

Annexure - 10

Price Centre K : Electrical & Mechanical works for Budhwarpeth Station.

S. No	Description of Items	Total Amount (INR)		Total Amount (Euro)		Total Amount (USD)	
		In Figures	In Words	In Figures	In Words	In Figures	In Words
Part - A	Electrical Works						
Part - B	Fire Protection System						
Part - C	Plumbing Works						
Part - D	Spares for the Entire project (Combined for Budhwarpeth, Mandai & Swargate stations)						
D1	Unit Exchange Spares						
D2	Mandatory Spares						
	TOTAL AMOUNT						

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Price Centre L: Electrical & Mechanical works for Mandai Station.

S. No	Description of Items	Total Amount (INR)		Total Amount (Euro)		Total Amount (USD)	
		In Figures	In Words	In Figures	In Words	In Figures	In Words
Part - A	Electrical Works						
Part - B	Fire Protection System						
Part - C	Plumbing Works						
	TOTAL AMOUNT						

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Price Centre M: Electrical & Mechanical works for Swargate Station.

S. No	Description of Items	Total Amount (INR)		Total Amount (Euro)		Total Amount (USD)	
		In Figures	In Words	In Figures	In Words	In Figures	In Words
Part - A	Electrical Works						
Part - B	Fire Protection System						
Part - C	Plumbing Works						
	TOTAL AMOUNT						

Part A: Electrical Works

BILL OF QUANTITIES FOR ELECTRICAL WORKS												
S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate (In INR)	Total (In INR)	Unit Rate (In EURO)	Total (In EURO)	Unit Rate (In USD)	Total (In USD)
SUB-MAIN SWITCHBOARDS AND LOCAL ELECTRICAL PANELS												
E.01	Switch Boards/panels											
a	Supply, installation, testing and commissioning of front operated, front / back access, cubicle type, indoor duty, floor / wall / recess / surface mounted (as specified below), totally enclosed dust and vermin proof switchboards / panels with minimum Ingress protection classification of IP 54, fabricated from 2 mm thick CRCA sheets with dip coat priming and epoxy powder coated finish. The panels must be suitable for 415 volts 3 phase, 4 wire, 50 Hz, system, must be able to withstand symmetrical fault level of 65KA and as specified for various panels for 1 sec at 415 V and must include all interconnections, earthing and bonding requirements etc. as per manufacturers Total Type Test conforming to IEC 61439 Pt 1 & 2. All internal wiring in the Panels/DBs shall be carried out using high Temperature FRLSZH wire. The panels must conform to Drawings& Standards specified in relevant specifications, as required and as given below.											
b	LV Switchboards must conform the relevant Section of the specifications											
c	All the items mentioned in relevant Sections / Clauses of the specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates											
d	In case of any contradiction between BOQ / Specifications and Drawings, the most stringent conditions of the above will apply.											
e	The Switchboards shall be provided with detachable gland plates for entry of cables from the top / bottom as required.											
f	All live accessible parts shall be shrouded and all equipment shall be finger touch proof. SMC / DMC shrouds and busbar supports suitably spaced shall be used. Hinged doors with padlocking facility shall be provided on all outgoing feeders with switch handles lockable in OFF position.											
g	All accessories & supporting structures such as channels, ISMC-100 base frame, mounting brackets, lifting lugs, panel heaters, ventilation arrangement etc shall be provided as required.											
h	Each incomer and outgoing feeder shall be provided with LED type status indication lamps suitable for 240 V, AC, as approved.											
i	Space provision as specified in Specifications for future expansion.											
j	Components and accessories shall be same for switchboards and panels for uniformity, standardisation and replaceability and shall be applicable to all panels/ boards under the scope of work											
k	All interconnections, labelling, earthing, associated foundation / masonry work, sealing of gaps around the panels by chequered plates & erection etc. complete shall be executed as required.											
l	MCCB's shall be as per relevant Section of Specifications and shall be current limiting type with front adjustable electronic releases for required protections against fault, suitable for isolation as per Annexure 7.1.2 of IEC 60947 – 2, with Ics and Icu values as specified in relevant clauses of Specifications and conforming to latest IEC 60947. The operating voltage (Ue) shall be 415 V and insulation voltage (Ui) 690V with trip free mechanism, handle indicating ON / OFF / tripped positions. The breaking capacity as mentioned in items of BOQ below, shall be Ics values and shall not be less then 35 kA. Breakers must have Ics = 100% Icu. Electronic trip units shall comply with the requirements as specified in Appendix F (EMC /EMI Compatibility) of IEC 60947-2 or EN 60947-2.											
m	MCCBs for Network / Feeder Protection shall have adjustable protection against Overload and adjustable protection against Short Circuit as specified in Specifications, whether specifically asked in BOQ or not. MCCB's for Network / Feeder Protection shall have releases with Earth Fault protection feature, wherever and as indicated in Bill of Quantities or Drawings. However, on completion of Cable Sizing Calculations and Fault calculations by the Contractor, if Earth Fault releases are required for additional feeders, where this requirement is not indicated in the BOQ, same shall be provided at no extra cost to the Employer. For Motor Protection MCCB's, requirements of Specifications shall be followed.											
n	ACBs/MCCBs shall be compact , suitably designed to provide protection of motors, cables, busbars to suit rated current, unbalanced power distribution, as required.											
o	Panel / Switchboard board design shall be compact and components / accessories of compact sizes shall be used to economise the room space available. Employer reserve the right to seek compact items in place of larger ones.											
p	Incomer ACB'S / MCCBs / MCBs of switchboards / panels shall be provided with NO / NC contacts as specified in specifications for interface with SCADA System and for manual / auto and local / remote operation.											
q	ACB's shall have Microprocessor based releases as specified in the Specifications.											
r	Total Discrimination solution for all devices i.e. ACB, MCCB, MPCB and MCB shall be complied with disrcrimination Chart and Let Through Energy Curves. In case higher frame sizes (than those specified in the BOQ) are required to be provided to achieve the requirement of Total Discrimination , the same shall be provided at no extra cost.											
s	Contractor must carry out Cable Sizing based on actual lengths of cables and Discrimination study for selection of trip units and settings for the releases during production of Working Drawings.											
t	All Motor feeders, having separate Thermal Over - load relay, shall be provided with Reset push button.											
u	Even though, ratings of MPCB / Contactors for Motor Feeders are mentioned in BOQ items below, after Selection of a particular make of Switchgear, MPCB / Contactors with ratings as per tested Type II Coordination from the selected manufacturer, only shall be provided.											
v	Description of Various panels/boards covered under this BOQ is as given below:											
w	All the panel shall be form form 4b type and shall be provided with Fire Trace tubing suitable for Clean Gas flooding system where as applicable.											
x	Multi functionn meter with sufficient contacts for interface with SCADA system for remote monitoring.											
y	2 pole MCBs, SPD,Space heaters of relevant rating and Luminaires etc. shall be provided wherever applicable.											
1.01	Lighting Sub Main Distribution Boards -, as per Specifications & Drawing complete and as per the following details. (LDP)	Sets	2	2	2	6						
A	INCOMING											
a)	1 No. 400/400 A, 415V, 65 KA, 3P motorised MCCB having (1) Electronic Trip Unit with adjustable Overload, adjustable Short Circuit and adjustable Earth Fault (All with adjustable time delays) protection; (2) Provision for remote tripping of MCCB; (3) NO/NC contacts for operation and (4) Neutral sensor for earth fault protection.											
b)	TNC switch											
c)	LED indication lamp for ON, OFF & TRIP.											
	Phase Indication for R, Y and B											
d)	Metering											
i)	1 No Digital Voltmeter & Ammeter with Inbuilt Selector Switch.											
ii)	3 Nos. CTs, 400/5A, 10VA, CL-1 for metering.											

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Revised BOQ - MEP Works

S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
B	BUS-BARS											
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars (as specified in Section E01 of Specifications) rated 400 Amps, suitable to withstand symmetrical fault level of 65kA for 1 second at 415 volts.											
C	OUTGOINGS											
	14 Nos. Feeders with 100 / 100 A, 3 pole, 50kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit.											
	BMS SCADA Connectivity All breakers shall be provided with communication facilities, Contractor shall provide single point to communicate with BMS/SCADA for all system parameters of the Panel / DB including DC sources and other accessories including software & hardware as required.											
1.02	Escalator & Lift Main Panel, as per Specifications & Drawing complete and as per the following details.	Sets	2	2	2	6						
A	INCOMING											
a)	1 No. 1250A/1250A, 415V, 3 Pole, 65KA, Electrically operated Draw Out type, ACB complete with safety shutters, 240V AC shunt trip coil and having microprocessor based releases with (1) Communication capability (2) Provision for measurement of three phase current (3) Protection against long time + short time + earth fault (all with adjustable time delays) + instantaneous (4) Zone Selective Interlocking Unit for Total Discrimination (5) Communication options to remotely read and set parameters for the protection functions, transmission of ammeter measurements (6) Signalling of the cause of tripping and alarms, maximeter reset etc (7) NO / NC contacts for interlocks and indications (8) 1 No. CT in the neutral to connect with the trip unit.											
b)	TNC switch											
c)	LED indication lamp for ON, OFF & TRIP.											
	Phase Indication for R, Y and B											
d)	Metering											
i)	1 No Digital Voltmeter & Ammeter with Inbuilt Selector Switch.											
iii)	3 Nos. CTs, 1250/5A, 10VA, CL-1 for metering.											
B	BUS-BARS											
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars (as specified in Section E01 of Specifications) rated 1250 Amps, suitable to withstand symmetrical fault level of 65kA for 1 second at 415 volts.											
C	OUTGOINGS											
1	7 Nos. 400/250 A, 415V, 50kA, 3P, MCCB having (1) Electronic Trip Unit with adjustable Overload, adjustable Short Circuit and adjustable Earth Fault (All with adjustable time delays) protection; (2) NO/NC contacts for operation and (3) Neutral sensor for earth fault protection.											
2	2 Nos. Feeders with 250 / 160 A, 3 pole, 50kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit.											
3	6 Nos. Feeders with 160 / 100 A, 3 pole, 50kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit.											
	BMS SCADA Connectivity All breakers shall be provided with communication facilities, Contractor shall provide single point to communicate with BMS/SCADA for all system parameters of the Panel / DB including DC sources and other accessories including software & hardware as required.											
1.03	Escalator & Lift Sub Panel , as per Specifications & Drawing complete and as per the following details.	Sets	2	2	2	6						
A.	INCOMER											
a)	Automatic Transfer Switch (ATS) with 2 Nos. 400/400A, 50 KA, 4 pole, motorised MCCBs, electrically and mechanically interlocked with base frame and controller having selector switch for automatic & forced operation on normal and emergency sources. ATS must have monitoring of normal source, automatic changeover, test facility, circuit breaker status indication (On, Off & Trip), 3 phase Under - voltage protection and Phase Sequence Protection inbuilt in the controller or separately provided. The controller should have communication capability with BMS/SCADA. The MCCB's must have Electronic Trip Unit with adjustable protection against Overload, adjustable protection against Short Circuit, shunt trip coil, auxiliary contacts for ON, OFF, TRIP indication etc. as per drawing and specifications.											
b)	LED indication lamp for the following-											
c)	LED phase indication lamp for R-Y-B.											
d)	Metering											
i)	1 No Digital Voltmeter & Ammeter with Inbuilt Selector Switch.											
ii)	3 Nos. CTs, 400/5A, 10VA, CL-1 for metering.											
B.	BUS BAR											
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars rated 400 Amps, suitable to withstand symmetrical fault level of 50kA for 1 second at 415 volts.											
C.	OUTGOING											
1	10 Nos. Feeder with 160/100 A, 3 pole, 50kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit											
	BMS SCADA Connectivity All breakers shall be provided with communication facilities, Contractor shall provide single point to communicate with BMS/SCADA for all system parameters of the Panel / DB including DC sources and other accessories including software & hardware as required.											
E.01.04	Local Motor Control Panels for Sewage Ejector Pumps as per Specifications & Drawing complete and as per the following details:	Each	2	2	2	6						
	Incomer											
A	Automatic Transfer Switch (ATS) with 2 Nos. 160/100A, 4 pole, motorised MCCBs, electrically and mechanically interlocked with base frame and controller having selector switch for automatic & forced operation on normal and emergency sources. ATS must have monitoring of normal source, automatic changeover, test facility, circuit breaker status indication (On, Off & Trip), 3 phase Under - voltage protection and Phase Sequence Protection inbuilt in the controller or separately provided. The controller should have communication capability with BMS/SCADA. The MCCB's must have Electronic Trip Unit with adjustable protection against Overload, adjustable protection against Short Circuit, shunt trip coil, auxiliary contacts for ON, OFF, TRIP indication etc. as per drawing and specifications.											
B.	BUS BAR											
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars rated 160 Amps, suitable to withstand symmetrical fault level of 35kA for 1 second at 415 volts.											

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Revised BOQ - MEP Works

S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
C.	OUTGOING											
1	3 Sets of Star Delta starter unit for Sewage Pumps (7.5 KW each) with Two Pump as Working and One as Standby. Each Starter Unit shall be equipped with the following.											
a	1 No. 3 pole,20 A, MPCB (with inbuilt Single Phasing Preventer) having 16 - 20 A Over - load release and having Auxiliary contacts for indications for On, Off and Trip.											
b	1 No. 4 pole, RCCB with 40A rating and 100 mA sensitivity.											
c	1 No. Digital Ammeter, CT operated.											
d	1 No. CT, 20/1A, 10VA, class - I for metering.											
e	Auto / Local / Remote Selector Switch key operated.											
f	Door mounted push buttons for Start and Stop functions.											
g	Emergency Stop push button lockable type.											
h	LED indication lamp for ON, OFF, Trip.											
i	3 No. 20A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.											
J	One No. Star Delta Timer.											
k	One No. timer with Instantaneous and Time Delay Contact (for programming in case selected pump is not operative then next shall be switched on automatically)											
l	Running hour meter.											
m	Auxiliary Contactors for Auto/Local/Remote Operation.											
n	Power & Control terminals for cable connections.											
	Equipment common for all feeders is indicated below:											
a)	2 No Working / Standby Selector Switch.											
b)	Auxiliary Contactors with 240 VAC operating coil (for Working / Standby selection).											
	BMS SCADA Connectivity All breakers shall be provided with communication facilities, Contractor shall provide single point to communicate with BMS/SCADA for all system parameters of the Panel / DB including DC sources and other accessories including software & hardware as required.											
E.01.05	Local Motor Control Panel for Seepage Pumps, for both the ends (north & south) as per Specifications & Drawing complete and as per the following details.	Each	2	2	2	6						
	Incomer											
A	Automatic Transfer Switch (ATS) with 2 Nos. 250/160A, 4 pole, motorised MCCBs, electrically and mechanically interlocked with base frame and controller having selector switch for automatic & forced operation on normal and emergency sources. ATS must have monitoring of normal source, automatic changeover, test facility, circuit breaker status indication (On, Off & Trip), 3 phase Under - voltage protection and Phase Sequence Protection inbuilt in the controller or separately provided. The controller should have communication capability with BMS/SCADA. The MCCB's must have Electronic Trip Unit with adjustable protection against Overload, adjustable protection against Short Circuit, shunt trip coil, auxiliary contacts for ON, OFF, TRIP indication etc. as per drawing and specifications.											
	LED phase indication lamp for R-Y-B.											
B	BUS BAR											
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars rated 250 Amps, suitable to withstand symmetrical fault level of 35kA for 1 second at 415 volts.											
C	OUTGOING											
f	3 Sets of Star Delta starter unit for Seepage Pumps (11 KW each) for Three Pumps as Working . Each Starter Unit shall be equipped with the following:											
g	1 No. 3 Pole 32 A MPCB (with in built Single Phasing Preventer) with 15-25 A O/L Release and having contact for indication - ON/OFF/Trip											
h	1 No. 4 Pole RCCB 40A rating and 100mA sensitivity.											
i	1 No. Digital Ammeter, CT operated.											
j	1 No. CT 30/5A, 10VA, class -1 for metering.											
k	Auto / Local / Remote Selector Switch key operated.											
l	Door mounted push buttons for Start and Stop functions.											
m	Emergency stop push button lockable type.											
n	LED indication lamp for ON, OFF, Trip.											
o	3 No. 32A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 230 VAC.											
p	One No. Star Delta Timer.											
q	One No. timer with Instantaneous and Time Delay Contact (for programming in case selected pump is not operative then next shall be switched on automatically)											
r	Running hour meter.											
s	Auxiliary Contactors for Auto/Local/Remote Operation.											
t	Power & Control terminals for cable connections.											
	Equipment common for all feeders is indicated below:											
u	1 No. 3 Position Selector Switch with all other accessories and auxiliary contactors (for level indication multiplication) to change the sequence of operation of three motors automatically.											
v	2 Nos. Feeders with 100/40 A, 3 pole, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit .Feeder shall be equipped with the following:											
w	LED indication lamp for ON, OFF & TRIP.											
x	Phase Indication for R, Y and B											
C	Metering											
y	1 No Digital Voltmeter & Ammeter with Inbuilt Selector Switch.											
z	3 Nos. CTs, 40/5A, 10VA, CL-1 for metering.											
	BMS SCADA Connectivity All breakers shall be provided with communication facilities, Contractor shall provide single point to communicate with BMS/SCADA for all system parameters of the Panel / DB including DC sources and other accessories including software & hardware as required.											

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Revised BOQ - MEP Works

S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
E.01.06	Local Motor Control Panel for Mid tunnel Pumps, as per Specifications & Drawing complete and as per the following details.	Each	2	2	2	6						
A	INCOMER											
a	100/60 A, 3 pole, 35kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit .											
b	LED phase indication lamp for R-Y-B.											
B	BUS BAR											
c	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars (as specified in Section E01 of Specifications) rated 100 Amps, suitable to withstand symmetrical fault level of 35kA for 1 second at 415 volts.											
C	OUTGOING											
d	2 Sets of DOL starter unit for Sump Pumps (3.70 KW each) with One Pump as Working and One as Standby. Each Starter Unit shall be equipped with the following.											
e	1 No. 3 pole, 10 A, MPCB (with inbuilt Single Phasing Preventer) having 6 - 10 A Over - load release and having Auxiliary contacts for indications for On, Off and Trip.											
f	1 No. 4 pole, RCCB with 40A rating and 100 mA sensitivity.											
g	1 No. Digital Ammeter, CT operated.											
h	1 No. CT, 10/5A, 10VA, class - I for metering.											
i	Auto / Local / Remote Selector Switch key operated.											
j	Door mounted push buttons for Start and Stop functions.											
k	Emergency Stop push button lockable type.											
l	LED indication lamp for ON, OFF, Trip.											
m	3 No. 18A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.											
o	One No. timer with Instantaneous and Time Delay Contact (for programming in case selected pump is not operative then next shall be switched on automatically)											
p	Running hour meter.											
q	Auxiliary Contactors for Auto/Local/Remote Operation.											
r	Power & Control terminals for cable connections.											
s	1 No Working / Standby Selector Switch.											
t	Auxiliary Contactors with 240 VAC operating coil (for Working / Standby selection).											
	BMS SCADA Connectivity All breakers shall be provided with communication facilities, Contractor shall provide single point to communicate with BMS/SCADA for all system parameters of the Panel / DB including DC sources and other accessories including software & hardware as required.											
E.01.07	Local Motor Control Panel for Water Treatment System, Pump Room as per Specifications & Drawing complete and as per the following details.	Each	1	1	1	3						
	Incomer											
A	2 Nos. 250/160 A, 415V, 35kA, 4P MCCB having Electronic Trip Unit with adjustable protection against Overload, adjustable protection against Short Circuit and having NO/NC contacts for operation. The MCCB's must be mechanically and electrically interlocked such that it is possible to manually close one of them at a time.											
b	LED phase indication lamp for R-Y-B.											
c	LED indication lamp for the following-											
d	ON, OFF, TRIP											
B	BUS BAR											
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars (as specified in Section E01 of Specifications) rated 250 Amps, suitable to withstand symmetrical fault level of 35kA for 1 second at 415 volts.											
C	Outgoing											
1	3 Sets of Star - Delta Starter Unit of 7.5 KW (one for Borewell Pump and one as spare). Each Starter Unit shall be equipped with the following:											
	1 No. 3 pole,18 A, MPCB (with inbuilt Single Phasing Preventer) having 13 - 18 A Over - load release and having Auxiliary contacts for indications for On, Off and Trip.											
	1 No. 4 pole, RCCB with 40A rating and 100 mA sensitivity.											
	1 No. Digital Ammeter, CT operated.											
	1 No. CT, 25/5A, 10VA, class - I for metering.											
	Auto / Local / Remote Selector Switch key operated.											
	Door mounted push buttons for Start and Stop functions.											
	Emergency stop push button lockable type.											
	LED indication lamp for ON, OFF, Trip.											
	3 No. 25A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.											
	One No. Star Delta Timer.											
	Running Hour meter.											
	Auxiliary Contactors for Auto/Local/Remote Operation.											
	Power & Control terminals for cable connections.											
2	9 Sets of DOL Starter Unit of 3.75kW each for Filter Feed Pump (1 Working + 1 Standby), Raw Water Pump (1 Working + 1 Standby),Soft Water Pump (1 Working + 1 Standby), Domestic Water Pump (1 Working + 1 Standby), and 1 nos Spare feeder. Each Starter Unit shall be equipped with the following:											
	1 No. 3 pole,10 A, MPCB (with inbuilt Single Phasing Preventer) having 6 - 10 A Over - load release and having Auxiliary contacts for indications for On, Off and Trip.											
	1 No. 4 pole, RCCB with 40A rating and 100 mA sensitivity.											
	1 No. Digital Ammeter, CT operated.											
	1 No. CT, 10/5A, 10VA, class - I for metering.											
	Auto / Local / Remote Selector Switch key operated.											
	Door mounted push buttons for Start and Stop functions.											
	LED indication lamp for ON, OFF, Trip.											

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Revised BOQ - MEP Works

S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
	Emergency stop push button lockable type.											
	3 No. 18A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.											
	One No. Star Delta Timer.											
	Running Hour meter.											
	Auxiliary Contactors for Auto/Local/Remote Operation.											
	Power & Control terminals for cable connections.											
	Equipment common for both feeders in each set of pumps (1 Working & 1 Standby) are indicated below Total Five Sets of such equipment shall be provided:											
	1 No Working / Standby Selector Switch.											
	Auxiliary Contactors with 240 VAC operating coil (for Working / Standby selection).											
3	4 Sets of DOL starter unit for Sump Pumps (2.2 KW each) with Two Pump as Working and Two as Standby. Each Starter Unit shall be equipped with the following.											
	1 No. 3 pole,6.3 A, MPCB (with inbuilt Single Phasing Preventer) having 4 - 6.3 A Over - load release and having Auxiliary contacts for indications for On, Off and Trip.											
	1 No. 4 pole, RCCB with 40A rating and 100 mA sensitivity.											
	1 No. Digital Ammeter, CT operated.											
	1 No. CT, 10/5A, 10VA, class - I for metering.											
	Auto / Local / Remote Selector Switch key operated.											
	Door mounted push buttons for Start and Stop functions.											
	Emergency Stop push button lockable type.											
	LED indication lamp for ON, OFF, Trip.											
	1 No. 18A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.											
	One No. timer with Instantaneous and Time Delay Contact (for programming in case selected pump is not operative then next shall be switched on automatically)											
	Running hour meter.											
	Auxiliary Contactors for Auto/Local/Remote Operation.											
	Power & Control terminals for cable connections.											
	2 Nos. Feeders with 160/100 A, 3 pole, 35kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit											
	3 Nos. Feeders with 100/100 A, 3 pole, 35kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit											
E.01.08	Small Power Distribution Board, as per Specifications & Drawing complete and as per the following details.	Each	2	3	3	8						
A	INCOMING											
a	1 No.400 A/400 A, 415V, 65kA, 3P motorised MCCB having (1) Electronic Trip Unit with adjustable Overload, adjustable Short Circuit and adjustable Earth Fault (All with adjustable time delays) protection; (2) Provision for remote tripping of MCCB; (3) NO/NC contacts for operation and (4) Neutral sensor for earth fault protection.											
b	TNC switch											
c	LED indication lamp for ON, OFF & TRIP.											
d	Phase Indication for R, Y and B											
	Metering											
e	1 No Digital Voltmeter with Inbuilt Selector Switch.											
f	1 No Digital Ammeter with Inbuilt Selector Switch.											
g	3 Nos. CTs, 400/5A, 10VA, CL-1 for metering.											
B	BUS-BARS											
h	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars rated 400 Amps, suitable to withstand symmetrical fault level of 65KA for 1 second at 415 volts.											
C	OUTGOINGS											
i	14 Nos. Feeders with 100A/100 A, 3 pole, 55kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit.											
j	Digital timer with 3pole with auxliary contacts and operating coil of 230 VAC.											
D	BMS SCADA Connectivity All breakers shall be provided with communication facilities, Contractor shall provide single point to communicate with BMS/SCADA for all system parameters of the Panel / DB including DC sources and other accessories including software & hardware as required.											
E.01.09	Retail Panel-1	Each	1	2	2	5						
A	Incoming											
a	100 amp TPN 50KA MCCB with built in microprocessor based release unit for short circuit, over current and earth fault protection with adjustable setting and with the following accessories :											
b	0-500 volts, digital voltmeter with 2 amps MCB's.											
c	0 – 100 amps digital ammeter and 100/5 amps 15 VA burden,CL 1 CTs											
d	Phase indicating lights protected by 2 amps MCB's.											
e	Each 1 no. NO/NC Auxiliary Contacts (ON/OFF Status) and Trip alarm contact (Trip status) for BMS Monitor (Potential free contacts)											
B	Bus Bars											
f	100 amps TPN copper bus bars with heat shrinkable insulation sleeves.											
C	Out Goings											
g	4 Nos. 63 amp 50kA TPN MCCB each with microprocessor based releases control unit for protection with site settable over current, short circuit, instantaneous short circuit , earth fault fault protection and indicating lamps, Each 1 no. NO/NC Auxillary Contacts (ON/OFF Status) and Trip alarm contact (Trip status) for BMS Monitor (Potential free contacts)											
h	1 no's 63 amp 690 volts TPN 50 kA MCCBs as spare											
D	Metering											
i	1 No., 230V, AC operated integral type Digital meter with RS-485 port for measuring Amps ,Voltage, Energy, frequency & power factor conforming to specifications, latest IEC/ EMC and EMI standards/criterion, with necessary Circuit MCBs and suitable size summing CTs for above two incomer metering supporting SCADA/BMS connectivity											

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Revised BOQ - MEP Works

S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
	Special Features:											
j	BMS compatibility for all incomers, Bus couplers and outgoing breakers including meters, BMS Control / Monitor Parameters (Potential free contacts)											
E.01.10	Main Fire Pump Panel, as per Specifications & Drawing complete and as per the following details.	Each	1	1	1	3						
A	INCOMER											
1	Automatic Transfer Switch (ATS) with 2 Nos. 400/400A, 65 KA, 4 pole, motorised MCCBs, electrically and mechanically interlocked with base frame and controller having selector switch for automatic & forced operation on normal and emergency sources. ATS must have monitoring of normal source, automatic changeover, test facility, circuit breaker status indication (On, Off & Trip), 3 phase Under - voltage protection and Phase Sequence Protection inbuilt in the controller or separately provided. The controller should have communication capability with BMS/SCADA. The MCCB's must have Electronic Trip Unit with adjustable protection against Overload, adjustable protection against Short Circuit, shunt trip coil, auxiliary contacts for ON, OFF, TRIP indication etc. as per drawing and specifications.											
b	METERING											
c	1 No Digital Voltmeter & Ammeter with Inbuilt Selector Switch.											
d	3 Nos. CTs, 400/5A, 10VA, CL-1 for metering.											
B	BUS BAR											
a	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars (as specified in of Specifications) rated 400 Amps, suitable to withstand symmetrical fault level of 50kA for 1 second at 415 volts.											
C	OUTGOING											
1	2 Sets of Star Delta starter unit for Fire Hydrant Pumps (Approximate 90 KW each) with One Pump as Working and One as Standby, Each Starter Unit shall be equipped with the following.											
	1 No. 3 Pole, 415V, 250 A, 50kA, 3P Motor Duty MCCB with Magnetic Trip Unit Only (having short circuit protection only) and auxiliary Contacts.											
	1 No. Digital Ammeter, CT operated.											
	1 No. CT, 250 /5A, 10VA, class - I for metering.											
	Auto / Local / Remote Selector Switch key operated.											
	Door mounted push buttons for Start and Stop functions.											
	Emergency stop push button lockable type.											
	LED indication lamp for ON, OFF, Trip.											
	3 No. 200A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.											
	One No. Star Delta Timer.											
	Auxiliary Contactors for Auto/Local/Remote Operation.											
	Triple pole, Suitable C.T. operated, bimetal Over Load relays (with in built single phasing protection) suitable for above mentioned motor feeder having arrangement for by - passing the Over Load relay in case the pump is running during an emergency scenario with all accessories including 3 Nos. Suitable C.T.s, Auxiliary Contactors etc.											
	Power & Control terminals for cable connections.											
	Equipment common for all feeders is indicated below:											
	1 No. Working / Standby Selector Switch.											
	Auxiliary Contactors with 240 VAC operating coil (for Working / Standby selection).											
2	1 Sets of Star Delta starter unit for Fire Sprinkler Pumps (55 KW) as require. Each Starter Unit shall be equipped with the following.											
	1 No. 3 Pole, 415V, 125A, 50kA, 3P Motor Duty MCCB with Magnetic Trip Unit Only (having short circuit protection only) and auxiliary Contacts.											
	1 No. Digital Ammeter, CT operated.											
	1 No. CT, 110 /5A, 10VA, class - I for metering.											
	Auto / Local / Remote Selector Switch key operated.											
	Door mounted push buttons for Start and Stop functions.											
	Emergency stop push button lockable type.											
	LED indication lamp for ON, OFF, Trip.											
	3 No. 150A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.											
	One No. Star Delta Timer.											
	Auxiliary Contactors for Auto/Local/Remote Operation.											
	Triple pole, Suitable C.T. operated, bimetal Over Load relays (with in built single phasing protection) suitable for above mentioned motor feeder having arrangement for by - passing the Over Load relay in case the pump is running during an emergency scenario with all accessories including 3 Nos. Suitable C.T.s, Auxiliary Contactors etc.											
	Power & Control terminals for cable connections.											
	Equipment common for all feeders is indicated below:											
	1 No. Working / Standby Selector Switch.											
	Auxiliary Contactors with 240 VAC operating coil (for Working / Standby selection).											
3	3 Sets of Star Delta Starter Unit (One Set for Hydrant Jockey Pump, One Set for Sprinkler Jockey Pump & One Set as spare) of 11 KW. Each Starter Unit shall be equipped with the followings:											
	1 No. 3 Pole, 415V, 100 A, 50kA, 3P Motor Duty MCCB with Magnetic Trip Unit Only (having short circuit protection only) and auxiliary Contacts.											
	1 No. Digital Ammeter, CT operated.											
	1 No. CT, 30/5A, 10VA, class - I for metering.											
	Auto / Local / Remote Selector Switch key operated.											
	Door mounted push buttons for Start and Stop functions.											
	Emergency stop push button lockable type.											
	LED indication lamp for ON, OFF, Trip.											
	3 No. 40A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.											
	One No. Star Delta Timer.											
	Auxiliary Contactors for Auto/Local/Remote Operation.											

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Revised BOQ - MEP Works

S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
	Triple pole, Suitable C.T. operated, bimetal Over Load relays (with in built single phasing protection) suitable for above mentioned motor feeder having arrangement for by - passing the Over Load relay in case the pump is running during an emergency scenario with all accessories including 3 Nos. Suitable C.T.s, Auxiliary Contactors etc.											
	Power & Control terminals for cable connections.											
	BMS SCADA Connectivity All breakers shall be provided with communication facilities, Contractor shall provide single point to communicate with BMS/SCADA for all system parameters of the Panel / DB including DC sources and other accessories including software & hardware as required.											
E.01.11	UPS Distribution Panel, for UPS as per Specifications & Drawing complete and as per the following details.	Each	2	2	2	6						
a	2 Nos. 250/200 A, 415V, 35kA, 4P MCCB having Electronic Trip Unit with adjustable protection against Overload, adjustable protection against Short Circuit and having NO/NC contacts for operation.											
b	LED indication lamp for the following-											
c	ON, OFF, TRIP (each for both the supplies)											
d	LED phase indication lamp for R-Y-B.											
A	Metering											
e	1 No Digital Voltmeter with Inbuilt Selector Switch.											
f	1 No Digital Ammeter with Inbuilt Selector Switch.											
g	3 Nos. CTs, 250/5A, 10VA, CL-1 for metering.											
B	BUS-BARS											
h	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars (as specified in Specifications rated 250 Amps, suitable to withstand symmetrical fault level of 35kA for 1 second at 415 volts.											
C	OUTGOINGS											
i	12 Nos. 40A, 4P, MCB (C curve) .											
j	4 Nos. Feeders with 100 / 40 A, 3 pole, 35kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit.											
D	BMS SCADA Connectivity All breakers shall be provided with communication facilities, Contractor shall provide single point to communicate with BMS/SCADA for all system parameters of the Panel / DB including DC sources and other accessories including software & hardware as required.											
E.01.12	Auto Transfer Switch of following Ratings as per Specifications & Drawing complete and as per the following details.	Each	2	2	2	6						
a	Automatic Transfer Switch (ATS) with 2 Nos. 400/250A, 4 pole, motorised MCCBs, electrically and mechanically interlocked with base frame and controller having selector switch for automatic & forced operation on normal and emergency sources. ATS must have monitoring of normal source, automatic changeover, test facility, circuit breaker status indication (On, Off & Trip), 3 phase Under - voltage protection and Phase Sequence Protection inbuilt in the controller or separately provided. The controller should have communication capability with BMS/SCADA. The MCCB's must have Electronic Trip Unit with adjustable protection against Overload, adjustable protection against Short Circuit, shunt trip coil, auxiliary contacts for ON, OFF, TRIP indication etc. as per drawing and specifications.											
b	LED indication lamp for the following-											
c	ON, OFF, TRIP (each for both the supplies)											
d	LED phase indication lamp for R-Y-B.											
e	Out going terminals for cable collection to be provided.											
E.01.13	Auto Transfer Switch of following Ratings as per Specifications & Drawing complete and as per the following details.	Each	2	2	2	6						
a	Automatic Transfer Switch (ATS) with 2 Nos. 160/100A, 4 pole, motorised MCCBs, electrically and mechanically interlocked with base frame and controller having selector switch for automatic & forced operation on normal and emergency sources. ATS must have monitoring of normal source, automatic changeover, test facility, circuit breaker status indication (On, Off & Trip), 3 phase Under - voltage protection and Phase Sequence Protection inbuilt in the controller or separately provided. The controller should have communication capability with BMS/SCADA. The MCCB's must have Electronic Trip Unit with adjustable protection against Overload, adjustable protection against Short Circuit, shunt trip coil, auxiliary contacts for ON, OFF, TRIP indication etc. as per drawing and specifications.											
b	LED indication lamp for the following-											
c	ON, OFF, TRIP (each for both the supplies)											
d	LED phase indication lamp for R-Y-B.											
e	Out going terminals for cable collection to be provided.											
E.01.14	DG Power Cum AMF with Synchronizing panel as per specifications & Drawing complete and as per the following details.	Sets	1	1	1	3						
A	INCOMMING-											
a	2 No. 2000/ 1600 A, 415V, 65kA, 3 Pole, Electrically operated Draw Out type ACB, complete with safety shutters, 240V AC shunt trip coil & closing coil and having microprocessor based releases with (1) Communication capability (2) Provision for measurement of V, A, W, VAR, VA, Wh, VARh, Hz, power factor etc (3) Protection against long time + short time + instantaneous + earth fault (all with adjustable time delays), over and under voltage, minimum and maximum frequency, voltage and current imbalance, phase sequence, load shedding and reconnection & reverse power protection (4) Measurement of interrupted currents, differentiated fault indications, maintenance indicators (5) Last few trippings and event histories and time stamping with facility for consulting the history file, maintenance indicator register etc (6) Communication options to remotely read and set parameters for the protection functions, transmission of all the calculated indicators and measurements (7) Signalling of the cause of tripping and alarms (8) NO / NC contacts for interlocks and indications.											
b	TNC switch											
c	Selector switch for following operation-											
d	Auto / Local / Remote operation of Breaker, Manual / Auto Synchronization, On line set selection.											
e	LED indication lamp for the following-											
f	ON, OFF, TRIP, spring charged & phase indication R-Y-B.											
g	Push Buttons for the following functions-											
h	Fault Accept, Annunciator Reset, Lamp test.											

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Revised BOQ - MEP Works

S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate (In INR)	Total (In INR)	Unit Rate (In EURO)	Total (In EURO)	Unit Rate (In USD)	Total (In USD)
B	Metering											
i	Multifunction energy meter for measurement of voltage, line current, power factor, power & energy											
j	4 Nos. CTs, 2000/5A, 15VA, CL-1 for metering.											
k	Protection-											
l	Microprocessor base restricted earth fault relay.											
m	Microprocessor base differential protection relay.											
n	Master Trip Lockout Relay.											
o	4 Nos. CTs, 2000/5A, 15VA, CL-PS.(3 Nos in Panel and One No in DG neutral) for REF protection.											
p	6 Nos. CTs, 200/5A, 15VA, CL-PS. (3 Nos in Panel and 3 Nos in Alternator Winding) for Differential protection.											
q	8 Window Annunciator with Hooter.											
r	1 No 250A, AC-3 duty, Power Contactor with Auxiliary Contacts for neutral.											
s	Synchronizing equipment-											
t	Provision & Installation of Auto Synchronising Module for each DG Set with AMF, Active & Reactive Auto load sharing & Auto Load Management, with 16 Nos. Digital Inputs & Digital Outputs, with provision for BMS / SCADA connectivity.											
u	DG Power Cum AMF with Synchronizing panel as per specifications & Drawing complete and as per the following details.											
v	Voltage Raise / Lower & Frequency Raise / Lower Switch.											
w	Solid state / Motorised Potentiometer for AVR and Speed control (as per manufacturer's requirement).											
x	1 No 24V DC source unit, 24V DC battery (for 8 hours back up) with battery charging circuit. (Common for all DG synchronization system).											
C	BUS BAR											
y	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars (as specified in of Specifications) rated 4000 Amps, suitable to withstand symmetrical fault level of 65kA for 1 second at 415 volts.											
D	OUTGOING FEEDERS											
1	2 nos. 400A/400A, 415V, 65kA, 3P, MCCB having Electronic Trip Unit with adjustable protection against Overload, adjustable protection against Short Circuit and Earth Fault (With Adjustable time delay); having NO/NC contacts for operation and neutral sensor for earth fault protection.											
	LED phase indication lamp for R-Y-B.											
	Digital Ammeter with Inbuilt Selector Switch											
	3 Nos. CTs, 400/5A, 10VA, CL-1 for metering.											
2	3 no. 1600A/1600A, 415V, 65kA, 3P, MCCB having Electronic Trip Unit with adjustable protection against Overload, adjustable protection against Short Circuit and Earth Fault (With Adjustable time delay); having NO/NC contacts for operation and neutral sensor for earth fault protection.											
	Digital Ammeter with Inbuilt Selector Switch											
	3 Nos. CTs, 1600/5A, 10VA, CL-1 for metering.											
	BMS SCADA Connectivity All breakers shall be provided with communication facilities, Contractor shall provide single point to communicate with BMS/SCADA for all system parameters of the Panel / DB including DC sources and other accessories including software & hardware as required.											
E.01.15	D.G. Auxiliary panel as per Specifications & Drawing complete and as per the following details.	Each	1	1	1	3						
	Incoming											
a	1No. 160 / 100 A, 415V, 35kA, 3P MCCB having Electronic Trip Unit with adjustable protection against Overload, adjustable protection against Short Circuit and Earth fault and having NO/NC contacts for operation and neutral sensor for earth fault protection.											
b	LED phase indication lamp for R-Y-B.											
c	Metering											
d	1 No Digital Ammeter with Inbuilt Selector Switch.											
e	3 Nos. CTs, 160/5A, 10VA, CL-1 for metering.											
	Bus bars											
f	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars (as specified in Section E01 of Specifications) rated 100 Amps, suitable to withstand symmetrical fault level of 35kA for 1 second at 415 volts.											
	Outgoings											
g	3 Sets of DOL Starter units of 0.75 kW each for Engine Lub-oil Priming Pump (2 Working + 1 Spare) & each shall be equipped as detailed below.											
h	1 No. 3 pole 2.5 Amps MPCB (with inbuilt single Phasing Preventer) having 1.6 - 2.4A Over - load release and having contacts for indications - On, Off, Trip.											
i	1 No. 4 pole, RCCB with 40A rating and 100 mA sensitivity.											
j	Auto / Local / Remote Selector Switch key operated.											
k	Door mounted push buttons for Start and Stop functions.											
l	Emergency stop push button lockable type.											
m	LED indication lamp for ON, OFF, Trip.											
n	1 No. 9A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.											
o	Auxiliary Contactors for Auto/Local/Remote Operation.											
p	Power & Control terminals for cable connections.											
q	2 Sets of DOL Starter units for Fuel Transfer Pumps (2.2 KW each) 1 Working + 1 Standby & each shall be equipped as detailed below.											
r	1 No. 3 pole 6.3 Amps MPCB (with inbuilt single Phasing Preventer) having 4 - 6.3A Over - load release and having contacts for indications - On, Off, Trip.											
s	1 No. 4 pole, RCCB with 40A rating and 100 mA sensitivity.											
t	1 No. Digital Ammeter, CT operated.											
u	1 No. CT, 10/5A, 10VA, class - I for metering.											
v	Auto / Local / Remote Selector Switch key operated.											
w	Door mounted push buttons for Start and Stop functions.											
x	Emergency stop push button lockable type.											
y	LED indication lamp for ON, OFF, Trip.											
z	1 No. 9A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 VAC.											

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Revised BOQ - MEP Works

S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
aa	One No timer with Instantaneous and Time Delay Contact (for programming in case selected pump is not operative then next shall be switched on automatically)											
ab	Running hour meter.											
ac	Auxiliary Contactors for Auto/Local/Remote Operation.											
ad	Power & Control terminals for cable connections.											
ae	Equipment common for all feeders as below:											
af	1 No Working / Standby Selector Switch.											
ag	Auxiliary Contactors with 240 VAC operating coil (for Working / Standby selection).											
ah	3No. 100 / 40 A, 415V, 50kA, 3P MCCB having Electronic Trip Unit with adjustable protection against Overload, adjustable protection against Short Circuit and Earth fault and having NO/NC contacts for operation and neutral sensor for earth fault protection. Breaker shall be equipped as detailed below.											
ai	LED phase indication lamp for R-Y-B.											
aj	LED indication lamp for the following-											
ak	ON, OFF, TRIP											
	BMS SCADA Connectivity All breakers shall be provided with communication facilities, Contractor shall provide single point to communicate with BMS/SCADA for all system parameters of the Panel / DB including DC sources and other accessories including software & hardware as required.											
1.16	Adjustment rates for addition/deletion of compartmentalised switchgear in above panels/board of following rating including the supply, fabrication, extension, modification of the enclosure or in a separate enclosure, earthing ,basbar, other sub-systems, accessories etc complete as required and as per specifications and as specified in of item 1.0 above											
1.16A	1 no. 1600 A, 415V, 50kA, 4P draw out Electrically operated ACB complete with:	No.	1	1	1	3						
a)	1- set Red/Green ON/OFF indicating lamps											
b)	1- set of three phase (red, yellow, blue) indicating lamps											
c)	Amber healthy trip indicating lamps											
d)	3 nos. cast resin current transformers with 15 VA Burden & Class 5P10 for protection.											
e)	3 nos. cast resin current transformers with 15VA burden and Class 1.0 for measurement											
f)	Microprocessor based release having variable range of overcurrent, short circuit,UVR and earth fault protection with time log facility for each of the fault for achieving discrimination along with distinct fault indication through LED's.											
g)	230 V AC shunt trip coil											
h)	230 V, AC Motor wound spring closing mechanism											
i)	Terminals to receive alum. XLPE armoured cables											
j)	RS-485 port for display of ON/OFF status of ACB on BMS workstation through MODBUS protocol											
1.16B	1 no. 1250- 1000 A, 415V, 50kA, 4P draw out Electrically operated ACB complete with:	No.	1	1	1	3						
a)	1- set Red/Green ON/OFF indicating lamps											
b)	1- set of three phase (red, yellow, blue) indicating lamps											
c)	Amber healthy trip indicating lamps											
d)	3 nos. cast resin current transformers with 15 VA Burden & Class 5P10 for protection											
e)	3 nos. cast resin current transformers with 15VA burden and Class 1.0 for measurement											
f)	Microprocessor based release having variable range of overcurrent, short circuit,UVR and earth fault protection with time log facility for each of the fault for achieving discrimination along with distinct fault indication through LED's.											
g)	230 V AC shunt trip coil											
h)	230 V, AC Motor wound spring closing mechanism											
i)	Terminals to receive alum. XLPE armoured cables											
j)	RS-485 port for display of ON/OFF status of ACB on BMS workstation through MODBUS protocol											
1.16C	1 no. 800 A, 415V, 50kA, 4P draw out Electrically operated ACB complete with:	No.	1	1	1	3						
a)	1- set Red/Green ON/OFF indicating lamps											
b)	1- set of three phase (red, yellow, blue) indicating lamps											
c)	Amber healthy trip indicating lamps											
d)	3 nos. cast resin current transformers with 15 VA Burden & Class 5P10 for protection.											
e)	3 nos. cast resin current transformers of 800/5 ratio with 15VA burden and Class 1.0 for measurement											
f)	Microprocessor based release having variable range of overcurrent, short circuit,UVR and earth fault protection with time log facility for each of the fault for achieving discrimination along with distinct fault indication through LED's.											
g)	230 V AC shunt trip coil											
h)	230 V, AC Motor wound spring closing mechanism											
i)	Terminals to receive alum. XLPE armoured cables											
j)	RS-485 port for display of ON/OFF status of ACB on BMS workstation through MODBUS protocol											
1.16D	MCCB											
a)	630A, 415V, Ics= 35 kA, 4P, MCCB with variable over current and short circuit releases and 1-set of three phase indicating lamps (red, yellow, blue)	No.	1	1	1	3						
b)	630A, 415V, Ics= 35 kA, TP, MCCB with variable over current and short circuit releases and 1-set of three phase indicating lamps (red, yellow, blue)	No.	1	1	1	3						
c)	400A, 415V, Ics=35 kA, 4P, MCCB with variable over current and short circuit releases and 1-set of three phase indicating lamps (red, yellow, blue)	No.	1	1	1	3						
d)	400A, 415V, Ics=35 kA, TP, MCCB with variable over current and short circuit releases and 1-set of three phase indicating lamps (red, yellow, blue)	No.	1	1	1	3						
e)	250/200A, 415V, Ics=35 kA, 4P, MCCB with variable over current and short circuit releases and 1-set of three phase indicating lamps (red, yellow, blue)	No.	1	1	1	3						
f)	250/200 A ,415V, Ics=35kA, TP, MCCB with variable over current and short circuit releases with heavy duty solid neutral link and 1-set of three phase indicating lamps	No.	1	1	1	3						
g)	100/63 A, 415V, Ics=25 kA ,TP, MCCB with variable over current and short circuit releases with heavy duty solid neutral link and 1- set of three phase indicating lamps	No.	1	1	1	3						
h)	Less than 63A to 40A, 415V, Ics=25 kA ,TP, MCCB with variable over current and short circuit releases with heavy duty solid neutral link and 1-set of three phase indicating lamps	No.	1	1	1	3						
1.16E	Electrical Operating mechanism (Motorised mechanism) for all types of above MCCBs	No.	1	1	1	3						
1.16F	Supply, installation and testing of 4 Way TPN sheet steel enclosure with incoming & outgoing cable, distribution Board complete as required.	No.	1	1	1	3						
1.16G	Supply, installation and testing of 200 Amp , 4P Isolator in sheet steel enclosure with incoming & outgoing cable box and ON indication lamp complete as required.	No.	1	1	1	3						

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Revised BOQ - MEP Works

S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
1.16G	100/75 HP, Star Delta starter comprising 3 Nos. TP contactor AC 3 duty Auto/Manual switch, Start Stop push button, bimetallic over current relays single phasing preventer and timer & with potential free contacts for remote monitoring and control.	No.	1	1	1	3						
1.16G	60 HP, Star Delta starter comprising 3 Nos. TP contactor AC 3 duty Auto/Manual switch, Start Stop push button, bimetallic over current relays single phasing preventer and timer & with potential free contacts for remote monitoring and control.	No.	1	1	1	3						
1.16G	50/45 HP, Star Delta starter comprising 3 Nos. TP contactor AC 3 duty Auto/Manual switch, Start Stop push button, bimetallic over current relays single phasing preventer and timer & with potential free contacts for remote monitoring and control.	No.	1	1	1	3						
1.16G	10/7.5 HP, Star Delta starter comprising 3 Nos. TP contactor AC 3 duty Auto/Manual switch, Start Stop push button, bimetallic over current relays single phasing preventer and timer & with potential free contacts for remote monitoring and control.	No.	1	1	1	3						
1.16G	Upto 5.5HP, DOL starter comprising 3 Nos. TP contactor AC-3 duty Auto/Manual switch, Start Stop push button, bimetallic over current relays single phasing preventer and timer & with potential free contacts for remote monitoring and control.	No.	1	1	1	3						
1.16H	Adjustment rates for addition/deletion of Power Contactor of the following ratings including the supply, fabrication, extension, modification of the enclosure or in a separate enclosure, earthing,basbar, other sub-systems, accessories etc complete as required and as per specifications	No.	1	1	1	3						
a)	400 A, 4 pole Power Contactor.	No.	1	1	1	3						
b)	300 A, 4 pole Power Contactor.	No.	1	1	1	3						
c)	250 A, 4 pole Power Contactor.	No.	1	1	1	3						
d)	200 A, 4 pole Power Contactor.	No.	1	1	1	3						
1.16 I	Adjustment rates for addition/deletion of Power Contactor of the following ratings including the supply, fabrication, extension, modification of the enclosure or in a separate enclosure, earthing,basbar, other sub-systems, accessories etc complete as required and as per specifications											
a)	Voltage Transducer	No.	1	1	1	3						
b)	Multifuction Meter	No.	1	1	1	3						
c)	Digital Load Manager with CT	No.	1	1	1	3						
d)	Electrical & Mechanical Interlock	No.	1	1	1	3						
e)	Micom Relay P-127 with CT	No.	1	1	1	3						
f)	Integrated type Digital Energy Multimeter with CT	No.	1	1	1	3						
g)	Coppr Bus Bar	Kg.	1	1	1	3						
1.16	Adjustment rates for addition/deletion of supply compartmentalised switchgear & fixing of following including making of suitable holes/space in the panel/DBs and making good all external finishes, terminations etc. complete as required.											
a)	Multiple LED/neon type indications	No.	1	1	1	3						
b)	Astronomic digital Timer	No.	1	1	1	3						
c)	AMF Meter with BMS/SCADA competiable	No.	1	1	1	3						
d)	TP Contractor - 40/32 Amp.	No.	1	1	1	3						
1.17	Other accessories (Quantity per station)											
	Supply and fixing of the following safety equipments in Aux. Sub.Station/MDB room as per detailed descriptions given below and as per relevant IE rules & code of standard practice	Set	1	1	1	3						
a)	1000 mm wide Insulating mat,confirming to IS 15652-2006 suitable to withstand 11 kV in front of all panels in ASS building & Pump room as required.											
b)	Laminated standard shock treatment charts in English, Hindi and Local language in ASS, ESR, DG room and Pump room in each station.											
c)	Danger plate as per approved Style & sample written in English, Hindi and Local languagefor MV installations as required as per IE rules, IES and IS 2551 (latest) - 8 nos. per station											
d)	2 nos. per station First Aid Box Complete as approved by St. John ambulance or Indian Red Cross.											
e)	4 nos. per station of 3-fire-buckets set each painted red with 'fire' written complete with sand filling, floor/wall mounting brackets/stand complete as per elewant IS and as required.											
f)	One Tool kit per station comprising 1 set of flat spanner (Taparia / Jalan), 1 set of box spanner, 1 no. Hacksaw frame with 10 No. blades, 1 no. large, medium, small screw drivers, 1 no. insulated plier, 1 no nose plier, 1 no. hand crimping tool upto 16 sq.mm, 1 no. digital multimeter, 1 no. test lamp and 1 no. tester. Screw driver set for all types of screw heads also to be provided.											
1.18	Supply and installing of Key Lockable Emergency Stop Push Button Box (including Emergency Push Button with contact, gland plate at both end of cable connection) confirming to IP 65 protection for each Motor & Punms.	No.	50	50	50	150						
1.19	Providing and fixing of wall mounted Alluminium cabinet of suitable size with glazed front opening door, equipment with hooks to house all keys.	No.	10	10	10	30						
E.02.8	NORMAL LIGHTING TPN DISTRIBUTION BOARDS FOR PLATFORM BOH	Each	10	10	10	30						
	INCOMER											
a	1 No. 63A, 4P, On - Load Manual Change - over Switch with 2 No. auxiliary contacts for position signalling.											
b	1 No. 25A, TPN MCB											
c	3 Nos. 25A, DP RCCB (30 mA Sensitivity)											
	OUTGOING											
d	18 Nos. 10A, SP MCB											
e	Terminals blocks for power & control cables.											
E.02.9	NORMAL LIGHTING TPN DISTRIBUTION BOARDS FOR CONC. BOH	Each	10	10	10	30						
	INCOMER											
a	1 No. 63A, 4P, On - Load Manual Change - over Switch with 2 No. auxiliary contacts for position signalling.											
b	1 No. 25A, TPN MCB											
c	3 Nos. 25A, DP RCCB (30 mA Sensitivity)											
	OUTGOING											
d	36 Nos. 10A, SP MCB											
e	Terminals blocks for power & control cables.											
E.02.10	EMERGENCY LIGHTING TPN DISTRIBUTION BOARDS	Each	6	8	8	22						
	INCOMER											
a	1 No. 32A, TPN MCB											

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Revised BOQ - MEP Works

S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
	OUTGOING											
b	9 Nos. Of 10A DP MCB + DP RCCB (30mA Sensitivity)											
c	Terminals blocks for power & control cables.											
E.02.11	EMERGENCY LIGHTING TPN DISTRIBUTION BOARDS	Each	6	6	6	18						
	INCOMER											
a	1 No. 32A, TPN MCB											
	OUTGOING											
b	12 Nos. Of 10A DP MCB + DP RCCB (30mA Sensitivity)											
c	Terminals blocks for power & control cables.											
E.02.12	TPN EMERGENCY LIGHTING DISTRIBUTION BOARD - (for tunnels)	Each	4	4	4	12						
	INCOMER											
a	One no 100 / 40 A, 3 pole, 35kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit. The MCCB should be suitable for remote ON and OFF and auxiliary ON and OFF contacts should be provided for remote monitoring.											
	OUTGOING											
b	30 Nos. Of 10A DP MCB + DP RCCB (30mA Sensitivity)											
c	Terminals blocks for power & control cables.											
E.02.13	SPN EMERGENCY DISTRIBUTION BOARD FOR SCADA	Each	5	8	8	21						
	INCOMER											
a	1 No. 32A, DP MCB											
b	OUTGOING											
c	8 Nos. Of 10A DP MCB + DP RCCB (30mA Sensitivity)											
d	Terminals blocks for power & control cables.											
E.02.14	SPN EMERGENCY DISTRIBUTION BOARD FOR UTILITY BUILDING UPS	Each	2	2	2	6						
	INCOMER											
a	1 No. 20A, DP MCB											
	OUTGOING											
b	9 Nos. Of 6A DP MCB + DP RCCB (30mA Sensitivity)											
c	Terminals blocks for power & control cables.											
E.02.15	SMALL POWER (SOCKET) TPN DISTRIBUTION BOARDS	Each	2	3	3	8						
	INCOMER											
a	1 No. 50A, TPN MCB											
b	3 Nos. 40A, DP RCCB (30 mA Sensitivity)											
	OUTGOING											
c	24 Nos. 25A, SP MCB											
d	6 Nos. 32A, 4P MCB + RCCB (30 mA Sensitivity)											
e	Terminals blocks for power & control cables.											
E.02.16	NORMAL LIGHTING TPN DISTRIBUTION BOARDS	Each	2	2	2	6						
	INCOMER											
a	1 No. 25A, TPN MCB											
b	3 Nos. 25A, DP RCCB (30 mA Sensitivity)											
	OUTGOING											
c	15 Nos. 10A, SP MCB											
d	Terminals blocks for power & control cables.											
	TOTAL FOR DISTRIBUTION BOARDS											
E.03	CABLES, CABLE TRAYS & STEELWORK											
	The Cable and Cable Containment System specified herein, must conform to relevant Section of the Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between specifications and description in BOQ, the most stringent of the condition will prevail.											
	All the items / parts mentioned in relevant clauses of the specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.											
	It may be noted that Contractor will be required to carry out cable sizing based on actual cable lengths, as per Working Drawings developed by him and after incorporating any changes in load requirements from the tendering stage. Optimisation must be carried out during cable sizing to reduce the cable requirement and size. Further, Contractor must obtain Engineer's approval on the Cable Sizing Calculation.											
E.03.1	Supply at the site of work of 1100 V grade, Copper Conductor, XLPE Insulated, armoured, Low Smoke Zero Halogen Type Cables conforming to BS 6724 and relevant Section of the specifications of the following sizes:											
	(Note: In case of any contradiction between BS 6724 and Specification , the stringent conditions of the two will apply)											
a	4 x 300 Sq.mm	RM	1300	1500	1500	4300						
b	4 x 240 Sq.mm	RM	200	230	230	660						
c	4 x 185 Sq.mm	RM	700	805	805	2310						
d	4 x 150 Sq.mm	RM	400	460	460	1320						
e	4 x 120 Sq.mm	RM	300	350	350	1000						
f	4 x 95 Sq.mm	RM	121	139	139	399						
g	3 x 95 Sq.mm	RM	450	500	500	1450						
g	4 x 70 Sq.mm	RM	1500	1725	1725	4950						
h	3 x 70 Sq.mm	RM	150	150	150	450						
i	4 x 50 Sq.mm	RM	1100	1265	1265	3630						
j	3 x 50 Sq.mm	RM	100	100	100	300						
k	4 x 35 Sq.mm	RM	1000	1150	1150	3300						
l	3 x 35 Sq.mm	RM	250	290	290	830						
m	4 x 25 Sq.mm	RM	4200	4830	4830	13860						

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Revised BOQ - MEP Works

S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
n	3 x 25 Sq.mm	RM	200	450	450	1100						
o	4 x 16 Sq.mm	RM	8250	9488	9488	27225						
p	3 x 16 Sq.mm	RM	1000	1150	1150	3300						
q	4 x 10 Sq.mm	RM	5000	6000	6000	17000						
r	3 x 10 Sq.mm	RM	539	620	620	1779						
s	4 x 6 Sq.mm	RM	100	115	115	330						
t	3 x 6 Sq.mm	RM	542	623	623	1789						
u	4 x 4 Sq.mm	RM	100	120	120	340						
v	3 x 4 Sq.mm	RM	600	690	690	1980						
w	4 x 2.5 Sq.mm	RM	100	100	100	300						
x	3 x 2.5 Sq.mm	RM	1000	1500	1500	4000						
y	2 x 2.5 Sq.mm	RM	2500	3000	3000	8500						
z	2 x 4Sq.mm	RM	1500	1800	1800	5100						
E.03.2	Supply at the site of work of 1100 V grade, Copper Conductor, XLPE Insulated, armoured, Low Smoke Zero Halogen, Fire Survival Type Cables conforming to BS 7846 and revevant Section of Specifications , of the following sizes:											
	(Note: In case of any contradiction between BS 7846 and Specification, the stringent conditions of the two will apply)											
a	4 x240Sq.mm	RM	20	20	20	60						
b	4 x185Sq.mm	RM	30	30	30	90						
c	4 x 95 Sq.mm	RM	50	50	50	150						
d	3 x 95 Sq.mm	RM	120	150	150	420						
e	3 x 70 Sq.mm	RM	100	120	120	340						
f	4 x 50 Sq.mm	RM	50	60	60	170						
g	3 x 50 Sq.mm	RM	300	300	300	900						
h	4 x 25 Sq.mm	RM	150	180	180	510						
i	3 x 16 Sq.mm	RM	53	53	53	159						
j	4 x 10 Sq.mm	RM	1277	1532	1532	4342						
k	3 x 10 Sq.mm	RM	100	100	100	300						
l	4 x 6 Sq.mm	RM	150	150	150	450						
m	4 x 2.5 Sq.mm	RM	100	200	200	500						
n	3 x 2.5 Sq.mm	RM	750	900	900	2550						
o	2 x 2.5 Sq.mm	RM	440	440	440	1320						
p	2 x 4 Sq.mm	RM	1200	1500	1500	4200						
E.03.3	Supply at the site of work of 1100 V grade, Copper Conductor, XLPE Insulated, armoured, Low Smoke Zero Halogen Type Control Cables conforming to BS 6724 & relevant section of Specifications, of the following sizes:											
	(Note: In case of any contradiction between BS 6724 and Specification , the stringent conditions of the two will apply)											
a	2 C x 2.5 Sq. mm Copper cable	RM	300	400	400	1100						
b	3 C x 2.5 Sq. mm Copper cable	RM	300	400	400	1100						
c	4 C x 2.5 Sq. mm Copper cable	RM	400	490	490	1380						
d	5 C x 2.5 Sq. mm Copper cable	RM	500	520	520	1540						
e	7 C x 2.5 Sq. mm Copper cable	RM	420	500	500	1420						
f	9 C x 2.5 Sq. mm Copper cable	RM	250	400	400	1050						
g	12 C x 2.5 Sq. mm Copper cable	RM	520	590	590	1700						
h	16 C x 2.5 Sq. mm Copper cable	RM	320	410	410	1140						
l	19 C x 2.5 Sq. mm Copper cable	RM	550	690	690	1930						
E.03.4	Supply at the site of work of 1100 V grade, Copper Conductor, XLPE Insulated, armoured, Low Smoke Zero Halogen, Fire Survival Type Auxiliary / Control Cables conforming to BS 7846 and relevant Section of Specifications , of the following sizes:											
	(Note: In case of any contradiction between BS 7846 and Specification , the stringent conditions of the two will apply)											
a	2 C x 2.5 Sq. mm Copper cable	RM	1320	1518	1518	4356						
a	3 C x 2.5 Sq. mm Copper cable	RM	330	380	380	1089						
b	4 C x 2.5 Sq. mm Copper cable	RM	2750	3163	3163	9075						
c	5 C x 2.5 Sq. mm Copper cable	RM	1650	1898	1898	5445						
d	7 C x 2.5 Sq. mm Copper cable	RM	1320	1518	1518	4356						
e	9 C x 2.5 Sq. mm Copper cable	RM	165	190	190	545						
f	12 C x 2.5 Sq. mm Copper cable	RM	110	127	127	363						
g	16 C x 2.5 Sq. mm Copper cable	RM	110	127	127	363						
h	19 C x 2.5 Sq. mm Copper cable	RM	330	380	380	1089						
E.03.5	Laying, testing and commissioning of 1100 V grade, Copper Conductor, XLPE Insulated, armoured, Low Smoke Zero Halogen Type and Fire Resistant / Survival Type Cables on existing trays/ walls/ columns/ indoor/ trenches with suitable clamps, saddles, hooks, bolts etc.											
a	4 x 300 Sq.mm	RM	1300	1500	1500	4300						
b	4 x 240 Sq.mm	RM	220	250	250	720						
c	4 x 185 Sq.mm	RM	730	835	835	2400						
d	4 x 150 Sq.mm	RM	400	460	460	1320						
e	4 x 120 Sq.mm	RM	300	350	350	1000						
f	4 x 95 Sq.mm	RM	171	189	189	549						
g	3 x 95 Sq.mm	RM	450	500	500	1450						
g	4 x 70 Sq.mm	RM	1500	1725	1725	4950						
h	3 x 70 Sq.mm	RM	250	270	270	790						
i	4 x 50 Sq.mm	RM	1150	1325	1325	3800						
j	3 x 50 Sq.mm	RM	400	400	400	1200						
k	4 x 35 Sq.mm	RM	1000	1150	1150	3300						

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Revised BOQ - MEP Works

S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
l	3 x 35 Sq.mm	RM	250	290	290	830						
m	4 x 25 Sq.mm	RM	4350	5010	5010	14370						
n	3 x 25 Sq.mm	RM	200	450	450	1100						
o	4 x 16 Sq.mm	RM	8250	9488	9488	27225						
p	3 x 16 Sq.mm	RM	1053	1203	1203	3459						
q	4 x 10 Sq.mm	RM	6277	7532	7532	21342						
r	3 x 10 Sq.mm	RM	639	720	720	2079						
s	4 x 6 Sq.mm	RM	250	265	265	780						
t	3 x 6 Sq.mm	RM	542	623	623	1789						
u	4 x 4 Sq.mm	RM	100	120	120	340						
v	3 x 4 Sq.mm	RM	600	690	690	1980						
w	4 x 2.5 Sq.mm	RM	100	100	100	300						
x	3 x 2.5 Sq.mm	RM	1000	1500	1500	4000						
y	2 x 2.5 Sq.mm	RM	440	440	440	1320						
z	2 x 4Sq.mm	RM	1500	1800	1800	5100						
E.03.6	Laying, testing and commissioning of 1100 V grade, Copper Conductor, XLPE Insulated, armoured, Low Smoke Zero Halogen Type and Fire Resistant / Survival Type Control Cables on existing trays/walls/columns/ indoor/ trenches with suitable clamps, saddles, hooks, bolts etc.											
a	2 C x 2.5 sqmm	RM	1353	1556	1556	4465						
b	3 C x 2.5 sqmm	RM	363	417	417	1198						
c	4 C x 2.5 sqmm	RM	2789	3207	3207	9204						
d	5 C x 2.5 sqmm	RM	1689	1942	1942	5574						
e	7 C x 2.5 sqmm	RM	1348	1550	1550	4448						
f	9 C x 2.5 sqmm	RM	204	235	235	673						
g	12 C x 2.5 sqmm	RM	149	171	171	492						
h	16 C x 2.5 sqmm	RM	149	171	171	492						
l	19 C x 2.5 sqmm	RM	380	437	437	1254						
E.03.7	Supply and providing terminations conforming to relevant Section of Specifications for XLPE insulated, LSZH and Fire Survival armoured / unarmoured cables of sizes given below including the cost of supplying, fixing and crimping copper lugs, double compression Flame proof brass glands, insulation tape etc. This also includes making holes in gland plate complete as per specifications and as required.											
a	4 x 300 Sq.mm	Each	134	170	170	474						
b	4 x 240 Sq.mm	Each	36	43	43	122						
c	4 x 185 Sq.mm	Each	18	22	22	61						
d	4 x 150 Sq.mm	Each	24	30	30	84						
e	4 x 120 Sq.mm	Each	2	2	2	6						
f	4 x 95 Sq.mm	Each	4	6	6	16						
g	3 x 95 Sq.mm	Each	2	2	2	6						
g	4 x 70 Sq.mm	Each	12	14	14	40						
h	3 x 70 Sq.mm	Each	4	6	6	16						
i	4 x 50 Sq.mm	Each	12	14	14	41						
j	3 x 50 Sq.mm	Each	4	6	6	16						
k	4 x 35 Sq.mm	Each	4	6	6	16						
l	3 x 35 Sq.mm	Each	2	2	2	6						
m	4 x 25 Sq.mm	Each	40	48	48	136						
n	3 x 25 Sq.mm	Each	2	2	2	6						
o	4 x 16 Sq.mm	Each	134	162	162	458						
p	3 x 16 Sq.mm	Each	4	6	6	16						
q	4 x 10 Sq.mm	Each	42	50	50	143						
r	3 x 10 Sq.mm	Each	40	48	48	136						
s	4 x 6 Sq.mm	Each	4	6	6	16						
t	3 x 6 Sq.mm	Each	34	42	42	118						
u	4 x 4 Sq.mm	Each	2	2	2	6						
v	3 x 4 Sq.mm	Each	4	6	6	16						
w	4 x 2.5 Sq.mm	Each	2	2	2	6						
x	3 x 2.5 Sq.mm	Each	2	2	2	7						
y	2 x 2.5 Sq.mm	Each	26	32	32	90						
z	2 x 4Sq.mm	Each	2	2	2	6						
E.03.8	Supply and Providing terminations conforming to relevant Section of Specifications for XLPE, LSZH, armoured / unarmoured cables of sizes given below including the cost of supplying, fixing and crimping copper lugs, double compression Flame proof brass glands, insulation tape etc. This also includes making holes in gland plate complete as per specifications and as required.											
a	3 C x 2.5 Sq.mm Cu. Cable	Each	8	10	10	27						
b	4 C x 2.5 Sq.mm Cu. Cable	Each	44	54	54	152						
c	5 C x 2.5 Sq.mm Cu. Cable	Each	44	54	54	152						
d	7 C x 2.5 Sq.mm Cu. Cable	Each	14	18	18	50						
e	9 C x 2.5 Sq.mm Cu. Cable	Each	8	10	10	27						
f	12 C x 2.5 Sq.mm Cu. Cable	Each	8	10	10	27						
g	16 C x 2.5 Sq.mm Cu. Cable	Each	8	10	10	27						
h	19 C x 2.5 Sq.mm Cu. Cable	Each	12	14	14	41						
l	2 C x 2.5 sqmm Cu. Cable	Each	66	80	80	226						
E.03.9	CABLE TRAY											

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Revised BOQ - MEP Works

S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
	Supply & installation of Prefabricated, perforated GI cable trays made of minimum 2mm thick GI sheets continuously connected including horizontal and vertical bends, reducers, tees, coupling plate and nut bolts washers, securing the support to the structure by dash fasteners, minor civil work, etc. duly suspended from the ceiling with 12mm dia vertical G.I rods supported by 40 mm X40 mm X5mm G.I angle etc. (or installed on wall supported on suitable brackets as required & approved) , conforming to relevant Specifications Section .											
a	600 mm wide x 50 mm deep	Meters	770	886	886	2541						
b	450 mm widex 50 mm deep	Meters	100	115	115	330						
c	300 mm wide x 50 mm deep	Meters	1650	1898	1898	5445						
d	150mm wide x 50mm deep	Meters	2530	2910	2910	8349						
e	100mm wide x 50mm deep	Meters	100	115	115	330						
	Without return flange											
a	600 mm wide x 50 mm deep	Meters	300	345	345	990						
b	450 mm widex 50 mm deep	Meters	50	58	58	165						
c	300 mm wide x 50 mm deep	Meters	3630	4175	4175	11979						
d	150mm wide x 50mm deep	Meters	2310	2657	2657	7623						
e	100mm wide x 50mm deep	Meters	1650	1898	1898	5445						
E.03.10	CABLE LADDER											
	Supply & installation of prefabricated, GI, ladder type cable tray conforming to Specifications , continuously connected including horizontal & vertical bends reducers, tees, coupling plate, nut bolts washers etc. The side runners shall be 100 x 20 x 2.5 mm and centre rungs shall be of size 30 x 15 x 2.5 mm with centre to centre distance of 250 mm, as required.											
a	600 mm wide	Meters	2800	3220	3220	9240						
b	450 mm wide	Meters	200	230	230	660						
c	300 mm wide	Meters	750	863	863	2475						
d	150 mm wide	Meters	150	173	173	495						
e	100 mm wide	Meters	100	115	115	330						
E.03.11	Supply, fabrication & installation of fabricated GI steel work conforming to specification, to support GI cable trays, bus duct, light fixtures, conduit wirings , Bracket ,& other electrical works including Tunnel servicesetc, as required. This includes all the fixing accessories like fasteners and all masonry works.	Kgs	41000	49200	49200	139400						
	TOTAL FOR CABLES, CABLE TRAYS & STEELWORK											
E.04	WIRING & ACCESSARIES											
	Whether explicitly stated in the schedules below or not, the following must be complied with:											
	For supply and installation of conduits, cable trunking, raceway, flexible conduits and wiring, relevant clauses of Specifications must be followed											
	Wires supplied must conform to relevant clauses of Specifications											
	Wiring accessories must conform to relevant Section of the Specifications											
	In case of any contradiction between BOQ and specifications, the most stringent condition of the two will apply.											
	All the items / parts mentioned in relevant clauses of the specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.											
E.04.1	Supply, Installation, Testing and Commissioning of conduting & wiring for primary point (MCB to first point) for light / fan / exhaust fan / call bell point with 2.5 sq. mm single core, copper conductor, LSZH wires, conforming to BS 7211 and relevant Section of Specifications, in cable trunking /conduits/flexible conduits/raceway complete, as required, as per specifications.	Points	65	75	75	215						
E.04.2	Supply, Installation, Testing and Commissioning of conduting & wiring for secondary point for light / fan / exhaust fan / call bell point with 2.5 sq. mm single core, copper conductor, LSZH wires, conforming to BS 7211 and Specifications, in cable trunking /conduits/flexible conduits/raceway complete, as required, as per specifications.	Points	449	516	516	1482						
E.04.3	Supply, Installation, Testing and Commissioning of conduting& wiring for primary point (MCB to first point) for light / fan / exhaust fan / call bell point with 2.5 sq. mm single core, copper conductor, Fire Survival Type, LSZH wires, conforming to BS 7846 and relevant Section of Specifications, in cable trunking /conduits/flexible conduits/raceway complete, as required, as per specifications.	Points	21	24	24	69						
E.04.4	Supply, Installation, Testing and Commissioning of conduting& wiring for secondary point for light / fan / exhaust fan / call bell point with 2.5 sq. mm single core, copper conductor, Fire Survival Type, LSZH wires, conforming to BS 7846 and relevant Section of Specifications, in cable trunking /conduits/flexible conduits/raceway complete, as required, as per specifications.	Points	150	173	173	495						
E.04.5	Supply, Installation, Testing and Commissioning of conduting& wiring for primary point (MCB to first point) for light / fan / exhaust fan / call bell point with 4 sq. mm single core, copper conductor, LSZH wires, conforming to BS 7211 and relevant Section of Specifications, in cable trunking /conduits/flexible conduits/raceway complete, as required, as per specifications.(For Flood lighting)	Points	7	8	8	23						
E.04.6	Supply, Installation, Testing and Commissioning of conduting& wiring for secondary point for light / fan / exhaust fan / call bell point with 4 sq. mm single core, copper conductor, LSZH wires, conforming to BS 7211 and relevant Section of Specifications, in cable trunking /conduits/flexible conduits/raceway complete, as required, as per specifications.(For Flood lighting)	Points	17	20	20	56						
E.04.7	Supply, Installation, Testing and Commissioning of conduting& wiring for primary point (From DB to switchboard & switch board to first point) for light / fan / exhaust fan / call bell point with 3 x 2.5 sq. mm single core, copper conductor, LSZH wires, conforming to BS 7211 and relevant Section of Specifications, in hot dipped galvanized welded steel conduit / flexible conduit, recessed / surface mounted complete with accessories such as bends, junction boxes, flexible conduit, pull boxes, saddles including cutting, chasing and refilling etc. complete, as required, with modular type switch, front plate, box etc. as per specifications.											
a	First point controlled by 16A switch\10A MCB	Each	72	83	83	238						
E.04.8	Supply, Installation, Testing and Commissioning of wiring for primary point (From DB to switchboard & switch board to first point) for light / fan / exhaust fan / call bell point with 3 x 2.5 sq. mm single core, copper conductor, Fire Survival Type, LSZH wires, conforming to BS 7846 and Section E02 of Specifications, in hot dipped galvanized welded steel conduit / flexible conduit, recessed / surface mounted complete with accessories such as bends, junction boxes, flexible conduit, pull boxes, saddles including cutting, chasing and refilling etc. complete, as required, with modular type switch, front plate, box etc. as per specifications.											
a	First point controlled by 16A switch\10A MCB	Each	25	29	29	83						
E.04.9	Supply, Installation, Testing and Commissioning of conduting& wiring for secondary / loop point for light / fan / exhaust fan / call bell point with 3 x 2.5 sq. mm single core, copper conductor, LSZH wires, conforming to BS 7211 and relevant Section of Specifications, in hot dipped galvanized welded steel conduit / flexible conduit, recessed / surface mounted complete with accessories such as bends, junction boxes, flexible conduit, pull boxes, saddles including cutting, chasing and refilling etc. complete, as required, with modular type switch, front plate, box etc. as per specifications.	Each	365	420	420	1205						

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S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
E.04.10	Supply, Installation, Testing and Commissioning of conduiting & wiring for secondary / loop point for light / fan / exhaust fan / call bell point with 3 x 2.5 sq. mm single core, copper conductor, Fire Survival Type, LSZH wires, conforming to BS 6387 and relevant Section of Specifications, in hot dipped galvanized welded steel conduit / flexible conduit, recessed / surface mounted complete with accessories such as bends, junction boxes, flexible conduit, pull boxes, saddles including cutting, chasing and refilling etc. complete, as required, with modular type switch, front plate, box etc. as per specifications.	Each	121	139	139	399						
E.04.11	Supply, Installation, Testing and commissioning of wiring for Tunnel light with 3 core x 4 sq.mm, armoured, XLPE insulated, Low Smoke Zero Halogen, Fire Resistant / Survival Type Cables conforming to BS 7846 and relevant Section of specifications, for tunnel lights including termination, saddles, earthing etc. complete as required.					0						
a	Primary Point	Each	60	69	69	198						
b	Secondary point	Each	470	541	541	1551						
E.04.12	Supply and fixing of M.S. electro-galvanised box in recess / surface for power points including providing and fixing of moulded plate type, universal 6 pin, 6 / 16A shrouded socket outlet (shuttered) as specified in Specifications, with 16A switch including connections, earthing and testing etc as required.	Each	150	173	173	495						
E.04.13	Supplying and fixing of 3 Phase, 5 pin, 32A industrial switch, (as specified in specifications), controlled socket outlet with straight plugs in IP - 65 enclosure including connections, earthing and testing etc. Complete as required	Each	21	24	24	69						
E.04.14	Supplying and fixing of 1 Phase, 3 pin, 16A industrial switch, (as specified in specifications), controlled socket outlet with straight plugs in IP - 65 enclosure for tunnel & station area including termination, earthing and testing etc. Complete as required	Each	78	90	90	257						
E.04.15	Supplying & fixing of 50 mm x 200 mm(w), rectangular, G.I. Cable trunking including pull boxes as required at site, 2 mm thick, as specified in relevant section of Specifications, with one side having continuous hinged cover with locking arrangement, earthing arrangement including provision of earthing strips at joints etc. complete as required.	RM	500	575	575	1650						
E.04.16	Supplying & fixing of 50 mm x 50 mm(w), rectangular, G.I. Cable trunking including pull boxes as required at site, 2 mm thick, as specified in section E03 of Specifications with one side having continuous hinged cover with locking arrangement, earthing arrangement including provision of earthing strips at joints etc. complete as required.	RM	1000	1150	1150	3300						
E.04.17	Supply and installation of following sizes of hot dipped galvanised welded steel conduit in surface / recess with GI junction boxes, pull box, saddles including cutting, chasing and refilling etc. complete as required.											
a	25mm dia conduit	RM	2000	2300	2300	6600						
b	32mm dia conduit	RM	300	345	345	990						
E.04.18	Supply and installation of following sizes of GI flexible conduit in surface / recess with coupler, saddles including cutting, chasing and refilling etc. complete as required.											
a	25mm dia conduit	RM	600	690	690	1980						
b	32mm dia conduit	RM	200	230	230	660						
E.04.19	Supply, Laying, Installation, Testing & commissioning of wiring for Advertisement point with 3 core x 4 sq.mm, armoured, XLPE insulated, LSZH, copper conductor cable/wire as per BS 6724 and relevant Section of specifications, including saddles, earthing etc. complete as required.											
a	Primary Point	Each	15	17	17	50						
b	Secondary point	Each	60	69	69	198						
E.04.20	Supply, Laying, Installation, Testing & commissioning of wiring for single phase 3 pin 16A industrial socket outlet with 3 core x 6 sq.mm, armoured, XLPE insulated, LSZH, copper conductor cable as per BS 6724 and relevant Section of specifications, including saddles, earthing etc. complete as required.											
a	Primary Point	Each	14	16	16	46						
b	Secondary point	Each	14	16	16	46						
4.22	Supply, Laying, Installation, Testing & commissioning of wiring for single phase 6 pin 6\16A socket outlet with 3 core x 4 sq.mm, armoured, XLPE insulated, LSZH, copper conductor cable/wire as per BS 6724 and relevant Section of specifications, including saddles, earthing etc. complete as required.											
a	Primary Point	Each	75	86	86	248						
b	Secondary point	Each	75	86	86	248						
E.04.21	Supply, Laying, Installation, Testing & commissioning of wiring for three phase, 5 pin, 32A industrial socket outlet with 4 core x 6 sq.mm, armoured, XLPE insulated, LSZH, copper conductor cable as per BS 6724 and relevant Section of specifications, including saddles, earthing etc. complete as required.	Each	21	24	24	69						
E.04.22	Supply, Laying, Installation, Testing & commissioning of wiring for single phase 3 pin 16A industrial socket outlet in Tunnel with 3 core x 6 sq.mm, armoured, XLPE insulated, LSZH, copper conductor cable as per BS 6724 and relevant Section of specifications, including saddles, earthing etc. complete as required.(Inside tunnel)											
a	Primary Point	Each	25	29	29	83						
b	Secondary point	Each	25	29	29	83						
E.04.23	Supply, Laying, Testing & commissioning of 4 core x 4 sq.mm, armoured, XLPE insulated, LSZH, copper conductor cable as per BS 6724 and relevant Section of specifications, for bus trunking connections including terminations, saddles, earthing etc. complete as required.	RM	800	920	920	2640						
E.04.24	Supply, Laying, Testing & commissioning of 2 core x 4 sq.mm, armoured, XLPE insulated, LSZH, copper conductor cable as per BS 6724 and relevant Section of specifications, for bus trunking connections including terminations, saddles, earthing etc. complete as required.	RM	50	58	58	165						
E.04.25	Supply, Laying, Testing & commissioning of 3 core x 2.5 sq.mm, LSZH, copper wire as per BS 7211 and relevant Section of specifications, from Tap off boxes to Lighting Fixture including connections, earthing etc. complete as required.	RM	1000	1150	1150	3300						
E.04.26	Supply, installation & testing of 25 A, Copper, Lighting Bus Trunking System in easy detachable and convenient assembly suitable for 415 +-10% Volts, 3 Phase+ Single Phase, 8 Wire, 50 Hz A C System with Cu Bus Conductors of minimum 2.5 sq mm section and stainless steel / hot galvanised steel enclosure, with tap off provision every 0.5 mtr. The Lighting Bus Trunking shall be confirming to latest IEC Standards. It shall be with IP-55 Protection, halogen free and Fault Level Withstand Capacity of 2.5 kA min for 0.1 Sec (Icw) and 9.6 kA (Ipk). The Bus Trunking shall be complete with accessies like supporting clamps for Installation at Site, Fixing Clamps for luminaries and cable & one run of Cu earthing of 25x3 sqmm. equal to phase etc as required.											
a	Straight Feeder 25 A (3 Mtrs Length)	Each	280	322	322	924						
b	End Feed Unit	Each	16	18	18	53						
c	End Covers	Each	16	18	18	53						
d	Flexible Joints	Each	5	6	6	17						
e	10/16 A Single Phase Tap Off Boxes with fuse and indication.	Each	280	322	322	924						
	TOTAL FOR WIRING & ACCESSARIES											
E.05	INDOOR LIGHTING AND FANS											

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S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
	The Lighting System specified herein, must conform to relevant Section of the Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between specifications and description in BOQ, the most stringent of the condition will prevail.											
	All the items / parts mentioned in relevant clauses of the specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.											
	Supply, Installation, Testing and Commissioning of the following LED Luminaires complete with LED chip,housing,heat sink and electronic driver, surface/recess mounting arrangement and all fixing accessories. All luminaries and accessories shall be as per Specification											
	All wiring within the luminaries must be with Low Smoke Zero Halogen Type and / or Fire Survival Type Wires, as per requirements Specifications.											
E.05.1	Supply, installation, testing and commissioning of surface mounted LED Batten - 38 Watt , with a system lumen output of 4000 lumens and a minimum system efficacy of >100 lumen/watt. The luminaire shall have a CRI of greater than 80 with rated system lifetime of 50,000 hours at L70. The luminaire is made of CRCA housing and shall have diffused optics. (BOH without False Ceiling Area)	Each	495	594	594	1683						
E.05.2	Supply, installation, testing and commissioning of LED 2X2 recess mounted fixture - 40 Watt that delivers 3500 nominal lumens at a system efficacy of >90lumen/watt for a design ambient temperature of 45 deg C . The luminaire shall have a CRCA powder coated body and a high efficiency diffuser. The light output shall have a CRI>80 and the luminaire shall be made available with a CCT 6500K. The electronic driver shall operate a power factor>0.9 and a THD<10%. (BOH with False Ceiling Area)	Each	51	61	61	173						
E.05.3	Supply, installation, testing and commissioning of LED trunking system - 40 Watt , with a system lumen output of 4000 lumens and a minimum system efficacy of >100 lumen/watt. The luminaire shall have a extrusion housing and light emitted shall have a CRI>80 with rated system lifetime of 50,000 hours at L70. The extrusion housing shall be available in 4', 8' and 12' sections. (Platform Public Area, Entry Corridor)	Each	337	404	404	1146						
E.05.4	Supply, Installation, Testing & commissioning of luminaire - 70 Watt as per approved make of list. Fitting should have a aluminium pressure die cast housing with dedicated optics with protected LED's giving a lumen output of 7200 lumens with efficacy of more than 100 lm/W giving optimal light distribution for symmetric/asymmetrical configuration and used for height levels between 5-9 metres.A system efficacy of >100 lm/W with a lumen output of 7000 lumens and a CCT of 5700K with a power factor of >.90.It is designed to meet IP65 specifications ensuring L70 for 50000 burning hours with a TDH<20%.The luminaire complies with requirements of CE ,CISPR 15Ed72 , IEC 61347-2-13, IEC 61547, IEC 62384. (Concourse Double Height Area)	Each	22	26	26	75						
E.05.5	Supply installation testing and commissioning of surface mounted LED Batten with 18 watt input wattage. Luminaire should be dust, jet and shock proof luminaire . Should have Polycarbonate	Each	128	154	154	435						
		Each										
E.05.6	Supply, installation, testing and commissioning of LED Downlighter - 12 Watt with a system lumen output of 1000 nominal lumens at a minimum system efficacy minimum 95 lm/W. The luminaire shall have a CRI greater than 80 with rated system lifetime of 50,000 hours at L70. The luminaire optics shall have a high efficiency diffuser with more than 85% transmittance. Height of luminaire shall not be more than 70mm. (Toilets)	Each	25	30	30	85						
E.05.7	Supply, installation, testing and commissioning of LED Linear 1x4 recessed fixture - 42 Watt, with a system lumen output of 3000 lumens at an efficacy of >65 lm/W. The luminaire shall have powder coated CRCA housing and light output is by means of Semi High Gloss optics with 3D Lamellae and High Purity Anodized Aluminium mirrors. (Concourse Public Area)	Each	154	185	185	524						
E.05.8	Supply, installation, testing and commissioning of surface mounted LED Bulkhead - 10 Watt with a system lumen output of 600 lumens and a system efficacy of minimum 60 lumen/watt. The luminaire shall be IP66 & IK09 rated and shall have a CRI of 70. The housing of luminaire is made of high pressure die cast aluminium with front cover made of polycarbonate diffuser. (Shaft Area)	Each	22	22	22	66						
E.05.9	Recess mounted luminaire suitable for TLED 18W lamps for vertical lighting with asymmetric light distribution for indoor application, Housing made up of CRCA sheet steel, powder coated white accommodating all electrical accessories prewired upto a terminal block. Asymmetric light distribution offers high vertical light levels for rack/shelf and suitable for single TLED in single lamp version (wall washer)	Each	11	13	13	37						
E.05.10	Supply, installation, testing and commissioning of surface mounted LED Batten - 42 watt, with a system lumen output of 3500 lumens and a minimum system efficacy of minimum 80 lumen/watt. The luminaire shall have a CRI of greater than 80 with rated system lifetime of 50,000 hours at L70. The luminaire is made of CRCA housing and shall have diffused optics. (Platform Walkway)	Each	33	40	40	112						
E.05.11	Supply, installation, testing and commissioning of Luminaire - 19 Watt consist of extruded Aluminium alloy body sealed on to an extruded polycarbonate Prismatic protector having impact resistance IK 10 with a removable sliding plate equipped with control gear on one side and lamp on the other; one or two frames made out of injection moulded polycarbonate sealed on to the ends of the Luminaire with one or two polycarbonate covers closed with 2 stainless steel screws. System ensures a tightness of IP 67 for the whole luminaire suitable for 8 LEDs with all mounting accessories and 2 numbers of glands (suitable for loop in and loop out). (Tunnel)	Each	530	636	636	1802						
E.05.12	Supply, installation, testing and commissioning of surface mounted LED flood light - 137 Watt with a system lumen output of 14400 lumens. The luminaire shall have a aluminium pressure die-cast housing and a minimum system efficacy of >100 lumen/watt. The luminaire shall have a CRI greater than 70 with rated system lifetime of 50,000 hours at L70. (Outdoor DG & Cooling Tower Area)	Each	10	10	10	30						
E.05.13	Supply, installation, testing and commissioning of surface mounted LED flood light - 140 watt with a system lumen output of 14000 lumens. The luminaire shall have a aluminium pressure die-cast housing and a minimum system efficacy of >100 lumen/watt. The luminaire shall have a CRI greater than 70 with rated system lifetime of 50,000 hours at L70.	Each	3	3	3	9						
E.05.14	LED Trunking with System Efficacy > 90 Lumens / Watt , CRI > 80 , with Lumen output of 4000 Lumens with 40 Watt , SDCM < 3.5 , with Xitanium Driver , Class 1 , Optics - Frosted Diffuser, Injection moulded Plastic Cap, Option of Symmetric, LED TRUNK;LP3.1X2;5000K.	Each	10	15	15	40						
E.05.15	Extruded Aluminum Housing with High Efficiency Extruded Polycarbonate Diffuser with provision of End to End connection and life class of 40 K Hours @ L70 and Efficacy of 80 Lm / Watt and wattage of 8 Watts with Voltage Range - 160 – 270 Watts , Driver Efficiency > 80 % , Power Factor > .9 , THD < 33 % , and High Cut off Protection at 270 Volts.	Each	10	10	10	30						
E.05.16	Down light with LEDs of Lumileds make which have non replaceable High Wattage LED. Color temperature =5700K. Constant current electronic driver. CRI>70. High efficiency white reflector. System Wattage of luminarie=15W.Voltage range of operation= 160V to 270V. Power factor> 0.9 System efficacy = 60 lumens per watt. Completely sealed from bottom with Polycarbonate Diffuser, Cut out =165mm. 40,000 hours burning life. Zero Maintenance , Zero mercury . The outer diameter of the front frame should not be more than 180mm made from high quality engineering plastic and the overall depth of the luminaire should not exceed 75mm.	Each	10	10	10	30						

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							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
E.05.17	Recessed mounted led down light luminaire with pressure die cast aluminum housing which acts as a proper heat sink to ensure a long service life. The total power consumption should not exceed 10W (including driver). The Luminaire should have an integrated electronic driver delivering constant current output. The luminaire should have a matt finished high efficiency aluminum reflector with polycarbonate diffuser . Led should have life of 40K with minimum 70% lumen maintenance. The outer diameter of the front frame should not be more than 110mm made from high quality engineering plastic and the overall depth of the luminaire should not exceed 75mm Color Temperature 5000K CRI>70. LM80-08 For LED Source & LM79-08 test report must be submitted.	Each	10	10	10	30						
E.05.18	LED Batten with System Efficacy > 90 Lumens / Watt , CRI > 80 , with Lumen output of 3800 Lumens with 40 Watt , SDCM < 3.5 , with Xitanium Driver, output of 3800 Lumens with 40 Watt , SDCM < 3.5 , with Xitanium Driver, Class 1 , Optics - Frosted Diffuser, Injection moulded Plastic Cap , Option of Class 1 , Optics - Frosted Diffuser, Injection moulded Plastic Cap , Option of Symmetric / Asymmetric.	Each	10	10	10	30						
E.05.19	LED 2X2 with Mid flux LED using efficient optics , System lumen efficacy > 80Lumen/Watt , System Luminous flux of 3450 lumens, System Wattage =43W . 50,000 hours burning life. . Color rendering index > 70 %. Color temperature 5000K. CRCA housing with high efficiency opal diffuser. Luminaire sealed from bottom. Inbuilt gear . Zero maintenance, Zero mercury. Offers 0.15w/sq ft /100Lux. LED efficacy>110 lumen/watt. LED binning code is 5SDCM. Lumen output >3500 from fixture level. Luminaire efficacy>80lumen/watt. Driver Surge protection available. Grey/white frame option.	Each	5	5	5	15						
E.05.20	2 x 2 Direct Indirect LED Luminaire with Life Class of 40 K Burning Hours @ L70 ,Stepped optics with Lumens of 2900 Lumens at System level , Lumen Efficacy of 76 Lumens / Watt , CRI > 70 , with built in Electronic Driver , PF > .9 , THD < 15 % , IEC Complint for Safety Performance & EMI , CRCA Housing and High Efficiency Diffuser.	Each	30	30	30	90						
E.05.21	Integral LED luminaire with a pressure die cast housing with dedicated opticsfor optimal light distribution. A specially designed heat management system to ensure system luminous efficacy > 90 lm/ W and ensure lumen depreciation upto 30% over 50,000 burning hours. The luminaire is designed to meet IP 65 classification and is compliant with relevant immunity, safety and performance and EMI standards. System wattage of 80 Watts , Lumen – 7300 lumens , CCT – 5700 K , CRI > 70 , Pf > .9 , THD < 20 %.	Each	30	30	30	90						
E.05.22	Endura LED- Bulkhead can be installed as ceiling mounted and wall mounted. It serves as a simple energy efficient alternative to CFL/incandescent bulkhead luminaires. The luminaire is designed to meet IP 66 and IK 09 classification and is compliant with relevant immunity, safety and performance and EMI standards. System wattage of 10 Watts , Lumen – 600 lumens , CCT – cool white , CRI > 70 , Pf > .9 , THD < 20 %.	Each	50	50	50	150						
E.05.23	Down light with LEDs of Lumileds make which have non replaceable High Wattage LED. Color temperature =5700K. Constant current electronic driver.CRI>70. High efficiency white reflector. System Wattage of luminarie=15W.Voltage range of operation= 160V to 270V. Power factor> 0.9 System efficacy = 60 lumens per watt. Completely sealed from bottom with Polycarbonate Diffuser, Cut out =165mm. 40,000 hours burning life. Zero Maintenance , Zero mercury . The outer diameter of the front frame should not be more than 180mm made from high quality engineering plastic and the overall depth of the luminaire should not exceed 75mm.	Each	20	20	20	60						
E.05.24	EnduraalLED Waterproof can be installed as surface mounted and suspended mounted. It serves as a simple energy efficient alternative to Fluorscent waterproof luminaires. The luminaire is designed to meet IP 65 classification and is compliant with relevant immunity, safety and performance and EMI standards. System wattage of 43 Watts , Lumen – 3500 lumens , CCT – 6500K , CRI > 80 , Pf > .9 , THD < 20 %.	Each	10	10	10	30						
E.05.25	SITC of Suspended Linear LED75 mm wide fitting with housing made of Extruded Aluminum and anodized finish. The diffuser should be Extruded Polycarbonate and the heat sink should be made of CRCA. The luminaire should have options for standalone(8ft and 4ft) unit lengths and should also have provision for continuous mounting. LED Used shall be SMD type and fixture should have minimum efficacy at System level (Not Chip Level) >=110lumens/watt, Life of fixture 50000hrs@L70B50 Lumen maintenance, CCT choice available in 4000K and 6500K, CRI >80, SDCM<5, PF >0.95, THD<10%, an operating Voltage Range of 140 - 270 V, 50Hz, and should have class B serviceability . Minimum Internal Surge Protection 2.5KV. The luminaire shall have a CRCA gear tray with reflectors for mounting of driver and this should ensure lower glare ratings for the fixture. The luminaire shall have movable suspension points for ease of installation. The fixture should comply with the parameters as per IS10322 and IEC60598, EMC / EMI compliance, Minimum system Lumens 4400 for a 8ft luminaire.	Each	100	100	100	300						
E.05.26	SITC of recess Mounted Linear LED 75 mm wide fitting with housing made of Extruded Aluminum and anodized finish. The diffuser should be Extruded Polycarbonate and the heat sink should be made of CRCA. The luminaire should have options for standalone(8ft and 4ft) unit lengths and should also have provision for continuous mounting. LED Used shall be SMD type and fixture should have minimum efficacy at System level (Not Chip Level) >=110lumens/watt, Life of fixture 50000hrs@L70B50 Lumen maintenance, CCT choice available in 4000K and 6500K, CRI >80, SDCM<5, PF >0.95, THD<10%, an operating Voltage Range of 140 - 270 V, 50Hz, and should have class B serviceability . Minimum Internal Surge Protection 2.5KV. The luminaire shall have a CRCA gear tray with reflectors for mounting of driver and this should ensure lower glare ratings for the fixture. The fixture should comply with the parameters as per IS10322 and IEC60598, EMC / EMI compliance, Minimum system Lumens 4400 for a 8ft.	Each	100	100	100	300						
E.05.27	SITC of LED indirect output light to ensure soft and uniform light for visual comfort. The LED light source should not be directly visible to avoid any kind of glare to users. The luminaire shall have a UGR<22 when installed at a general height of 10ft from the ground. The Luminaire shall be avaulable in CCT of 6500K with a CRI>80 and SDCM of 4. THD<10% PF>0.9 Lifetime of atleast 50000 burning hours at L70B50 at an ambient temperature of 25 degreeC for reliable performance. There should be no flicker in the operation of the light. The luminare shall have a lumen output of atleast 3600lumens with a system efficacy of 100lm/W. Should have an option of DALI dimming. it should have a CLass B servicability. LM79 adn LM80 reports of the fixture to support the technical requirment.	Each	50	50	50	150						
E.05.28	SITC of LED light with semi high gloss optics with 3D lamella D8 office compliant fixture . The Luminaire shall be avaulable in CCT of 6500K with a CRI>80 and SDCM of 4. THD<10% PF>0.9 Lifetime of atleast 50000 burning hours at L70B50 at an ambient temperature of 25 degreeC for reliable performance. There should be no flicker in the operation of the light. The luminare shall have a lumen output of atleast 2800lumens with a system efficacy of 65lm/W. Powder coated CRCA housing high pure anodized reflective mirrors. Should have an option of DALI dimming. it should have a CLass B servicability. LM79 adn LM80 reports of the fixture to support the technical requirment.	Each	50	50	50	150						
E.05.29	SITC of High Pressure Die Cast Aluminium Alloy housing LED High Bay Luminaire with specially designed heat sinks dust free. for high ceiling heights having beam Angle 60 deg / 110Degree,PMMA material Penuts Lenses for effective light distribution, minimum Luminous flux (Lumen)16500 with a system 120lm/W .Corelated Color Temp 6500K,CRI>80,Maintenance of lumen L70 (Hrs) 50K@L70,Ambient temperature (Ta) 45Degree,optics narrow or widebeam optics, optical cover glass. Aluminium PDC Housing. Protection of Fixture:- IP65,IK08,Class I, power factor >0.95, Surge protection 4KV,Votage range 120-277V AC, Lumen standard /Test certificate as per IEC 60598 and IS10322. LM 79 and LM80 reports needs to be submitted from a NABL/UL Approved Laboratory. The luminaire should be DALI Dimmable. Driver should be as per BIS approved. Spare driver should be easily replaceable at the site.	Each	10	10	10	30						

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							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
E.05.30	SITC of LED Flood light fixture with high power LEDs , IP66 and IK05 protection made of single LM6 high pressure die cast aluminum housing capable of delivering a nominal system lumen output in the range of 14000- 22000 lumens at a minimum system efficacy of 105lumen/watt and a CRI at least 70. The luminaire shall have options of rotationally symmetrical beam as well as a narrow and asymmetric beam with the help of secondary lenses on the LED light source. The lens plate should not be glued to the body of the luminaire but should be screwed. The fitting shall have a defined system of heat dissipation with the help of vertical fins to abstain from accumulation of dust/dirt on the luminaire. It should have a universal bracket and a graduation disk for aiming to ensure proper installation. The luminaire shall have a life class of 50,000 hours @ L70 for a design ambient of 35 Deg. C and driver efficiency of >85%. THD < 20% and minimum power factor of 0.9 at full load. The luminaire shall be Class I protection enabled. The overall height of the luminaire shall not be more than 165mm. LM-79/LM-80 report should be supplied for LED luminaire/LED chip.	Each	10	10	10	30						
E.05.31	SITC of interior rated cove lighting fixtures with beam options of washing as well as grazing applications. The luminaire to have an asymmetric wash for better uniformity with a uniformity ratio of less than 3:1 on a 3 m (9 ft) wall with an 0.5 m (1.5 ft) setback. The fixture should be available in standard sizes of 1/4ft with system lumen output of 880lm/ft at a CCT of 4000K and CRI of 81 and a system lumen efficacy of atleast 76lm/W. Lifetime of atleast 50000 burning hours at L70 at 25degC. The luminaire shall have a powerfactor of 0.99 at 120V supply. The luminaire shall be dimmable by the avialable ELV type dimmers. The width of the fixture to be not more than 41mm for ease of installation.UL / cUL, FCC Class B, CE, C-Tick, CCC certified. IP20 rated fixture for indoor use. Operating temperature range of minus 40 to 50degC and humidity of 0-95%. Die cast aluminium housing with polycarbonate lens. Operating voltage range of 100-277V AC.	Each	10	10	10	30						
E.05.32	SITC of LED lights with textile to create a white light ceiling surface for daylight experience that hides the source of light completely. Dimension of one panel luminaire dimension should not be greater than 2.7x1.8mt with the smallest dimension being 0.9x0.9mt with a depth of 155mm .Depth is considered with e-box. The weight of the luminiare should be gretae than 42kg. The light output should be at least 3200lm/sq mt. The CCT should be 3000k or 4000k. The CRI of the luminiare should be not less than 85. The luminaire should have life of 50k hrs for L70. The luminaire should have acoustics properties of aw 0.6 class C EN 11654, also the noise reduction co-efficient of NRC 0.6 ASTM C423 – 99. The luminaire driver should be compatible for DALI or 0-10V. The lumnaire should be compatible for ambient temp of 5 to 35 °C. Approbated for fire rating of fabric by (EN 13501) B-s1, d0 and panel at (EN 13501) B-s2, d0. CE certified luminaire.	Each	10	10	10	30						
E.05.33	SITC of wall or ceiling mounted textile panels with high quality industrial fabric of Class B-s2,d0 (EN 13501-2 Euroclass)fire rating with mutli-colored LED with the ability to display dynamic content remotely controlled and managed. Maximum size of panel possible 6.4x1.2mt. Possibility of wall(surface/recessed) or ceiling mounting (surface,recess or suspended).Solution to have customised dimensions as per site requirement .The fixture shall have thickness of not more than 127mm, including mounting elements. It should be available in different sizes to suit the applications. Suitable for indoor use, IP20rated. Maximum weight is 19.3kg/m2.The panel shall have a power consumption of not more than 55W/ sqmt and luminance of upto 170Cd/sqmt for specific textiles. Pixel pitch of 60mm with RGB LEDs with an integrated playback controller. Should be compatible with content manager software for programming and content source to be .wmv files. It should be controllable through all of the below mentioned features- DiscoverME LTP mobile applications/Remote control/Intregrated scheduler/ access through any computer connected to the luminous textile panel network. There should not be any limit to the number of panels connected in a system. It should have a sound absorption coefficient of 0.45. Main power connection with IEC connectors, RJ45 Ethernet connector for Data. Operating voltage range of 100-240VAC, operating frequency range of 50-60Hz and operating temperature range of 5-35degC. Lifetime to be atleast 60000 hours at L70 at an ambient temp of 25 degC. Class B-s2,d0 (EN 13501-2 Euroclass)rated for fire safety. EN13501-2 rated. CE/UL/CCC/ GOST-R approved.	Each	10	10	10	30						
E.05.34	LED Step-Light BWG150, Low-power white-light LED light source, available in a choice of warm white (3000 K) or neutral white (4000 K), Long lifetime of 25,000 hours (70% lumen maintenance @ Tc = 25°C), IP67 protection.	Each	10	10	10	30						
E.06	Temporary Lighting at Station					0						
E.06.1	Installation & Commissioning of 40Watt tube lights with cover 350 No. approx. along with the necessary wiring & power supply arrangement to provide general lighting at concourse, Platform ,Undercroft and Tunnel area during construction period.	per tube light for 240 days	200	200	200	600						
E.06.2	Cost (Addition/deletion) of Installation and Commissioning of 40 watt tube lights with cover 10No/day approx. along with the necessary wiring and power supply arrangement , to provide general lighting at concourse, Platform, Unddercroft& Tunnel area during construction period.	L/s	1	1	1	3						
E.07	External Station Lighting					0						
E.07.1	9.0 meter hot dipped galvanised Octagonal Lighting pole with single overhang arith foundation bolts, base plate complete with foundation, entry and exit pipes, control JB with connector generally as shown on drawings and as per specifications.	Each	10	10	10	30						
E.07.2	9.0 meter hot dipped galvanised Octagonal Lighting pole with double overhang arith foundation bolts, base plate complete with foundation, entry and exit pipes, control JB with connector generally as shown on drawings and as per specifications.	Each	10	10	10	30						
E.07.3	7.0 meter hot dipped galvanised Octagonal Lighting pole with single overhang arith foundation bolts, base plate complete with foundation, entry and exit pipes, control JB with connector generally as shown on drawings and as per specifications.	Each	10	10	10	30						
E.07.4	7.0 meter hot dipped galvanised Octagonal Lighting pole with double overhang arith foundation bolts, base plate complete with foundation, entry and exit pipes, control JB with connector generally as shown on drawings and as per specifications.	Each	10	10	10	30						
E.07.5	Supply, installation, testing and commissioning of LED Street light fixture - 70 watt with IP66 protected LM6 high pressure aluminium die cast housing capable of delivering a nominal system lumen output of 7200 lumens with a minimum system efficacy of >85 lumen/watt and a CRI greater than 70. The luminaire shall have a life class of 50,000 hours @ L70 and driver efficiency of >85%.	Each	20	20	20	60						
E.07.6	Supply of 75mm dia HDPE pipe confirming to PN-4 boring of road channel area by using open trench method and laying of HDPE pipe properly continuously jointed restoring the surface where pitting is done ,to original position.	RM	100	100	100	300						
E.07.7	Supply of 75mm dia HDPE pipe confirming to PN-4 boring of road channel area by using trench less method and laying of HDPE pipe properly continuously jointed restoring the surface where pitting is done ,to original position.	RM	100	100	100	300						
E.07.8	Supply and laying of 6 SWG wire along with the cable	RM	300	300	300	900						
E.07.9	Providing and fixing thermo plastic poly carbonate pole boxex confirming to IP-65 degree of protection, along with 16A MCB and 5 way connector and 2 No. cable gland suitable for 4x25 sq.mm cable.	Each	50	50	50	150						
E.07.10	wiring for luminaries in existing poles with following sizes of unarmoured cu cables from pole box to each fittings.											
a	3x2.5 sq mm	RM	1000	1000	1000	3000						
	TOTAL FOR INDOOR LIGHTING AND FANS											
E.08	PROTECTIVE, CLEAN EARTH AND LIGHTNING PROTECTION SYSTEM											
	The Earthing and Lightning Protection System specified herein, must conform to relevant Section of the Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between specifications and description in BOQ, the most stringent of the condition will prevail.											
	All the items / parts mentioned in relevant clauses of the specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.											
E.08.1	Earthmat											

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Revised BOQ - MEP Works

S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
a	Supply, laying, testing and commissioning of 20 mm dia Copper rod (min. 97% conductivity) for earth mat (min. 500mm deep below base slab as per approved drawing and as directed) as per specifications including lap (of not less than 150mm) & cross weld joints (including exothermic weld/mold) and providing bitumin coat at every joint as required. Risers from earth mat to be brought out as per approved drawings and specifications. (Cost of risers not included in this item).	RMT	800	800	800	2400						
b	Supply, laying, testing and commissioning of 20 mm dia Copper rod, laying of vertical earth electrodes 3 m deep with earth enhancing material from earth mat including weld joints (including exothermic weld/mold) with earth mat as per approved drawings and specifications. The weld joints to be provided with bitumin coats.	Nos.	40	40	40	120						
c	Supply, laying, testing and commissioning of 240 sqmm Cu flexible conductor, for each electrode up to 1.5 mtr above the undercroft finished floor level including 50 mm dia HDPE pipe for mechanical protection of flexible rised as required as per approved design.	mtr	1000	1000	1000	3000						
E.08.2	Clean Earthmat											
a	Supply, laying, testing and commissioning of 13 mm dia Copper rod (min. 97% conductivity) for earth mat (min. 500mm deep below base slab as per approved drawing and as directed) as per specifications including lap (of not less than 150mm) & cross weld joints (including exothermic weld/mold) and providing bitumin coat at every joint as required. Risers from earth mat to be brought out as per approved drawings and specifications. (Cost of risers not included in this item).	RMT	200	200	200	600						
b	Supply, laying, testing and commissioning of 13 mm dia Copper rod, laying of vertical earth electrodes 3 m deep with earth enhancing material from earth mat including weld joints (including exothermic weld/mold) with earth mat as per approved drawings and specifications. The weld joints to be provided with bitumin coats.	Nos.	10	10	10	30						
c	Supply, laying, testing and commissioning of 120 sqmm Cu flexible conductor, for each electrode up to 1.5 mtr above the undercroft finished floor level including 50 mm dia HDPE pipe for mechanical protection of flexible rised as required as per approved design.	mtr	200	200	200	600						
E.08.3	Supply and laying,Testing and commissioning of copper/wire for interconnecting the earthing stations ,panels,DBs etc. of the following sizes in built up trenches /surface/wall/ground complete with holes & fixing,jointing / terminating accessories as per specifications & drawing as required. (Quantity shall be paid as per the actual measurement as executed, however direct measurement shall not excced the quantity indicated in drawing approved .											
d	75mmx10mm Cu strip for MET	RM	300	500	500	1300						
d	50 mm x 6 mm Cu strip	RM	2500	3000	3000	8500						
e	50 mm x 4 mm Cu strip	RM	1500	1800	1800	5100						
f	25mm x 3 mm Cu strip	RM	4000	4800	4800	13600						
	Supply of GI strips / rods / wires (minimum 97% conductivity) of the following sizes for provision in Earthing System.											
g	75 mm x 10 mm GI strip	RM	200	240	240	680						
h	50 mm x 10 mm GI strip	RM	200	240	240	680						
i	50 mm x 6 mm GI strip	RM	1500	1800	1800	5100						
j	32 mm x 5 mm GI strip	RM	100	120	120	340						
k	25 mm x 6 mm GI strip	RM	1000	1200	1200	3400						
l	8 SWG / 4 mm diameter, copper Wire	RM	500	600	600	1700						
	Supply, laying and testing of unarmoured, stranded copper conductor, Low Smoke Zero Halogen, green coloured cables of following sizes, conforming to BS 7211, for earthing, including termination of the same by copper lugs at both ends.											
m	1 x 6 sq. mm	RM	100	120	120	340						
n	1 x 10 sq. mm	RM	100	120	120	340						
o	1 x 16 sq. mm	RM	100	120	120	340						
p	1 x 70 sq. mm	RM	500	600	600	1700						
q	1 x 150 sq. mm	RM	250	300	300	850						
E.08.4	Supply and making of G.I Main earth connection / terminal of size 75 mm x 10 mm, 600 mm mounted on 2 Nos. SMC / DMC insulator for connection with Principal earth Terminal / Connection including copper nut-bolts, washers etc. complete as per specifications and drawings for protective earthing.	Each	40	48	48	136						
E.08.5	Supply and making of G.I Main earth connection / terminal of size 32 mm x 5 mm, 300 mm mounted on 2 Nos. SMC / DMC insulator for connection with Principal earth Terminal / connection including G.I nuts-bolts, washers etc complete as per drawings for clean earthing.	Each	10	12	12	34						
E.08.6	Supply and laying of G.I air terminations of 25 mm diameter, 600 mm length, copper tube having five prong at top, 3 mm thick, 100 mm diameter, G.I base plate with holes, making foundation and fixing hard ware, as required and as per specifications and drawings.	Each	10	12	12	34						
E.08.7	Supply, Installation, Testing and commissioning of Copper Rod earth electrodes of the following sizes complete with nut, bolts & washers for terminations, as required, and as per specifications & drawings.											
a.	22 mm diameter 3000 mm long copper earth electrode	Each	16	19	19	54						
E.08.8	Supplying & Installaion of test joints with the following sizes of G.I Strip with bimetallic test link of length 125 mm ,4 nos. bolts, nuts and washers of brass, DMC support, as required, and as per specifications and drawings etc.											
a	75 mm x 10 mm G.I strip	Each	12	14	14	41						
b	50 mm x 6 mm G.I strip	Each	6	7	7	20						
E.08.9	Providing and making plate earthing station including the cost of 600 mm x 600 mm x 6.3 mm G. I. plate electrode, 15 mm dia G.I.watering pipe, CI funnel with wiremesh charcoal/coke , salt, all earth work, masonry enclosure with frame, Heavy duty RCC top cover plate having locking arrangement,Disconnecting links, complete as per IS 3043:1987 for earthing.	Each	6	7	7	20						
E.08.10	Providing and making plate earthing station with 600mm x 600 mm x 3 mm Cu plate electrode , 15 mm dia G.I.watering pipe, CI funnel with wiremesh charcoal/coke , salt, all earth work, masonry enclosure with frame, Heavy duty RCC top cover plate having locking arrangement,Disconnecting links, complete as required as per IS-3043-1987 for earthing.	Each	6	7	7	20						
	TOTAL FOR PROTECTIVE, CLEAN EARTH AND LIGHTING PROTECTION SYSTEM											
E.09	UPS											
	Supply, Installation, Testing and Commissioning of 2 x 80KVA, True Online Double Conversion, Parallel Redundant, 3 Phase AC Input & 3 Phase AC Output, UPS System having an Ingress protection Rating of IP 21 consisting of the following:	Sets	2	2	2	6						
	Galvanic Isolation Transformer at Inverter output with Delta Connection of primary to separate input and Output neutral.											
	IGBT Rectifier Modules to achieve less than 5% Input Current Distortion and greater than 0.9 Power Factor at Input											
	Completely Microprocessor based with Diagnostics capability											
	Input phase Reversal Correction without switching to batteries											
	Maintenance by-pass module.											

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Revised BOQ - MEP Works

S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
	SMF VRLA battery each having 30 minutes back up time at full load with interconnecting cables, racks and standard accessories (2V Cells with 20 Years Design life).											
	Isolation switches / MCCB for UPS as per Drawings & Specification and MCCB box with 2 pole DC MCCB of suitable rating for battery bank.											
	Note: One Set of UPS = Two Nos of 80 KVA Unit including Battery Bank with each Unit.											
	TOTAL FOR UPS											
9.1	BUS DUCTS											
	Design, manufacture, testing at works, supplying, testing of sheet steel structure following rating (Amps) Sandwich type TPN "Cu" bus duct having neutral cross section equal to phase, 50% Integral earth which is part of housing itself and class F insulation and enclosure will be of minimum 1.6 mm GI sheet steel epoxy powder coated. The bus bar will be of copper with radialised edges. Individual sections will not be more than 3 meters long uniblock. One section will be connected to adjacent section by joint system operating by single bolt. Sub assembly will removable with out disturbing the adjacent bus bars. Rates shall be inclusive of all accessories i.e. bends, end feed box etc. as required.											
9.2	5000A Sandwich Bus duct With short circuit withstand of 65kA for One sec											
	supplying, Installation testing & commissioning of flanged end copper flexible with all accessories as required for the following rating of bus duct. The Flange End should be suitable for the Transformers/ Panels: 5000 Amps											
	Supply, Installation, Testing and Commissioning of the following totally enclosed, dust and vermi proof Low impedance compact sandwich bus duct as per technical specification, relevant standards & codes of practice applicable complete as required:											
	Ingress protection IP - 66											
	Outdoor Mounts											
	14 SWG sheet steel clad											
	Operation at 415 Volt 3 phase 50 Hz system											
9.3	Insulation voltage 1100 Volts											
1	Fault withstand 65 kA symmetrical for 1 second											
a	50% Internal Earth Bus											
b	The bus duct shall be complete with all required accessories like clamps, end covers, thrust pads, flexible connections etc. as required and including wall mounting brackets and including the cost of expansion joints complete as per specifications, as required and as below and suitable for operation at 415 volt 3 phase 50 Hz system.	RM	80	80	80	240						
Note:-	2000 amps 3P + 100% N including bends	RM	20	20	20	60						
a	Supply, Installation, Testing and Commissioning of the Aluminum / Copper /Bi metallic flexible end termination / flange joints including adapter box suitable for bus duct connection from top / bottom of switchgear panels / equipments and of the following current ratings compatible with the bus ducts as per above complete as required:											
b	2000 amps 3P + 100% N	Each	5	6	6	17						
	TOTAL FOR BUS DUCTS											
E.10	Diesel Generator Sets											
	Design, Manufacture & Supply of DG sets along with AMF Panel and all accessories etc. as require, as per the following details and Capacity / Rating: The entire set shall be housed in sound proof enclosure mounted on suitable rubber-in-shear type vibration mounting with 6 mm static deflection for isolating the building floor, adapter box for cable termination with extension bus bar including 2000 A, 4-Pole MCCB isolator, alongwith Batteries and Battery Chargers (with stand), for normal and tricle charging facility with isolating switch, leads, cover etc. Drip Tray for fuel tank,Drip Tray below engine crank case Any other item not specifically mentioned but required for proper performance and safe working of the system. <u>BMS SCADA Connectivity</u> The DG Set shall be provided with Communication facilities, Contractor should provide Single point to communicate with BMS/SCADA for all system parameters of the the DG Set. Including accessories & software and hardware as required,											
	DG sets shall be suitable for auto starting & auto synchronising with auto load sharing and remote monitoring & control arrangement compatible with the existing electrical system as per particular specifications, complete as required.											
	Suitable number of silencers per DG set along with the insulation / aluminium cladding for sound attenuation as per specifications.											
	Supply of rubber mat in front and back of DG Control Panel (/ AMF panel)/ <u>Isolation panel as per latest standards (IS:15652:2006) amended upto date.</u>											
	Detailed, Maintenance & Operation manuals, to be supplied after 3 months of Date of vendor approval of DG sets complete as per the specifications.											
	1820 KVA (comprising of 2 DG sets of minimum 910 kVA capacity each).	Sets	1	1	1	3						
E.10.1	INSTALLATION of DG sets											
	Installation/Erection, Testing & Commissioning including Integrated Testing with all systems for the DG sets along with all accessories for the following Capacity DG sets complete as per specifications as required.											
	1820 KVA (comprising of 2 DG sets of minimum 910 kVA capacity each).	Sets	1	1	1	3						
E.10.2	Exhaust System											
a.	Supply, installation of following sizes of MS Piping for Exhaust system as per IS: 3589 and 1239 (part - I) including providing suitable bends, reducers etc.											
	350mm (NB) MS ERW pipe 4.85 mm	RM	30	30	30	90						
	250mm (NB) MS ERW pipe 4.85 mm	RM	15	15	15	45						
	The rate for the MS exhaust pipe should be inclusive of supply & fixing of SS expansion joints (Bellows) according to size of horizontal / vertical exhaust pipes of DG sets as required at site. It shall not be payable separately.											
	Measurement for MS Exhaust piping will be taken excluding the length of Expansion Joints (SS bellows) and silencer.											
b.	Supply, installation, testing and commissioning of 75 mm thick Rockwool LRB mattress insulation (of 150 Kg/m ³ density) over the exhaust pipes of following diameter including cladding with aluminium sheet of 24 SWG and covering from outside complete as required suitable for DG exhaust pipe temp. upto 450°C etc.											
	350mm (NB)	RM	30	30	30	90						
	250mm (NB)	RM	15	15	15	45						

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Revised BOQ - MEP Works

S.N.	Description	Unit	Budhwarpeth	Mandai	Swargate	Total Qty	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In EURO)	(In EURO)	(In USD)	(In USD)
c.	Supply & Fixing of miscellaneous structural support for horizontal / vertical exhaust piping including fabrication, hardwares and painting as per requirement.	KG	8500	8500	8500	25500						
d	Portable Oil Filling pump- Electrical Type necessary to deliver the oil upto height of 10 mtrs.	Each	2	2	2	6						
e	990 Ltrs MS Fuel Tanks with float/limit switch indicator for low & high fuel level.Required number of contacts to be provided for connecting level linmit switch for indication in DG Control panel. Fuel system consisiting of Connect fuel pipe with MS "C"Class pipe with Flange & gas welded joint & pipe fittings like valaves & other accessories and breather drain pipes if required need to be provided.	Each	2	2	2	6						
f	Providing & fixing of pre- fabricated 22SWG GI sheet ducting (120 gsm galvanisation) for hot air discharge /supply air intake complete including supports, bends, flanges etc. as required.	sqm	50	50	50	150						
E.10.3	Civil works											
	Civil work for cable trench / hume pipes from DG Sets to existing cable trench and making the same in good condition at station.	Job	1	1	1	3						
	Civil foundation for 910 KVA DG set (only PCC raft of 300 mm) for the existing site condition.	Cum	20	20	20	60						
	Provision of making cable trenches, cut outs, finishing works etc as per the works required for the DG sets Installation	Cum	20	20	20	60						
	Supplying and laying of GI pipes of 150 mm Nominal Bore 4.85 mm thick as per IS 1239 to accommodate all cables, earthing strips and fuel pipe lines as utility to DG set.	RM	10	10	10	30						
	Operation & Maintenance Training for the Staff complete as per the specifications.											
E.10.4	OPERATION & MAINTENANCE OF DG SET BEFORE REVENUE OPERATION DATE.											
	Providing of maintenance and operating services for different "aggregate capacities" of DG sets installed at a station as specified below. (before the Revenue Operation of the Corridor / DG set is taken over by client).											
	1820 KVA (comprising of 2 DG sets of minimum 910 kVA capacity each).	Days	90	90	90	270						
	Note:-											
	1. The above items includes the cost of providing skilled DG set operator, all Consumables (like battery water, Lubricating Oil, Coolant, etc) except Diesel. (Diesel as per requirement shall be supplied by client).											
	2. Based on the hours of operation, the firm will be responsible for complying with the requirements of timely maintenance as per the recommendations of Engine Manufacturer.											
	3. The operation of DG set will not affect the warranty conditions of the DG sets supplied in this tender. The warranty clause will be applied from the date of Taking over of DG set by Employer.											
	4. Permission for Operating the DG set and period of its operation will be specifically approved by Engineer- In- Charge.											
E.10.5	COMPREHENSIVE MAINTENANCE OF DG SET AFTER DEFECT LIABILITY PERIOD.											
	Providing of Comprehensive maintenance services (Inclusive of all preventive maintenance spares and consumables, site visits, attending to breakdown calls etc. but excluding cost of breakdown spares) for "3- years" After Defect Liability period for different capacities of DG sets for the capacities of DG sets as specified below.											
	1820 KVA (comprising of 2 DG sets of minimum 910 kVA capacity each).	Each	1	1	1	3						
	Note:-											
	1. In the above item, Rates quoted by the Firm should be for each DG set for 3-years maintenance.											
	2. The above item includes cost of providing skilled service personal for the maintenance, Tools and Plant etc. for preventive maintenance. (Diesel is are not to be included in the rates.)											
	3. Breakdown maintenance staff, Tools, and equipment etc. for carrying out the maintenance to the Employers satisfaction.											
	4. Contractor will be required to maintain a fully equipped" 24 - hour Complaint Centre" in Pune and after receiving the Complaint the site should be attended by the maintenance staff within one hour.											
	TOTAL FOR DIESEL GENERATOR SETS											

Part B: Fire Protection System

BILL OF QUANTITIES FOR FIRE PROTECTION SYSTEM

S. N.	Description	Unit	Budhwar peth	Mandai	Swargate	Total Qty.	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In USD)	(In USD)	(In Euro)	(In Euro)
F.11	PUMPS FOR FIRE PROTECTION SYSTEM											
	Note:											
i)	Whether explicitly specified or not, the Pumps for Fire Protection System specified herein, must conform to respective Sections of the Specifications, in addition to the description given in respective items of BOQ. In case of contradiction between specifications and description in BOQ, the most stringent of the condition will prevail.											
ii)	The motor HP to be confirmed by the supplier for the duty mentioned for each pump.											
iii)	Rates quoted shall be inclusive of all structural supports, clamps etc. as per approved design/specifications.											
(iv)	All Main Fire Pumps shall be capable of delivering 150% of the rated flow at a head not less than 65% of the rated head. Also the shut-off head shall not exceed 140% of the rated head.											
(v)	All the items / parts mentioned in relevant clauses of the specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.											
11.1	Providing and fixing horizontal Fire Pumping Set with CI body, Bronze Impeller, Stainless Steel Shaft and connected by a flexible coupling to a totally enclosed, fan cooled induction motor, mounted on common structural base plate with all pump accessories complete as per Specifications including mechanical seal & neoprene lined vibration eliminators. Motors shall be suitable for 415 volts, 3 phase, 50 cycles, A/C supply as per Specifications.											
a)	MAIN FIRE PUMPS FOR COMBINED SYSTEM.											
	Horizontal Split Casing											
	Capacity - 3785 LPM											
	Head - 112 M											
	HP - To suit power requirements for flow at 150% of the duty point											
	RPM - 1450/2950	Nos	2	2	2	6						
c)	JOCKEY PUMP (FOR COMBINED SYSTEM)											
	Capacity - 180 LPM											
	Head - 112 M											
	HP - As required	Nos	1	1	1	3						
	TOTAL OF PUMPS FOR FIRE PROTECTION SYSTEM											
F.12	PIPE WORK FOR FIRE SYSTEM											
	The Pipe Work specified herein, must conform to Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between specifications and description in BOQ, the most stringent of the condition will prevail.											
	All the items / parts mentioned in relevant clauses of the specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.											
F.12.1	Providing and fixing of heavy duty Galvanised Steel Pipe (conforming to Specifications) with all fittings viz. flanges, bends, tees, elbows, reducers, as specified, including cutting, welding / making threaded joint and fixing to floor / wall with approved structural supports such as clamps, hangers etc. This further includes (1) Cutting holes / chases in brick or RCC walls / slabs and making good the same (2) Painting with two or more coats of synthetic enamel paint of approved shade as per pipe colour code over two coats of primer (3) Painting of legends with direction arrows complete as per specifications.											
F.12.1.1	25mm	RM	80	80	100	260						
F.12.1.2	32mm	RM	128	128	160	416						
F.12.1.3	40 mm	RO										
F.12.1.4	50mm	RM	104	104	130	338						
F.12.1.5	65mm	RM	8	8	10	26						
F.12.1.6	80mm	RM	500	500	625	1625						
F.12.1.7	100mm	RM	232	232	290	754						
F.12.1.8	150mm	RM	2560	2560	3200	8320						
F.12.1.9	200mm	RM	36	36	45	117						
F.12.1.10	250 mm	RM	1	1	1	3						
F.12.2	Providing and fixing Heavy Duty galvanised steel pipes, enbeded in earth shall be conforming to Specifications with all fittings like couplings, bends, elbows, tees, flanges, CAF gaskets etc., including welding as required. This also includes necessary excavation in all kinds of soil (including hard rock) up to the required depth and providing 150 mm thick sand layer all around the pipes, refilling, ramming, removal and disposal of surplus earth complete in all respects as per the specifications. This further includes provision of corrosion protection by wrapping two layers of 400 microne thick polythene sheet over two coats of bitumen.											
F.12.2.1	80mm	RM	28	28	35	91						
F.12.2.2	100mm	RM	1	1	1	3						
F.12.2.3	150mm	RM	8	8	10	26						
F.12.2.4	200mm	RM	1	1	1	3						
	TOTAL OF PIPE WORK FOR FIRE SYSTEM											
F.13	PIPING ANCILLARIES FOR FIRE SYSTEMS											
	The piping ancillaries specified herein, must conform to Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between specifications and description in BOQ, the most stringent of the condition will prevail.											

UGC-02 - Corrigendum III - Annexure 10
Revised BOQ - MEP Works

S. N.	Description	Unit	Budhwar peth	Mandai	Swargate	Total Qty.	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In USD)	(In USD)	(In Euro)	(In Euro)
	All the items / parts mentioned in relevant clauses of the specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.											
F.13.1	Providing and fixing Butterfly Valves of the following sizes (conforming to BS: 5155 and Specifications), suitable for pressure rating of 16 Kg / Sq. cm, with gaskets, flanges, nuts, bolts and washers including painting complete as required.											
F.13.1.1	65mm dia.	Each	2	2	2	6						
F.13.1.2	80mm dia.	Each	24	24	30	78						
F.13.1.3	100mm dia	Each	3	3	4	10						
F.13.1.4	150mm dia	Each	16	16	20	52						
F.13.1.5	200mm dia	Each	5	5	6	16						
F.13.2	Providing and fixing Wafer type Double Plate Check Valves of the following sizes (conforming to API-594 and Specifications), suitable for pressure rating of 16 Kg / Sq. cm with cast iron body conforming to BS 1452, including gasket, flanges, nuts, bolts and washers including painting complete as per Specifications.											
F.13.2.1	65mm	Each	2	2	2	6						
F.13.2.2	100mm	Each	2	2	2	6						
F.13.2.3	150mm	Each	4	4	5	13						
F.13.3	Providing and fixing Cast Iron Double Flanged 'Y' type Strainers of the following sizes with nuts, bolts, gaskets etc. complete in all respect as described in Specifications.											
F.13.3.1	200 mm dia	Each	3	3	4	10						
F.13.3.2	80 mm dia	Each	2	2	2	6						
F.13.4	Providing and fixing Gate Valves of the following sizes (conforming to BS: 5154 and Specifications) having Bronze body conforming to BS 1400 with screwed ends suitable for pressure rating of 16 bars.											
F.13.4.1	25mm dia	Each	4	4	5	13						
F.13.4.2	32mm dia	Each	6	6	7	18						
F.13.4.3	40 mm dia	Each	1	1	1	3						
F.13.5	Providing and fixing Gun metal Air Release Valve as per Specificatons.	Each	1	1	1	3						
F.13.6	Providing and fixing 150 mm diameter, Bourden type, Brass, Dial type Pressure Gauge calibrated for 0 - 15 kg / Sq. mm range with brass isolation valve complete as per Specifications.	Each	8	8	10	26						
F.13.7	Providing and fixing 80 mm dia Pressure Relieving Valve and Gate Valve to be fixed on Hydrants Pump Delivery Line with by pass connection to pump suction line.	Each	2	2	2	6						
F.13.8	Supply and installation of stainless steel Expansion Bellow											
F.13.8.1	200 mm dia	Each	3	3	4	10						
F.13.8.2	150 mm dia	Each	3	3	4	10						
F.13.8.3	80 mm dia	Each	2	2	2	6						
F.13.8.4	65 mm dia	Each	2	2	2	6						
F.13.9	Supply and installation of Orifice Plate 80mm OD(Brass)	Each	21	21	26	68						
	TOTAL OF PIPING ANCILLARIES FOR FIRE SYSTEMS											
F.14	FIRE HYDRANT SYSTEM											
	The Fire Hydrant System specified herein, must conform to Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between specifications and description in BOQ, the most stringent of the condition will prevail.											
	All the items / parts mentioned in relevant clauses of the specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.											
F.14.1	Providing and fixing Vertical Air Vessel of size 450 mm diameter and 1.50 m high, fabricated out of 6 mm thick M.S. plate having dish ends of 8 mm thick MS plate, complete with pressure switches (for every individual pump to operate at drop of pre - set pressure).This includes Bronze Air Release Valve, GM Gate Valves, pressure gauge, safety valve, drain valve etc. complete in all respects. Air Vessel must be painted with two coats of synthetic enamel paint of approved shade over one coat of primer,	Nos.	2	2	2	6						
F.14.2	Providing and fixing following types of Fire Hydrant Valves conforming to IS : 5290 and Specifications having female instantaneous type connection with matching flange, gaskets, nuts and bolts complete in all respects.											
F.14.2.1	Single headed	Each	22	22	28	72						
F.14.2.2	Double headed	Each	24	24	30	78						
F.14.3	Providing and fixing 63 mm diameter, 15 metre long, synthetic non percolating hose (conforming to IS 636/88 type-B with UL listed and Specifications) having Stainless steel male and female Instantaneous type coupling, machine wound with copper wire complete in all respects.	Each	141	141	176	458						
F.14.4	Providing and fixing of standard size Stainless steel 63 mm diameter short branch pipe with nozzle, conforming to IS 903 and Specifications	Each	25	25	31	81						
F.14.5	Providing and fixing Fire Man Axe conforming to IS : 926 : 1985 with Clamps.	Each	3	3	4	10						
F.14.6	Providing and fixing Wall mounted Swinging type First - Aid Fire Hose Reel conforming to (IS 12585 : 1988 & IS : 884 : 1985 for drum) and as per Specifications having 25 mm diameter and 45 M length. The Hose Reel must be non kinking type made up of Thermo Plastic Synthetic, must be suitable for with - standing a bursting pressure of not less than 27 bars and must include 7-8 mm Brass Jet & Spray type Nozzle having Shut - Off valve complete in all respect.	Each	19	19	24	62						
F.14.7	Providing and fixing Fire Hose Cabinet made up of fully welded construction of size 750 x 600 x 250 mm, fabricated from 14 SWG GI sheet, having hinged double front door with locking arrangements and partially glazed with 5 mm thick glass. Cabinet must have Stove enamelled Fire Red finish with "FIRE HOSE" written on front and must be suitable for housing 2 Nos. 15m long synthetic Hose with couplings, 1 No. Branch Pipe, Fire Man Axe complete as specified in drawing.	Each	6	6	7	19						

UGC-02 - Corrigendum III - Annexure 10
Revised BOQ - MEP Works

S. N.	Description	Unit	Budhwar peth	Mandai	Swargate	Total Qty.	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In USD)	(In USD)	(In Euro)	(In Euro)
F.14.8	Providing and fixing of Fire Hose Cabinet Shutter made up of MS 50 x 50 x 2 mm tubular steel section (shutter framing), rebated section framing of 2 mm thick MS sheet for fixing of shutter framing and fully welded construction of Hose Cabinet Size of 1200 x 2100 mm approximately, having hinged double front door with locking arrangements and partially glazed with 5 mm thick glass. Glass shall be fixed by MS beading screwed to shutter frame. Cabinet Shutter and steel parts must be powder coated to Fire Red finish with "FIRE HOSE" painted on glazing (for internal Hydrants). The width & height of the cabinet shall depend upon the actual size of the fire niche available. Contractor shall make shop drawings and get these approved before fabrication. Shutter and frame shall have provision for fixing of Magnetic Contact.	Each	12	12	15	39						
F.14.8a	Providing and fixing of Fire Hose Cabinet Shutter as per description at 14.8 (above) but of Stainless steel SS-304 construction (only for FHCs in public areas)	Each	7	7	9	23						
F.14.9	Providing and fixing Stainless steel, four way, Collecting Head conforming to IS 904 with 63 mm diameter Instantaneous type Inlet with built - in Check Valve for Fire Brigade connection to fire water.	Each	1	1	1	3						
F.14.1	Providing and fixing Four way, Stainless steel Collecting Head conforming to IS 904 : 1983 for Fire Brigade connection to Sprinkler and Hydrant Mains with hood Butterfly Valve and 100 mm diameter C.I. Double flanged Non - return Valve including nuts, bolts, gaskets etc. complete in all respect.	Each	2	2	2	6						
14.11	Providing and fixing standard Draw Out connection with 63 mm diameter Instantaneous type coupling conforming to relevant standards for installation at Main Fire Water Tank.	Each	1	1	1	3						
14.12	Providing and fixing Butterfly Valve of 150 mm dia conforming to BS : 5155 with limit switches for remote indication of 'OPEN' and 'CLOSE' positions suitable for pressure rating of 16 kg/sq.cm. With gasket, flanges,nuts, bolts etc.(but excluding signal wire or indication devices).	Each	1	1	1	3						
	TOTAL OF FIRE HYDRANT SYSTEM											
F.15	FIRE SPRINKLER SYSTEM											
	The Fire Sprinkler System specified herein, must conform to Specifications, in addtion to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between specifications and description in BOQ, the most stringent of the condition will prevail.											
	All the items / parts mentioned in relevant clauses of the specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.											
F.15.1	Providing, Fixing, Testing and Commissioning of 15 mm diameter Quartzoid Bulb type Sprinkler Set designed to operate at 68 Degree Centigrade including UL listed Sprinkler Guard. (UL / FM / FOC listed or approved).											
F.15.1.1	Pendant type Standard Response K80	Nos.	8	8	10	26						
F.15.1.2	Sidewall Sprinkler Standard Response K80	Nos.	6	6	7	18						
F15.2	Not used											
F.15.3	Providing and fixing 150 mm diameter Deluge Valve, Electrical release Trim type (UL Listed), suitable for working pressure of 12.5 bars with flange connection, complete in all respects.	Each	0	0	0	0						
F.15.4	Providing and fixing 150 mm diameter Motorised Butterfly valve complete as required.	Each	2	2	2	6						
F.15.5	Providing and fixing electrically operated Flow Indicating switches including 1.5 mm thick gasket, nuts and bolts complete as per Specification.											
F.15.5.1	For 25mm dia pipes	Nos.	4	4	5	13						
F.15.5.2	For 50mm dia pipes	Nos.	6	6	7	19						
F.15.5.3	For 80mm to 150 mm dia pipes	Nos.	23	23	29	75						
F.15.6	Providing and fixing MS cabinet of size 600 x 300 x 150mm, fabricated from 16 SWG MS sheet, with double front glass door and locking arrangement, having suitable shelves with space for 6 spare sprinklers and 6 spare medium velocity spray nozzle including one spanner properly fixed in the shelf. Cabinet shall be painted with enamel paint of approved shade, complete as per drawing.	Each	1	1	1	3						
F.15.7	Providing and fixing 150 mm diameter Installation Control Valve conforming to BS: 5153 or equivalent with water turbine type automatic alarm. This includes all standard fittings & valves like drain valve, test valve assembly, non return valve, stop valve, 'Y' strainer, pressure gauges etc. complete as per Specification	Each	1	1	1	3						
	TOTAL OF FIRE SPRINKLER SYSTEM											
F.16	MISCELLANEOUS FIRE SERVICES EQUIPMENT											
	The Miscellaneous Fire Services Equipment specified herein, must conform to Specifications, in addtion to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between specifications and description in BOQ, the most stringent of the condition will prevail.											
	All the items / parts mentioned in relevant clauses of the specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.											
F.16.1	Providing and fixing fully charged Portable Fire Extinguisher of 9 litres capacity, Water type (Gas Cartridge) complete with Standard Discharge Valve and tube including CI bracket for wall mounting etc. conforming to IS 15683 : 2006	Each	19	19	24	62						
F.16.2	Providing and fixing portable fire extinguisher, dry powder type (gas cartridge) with cylinder initially fully charged with dry powder (ABC type) of 6 Kg, complete with standard discharge valve with tube, CI bracket for wall mounting etc. conforming to relevant standard IS 15683 : 2006)	Each	5	5	6	16						
F.16.3	Providing and fixing initially fully charged Portable Fire Extinguisher of 4.5 Kg. capacity, carbon dioxide type with cylinder with CO2 gas, complete with squeeze lever Discharge Valve, Pressure Gauge, Discharge Tube Horn including CI bracket for wall mounting etc. conforming to IS 15683 : 2006	Nos.	35	35	44	114						
F.16.4	Fire protective clothing & breathing apparatus											
F.16.4.1	Set of protective clothing containing 2 nos.	Nos.	2	2	2	6						
	Each following items ;											
	a. Coat											
	b. Trouser											
	c. Gloves											
	d. Anti-Flash Hood											

S. N.	Description	Unit	Budhwar peth	Mandai	Swargate	Total Qty.	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In USD)	(In USD)	(In Euro)	(In Euro)
	e. Helmets											
	f. Boots											
	g. FRP/stainless steel case for storage of Fire Suits											
F.16.4.2	Self- contained open circuit type compressed air Breathing apparatus set confirming to EN-137: 2006, standard complete with one spare cylinders	Nos.	2	2	2	6						
	a) Air cylinder with valve											
	b) Back plate with body harness											
	c) Face mask											
	d) Pressure reducer											
	e) Lung demand valve											
	f) Pressure gauge & warning whistle											
	g) Hoses											
	h) Carrying case											
	i) Spare air cylinder											
	j) Wall mount cabinet for Breathing Apparatus											
F.16.4.3	Water-jel fire blanket consisting scientifically formulated cooling gel and a carrier in size 96" * 72" n canister.	Nos.	1	1	1	3						
F.16.4.4	Water-jel fire blanket consisting scientifically formulated cooling gel and a carrier in size 72" * 60" n canister.	Nos.	1	1	1	3						
F.16.4.5	Snap light emergency evacuation system complete with two high intensity yellow klcolourcyalumelightsticsk (light proof, water proof, wind proof, non explosive, and non toxic) with temper proof pin on a all mounted unit.	Nos.	2	2	2	6						
	TOTAL OF MISCELLANEOUS FIRE SERVICES EQUIPMENT											
F.17	CLEAN AGENT GAS BASED HIGH TEMPERATURE POLYMER TUBE PANEL FLOODING SYSTEM											
	Supply, fixing, testing and commissioning of Polymer Tube Detection based Clean Agent System for Electrical Panels (Polymer Tube Panel Protection System), consisting of the following components:											
F.17.1	10 LB capacity Clean Agent system, complete with all necessary Clean Agent gas, fitting, support and accessories, connected with valve.	No.	6	6	8	20						
F.17.2	5 LB capacity Clean Agent system, complete with all necessary Clean Agent gas, fitting, support and accessories, connected with valve.	No.	4	4	5	13						
F.17.3	End of Line adapter	No.	10	10	13	33						
F.17.4	Pressure Switch	No.	10	10	13	33						
F.17.5	Polymer Detection Tube with all necessary fittings & support	M	522	522	652	1696						
F.17.6	Master Control Unit for controlling each system, buzzers and electronic hooters, including all necessary accessories + electrical wiring to make each entire system functional	No.	10	10	13	33						
	Note: The items indicated above are notable items. The vendor to include all allied and implied items in required quantity at no extra cost.											
	TOTAL OF CLEAN AGENT GAS BASED HIGH TEMPERATURE POLYMER TUBE SYSTEM											
F.18	INERGENT / CLEAN GAS ROOM FLOODING											
F.18.1	Clean agent system complying with NFPA 2007 gas suppression system for signaling equipment room, Telecom equipment room, UPS room based on NFPA 2007. Including pipe headers, nozzles, pressure relief vents and other accessories for the each room with facilities for manual override; predischage alarm and Abort switch for each room sizes given below.											
a)	Signaling equipment room, Telecom equipment room, S&T UPS room	M3	480	480	600	1560						
	Total of INERGENT / CLEAN GAS FLOODING System											
F.19	FIRE ALARM AND DETECTION SYSTEM											
	The Fire Alarm and Detection System specified herein, must conform to Specifications, in addtion to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between specification and description in BOQ, the most stringent of the condition will prevail.											
	All the items / parts mentioned in relevant clauses of the specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.											
	All the items not specifically mentioned here but necessary to make the system complete and suitable for desired application as per Specifications and Drawings will be deemed to be included in the quoted prices											
F.19.01	Supply, Installation, Testing and Commissioning of 8 Loop Addressable Main Fire Alarm Control Panel (MFACP) complete with capacity to connect Devices & Detectors (in zoned manner) as per Specifications & Drawings but not limited to the following:	Set	1	1	1	3						
F.19.1.1	8 Loop Panel											
F.19.1.2	Repeater Driver Board											
F.19.1.3	Communication Board											
F.19.1.4	Software & Graphics											
F.19.1.5	PC with 21" TFT + 80column Printer.											
F.19.1.6	Nicl. Batteries & Battery Charger.											
F.19.1.7	Amplifier card											
F.19.1.8	Provision for interfacing with other systems such as SCADA / BMS with all required Hardware & Software.											
F19.02	Supply, Installation, Testing and Commissioning of Repeater Annunciator Panel with Mimic panel as per Specifications and Drawings.	Set	1	1	1	3						
F19.03	Supply, Installation, Testing & Commissioning of Signal Initiating (Intelligent Analogue Addressable) devices complete with Detector Base etc. as per Specifications.											
F19.03.1	Intelligent Addressable Multi Sensor Smoke Detector.	Nos.	360	360	450	1170						

S. N.	Description	Unit	Budhwar peth	Mandai	Swargate	Total Qty.	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In USD)	(In USD)	(In Euro)	(In Euro)
F19.03.2	Addressable Fault Isolator Base	Nos.	1	1	1	3						
F19.03.3	Addressable Fault Isolator	Nos.	25	25	31	81						
F19.03.4	Addressable Mannual Glass Break Unit	Nos.	17	17	21	55						
F19.03.5	Sounder with strobe light	Nos.	17	17	21	55						
F19.03.6	Addressable Loop Sounder 6.8 W.	Nos.										
F19.03.7	Response Indicator	Nos.	111	111	139	361						
F19.03.8	Intelligent Addressable Duct Detector.	Nos.	3	3	4	10						
F19.03.9	Intelligent Addressable Control Module.	Nos.	17	17	21	55						
F19.03.10	Intelligent Addressable Monitoring Modules	Nos.	1	1	1	3						
F19.03.11	Intelligent Addressable water Flow Monitoring Modules	Nos.	21	21	26	68						
F19.03.12	Magnetic Lock Assembly for mimimum 400 Kg. Load	Nos.	4	4	4	12						
F19.03.13	Magnetic Contact	Nos.	4	4	4	12						
F19.03.14	Emergency Door Release Switch	Nos.	4	4	4	12						
F19.03.15	Power supply unit for Powering Magnetic Door Lock	Nos.	4	4	4	12						
F19.03.16	High Temperature (min. 80 C degree trip) Heat detector	Nos.	6	6	8	20						
F19.04	Supplying, Laying, Termination, Testing &Commisioning of Fire Survival Cables (confirming to BS: 7846 and specifications for performance requirements of Fire Survival Cables) armoured, 1 pair 2.5 sq.mm, screened / shielded, Copper conductor (one pair shielded and one pair unshielded) cable or Mineral Insulated cable complying the CWZ category.	Metre	872	872	1090	2834						
F19.05	Supplying, Laying, Termination, Testing &Commisioning of Fire Survival Cables (confirming to BS: 7846 and specifications for performance requirements of Fire Survival Cables) armoured, 1 twisted pair 1.5 sq.mm, screened / shielded copper conductor cable or Mineral Insulated cable complying the CWZ category for looping of detection units etc.	Metre	2980	2980	3725	9685						
	TOTAL OF FIRE ALARM AND DETECTION SYSTEM											
F.20	Continuous Fibre Optic Distributed Linear Heat Sensing System to be installed in the entire length of the tunnels and trackway with redundancy complete with temperature monitoring capabilities.											
F.20.1	Linear Heat Detection controller with Measurement Range 4 km ntegrated Relay Board having TCP/IP Interface including: 2 Sensor Channel withHD I/O Connection Set with	Set	1	1	1	3						
F.20.2	Linear Heat Detection System Software-for Commissioning and Configuration Software	Set	1	1	1	3						
F.20.3	Power Converter for Linear Heat Detection controller	Set	1	1	1	3						
	- AC Input 85-264 VAC, 45-65 Hz											
	- DC Input 90-350 VDC											
	- Output 24 VDC 2.5 A											
F.20.4	Outdoor Housing:	Set	1	1	1	3						
	- IP66 Std. Display											
	- Multicolor LCD (Alarm, Status, Operation)											
	- Coated Steel, RAL 7035, Wall Mount											
	- IP66 Rated (NEMA4)											
	LINEAR HEAT SENSOR CABLE – FIBER OPTICAL & ACCESSORIES											
F.20.5	Sensor Cable - Thermoplastic	Metre	2560	2560	3200	8320						
	- Tight Buffered Design											
	- Flame Retardant Non Corrosive Jacket											
	- 4 x Multimode Graded Index 50/125 µmFibers											
F.20.6	E2000 8° Pigtail for Multimode Graded Index 50/125µm,	Set	2	2	2	6						
F.20.7	Heavy Duty Splice Box	Set	2	2	2	6						
	- IP67 aluminum											
	- Indoor / Outdoor Use											
	TOTAL OF LINEAR HEAT DETECTION SYSTEM											
F.21	Supply, installation, testing and commissioning of UL/FM approved VESDA System for Signaling equipment room, Telecom equipment room, S&T UPS room, E&M UPS room and ASS rooms including VLP panels associated aspirating devices and piping, integrating devices with the main fire alarm system.	set	7	7	7	21						
F.21.1	Supply , installtion, testing and commissioning of SCADA/ control system network etc for VESDA system including of PCN network cabling etc	lot	1	1	1	3						
	TOTAL OF VESDA SYSTEM											

Part C: Plumbing Works

BILL OF QUANITIES FOR PLUMBING WORKS

S.N.	Description	Unit	Budhwar peth	Mandai	Swargate	Total Qty.	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In USD)	(In USD)	(In Euro)	(In Euro)
1.00	SUB HEAD I : SANITARY INSTALLATION											
1.01	Providing and fixing best Indian make White vitreous Chinaware water closet (European) wall hung with integral `P` trap size 100 mm including fittings and clamps cutting and making good the walls and floors where required, including	Each	3	3	3	9						
	a. 32 mm CP brass flush valve concealed or exposed type with isolation valve, CP brass flush bend etc.											
	b. Black coloured solid plastic seat & cover very heavy quality with rubber buffer fixed to the closet with CP brass hinges											

S. N.	Description	Unit	Budhwar peth	Mandai	Swargate	Total Qty.	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In USD)	(In USD)	(In Euro)	(In Euro)
1.02	Providing and fixing white vitreous china pedestal type water closet (European type) with seat and lid, with C.P. brass hinges and rubber buffers, 10 litre low level flushing cistern with fittings, C.I./M.S. brackets, 40 mm flush bend, overflow arrangement with specials of standard make and mosquito proof coupling of approved municipal design including painting of fittings and brackets, cutting and making good the walls and floors wherever required.	Each	7	7	7	21						
	W.C. pan with ISI marked black solid plastic seat and lid with white vitreous china flushing cistern and C.P. flush bend.											
1.04	Providing and fixing best Indian make white glazed vitreous Chinaware wash hand basin mounted on cantilever supports fixed to wall comprising	Each	10	10	10	30						
	a.Under counter oval wash basin size 550 mm x 400 mm similar to H.S. Cat. No. 10016.											
	b. Cantilevered M.S. or C.I. supporting brackets											
	c. 1 No. 15 mm CP brass self closing pillar tap.											
	d. 32 mm CP brass waste with rubber plug and CP chain											
	e. 32 mm CP brass (cast) bottle trap with extension piece to wall flange with rubber adopter for waste connection											
	f. 15 mm heavy quality CP brass angular stop cock with CP brass flexible connector pipe, nuts, washers etc.											
	The supporting bracket shall be provided with two coats of approved paint over a coat of red oxide primer											
1.07	Providing and fixing vitreous chinaware urinal comprising	Each	15	15	15	45						
	a. Large flat back wall hung urinal in white glazed vitreous China 610mm x 400 mm x 380 mm											
	b. 15 mm battery operated solenoid valve with infra red sensor mounted in a box with SS Cover											
	c. CP brass chromium plated flush piping from valve to urinal terminated with a 15 mm screwed spreader											
	d. 32 mm nominal bore CP cast brass waste											
	e. 32 mm nominal bore CP cast bottle trap with extension pipe rubber adopter for waste connection											
1.08	Supply installation testing and commissioning water cooler having nominal cooling capacity of 40 liters per hours, with 40 litres storage tank with 2 nos. of faucets, one no goose neck type(for glass filling) and other one fountain type (for drinking) both with separate mecahnical lever control with 1.5 HP electric motor for compressor to work on one phase 230 volts 50 Hz AC power supply with complete assessories including cutting and making wall as required.	Each	1	1	1	3						
1.09	Providing and fixing stainless steel single bowl sink overall size 610 x 457 mm and bowl size 500 x 406 x 203 mm with CI brackets, 40 mm CP brass waste with CP brass union, complete including cutting and making good the walls wherever required.	No.	2	2	2	6						
1.10	Providing and fixing CP brass twin coat hooks fixed to wooden cleats with CP brass screws, hooks or approved equivalent.	Each	4	4	4	12						
1.11	Providing and fixing double heater type solid state fully hygienic no touch hand drier rated for continuous repeat usage with solid state time delay LSF protection, with independent ambient light level & seasonal control temperatures including providing necessary C.I./M.S. brackets painted with two or three coats of enamel paint of approved shade over a coat of primer, wiring cables from drier to plug, plug tops etc. complete including cutting and making good the walls wherever required. (Kopal or equivalent make)	Each	2	2	2	6						
1.12	Providing and fixing, testing and commissioning of 25 litres storage type water heater (Geyser) etc. with automatic thermostatic control electric element, pressure release valve, M.S. nuts and bolts etc. conforming to IS: 2082 with 2 nos. 15 mm heavy quality CP brass angular stop cock with CP brass flexible connector pipe, nuts, washers etc.	Each	2	2	2	6						
1.13	Providing and fixing stain less steel Paper towel Dispenser similar toTUB model no.4000 size-280 x369x102mm including cutting and making good the wall wherever required.	Each	3	3	3	9						
1.14	Providing and fixing wall mounting type push-type liquid soap dispenser with 1000 ml bulk volume, with pump suitable for operation on less than 5 PSI complete in all respects.	Each	3	3	3	9						
1.15	Providing & fixing automatic aerosal dispensar spray interval setting 5-25 minutes size 8.5 x7 x21 cm similar to UTEC system model no.UT-6MA	Each	4	4	4	12						
1.16	Providing and fixing C.P. brass Health Faucet with 1m flexible tube with wall hook (Jaquar make model No. 573 or approved equivalent make) with PVC cleats and S.S. screws including cutting and making good the walls wherever required complete as directed by Engineer in charge.	Each	15	15	15	45						
1.17	Providing and fixing stainless steel handicapped grab bar similar to TUB model no. 7800.	Each	4	4	4	12						
1.18	Providing and fixing stainless steel toilet tissue dispenser size 162 x 162 x52 mm similar toTUB model no.8111.	Each	15	15	15	45						
1.19	Supply installation testing and commissioning water purifier comprising 5 micron filter and UV steriliser on cold water supply in drinking water cooler to work on single phase 230 volts 50 HZ AC power supply with capacity 120 lph (Aquaguard make).	Each	1	1	1	3						
1.20	Supply installation testing 15mm dia C.P. brass adjustable shower with two nos. concealed stop cock & wall mixer with spout	Each	1	1	1	3						

S. N.	Description	Unit	Budhwar peth	Mandai	Swargate	Total Qty.	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In USD)	(In USD)	(In Euro)	(In Euro)
1	PIPE WORKS FOR HYDRAULIC SERVICES											
	The Pipe Work specified herein, must conform to Plumbing, Drainage and Water Supply Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between Plumbing, Drainage and Water Supply specifications and description in BOQ, the most stringent of the condition will prevail.											
	All the items / parts mentioned in relevant clauses of the Plumbing, Drainage and Water Supply specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.											
1.1	Providing and fixing Heavy Duty GI pipes of the following sizes conforming to IS:1239 and Plumbing, Drainage and Water Supply Specifications complete with all fittings and specials such as bends, tees, unions, reducers, flanges & plugs etc. conforming to IS:1879 and Plumbing, Drainage and Water Supply Specifications including fixing at wall / ceiling level supported by structural supports, clamps, hangers etc. This also includes threading, jointing, making connections, cutting holes in wall / floor / slab and making good the same with cement concrete 1:2:4, complete in all respect as per specifications.											
a	15 mm dia	R.M.	24	24	30	78						
b	20 mm dia	R.M.	192	192	240	624						
c	25 mm dia	R.M.	80	80	100	260						
d	32 mm dia	R.M.	24	24	30	78						
e	40 mm dia	R.M.	48	48	60	156						
f	50 mm dia	R.M.	80	80	100	260						
g	65 mm dia	R.M.	16	16	20	52						
1.2	Painting of GI pipe and fittings of the following sizes with two or more coats of synthetic enamel paint, of approved quality and shade, as per pipe colour code over a coat of primer. This includes painting of legends with direction arrows complete as per specifications.											
a)	15 mm dia	R.M.	24	24	30	78						
b)	20 mm dia	R.M.	192	192	240	624						
c)	25 mm dia	R.M.	80	80	100	260						
d)	32 mm dia	R.M.	24	24	30	78						
e)	40 mm dia	R.M.	48	48	60	156						
f)	50 mm dia	R.M.	80	80	100	260						
g)	65 mm dia	R.M.	16	16	20	52						
1.3	Providing protection to embedded G.I. Pipes and fittings of the following sizes, in wall chases, by wrapping two layers of 400 micron thick polythene sheet over two coats of bitumen. This includes proper overlaps on joints complete as per specifications.											
a)	15 mm dia	R.M.	24	24	30	78						
b)	20 mm dia	R.M.	80	80	100	260						
c)	25 mm dia	R.M.	24	24	30	78						
d)	32 mm dia	R.M.	16	16	20	52						
1.4	Providing and fixing insulation to hot water pipes of the following sizes (exposed) with 13 mm thick, flexible, closed cell, EPDM and low density elastomeric thermal insulation tube of expanded synthetic rubber, jointed with self-adhesive rubber insulation tape including making good the walls as required.											
a)	15 mm dia	R.M.	24	24	30	78						
b)	20 mm dia	R.M.	36	36	45	117						
1.5	Providing and fixing centrifugally cast iron (spun) soil, waste & vent pipe of the following sizes conforming to IS 3989 and Plumbing, Drainage and Water Supply Specifications with all fittings such as access door, tees, bends, cowls etc. This includes jointing of 25 mm deep lead joint with refined pig lead, provision of structural supports as required, cutting chases or holes in wall and floors and making good the same with 1:3 cement mortar or 1:2:4 cement concrete wherever required.											
a)	75mm dia	R.M.	216	216	270	702						
b)	100mm dia	R.M.	320	320	400	1040						
c)	150mm dia	R.M.	60	60	75	195						
1.6	DI pipes and fittings											
	Supply and Installation of DI Pipes (K9) Including supply, storage, transportation and handling of all pipes, fittings and accessories (including all types of bends, adaptors, short piece sockets and spigots, collars, tees, flexible couplings, reducers, blind flanges, puddle flanges, dismantling joints...etc.), jointing materials, PE protective sleeving throughout, and all other materials required; excavation at any depth in any kind of soil and rock, any type of surface, natural, asphalt, concrete ...etc., laying of pipes including all jointing, any ancillary necessary for proper laying and jointing of pipes; supply from any distance placing and compaction of bedding, embedment (sand fill), backfilling and surface reinstatement, including warning tape and electronic identifiers or warning tape with ferrous strip ; testing; flushing and disinfection; all to the approval of the Engineer.											
	Class K7											

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Revised BOQ - MEP Works

S. N.	Description	Unit	Budhwar peth	Mandai	Swargate	Total Qty.	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In USD)	(In USD)	(In Euro)	(In Euro)
a)	100mm dia	R.M.	248	248	310	806						
b)	200mm dia	R.M.	208	208	260	676						
	Class K9											
a)	100mm dia	R.M.	80	80	100	260						
b)	150mm dia	R.M.	24	24	30	78						
c)	200mm dia	R.M.	272	272	340	884						
1.6	Providing and laying Cement Concrete 1:2:4 (1 cement: 2 coarse sand : 4 graded stone aggregate 40mm nominal size), of 75mm thick (average), around Cast Iron soil and waste pipes of the following sizes, below floor, including necessary shuttering and timbering etc. complete as required.											
a)	100mm dia pipe	R.M.	40	40	50	130						
b)	150mm dia pipe	R.M.	80	80	100	260						
1.7	Constructing brick masonry channel with F.P.S. bricks of class designation 75 in cement mortar 1:4 (1 cement : 4 sand) including necessary excavation, 10 cm thick cement concrete 1:5:10 (1 cement : 5 sand : 10 graded stone aggregate 40 mm nominal size) for foundation and 25 mm thick cement concrete 1:2:4 (1 cement : 2 sand : 4 graded stone aggregate 12.5 nominal size) for filling haunches, including 12 mm cement plaster 1:4 (1 cement : 4 sand) with a floating coat of neat cement inside the drain, its top and exposed side including providing cast iron grating and fixing to the drain complete as required.											
a)	150mm wide channel 200 mm average depth (For Pump Room)	R.M.	21	21	26	68						
1.8	Providing and fixing UV stabilized UPVC rain water pipe (SWR) with one end plain and other end socketed with injection moulded/fabricated fittings such as tees, bends, doors etc. and provided with square grooved along with V shaped rubber ring including making good wall and flooring wherever necessary. The wall thickness of the pipe and other technical characteristics shall be conforming to IS: 13592/92 Type A. The jointing is to be completed with rubber lubricant.											
a)	100 mm (OD)	R.M.	32	32	40	104						
b)	150 mm (OD)	R.M.	60	60	75	195						
	TOTAL											
2	PIPING ANCILLARIES FOR HYDRAULIC SERVICES											
	The Pipe Ancillaries specified herein, must conform to Plumbing, Drainage and Water Supply Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between Plumbing, Drainage and Water Supply specifications and description in BOQ, the most stringent of the condition will prevail.											
	All the items / parts mentioned in relevant clauses of the Plumbing, Drainage and Water Supply specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.											
2.1	Providing and fixing Brass Ball Valves of the following sizes conforming to BS 5351 and Plumbing, Drainage and Water Supply Specifications, suitable for pressure rating of 10 kg / Sq.cm, with lever and fittings viz. flanges / union, nuts, bolts, washer etc. complete as per Plumbing, Drainage and Water Supply specification.											
a)	20 mm dia	Each	10	10	12	32						
b)	25 mm dia	Each	8	8	10	26						
c)	32 mm dia	Each	4	4	5	13						
d)	40 mm dia	Each	6	6	8	20						
e)	50 mm dia	Each	4	4	5	13						
f)	65 mm dia	Each	2	2	2	6						
2.2	Providing and fixing Butterfly Valves of the following sizes conforming to BS: 5155 and Plumbing, Drainage and Water Supply Specifications, suitable for pressure rating of 10 kg / Sq.cm, with hand lever operation, rubber gaskets, flanges, nuts, bolts and washers including painting complete as per Plumbing, Drainage and Water Supply specification.											
a)	65 mm dia	Each	5	5	6	16						
b)	100 mm dia	Each	6	6	8	20						
c)	150 mm dia	Each	10	10	12	32						
2.3	Providing and fixing Wafer type Double Plate Check Valves of the following sizes conforming to API-594 and Plumbing, Drainage and Water Supply Specifications, suitable for pressure rating of 10 kg / Sq.cm with cast iron body conforming to BS 1452, rubber gasket, flanges, union, nuts, bolts and washers including painting complete as per Specifications.											
a)	50 mm dia	Each	2	2	3	7						
c)	100 mm dia	Each	2	2	3	7						
d)	150 mm dia	Each	10	10	12	32						
2.4	Providing and fixing Double Flanged Flexible Rubber Expansion Joint of standard length with Unit Control as described on Plumbing, Drainage and Water Supply Specification, of the following sizes, complete with all accessories including rubber gaskets, flanges nuts, bolts and washers tested to a pressure of 10 kg / Sq.cm.											
a)	50 mm dia	Each	2	2	2	6						

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Revised BOQ - MEP Works

S. N.	Description	Unit	Budhwar peth	Mandai	Swargate	Total Qty.	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In USD)	(In USD)	(In Euro)	(In Euro)
2.5	Providing and fixing Cast Iron Double Flanged 'Y' type Strainers of the following sizes with nuts, bolts, gaskets etc. complete in all respect as described in the Plumbing, Drainage and Water Supply Specification.											
a)	65 mm dia	Each	2	2	2	6						
b)	100 mm dia	Each	2	2	3	7						
2.6	Providing and fixing C.I. Sluice valves of the following sizes conforming to BS : 5150 and Plumbing, Drainage and Water Supply specifications complete with bolts, nuts, rubber insertions etc.											
	100 mm dia	Each	2	2	3	7						
2.7	Providing and fixing in position Float Valve with Copper Ball Float and Brass Rod of required length conforming to BS 1212 and Plumbing, Drainage and Water Supply Specifications suitable for pressure of 10 kg / Sq.cm.											
	100 mm dia	Each	6	6	8	20						
2.8	Providing and fixing 100 mm diameter, Brass Dial Type Pressure Gauge as described in Plumbing, Drainage and Water Supply Specifications suitable for 0 - 15 kg / Sq.cm pressure range with isolation cock and complete in all respects.	Each	8	8	10	26						
2.9	Providing and fixing air vent for Domestic water supply risers with Ball Valve as described in Plumbing, Drainage and Water Supply Specifications suitable for pressure of 10 kg / Sq.cm complete, as per specifications.											
a)	20 mm dia	Each	3	3	4	10						
	TOTAL											
3	MISCELLANEOUS PLUMBING AND DRAINAGE EQUIPMENT											
	Whether explicitly specified or not, the Miscellaneous Plumbing and Drainage Equipment specified herein, in addition to the description given in respective items of BOQ.											
	All the items / parts mentioned in relevant clauses of the Plumbing, Drainage and Water Supply specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.											
3.1	Providing and fixing CI "P" or "S" trap (conforming to IS: 3989) of self-cleaning design, with or without vent arm, complete including cost of cutting and making good the walls and floors.											
a)	100 mm inlet and 100 mm outlet.	Each	8	8	10	26						
b)	100 mm inlet and 75 mm outlet.	Each	6	6	8	20						
3.2	Providing and fixing WC connector (straight or bend type) of 100 mm diameter and required length including proper connection to C.I. pipe complete as required.	Each	8	8	10	26						
3.3	Providing and fixing floor drain with 4mm thick stainless steel gratings (100 mm diameter) with frame including fixing to the floor with cement mortar.	Each	12	12	15	39						
3.4	Providing and fixing Stainless Steel 'Cockroach' Trap with 150 mm x 150 mm stainless steel grating fixed on top of floor trap. The cost includes the cost of all ancillary works as required to complete the work.	Each	16	16	20	52						
3.5	Providing and fixing Stainless Steel grating, Grade 304 on top of floor trap. The rate includes the cost of all ancillary works and material as required to complete the work.											
a)	125 x 125 x 1mm or 125mm dia x 1 mm	Each	16	16	20	52						
3.6	Providing and fixing floor clean out plug for Cast Iron Soil or waste pipes of the following sizes comprising of C.I. Plug, nipples, bends including lead jointing etc. complete.											
a)	150mm diameter	Each	10	10	12	31						
b)	100mm diameter	Each	3	3	4	10						
3.7	Providing and fixing of 200 mm X 200 mm C.I. Square grating at terrace RWP complete in all respect.	Each	16	16	20	52						
3.8	Providing and fixing 100 mm dia G.I. Vent pipe at the roof level of water tanks with anti-mosquito brass grating, bends as required complete in all respects as per drawing.	Each	6	6	8	20						
	TOTAL											
4	EXTERNAL SEWAGE & STORM WATER DRAINAGE:											

S. N.	Description	Unit	Budhwar peth	Mandai	Swargate	Total Qty.	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In USD)	(In USD)	(In Euro)	(In Euro)
4.1	Providing and laying non-pressure NP4 class RCC pipes with collars jointed with stiff mixture of Cement mortar in the proportion of 1:2 (1 cement: 2 fine sand) including testing of joints etc. complete. This also includes excavation in all kinds of soil (including hard rock), dewatering, refilling, watering, ramming, removing and disposal of the surplus excavated material and making good the same, complete as required.											
a)	250 mm dia RCC pipe	R.M.	72	72	90	234						
b)	200 mm dia RCC pipe	R.M.	32	32	40	104						
c)	150 mm dia RCC pipe	R.M.	40	40	50	130						
4.2	Providing and laying Cement Concrete in the proportion 1:4:8 (1 cement : 4 coarse sand : 8 graded stone aggregate of 40 mm nominal size) for NP 4 class RCC pipes with concrete bedding and haunches up to the center of pipe including shuttering & timbering complete as required.											
a)	For 250 mm dia pipe – 150mm thick PCC bedding	R.M.	72	72	90	234						
b)	For 200 mm dia pipe – 150mm thick PCC bedding	R.M.	32	32	40	104						
c)	For 150 mm dia pipe – 100mm thick PCC bedding	R.M.	40	40	50	130						
4.3	Providing, fixing, jointing and testing in position, the following C.I. Class (LA) Pipes, conforming to IS:1536 and cut to required lengths for drainage. This also includes making proper connections with refined pig lead of required depths. The pipe must be laid below ground level in trenches up to the required depth including excavation in all kind of soils (including hard rock), dewatering, refilling, watering, ramming, removing and disposal of the surplus excavated material as per instructions by site in charge and making good the same, complete as required.											
a)	150 mm dia	R.M.	120	120	150	390						
4.4	Constructing rectangular manhole of the following types in brick masonry with Class 75 designation bricks of approved quality in Cement Mortar in the proportion 1:4 (1 cement : 4 coarse sand) having RCC top slab with 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), foundation with cement concrete 1:4:8 (1 cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) and finished with a floating coat of neat cement, outer plaster 15 mm thick with cement concrete 1:4 (1 cement : 4 coarse sand) including making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) and finished with a floating coat of neat cement, fixing of foot rests made up of 20 mm M.S. square bar in 1:2:4 cement concrete (1 cement : 2 coarse sand : 4 graded stone aggregate of 20 mm nominal size) block of size 200 mm x 200 mm x 100 mm. This also includes excavation in all kinds of soil (including hard rock), dewatering, refilling, watering,											
	ramming, removing and disposing surplus excavated material, complete as required.											
a)	Inside size 900 mm x 800 mm and 600 mm depth with 560 mm diameter SFRC, heavy duty perforated cover with frame conforming to IS:12592 fixed in top slab.	Each	10	10	12	32						
b)	Inside size 1200 mm x 900 mm and 900 mm depth with 560 mm diameter SFRC, heavy duty perforated cover with frame conforming to IS:12592 fixed in top slab.	Each	12	12	15	39						
4.5	Making connection of storm water drain / sewer line with Municipal external storm water / sewer line including necessary excavation in all kinds of soil up to required depth, breaking the wall / floor of municipal manhole / nallah and making good the same with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate of 20mm nominal size), plastering on both sides with cement mortar 1:4 (1 cement : 4 coarse sand) finished with a floating coat of neat cement and making necessary channels for drain etc. complete. This also includes the liasoning work such as filling necessary applications, submission of forms for approval to the municipal authorities, depositing the necessary fees and other amounts as required for getting the premises / installations inspected and approved and all other formalities required till the connection is obtained. All the expenses incurred in this regard shall be borne by the contractor except for the payments to be made for any security deposits which will be reimbursn all kinds o											
a)	For Sewer connection	Job	1	1	1	3						
b)	For Storm water connection	Job	2	2	2	5						
20	PUMPS FOR WATER SUPPLY / SEWAGE/ SEEPAGE WATER											
	Whether explicitly specified or not, the Pumps for Water Supply / Water Treatment specified herein, must conform to Specifications and Motors must conform to Specifications, in addition to the description given in respective items of BOQ. In case of contradiction between specifications and description in BOQ, the most stringent of the condition will prevail.											
	All the items / parts mentioned in relevant clauses of the specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.											
	The motor HP to be confirmed by the supplier for the duty mentioned for each pump.											
	Rates quoted shall be inclusive of all structural supports, clamps etc. as per approved design / specifications.											
20.1	Supply, Installation, Testing and Commissioning of following Hydropneumatically operated pumping set (pressure switch operated fully automatic) with C.I. Body, bronze Impeller, stainless steel shaft and induction motor, vibration eleminating pads and accessories including pressure tank, pressure switches, automatic control panel etc.mounted on a common skid complete in all respect.											
a)	Not Used											
b)	For domestic water supply to station											
	Type of pump : Centrifugal											

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Revised BOQ - MEP Works

S. N.	Description	Unit	Budhwar peth	Mandai	Swargate	Total Qty.	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In USD)	(In USD)	(In Euro)	(In Euro)
	Capacity :6 Cum/Hr											
	Head : 15 m											
	Motor RPM : 2900											
	Each set consists of 2 pumps and 1 pressure tank. At any given time, only one pump need operate. Both the pumps must operate alternatively in service.	Set	1	1	1	3						
20.2	Supply, Installation, Testing and Commissioning of the following horizontal single / multistage centrifugal pump pit with CI body, baring impeller, SS shaft and induction motor mounted on a comon base frame, vibration eliminating pads accessories complete											
a)	Filter Feed Pump											
	Capacity :15 Cum/Hr											
	Head : 30 m											
	Motor-RPM- 2900											
	Each set consists of 2 pumps (1 Working + 1 Standby). At any given time, only one pump need operate. Both the pumps must operate alternatively in service.	Set	1	1	1	3						
20.3	Supply, Installation, Testing and Commisioning the following Submersible Sump Pumps conforming to Specifiactions with motors conforming Specifiactions for waste water drainage, free standing type, complete with											
a)	For Main Sewage Sumps at concourse level / Undercroft level											
	Solid handling Capacity 40 mm											
	Flow Rate - 120 LPM											
	Head - 30 M											
	RPM - 2900											
	Each set consists of 2 pumps (1 Working + 1 Standby). At any given time, only one pump must operate. Both the pumps must operate alternatively in service.	Set	1	2	2	5						
b)	For Sump at basement of Ancillary building											
	Solid handling Capacity 40 mm											
	Flow Rate - 300 LPM											
	Head -20 M											
	RPM - 2900											
	Each set consists of 2 pumps (1 Working + 1 Standby). At any given time, only one pump must operate. Both the pumps must operate alternatively in service.	Set	1	1	1	3						
c)	For Main Seepage Sumps at Undercroft level											
	Solid handling Capacity 40 mm											
	Flow Rate - 600 LPM											
	Head - 30M											
	RPM - 2900											
	Each set consists of 3 pumps (1 Working + 1 Standby + 1 Assisting Pump). However in case of operation of fire pumps all the three pumps may operate simultaneuosly.	Set	2	2	2	6						
d)	For Main Seepage Sumps at middle of tunnel											
	Solid handling Capacity 40 mm											
	Flow Rate - 600 LPM											
	Head - 30M											
	RPM - 2900											
	Each set consists of 2 pumps (1 Working + 1 Standby). However in case of operation of fire pumps all the two pumps may operate simultaneuosly.	Set	1	1		2						
e)	For Seepage Sumps at Entry / Exit at Undercroft Level											
	Solid handling Capacity 40 mm											
	Flow Rate - 300 LPM											
	Head - 20 M											
	RPM - 2900											
	Each set consists of 2 pumps (1 Working + 1 Standby). However in case of operation of fire pumps all the two pumps may operate simultaneuosly.	Set	4	4	5	13						
20.4	Supply, Installation, Testing and commissioning of level controller switches for automatic operation of seepage/sewage pumps with S.S. probes 2X1.5 sq.mm conductor cables from motors control center to probes.	Set	10	11	12	33						
	TOTAL OF PUMPS FOR WATER SUPPLY / SEWAGE/ SEEPAGE WATER											
21	WATER TREATMENT PLANT											
	Whether explicitly specified or not, the Water Treatment Plant and Pumps specified herein, must conform to the Specifications and Motors must conform to Specifications, in addition to the description given in respective items of BOQ. In case of contradiction between specifications and description in BOQ, the most stringent of the condition will prevail.											
	All the items / parts mentioned in relevant clauses of the specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.											
	The motor HP to be confirmed by the manufacturer for the duty mentioned for each pump along with performance characteristic curve.											
	Rates quoted shall be inclusive of all structural supports, clamps etc. as per approved design / specifications.											
21.1	DUAL MEDIA FILTER											
	Providing and fixing of mild steel (rubber Lined) pressure vessel confirming to IS:2825 dual media filter complete in all respects as	NO.	1	1	1	3						

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Revised BOQ - MEP Works

S. N.	Description	Unit	Budhwar peth	Mandai	Swargate	Total Qty.	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In USD)	(In USD)	(In Euro)	(In Euro)
	1) Capacity = 15Cum / hr											
	2) Rate of flow = Not more than 12.5 Cum / hr / sqm of surface area											
	3) Wall thickness of shell and of dished ends as per IS:2825											
	4) Initial charge of media.											
	5) Sample valves											
	6) Sockets and valve for dosing chemicals.											
	7) Pressureg gauge at inlet and outlet with isolating cocks and supports.											
21.2	SOFTENER UNITS											
	Providing and fixing of mild steel (rubber Lined) pressure vessel confirming to IS:2825 dual media filter complete in all respects as per specifications,having following	NO.	1	1	1	3						
	1) Capacity = 15Cum / hr											
	2) Rate of flow = Not more than 15 Cum / hr / sqm of surface area											
	3) Wall thickness of shell and of dished ends as per IS:2825											
	4) Initial charge of media.											
	5) Sample valves											
	6) OBR (13 Hrs) 200 cum											
	7) Pressureg gauge at inlet and outlet with isolating cocks and supports.											
	8) All Face piping and diaphragm valve etc..											
	9) Thickness of rubber lining not less then 3mm											
	10) All pipes to be as per IS : 1239 class "c"											
	11) Ejector for regeneration											
	12) For resin quantity and design purpose consider hardness of water as 350 ppm,quality of outgoing water - commercial Zero hardness.											
21.3	IRON REMOVAL FILTER											
	Providing and fixing of mild steel (rubber Lined) pressure vessel confirming to IS:2825 dual media filter complete in all respects as per specifications,having following	NO.	1	1	1	3						
	1) Capacity = 15Cum / hr											
	2) Rate of flow = Not more than 10 Cum / hr / sqm of surface area											
	3) Wall thickness of shell and of dished ends as per IS:2825											
	4) Initial charge of media.											
	5) Sample valves											
	6) OBR (13 Hrs) 200 cum											
	7) Pressureg gauge at inlet and outlet with isolating cocks and supports.											
	8) All Face piping and diaphragm valve etc..											
	9) Thickness of rubber lining not less then 3mm											
	10) All pipes to be as per IS : 1239 class "c"											
	11) Ejector for regeneration											
	12) For resin quantity and design purpose consider hardness of water as 350 ppm,quality of outgoing water - commercial Zero hardness.											
21.4	REGENERATION TANK / SALT DILUTION TANK											
	Providing and fixing HDPE tank of Capacity 2000 litres to store and measure brine for regeneration of softening plant.Tank shall be complete with all interconnecting MS / HDPE pipes and other assemblies / accessories required for commissioning.											
a)	Brine Measuring Tank - 2000 litres capacity	NO.	1	1	1	3						
21.5	CHEMICAL DOSING PUMP											
	Providing , fixing ,Instalation and comissioning of chemical dosing pump capacity 6 lph with 250 ltrs capacity chemical tank.	NO.	1	1	1	3						
21.6	LEVEL CONTROLLERS / LEVEL INDICATORS											
	Supply, Installation, Testing and Commisioning of Magnetic Float type Level Controllers / Indicators having adequete number of switches (Minimum 5 Nos.) for the services mentioned below. Contoller Equipment shall be mounted inside the electrical panels											
a)	For Domestic Water tanks for the following levels.											
i)	High High level to trigger alarm.											
ii)	High Level to switch OFF the Tube well.											
iii)	Raw Water Tank 1/2 full											
v)	Low Low level to trigger alarm	Set	1	1	1	3						
b)	For Fire Water Tanks, one set for each of the tanks for the following levels.											
i)	High Level to trigger alarm											
ii)	Full Fire Water Tank indication											
iii)	Low low level in fire water tank to trigger alarm	Set	2	2	2	6						
c)	For Treated Water Tank for the following levels											
i)	High High level to trigger alarm											
ii)	High Level to switch OFF the Filter Feed Pumps.											
iii)	Treate Water Tank 1/2 full											
iv)	Low Level to switch ON the Filter Feed Pumps											
v)	Low Low level to trigger alarm	Set	1	1	1	3						
	<u>Note:</u>											

S. N.	Description	Unit	Budhwar peth	Mandai	Swargate	Total Qty.	Unit Rate	Total	Unit Rate	Total	Unit Rate	Total
							(In INR)	(In INR)	(In USD)	(In USD)	(In Euro)	(In Euro)
	All above level Controllers / Indicators to be complete with sensors, switches, relays, all wiring from the sensors to the Control Unit, Control Units to Motor Control Centers of the various Pumps and to the various alarm and indicating devices.											
	Sensors Terminal Units would be in weather proof enclosures (IP-56).											
	TOTAL OF WATER TREATMENT PLANT											

PART - D - SPARES							
<u>D1. Unit Exchange Spares</u>							
S.No.	Item	Unit	Quantity	Unit Price		Total Amount	
				INR	Foreign Currency	INR	Foreign Currency
1	Main Fire Pumps set for Hydrant System	Nos.	1				
2	Main Fire Pumps set for Sprinkler System	Nos.	1				
3	Jockey Pump set for Fire Hydrant System	Nos.	1				
4	Jockey Pump set for Sprinkler System	Nos.	1				
5	Seepage Pumps (1 set comprising of 1 pump of each type)	Set	1				
6	Sewage Pumps (1 set comprising of 1 pump of each type)	Set	1				
7	ACB (1 set comprising of 1 ACB of each rating)	Set	1				
8	MCCB (1 set comprising of 1 MCCB of each rating)	Set	1				
TOTAL AMOUNT FOR UNIT EXCHANGE SPARES							

<u>D2. Mandatory Spares</u>							
S.No	Item	Unit	Quantity	Unit Price		Total Amount	
				INR	Foreign Currency	INR	Foreign Currency
1	Butterfly Valve (65mm, 80mm, 100mm, 150mm, 200mm dia – 1 of each size)	Set	1				
2	Double Plate Check Valve (65mm, 100mm, 150mm dia – 1 of each size)	Set	1				
3	Y Strainers (80mm, 200mm – 1 of each size)	Set	1				
4	Gate Valve (25mm, 40mm, 50mm dia – 1 of each type)	Set	1				
5	Gunmetal Air Release valve	Nos.	1				
6	Bourden Type, Brass Dial Type	Nos.	5				
7	Fire Hydrant Valve (Single & Double Headed both type)	Nos.	1				
8	Vertical Air Vessel	Nos.	1				
9	Sprinkler (Pendant Type)	Nos.	5				
10	Sprinkler (Side wall Type)	Nos.	3				
11	Level Sensor (Each type)	Set	2				
12	Luminaries including all accessories like HF electronic ballast, holder & lamp etc. (1 set comprising of 5 luminaries of each type)	Set	1				
13	Automatic Transfer Switch(ATS)	Nos.	5				
14	Programmable Logic Controller (PLC) for MDB	Nos.	1				
15	Printed Circuit Board/Card (1 set comprising of each type of card for each type of UPS)	Sets	1				
16	Globe valve (1 set comprising of 1 valve of each size)	Sets	5				
17	Pressure Relief Valve (1 Set comprising of 1 valve of each size)	Sets	5				
18	Filter for Y-Strainer (1 set comprising of 1 Filter of each size)	Sets	15				
19	Expansion Bellow (1 Set comprising of 1 bellow of each size)	Sets	5				
20	Rubber make roll for Gasket	Sets	3				
21	Auto coupling for Sewage Pump	Sets	15				
22	Gasket for valves (1 set comprising of 1 gasket of each type)	Sets	20				
23	Pressure switch for fire Pumps (1 set comprising of 1 pressure switch of each type)	Sets	10				
24	Pressure gauges for fire pumps (1 set comprising of 1 gauge of each type)	Sets	10				

Revised BOQ - MEP Works D3: MINIMUM LIST OF DLP SPARES

S.NO	DESCRIPTION	MINIMUM NUMBER OF SPARES
A	ACB	
1	ACB OF EACH RATING OF EACH MAKE	1 nos . For each rating for each make
2	COMMUNICATION PORT FOR BREAKER RS 485	2 nos . For each rating for each make
3	CLOSING COIL	4 nos . For each rating for each make
4	SHUNT TRIP	4 nos . For each rating for each make
5	UNDER VOLTAGE WITH CONNECTOR	4 nos . For each rating for each make
6	SP CH MOTOR	2 nos . For each rating for each make
7	3 WIRE CONNECTOR(AUC CONTACT ADD ON BLOCK)	2 nos . For each rating for each make
8	4NO+4NC AUX CONTACT BLOCK(OF)	4 nos . For each rating for each make
9	FAULT SIGNILING CONTACT	2 nos . For each rating for each make
10	3P ACB NEUTRAL CT	2 nos . For each rating for each make
11	ACB RELEASE	2 nos . For each rating for each make
12	SMPS FOR CONTROL SUPPLY	2 nos . For each rating for each make
B	MCCB	
1	MCCB OF EACH RATING OF EACH MAKE	1 nos . For each rating for each make
2	MOTOR MECHANISHM	4 nos . For each rating for each make
3	AUX+TRIP CONTACT	2 nos . For each rating for each make
4	NETURAL SENSER CT	2 nos . For each rating for each make
5	SHUNT TRIP COIL	4 nos . For each rating for each make
6	EXTENDED ROM	2 nos . For each rating for each make
7	ULP COMMUNICATION MODULE	2 nos . For each rating for each make
8	ANY OTHER PART OF SIMILAR NATURE RECOMMENDER BY OEM	As recommended
C	MPCB	
1	MPCB OF EACH RATING OF EACH MAKE	2 nos . For each rating for each make
2	AUX CONTACT 1NO+1NC	2 nos . For each rating for each make
3	FAULT TRIP CONTAECT 1NO+1NC	2 nos . For each rating for each make
4	ANY OTHER PART OF SIMILAR NATURE RECOMMENDER BY OEM	As recommended
D	METERS	
1	MULTIFUNCTION METER	2 nos . For each rating for each make
2	AMMETER	2 nos . For each rating for each make
3	VOLTMETER	2 nos . For each rating for each make
E	CT	
1	CURRENT T/F WITH MOUNTING INSERT & TERMINALSHROUDING	2 nos . For each rating for each make
F	LIGHT & PUSH BUTTON	
1	INDICATING LAMP RED	
2	INDICATING LAMP YELLOW	40 nos.
3	INDICATING LAMP BLUE	40 nos.
4	INDICATING LAMP GREEN	40 nos.
5	INDICATING LAMP AMBER	40 nos.
6	EMERGENCY PUSH BUTTON LOCKABLE	40 nos.
7	RED PUSH BUTTON WITH NO	20 nos.
8	GREEN PUSH BUTTON WITH NC	20 nos.
G	RELAY & TIMERS	
1	MICRO RELAY WITH 14PIN BASE WITH SURGE SUPPRESSOR	100 nos.
2	RELAY BASE, RELAY WITH LED, RC CIRCUIT	100 nos.
3	MULTIFUNCTION METER	10 nos.
4	S/D TIMER	10 nos.
5	HOURLY METER	10 nos.
6	MOISTURE PROTECTION AUX SUPP.230VAC WITH O/P CONTACT 1C/O RESET MODE AUTO (1NO+1NC	10 nos.
7	TVMR RELAY	10 nos.
H	SWITCHES	
1	TNC SWITCH WITH KEY WITH ELEMENT	20 nos.
2	LOCAL/REMOTE WITH SWITH 2 STAY PUT, LOCABLE	20 nos.
3	AUTO/LOCAL/REMOTE WITH SWITCH 3 STAY PUT, LOCKABLE	20 nos.
4	INTERLOCKING BYPASS S/SWITCH 2STAY PUT LOCKABLE	20 nos.
5	WORK STAND BY S/S 1P2W, LOCKABE	20 nos.
I	CAPACITORS	
1	7% HARMONIC D-TUNED FILTER	10 nos.

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S.No	Revised BOQ - MEP Works	DESCRIPTION	MINIMUM NUMBER OF SPARES
2	3P 415V CAPACITOR HERMATICALLY SEALED METALISED POLYPROPYLENE HEAVY DUTY		10 nos.
J	MCB & RCCB		
1	MCB		10 nos . of each rating for each make
2	RCCB		10 nos . of each rating for each make
3	RCCB AUX CONTACT		20 nos.
K	CONTACTORS		
1	AUX CONTACTOR		10 nos . of each rating for each make
2	POWER CONTRACTOR 3P		10 nos . of each rating for each make
3	CAP. DUTY CONTRACTOR 3P		10 nos . of each rating for each make
4	ADD ON BLOCK 2NO+2NC		10 nos . of each rating for each make
5	ADD ON BLOCK 1NO+1NC		10 nos . of each rating for each make
L	HEATER & FAN & HUMIDISTAT		
1	HUMIDISTAT		20 nos . of each rating for each make
2	SPACE HEATER		20 nos . of each rating for each make
3	CFL WITH DOOR SWITCH		20 nos . of each rating for each make
4	CONTROL TERMINAL		20 nos . of each rating for each make
M	FUSES		
1	FUSES		20 nos . of each rating for each make
N	LIGHTS		
1	LIGHT FIXTURES (COMPLETE ASSEMBLY WITH FIXTURE , BALLAST, LAMP etc.)		10 nos . of each rating for each make
2	BALLAST		20 nos . of each rating for each make
3	LAMP		20 nos . of each rating for each make
4	HOLDER		20 nos . of each rating for each make
O	ATS		
1	ATS (COMPLETE ASSEMBLY)		10 nos . of each type
2	CONTROLLER		10 nos . of each type
3	AUXILLARY CONTACT BLOCK		10 nos . of each type
4	MOTOR MECHANISM/MOTOR		10 nos . of each type
P	UPS		
1	FUSES		50 nos . of each type
2	CARDS		2 nos . of each type
3	MCB/MCCBs		5 nos . of each type
Q	FIRE ALARAM SYSTEM		
1	CARDS		2 nos . of each type
2	ADDRSESSABLE POWER SUPPLY , 240VAC		2 nos . F each type
3	INTELLIGENT PHOTO THERMAL DETECTOR		50 nos . of each type
4	INTELLIGENT DETECTOR BASE		10 nos . of each type
5	INTELLIGENT ADDRESSABLE DUCT PHOTO DETECTOR		10 nos . of each type
6	LOOP ISOLATOR MODDULE		10 nos . of each type
7	ADDRESSABLE CONTROL MODULE		10 nos . of each type
8	ADDRESSABLE RELAY MODULE		10 nos . of each type
9	ADDRESSABLE MONITOR MODULE		10 nos . of each type
10	ADDRESSABLE PUL STATION		10 nos . of each rating for each make type
11	HOOTER STROBE		10 nos . of each rating for each type
12	FLOW SWITCHES		10 nos . of each rating for each type for pipe size
13	ISOLATOR BASE		20 nos. of each type
14	RESPONSE INDICATOR		20 nos. of each type
15	CPU F FACP		2 nos. of each type
R	PANEL GAS FLOODING SYSTEM		
1	FILLING ADAPTAR		20 nos.
2	OUTLET ADAPTER		20 nos.
3	END OF LINE ADAPTER		20 nos.
4	PRESSURE SWITCH		20 nos.
5	DETCTION TUBE		100 nos.
6	MASTER CONTROL UNIT		2 nos
7	AUTO WEIGHT MEASURING UNIT		2 nos.
S	PUMPS		
1	JOCKEY PUMP HYDRANT		1 nos.

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S.No	Revised BOQ - MEP Works	DESCRIPTION	MINIMUM NUMBER OF SPARES
2	JOCKEY PUMP SPRINKLER		1 nos.
3	SEEPAGE PUMPS		2 nos of each rating
4	WATER SUPPLY PUMPS		2 nos of each rating
5	SEWAGE PUMPS		2 nos of each rating
6	WEAR RINGS		5 nos. for each type of pump
7	GLAND PACKING		5 nos. for each type of pump
8	SHAFT SLEEVE		5 nos. for each type of pump
9	SET OF O RINGS		5 nos. for each type of pump
10	GASKET SET		5 nos. for each type of pump
11	MECHANICAL SEAL		5 nos. for each type of pump
T	LEVEL CONTROLLERS		
1	LEVEL SENSOR		10 nos. of each type
2	LEVEL CONTE		10 nos. of each type
U	VALVES		
1	HYDRANT VALVES		5 nos. of each type
2	BUTTERFLY VALVES		5 nos. of each type
3	GATE VALVES		5 nos. of each type
4	BALL VALVES		5 nos. of each type
5	MOTORIZED BUTTERFLY VALVES		5 nos. of each type
6	EXPANSION BELLOW		5 nos. of each type
7	Y-STRAINERS		5 nos. of each type
8	MOTOR MECHANISM BUTTERFLY VALVES		5 nos. of each type
9	STRAINER OF Y-STRAINER		10 nos. of each type
10	PRESSURE RELIEF VALAVE (PRV)		5 nos. of each type
11	GLOBE VALVE		5 nos. of each type
12	GASKETS		5 nos. of each type
13	AUTO COUPLING		5 nos. of each type
V	PRESSURE GUAGE/ SWITCH		
1	PRESSURE GUAGE		5 nos. of each type
2	PRESSURE SWITCHI		5 nos. of each type

NOTE

1	The above list is indicative and not exhaustive (for guidance purpose only). Any additional spare if required the same may be indicated by the firm in their Technical offer. However, nothing extra will be paid for any additional spares indicated by the firm
2	The cost of items listed above , for maintenance during DLP have to be included in the quoted prices. Nothing extra will be payable for such spare parts
3	If any additional items apart from the ones mentioned above are required during the DLP period the same will be arranged by us, without any Extra Payments
4	This will not absolve us of the responsibility to fulfill the DLP obligations as per relevant clauses of tender conditions
5	Contractors has to ensure the availability of above spares along with the required skilled personnel, T&Ps , M&P, Testing Instruments, Material Handling Equipment, Jigs & Fixtures and ladder etc. in desired location at specified intervals as approved by the employer during DLP to ensure that maintenance of Equipment is not effected
6	The balance DLP spares (balance after actual consumption, the contractor has to take written permission for using DLP spares from employer otherwise it will be assumed that the contractor has not used DLP spares and shall be return these spares after completion of DLP) shall be the property of the employer and if any additional spares are required the contractor shall arrange the same without any extra payment