioning of 24 Port POE Plus Network Switch as required for completeness and direction of EIC.	Each	6			Rs. -
1.8	Supply, installation, testing & commissioning of Power cable of 2x1.5 sq. mm FRLS shielded copper conductor cable as required for completeness and direction of EIC.	Each	300			Rs. -
1.9	Supply, installation, testing & commissioning of Giga Speed Category 6 Non plenum U/UTP cable, Color state /CAT 6 cable	mtr	4000			Rs. -
<b>SUB TOTAL OF CCTV SYSTEM</b>						<b>Rs. -</b>



<p align="center"><b>Bill of quantity</b>  <b>Supply, Installation, Testing and Commissioning of Fire alarm system, Public address system , CCTV , IBMS for Retail building and IBMS for Commercial Office Complex building on plot no. CO3 at sector-21 of Naya Raipur</b></p>						
S.No.	Description	Unit	Qty.	Rate (in Rs.)	Rate(In INR) (In Figure)	Amount (in Rs.)
A)	Design, Supply, Installation, Testing, Commissioning & Handing over the Building Management System (BMS) as per specifications & BOQ as below.					
1.0	<p><b>BMS System Software</b> : Web Based Graphical Software for the building management system. The provided / quoted software includes the operation and the programming / engineering and logic preparation license also. . There should not be additional cost for the further expansion or in case any hardware points increases. Software should be with customised vector graphics. The contractor should take the approval of the graphics from the consultant before executing the graphics works and it should animate the Graphics, Navigation between pages, display of logs, changing the time zones, popup alarms, configurable password protection for Building Mgmt System as per Specifications. Same software can be utilized as programming / commissioning software of DDC, NAC etc and Supervisory Software with the below mentioned capabilities</p> <ol style="list-style-type: none"> <li>1. Supports unlimited users over internet/intranet.</li> <li>2. Optional enterprise level data archiving using SQL,MYSQL,CSV,Oracle,DB2 database.</li> <li>3. Audit Trail for all system function such as database backup, scheduling,energy management routines.</li> <li>4. Alarm Processing and routing including email alarm.</li> <li>5. Intergration with 3rd party system via ethernet based driver such as BACNET/IP, OPC, MODBUS,LON,SNMP.</li> <li>6. Should be having built in tools for Graphics, Data management , controller configurations, user level managements, system configurations , alarm configurations etc.</li> <li>7.A high level an app should have customized reports, Real-time usage for respective utilities, Helpdesk, Alerts &amp; Notifications and a payment gateway for making payment towards utilities</li> </ol>	No.	1			Rs. -
2.0	<p><b>Energy Software</b> : Graphical Software for the Energy management. The Software should be able to tag the graphics and should be able to collect the data either from the BMS Software or from the energy meters. The ES system either part of the BMS Software with the customised graphics and data or the separate software. It should have multi level password protection.</p>	No.	1			Rs. -
3.0	Supply of Dongle / HARDWARE LICENSE for BMS Controller Commissioning. (If Required)	No.	1			Rs. -

4.0	Supply Installation, Testing & Commissioning of BMS Server Processor – Intel i7 4770K/ 2.70 GHz,Memory – Minimum 4 GB RAM ,Hard disks – 2TB SATA at 7200 rpms,OS- Windows 7, Ultimate edition 64bit,Network Card – 1Gbit/s network card,Graphic card of minimum 1 GB memory.	1	Set			Rs.	-
5.0	Supply Installation, Testing & Commissioning of Client Workstation Processor – Intel i3 4770K/ 1.70 GHz,2GB RAM Hard disks – 1 TB SATA at 7200 rpms,OS- Windows 7, Ultimate edition 64bit,Network Card – 1Gbit/s network card,Graphic card of minimum 1 GB memory,32" LCD,Keyboard,Mouse,	1	Set			Rs.	-
6.0	Supply Installation, Testing & Commissioning of 9 Inch Five Points Multi Touch Capacitive Screen (800x480 pixel,16:9),RAM: DDR3 512MB Nand Flash: 4GB ,Google Android 4.0.3, Support Flash 11.1 based Portable Hand Held terminal along with mounting accessories to mount on DDC Panel if required.	2	No			Rs.	-
7.0	Web Based Integrator for interfacing different third party equipments/ services on the open protocols , Modbus, BACnet/ IP,BACnet/MSTP, / LON TP /FT -10. The integartor sshould be able to map the third party devise and points on all the above protocols. The Integrator should have 4 GB intrenal memory , should be able to handle 450 i/o hard points also. It should be BTL approved and UL Listed. The suitable integrator required , complete with software, hardware and all the integrators should be of same make of BMS						
7.1	For Chiller Plant Management System	No.	1			Rs.	-
7.2	For HT/LT & Lift Panel	No.	1			Rs.	-
7.4	For DG Sets (2 No.s)	No.	1			Rs.	-

7.5	For UPS on Modbus ( 2 Nos)	No.	1		Rs. -
7.7	For 2 Nos of Lifts on modbus RTU	No.	1		Rs. -
7.8	For Fire Alarm Panel (1no.s)	No.	1		Rs. -
7.9	For server cooling system on modbus	No.	1		Rs. -
8.0	<p>The DDC Controller shall be 32 bit microprocessor based expendable type Lon work approved. The DDC controllers should not have fix i/o points capacity, it should be moduler and expendable. Each controller shall have capacity to expand. The controllers should operate on 24 VDC or 19-40 VAC. The Controller should be able to connect with POT and the controller should have on board POT port. The DDC controller shall have in built real time clock &amp; controllers commuinacte with each other using a common network,LONWORKS TP/FT-10, 78 kbps. Each controllers should have two parts , the main PCB part and Terminal module part. The Terminal part should be plug in type. All the Controllers should house in MS, 1.6 MM, IP 65 locakable cabinets duly powder coated connector strip, internal wiring and space to house controller &amp; relays, connector strip current transformer, MCB, internal wiring. Max 2 AHU can be controlled through One DDC controller. For other services controlling Max. 100 points can be clubbed / controlled Through one place or One DDC</p>				
8.1	DDC Controllers for Chiller machine & HVAC make up water pump.				Rs. -
8.2	DDC Controllers for AHU/ AHU Supply Panel & Motorized Dampers.				
8.3	DDC Controllers for Hot Water Generator.				
8.4	DDC Controllers for Air washer Unit				
8.5	DDC Controllers for Softner feed pump, Irrigation Pump, Domestic Water Supply pump.				
8.6	DDC Controllers for Flushing water supply pump, Drainage Sump, Sewerage Sump pump.	Lot	1		

Signature of Contractor.....

Signature of NRDA.....

8.7	DDC Controllers for Overhead water tanks & Underground water tank					
8.8	DDC Controllers for Ventilation fans (Toilet/ Fire pump room/ Utility / Transformer room / liftwell/ basement )					
8.9	DDC Controllers for Lifts					
8.10	DDC Controllers for Fire Fighting pump					
8.11	DDC Controllers for DG Set.					
8.12	DDC Controllers for Electrical system (HT Panel , LT Panel & transformer)					
<b>TOTAL OF A : CARRIED OVER TO SUMMARY.</b>						<b>Rs. -</b>
<b>B) SENSORS AND FIELD DEVICES</b>						
<b>Supply, installation, testing, commissioning of necessary Input sensor transmitters / transducers comprising the following:</b>						
1.0	Immersion Temp Sensor, NTC 1.8 k ohm, Operating Temp -40 deg C to 150 Deg C . The enclosure should be IP 65 and tube should be of Stainless steel material.	Nos	8			Rs. -
2.0	Outside Temp & Humidity Sensor. The humidity sensor should be capacitive polymer sensor, enclosure should be 1P 65. The sensor protective filter material should be of Bronze. The Accuracy (at 20 deg C) should be ± 2% Rh. The Temp sensor should ne NTC 1.8 K ohm	Nos	1			Rs. -
3.0	Duct Type Temperature Sensor	Nos	32			Rs. -
4.0	Water Level Switches Low / high as required as per I/O	Nos	38			Rs. -
5.0	Differential Switches for Water Pumps	Nos	2			Rs. -

6.0	DP Switch Air for Monitoring Blower, Fan & Filter Status. The switch should be suitable for the air and natural gases. Pressure range should be .02 - 50 mbar and tolerable overload on one side 75mbar at -30...75deg C	Nos	92			Rs. -
7.0	Duct Mount & RH sensor	Nos	16			Rs. -
8.0	Ultrasonic Water Flow Meter	Nos	1			Rs. -
9.0	Flame Proof Level Transmitter	Nos	1			Rs. -
10.0	Water Flow Switch	Nos	2			Rs. -
11.0	Water Pressure Transducer	Nos	1			Rs. -
12.0	Hardness Analyzer	Nos	1			Rs. -
13.0	PH Analyzer	Nos	1			Rs. -
14.0	TDS Analyzer	Nos	1			Rs. -

15.0	Outdoor Lux Sensor	Nos	3			Rs.	-
16.0	Flameproof level switch	Nos	5			Rs.	-
<b>TOTAL OF B : CARRIED OVER TO SUMMARY.</b>						<b>Rs.</b>	<b>-</b>
<b>C) CONDUITING, WIRING AND CABLING</b>							
1.0	<b>Supply, installation, testing and commissioning of following cables:</b>						
1.1	Supplying, laying, termination, testing and commissioning of signal cables. (2 core 1 mm <sup>2</sup> ), PVC insulated, tinned copper conductor cable Armoured cable.	RM	19500			Rs.	-
1.2	Supplying, laying, termination, testing and commissioning of communication cables. (2 core 1 mm <sup>2</sup> ), PVC insulated, Twisted Pair, tinned copper conductor cable Armoured cable.	RM	4000			Rs.	-
1.3	Supplying, laying, termination, testing & commissioning of LAN cables for BMS Network.	RM	18000			Rs.	-
1.4	Flexible PVC Flexible conduit for termination in the DDC Pannels	RM	3500			Rs.	-
<b>TOTAL OF C : CARRIED OVER TO SUMMARY.</b>						<b>Rs.</b>	<b>-</b>
<b>SUB TOTAL (TOTAL OF A+B+C)</b>						<b>Rs.</b>	<b>-</b>

**IO SUMMARY**

**Building Automation System**

Sr.No.	Point Description	AI	DI	AO	DO	BMS Provider	HVAC Vendor Scope
<b>1</b>	<b>Comforts Chilling Machine (2No.s)</b>						
1	Chillers ON/OFF COMMAND				2	Wiring, termination and 5 amp. relay output from the BMS Controller	Provision of Potential free points for the BMS connectivity at Chiller Microprocessor panel.
2	Chiller Run status		2			Wiring and Termination on the potential free points of Run status at Chiller Microprocessor / MCC panel and DDC panel.	Provision of Potential free points for the BMS connectivity
3	Chiller- Remote/Local status		2			Wiring and Termination on the potential free points of A/M status at Chiller Microprocessor / MCC panel and DDC panel.	Provision of Potential Free points for the BMS connectivity.
4	Chiller /Condenser water flow status		2			Wiring and Termination and Inst of Flow Switch on the Chiller Line.	Provision of suitable size sockets for the Inst of Flow Switch
5	Chilled Water supply Temperature	2				Wiring and Termination and Inst of Imm Temp sensor on the Chw pipe Line.	Provision of suitable size sockets for the Inst of Imm.Temp sensor
6	Chilled Water return Temperature	2				Wiring and Termination and Inst of Imm Temp sensor on the CHW pipe Line.	Provision of suitable size sockets for the Inst of Imm.Temp Sensor.
7	Condenser Water supply Temperature	2				Wiring and Termination and Inst of Imm Temp sensor on the CDW pipe Line.	Provision of suitable size sockets for the Inst of Imm.Temp Sensor
8	Condenser Water return Temperature	2				Wiring and Termination and Inst of Imm Temp sensor on the CDW pipe Line.	Provision of suitable size sockets for the Inst of Imm.Temp Sensor
9	CHW Motorised isolation valves open/close command				2	Wiring &Termination at motorised valves and DDC Panels	Providing and fixing of Isolation valves and identification of BMS termination points in the motorised Valves
10	CHW outlet valves open/close status		4			Wiring & Termination at motorised valves and DDC Panels	Providing and fixing of Isolation valves and identification of BMS termination points in the motorised Valves
11	Condenser isolation valves open/close command.				2	Wiring &Termination at motorised valves and DDC Panels	Providing and fixing of Isolation valves and identification of BMS termination points in the motorised Valves
12	Condenser outlet valves open/close status		4			Wiring &Termination at motorised valves and DDC Panels	Providing and fixing of Isolation valves and identification of BMS termination points in the motorised Valves
13	BTU Meter	1				Providing of Suitable size ultrasonic type BTU meter and termination	Installation of BTU Meter
14	Chiller microprocessor (software) integration for Chiller intrinsic parameter monitoring					Mapping, graphics and Tagging of the chiller intrinsic microprocess data for the software integration on open (Modbus/BAC net) protocols	Providing of the mapping details, register values and termination points

Sr.No.	Point Description	AI	DI	AO	DO	BMS Provider	HVAC Vendor Scope
<b>1</b>	<b>Comforts Chilling Machine (2No.s)</b>						
15	Outside air temperature and relative humidity monitoring	1				Providing, termination and Inst. Of Temp and Rh Sensor Outside	Installation provision for Outdoor temp & Humidity sensor & Wiring
	<b>Total for 2 no.s of chiller machine</b>	<b>10</b>	<b>14</b>	<b>0</b>	<b>6</b>		
	<b>Total for 2 nos. chiller machine with 20% Spare</b>	<b>12</b>	<b>17</b>	<b>0</b>	<b>7</b>		
	<b>Part B -TO BE EXECUTED BY MAIN ELECTRICAL CONTRACTOR (FOR INFORMATION AND TAKING NECESSARY PROVISIONS IN HVAC ELECTRIAL PANELS)</b>						
<b>2</b>	<b>Air Handling Units (16 Units)</b>						
a	AHU On/Off command				16	Relay output @ 2 amp, 230 V & wiring from AHU MCC	Panel vendor to provide terminals to accept remote start/stop
b	AHU On/Off status		16			Differential Pressure Switch - Air	Panel vendor to provide terminals to accept remote start/stop
c	AHU Fan Auto/Manual status		16			Potential free contact from DDC to the Panel	Panel vendor to provide voltfree terminals
d	AHU Trip status		16			Potential free contact from DDC to the Panel	Panel vendor to provide voltfree terminals
e	Supply Air Temperature Sensor	16				Duct Temperature Sensor	IBMS vendor
f	Return Air Temperature Sensor	16				Duct Temperature Sensor	IBMS vendor
g	Smoke detector		16			Potential free contact from DDC to the Panel	IBMS vendor
h	Diff. Pressure Switch Across Filter status		16			Differential Pressure Switch - Air	IBMS vendor
i	Diff. Pressure Switch Across Fan status		16			Differential Pressure Switch - Air	IBMS vendor
j	Humidity Sensor	16				Duct type Humidity sensor	IBMS vendor
k	2 way motorized valve Modulation			16		0-10 V signal to 2 way modulating valve	Valve to be provided by Mechanical vendor, Controlsignal by IBMS vendor
l	2 way motorized valve Modulation Status		16			Wiring and termination	Termination Points
	<b>Sub Total for 16 nos. AHUs</b>	<b>48</b>	<b>112</b>	<b>16</b>	<b>16</b>		
	<b>Total for 16 nos. AHUs with 20% Spare</b>	<b>58</b>	<b>134</b>	<b>19</b>	<b>19</b>		
<b>3</b>	<b>Hot Water Generator</b>						
1	Hot water generator - ON / OFF Command				1	Relay output @ 2 amp, 230 V and wiring from MCC	Wiring and termination of potential free contact in auto mode in the control circuit of HWG.
2	Hot water generator Auto / Manual switch status		1			Wiring from Auto/ Manual Switch	Wiring & termination at auxiliary potential free contact of auto manual switch of HWG.
3	Hot water generator run status		1			Differential pressure switch - water	installation of Suitable Socket in Pipe
4	Hot water generator trip status		1			Wiring from MCC	Wiring & termination at auxiliary potential free contact of the over load relay of HWG
	<b>Sub Total - HWG (1 No.s)</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>1</b>		
	<b>Total for (1 nos.) HWG with 20% Spare</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>1</b>		
<b>4</b>	<b>MOTORISED DAMPERS</b>						
a	AHU room Duct smoke dampers Open/Close Status ( 1. AHU supply duct, 2. AHU return air duct )		32			Potential free contact from DDC to the damper actuator panel	HVAC vendor to provide terminals to take status



Sr.No.	Point Description	AI	DI	AO	DO	BMS Provider	HVAC Vendor Scope
1	Comforts Chilling Machine (2No.s)						
	<b>Sub Total for Motorised Dampers</b>	<b>0</b>	<b>16</b>	<b>0</b>	<b>0</b>		
	<b>Total for Motorised dampers inc of 20% Spare</b>	<b>0</b>	<b>19</b>	<b>0</b>	<b>0</b>		
5	<b>Ventilation Fans (Toilet)</b>						
a	Fan On/Off Command				10	MCC Panel - Ventilation Fans	Panel vendor to provide terminals to accept remote start/stop
b	Fan Status		10			MCC Panel - Ventilation Fans	Panel vendor to provide volt free contact for indicating ventilation fan running status
c	Fan trip Status		10			MCC Panel - Ventilation Fans	Panel vendor to provide volt free contact for indicating fan trip status
d	Fan Auto/Manual status		10			MCC Panel - Ventilation Fans	Panel vendor to provide voltfree terminals for indicating Auto/Manual status
	<b>Sub Total - Ventilation Fans (Toilets)</b>	<b>0</b>	<b>30</b>	<b>0</b>	<b>10</b>		

Sr.No.	Point Description	AI	DI	AO	DO	BMS Provider	HVAC Vendor Scope
<b>1</b>	<b>Comforts Chilling Machine (2No.s)</b>						
	<b>Total for Ventilation Fans (Toilets) inc of 20% Spare</b>	<b>0</b>	<b>36</b>	<b>0</b>	<b>12</b>		
<b>6</b>	<b>Fire Pump &amp; Utility&amp; transformer Room Ventilation Fans</b>						
a	Fan On/Off Command				31	MCC Panel - Ventilation Fans	Panel vendor to provide terminals to accept remote start/stop
b	Fan Run Status		31			MCC Panel - Ventilation Fans	Panel vendor to provide volt free contact for indicating ventilation fan running status
c	Fan trip Status		31			MCC Panel - Ventilation Fans	Panel vendor to provide volt free contact for indicating fan trip status
d	Fan Auto/Manual status		31			MCC Panel - Ventilation Fans	Panel vendor to provide voltfree terminals for indicating Auto/Manual status
	<b>Sub Total - Fire Pump &amp; Utility Rooms Ventilation Fans</b>	<b>0</b>	<b>93</b>	<b>0</b>	<b>31</b>		
	<b>Total for Fire Pump &amp; Utility Rooms Ventilation Fans inc of 20% Spare</b>	<b>0</b>	<b>112</b>	<b>0</b>	<b>37</b>		
<b>7</b>	<b>Lift Well / Lift Lobby pressurisation Fans / stairwell</b>						
a	Fan On/Off Command				18	MCC Panel - Ventilation Fans	Panel vendor to provide terminals to accept remote start/stop
b	Fan Run Status		18			Differential Pressure Switch - Air	
c	Fan trip Status		18			MCC Panel - Ventilation Fans	Panel vendor to provide volt free contact for indicating fan trip status
d	Fan Auto/Manual status		18			MCC Panel - Ventilation Fans	Panel vendor to provide voltfree terminals for indicating Auto/Manual status
	<b>Sub Total - Lift Well / Lift Lobby pressurisation Fans</b>	<b>0</b>	<b>54</b>	<b>0</b>	<b>18</b>		
	<b>Total for Lift Well / Lift Lobby pressurisation Fans inc of 20% Spare</b>	<b>0</b>	<b>65</b>	<b>0</b>	<b>22</b>		

Sr.No.	Point Description	AI	DI	AO	DO	BMS Provider	HVAC Vendor Scope
1	Comforts Chilling Machine (2No.s)						
8	Basement - Ventilation / Smoke Exhaust Fans						
a	Fan On/Off Command				22	MCC Panel - Ventilation Fans	Panel vendor to provide terminals to accept remote start/stop
b	Fan run Status		22			Differential Pressure Switch - Air	
c	Fan trip Status		22			MCC Panel - Ventilation Fans	Panel vendor to provide volt free contact for indicating fan trip status
d	Fan Auto/Manual status		22			MCC Panel - Ventilation Fans	Panel vendor to provide voltfree terminal for indicating Auto/Manual status
	<b>Sub Total : Basement - Ventilation / Smoke Exhaust Fans</b>	<b>0</b>	<b>66</b>	<b>0</b>	<b>22</b>		
	<b>Total for Basement - Ventilation / Smoke Exhaust Fans inc of 20% Spare</b>	<b>0</b>	<b>79</b>	<b>0</b>	<b>26</b>		
9	Air Washer Unit : DG Room Cooling						
a	Air Washer Unit Fan On/ Off Command				2	Potential free contact from DDC to the Panel	Panel vendor to provide terminals to accept remote start/stop
b	Air Washer Fan Auto/ Manual Status		2			Potential free contact from DDC to the Panel	Panel vendor to provide voltfree terminals for indicating Auto/Manual status
c	Air Washer Fan Run Status		2			Differential Pressure Switch - Air	Panel vendor to provide volt free contact for indicating air washer fan running status
d	Air Washer Unit Pump On/ Off Command				2	Potential free contact from DDC to the Panel	Panel vendor to provide volt free contact for indicating air washer fan running status
e	Air Washer Unit Pump Auto/ Manual Status		2			Potential free contact from DDC to the Panel	Panel vendor to provide terminals to accept remote start/stop
f	Air Washer Pump Run Status		2			Differential Pressure Switch -water	Panel vendor to provide volt free contact for indicating air washer pump running status
g	Air Washer High / Low Water Level Status		4			Water Level switch	Panel vendor to provide volt free contact for indicating air washer water level status
h	Air Washer Filter Status		2			Differential Pressure Switch - Air	Panel vendor to provide volt free contact for indicating air washer filter status
	<b>Sub Total : Air Washer Unit : DG Room Cooling</b>		<b>14</b>		<b>4</b>		
	<b>Total for Air Washer Unit : DG Room Cooling inc of 20% Spare</b>	<b>0</b>	<b>17</b>	<b>0</b>	<b>5</b>		
10	Chiller Incomig Panel						
a	Chiller Panel On/Off				1	Potential free contact from DDC to the Panel	Panel vendor to provide volt free contact for indicating status
b	Chiller Panel status		1			Potential free contact from DDC to the Panel	Panel vendor to provide volt free contact for indicating status
	<b>Sub Total : Chiller Incomig Panel</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>		
	<b>Total for Chiller Incomig Panel inc of 20% Spare</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>		
11	AHU supply Panel						
a	AHU Supply Panel On/Off				9	Potential free contact from DDC to the Panel	Panel vendor to provide volt free contact for indicating status

Sr.No.	Point Description	AI	DI	AO	DO	BMS Provider	HVAC Vendor Scope
<b>1</b>	<b>Comforts Chilling Machine (2No.s)</b>						
b	AHU Supply Panel status		9			Potential free contact from DDC to the Panel	Panel vendor to provide volt free contact for indicating status
	<b>Sub Total : AHU supply Panel</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>9</b>		
	<b>Total for AHU supply Panel inc of 20% Spare</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>11</b>		
<b>12</b>	<b>HVAC Make Up Water Pump :</b>						
a	HVAC Make Up Water Pump On/Off Command				2	MCC Panel	Panel vendor to provide volt free for accept remote start/stop
b	HVAC Make Up Water Pump status		2			MCC Panel	Panel vendor to provide volt free for indicating pump running status
c	HVAC Make Up Water Pump trip status		2			MCC Panel	Panel vendor to provide volt free for indicating pump trip status
d	HVAC Make Up Water Pump auto / manual status		2			MCC Panel	Panel vendor to provide volt free for indicating pump Auto/ Manual status
	<b>Sub Total - Soft Water Transfer Pumps</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>2</b>		
	<b>Total for Soft Water Transfer Pumps inc of 20% Spare</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>2</b>		
<b>13</b>	Signal for integration with Electronic billing software for MD status, electrical parameter status in HT panels and Main substation panels		1			Software integration on open protocol to map the data and actual on line consumption	Providing of open protocol , mappingt details, register value on open porotocol to integtrte with the BMS System
<b>14.0</b>	<b>Plumbing Pumps :</b>						
<b>14.1</b>	<b>Softener Feed Pump - 2 No (1W+1S)</b>						
a.	Softener Feed Pump On/Off Command				2	Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for accept remote start/stop
b.	Softener Feed Pump run status		2			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump running status
c.	Softener Feed Pump trip status		2			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump trip status
d.	Softener Feed Pump auto / manual status		2			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump trip status
<b>14.2</b>	<b>Soft Water Transfer Pump - 2 No (1W+1S)</b>						
a.	Soft Water Transfer Pump On/Off Command				2	Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for accept remote start/stop
b.	Soft Water Transfer Pump run status		2			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump running status
c.	Soft Water Transfer Pump trip status		2			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump trip status
d.	Soft Water Transfer Pump auto / manual status		2			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump trip status
<b>14.3</b>	<b>Irrigation Pump - 2 No (1W+1S)</b>						
a.	Irrigation Pump On/Off Command				2	Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for accept remote start/stop

Sr.No.	Point Description	AI	DI	AO	DO	BMS Provider	HVAC Vendor Scope
<b>1</b>	<b>Comforts Chilling Machine (2No.s)</b>						
b.	Irrigation Pump run status		2			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump running status
c.	Irrigation Pump trip status		2			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump trip status
d.	Irrigation auto / manual status		2			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump Auto / Manual status
<b>14.4</b>	<b>Hydropneumatic System For Domestic Water Supply 3 No (2W+1S)</b>						
a.	Domestic Water Pump On/Off Command				3	Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for accept remote start/stop
b.	Domestic Water Pump run status		3			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump running status
c.	Domestic Water Pump trip status		3			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump trip status
d.	Domestic Water auto / manual status		3			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump Auto / Manual status
<b>14.5</b>	<b>Hydropneumatic System For Flushing Water Supply 3 No (2W+1S)</b>						
a.	Flushing Water Pump On/Off Command				3	Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for accept remote start/stop
b.	Flushing Water Pump run status		3			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump running status
c.	Flushing Water Pump trip status		3			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump trip status
d.	Flushing Water auto / manual status		3			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump Auto / Manual status
<b>14.6</b>	<b>Drainage Sump - 7 sets of Two Pumps ( 1W+1S)</b>						
a.	Drainage Sump Pump On/Off Command				14	Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for accept remote start/stop
b.	Drainage Sump Pump run status		14			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump running status
c.	Drainage Sump Pump trip status		14			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump trip status
d.	Drainage Sump Pump auto / manual status		14			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free for indicating pump Auto / Manual status
e.	Drainage Sump Low/ High Level	14				Water Level Switch	Provision for installation of water level switch
<b>14.7</b>	<b>Sewerage Sump - 1 Sets of Two Pumps ( 1W+1S)</b>						
a.	Sewerage Sump Pump On/Off Command				2	Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free contact for accept remote start/stop
b.	Sewerage Sump Pump run status		2			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free contact for indicating pump running status
c.	Sewerage Sump Pump trip status		2			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free contact for indicating pump trip status
d.	Sewerage Sump Pump auto / manual status		2			Wiring, termination of potential free Contacts at Pump panel.	Panel vendor to provide volt free contact for indicating pump trip status

Sr.No.	Point Description	AI	DI	AO	DO	BMS Provider	HVAC Vendor Scope
<b>1</b>	<b>Comforts Chilling Machine (2No.s)</b>						
e.	Sewerage Sump Low/ High Level	<b>2</b>				Water Level Switch	Provision for installation of water level switch.
<b>14.8</b>	<b>Under Ground Water Tank</b>						
a	Under Ground Fire Tank Low / High Level status - 1 No.	<b>2</b>				Water Level Switch	Provision for installation of level switch
b	Under Ground Soft Water Tank Low / high level status - 1No.	<b>2</b>				Water Level Switch	Provision for installation of level switch
c	Under Ground Domestic Water Tank Low / High level status - 2 No.	<b>4</b>				Water Level Switch	Provision for installation of level switch
d	Under Ground Flushing Water Tank Low / High level status - 2 No.	<b>4</b>				Water Level Switch	Provision for installation of level switch
<b>14.9</b>	<b>Over Head Water Tank</b>						
a	Tower - A ( Fire Water Tank ) Low/ High level - 1 No.	<b>2</b>				Water Level Switch	Provision for installation of level switch
b	Tower - A ( Domestic Water Tank ) Low/ High Level - 1 No.	<b>2</b>				Water Level Switch	Provision for installation of level switch
c	Tower - A ( Soft Water Tank ) Low/ High Level- 1 No.	<b>2</b>				Water Level Switch	Provision for installation of level switch
d	Tower - C ( Fire Water Tank ) Low/ high level - 1 No.	<b>2</b>				Water Level Switch	Provision for installation of level switch
e	Tower - C ( Domestic Water Tank ) Low/ high level - 1 No.	<b>2</b>				Water Level Switch	Provision for installation of level switch
<b>14.1</b>	<b>Fire Fighting Pump :</b>						
a	Fire Diesel Main Pump Run Status - 1 No.		<b>1</b>			Fire MCC Panel	Panel vendor to provide volt free for indicating pump run status
b	Diesel Engine oil tank (Low/High) level	<b>1</b>				Flame proof level switch	Provision for installation of Flame proof level switch
c	Electrical Hydrant Pump run status - 1 No.		<b>1</b>			Fire MCC Panel	Panel vendor to provide volt free for indicating pump run status
d	Electrical Hydrant Pump A/M status - 1 No.		<b>1</b>			Fire MCC Panel	Panel vendor to provide volt free for indicating pump Auto/ Manual status
e	Electrical Hydrant Jockey Pump Run Status - 1 No.		<b>1</b>			Fire MCC Panel	Panel vendor to provide volt free for indicating pump run status
f	Electrical Hydrant Jockey Pump A/ M Status - 1 No.		<b>1</b>			Fire MCC Panel	Panel vendor to provide volt free for indicating pump Auto/ Manual status
g	Electrical Sprinkler Pump Run status- 1 No.		<b>1</b>			Fire MCC Panel	Panel vendor to provide volt free for indicating pump Run status
h	Electrical Sprinkler Pump A/ M status- 1 No.		<b>1</b>			Fire MCC Panel	Panel vendor to provide volt free for indicating pump Auto/ Manual status
i	Electrical Jockey Pump run status (For Water Curtain - 1 No.)		<b>1</b>			Fire MCC Panel	Panel vendor to provide volt free for indicating pump run status
j	Electrical Jockey Pump A/ M status (For Water Curtain - 1 No.)		<b>1</b>			Fire MCC Panel	Panel vendor to provide volt free for indicating pump Auto / Manual status
k	Electrical Pump Run status (For Water Curtain - 1 No.)		<b>1</b>			Fire MCC Panel	Panel vendor to provide volt free for indicating pump run status
l	Electrical Pump A / M status (For Water Curtain - 1 No.)		<b>1</b>			Fire MCC Panel	Panel vendor to provide volt free for indicating pump A/M status
	<b>Sub Total - Plumbing Pumps</b>	<b>39</b>	<b>95</b>	<b>0</b>	<b>28</b>		

Sr.No.	Point Description	AI	DI	AO	DO	BMS Provider	HVAC Vendor Scope
1	Comforts Chilling Machine (2No.s)						
	<b>Total for Plumbing Pumps inc of 20% Spare</b>	<b>47</b>	<b>114</b>	<b>0</b>	<b>34</b>		
15	<b>DG Set (2 NO.s)</b>						
1	DG Run Status		2			Wiring, termination of potential free Contacts DG Panel / DG PLC / AMF panel.	Provision of Potential free point Contacts.
2	DG Trip Status		2			Wiring, termination of potential free Contacts DG Panel / DG PLC / AMF panel	Provision of Potential free point Contacts.
3	DG Volatge Battery Status		2			Wiring, termination and providing of Voltage Transducer	Provision of Potential free point Contacts.
4	Oil Level - Low/High - Day Oil tank	4				Providing of Flame Proof Level Sw	Suitable provision to fix the Level switch in day oil tanks
5	Bult Oil Tank Level transmitter	1				Providing of level transmitter	Provision for installation of level transmitter
6	DG software Integration - 2 No.s					Mapping of DG parameters data to BMS on open Modbus/ BACnet Protocol.	Providing of mapping details, register values and termination points of open protocol for the BMS integration
16	<b>UPS(2 No.s)</b>						
1	UPS software Integration - 2 No.s					Mapping of UPS data to BMS on open Modbus/ BACnet Protocol.	Providing of mapping details, register values and termination points of open protocol for the BMS integration
17	<b>Fire Alarm Panel 1 No</b>						
1	Fire Alarm Panel software Integration - 1 No.s					Mapping of Fire Alarm Panel data to BMS on open Modbus/ BACnet Protocol.	Providing of mapping details, register values and termination points of open protocol for the BMS integration.
18	<b>Lift Management System ( 2No.s)</b>						
1	Lifts Software Integration 2 no.s					Mapping of Lift data to BMS on open Modbus/ BACnet Protocol.	Providing of mapping details, register values and termination points of open protocol for the BMS integration
2	Lift Run Status		2			wiring & termination in lift panel for Run status	Provision of suitable Potential free contacts
3	Lift Floor Indication		6			wiring & termination in lift panel for floorstatus	Provision of suitable Potential free contacts
19	<b>Electricals (LT / HT)</b>						
1	Transformer Status		3			wiring & termination in Transformer Panel for Run status	Provision of suitable Potential free contacts
2	Transformer Trip Status		3			wiring & termination in Transformer Panel for Trip status	Provision of suitable Potential free contacts
3	HT Panel Status		4			wiring & termination in Transformer Panel for Trip status	Provision of suitable Potential free contacts
4	HT Panel Incommer Status		4			wiring & termination in HT Panel for incomer status	Provision of suitable Potential free contacts
5	HT Panel Incommer Trip Status		4			wiring & termination in HT Panel for Trip status	Provision of suitable Potential free contacts
6	Bus Coupler Status		4			wiring & termination in HT Panel for Coupler status	Provision of suitable Potential free contacts

Sr.No.	Point Description	AI	DI	AO	DO	BMS Provider	HVAC Vendor Scope
1	Comforts Chilling Machine (2No.s)						
7	LT Panel Status		3			wiring & termination in LT Panel for Coupler status	Provision of suitable Potential free contacts
8	LT Panel Trip Status		3			wiring & termination in LT Panel for Trip status	Provision of suitable Potential free contacts
9	LT Panel Incomer Status		3			wiring & termination in LT Panel for Incomer status	Provision of suitable Potential free contacts
10	LT Panel Incomer Trip Status		3			wiring & termination in LT Panel for Trip status	Provision of suitable Potential free contacts
11	LT Panel Out Going Status		3			wiring & termination in LT Panel for Outgoing status	Provision of suitable Potential free contacts
12	LT Panel Out Going Trip Status		3			wiring & termination in LT Panel for Outgoing trip status	Provision of suitable Potential free contacts
13	LT Feeders Status		7			wiring & termination in LT Panel for feeder status	Provision of suitable Potential free contacts
14	LT Feeders Trip Status		7			wiring & termination in LT Panel for Trip status	Provision of suitable Potential free contacts
15	Out Side Lux Sensor	3				Outside Lux sensor	Provision of suitable Potential free contacts
16	Out Side Block Panel Run Status (Lighting Panel)		1			wiring & termination in Lighting Panel for Run status	Provision of suitable Potential free contacts
17	Out Side Block Panel Trip Status (Lighting Panel)		1			wiring & termination in Lighting Panel for Trip status	Provision of suitable Potential free contacts
18	Out Side Lights On /Off				10	wiring & termination in Lighting Panel for On / off command	Provision of suitable Potential free contacts
19	Out Side Lights On /Off Status				10	wiring & termination in Lighting Panel for On/ Off status	Provision of suitable Potential free contacts
	<b>Sub Total - HT / LT , Transformer, Lift, DG set</b>	<b>8</b>	<b>70</b>	<b>0</b>	<b>20</b>		
	<b>Total for HT/ LT, Transformer, lift, DG inc of 20% Spare</b>	<b>10</b>	<b>84</b>	<b>0</b>	<b>24</b>		
	<b>TOTAL - BMS SYSTEM</b>	<b>127</b>	<b>700</b>	<b>19</b>	<b>202</b>		
	<b>Grand Total for BMS System</b>		<b>1,047</b>				