

SCHEDULE OF BMS INPUT - OUTPUT POINTS

SNO.	ITEM	QTY	FUNCTION	AI	DI	AO	DO	Device	Soft points QTY	Provided by
(A)	Electrical Services									
1	H.T. Panel									
a)	H.T Incoming Breaker	2	Monitor ON-OFF Status Trip Status Spring Charge Breaker Status Breaker ON Breaker OFF Trip for Inv O.C. Trip for Inst O.C. Residual Earth Fault Voltage Current PF kWh Monitoring		2 2 2 2 2 2 2 6 6 1			Pot Free Contact Pot Free Contact Pot Free Contact Pot Free Contact Pot Free Contact Pot Free Contact Pot Free Contact Pot Free Contact Pot Free Contact Pot Free Contact Voltage Transducer Current Transducer Power Factor Transducer Modbus / Backnet	1	Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor
b)	Bus coupler	1	Monitor On-Off Status Control ON OFF		1			Pot. Free Contact Pot. Free Contact Pot. Free Contact		Electrical Contractor Electrical Contractor Electrical Contractor
c)	Outgoings	6	Monitor kWh Monitoring Line Voltage Line Current Breaker Status Breaker ON Breaker OFF Control Breaker ON Breaker OFF	6	6 6			Modbus / Backnet Voltage Transducer Current Transducer Pot Free Contact Pot Free Contact Pot Free Contact Pot. Free Contact Pot. Free Contact	6	Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor

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3	c) Outgoings	14	Monitor					Modbus / Backnet	14	Electrical Contractor Electrical Contractor Electrical Contractor	
			kWH					Voltage Transducer			
			Voltage	14				Current Transducer			
			Current	14							
				Control							Electrical Contractor Electrical Contractor
				Breaker ON				2	Pot. Free Contact		
				Breaker OFF				2	Pot. Free Contact		
	Building Sub - LT Panels (For Fire & Water Pumps)										
	4	a) LT Incoming Breakers	1	Monitor							Electrical Contractor Electrical Contractor Electrical Contractor
				ON-OFF Status			1		Pot Free Contact		
Voltage				3				Voltage Transducer			
Current				3				Current Transducer			
				Control							Electrical Contractor Electrical Contractor
				Breaker ON				1	Pot. Free Contact		
				Breaker OFF				1	Pot. Free Contact		
b) Outgoings		20	Monitor								Electrical Contractor Electrical Contractor Electrical Contractor
	ON-OFF Status		20				kWH Transducer				
	Voltage		20				Voltage Transducer				
	Current		20				Current Transducer				
Building Sub - LT Panels (For Lifts)											
4	a) LT Incoming Breakers	1	Monitor							Electrical Contractor Electrical Contractor Electrical Contractor	
			ON-OFF Status			1		Pot Free Contact			
			Voltage	3				Voltage Transducer			
				Current	3				Current Transducer		
				Control							
				Breaker ON				1	Pot. Free Contact		
			Breaker OFF				1	Pot. Free Contact			

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b)	Outgoings	19	Monitor ON-OFF Status Voltage Current	19 19	19			kWH Transducer Voltage Transducer Current Transducer		Electrical Contractor Electrical Contractor Electrical Contractor
5	Building Sub - LT Panels (For Security & Circulation Lighting)									
a)	LT Incoming Breakers	1	Monitor ON-OFF Status Voltage Current Control Breaker ON Breaker OFF	6 2	2			Pot Free Contact Voltage Transducer Current Transducer Pot. Free Contact Pot. Free Contact		Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor
b)	Outgoings	3	Monitor ON-OFF Status Voltage Current	3 3	3			kWH Transducer Current Transducer Current Transducer		Electrical Contractor Electrical Contractor Electrical Contractor
6	Building Sub - Distribution Boards									
a)	LT Incoming Breakers	190	Monitor ON-OFF Status Voltage Current Control Breaker ON Breaker OFF	190 190	190			Pot Free Contact Voltage Transducer Current Transducer Pot. Free Contact Pot. Free Contact		Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor Electrical Contractor

SNO.	ITEM	QTY	FUNCTION	AI	DI	AO	DO	Device	Soft points QTY	Provided by
7	D G Sets & Ancillaries	3	Interface with Control Panel					Modbus / Backnet	3	Generator Contractor
	a) D G Sets		<u>Monitor</u> Gen Temperature Run Status Gen Failed to Start Alarm Generator Fault Alarm Generator Main Circuit Trip Gen Low Battery Conditions Gen. Engine Overspeed Trip Gen Low Oil Pressure Alarm Generator Fuel Tank Shut-off Valve Position <u>Control</u> Gen Start - Stop							
	b) Auto Mains Failure	3	<u>Monitor</u> ON/OFF Status		3			Pot Free Contact		BMS Contractor
	c) Auxiliary Fuel Storage	1	<u>Monitor</u> HI/LO Level Status		1			Level Switch		BMS Contractor
	d) Daily Oil Service Tank	3	<u>Monitor</u> HI/LO Level Status		3			Level Switch		BMS Contractor
	e) Fuel Transfer Pumps	1	Interface with Control Panel <u>Monitor</u> Auto - Manual Switch Flow Status <u>Control</u> Pump Start - Stop					Modbus / Backnet	1	Generator Contractor
	f) Synchronization Panel	1	Interface with Control Panel <u>Monitor</u> ON/OFF Status Voltage Current Load demand					Modbus / Backnet	1	Generator Contractor

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8	Lifts	15	Interface with Control Panel Monitor Lift Status Lift Stuck-up Status Fire Man Override Switch Control Lift Homing in case of Fire					Open connectivity protocol	15	Lifts Contractor
9	Escalators	6	Interface with Control Panel Monitor Escalator Status Escalator Stuck-up Status				15	Pot Free Contact Open connectivity protocol	6	Fire Alarm Contractor Escalator Contractor
10	UPS	23	Interface with UPS Monitor ON/OFF Status UPS Fault Alarm UPS Low Battery Conditions Control UPS ON/OFF					Modbus / Backnet	23	Electrical Contractor
11	Voltage Regulator	3	Monitor ON/OFF Status Fault Alarm Control ON/OFF		3 3			Pot Free Contact Pot Free Contact ON/OFF Relay		Electrical Contractor Electrical Contractor Electrical Contractor
12	RFID parking barrier gate	2	Monitor OPEN/CLOSE Status Gate Fault Alarm		2 2			Pot Free Contact Pot Free Contact		Security Contractor Security Contractor
13	Fire Detection & Alarm System									
	a) Fire alarm control panel	4	Monitor Alarm Status Fault Alarm					Modbus / Backnet	4	Fire Alarm Contractor

SNO.	ITEM	QTY	FUNCTION	AI	DI	AO	DO	Device	Soft points QTY	Provided by
	b) Smoke/Heat detectors	1530	Monitor Alarm Status Fault Alarm					Modbus / Backnet	1530	Fire Alarm Contractor
	c) Speaker/Strobelights	159	Monitor Alarm Status Fault Alarm					Modbus / Backnet	159	Fire Alarm Contractor
	d) Manual alarm call point	167	Monitor Alarm Status Fault Alarm					Modbus / Backnet	167	Fire Alarm Contractor
14	Intruder alarm panel	1	Monitor Alarm Status Fault Alarm					Modbus / Backnet	1	Security Contractor
15 (a)	CCTV Server	2	Monitor Alarm Status Fault Alarm		2 2			Pot Free Contact Pot Free Contact		Security Contractor Security Contractor
	(b) IP CCTV Cameras	543	Monitor Operational Status					Software interface	543	Security Contractor
16 (a)	Access control Server	1	Monitor Alarm Status Fault Alarm		2 2			Pot Free Contact Pot Free Contact		Security Contractor Security Contractor
	(b) IP Proximity card reader	848	Monitor Operational Status					Software interface	848	Security Contractor

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(B)	<u>Mechanical Services</u>									
1	Water Tanks	7	HI/LO Level Status		7			Level Switch		BMS Contractor
2	Sump Pumps (Submersible)	3	Interface with Control Panel <u>Monitor</u> Pump Status Sump Level Status <u>Control</u> Pump Start - Stop					Modbus / Backnet	3	Plumbing Contractor
3	Irrigation Pump	1	Interface with Control Panel <u>Monitor</u> Pump Status Flow Status <u>Control</u> Pump Start - Stop					Modbus / Backnet	1	Plumbing Contractor
4	Booster Pump	1	Interface with Control Panel <u>Monitor</u> Pump Status Flow Status <u>Control</u> Pump Start - Stop					Modbus / Backnet	1	Plumbing Contractor
5	Drain Pump	2	Interface with Control Panel <u>Monitor</u> Pump Status Flow Status <u>Control</u> Pump Start - Stop					Modbus / Backnet	2	Plumbing Contractor
6	Rain water Pump	1	Interface with Control Panel <u>Monitor</u> Pump Status Flow Status <u>Control</u> Pump Start - Stop					Modbus / Backnet	1	Plumbing Contractor

SNO.	ITEM	QTY	FUNCTION	AI	DI	AO	DO	Device	Soft points QTY	Provided by
7	Back washing Pump	1	Interface with Control Panel Monitor Pump Status Flow Status Control Pump Start - Stop					Modbus / Backnet	1	Plumbing Contractor
8	Fountain Pump	1	Interface with Control Panel Monitor Pump Status Flow Status Control Pump Start - Stop					Modbus / Backnet	1	Plumbing Contractor
9	Water Feature Pump	1	Interface with Control Panel Monitor Pump Status Flow Status Control Pump Start - Stop					Modbus / Backnet	1	Plumbing Contractor
10	Reverse Osmosis plant	1	Interface with Control Panel Monitor Pump Status Flow Status Filter status Control Pump Start - Stop					Modbus / Backnet	1	Plumbing Contractor
11	Solar heating circulation Pump	4	Interface with Control Panel Monitor Pump Status Flow Status Flow - H.W.Supply/Return Temp. Control Pump Start - Stop					Modbus / Backnet	4	Pumps Contractor

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12	Hot water circulation Pump	4	Interface with Control Panel <u>Monitor</u> Pump Status Flow Status Flow - H.W.Supply/Return Temp. <u>Control</u> Pump Start - Stop					Modbus / Backnet	4	Pumps Contractor
13	Borehole Pump	4	Interface with Control Panel <u>Monitor</u> Pump Status Flow Status Flow - Low level/ High level. <u>Control</u> Pump Start - Stop					Modbus / Backnet	4	Pumps Contractor
14	Fire Protection System	7	Interface with Control Panel					Modbus / Backnet	7	Fire Protection Contractor
	i Hose Reel Pump	2	<u>Monitor</u> Pump Status							
	ii Sprinkler Pump	3	<u>Monitor</u> Pump Status							
	iii Fire Hydrant	1	<u>Monitor</u> Pump Status							
	iv Wet riser Pump	1	<u>Monitor</u> Pump Status							
15	Toilet Extract fans (Only centrifugal, cabinet and axial flow type fans).	10	Interface with Control Panel <u>Monitor</u> Auto-Manual Switch Air Flow Status Fan Current Consumption <u>Control</u> Fan Start-Stop Ventilation Fan Trip in Case of Fire Motorised Damper					Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet	10	HVAC Contractor

SNO.	ITEM	QTY	FUNCTION	AI	DI	AO	DO	Device	Soft points QTY	Provided by
16	Kitchen Extract fan (Only centrifugal, cabinet and axial flow type fans).	2	Interface with Control Panel <u>Monitor</u> Auto-Manual Switch Fan Status Fan Current Consumption <u>Control</u> Fan Start-Stop Fan Trip in Case of Fire					Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet	2	HVAC Contractor
17	Refuse chute Extract fan (Only centrifugal, cabinet and axial flow type fans).	2	Interface with Control Panel <u>Monitor</u> Auto-Manual Switch Fan Status Fan Current Consumption <u>Control</u> Fan Start-Stop Fan Trip in Case of Fire					Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet	2	HVAC Contractor
18	Office Extract fan (Only centrifugal, cabinet and axial flow type fans).	4	Interface with Control Panel <u>Monitor</u> Auto-Manual Switch Fan Status Fan Current Consumption <u>Control</u> Fan Start-Stop Ventilation Fan Trip in Case of Fire Motorised Damper					Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet	34	HVAC Contractor
19	Gym floor Extract fans (Only centrifugal, cabinet and axial flow type fans).	4	Interface with Control Panel <u>Monitor</u> Auto-Manual Switch Fan Status Fan Current Consumption <u>Control</u> Fan Start-Stop Ventilation Fan Trip in Case of Fire Motorised Damper					Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet	4	HVAC Contractor

SNO.	ITEM	QTY	FUNCTION	AI	DI	AO	DO	Device	Soft points QTY	Provided by
20	Basement Extract fan (Only centrifugal, cabinet and axial flow type fans).	31	Interface with Control Panel <u>Monitor</u> Auto-Manual Switch Fan Status Fan Current Consumption <u>Control</u> Fan Start-Stop Ventilation Fan Trip in Case of Fire Motorised Damper					Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet	31	HVAC Contractor
21	Basement Supply fan (Only centrifugal, cabinet and axial flow type fans).	5	Interface with Control Panel <u>Monitor</u> Auto-Manual Switch Fan Status Fan Current Consumption <u>Control</u> Fan Start-Stop Ventilation Fan Trip in Case of Fire Motorised Damper					Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet	5	HVAC Contractor
22	Tunnel Extract fan (Only centrifugal, cabinet and axial flow type fans).	8	Interface with Control Panel <u>Monitor</u> Auto-Manual Switch Fan Status Fan Current Consumption <u>Control</u> Fan Start-Stop Ventilation Fan Trip in Case of Fire Motorised Damper					Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet	8	HVAC Contractor
23	Tunnel Supply fan (Only centrifugal, cabinet and axial flow type fans).	4	Interface with Control Panel <u>Monitor</u> Auto-Manual Switch Fan Status Fan Current Consumption <u>Control</u> Fan Start-Stop Ventilation Fan Trip in Case of Fire Motorised Damper					Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet	4	HVAC Contractor

SNO.	ITEM	QTY	FUNCTION	AI	DI	AO	DO	Device	Soft points QTY	Provided by
24	Pressurization fan (Only centrifugal, cabinet and axial flow type fans).	2	Interface with Control Panel <u>Monitor</u> Auto-Manual Switch Fan Status Fan Current Consumption <u>Control</u> Fan Start-Stop Ventilation Fan Trip in Case of Fire Motorised Damper					Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet	2	HVAC Contractor
25	Fan controller	4	Interface with Control Panel <u>Monitor</u> Controller Status <u>Control</u> Controller Start - Stop					Modbus / Backnet Modbus / Backnet	8	HVAC Contractor
26	VRF AC Controller	11	Interface with Controller <u>Monitor</u> Auto-Manual Switch Air Flow Status Trip Status Current Consumption <u>Control</u> Start-Stop					Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet	11	HVAC Contractor
27	Split AC Controller	8	Interface with Controller <u>Monitor</u> Auto-Manual Switch Air Flow Status Trip Status Current Consumption <u>Control</u> Start-Stop					Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet Modbus / Backnet	8	HVAC Contractor

SNO.	ITEM	QTY	FUNCTION	AI	DI	AO	DO	Device	Soft points QTY	Provided by
28	Tunnel Packaged air conditioning unit	2	Interface with Controller <u>Monitor</u> Auto-Manual Switch Air Flow Status Trip Status Current Consumption <u>Control</u> Start-Stop					Modbus / Backnet	2	HVAC Contractor
29	Kitchen cold room control panel	1	Interface with Control Panel <u>Monitor</u> Compressor Status Coldroom temperature Status <u>Control</u> Compressor Start - Stop					Modbus / Backnet	1	Coldroom Contractor
30	BMU	14	Interface with Control Panel <u>Monitor</u> Motor Status					Modbus / Backnet	14	BMU Contractor
31	Fire suppression control panel	10	Interface with Control Panel <u>Monitor</u> System Status <u>Control</u> Trigger media discharge					Modbus / Backnet	10	Fire Protection Contractor
			TOTAL BMS POINTS	561	289	0	450		3511	

Allow a contingency of approximately 10 points for future consideration

NOTE:

- 1. MODBUS/BACKNET- Supplier to confirm availability of all signals for monitor or control using Backnet/Modbus connectivity and to highlight signals to go to Analogue or Digital Input or Output signals not available in Backnet/Modbus, but to be provided via potential free contact.**