

BID TOTAL PART-II

In accordance with the accompanying and signed form of bid, we (the Bidder) offer to supply, install, test, commission, and remedy at any defects of the whole said works, in conformity with the said drawings, particular specifications, conditions of contracts and other contract documents of **bid of Jaipur for Electrical and Mechanical System for Chhoti Chaupar and Badi Chaupar** for the following sums:

PRICES FOR WORKS CHHOTI CHAUPAR & BADI CHAUPAR U/G STATIONS AND ASSOCIATE FOR TUNNEL SECTION.

Section No.	DESCRIPTION	Total Brought From below Bills	
		INR	Foreign Currency
PART-A	BOQ FOR ELECTRICAL WORKS		
PART-B	BOQ FOR PLUMBING WORKS		
PART-C	BOQ FOR FIRE PROTECTION SYSTEM		
PART-D	BOQ for Civil Works as per DSR		
PART-E	BOQ for Additional Miscellaneous Items		
PART- F	BOQ for Spares		
PART- G	BOQ for Training & Training Manuals		
PART- H	BOQ for Operation and Maintenance manuals		
TOTAL SUM			

TOTAL SUM IN WORDS, OF INDIAN RUPEES
TOTAL SUM IN WORDS, OF FOREIGN CURRENCY

Note:-1.

All Sections will be part of evaluation. Employer reserves the rights not to award the any or all Items in BOQ. Additional items need to be operated with prior approval of employer.

Note:-2.

For items in BOQ, price shall be quoted considering that price will be inclusive of all related equipments, parts/ accessories if not covered in BOQ elsewhere and required for successful installation, testing & commissioning of that item for its proper uses.

Note:-3.

The rates quoted against the rate only (RO) items shall not be unbalanced. The same shall be executed with prior approval of the employer.

PART-A BOQ for Electrical Works

Section No.	DESCRIPTION	Total brought from below Bills	
		INR	FOREIGN CURRENCY
<u>PART – A</u>	BOQ for Electrical Works		
TOTAL SUM			

TOTAL SUM IN WORDS, OF INDIAN RUPEES

TOTAL SUM IN WORDS, OF FOREIGN CURRENCY

PART-B BOQ for Plumbing Works

Section No.	DESCRIPTION	Total brought from below Bills	
		INR	FOREIGN CURRENCY
PART - B	BOQ FOR Plumbing Works		
TOTAL SUM			

TOTAL SUM IN WORDS, OF INDIAN RUPEES

TOTAL SUM IN WORDS, OF FOREIGN CURRENCY

PART-C BOQ for Fire Protection System

Section No.	DESCRIPTION	Total brought from below Bills	
		INR	FOREIGN CURRENCY
PART - C	BOQ FOR Fire Protection System		
TOTAL SUM			

TOTAL SUM IN WORDS, OF INDIAN RUPEES

TOTAL SUM IN WORDS, OF FOREIGN CURRENCY

PART-D BOQ FOR CIVIL Works as per DSR

Section No.	DESCRIPTION	Total brought from below Bills	
		INR	FOREIGN CURRENCY
PART – D	BOQ FOR CIVIL Works as per DSR		
TOTAL SUM			

TOTAL SUM IN WORDS, OF INDIAN RUPEES

TOTAL SUM IN WORDS, OF Foreign Currency

PART-E BOQ FOR Additional Misc. Items

Section No.	DESCRIPTION	Total brought from below Bills	
		INR	FOREIGN CURRENCY
PART – E	BOQ FOR Additional Misc. Items		
TOTAL SUM			

TOTAL SUM IN WORDS, OF INDIAN RUPEES

TOTAL SUM IN WORDS, OF FOREIGN CURRENCY

PART- F BOQ FOR SPARES

Section No.	DESCRIPTION	Total brought from below Bills	
		INR	FOREIGN CURRENCY
PART - F	BOQ FOR SPARES		
TOTAL SUM			

TOTAL SUM IN WORDS, OF INDIAN RUPEES

TOTAL SUM IN WORDS, OF FOREIGN CURRENCY

PART-G BOQ for Training & Training Manuals

Section No.	DESCRIPTION	Total brought from below Bills	
		INR	FOREIGN CURRENCY
PART - G	BOQ FOR TRAINING MANUALS		
TOTAL SUM			

TOTAL SUM IN WORDS, OF INDIAN RUPEES

TOTAL SUM IN WORDS, OF FOREIGN CURRENCY

PART- H BOQ for Operation and Maintenance Manuals

Section No.	DESCRIPTION	Total brought from below Bills	
		INR	FOREIGN CURRENCY
PART - H	BOQ for Operation and Maintenance manuals		
TOTAL SUM			

TOTAL SUM IN WORDS, OF INDIAN RUPEES

TOTAL SUM IN WORDS, OF FOREIGN CURRENCY

Bid Total-Part-II (E&M works)

In accordance with the accompanying and signed form of Bid, we (the Bidder) offer to supply, install, test, commission, and remedy at any defects of the whole said works, in conformity with the said drawings, particular specifications, conditions of contracts and other contract documents of Bid of Jaipur for E& M system for Chhoti Chaupar and Badi Chaupar for the following sums: Prices for works Chhoti Chaupar & Badi Chaupar U/G Stations and Associate for Tunnel Section.

SECTION No.	DESCRIPTION	TOTAL Brought from above Bills	
		INR	Foreign Currency
PART-A	BOQ FOR ELECTRICAL WORK		
PART-B	BOQ FOR PLUMBING WORK		
PART-C	BOQ FOR FIRE PROTECTION WORK		
PART-D	BOQ FOR CIVIL WORK AS PER DSR		
PART-E	ADDITIONAL WORK		
PART-F	BOQ FOR SPARES		
PART-G	BOQ FOR TRAINING AND TRAINING MANUALS		
PART-H	BOQ FOR OPERATION AND MAINTENANCE MANUALS		
	TOTAL SUM		
TOTAL SUM IN WORDS, OF INDIAN RUPEES			
TOTAL SUM IN WORDS, OF FOREIGN CURRENCY			

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
1	LV MAIN SWITCHBOARDS, SUB-MAIN SWITCHBOARDS AND LOCAL ELECTRICAL PANELS									
	Switch Boards/panels									
	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 70kA (as specified for various panels) for 1 sec at 415 V and must include all interconnections, earthing and bonding requirements etc. The panels must conform to Drawings & Standards specified in relevant specifications, as required and as given below.									
a	Main LV Switchboards must conform to Section E01 of the M & W specifications.									
b	All Sub - Main LV Switchboards must conform to Section E01 of the M & W specifications									
c	All Local Electrical Panels must conform to Section E01 of the M & W specifications									
d	SPD shall be class B in MDBs.									
e	All the items mentioned in relevant Sections / Clauses of the M & W specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates									
f	In case of any contradiction between BOQ / M & W Specifications and Drawings, the most stringent conditions of the above will apply.									
g	The Switchboards shall be provided with detachable gland plates for entry of cables from the top / bottom as required.									
h	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.									
i	The panel shall have copper busbars as specified in Section E01 of M & W Specifications with bar type feeder connections, spacers etc. with full sized neutral.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
j	Earthing all components, frames etc. to a common internal earth bar Cu. as required by the fault withstand level specified for the board.									
k	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.									
l	Each incomer and outgoing feeder shall be provided with LED type status indication lamps suitable for 240 V, AC, as approved.									
m	Space provision as specified in M & W Specifications for future expansion.									
n	The make of all switchgear (ACB / MCCB / MCB etc.) must be same to have total discrimination.									
o	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									
p	All interconnections, labeling, earthing, associated foundation / masonry work, sealing of gaps around the panels by chequered plates & erection etc. complete shall be executed as required.									
q	MCCB's shall be as per Section E01 of M & W 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 M & W 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 than 35kA. 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.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
r	MCCBs for Network / Feeder Protection shall have adjustable protection against Overload and adjustable protection against Short Circuit as specified in Section E01 of M & W 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 Section E06 of M & W Specifications shall be followed.									
s	ACBs/MCCBs shall be compact , suitably designed to provide protection of motors, cables, busbars to suit rated current, unbalanced power distribution, as required.									
t	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 inplace of larger ones.									
u	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.									
v	ACB's shall have Microprocessor based releases as specified in the M & W Specifications.									
w	In case higher frame sizes (than those specified in the BOQ) are required to be provided to achieve the requirement of Total Discrimination mentioned in Section E01 of M & W Specifications, due to selection of a particular make, the same shall be provided at no extra cost if other makes are able to achieve the same with the specified frame size.									
x	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.									
y	All Motor feeders, having separate Thermal Over - load relay, shall be provided with Reset push button.									
z	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.									
aa	Surge Protection Device (SPD) shall be provided in all panels.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	Description of Various panels/boards covered under this BOQ is as given below:									
1.01										
I	Main Distribution Board DB-100 as per Technical Specifications and as per following details:	Sets		1	1	2				
I										
A	INCOMER									
	TRANSFORMER - I INCOMING each comprising of following									
a)	1 No. 5000 A / 5000 A, 415V, 70kA, 4 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 shall be as per I/O Schedule (3) Protection against long time + short time + earth fault (all with adjustable time delays) + instantaneous, over and under voltage, minimum and maximum frequency, voltage and current imbalance, phase sequence, load shedding and reconnection (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 (9) 1No.Lockable Emergency Push Button with contact.									
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for the following-									
	ON, OFF, TRIP, spring charged & phase indication (R-Y-B).									
e)	<u>Metering</u>									
i)	1 No. Multifunction energy meter for measurement of voltage, line current, power factor, power & energy.									
ii)	4 Nos. CTs 5000/5A, 15VA, CL-0.5S for metering (Dual Ratio).									
iii)	1 Nos. CTs 5000/5A, 15VA, CL-1 for APFCR relay.									
f)	<u>Protection</u>									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
i)	4 Nos. CTs, 5000/1A, CL-PS, in the MDB. Contractor carry out interface, to ensure that these CT's are matching with the CT provided in the neutral section of the Transformer by the Power Supply Contractor. In case any changes are required in the Specifications given above due to interface, including the rating of the CT's, same shall be done at no extra cost to the Employer.									
g)	Front Display Module(FDM)									
B	ASS-1 to ASS-2 (TIE BREAKER for connecting DB-100 to DB-200)									
a	1 No. 2500A/2500A, 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 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) Signaling 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.(9) 1No.Lockable Emergency Push Button with contact									
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
f)	3 Nos. CTs, 2500/5A, 15VA, CL-1 for metering.									
C	Interconnector Bus-Section Circuit Breaker (Bus Coupler comprising of following)									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
a)	1 No. 3200/3200A, 415V, 70kA, 4 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 three phase and neutral 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) Signaling of the cause of tripping and alarms, maximeter reset etc (7) NO / NC contacts for interlocks and indications. (8) Status Indication ON, OFF, TRIP									
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
D	BUS-BARS									
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars rated 5000 Amps, suitable to withstand symmetrical fault level of 70kA for 1 second at 415 volts.									
E	OUT GOING FEEDERS									
1	Outgoing feeders - (Total 2 Nos),DB-170, One No. & One No.spare with each of the above feeders consisting of the following:									
a	1 No. 2500A/2500A, 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 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) Signaling 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)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
f)	3 Nos. CTs, 2500/5A, 15VA, CL-1 for metering.									
2)	Outgoing feeder - (Total 1 Nos) -One No.CAP-100 of the above feeders consisting of the following:									
a)	1 No. 630A/630A, 415V, 65KA, 3 Pole motorised MCCB with 240V AC shunt trip coil and having electronics releases with (1) Communication capability (2) Provision for measurement of three phase current (3) Protection against Overload (with base setting and fine adjustment), Short Circuit and earth fault (all with adjustable time delays) + Instantaneous (4) Communication options to remotely read parameters for the protection functions transmission of ammeter measurements, signaling of cause of tripping, maximeter reset etc. (5) NO / NC contacts for interlocks and indications (6) 1 No.CT in Neutral for earth fault protection.									
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
f)	3 Nos. CTs, 630/5A, 15VA, CL-1 for metering.									
3	Outgoing feeders - (Total 2 Nos) - One No. for DB-140 ,One No. for DB-240 (BU)with each of the above feeders consisting of the following:									
a)	1 No. 1600A/1600A, 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 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) Signaling 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.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
f)	3 Nos. CTs, 1600/5A , 15VA, CL-1 for metering.									
4	Outgoing feeders - (Total 2 Nos) - One No. for DB-150, One No.for spare with each of the above feeders consisting of the following:									
a)	1 No. 1250A/1250A, 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 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) Signaling 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)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
f)	3 Nos. CTs, 1250/5A, 15VA, CL-1 for metering.									
5	Outgoing feeders - (Total 2 Nos) - One No. for DB-130 & One No. for DB-230 with each of the above feeders consisting of the following:									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
a)	1 No. 1000A/1000A, 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 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) Signaling 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)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
f)	3 Nos. CTs, 1000/5A, 15VA, CL-1 for metering.									
6	Outgoing feeders - (Total 2 Nos) - One No. for DB-110 & One No. for Spare with each of the above feeders consisting of the following:									
a)	1 No. 630A/630A, 415V, 65KA, 3 Pole motorised MCCB with 240V AC shunt trip coil and having electronics releases with (1) Communication capability (2) Provision for measurement of three phase current (3) Protection against Overload (with base setting and fine adjustment), Short Circuit and earth fault (all with adjustable time delays) + Instantaneous (4) Communication options to remotely read parameters for the protection functions transmission of ammeter measurements, signaling of cause of tripping, maximeter reset etc. (5) NO / NC contacts for interlocks and indications (6) 1 No.CT in Neutral for earth fault protection.									
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	Digital Ammeter with Inbuilt Selector Switch									
f)	3 Nos. CTs, 630/5A, 15VA, CL-1 for metering.									
7	Outgoing feeders - (Total 2 Nos) - One No. for DB-120,One no Spare with each of the above feeders consisting of the following:									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
a)	1 No. 250A/200A, 415V, 65KA, 3 Pole motorised MCCB with 240V AC shunt trip coil and having electronics releases with (1) Communication capability (2) Provision for measurement of three phase current (3) Protection against Overload (with base setting and fine adjustment), Short Circuit and earth fault (all with adjustable time delays) + Instantaneous (4) Communication options to remotely read parameters for the protection functions transmission of ammeter measurements, signaling of cause of tripping, maximeter reset etc. (5) NO / NC contacts for interlocks and indications (6) 1 No.CT in Neutral for earth fault protection.									
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
f)	3 Nos. CTs, 200/5A, 15VA, CL-1 for metering.									
F	INTERLOCKING ARRANGEMENT									
	PLC unit, suitable for interlocking 16 Nos Circuit Breakers, complete with all hardware and software as per interlocking schedule.									
G	SCADA CONNECTIVITY									
	All the breakers should be provided with communication facilities & contractor should provide single point to the marshalling box to communicate with BMS/SCADA for all system parameters of the panel. DC source & other accessories including software and hardware required for this is in the scope of contractor.									
	Transducer and wiring upto marshalling box for all relevant I/O points for panels for SCADA/BMS Connectivity in the scope of contractor.									
1.02										
I	Main Distribution Board DB-200 as per Technical Specifications and as per following details:	Sets		1	1	2				
A	INCOMER									
	TRANSFORMER -II INCOMING each comprising of following									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
a)	1 No. 5000 A / 5000 A, 415V, 70kA, 4 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 shall be as per I/O Schedule (3) Protection against long time + short time + earth fault (all with adjustable time delays) + instantaneous, over and under voltage, minimum and maximum frequency, voltage and current imbalance, phase sequence, load shedding and reconnection (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) Signaling of the cause of tripping and alarms (8) NO/NC contacts for interlocks and indications.(9) 1No.Lockable Emergency Push Button with contact.									
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for the following- ON, OFF, TRIP, spring charged & phase indication (R-Y-B).									
e)	<u>Metering</u>									
i)	1 No. Multifunction energy meter for measurement of voltage, line current, power factor, power & energy.									
ii)	4 Nos. CTs 5000/5A, 15VA, CL-0.5S for metering (Dual Ratio).									
iii)	1 Nos. CTs 5000/5A, 15VA, CL-1 for APFCR relay.									
f)	<u>Protection</u>									
i)	4 Nos. CTs, 5000/1A, CL-PS, in the MDB. Contractor carry out interface, to ensure that these CT's are matching with the CT provided in the neutral section of the Transformer by the Power Supply Contractor. In case any changes are required in the Specifications given above due to interface, including the rating of the CT's, same shall be done at no extra cost to the Employer.									
g)	1 No. Front Display Module(FDM)									
B	ASS-1 to ASS-2 (TIE BREAKER for connecting DB-100 to DB-200)									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
a	1 No. 2500A/2500A, 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 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) Signaling 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)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
f)	3 Nos. CTs, 2500/5A, 15VA, CL-1 for metering.									
C	Interconnector Bus-Section Circuit Breaker (Bus Coupler comprising of following)									
a)	1 No. 3200A/3200A, 415V, 70kA, 4 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 three phase and neutral 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) Signaling of the cause of tripping and alarms, maximeter reset etc (7) NO / NC contacts for interlocks and indications. (8) Status Indication ON, OFF, TRIP									
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
D	BUS-BARS									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars rated 5000 Amps, suitable to withstand symmetrical fault level of 70kA for 1 second at 415 volts.									
E	OUT GOING FEEDERS									
1	Outgoing feeders - (Total 2 Nos),One No.DB-270 & One No.spare with each of the above feeders consisting of the following:									
a	1 No. 2500A/2500A, 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 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) Signaling 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)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
f)	3 Nos. CTs, 2500/5A, 15VA, CL-1 for metering.									
2)	Outgoing feeder - (Total 1 Nos) -One No.CAP-200 of the above feeders consisting of the following:									
a	1 No. 630A/630A, 415V, 65KA, 3 Pole motorised MCCB with 240V AC shunt trip coil and having electronics releases with (1) Communication capability (2) Provision for measurement of three phase current (3) Protection against Overload (with base setting and fine adjustment), Short Circuit and earth fault (all with adjustable time delays) + Instantaneous (4) Communication options to remotely read parameters for the protection functions transmission of ammeter measurements, signaling of cause of tripping, maximeter reset etc. (5) NO / NC contacts for interlocks and indications (6) 1 No.CT in Neutral for earth fault protection.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
f)	3 Nos. CTs, 630/5A, 15VA, CL-1 for metering.									
3	Outgoing feeders - (Total 2 Nos) - One No. for DB-240 , One No. for DB-140(BU), with each of the above feeders consisting of the following:									
a)	1 No. 1600A/1600A, 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 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) Signaling 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)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
f)	3 Nos. CTs, 1600/5A, 15VA, CL-1 for metering.									
4	Outgoing feeders - (Total 2 Nos) - One No. for DB-250 & One No.Spare with each of the above feeders consisting of the following:									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
a)	1 No. 1250A/1250A, 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 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) Signaling 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)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	Digital Ammeter with Inbuilt Selector Switch									
f)	3 Nos. CTs, 1250/5A, 15VA, CL-1 for metering.									
5	Outgoing feeders - (Total 2 Nos) - One No. for DB-130 & One No. for DB-230 with each of the above feeders consisting of the following:									
a)	1 No. 1000A/1000A, 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 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) Signaling 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)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No. Multifunction energy meter for measurement of voltage, line current, power factor									
f)	3 Nos. CTs, 1000/5A, 15VA, CL-1 for metering.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
6	Outgoing feeders - (Total 2 Nos) - One No. For DB-210 & One No. for Spare with each of the above feeders consisting of the following:									
a)	1 No. 630A/630A, 415V, 65KA, 3 Pole motorised MCCB with 240V AC shunt trip coil and having electronics releases with (1) Communication capability (2) Provision for measurement of three phase current (3) Protection against Overload (with base setting and fine adjustment), Short Circuit and earth fault (all with adjustable time delays) + Instantaneous (4) Communication options to remotely read parameters for the protection functions transmission of ammeter measurements, signaling of cause of tripping, maximeter reset etc. (5) NO / NC contacts for interlocks and indications (6) 1 No.CT in Neutral for earth fault protection.									
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
f)	3 Nos. CTs, 630/5A, 15VA, CL-1 for metering.									
7	Outgoing feeders - (Total 2 Nos) - One No. for DB-220, & One Nos. for Spare with each of the above feeders consisting of the following:									
a)	1 No. 250A/200A, 415V, 65KA, 3 Pole motorised MCCB with 240V AC shunt trip coil and having electronics releases with (1) Communication capability (2) Provision for measurement of three phase current (3) Protection against Overload (with base setting and fine adjustment), Short Circuit and earth fault (all with adjustable time delays) + Instantaneous (4) Communication options to remotely read parameters for the protection functions transmission of ammeter measurements, signaling of cause of tripping, maximeter reset etc. (5) NO / NC contacts for interlocks and indications (6) 1 No.CT in Neutral for earth fault protection.									
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
f)	3 Nos. CTs, 200/5A, 15VA, CL-1 for metering.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
F	INTERLOCKING ARRANGEMENT									
	PLC unit, suitable for interlocking 16 Nos Circuit Breakers, complete with all hardware and software as per interlocking schedule.									
G	SCADA CONNECTIVITY									
	All the breakers should be provided with communication facilities & contractor should provide single point to the marshalling box to communicate with BMS/SCADA for all system parameters of the panel. DC source & other accessories including software and hardware required for this is in the scope of contractor.									
	Transducer and wiring upto marshalling box for all relevant I/O points for panels for SCADA/BMS Connectivity in the scope of contractor.									
1.04	Small power distribution panels (DB-110 & DB-210) as per Technical Specifications and as per the following details.	Sets		2	2	4				
A	INCOMING									
a)	1 No. 630 A / 630 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) 1 No.CT in Neutral for earth fault protection.									
b)	TNC switch									
c)	LED indication lamp for ON, OFF & TRIP. Phase Indication for R, Y and B									
d)	<u>Metering</u>									
i)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor, power & energy.									
ii)	3 Nos. CTs, 630/5A, 10VA, CL-1 for metering.									
B	BUS-BARS									
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars rated 630 Amps, suitable to withstand symmetrical fault level of 65KA for 1 second at 415 volts.									
C	OUTGOING									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
1	25 Nos. Feeders with 100A/63A, 3 pole, 50kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit									
	Scada/BMS Connectivity at the separate Marshelling box in the panel with provision of all necessary I/O points & Transducers mounting prewired upto marshelling box terminal boards from the factory itself and audited in factory from the BMS provider									
1.05	Lighting distribution panels (DB-120 & DB-220) as per Technical Specifications and as per the following details.	Sets		2	2	4				
A	INCOMING									
a)	1 No. 250 A/200 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) 1 No.CT in Neutral for earth fault protection.									
b)	TNC switch									
c)	LED indication lamp for ON, OFF & TRIP.									
	Phase Indication for R, Y and B									
d)	<u>Metering</u>									
i)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor, power & energy.									
ii)	3 Nos. CTs, 200/5A, 10VA, CL-1 for metering.									
B	BUS-BARS									
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars rated 250 Amps, suitable to withstand symmetrical fault level of 65KA for 1 second at 415 volts.									
C	OUTGOINGS									
1	14 Nos. Feeders with 100A/63 A, 3 pole, 50kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit.									
	Scada/BMS Connectivity at the separate Marshelling box in the panel with provision of all necessary I/O points & Transducers mounting prewired upto marshelling box terminal boards from the factory itself and audited in factory from the BMS provider									
1.06	Escalator & lift panels (DB-150 & DB-250) as per Technical Specifications and as per the following details.	Sets		2	2	4				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
A	INCOMING									
a)	1 No. 1250A/1250A, 415V, 65kA, 4 Pole, 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) Signaling 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)	<u>Metering</u>									
i)	1 No. Multifunction energy meter for measurement of voltage, line current, power factor, power & energy.									
ii)	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 rated 1250 Amps, suitable to withstand symmetrical fault level of 65 KA for 1 second at 415 volts.									
C	OUTGOINGS									
1	2 Nos. Feeder with 400A/400A, 3 pole, 50 kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit.									
2	8 Nos. Feeder with 400A/250A, 3 pole, 50 kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
3	8 Nos. Feeders with 160 A/ 100 A, 3 pole, 50 kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit.									
	Scada/BMS Connectivity at the separate Marshelling box in the panel with provision of all necessary I/O points & Transducers mounting prewired upto marshelling box terminal boards from the factory itself and audited in factory from the BMS provider									
1.07	Escalator distribution Boards (DB-151 & DB-251) as per Technical Specifications and as per the following details.	Sets		2	2	4				
A.	INCOMER									
a)	Automatic Transfer Switch (ATS) with 2 Nos. 400/400A, 65kA, 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- ON, OFF, TRIP (each for both the supplies)									
c)	LED phase indication lamp for R-Y-B.									
d)	<u>Metering</u>									
i)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor, power & energy.									
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 65 KA for 1 second at 415 volts.									
C.	OUTGOING									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
1	10 Nos. Feeder with 160A/100 A, 3 pole, 50 kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit									
	<u>Metering</u>									
i)	10 No.Multifunction energy meter for measurement of voltage, line current, power factor.									
ii)	3 Nos. CTs, 100/5A, 10VA, CL-1 for metering.									
	Scada/BMS Connectivity at the separate Marshelling box in the panel with provision of all necessary I/O points & Transducers mounting prewired upto marshelling box terminal boards from the factory itself and audited in factory from the BMS provider									
1.08	UPS Distribution Panels (DB - 180 & DB - 280) as per Technical Specifications and as per the following details.	Sets		2	2	4				
A	INCOMER									
a)	2 Nos. 250A/200A, 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-									
	ON, OFF, TRIP (each for both the supplies)									
c)	LED phase indication lamp for R-Y-B.									
	<u>Metering</u>									
i)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor, power & energy.									
ii)	3 Nos. CTs, 200/5A, 10VA, CL-1 for metering.									
B	BUS-BARS									
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars rated 200 Amps, suitable to withstand symetrical fault level of 35kA for 1 second at 415 volts.									
C	OUTGOINGS									
1	12 Nos. 40A, 4P MCB									
2	2 Nos. Feeders with 40 A, 3 pole, 35kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
3	2 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.									
4	1 No. Feeders with 160/100 A, 3 pole, 35kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit.									
	Scada/BMS Connectivity at the separate Marshelling box in the panel with provision of all necessary I/O points & Transducers mounting prewired upto marshelling box terminal boards from the factory itself and audited in factory from the BMS provider									
1.09	Capacitor Panel/Power Factor Correction Panel of 250 KVAR as per Technical specifications and as per the following details.	Sets		2	2	4				
A	INCOMER									
a)	1 No. 630 A / 630 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) 1 No.CT in Neutral for earth fault protection.									
b)	LED indication lamp for the following- ON, OFF, TRIP									
c)	LED phase indication lamp for R-Y-B.									
d)	12 Step APFCR relay.									
e)	1 No Auto / manual Selector Switch.									
	<u>Metering</u>									
i)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor, power & energy.									
ii)	3 Nos. CTs, 630/5A, 10VA, CL-1 for metering.									
B	BUS-BARS									
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars rated 630 Amps, suitable to withstand symmetrical fault level of 65 KA for 1 second at 415 volts.									
C	OUTGOINGS									
	8 Nos. feeders with each feeder containing the following-									
a)	1 No. 100 A, 3 pole, 50kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit									
b)	Capacitor Duty, 3 - Pole Contactor suitable for 25 kVAR capacitor , with Auxiliary Contacts.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
c)	2 Nos Push Button for ON & OFF.									
d)	2 Nos LED Indication Lamp for ON & OFF indication.									
e)	1 No. 25 KVAR, 3 - phase, 415V, hermatically sealed metalised polypropylene capacitor (heavy-duty) with 7% harmonic D-tuned filters.									
	2 Nos. feeders with each feeder containing the following-									
a)	1 No. 63 A, 3 pole, 50kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit									
b)	Capacitor Duty, 3 - Pole Contactor suitable for 15 kVAR capacitor , with Auxiliary Contacts.									
c)	2 Nos Push Button for ON & OFF.									
d)	2 Nos LED Indication Lamp for ON & OFF indication.									
e)	1 No. 15 KVAR, 3 - phase, 415V, hermatically sealed metalised polypropylene capacitor (heavy-duty) with 7% harmonic D-tuned filters.									
	2 Nos. feeders with each feeder containing the following-									
a)	1 No. 32 A, 3 pole, 50kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit									
b)	Capacitor Duty, 3 - Pole Contactor suitable for 10 kVAR capacitor , with Auxiliary Contacts.									
c)	2 Nos Push Button for ON & OFF.									
d)	2 Nos LED Indication Lamp for ON & OFF indication.									
e)	1 No. 10 KVAR, 3 - phase, 415V, hermatically sealed metalised polypropylene capacitor (heavy-duty) with 7% harmonic D-tuned filters.									
	Scada/BMS Connectivity at the separate Marshelling box in the panel with provision of all necessary I/O points & Transducers mounting prewired upto marshelling box terminal boards from the factory itself and audited in factory from the BMS provider									
1.10	Auto Transfer Switch for UPS - 100 & UPS - 200 as per Technical Specifications & as per the following details.	Sets		2	2	4				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
1	Automatic Transfer Switch (ATS) with 2 Nos. 400A/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-									
	ON, OFF, TRIP (each for both the supplies)									
c)	LED phase indication lamp for R-Y-B.									
	Out going terminals for cable collection to be provided.									
	Scada/BMS Connectivity at the separate Marshelling box in the panel with provision of all necessary I/O points & Transducers mounting prewired upto marshelling box terminal boards from the factory itself and audited in factory from the BMS provider									
1.11	Auto Transfer Switch for Lifts ATS as per Technical Specifications and as per the following details.	Sets		3	3	6				
1	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-									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	ON, OFF, TRIP (each for both the supplies)									
c)	LED phase indication lamp for R-Y-B.									
d)	1 No 6A, DP, MCB (B curve) for Lift control supply (UPS supply) local isolation.									
	Out going terminals for cable connection to be provided.									
	Scada/BMS Connectivity at the separate Marshelling box in the panel with provision of all necessary I/O points & Transducers mounting prewired upto marshelling box terminal boards from the factory itself and audited in factory from the BMS provider									
1.16	Local Motor Control Panel for Seepage Pumps, DB - 155 & DB-255 as per as per technical Specifications & as per the following details.	Sets		2	2	4				
A.	Incomer									
a)	Automatic Transfer Switch (ATS) with 2 Nos. 250A/160 A, 4 pole, 35kA 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-									
	ON, OFF, TRIP (each for both the supplies)									
c)	LED phase indication lamp for R-Y-B.									
d)	Flow meter with BMS Interfacing									
e)	METERING									
i)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor, power & energy.									
ii)	3 Nos. CTs, 160/5A, 10VA, CL-1 for metering.									
B.	BUS BAR									
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars rated 160 Amps, suitable to withstand symetrical fault level of 35 kA for 1 second at 415 volts.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
C.	OUTGOING									
1	3 Sets of Star Delta starter unit for Seepage Pumps upto (11.25 KW each) with Three Pumps as Working. Each Starter Unit shall be equipped with the following:									
a)	1 No. 3 Pole suitable rating of MPCB (with Inbuilt Single Phasing Preventor) with suitable rating of Over - load release and having contacts for indications - On, Off, Trip.									
b)	1 No. 4 Pole RCBO 40A rating and 100mA sensitivity.									
c)	1 No. Multifunction energy meter for measurement of voltage, line current, power factor									
d)	1 No. CT 30/5A, 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. 32A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 230 VAC.									
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)	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.									
2	2 Nos. Feeders(1 No.For Mid Tunnel Pump+1No. Spare) with 100A/40 A, 3 pole, 35kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit .Feeder shall be equipped with the following:									
a)	LED indication lamp for ON, OFF & TRIP.									
b)	Phase Indication for R, Y and B									
c)	Metering									
i)	1 No Digital Voltmeter with Inbuilt Selector Switch.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
ii)	1 No Digital Ammeter with Inbuilt Selector Switch.									
iii)	3 Nos. CTs, 40/5A, 10VA, CL-1 for metering.									
	Scada/BMS Connectivity at the separate Marshelling box in the panel with provision of all necessary I/O points & Transducers mounting prewired upto marshelling box terminal boards from the factory itself and audited in factory from the BMS provider									
1.17	Local Motor Control Panel for Mid tunnel Pumps as per technical Specifications & as per the following details.	Sets		2	2	4				
A.	INCOMER									
a)	100A/40 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.									
c)	Flow meter with BMS Interfacing									
d)	METERING									
i)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
ii)	3 Nos. CTs, 40/5A, 10VA, CL-1 for metering.									
B.	BUS BAR									
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars rated 40 Amps, suitable to withstand symmetrical fault level of 35kA for 1 second at 415 volts.									
C.	OUTGOING									
1	2 Sets of Star Delta starter unit for Sump Pumps (upto 3.7 KW each) with one Pump as Working and One as Standby. Each Starter Unit shall be equipped with the following.									
a	1 No. 3 Pole suitable rating of MPCB (with Inbuilt Single Phasing Preventor) with suitable rating of Over - load release and having contacts for indications - On, Off, Trip.									
b	1 No. 4 pole, RCBO with 40A rating and 100 mA sensitivity.									
c	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
d	1 No. CT, 10/5A, 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.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
i	3 No. 18A, 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)	1 No Working / Standby Selector Switch.									
b)	Auxiliary Contactors with 240 V AC operating coil (for Working / Standby selection).									
	Scada/BMS Connectivity at the separate Marshelling box in the panel with provision of all necessary I/O points & Transducers mounting prewired upto marshelling box terminal boards from the factory itself and audited in factory from the BMS provider									
1.18	Local Motor Control Panel for Fire Fighting Pumps, DB - 260 as per technical Specifications & as per the following details.	Sets		1	1	2				
A.	INCOMER									
a)	Automatic Transfer Switch (ATS) with 2 Nos. 400 A/400 A, 4 pole, 65KA 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- ON, OFF, TRIP (each for both the supplies)									
c)	LED phase indication lamp for R-Y-B.									
d)	Flow meter with BMS Interfacing									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
e)	METERING									
i)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor, power & energy.									
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 65 KA for 1 second at 415 volts.									
C.	OUTGOING									
1	2 Sets of Star Delta starter unit for Fire Sprinkler Pumps (upto 55 KW each) with One Pump as Working and One as Standby. Each Starter Unit shall be equipped with the following.									
a)	1 No. 3 Pole, 415V, 160 A, 50 kA, 3P Motor Duty MCCB with Magnetic Trip Unit Only (having short circuit protection only) and auxiliary Contacts.									
b)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
c)	1 No. CT, 160 /5A, 10VA, class - I for metering.									
d)	Auto / Local / Remote Selector Switch key operated.									
e)	Door mounted push buttons for Start and Stop functions.									
f)	Emergency stop push button lockable type.									
g)	LED indication lamp for ON, OFF, Trip.									
h)	3 No. 150A or equivalent, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.									
i)	One No. Star Delta Timer.									
j)	Auxiliary Contactors for Auto/Local/Remote Operation.									
k)	Triple pole saturable C.T. operated electronic over Current relays (with in built single phasing protection) suitable for above mentioned motor; by passing arrangement in case of emergency with all accessories (3nos saturable C.T.s, auxiliary contactors etc.).									
l)	Power & Control terminals for cable connections.									
	Equipment common for all feeders is indicated below:									
a)	1 No. Working / Standby Selector Switch.									
b)	Auxiliary Contactors with 240 V AC operating coil (for Working / Standby selection).									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
2	3 Sets of Star Delta starter unit for Fire Hydrant Pumps (upto 75.0 KW each) with One Pump as Working and One as Standby & One no. Spare. Each Starter Unit shall be equipped with the following.									
a)	1 No. 3 Pole, 415V, Suitable rating, 50kA, 3P Motor Duty MCCB with Magnetic Trip Unit Only (having short circuit protection only) and auxiliary Contacts.									
b)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
c)	1 No. CT, Suitable rating, 10VA, class - I for metering.									
d)	Auto / Local / Remote Selector Switch key operated.									
e)	Door mounted push buttons for Start and Stop functions.									
f)	Emergency stop push button lockable type.									
g)	LED indication lamp for ON, OFF, Trip.									
h)	3 No. Suitable rating,, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.									
i)	One No. Star Delta Timer.									
j)	Auxiliary Contactors for Auto/Local/Remote Operation.									
k)	Triple pole saturable C.T. operated electronic over Current relays (with in built single phasing protection) suitable for above mentioned motor; by passing arrangement in case of emergency with all accessories (3nos saturable C.T.s, auxiliary contactors etc.).									
l)	Power & Control terminals for cable connections.									
	Equipment common for all feeders is indicated below:									
a)	1 No. Working / Standby Selector Switch.									
b)	Auxiliary Contactors with 240 V AC operating coil (for Working / Standby selection).									
3	3 Sets of Star Delta Starter Unit (One Set for Sprinkler Jockey Pump, Hydrant Jockey Pump & one Set as spare) of 5.5 KW. Each Starter Unit shall be equipped with the followings:									
a)	1 No. 3 Pole, 415V, 32 A, 50 kA, 3P Motor Duty MCCB with Magnetic Trip Unit Only (having short circuit protection only) and auxiliary Contacts.									
b)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
c)	1 No. CT, 30/5A, 10VA, class - I for metering.									
d)	Auto / Local / Remote Selector Switch key operated.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
e)	Door mounted push buttons for Start and Stop functions.									
f)	Emergency stop push button lockable type.									
g)	LED indication lamp for ON, OFF, Trip.									
h)	3 No. 40A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.									
i)	One No. Star Delta Timer.									
j)	Auxiliary Contactors for Auto/Local/Remote Operation.									
k)	Triple pole saturable C.T. operated electronic over Current relays (with in built single phasing protection) suitable for above mentioned motor; by passing arrangement in case of emergency with all accessories (3nos saturable C.T.s, auxiliary contactors etc.).									
l)	Power & Control terminals for cable connections.									
	Scada/BMS Connectivity at the separate Marshelling box in the panel with provision of all necessary I/O points & Transducers mounting prewired upto marshelling box terminal boards from the factory itself and audited in factory from the BMS provider									
1.19	Local Motor Control Panel for Water Treatment System, DB - WT as per technical Specifications & as per the following details.	Sets		1	1	2				
A.	Incomer									
a)	2 Nos. 250 A/160 A, 415V, 35 kA, 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-									
	ON, OFF, TRIP									
d)	Flow meter with BMS Interfacing									
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.									
C.	Outgoing									
1	3 Sets (Bore well) of Star - Delta Starter Unit of 5.5kW. Each Starter Unit shall be equipped with the following:									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
a)	1 No. 3 pole, 20A, MPCB (with inbuilt Single Phasing Preventor) having 14 - 20 A Over - load release and having Auxiliary contacts for indications for On, Off and Trip.									
b)	1 No. 4 pole, RCBO with 40A rating and 100 mA sensitivity.									
c)	1 No. Multifunction energy meter for measurement of voltage, line current, power factor									
d)	1 No. CT, 25/5A, 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)	Running Hour meter.									
l)	Auxiliary Contactors for Auto/Local/Remote Operation.									
m)	Power & Control terminals for cable connections.									
2	6 Sets of Star - Delta Starter Unit of 3.7kW. Each Starter Unit shall be equipped with the following:									
a)	1 No. 3 pole, 13A, MPCB (with inbuilt Single Phasing Preventor) having 6 - 10 A Over - load release and having Auxiliary contacts for indications for On, Off and Trip.									
b)	1 No. 4 pole, RCBO with 40A rating and 100 mA sensitivity.									
c)	1 No. Multifunction energy meter for measurement of voltage, line current, power factor									
d)	1 No. CT, 10/5A, 10VA, class - I for metering.									
e)	Auto / Local / Remote Selector Switch key operated.									
f)	Door mounted push buttons for Start and Stop functions.									
g)	LED indication lamp for ON, OFF, Trip.									
h)	Emergency stop push button lockable type.									
i)	3 No. 13A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.									
j)	One No. Star Delta Timer.									
k)	Running Hour meter.									
l)	Auxiliary Contactors for Auto/Local/Remote Operation.									
m)	Power & Control terminals for cable connections.									
3	2 Sets of DOL starter unit for Sump Pumps (2.0HP each) with one Pump as Working and One as Standby. Each Starter Unit shall be equipped with the following.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
a	1 No. 3 pole, 6.3 A, MPCB (with inbuilt Single Phasing Preventor) having 4 - 6.3 A Over - load release and having Auxiliary contacts for indications for On, Off and Trip.									
b	1 No. 4 pole, RCBO with 40A rating and 100 mA sensitivity.									
c	1 No. Multifunction energy meter for measurement of voltage, line current, power factor									
d	1 No. CT, 10/5A, 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	1 No. 10 A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.									
j	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)									
k	Running hour meter.									
l	Auxiliary Contactors for Auto/Local/Remote Operation.									
m	Power & Control terminals for cable connections.									
	Scada/BMS Connectivity at the separate Marshelling box in the panel with provision of all necessary I/O points & Transducers mounting prewired upto marshelling box terminal boards from the factory itself and audited in factory from the BMS provider									
1.20	Local Motor Control Panels for Sewage Pumps, DB - 111 & 211 as per technical Specifications & as per the following details.	Sets		1	1	2				
A.	Incomer									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
a	Automatic Transfer Switch (ATS) with 2 Nos. 100A/63A, 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 phase indication lamp for R-Y-B.									
c)	Flow meter with BMS Interfacing									
d)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor, power & energy.									
e)	1 No. CT, 63/5A, 10VA, class - I for metering.									
B.	BUS BAR									
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars rated 63 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 for Sewage Pumps (3.75 KW each) with one Pump as Working and One as Standby and 1 spare Each Starter Unit shall be equipped with the following.									
a	1 No. 3 pole,10 A, MPCB (with inbuilt Single Phasing Preventor) having 6 - 10 A Over - load release and having Auxiliary contacts for indications for On, Off and Trip.									
b	1 No. 4 pole, RCBO with 40A rating and 100 mA sensitivity.									
c	1 No.Multifunction energy meter for measurement of voltage, line current, power factor									
d	1 No. CT, 10/5A, 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. 18A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
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)	1 No Working / Standby Selector Switch.									
b)	Auxiliary Contactors with 240 V AC operating coil (for Working / Standby selection).									
	Scada/BMS Connectivity at the separate Marshelling box in the panel with provision of all necessary I/O points & Transducers mounting prewired upto marshelling box terminal boards from the factory itself and audited in factory from the BMS provider									
1.21	Local Motor Control starter for Entry/Exit sumps as per technical Specifications & as per the following details.	Sets		4	4	8				
	1 Sets of DOL starter unit for Sump Pumps (2.2 KW each) with one Pump as Working. Each Starter Unit shall be equipped with the following.									
a	1 No. 3 pole, 6.3 A, MPCB (with inbuilt Single Phasing Preventor) having 4 - 6.3 A Over - load release and having Auxiliary contacts for indications for On, Off and Trip.									
b	1 No. 4 pole, RCBO with 40A rating and 100 mA sensitivity.									
c	1 No. Multifunction energy meter for measurement of voltage, line current, power factor									
d	1 No. CT, 10/5A, 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	1 No. 18A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.									
j	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)									
k	Running hour meter.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
I	Auxiliary Contactors for Auto/Local/Remote Operation.									
m	Power & Control terminals for cable connections.									
	Equipment common for all feeders is indicated below:									
a)	1 No Working / Standby Selector Switch.									
b)	Auxiliary Contactors with 240 V AC operating coil (for Working / Standby selection).									
1.22	Supply & Installing of Key lockable Emergency Stop push button box (including Emergency push button with contact, gland plate at both end for cable connection) conforming to IP-65 protection for each Motor & Pump.	No		10	10	20				
1.23	Supply & placing of ribbed surface rubber mat 8 mm thick and 900 mm width as required including cutting to required lengths, of approved make, with test certificates for L.T. panels. (lastest IS and lastest revision)	Mtr		80	80	160				
1.24	Providing and fixing of M.V. danger plate of 200 x 150 mm of mild steel at least 2 mm thick and vitreous enamelled white on both side and with inscription in signal red colour on front side as required.	No		12	12	24				
1.25	Providing and fixing of wall mounted Aluminium cabinet of suitable size with glazed front-opening door, equipment with hooks to house all keys.	No		3	3	6				
	Scada/BMS Connectivity at the separate Marshelling box in the panel with provision of all necessary I/O points & Transducers mounting prewired upto marshelling box terminal boards from the factory itself and audited in factory from the BMS provider									
	TOTAL FOR SH 01 carried over to summary									
2	DISTRIBUTION BOARDS									
	The Distribution Boards specified herein, must conform to technical Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between technical specifications and description in BOQ, the most stringent of the specified conditions will prevail.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	All the items / parts mentioned in relevant clauses of the technical specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.									
	Supply, Installation, Testing & Commissioning of front operated, indoor, front access cubicle type, dead rear, wall / recess / surface mounted Distribution Boards, (confirming to specifications given in technical Specifications). The Distribution Boards must have Ingress Protection Classification of IP 54, Current Rating of 100A and must be suitable to withstand symmetrical fault current level of 10 KA for 1 sec at 415 volts, with the configurations detailed below. Distribution boards must be provided with electrolytic, high conductivity, TPN copper bus-bars as specified in technical specifications (with full sized Neutral busbar), gland plates at both ends, blanking plates etc. as required. All internal wiring within the Distribution boards must be with Copper Conductor, LSZH wires (conforming to BS 7211 and technical Specifications) for Normal Lighting and Socket Distribution Boards and with Fire Resistant / Survival wires (conforming to BS 6387 and technical Specifications) for Emergency Lighting Distribution Boards. All distribution-boards shall be provided with 20% future space provision as required.									
2.1	SMALL POWER TPN DISTRIBUTION BOARDS									
2.1.1	UNDERCROFT & PLATFORM B.O.H.									
2.1.1.1	INCOMER (Type-1)	NOS		1	1	2				
1)	1 No. 63A, 4P, On - Load Manual Change - over Switch with 2 No. auxiliary contacts for position signalling.									
2)	1 No. 50A, TPN MCB									
3)	3 Nos. 40A, DP RCBO (30 mA Sensitivity)									
4)	1 No. Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									
	OUTGOING									
1)	24 Nos. 25A, SP MCB									
2)	6 Nos. 32A, 4P, RCBO (30 mA Sensitivity)									
	Terminals blocks for power & control cables.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
2.1.1.2	INCOMER (Type-2)	NOS		2	2	4				
1)	1 No. 63A, 4P, On - Load Manual Change - over Switch with 2 No. auxiliary contacts for position signalling.									
2)	1 No. 50A, TPN MCB									
3)	3 Nos. 40A, DP RCBO (30 mA Sensitivity)									
4)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									
	OUTGOING									
1)	18 Nos. 25A, SP MCB									
2)	6 Nos. 32A, 4P, RCBO (30 mA Sensitivity)									
	Terminals blocks for power & control cables.									
2.1.1.3	INCOMER (Type-3)	NOS		2	2	4				
1)	1 No. 63A, 4P, On - Load Manual Change - over Switch with 2 No. auxiliary contacts for position signalling.									
2)	1 No. 50A, TPN MCB									
3)	3 Nos. 40A, DP RCBO (30 mA Sensitivity)									
4)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									
	OUTGOING									
1)	15 Nos. 25A, SP MCB									
2)	4 Nos. 32A, 4P, RCBO (30 mA Sensitivity)									
	Terminals blocks for power & control cables.									
2.1.1.4	INCOMER (Type-4)	NOS		2	2	4				
1)	1 No. 63A, 4P, On - Load Manual Change - over Switch with 2 No. auxiliary contacts for position signalling.									
2)	1 No. 50A, TPN MCB									
3)	3 Nos. 40A, DP RCBO (30 mA Sensitivity)									
4)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									
	OUTGOING									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
1)	6 Nos. 25A, SP MCB									
2)	6 Nos. 32A, 4P, RCBO (30 mA Sensitivity)									
	Terminals blocks for power & control cables.									
2.1.2	CONCOURSE & PLATFORM PUBLIC AREAS									
2.1.2.1	INCOMER (Type-1)									
1)	1 No. 63A, 4P, On - Load Manual Change - over Switch with 2 No. auxiliary contacts for position signalling.									
2)	1 No. 50A, TPN MCB									
3)	3 Nos. 40A, DP RCBO (30 mA Sensitivity)									
4)	LED indication lamp for ON, OFF, Trip.									
5)	1 No. Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									
	OUTGOING	NOS		2	2	4				
1)	15 Nos. 25A, SP MCB									
2)	2 Nos. 32A, 4P, RCBO (30 mA Sensitivity)									
	Terminals blocks for power & control cables.									
2.1.2.2	INCOMER (Type-2)	NOS		2	2	4				
1)	1 No. 63A, 4P, On - Load Manual Change - over Switch with 2 No. auxiliary contacts for position signalling.									
2)	1 No. 50A, TPN MCB									
3)	3 Nos. 40A, DP RCBO (30 mA Sensitivity)									
4)	LED indication lamp for ON, OFF, Trip.									
5)	1 No. Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									
	OUTGOING									
1)	12 Nos. 25A, SP MCB									
2)	2 Nos. 32A, 4P, RCBO (30 mA Sensitivity)									
	Terminals blocks for power & control cables.									
2.1.2.3	INCOMER (Type-3)	NOS		2	2	4				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
1)	1 No. 63A, 4P, On - Load Manual Change - over Switch with 2 No. auxiliary contacts for position signalling.									
2)	1 No. 50A, TPN MCB									
3)	3 Nos. 40A, DP RCBO (30 mA Sensitivity)									
4)	LED indication lamp for ON, OFF, Trip.									
5)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									
	OUTGOING									
1)	6 Nos. 25A, SP MCB									
2)	2 Nos. 32A, 4P, RCBO (30 mA Sensitivity)									
	Terminals blocks for power & control cables.									
2.1.3	CONCOURSE OPERATIONAL ROOMS	NOS		3	3	6				
	INCOMER									
1)	1 No. 63A, 4P, On - Load Manual Change - over Switch with 2 No. auxiliary contacts for position signalling.									
2)	1 No. 50A, TPN MCB									
3)	3 Nos. 40A, DP RCBO (30 mA Sensitivity)									
4)	LED indication lamp for ON, OFF, Trip.									
5)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									
	OUTGOING									
1)	24 Nos. 25A, SP MCB									
2)	6 Nos. 32A, 4P, RCBO (30 mA Sensitivity)									
	Terminals blocks for power & control cables.									
2.1.4	ANCILIARY BUILDING	NOS		1	1	2				
	INCOMER									
1)	1 No. 63A, 4P, On - Load Manual Change - over Switch with 2 No. auxiliary contacts for position signalling.									
2)	1 No. 50A, TPN MCB									
3)	3 Nos. 40A, DP RCBO (30 mA Sensitivity)									
4)	LED indication lamp for ON, OFF, Trip.									
5)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	OUTGOING									
1)	24 Nos. 25A, SP MCB									
2)	6 Nos. 32A, 4P, RCBO/ MCB + RCCB (30 mA Sensitivity)									
	Terminals blocks for power & control cables.									
2.1.5	TUNNEL POWER OUTLETS	NOS		2	2	4				
	INCOMER									
1)	1 No. 63A, 4P, On - Load Manual Change - over Switch with 2 No. auxiliary contacts for position signalling.									
2)	1 No. 50A, TPN MCB									
3)	3 Nos. 40A, DP RCBO (30 mA Sensitivity)									
4)	LED indication lamp for ON, OFF, Trip.									
5)	1 No. Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									
	OUTGOING									
1)	36 Nos. 25A, SP MCB									
	Terminals blocks for power & control cables.									
2.1.6	ADVERTISEMENT POWER OUTLET	Nos		4	4	8				
	INCOMER									
1)	1 NO. 63A, 4P, ON-Load manual Change-over Switch with 2 No. Auxiliary Contacts for position signalling									
2)	1 No 50A TPN MCB									
3)	3 Nos. 40A, DP RCBO (30 mA Sensitivity)									
4)	LED indication lamp for ON, OFF, Trip.									
	OUTGOING									
1)	24 Nos, 25A, SP MCB,									
	Terminals blocks for power & control cables.									
2.2	LIGHTING TPN DISTRIBUTION BOARDS									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
2.2.1	CONCOURSE & PLATFORM PUBLIC AREAS									
2.2.1.1	INCOMER (Type-1)	Nos		4	4	8				
1)	1 No. 63A, 4P, On - Load Manual Change - over Switch with 2 No. auxiliary contacts for position signalling.									
2)	1 No. 32A, TPN MCB									
3)	3 Nos. 25A,4 Pole RCBO (30 mA Sensitivity)									
4)	3 Nos. 25A,3 Pole AC-3 duty contactor									
5)	Auxiliary Contactors, 4 Nos push buttons,indication lamp for 50%, 75% and 100% selection, Local/Remote selector switch for Auto/Local Operation and Lighting control from control desk located at station control room or through SCADA									
6)	LED indication lamp for ON, OFF, Trip.									
7)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									
	OUTGOING									
1)	21 Nos. 10A, SP MCB									
	Terminals blocks for power & control cables.									
2.2.1.2	INCOMER (Type-2)	Nos		2	2	4				
1)	1 No. 63A, 4P, On - Load Manual Change - over Switch with 2 No. auxiliary contacts for position signalling.									
2)	1 No. 32A, TPN MCB									
3)	3 Nos. 25A,4 Pole RCBO (30 mA Sensitivity)									
4)	3 Nos. 25A,3 Pole AC-3 duty contactor									
5)	Auxiliary Contactors, 4 Nos push buttons,indication lamp for 50%, 75% and 100% selection, Local/Remote selector switch for Auto/Local Operation and Lighting control from control desk located at station control room or through SCADA									
6)	LED indication lamp for ON, OFF, Trip.									
7)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									
	OUTGOING									
1)	15 Nos. 10A, SP MCB									
	Terminals blocks for power & control cables.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
2.2.2	BACK OF HOUSE & OPERATIONAL ROOMS	Nos		6	6	12				
2.2.2.1	INCOMER									
1)	1 No. 63A, 4P, On - Load Manual Change - over Switch with 2 No. auxiliary contacts for position signalling.									
2)	1 No. 25A, TPN MCB									
3)	3 Nos. 25A, 4 Pole DP RCBO (30 mA Sensitivity)									
4)	LED indication lamp for ON, OFF, Trip.									
5)	1 No. Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									
	OUTGOING									
1)	24 Nos. of 10A SP MCB									
	Terminals blocks for power & control cables.									
2.3	LIGHTING TPN DISTRIBUTION BOARDS - EMERGENCY									
2.3.1	BACK OF HOUSE & OPERATIONAL ROOMS	Nos		6	6	12				
	INCOMER									
1)	1 No. 32A, TPN MCB									
2)	LED indication lamp for ON, OFF, Trip.									
3)	1 No. Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									
	OUTGOING									
1)	15 Nos. Of 10A, DP RCBO (30 mA Sensitivity)									
	Terminals blocks for power & control cables.									
2.3.2	CONCOURSE & PLATFORM PUBLIC AREA	Nos		6	6	12				
	INCOMER									
1)	1 No. 32A, TPN MCB									
2)	LED indication lamp for ON, OFF, Trip.									
3)	1 No. Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	OUTGOING									
1)	10 Nos. Of 10A DP RCBO (30 mA Sensitivity)									
	Terminals blocks for power & control cables.									
2.4	SPN EMERGENCY DISTRIBUTION BOARD FOR SCADA	Nos		4	4	8				
	INCOMER									
a)	1 No. 32A, TPN MCB									
b)	3 Nos. 32A, DP MCB with 3 Nos. 32A, DP RCBO/ RCCB (100 mA Sensitivity)									
c)	LED indication lamp for ON, OFF, Trip.									
d)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									
	OUTGOING									
a)	8 Nos. Of 10A DP RCBO (30 mA Sensitivity)									
b)	Terminals blocks for power & control cables.									
2.5	Supply, installation, testing and commissioning of isolator box for S&T UPS	Nos		2	2	4				
	250 A 4 pole MCCB with indication lamp IP-52									
2.6	TUNNEL LIGHTING	Nos		2	2	4				
1	INCOMER									
a)	1 No. 63A, TPN MCCB with 2No. auxillary Contacts									
b)	LED indication lamp for ON, OFF, Trip.									
c)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor with suitable CT rating									
2	OUTGOING									
a)	30 Nos. Of 10A DP RCBO (30 mA Sensitivity)									
b)	Terminals blocks for power & control cables.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	TOTAL FOR SH 02 carried over to summary									
3	CABLES, CABLE TRAYS & STEELWORK									
	The Cable and Cable Containment System specified herein, must conform to Technical Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between Technical specifications and description in BOQ, the most stringent of the condition will prevail.									
	All the items / parts mentioned in relevant clauses of the Technical 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 Biding 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.									
3.01	Supply at the site of work of 600/1000 V grade, Copper Conductor, XLPE Insulated, armoured, Low Smoke Zero Halogen Type Cables conforming to BS 6724 and Technical 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	Metres		3256	2711	5967				
b	4 x 240 Sq.mm	Metres		3518	3950	7468				
c	4 x 185 Sq.mm	Metres		757	965	1722				
d	4 x 150 Sq.mm	Metres		385	595	980				
e	4 x 120 Sq.mm	Metres		300	300	600				
f	4 x 95 Sq.mm	Metres				RO				
g	3 x 95 Sq.mm	Metres				RO				
h	4 x 70 Sq.mm	Metres		427	427	854				
i	3 x 70 Sq.mm	Metres				RO				
j	4 x 50 Sq.mm	Metres		845	845	1690				
k	3 x 50 Sq.mm	Metres				RO				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
l	4 x 35 Sq.mm	Metres		917	917	1834				
m	3 x 35 Sq.mm	Metres				RO				
n	4 x 25 Sq.mm	Metres		3148	3148	6296				
o	3 x 25 Sq.mm	Metres				RO				
p	4 x 16 Sq.mm	Metres		3927	3927	7854				
q	3 x 16 Sq.mm	Metres				RO				
r	4 x 10 Sq.mm	Metres		2099	2099	4198				
s	3 x 10 Sq.mm	Metres				RO				
t	4 x 6 Sq.mm	Metres		300	300	600				
u	3 x 6 Sq.mm	Metres		215	215	430				
v	4 x 4 Sq.mm	Metres		80	80	160				
w	3 x 4 Sq.mm	Metres		606	626	1232				
x	4 x 2.5 Sq.mm	Metres				RO				
y	3 x 2.5 Sq.mm	Metres				RO				
z	2 x 2.5 Sq.mm	Metres				RO				
aa	2 x 4Sq.mm	Metres				RO				
3.02	Supply at the site of work of 600/1000 V grade, Copper Conductor, XLPE Insulated, armoured, Low Smoke Zero Halogen, Fire Resistant / Survival Type Cables conforming to BS 7846 and Technical Specifications , of the following sizes:									
	(Note: In case of any contradiction between BS 7846 and Technical specifications, the stringent conditions of the two will apply)									
a	4 x 240 Sq.mm	Metres		132	132	264				
b	4 x 185 Sq.mm	Metres		80	80	160				
c	3 x 185 Sq.mm	Metres				RO				
d	4 x 120 Sq.mm	Metres				RO				
e	3 x 120 Sq.mm	Metres				RO				
f	4 x 95 Sq.mm	Metres		140	140	280				
g	3 x 95 Sq.mm	Metres				RO				
h	4 x 70 Sq.mm	Metres		50	50	100				
i	3 x 70 Sq.mm	Metres		154	154	308				
j	4 x 50 Sq.mm	Metres		460	460	920				
k	3 x 50 Sq.mm	Metres		620	620	1240				
l	4 x 35 Sq.mm	Metres				RO				
m	3 x 35 Sq.mm	Metres		120	120	240				
n	4 x 25 Sq.mm	Metres		440	440	880				
o	3 x 25 Sq.mm	Metres				RO				
p	4 x 16 Sq.mm	Metres		570	570	1140				
q	3 x 16 Sq.mm	Metres				RO				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
r	4 x 10 Sq.mm	Metres		2148	2148	4296				
s	3 x 10 Sq.mm	Metres				RO				
t	4 x 6 Sq.mm	Metres		34	34	68				
u	3 x 6 Sq.mm	Metres		580	580	1160				
v	4 x 4 Sq.mm	Metres				RO				
w	3 x 4 Sq.mm	Metres		410	410	820				
x	4 x 2.5 Sq.mm	Metres				RO				
y	3 x 2.5 Sq.mm	Metres				RO				
z	2 x 2.5 Sq.mm	Metres		326	326	652				
aa	2 x 4 Sq.mm	Metres		858	858	1716				
3.03	Supply at the site of work of 600/1000 V grade, Copper Conductor, XLPE Insulated, armoured, Low Smoke Zero Halogen Type Control Cables conforming to BS 6724 and Technical 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	Metres		10	10	20				
b	3 C x 2.5 Sq. mm Copper cable	Metres		520	520	1040				
c	4 C x 2.5 Sq. mm Copper cable	Metres		10	10	20				
d	5 C x 2.5 Sq. mm Copper cable	Metres		250	250	500				
e	7 C x 2.5 Sq. mm Copper cable	Metres		10	10	20				
f	9 C x 2.5 Sq. mm Copper cable	Metres		175	175	350				
g	12 C x 2.5 Sq. mm Copper cable	Metres		75	75	150				
h	16 C x 2.5 Sq. mm Copper cable	Metres		560	560	1120				
l	19 C x 2.5 Sq. mm Copper cable	Metres		20	20	40				
3.04	Supply at the site of work of 600/1000 V grade, Copper Conductor, XLPE Insulated, armoured, Low Smoke Zero Halogen, Fire Resistant / Survival Type Auxiliary / Control Cables conforming to BS 7846 and Technical 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	Metres		10	10	20				
b	3 C x 2.5 Sq. mm Copper cable	Metres		10	10	20				
c	4 C x 2.5 Sq. mm Copper cable	Metres		10	10	20				
d	5 C x 2.5 Sq. mm Copper cable	Metres		10	10	20				
e	7 C x 2.5 Sq. mm Copper cable	Metres		10	10	20				
f	9 C x 2.5 Sq. mm Copper cable	Metres		10	10	20				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
g	12 C x 2.5 Sq. mm Copper cable	Metres		10	10	20				
h	16 C x 2.5 Sq. mm Copper cable	Metres		100	100	200				
i	19 C x 2.5 Sq. mm Copper cable	Metres		300	300	600				
3.05	Laying, testing and commissioning of 600/1000 V grade, Copper Conductor, XLPE Insulated, armoured, Low Smoke Zero Halogen Type and Fire Resistant / Survival Type Cables (as per technical specification) on existing trays/ walls/ columns/ indoor/ trenches with suitable clamps, saddles, hooks, bolts etc.									
a	4 x 300 Sq.mm	Metres		3256	2711	5967				
b	4 x 240 Sq.mm	Metres		3650	4082	7732				
c	4 x 185 Sq.mm	Metres		837	1045	1882				
d	4 x 150 Sq.mm	Metres		385	595	980				
e	4 x 120 Sq.mm	Metres		300	300	600				
f	4 x 95 Sq.mm	Metres		140	140	280				
g	3 x 95 Sq.mm	Metres				RO				
h	4 x 70 Sq.mm	Metres		477	477	954				
i	3 x 70 Sq.mm	Metres		154	154	308				
j	4 x 50 Sq.mm	Metres		1305	1305	2610				
k	3 x 50 Sq.mm	Metres		620	620	1240				
l	4 x 35 Sq.mm	Metres		917	917	1834				
m	3 x 35 Sq.mm	Metres		120	120	240				
n	4 x 25 Sq.mm	Metres		3588	3588	7176				
o	3 x 25 Sq.mm	Metres				RO				
p	4 x 16 Sq.mm	Metres		4497	4497	8994				
q	3 x 16 Sq.mm	Metres				RO				
r	4 x 10 Sq.mm	Metres		4247	4247	8494				
s	3 x 10 Sq.mm	Metres				RO				
t	4 x 6 Sq.mm	Metres		334	334	668				
u	3 x 6 Sq.mm	Metres		795	795	1590				
v	4 x 4 Sq.mm	Metres		80	490	570				
w	3 x 4 Sq.mm	Metres		1016	626	1642				
x	4 x 2.5 Sq.mm	Metres				RO				
y	3 x 2.5 Sq.mm	Metres		0	0	RO				
z	2 x 2.5 Sq.mm	Metres		326	326	652				
aa	2 x 4Sq.mm	Metres		858	858	1716				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
3.06	Laying, testing and commissioning of 600/1000 V grade, Copper Conductor, XLPE Insulated, armoured, Low Smoke Zero Halogen, Fire Resistant / Survival Type Cables conforming to BS 7846 and Technical Specifications , of the following sizes:									
	(Note: In case of any contradiction between BS 7846 and Technical specifications, the stringent conditions of the two will apply)									
a	2 C x 2.5 sqmm	Metres		20	20	40				
b	3 C x 2.5 sqmm	Metres		530	530	1060				
c	4 C x 2.5 sqmm	Metres		20	20	40				
d	5 C x 2.5 sqmm	Metres		260	260	520				
e	7 C x 2.5 sqmm	Metres		20	20	40				
f	9 C x 2.5 sqmm	Metres		185	185	370				
g	12 C x 2.5 sqmm	Metres		85	85	170				
h	16 C x 2.5 sqmm	Metres		660	660	1320				
l	19 C x 2.5 sqmm	Metres		320	320	640				
3.07	Supply and providing terminations conforming to Technical Specifications for XLPE insulated, LSZH (as per technical Specification) 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	Nos		88	88	176				
b	4 x 240 Sq.mm	Nos		56	56	112				
c	4 x 185 Sq.mm	Nos		20	20	40				
d	4 x 150 Sq.mm	Nos		4	4	8				
e	4 x 120 Sq.mm	Nos		8	8	16				
f	4 x 95 Sq.mm	Nos		8	8	16				
g	3 x 95 Sq.mm	Nos				RO				
h	4 x 70 Sq.mm	Nos		8	8	16				
i	3 x 70 Sq.mm	Nos		8	8	16				
j	4 x 50 Sq.mm	Nos		10	10	20				
k	3 x 50 Sq.mm	Nos		10	10	20				
l	4 x 35 Sq.mm	Nos		12	12	24				
m	3 x 35 Sq.mm	Nos		8	8	16				
n	4 x 25 Sq.mm	Nos		44	44	88				
o	3 x 25 Sq.mm	Nos				RO				
p	4 x 16 Sq.mm	Nos		64	64	128				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
q	3 x 16 Sq.mm	Nos				RO				
r	4 x 10 Sq.mm	Nos		78	78	156				
s	3 x 10 Sq.mm	Nos				RO				
t	4 x 6 Sq.mm	Nos		6	6	12				
u	3 x 6 Sq.mm	Nos		48	48	96				
v	4 x 4 Sq.mm	Nos		8	8	16				
w	3 x 4 Sq.mm	Nos		60	60	120				
x	4 x 2.5 Sq.mm	Nos				RO				
y	3 x 2.5 Sq.mm	Nos		14	14	28				
z	2 x 2.5 Sq.mm	Nos				RO				
aa	2 x 4Sq.mm	Nos				RO				
3.08	Supply and Providing terminations conforming to Technical Specifications of XLPE, Fire Survival Cables armoured, / unarmoured cables (as per technical Specification) 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	Nos		6	6	12				
b	4 C x 2.5 Sq.mm Cu. Cable	Nos		40	40	80				
c	5 C x 2.5 Sq.mm Cu. Cable	Nos		40	40	80				
d	7 C x 2.5 Sq.mm Cu. Cable	Nos		12	12	24				
e	9 C x 2.5 Sq.mm Cu. Cable	Nos		6	6	12				
f	12 C x 2.5 Sq.mm Cu. Cable	Nos		6	6	12				
g	16 C x 2.5 Sq.mm Cu. Cable	Nos		6	6	12				
h	19 C x 2.5 Sq.mm Cu. Cable	Nos		10	10	20				
l	2 C x 2.5 sqmm Cu. Cable	Nos		60	60	120				
	CABLE TRAY									
3.09.a										
	Supply & installation of Prefabricated, perforated GI cable trays made of GI sheets continuously connected including horizontal and vertical bends, reducers, tees, coupling plate and nut bolts washers & all material required for installation i.e Tie Rods, GI angles, Channels, earth link etc, conforming to Technical Specifications, complete as required. (With Double Reverse flange - Heavy duty)									
a	600 mm wide x 50 mm deep x 2mm thick	Meters		560	560	1120				
b	450 mm wide x 50 mm deep x 2mm thick	Meters		70	70	140				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
c	300 mm wide x 50 mm deep x 2mm thick	Meters		1200	1200	2400				
d	150mm wide x 50mm deep x 2mm thick	Meters		180	180	360				
e	100mm wide x 50mm deep x 2mm thick	Meters		30	30	60				
3.09.b	Supply & installation of Prefabricated, perforated GI cable trays made of GI sheets continuously connected including horizontal and vertical bends, reducers, tees, coupling plate and nut bolts washers & all material required for installation i.e Tie Rods, GI angles, Channels, earth link etc, conforming to Technical Specifications, complete as required. (Standard conventional Design)									
a	600 mm wide x 50 mm deep x 2mm thick	Meters		1330	1500	2830				
b	450 mm wide x 50 mm deep x 2mm thick	Meters		980	1150	2130				
c	300 mm wide x 50 mm deep x 2mm thick	Meters		3724	3724	7448				
d	150mm wide x 50mm deep x 2mm thick	Meters		7338	7338	14676				
e	100mm wide x 50mm deep x 2mm thick	Meters		140	140	280				
	CABLE LADDER									
3.10	Supply & installation of prefabricated, GI, ladder type cable tray conforming to Technical 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		3000	3000	6000				
b	450 mm wide	Meters		750	750	1500				
c	300 mm wide	Meters		1000	1000	2000				
d	150 mm wide	Meters		1000	1000	2000				
e	100 mm wide	Meters		100	100	200				
3.11	Supply, fabrication & installation of fabricated GI steel work conforming to Technical specification, to support GI, bus duct, light fixtures, conduit wirings, Bracket, & other electrical works including Tunnel services etc, as required. This includes all the fixing accessories like fasteners and all masonry works.	Kgs		70000	70000	140000				
	TOTAL FOR SH 03 carried over to summary									
4	WIRING & ACCESSORIES									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	Whether explicitly stated in the schedules below or not, the following must be complied with:									
a	For supply and installation of conduits, cable trunking, raceway, flexible conduits and wiring, relevant clauses Technical specifications must be followed									
b	Wires supplied must conform to relevant clauses of Technical specifications									
c	Wiring accessories must conform to Technical specifications									
d	In case of any contradiction between BOQ and Technical specifications, the most stringent condition of the two will apply.									
	All the items / parts mentioned in relevant clauses of the Technical specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.									
4.1	Supply, Installation, Testing and Commissioning of conduiting & wiring for primary point (MCB 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 Technical specifications, in cable trunking /conduits/flexible conduits/raceway complete, as required, as per Technical specifications.	Points		80	80	160				
4.2	Supply, Installation, Testing and Commissioning of conduiting & wiring for secondary 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 Technical specifications, in cable trunking /conduits/flexible conduits/raceway complete, as required, as per Technical specifications.	Points		700	700	1400				
4.3	Supply, Installation, Testing and Commissioning of conduiting & wiring for primary point (MCB 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, XLPE insulated LSZH wires conforming to CWZ category of BS 6387 as per technical specification, in cable trunking /conduits/flexible conduits/raceway complete, as required, as per Technical specifications.	Points		50	50	100				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
4.4	Supply, Installation, Testing and Commisioning of coduiting & wiring for secondary 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 CWZ catagory of BS 6387 and Technical specifications, in cable trunking /codiuits/flexible conduits/raceway complete, as required, as per Technical specifications.	Points		300	300	600				
4.5	Supply, Installation, Testing and Commisioning of coduiting & wiring for primary point (MCB to first point) for light / fan / exhaust fan / call bell point with 3 x 4 sq. mm single core, copper conductor, LSZH wires, conforming to BS 7211 and Technical specifications, in cable trunking /codiuits/flexible conduits/raceway complete, as required, as per Technical specifications. (For Flood lighting)	Points		4	4	8				
4.6	Supply, Installation, Testing and Commisioning of conduiting & wiring for secondary point for light / fan / exhaust fan / call bell point with 3 X 4 sq. mm single core, copper conductor, LSZH wires, conforming to BS 7211 and Technical specifications, in cable trunking /codiuits/flexible conduits/raceway complete, as required, as per Technical specifications.(For Flood lighting)	Points		12	12	24				
4.7	Supply, Installation, Testing and Commisioning of conduiting & 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 Technical 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 Technical specifications.									
a	First point controlled by 10A switch\10A MCB	Nos.		50	50	100				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
4.8	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 CWZ category of BS 6387 and Technical 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 Technical specifications.									
a	First point controlled by 10A switch\10A MCB	Nos.		35	35	70				
4.9	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, LSZH wires, conforming to BS 7211 and Technical 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 Technical specifications.	Nos.		320	320	640				
4.10	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 7211 & CWZ category of BS 6387 and Technical 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 Technical specifications.	Nos.		80	80	160				
4.11	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 Technical specifications, for tunnel lights including termination, saddles, earthing etc. complete as required.									
a	Primary Point	Nos.		40	40	80				
b	Secondary point	Nos.		225	225	450				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
4.12	Supply and fixing of 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 Technical specifications, with 16A switch including connections, earthing and testing etc as required.	Nos		120	120	240				
4.13	Supplying and fixing of 3 Phase, 5 pin, 32A industrial switch, (as specified in Technical specifications), controlled socket outlet with straight plugs in IP - 65 enclosure including connections, earthing and testing etc.complete as required	Nos		26	26	52				
4.14	Supplying and fixing of 1 Phase, 3 pin, 16A industrial switch, (as specified in Technical specifications), controlled socket outlet with straight plugs in IP - 65 enclosure for tunnel including termination, earthing and testing etc.complete as required	Nos		82	82	164				
4.15	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 Technical specifications, with one side having continuous hinged cover with locking arrangement, earthing arrangement including provision of earthing strips at joints etc. complete as required.	Mtr.		250	250	500				
4.16	Supplying & fixing of 50 mm x 150 mm(w), rectangular, G.I. Cable trunking including pull boxes as required at site, 2 mm thick, as specified in Technical specifications with one side having continuous hinged cover with locking arrangement, earthing arrangement including provision of earthing strips at joints etc. complete as required.	0		100	100	200				
4.17	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	Mtr.		700	700	1400				
b	32mm dia conduit	Mtr.		100	100	200				
4.18	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	Mtr.		100	100	200				
b	32mm dia conduit	Mtr.		100	100	200				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
4.19	Supply, Installation, Testing & commisionig of wiring for Advertisement point with 3 core x 4 sq.mm, armoured, XLPE insulated, LSZH, copper conductor cable as per BS 6724 and Technical specifications, including saddles, earthing etc. complete as required.									
a	Primary Point	Nos.		20	20	40				
b	Secondary point	Nos.		80	80	160				
4.20	Supply, Installation, Testing & commisionig 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 Technical specifications, including saddles, earthing etc. complete as required.									
a	Primary Point	Nos.		15	15	30				
b	Secondary point	Nos.		30	30	60				
4.21	Supply, Installation, Testing & commisionig 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 as per BS 6724 and Technical specifications, including saddles, earthing etc. complete as required.									
a	Primary Point	Nos.		42	42	84				
b	Secondary point	Nos.		140	140	280				
4.22	Supply, Installation, Testing & commisionig 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 Technical specifications, including saddles, earthing etc. complete as required.	No.		26	26	52				
4.23	Supply, Installation, Testing & commisionig 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 Technical specifications, including saddles, earthing etc. complete as required.(Inside tunnel)									
a	Primary Point	Nos.		22	22	44				
b	Secondary point	Nos.		44	44	88				
4.24	Supply, Laying, Testing & commisionig of 4 core x 4 sq.mm, armoured, XLPE insulated, LSZH, copper conductor cable as per BS 6724 and Technical specifications, for bus trunking connections including terminations, saddles, earthing etc. complete as required.	Meter		400	400	800				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
4.25	Supply, Laying, Testing & commissioning of 2 core x 4 sq.mm, armoured, XLPE insulated, LSZH, copper conductor cable as per BS 6724 and Technical specifications, for bus trunking connections including terminations, saddles, earthing etc. complete as required.	Meter		200	200	400				
4.26	Supply, Laying, Testing & commissioning of 3 core x 2.5 sq.mm, LSZH, copper wire as per BS 7211 and Technical specifications, from Tap off boxes to Lighting Fixture including connections, earthing etc. complete as required.	Meter		600	600	1200				
4.27	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 conforming 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 (lcv) and 9.6 kA (lpc). The Bus Trunking shall be complete with accessories like supporting clamps for Installation at Site, Fixing Clamps for luminaries and cable & one run of Cu earthing equal to fault level as required.									
a	Straight Feeder 25 A (3 Mtrs Length)	Nos		150	150	300				
b	End Feed Unit	Nos		4	4	8				
c	End Covers	Nos		4	4	8				
d	Flexible Joints	Nos		4	4	8				
e	10/16 A Single Phase Tap Off Boxes with fuse and indication.	Nos		200	200	400				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
4.28	Supply, installation & testing of 25 A, Copper, Lighting Bus Trunking System in easy detachable and convenient assembly suitable for 415 +-10% Volts, Single Phase, 2 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 1.0 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 accessories like supporting clamps for Installation at Site, Fixing Clamps for luminaries and cable & one run of Cu earthing of X-section equal to phase etc as required.									
a	Straight Feeder 25 A (3 Mtrs Length)	Nos		65	65	130				
b	End Feed Unit	Nos		14	14	28				
c	End Covers	Nos		14	14	28				
d	Flexible Joints	Nos		4	4	8				
e	16 A Single Phase Tap Off Boxes with fuse and indication	Nos		120	120	240				
	TOTAL FOR SH04									
5	<u>INDOOR LIGHTING AND FANS</u>									
	The Lighting System specified herein, must conform to Section E08 of the M & W Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between M & W specifications and description in BOQ, the most stringent of the condition will prevail.									
	All the items / parts mentioned in relevant clauses of the M & W specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
5.1	Supply, Installation, Testing and Commissioning of the following Luminaires including all accessories like H.F electronic ballast, holder & Lamp etc. with surface/recess mounting arrangement and all fixing accessories. All luminaries and accessories shall be as per Specification E08.									
	The Tubular Florecent lamps to be used must be similar to Philips Lamp Model No 'TL' D 80 NG in terms of Lumen Output, Efficacy, Colour Rendering Index, Life and other technical parameters.									
	All wiring within the luminaries must be with Low Smoke Zero Halogen Type and / or Fire Survival Type Wires, as per requirements of section E 08 of M & W Specifications.									
A	General purpose, basic batten luminaries (Similar to Philips catalogue No.TMS 122 2x28 t5 OR Keselec Catalog no.Railux 2x28 HF) for 'TL'D fluorescent lamp (T5 Lamp) with - Surface mounting arrangement on wall or ceiling - Single piece channel construction made of powder coated CRCA white sheet steel - Lamp holder brackets and HF electronics ballast. The luminaries should be suitable for 2 x 28W Tubular Fluorescent Lamp (T5 lamp) and supplied with 2 Nos 28W Tubular Fluorescent lamp (T5 lamp)	Nos.		140	140	280				
B	General purpose, basic batten luminaries (Similar to Philips catalogue.No. TMC 122 / 1X28 OR Keselec Catalog no Railux 1x28 HF) for 'TL'D fluorescent lamp (T5 Lamp) with - Surface mounting arrangement on wall or ceiling - Single piece channel construction made of powder coated CRCA white sheet steel - Lamp holder brackets and HF electronics ballast. The luminaries should be suitable for 1 x 28W Tubular Fluorescent Lamp (T5 lamp) and supplied with 1 No. 28W Tubular Fluorescent lamp (T5 lamp)	Nos.		100	100	200				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
C	General purpose basic batten luminaries (Similar to Philips catalogue.No. TMS 122 / 2X28W OR Keselec Catalog no. Indilux V 228 HF with vitreous enamelled reflector) for 'TL'D fluorescent lamp (T5 Lamp) with - Surface mounting arrangement on wall or ceiling - Single piece channel construction made of powder coated CRCA white sheet steel - Vitreous Enamelled Reflector of white colour - Lamp holder brackets and HF electronics ballast. The luminaries should be suitable for 2x28W Tubular Fluorescent lamp and supplied with 2 Nos 28W Tubular Fluorescent lamp (T5 lamp). B1428B1439B1442	Nos.		300	300	600				
D	NOT USED					0				
E	Efficient, low glare, surface mounted luminaries (Similar to Philips Catalogue No. MPF 922 / 1 X 70W) with integral gear, electrochemically brightened and anodized high purity aluminium reflector of asymmetrical type. The luminaries must be non corrosive pressure die cast aluminium housing and white powder coated finish and must be suitable for ceiling mounting. It should have cover made of heat resistant toughened glass and the must be conforming to Ingress Protection Classification of IP 65 (for dust and moisture protection). The luminaries should be suitable for, and supplied with, One No 70W Metal Halide lamp .	Nos.		10	10	20				
F	Mirror Optic Recess mounted luminaries (Similar to Philips catalogue.No TCS 252 / 2x28 OR Keselec equivalent subject to approval by ER, Catalog no Pharma (Sym/Asym) 2x28 OR Keselec Catalog no FZ (Sym/Asym) 2x28) with housing made of white powder coated CRCA sheet steel, accommodating all electrical accessories pre-wired upto a terminal block. It should have high efficiency mirror optic anodised aluminium reflector for symmetrical and asymmetrical light distribution and must conform to Ingress Protection Classification of IP 54 (for dust and moisture protection). The luminaries should be suitable for 2x28W Tubular Fluorescent lamp (T5 lamp) and supplied with 2 Nos 28W Tubular Fluorescent lamp (T5 lamp).	Nos.		100	100	200				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
G	Efficient, low glare, surface mounted luminaries (Similar to Philips Catalogue No. MPF 112 / 1 X 70W) with integral gear, electrochemically brightened and anodized high purity aluminium reflector of symmetrical type. The luminaries must be non corrosive pressure die cast aluminium housing and white powder coated finish and must be suitable for ceiling mounting. It should have cover made of heat resistant toughened glass and the must be conforming to Ingress Protection Classification of IP 65 (for dust and moisture protection). The luminaries should be suitable for, and supplied with, One No 70W Metal Halide lamp .	Nos.		1	1	2				
H	General purpose basic batten luminaries (Similar to Philips catalogue.No. TCW 450 / 1X28 OR Keselec Catalog no.Railux 1x28 HF) for 'TL'D fluorescent lamp (T5 Lamp) with - Surface mounting arrangement on wall or ceiling - Single piece channel construction made of powder coated CRCA white sheet steel - Lamp holder brackets and HF electronics ballast - Wire Guard to protect the lamp The luminaries should be suitable for 1x28W Tubular Fluorescent lamp and supplied with 1 Nos 28W Tubular Fluorescent lamp (T5 lamp).	Nos.		100	100	200				
I	Recessed Circular Down Light luminaries (Similar to Philips catalogue.No FBH 145 / 218 OR Keselec Catalog no.Nova 2x18 (G)) with satin finished, anodised aluminium reflector and clear glass cover. The luminaries should be suitable for 2 x 18 W CFL lamps and supplied with 2 Nos 18W CFL lamps.	Nos.		1	1	2				
J	Mirror Optic, recessed mounted Luminaries (Similar to Philips catalogue.No TBS 255 TCS 228 OR Keselec Catalog no.Pharma 2x28 HF) with housing made of white powder coated CRCA Sheet Steel, accomodating all electrical accessories pre-wired upto a terminal box. It should have high efficiency mirror optic anodised aluminium reflector and must conform to Ingress Protection Classification of IP 54 (for dust and moisture Protection). The Luminaries should be suitable for 2x28W Tubular Fluorescent lamp and supplied with 2 Nos. 28W Tubular Fluorescent Lamp (T5 Lamp).	Nos.		1	1	2				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
K	Mirror Optic Recess mounted luminaries (Similar to Philips catalogue.No TBS 669 / 228 D6 OR Keselec Catalog no.CT lux 2x28 HF) with housing made of white powder coated CRCA sheet steel, accommodating all electrical accessories pre-wired upto a terminal block. It should have high efficiency mirror optic reflector of high quality aluminium with parabolic side reflector, 3D cross lamallae with fresnell top and concave lower contour. The luminaries should be suitable for 2x28W Tubular Fluorescent lamp (T5 lamp) and supplied with 2 Nos 28W Tubular Fluorescent lamp (T5 lamp).	Nos.		1	1	2				
L	Mirror Optic Recess mounted luminaries (Similar to Philips catalogue.No TBS 669 / 128 D6 OR Keselec Catalog no.CT lux DL 1x28 HF) with housing made of white powder coated CRCA sheet steel, accommodating all electrical accessories pre-wired upto a terminal block. It should have high efficiency mirror optic reflector of high quality aluminium with parabolic side reflector, 3D cross lamallae with fresnell top and concave lower contour. The luminaries should be suitable for 1x28W Tubular Fluorescent lamp (T5 lamp) and supplied with 1 Nos 28W Tubular Fluorescent lamp (T5 lamp).	N o.		60	60	120				
M	Recessed mounted square type luminaire (Similar to Keselec Zumtobel No. Nova Square with highly specular facted optic made of aluminised polycarbonate reflector accomodating all electrical accessories pre-wired upto a terminal box. Having high operating efficiency and homogenous lighting solutions with pyramid shape pattern of luminous intensity with glass and supplied with 2 Nos. 26W CFL lamps.	Nos.		160	160	320				
N	Tunnel luminaire consisting of an extruded anodised aluminium alloy body sealed onto an extruded polycarbonate prismatic protector with high impact resistance IK10; a removable sliding plate equipped with control gear on one side and lamp(s) on the other; one or two frames made out of injection moulded on the other; one or two frames made out of injection moulded two polycarbonate covers closed with two stainless steel screws. This system ensures tightness of IP-67 for the whole luminaire. The fixture suitable for 1x36W CFL lamp with all mounting accessories and 2 nos glands (suitable for loop in & loop out with 4x4 sq mm/4x2.5 sq mm cable). similar to Schreder Cat MY-1 and supplied with one lamp suitable for the above fixture.	Nos.		10	10	20				
O	NOT USED									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
P	Bulk Head luminaries (Similar to Philips Catalogue No FXC 101 <u>OR Keselec Catalog no. KBH 1x9 W</u>) suitable for mounting on wall / ceiling having Single piece pressure die cast Aluminium housing - Wire Guard made of powder coated MS - Heat resistant Glass cover The luminaries must conform to Ingress Protection Classification of IP 54 (for dust and Moisture Protection). The luminaries should be suitable for 1 x 9W CFL lamp and supplied with 1 No. 9W CFL lamp and control accessories.	Nos.		30	30	60				
Q	Surface/Suspended type moisture proof diffuser luminare with housing made of grey, high impact resistant polycarbonate, with Non-ageing gasket consisting of 2-component polyurethane foam. Difuser made of one piece injection moulded high impact resistant polycarbonate also computer optimised internal prismatic structure for precise direction of light and glare reduction, with difuser clips made of stainless steel, roll formed galvanised steel reflector that is enamelled white and can be suspended from either side of the housing. Suitable for 2x28W FTL Lamp (T5 Lamp) prewired upto a terminal box with lamp. Having IP 65 (similar to Philips catalogue No. TCW 097 \ 2x28W D6 HF or Keselec zumtobel make FZ 2x28W HF) and supplied with 2 Nos 28W Tubular Fluorescent lamp (T5 lamp).	Nos.		70	70	140				
FL-1	Compact, sturdy, general purpose floodlight luminaries (Similar to Philips catalogue. No TEMPO3 SWF 330 SK type) with integral gear, electrochemically brightened and anodized high purity aluminium reflector of symmetrical type. The luminaries must be adjustable with rugged, non corrosive pressure die cast aluminium housing and black powder coated finish and must be suitable for column mounting. It should have cover made of heat resistant toughened glass and the must be conforming to Ingress Protection Classification of IP 65 (for dust and moisture protection). The luminaries should be suitable for, and supplied with, One No 250W Sodium Vapour lamp.	Nos.		5	5	10				
5.2	Temperory Lighting at Station									
1	Installation and Commisioning of 40 Watt tube lights with cover along with the necessary wiring and 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	400				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
2	Cost (Addition/Deletion) of Installation and Commissioning of 40 Watt tube lights with cover 10 No/day approx along with the necessary wiring and power supply arrangement ,to provide general lighting at Concourse,Platform,Undercroft and Tunnel area during construction period.	L/s		1	1	2				
5.3	Supply, installation, testing and commissions of External lights as per specifications and as per following details.									
a	Bajaj Cat. No. BOP-1030/Philips/Keselec or equivalent welded baseplate, padestal of specified height to IS:2713 part II-1980 or latest as per specifications and drawings.									
b	1:3:6 concrete foundation and pedestal coping 300 dia of height as per specification and relevant IS and as required. Contractor to obtain approval of foundation design before proceeding further.									
c	6 ways, 20A connector & 6A MCB mounted on 6mm thick painted MS/GI plate, insulated, and accommodated inside the pole with gasketted weather, vermin proof, hinged lockable covered GI/MS box or integral cast box in padestal as required.									
d	Wiring to Luminaries from the 2A SP MCB, with 3 x 2.5 FRLS copper stranded conductor (P+N+PE) double sheathed wire and making connections & earthing of pole.									
e	Painting of pole accessories with 2 coats of primer and 2 coats of oil paint of approved colour.									
f	Luminaire as specified with lamps, necessary cross arm to the luminaire, integral control gear and as under.									
i	Poles									
a	9.0 meter hot dipped galvanised Octagonal with single overhang arm & with foundation bolts, base plate complete with foundation, entry and exit pipes, control JB with connector generally as shown on drawings and as per specifications.	No.		5	5	10				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
b	9.0 meter hot dipped galvanised Octagonal with double overhang arm & with foundation bolts, base plate complete with foundation, entry and exit pipes, control JB with connector generally as shown on drawings and as per specifications.	No.		5	5	10				
ii	Luminares									
a	Supply, installation, testing and commissioning of street light luminaire with aesthetically designed die cast aluminium housing POT optics reflector and toughened flat glass (IP 65) (Similar to Philips Cat. No. CRP330/150W SON-T/CDM-TT including Lamp as required.	No.		15	15	30				
5.4	Supply, installation, Testing and Commissioning 20 m high area lighting High Mast of Bajaj/Philips suitable for 06 nos 1 x 400 W luminaires complete with all standard accessories like winches, latern carriage etc. including the cost of providing supplying and fixing 6 nos 2 x 400 W HPSV flood ligh luminaires with die cast / extruded Aluminium body, pre anodised Aluminium asymetric/symetric reflector, IP 54 and above, heavy duty control gear housed in a weather proof housing of Philips/Bajaj or equivalent to cat no. RT 3/N/2x400 of philips equivalent and including cost of the 400 W lamps type SON-T plus of Philips,also including Lightning Arrestor and others accessories like phosper Bronz Gear, double drum, stainless steel wire ropes, suitable MCB wires/cables as required with alongwith the folowing accessories as required as under:									
a	Suitable foundation for the Mast considering soil bearing capacity 10 Ton per Sqm, with base pedestal of approve design, incorporating a suitable cable looping box with terminal blocks MCB etc. High Mast foundation design shall be approved by employer's representative before executing.									
b	S.I.T.C. of Earth station of Pipe earthing as per IS 3043-1987(or latest) , including duplicate earth connection to the mast with 25x3 mm size GI Strip or equivalent insulated copper cable.									
c	S.I.T.C. of suitable neon Aviation lights.									
	High mast complete as above & as per technical specifications	No.		1	1	2				
5A	<u>INDOOR LED LIGHTING</u>									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
5A.1	LED Lights to be used must be similar to Philips Products in terms of Lumen Output, Efficiency, Colour Rendering Index, Life and other technical parameters.									
	All wiring within the luminaries must be with Low Smoke Zero Halogen Type and / or Fire Survival Type Wires, as per requirements of section E 08 of M & W Specifications.									
A	Energy Efficient and low Maintenance (Similar to Philips Sereno LED of 42W) Power consumption with lumen output of 3275Lm - Surface mounting arrangement on wall or ceiling - High Efficiency Opal Diffuser - Extruded Aluminium Housing	Nos.		1	1	2				
B	Energy Efficient and low Maintenance (Similar to Philips Arcus LED of 24W) Power consumption with lumen output of 2000Lm - Surface mounting arrangement on wall or ceiling - Extruded Aluminium Housing	Nos.		1	1	2				
C	Energy Efficient and low Maintenance (Similar to Philips Stratus LED of 54W) Power consumption with lumen output of 4400Lm - Installation Pendant Mounted - Extruded Aluminium Housing - High Efficiency Opal Diffuser	Nos.		1	250	251				
D	NOT USED									
E	Efficient Green Bay Gen II-Versatile LED Lighting @100 Lm/W, suitable for recessed /Surface mounting/Suspended Mounting with suspension or eyebolt system Power-140W, electrochemically brightened and anodized high purity aluminium reflector of asymmetrical type..The luminaries must be non corrosive pressure die cast aluminium housing and white powder coated finish.It should have cover made of heat resistant toughened glass and the must be conforming to Ingress Protection Classification of IP 65 (for dust and moisture protection) Similer .	Nos.		20	20	40				
F	Energy Efficient and low Maintenance (Similar to Philips Stratus LED of 54W) Power consumption with lumen output of 4400Lm - Installation Pendant Mounted - Extruded Aluminium Housing - High Efficiency Opal Diffuser	Nos.		1	1	2				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
G	Efficient Green Bay Gen II-Versatile LED Lighting @100 Lm/W, suitable for recessed /Surface mounting/Suspended Mounting with suspension or eyebolt ,system Power-70W, electrochemically brightened and anodized high purity aluminium reflector of symmetrical type.The luminaries must be non corrosive pressure die cast aluminium housing and white powder coated finish.It should have cover made of heat resistant toughened glass and the must be conforming to Ingress Protection Classification of IP 65 (for dust and moisture protection).	Nos.		10	10	20				
H	EnduraLED Waterproof -WT550C Series,and must conform to Ingress Protection Classification of IP 65,LED based-Virgin PC Housing and cover with system Power 42W,Suitable for Chain wire Mounting/Surface mounting	Nos.		1	1	2				
I	Recessed Circular Down Light luminaries (Similar to Philips catalogue.Green LEDi1200 DN195B) having optics with high quality Diffuser with satin finished, anodised aluminium reflector and clear glass cover. The luminaries shouldHave system power of 18W and lumen package 1200 Lm.	Nos.		70	70	140				
J	Green Perform LED Batten BN208C with 40W system Wattage having system effiacy >90% with Conduit/Suspended/Surface type mounting.	Nos.		200	200	400				
K	Energy Efficient and low Maintenace (Similar to Philips LED of 54W) Power consumption with lumen output of 4400Lm - Recessed Type - Exturded Aluminium Housing - High Efficiency Opal Diffuser	Nos.		198	198	396				
L	Energy Efficient and low Maintenace (similar to Philips Arcus LED of 24W) Power consumption with lumen output of 2000Lm - Surface mounting arrangement on wall or ceiling - Exturded Aluminium Housing	N o.		1	1	2				
M	Tunnel luminaire consisting of a high-presuure diecasting aluminium alloy body sealed onto an extruded polycarbonate prismatic protector with high impact resistance IK10; This system ensures tightness of IP-67 for the whole luminaire. The fixture suitable for LED lamp with all mounting accessories and 2 nos glands (suitable for loop in & loop out with 4x4 sq mm/4x2.5 sq mm cable). (similar to Philips LED BWP120 LED 16CW PC)	Nos.		280	350	630				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	TOTAL FOR SH 05 carried over to summary									
6	PROTECTIVE, CLEAN EARTH AND LIGHTING PROTECTION SYSTEM									
	The Earthing and Lightning Protection System specified herein, must conform to technical specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between Technical specifications and description in BOQ, the most stringent of the condition will prevail.									
	All the items / parts mentioned in relevant clauses of the Technical specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.									
6.1	Supply of GI strips / rods / wires (minimum 8.6% conductivity as per IEEE-80) of the following sizes (as specified in technical Specifications) for provision in Earthing System.									
a	90 mm x 10 mm GI strip	Metres		250	250	500				
b	75 mm x 10 mm GI strip	Metres		250	250	500				
c	50 mm x 10 mm GI strip	Metres		3500	3500	7000				
d	50 mm x 6 mm GI strip	Metres		400	400	800				
e	40 mm x 10 mm GI strip	Metres		500	500	1000				
f	25 mm x 6 mm GI strip	Metres		2000	2000	4000				
g	6 SWG GI Wire	Metres		500	500	1000				
6.2	Laying, testing and commissioning of the following sizes of GI strips / rods / wires in trenches / surface / wall / trays / ladders etc. including provision of spacers and saddles etc.for interconnecting the Earthing Stations, Earth Grid, Electrical Distribution Switchboards, Distribution Boards, Motor Control Centres, Transformer, DG Set, Motors and any other equipment / service / structure etc. required to be earthed.									
a	90 mm x 10 mm GI strip	Metres		250	250	500				
b	75 mm x 10 mm GI strip	Metres		250	250	500				
c	50 mm x 10 mm GI strip	Metres		3500	3500	7000				
d	50 mm x 6 mm GI strip	Metres		400	400	800				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
e	40 mm x 10 mm GI strip	Metres		500	500	1000				
f	25 mm x 6 mm GI strip	Metres		2000	2000	4000				
g	6 SWG GI Wire	Metres		500	500	1000				
6.3	Supply, laying and testing of unarmoured, stranded copper conductor, Low Smoke Zero Halogen, green coloured cables of following sizes, conforming to BS 7211 and technical Specifications, for earthing, including termination of the same by copper lugs at both ends.									
a	1 x 6 sq. mm	Metres		50	50	100				
b	1 x 10 sq. mm	Metres		50	50	100				
c	1 x 16 sq. mm	Metres		50	50	100				
d	1 x 70 sq. mm	Metres		1200	1200	2400				
e	1 x 150 sq. mm	Metres		50	50	100				
6.4	Supply and making of GI Main earth connection / terminal of size 100 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 technical specifications and as required for protective earthing.	Nos.		40	40	80				
6.5	Supply and making of Copper 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 copper nuts-bolts, washers etc complete as per technical specifications and as required for clean earthing.	Nos.		12	12	24				
6.6	Supply and laying of copper air terminations of 25 mm diameter, 600 mm length, copper tube having five prong at top, 3 mm thick, 100 mm diameter, copper base plate with holes, making foundation and fixing hard ware, as required and as per technical specifications and as required.	Nos.		10	10	20				
6.70	Supplying of Copper Rod earth electrodes of the following sizes complete with nut, bolts & washers for terminations, as required, and as per technical specifications and as required.									
a	25 mm diameter 3000 mm long copper earth electrode	Nos.		16	16	32				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
6.8	Labour charges for making earth pit with 20 mm diameter, 3 meter long copper earth rod by driving directly in ground including termination with grid, as required, and as per technical specifications and as required.	Nos.		16	16	32				
6.9	Supplying & making of test joints with the following sizes of Copper Strip of length 125 mm with 4 nos. bolts, nuts and washers of brass, DMC support, as required, and as per technical specifications and as required.									
a	25 mm x 3 mm Copper strip	Nos.		16	16	32				
6.10	Providing and making plate earthing station with 600 x 600 x 6 mm copper plate earth electrode, 50 mm dia GI watering pipe, reducer & CI funnel with wire mesh, 150 mm coke / charcoal and salt around plate earth, all earth work, masonry enclosure with frame & cast iron hinged cover plate as per IS 3043.	Nos.		6	6	12				
6.11	Earth terminations with 50 mm dia GI perforated pipe complete with 15mm GI watering pipe with funnel with wire mesh etc. complete as per specification and as required	Nos.		8	8	16				
6.12	Supplying and laying of the GI strip down conductor size 25 x 3 on surface/wall/parapet/shaft complete with joints, bimetallic connectors, testing links & other fixing accessories and clamping/ connection with earth terminations as per specifications & as required (For Lightning Protection)	Metres		1200	1200	2400				
6.13	Supplying and laying of the . bimetallic connectors, testing links & other fixing accessories and clamping/ connection with earth terminations as per specifications & as required (as per specification or drawing.)	Nos.		16	16	32				
	TOTAL FOR SH 06 carried over to summary									
7	UNINTERRUPTED POWER SUPPLY SYSTEM									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
7.1	Supply, Installation, Testing and Commissioning of true parallel redundant 2 x 80 KVA online, UPS system suitable for providing power supply to emergency lighting and Computerised Control panel load of approved make, suitable for incoming 415 volts, 3 phase +10 % -20%, 50 Hz, supply and 3 phase 415 volts, output voltage, variation $\pm 1\%$, including inbuilt isolation transformer, IGBT rectifier Modules /dual converter, static switch, inverter, filters, Bypass & static transfer switch for automatic switch over without giving any break of power, maintenance bypass switch, Micro processor/software controlled annunciation, protection (including against input phase reversal), and menu run diagnostic module, associated cabling and connections/terminations, erection including associated foundation/masonry or RCC work for mounting on base channels etc. complete as per specifications and as required.	Nos.		2	2	4				
	Note-1: The price of above item is exclusive of Automatic changeover switch suitable for terminating 2 nos of fire survival copper conductor cables as per technical specifications on the incoming side of UPS and is included in the UPS ATS item . The Automatic change over switch may be wall mounted in the UPS room or as provided. From changeover switch to UPS, the connection should be through an adequately rated fire survival copper cable, and RS 485 port for display of ON/OFF status of UPS on BMS work station through MODBUS protocol									
7.1.a	Supply, Installation, Testing and Commissioning SMF VRLA each having 120 minutes back up time at full load with interconnecting cables, racks and standard accessories UPS above. Battery shall comply with relevant regulations & Battery racks shall be made of acid resistant material.	Nos.		2	2	4				
	All the Items / parts mentioned in relevant clauses of the M & W specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded									
	TOTAL FOR SH 07 carried over to summary									
8	COMPACT SANDWICH TYPE BUS DUCT									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
8.1	Supply, Installation, Testing & commissioning of the following totally enclosed, dust and vermin proof Low impedance compact sandwich bus duct as per technical specification, relevent standadrds & codes of practice applicable complete as required.									
	Ingress protection IP 65									
	Indoor mounts									
	14 SWG sheet steel clad									
	Electrolytic grade copper bus bar									
	Operation at 415 Volt 3 phase 50 Hz system									
	Insulation voltage 1000 volts									
	Fault withstand 70 kA symmetrical for 1 second									
	50% Internal Copper Earth Bus									
	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.									
a	5000 amps 3P +100%N including bends	m		40	40	80				
b	4000 amps 3P +100%N including bends	m								
8.2	Supply, installation, testing & commissioning of copper flexible end termination/ flange joints including adopter box suitable for bus duct connections from Top/ Bottom of switchgear panels/ equipments and of the following current ratings compatible with the bus ducts as per above complete as required.									
a	5000 amps 3P +100%N	sets		4	4	8				
b	4000 amps 3P +100%N	sets								
	TOTAL FOR SH 08 carried over to summary									
9	ADDITION DELETION WORK									
	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 item above									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
i a)	1 No. 3200 A, 415V, 65 KA, 4 Pole/4Pole, 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 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) Signaling 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.			1	1	2				
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor.									
f)	3 Nos. CTs, 3200/5A, 15VA, CL-1 for metering.									
i b)	1 No. 2500 A, 415V, 65 KA, 4 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 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) Signaling 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.			1	1	2				
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor.									
f)	3 Nos. CTs, 2500/5A, 15VA, CL-1 for metering.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
i c	1 No. 2000 A, 415V, 65 KA, 4 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 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) Signaling 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.	No.		1	1	2				
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor.									
f)	3 Nos. CTs,1600/5A 15VA, CL-1 for metering.									
i d)	1 No. 1600 A, 415V, 65 KA, 4 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 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) Signaling 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.	No.		1	1	2				
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor.									
f)	3 Nos. CTs,1600/5A 15VA, CL-1 for metering.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
i e)	1 No. 1250/1250 A, 415V, 65 KA, 4 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 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) Signaling 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.	No.		1	1	2				
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor.									
f)	3 Nos. CTs,1250/5A 15VA, CL-1 for metering.									
i f)	1 No. 1000/100 A, 415V, 65 KA, 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 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) Signaling 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.	No.		1	1	2				
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	Digital Ammeter with Inbuilt Selector Switch									
f)	3 Nos. CTs,1000/5A 15VA, CL-1 for metering.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
i g)	1 No. 800 A, 415V, 65 KA, 4 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 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) Signaling 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.	No.		1	1	2				
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor.									
f)	3 Nos. CTs,800/5A 15VA, CL-1 for metering.									
ii	630/630 A 415 volts, 3 pole, 50 kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit	No.		1	1	2				
iii	400/400 A 415 volts, 3 pole, 50 kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit	No.		1	1	2				
iiia	400/250 A 415 volts, 3 pole, 50 kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit	No.		1	1	2				
iv	250/200A, 415 volts, 3 pole, 35 kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit	No.		1	1	2				
v	160/100 A 415 volts, 3 pole, 35 kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit	No.		1	1	2				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
vi	Less than 100A, 415 volts, 3 pole, 35 kA, MCCB having Electronic Trip Unit with adjustable protection against Overload and adjustable protection against Short Circuit	No.		1	1	2				
vii	Electrical Operating mechanism (Motorised mechanism) for all types of above MCCBs	No.		1	1	2				
a	5-32A FP MCB 9/10 kA	No.		1	1	2				
b	40-63A FP MCB 9/10 kA	No.		1	1	2				
c	5-32A TP MCB 9/10 kA	No.		1	1	2				
d	40-63A TP MCB 9/10 kA	No.		1	1	2				
e	5-32A DP MCB 9/10 kA	No.		1	1	2				
f	40-63A DP MCB 9/10 kA	No.		1	1	2				
g	5-32A SP MCB 9/10 kA	No.		1	1	2				
h	40-63A SP MCB 9/10 kA	No.		1	1	2				
i	16-32Amp DP RCCB, 30 mA	No.		1	1	2				
j	16-32Amp DP RCBo, 30 mA	No.		1	1	2				
k	2-6A TP MPCB 25KA	No.		1	1	2				
l	6.3-16 A TP MPCB 25KA	No.		1	1	2				
m	17-32A TP MPCB 25KA	No.		1	1	2				
	TOTAL FOR SH 09 carried over to summary									
9A	OPTIONAL ITEM FOR DG SETS									
9A.1	DG Supply Incoming feeder IN DB-100/DB-200	Sets		1	1	2				
a	1 No. 2500A/2500A, 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 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) Signaling 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									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No. Multifunction energy meter for measurement of voltage, line current, power & energy.									
g)	3 Nos. CTs, 2500/5A, 15VA, CL-1 for metering.									
9A.2	DG Panel (DB-290) as per Technical Specifications and as per the following details.	Sets		1	1	2				
A	INCOMER									
	DG SET - I & II INCOMING each comprising of following									
a)	1 No. 1600 A/1600 A, 415V, 65 KA, 4 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 shall be as per I/O Schedule (3) Protection against long time + short time + earth fault (all with adjustable time delays) + instantaneous, over and under voltage, minimum and maximum frequency, voltage and current imbalance, phase sequence, load shedding and reconnection (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) Signaling of the cause of tripping and alarms (8) NO/NC contacts for interlocks and indications.									
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for the following- ON, OFF, TRIP, spring charged & phase indication (R-Y-B).									
e)	Metering									
i)	Multifunction energy meter for measurement of voltage, line current, power factor, power & energy.									
ii)	4 Nos. CTs 1600/5A, 15VA, CL-1 for metering.									
B	Main Grid Supply Incomer									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
a)	1 No. 2500A/2500A, 415V, 50kA, 4 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 three phase and neutral 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) Signaling of the cause of tripping and alarms, maximeter reset etc (7) NO / NC contacts for interlocks and indications. (8) Status Indication ON, OFF, TRIP.									
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
	Digital Ammeter with Inbuilt Selector Switch									
e)	3 Nos. CTs, 2500/5A, 15VA, CL-1 for metering.									
C	BUS-BARS									
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars rated 2500 Amps, suitable to withstand symmetrical fault level of 65 KA for 1 second at 415 volts.									
D	OUT GOING FEEDERS									
1	Outgoing feeders - (Total 2 Nos) - One No DB-170, One Nos. for Spare with each of the above feeders consisting of the following:									
a)	1 No. 2500A/2500A, 415V, 50kA, 4 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 three phase and neutral 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) Signaling of the cause of tripping and alarms, maximeter reset etc (7) NO / NC contacts for interlocks and indications. (8) Status Indication ON, OFF, TRIP.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
	1 No.Multifunction energy meter for measurement of voltage, line current, power factor.									
e)	3 Nos. CTs, 2500/5A, 15VA, CL-1 for metering.									
2	Outgoing feeders - (Total 4 Nos) - One Nos. for DB - 260, One Nos. for DB - 310 & One Nos. for Spare with each of the above feeders consisting of the following:									
a)	1 No. 400A/400A, 415V, 50KA, 3 Pole motorised MCCB with 240V AC shunt trip coil and having electronics releases with (1) Communication capability (2) Provision for measurement of three phase current (3) Protection against Overload (with base setting and fine adjustment), Short Circuit and earth fault (all with adjustable time delays) + Instantaneous (4) Communication options to remotely read parameters for the protection functions transmission of ammeter measurements, signaling of cause of tripping, maximeter reset etc. (5) NO / NC contacts for interlocks and indications (6) 1 No.CT in Neutral for earth fault protection.									
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor.									
f)	3 Nos. CTs, 400/5A, 15VA, CL-1 for metering.									
3	Outgoing feeders - (Total 1 No) - One Nos. for DB - 291 with each of the above feeders consisting of the following:									
a)	1 No. 100A/40A, 415V, 50KA, 3 Pole motorised MCCB with 240V AC shunt trip coil and having electronics releases with (1) Communication capability (2) Provision for measurement of three phase current (3) Protection against Overload (with base setting and fine adjustment), Short Circuit and earth fault (all with adjustable time delays) + Instantaneous (4) Communication options to remotely read parameters for the protection functions transmission of ammeter measurements, signaling of cause of tripping, maximeter reset etc. (5) NO / NC contacts for interlocks and indications (6) 1 No.CT in Neutral for earth fault protection.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
b)	TNC switch									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	LED indication lamp for ON, OFF & TRIP.									
e)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor.									
f)	3 Nos. CTs 40/5A, 15VA, CL-1 for metering.									
D	INTERLOCKING ARRANGEMENT									
	PLC unit, suitable for interlocking 16 Nos Circuit Breakers, complete with all hardware and software as per interlocking schedule.									
E	SCADA CONNECTIVITY									
	All the breakers should be provided with communication facilities & contractor should provide single point to the marshalling box to communicate with BMS/SCADA for all system parameters of the panel. DC source & other accessories including software and hardware required for this is in the scope of contractor.									
	Transducer and wiring upto marshalling box for all relevant I/O points for panels for SCADA/BMS Connectivity in the scope of contractor.									
9A.3	D.G. Auxiliary panel DB-291 as per technical Specifications & as per the following details.	Sets		1	1	2				
A.	INCOMER									
a)	1No. 100A/40 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 1 No.CT in Neutral for earth fault protection.									
b)	LED phase indication lamp for R-Y-B.									
c)	<u>Metering</u>									
i)	1 No.Multifunction energy meter for measurement of voltage, line current, power factor.									
ii)	3 Nos. CTs, 40/5A , 10VA, CL-1 for metering.									
B	BUS BARS									
	Electrolytic high conductivity T P & N (full size) copper conductor bus-bars rated 40 Amps, suitable to withstand symmetrical fault level of 35kA for 1 second at 415 volts.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
C	OUTGOINGS									
1	6 Sets of DOL Starter units of 1 kW, Two Nos. for Engine Lub-oil Priming Pump, Two Nos. for DG battery Charging, Two Nos. For spare & each shall be equipped as detailed below.									
a)	1 No. 3 pole 2.5 Amps MPCB (with inbuilt single Phasing Preventor) having 1.6 - 2.4A Over - load release and having contacts for indications - On, Off, Trip.									
b)	1 No. 4 pole, RCCB with 40A rating and 100 mA sensitivity.									
c)	Auto / Local / Remote Selector Switch key operated.									
d)	Door mounted push buttons for Start and Stop functions.									
e)	Emergency stop push button lockable type.									
f)	LED indication lamp for ON, OFF, Trip.									
g)	1 No. 9A, AC-3 Duty, 3 - pole Contactor with Auxiliary Contacts and Operating Coil of 240 V AC.									
h)	Auxiliary Contactors for Auto/Local/Remote Operation.									
i)	Power & Control terminals for cable connections.									
j)	1 No Working / Standby Selector Switch.									
k)	Auxiliary Contactors with 240 V AC operating coil (for Working / Standby selection).									
2	1 Nos. 10 A, MCB for Canopy light.									
	Scada/BMS Connectivity at the separate Marshelling box in the panel with provision of all necessary I/O points & Transducers mounting prewired upto marshelling box terminal boards from the factory itself and audited in factory from the BMS provider									
9A.4	CABLES, CABLE TRAYS & STEELWORK									
	The Cable and Cable Containment System specified herein, must conform to Technical Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between Technical specifications and description in BOQ, the most stringent of the condition will prevail.									
	All the items / parts mentioned in relevant clauses of the Technical specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	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 Bidding 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.									
1	Supply at the site of work of 600/1000 V grade, Copper Conductor, XLPE Insulated, armoured, Low Smoke Zero Halogen Type Cables conforming to BS 6724 and Technical 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 400 Sq.mm	Metres								
b	4 x 300 Sq.mm	Metres		1190	1160	2350				
c	3 x 2.5 Sq.mm	Metres		225	225	450				
2	Supply at the site of work of 600/1000 V grade, Copper Conductor, XLPE Insulated, armoured, Low Smoke Zero Halogen, Fire Resistant / Survival Type Auxiliary / Control Cables conforming to BS 7846 and Technical 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	19 C x 2.5 Sq. mm Copper cable	Metres		1160	1160	2320				
3	Supply and Providing terminations conforming to Technical Specifications of XLPE, Fire Survival Cables armoured, / unarmoured cables (as per technical Specification) 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	19 C x 2.5 Sq.mm Cu. Cable	Nos		10	10	20				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
4	Laying, testing and commissioning of 600/1000 V grade, Copper Conductor, XLPE Insulated, armoured, Low Smoke Zero Halogen Type and Fire Resistant / Survival Type Cables (as per technical specification) on existing trays/ walls/ columns/ indoor/ trenches with suitable clamps, saddles, hooks, bolts etc.									
a	4 x 400 Sq.mm	Metres								
b	4 x 300 Sq.mm	Metres		1190	1160	2350				
c	3 x 2.5 Sq.mm	Metres		225	225	450				
5	Supply and providing terminations conforming to Technical Specifications for XLPE insulated, LSZH (as per technical Specification) 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 400 Sq.mm	Nos								
b	4 x 300 Sq.mm	Nos		28	28	56				
c	3 x 2.5 Sq.mm	Nos		14	14	28				
10.5	CABLE TRAY									
1	Supply & installation of Prefabricated, perforated GI cable trays made of GI sheets continuously connected including horizontal and vertical bends, reducers, tees, coupling plate and nut bolts washers & all material required for installation i.e Tie Rods, GI angles, Channels, earth link etc, conforming to Technical Specifications, complete as required. (With Double Reverse flange - Heavy duty)									
d	150mm wide x 50mm deep x 2mm thick	Meters		45	45	90				
e	100mm wide x 50mm deep x 2mm thick	Meters		30	30	60				
2	Supply & installation of Prefabricated, perforated GI cable trays made of GI sheets continuously connected including horizontal and vertical bends, reducers, tees, coupling plate and nut bolts washers & all material required for installation i.e Tie Rods, GI angles, Channels, earth link etc, conforming to Technical Specifications, complete as required. (Standard conventional Design)									
a	600 mm wide x 50 mm deep x 2mm thick	Meters		45	45	90				

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
b	450 mm widex 50 mm deep x 2mm thick	Meters		150	150	300				
c	300 mm wide x 50 mm deep x 2mm thick	Meters		150	150	300				
10.6	CABLE LADDER									
1	Supply & installation of prefabricated, GI, ladder type cable tray conforming to Technical Specifications, continously 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		10	10	20				
b	450 mm wide	Meters		40	40	80				
c	300 mm wide	Meters		40	40	80				
2	Supply, fabrication & installation of fabricated GI steel work conforming to Technical specification, to support GI, bus duct, light fixtures, conduit wirings, Bracket, & other electrical works including Tunnel services etc, as required. This includes all the fixing accessories like fastners and all masonary works.	Kgs		500	500	1000				
10.7	Bus Duct									
1	Supply, Installation, Testing & commissioning of the following totally enclosed, dust and vermin proof Low impedance compact sandwich bus duct as per technical specification, relevent standadrds & codes of practice applicable complete as required.									
	Ingress protection IP 65									
	Indoor mounts									
	14 SWG sheet steel clad									
	Electrolytic grade Aluminium bus bar									
	Operation at 415 Volt 3 phase 50 Hz system									
	Insulation voltage 1000 volts									
	Fault withstand 65 kA symmetrical for 1 second									
	50% Internal Earth Bus									

PART-A FOR ELECTRICAL WORKS

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	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.									
a	1600 amps 3P +100%N including bends	m		45	45	90				
2	Supply, installation, testing & commissioning of copper flexible end termination/ flange joints including adopter box suitable for bus duct connections from Top/ Bottom of switchgear panels/ equipments and of the following current ratings compatible with the bus ducts as per above complete as required.									
a	1600 amps 3P +100%N including bends	sets		4	4	8				
	TOTAL FOR SH 9A carried over to summary									

S. No.	Description	Unit	Country of Origin	Qty Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
10	PUMPS FOR WATER SUPPLY / SEWAGE/ SEEPAGE WATER									
	Whether explicitly specified or not, the Pumps for Water Supply / Water Treatment specified herein, must conform to Section E14 of the M & W Specifications and Motors must conform to Section E12 of the M & W Specifications, In addition to the description given in respective items of BOQ. in case of contradiction between M&W Specification and BOQ description, The most stringent of the condition will prevail.									
	All the items / parts mentioned in relevant clauses of the M & W 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.									
	Actual Head Should be as Per Contractor Calculation , Without Any Extra cost for all Pump.									
10.1	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 eliminating pads and ac									
a)	For treated water supply to cooling towers and drinking water fountains									
	Type of pump : Centrifugal									
	Capacity : 10 cu. M./hr.									
	Head : 20 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		-	1.00	1.00				
b)	For raw water supply to station									
	Type of pump : Centrifugal									
	Capacity : 3 cu. M./hr.									

S. No.	Description	Unit	Country of Origin	Qty Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	Head : 20 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		-	1.00	1.00				
10.2	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 common base frame, vibration eliminating pads accessories complete									
a)	Treated Water Supply Pump Tank To WTP.									
	Capacity : 10 cu.m/hr									
	Head : 35 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		1.00	1.00	2.00				
10.3	Supply, Installation, Testing and Commissioning the following Submersible Sump Pumps conforming to Section E14 of M & W Specifications with motors conforming to Section E12 of M & W Specifications for waste water drainage, free standing type, complete with MS galvanised lifting chain of suitable length, fasteners, expansion bolts etc. Sump pump shall be having automatic operation complete with motors, built in suction stainer, bottom support frame guide wires, motor control centre (including submersible cable from the control panel to the pump motors, sensors/probes for automatic operation complete as per M&W specifications. One additional pair of C.O contacts should be availbale for BMS purposes.									
a)	For Main Sewage Sumps at undercroft level									
	Solid handling Capacity 40 mm									
	Flow Rate - 120 LPM									
	Head - 25 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		1.00	1.00	2.00				
b)	For Seepage Sump at basement of Ancillary building									
	Solid handling Capacity 40 mm									
	Flow Rate - 300 LPM									
	Head - 10 M									

S. No.	Description	Unit	Country of Origin	Qty Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	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.in case of operation of fire pumps all the two pumps may operate simultaneously.	Set		1.00	1.00	2.00				
c)	For Main Seepage Sumps at Undercroft level									
	Solid handling Capacity 40 mm									
	Flow Rate - 600 LPM									
	Head - 25 M									
	RPM - 2900									
	Each set consists of 3 pumps (1 Working + 1 Standby + 1 Assist). However in case of operation of fire pumps all the three pumps may operate simultaneously.	Set		2.00	2.00	4.00				
d)	For Main Seepage Sumps at middle of tunnel									
	Solid handling Capacity 40 mm									
	Flow Rate - 300 LPM									
	Head - 30 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 simultaneously.	Set		1.00	1.00	2.00				
f)	For Seepage Sump at entry staircases									
	Solid handling Capacity 40 mm									
	Flow Rate - 120 LPM									
	Head - 15 M									
	RPM - 2900									
	Each set consists of 1 pump (1 Working only).	Set		4.00	4.00	8.00				
g)	For Trench Sump									
	Solid handling Capacity 40 mm									
	Flow Rate - 120 LPM									
	Head - 10 M									
	RPM - 2900									
	Each set consists of 1 pump (1 Working only).	Set		1.00	1.00	2.00				

S. No.	Description	Unit	Country of Origin	Qty Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
10.4	Supply, Installation, Testing and commissioning of level controller switches for automatic operation of seepage/sewage pumps mentioned in item No. 10.3 with PVC Float type level probe and cables of required size from motors control centre to probes, Complete in all aspects	Set		6.00	6.00	12.00				
	TOTAL OF SH-10									
11	WATER TREATMENT PLANT									
	Whether explicitly specified or not, the Water Treatment Plant and Pumps specified herein, must conform to Section E14& E15 of the M & W Specifications and Motors must conform to Section E12 of the M & W Specifications, in addition to the description give in respective item of BOQ in case of contradiction between M&W Specification and Description in BOQ, the BOQ or most stringent of the condition will prevail.									
	All the items / parts mentioned in relevant clauses of the M & W 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.									
11.1	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.		1.00	1.00	2.00				
	1) Capacity = 10 Cum / 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) Pressure gauge at inlet and outlet with isolating cocks and supports.									

S. No.	Description	Unit	Country of Origin	Qty Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
11.2	SOFTENER UNITS									
	Providing and fixing of mild steel (rubber Lined) pressure vessel confirming to IS:2825 Softener complete in all respects as per M & W specifications, having following	NO.		1.00	1.00	2.00				
	1) Capacity = 10 Cum / 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) Pressure 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.									
11.3	IRON REMOVAL FILTER									
	Providing and fixing of mild steel (rubber Lined) pressure vessel confirming to IS:2825 Iron Removal Filter complete in all respects as per M & W specifications, having following	NO.		1.00	1.00	2.00				
	1) Capacity = 10 Cum / 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) Pressure gauge at inlet and outlet with isolating cocks and supports.									
	7) All Face piping and diaphragm valve etc..									
	8) Thickness of rubber lining not less then 3mm									
	9) All pipes to be as per IS : 1239 class "c"									
	10) For design purpose consider , quality of outgoing water 0.3 PPM iron(as Fe) as per IS 10500.									
11.4	REGENERATION TANK / SALT DILUTION TANK									

S. No.	Description	Unit	Country of Origin	Qty Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	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 - 1500 litres capacity	NO.		1.00	1.00	2.00				
11.5	CHEMICAL DOSING PUMP									
	Providing , fixing ,Installation and commissioning of chemical dosing pump capacity 6 lph with 250 ltrs capacity chemical tank.	NO.		1.00	1.00	2.00				
11.6	LEVEL CONTROLLERS / LEVEL INDICATORS									
	Supply, Installation, Testing and Commissioning of Magnetic Float type Level Controllers / Indicators having adequate number of switches (Minimum 5 Nos.) for the services mentioned below. Controller Equipment shall be mounted inside the electrical panels o									
a)	For Raw 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		1.00	1.00	2.00				
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		2.00	2.00	4.00				
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 / Softener Plant Pumps.									
iii)	Treated Water Tank 1/2 full									
iv)	Low Level to switch ON the Filter Feed / Softener Plant Pumps									
v)	Low Low level to trigger alarm	Set		1.00	1.00	2.00				
	<u>Note:</u>									

S. No.	Description	Unit	Country of Origin	Qty Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	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 Centres 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 SH-11									

S.No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
12	PUMPS FOR FIRE PROTECTION SYSTEM									
	Whether explicitly specify or not, the pumps for Fire protection system Specified herein , must conform to Section E16 of the M & W specifications and motors must conform to Section E 12 of the M & W specifications and , in addition to description given in respective items of BOQ, In case of contradiction between M & W specification and Description in BOQ the most stringent of the condition will prevail.									
	The motor HP to be conformed by the supplier for the duty mentioned for each pump.									
	Rates quoted shall be inclusive of all structural support, clamps etc. as per approved design/Specification									
	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.									
	All the items / parts mentioned in relevant clauses of the M & W specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.									
	Actual Head Should be as Per Contractor Calculation , Without Any Extra cost for all pump .									
12.1	Providing and fixing horizontal/Vertical 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 Section E16 of M & W Specifications including mechanical seal & neoprene lined vibration eliminators. Motors shall be suitable for 415 volts, 3 phase, 50 cycles, A/C supply as per Section E12 of M & W Specifications.									
a)	<u>MAIN FIRE PUMPS FOR HYDRANT SYSTEM.</u>									
	Horizontal Split Casing									
	Capacity - 2839 LPM									
	Head - 75 MWC									
	HP - To suit power requirements for flow at 150% of the duty point									
	RPM - 1450/2950	Nos		1	0	1				
b)	<u>MAIN FIRE PUMPS FOR HYDRANT SYSTEM.</u>									
	Horizontal Split Casing									
	Capacity - 2839 LPM									
	Head - 88 MWC									

S.No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	HP - To suit power requirements for flow at 150% of the duty point									
	RPM - 1450/2950	Nos		0	1	1				
c)	<u>MAIN FIRE PUMPS FOR SPRINKLER SYSTEM.</u>									
	Horizontal Split Casing									
	Capacity - 2839 LPM									
	Head - 56 MWC									
	HP - To suit power requirement for flow at 150% of the duty point									
	RPM - 1450/2950	Nos		1	1	2				
d)	<u>JOCKEY PUMP (FOR FIRE HYDRANT SYSTEM)</u>									
	Capacity - 189 LPM									
	Head - 75 MWC									
	HP - As required									
	RPM - 2900	Nos		1	0	1				
e)	<u>JOCKEY PUMP (FOR FIRE HYDRANT SYSTEM)</u>									
	Capacity - 189 LPM									
	Head - 88 MWC									
	HP - As required									
	RPM - 2900	Nos		0	1	1				
f)	<u>JOCKEY PUMP (FOR SPRINKLER SYSTEM)</u>									
	Capacity - 189 LPM									
	Head - 56 MWC									
	HP - As required									
	RPM - 2900	Nos		1	1	2				
12.2	Supply, installation, testing and commissioning of Diesel Engine driven fire pump suitable for automatic operation comprising of the following and conforming to BS 649/IS 10002 all amended upto date. Horizontal, end section/split casing, high pressure singel/ multistage centrifugal pump, The installation shall be complete with flexible coupling and coupling guard as required. Fire pump shall have C.I. casing, CS diffusers, bronze impeller (hard finished and dynamically balanced) and SS (304) shaft with mechanical seal, gland packing seal, capable for delivering LPS at outlet head of mts to ensure a minimum pressure of 3.5 Kg/Sqcm at the farthest or topmost hydrant / sprinkler. The installation shall be complete with necessary pressure gauge with gun metal shut off cock on delivery side (The pump should be tested for bench mark duty point test at factory and shall be gotten got approved by the Local Fire Authority). Pump shall be capable of furnishing not less than 150% of rated discharge capacity at a head of not less than 65% of the rated head. The shut off head shall not exceed 120% of rated head.									

S.No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	Heat exchanger/Radiator cooled (secondary cooling) diesel engine of speed 1500 RPM suitable for the above pump with automatic starting mechanism and other accessories including fuel tank (fabricated from 3mm MS sheet, painted with two coats of synthetic enamel paint over a coat of primer) of capacity adequate to sustain pump operation for 8 hours continuous working. The tank shall be fitted with Magnetic oil level indicator, MH with cover, drain valve, air vent including structural supports (painted with approved shade), 2 Nos. x 12 volt battery, heat exchanger with necessary piping connections & fittings, flexible coupling, coupling guard & exhaust pipe connection complete as required. Common base plate for (a) and (b) from M.S. channel of required size. Suitable cement concrete foundation with plaster, (design and drawing) to be provided by the Contractor while the foundation will be done by others) complete with antivibration arrangement of cushy foot mountings. Set									
a)	STAND BY FIRE PUMPS FOR HYDRANT SYSTEM.									
	Horizontal Split Casing									
	Capacity - 2839 LPM									
	Head - 88 MWC	Nos		0	1	1				
	RPM-1400/2900									
b)	STAND BY FIRE PUMPS FOR HYDRANT SYSTEM.									
	Horizontal Split Casing									
	Capacity - 2839 LPM									
	Head - 75 MWC	Nos		1	0	1				
	RPM-1400/2900									
c)	STAND BY FIRE PUMPS FOR SPRINKLER SYSTEM.									
	Horizontal Split Casing									
	Capacity - 2839 LPM									
	Head - 56 MWC	Nos		1	1	2				
	RPM-1400/2900									
	TOTAL OF SH-12									
13	PIPE WORK FOR FIRE SYSTEM									
	The Pipe Work specified herein, must conform to M & W Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between M & W specifications and description in BOQ, the most stringent of the condition will prevail.									

S.No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	All the items / parts mentioned in relevant clauses of the M & W specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.									
13.1	Providing and fixing of heavy duty Galvanised Steel Pipe (conforming to Section E17 of M & W 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.									
13.1.1	25mm	RM		140	140	280				
13.1.2	32mm	RM		35	35	70				
13.1.3	40 mm	RM		50	50	100				
13.1.4	50mm	RM		215	215	430				
13.1.5	65mm	RM		20	20	40				
13.1.6	80mm	RM		205	205	410				
13.1.7	100mm	RM		185	185	370				
13.1.8	150mm	RM		4500	4200	8700				
13.1.9	200mm(6mm thick)	RM		25	25	50				
13.1.10	250 mm(6mm thick)	RM		45	45	90				
13.2	Providing and fixing Heavy Duty galvanised steel pipes, enbeded in earth shall be conforming to Section E17 of M & W 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 bywrapping two layers of 400 microne thick polythene sheet over two coats of bitumen.									
13.2.1	80mm	RM		15	15	30				
13.2.2	100mm	RM		15	15	30				
13.2.3	150mm	RM		320	320	640				
13.2.4	200mm(6mm thick)	RM		10	10	20				
	TOTAL OF SH13									

S.No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
14	PIPING ANCILLARIES FOR FIRE SYSTEMS									
	The piping ancillaries specified herein, must conform to Section E18 of the M & W Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between M & W specifications and description in BOQ, the most stringent of the condition will prevail.									
	All the items / parts mentioned in relevant clauses of the M & W specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.									
14.1	Providing and fixing Butterfly Valves of the following sizes (conforming to BS: 5155 and Section E30 of the M & W Specifications), suitable for pressure rating of 16 Kg / Sq. cm, with gaskets, flanges, nuts, bolts and washers including painting complete as required.									
14.1.1	65mm dia.	Each		2	2	4				
14.1.2	80mm dia.	Each		28	28	56				
14.1.3	100mm dia	Each		4	4	8				
14.1.4	150mm dia	Each		49	49	98				
14.1.5	200mm dia	Each		4	4	8				
14.1.6	250 mm dia	Each		2	2	4				
14.2	Providing and fixing Wafer type Double Plate Check Valves of the following sizes (conforming to API-594 as per M & W 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 M & W Specifications.									
14.2.1	65mm	Each		2	2	4				
14.2.2	100mm	Each		2	2	4				
14.2.3	150mm	Each		8	8	16				
14.3	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 Section E18 of the M & W Specifications.									
14.3.1	200 mm dia	Each		4	4	8				

S.No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
14.3.2	80 mm dia	Each		2	2	4				
14.4	Providing and fixing Gate Valves of the following sizes (conforming to BS: 5154 and Section E18 of the M & W Specifications) having Bronze body conforming to BS 1400 with screwed ends suitable for pressure rating of 16 bars.									
14.4.1	25mm dia	Each		80	80	160				
14.4.2	40mm dia	Each		1	1	2				
14.4.3	50mm dia	Each		11	11	22				
14.5	Providing and fixing Gun metal Air Release Valve as per Section E18 of the M & W Specifications.	Each		2	2	4				
14.6	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 Section E23 of the M & W Specifications.	Each		34	34	68				
14.7	Providing and fixing 80 mm dia Pressure relieving valve and gate valve to be fixed in Pump delivery line with by pass connection to pump suction line.	Each		2	2	4				
14.8	Supply and installation of stainless steel Expansion Bellow.									
14.8.1	200 mm dia	Each		4	4	8				
14.8.2	150 mm dia	Each		4	4	8				
14.8.3	80 mm dia	Each		2	2	4				
14.8.4	65 mm dia	Each		2	2	4				
14.9	Supply and installation of following (SS) Orifice Plate									
14.9.1	80 mm OD	Each		21	21	42				
14.9.2	100 mm OD	Each		20	20	40				

S.No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
14.9.3	150 mm OD	Each		10	10	20				
14.9.4	200 mm OD	Each		10	10	20				
	TOTAL OF SH14									
15	FIRE HYDRANT SYSTEM									
	The Fire Hydrant System specified herein, must conform to Section E19 of the M & W Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between M & W specifications and description in BOQ, the most stringent of the condition will prevail.									
	All the items / parts mentioned in relevant clauses of the M & W specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.									
15.1	Providing and fixing Vertical Air Vessel of size 450 mm diameter and 1.50 m high, fabricated out of 8 mm thick M.S. plate having dish ends of 8 mm thick MS plate, complete with pressure switches (for every individual pump to	Nos.		2	2	4				
15.2	Providing and fixing following types of Fire Hydrant Valves conforming to IS : 5290 and Section E19 of M & W Specifications having female instantaneous stainless steel type connection with matching flange, gaskets, nuts and bolts complete in all respects.									
15.2.1	Single headed(TYPE A)	Each		20	20	40				
15.2.2	Double headed (TYPE B)	Each		64	64	128				
15.3	Providing and fixing 63 mm diameter, 15 metre long, UL Listed Synthetic hose (conforming to Section E19 of M & W Specifications) having stainless steel male and female Instantaneous type coupling, machine wound with copper wire complete in all respects.	Each		44	44	88				
15.4	Providing and fixing of standard size Stainless Steel 63 mm diameter short branch pipe with nozzle, conforming to IS 903 and Section E19 of M & W Specifications	Each		20	20	40				
15.5	Providing and fixing Fire Man Axe conforming to IS : 926 : 1985 with Clamps.	Each		22	22	44				

S.No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
15.6	Providing and fixing Wall mounted Swinging type First - Aid Fire Hose Reel conforming to IS : 12585 Type II : 1985 and as per Section E19 of M & W Specifications having 20 mm diameter and 30 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 Brass Jet & Spray type Nozzle having Shut - Off valve complete in all respect.	Each		22	22	44				
15.7	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 RRL Hose with couplings, 1 No. Branch Pipe, Fire Man Axe complete as specified in drawing.	Each		24	24	48				
15.8	Providing and fixing of Fire Hose Cabinet Shutter made up of Stainless Steel 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		22	22	44				
15.9	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	2				
15.1	Providing and fixing Stainless Steel Four way, Collecting Head conforming to IS 904 : 1983 for Fire Brigade connection to Sprinkler and Hydrant Mains with hood Butterfly Valve and 150 mm diameter C.I. Double flanged Non - return Valve including nuts, bolts, gaskets etc. complete in all respect.	Each		2	2	4				
	Providing and fixing standard Stainless Steel Draw Out connection									

S.No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
15.11	Providing and fixing standard Stainless Steel Draw Out connection conforming to relevant standards for installation at Main Fire Water Tank.	Each		1	1	2				
15.12	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		4	4	8				
	TOTAL OF SH15									
16	FIRE SPRINKLER SYSTEM									
	The Fire Sprinkler System specified herein, must conform to Section E20 of the M & W Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between M & W specifications and description in BOQ, the most stringent of the condition will prevail.									
	All the items / parts mentioned in relevant clauses of the M & W specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.									
16.1	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).									
16.1.1	Pendant type(K80 Standard Response)	Nos.		12	12	24				
16.1.2	Sidewall Sprinkler (K80 Standard Response)	Nos.		5	5	10				
16.2	Providing and fixing k 18 / 22 Open Spray Medium Velocity Nozzle (UL listed) having natural finish or Nickel Chrome plated, as required, suitable for pressure rating of 12 bars.	Each		110	110	220				
16.3	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				
16.4	Providing and fixing 150 mm diameter Motorised Butterfly valve complete as required.	Each		2	2	4				

S.No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
16.5	Providing and fixing electrically operated Flow Indicating switches including 1.5 mm thick gasket, nuts and bolts complete as per M & W Specification.									
16.5.1	For 25mm dia pipes	Nos.		1	1	2				
16.5.2	For 50mm dia pipes	Nos.		7	7	14				
16.5.3	For 80mm to 150 mm dia pipes	Nos.		26	26	52				
16.6	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	Each		2	2	4				
16.7	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 M & W Specification	Each		1	1	2				
	TOTAL OF SH16									
17	MISCELLANEOUS FIRE SERVICES EQUIPMENT									
	The Miscellaneous Fire Services Equipment specified herein, must conform to Section E21 of the M & W Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between M & W specifications and description in BOQ, the most stringent of the condition will prevail.									
	All the items / parts mentioned in relevant clauses of the M & W specifications and not specifically mentioned in BOQ shall be deemed to be included in the quoted rates, unless specifically excluded.									
17.1a	Providing and fixing fully charged Portable Fire Extinguisher of 9 litres capacity, Water type (Gas Cartridge) complete with pressure gauge, Standard Discharge Valve and tube including CI bracket for wall mounting etc. conforming to IS 940 : 1989	Each		17	17	34				
17.1b	Mechanical foam type fire extnguisher, Capacity 9.0 Litre.	Each		1	1	2				
17.2	Providing and fixing portable fire extinguisher, dry powder type (gas cartridge) with cylinder initially fully charged with dry powder (ABC type) of 5 Kg, complete with standard discharge valve with tube, CI bracket for wall	Each		10	10	20				

S.No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	mounting etc. conforming to relevant standard.									
17.3	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	Nos.		24	24	48				
17.4	Fire protective clothing & breathing apparatus									
17.4.1	Set of protective clothing containing 2 nos.	Nos.		2	2	4				
	Each following items ;									
	a. Coat									
	b. Trouser									
	c. Gloves									
	d. Anti-Flash Hood									
	e. Helmets									
	f. Boots									
17.4.2	Self- contained open circuit type compressed air Breathing apparatus set confirming to EN-137:1993 , standard complete with one spare cylinders,	Nos.		4	4	8				
	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									
	(as per attached details & specification annexure page 7 to 9)									
17.4.3	Water-jel fire blanket consisting scientifically formulated cooling gel and a carrier in size 96" * 72" n canister.	Nos.		2	2	4				
	(as per attached details & specification annexure Page 10)									
17.4.4	Water-jel fire blanket consisting scientifically formulated cooling gel and a carrier in size 72" * 60" n canister.	Nos.		2	2	4				
	(as per attached details & specification annexure Page 10)									

S.No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
17.4.5	Snap light emergency evacuation system complete with two high intensity yellow klcolour cyalume lightsticsk (light proof, water proof, wind proof, non explosive, and non toxic) with temper proof pin on a all mounted unit.	Nos.		20	20	40				
17.4.6	Thermal Imaging Camera	No.		2	2	4				
17.4.7	22.5 kg Carbon Dioxide Portable fire extinguisher with CCE marked high Pressure Seamless cylinder (Cylinder bearing IS:7285 marking) with wheel type valve(IS:3224 marked), Internal discharge tube, five metre, long live pressure discharge tube, Non conducting horn mounted on two wheeled trolley, and IS 2878 marked with CO2 filling CComplete.	No.		6	6	12				
17.4.8	Supply of ISI marked Dry Chemical type portable Fire Extinguisher of 25 Kg capacity made of high pressure steel cylinder complete with discharge tube, 1 M long high pressure wire braided discharge hose, discharge horn fully charged with ABC powder and with 2 kg CO2 external cartridge, plunger, two wheel trolley complete.	No.		1	1	2				
	TOTAL OF SH17									
18.0	CLEAN AGENT PANEL FLOODING SYSTEM- FIRE TRACE TUBE SYSTEM OR EQUIVALENT WITH UL LISTED SYSTEM									
	All the Item not specifically mentioned here but necessary to make the system complete and suitable for desired application as per E23 M & W specification and drawing will be deemed to be a quoted Price.									
18.1	Providing, Installation, Testing and Commissioning of iClean agent panel flooding system complete in following panels, Note near by panel covered with one unit , In case of activation of gas signal shall be provided to Fire alarm system.									
a	Panel DB100/DB200/DB110/DB210/DB120/DB220/DB150/DB250									
b	PANEL DB155/DB255/DB151/DB251/DB160/260									
c	PANEL DB 111/211/DB180/DB280/ DG 290									
	Capacitor panel,ATS-UPS& Lift, Mid Tunnel Pump panel as required	Lot		1	1	2				
18.2	CLEAN AGENT TRANSFORMER PROTECTION SYSTEM- FIRE TRACE TUBE SYSTEM OR EQUIVALENT WITH UL LISTED SYSTEM									

S.No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	All the items/Parts mentioned in relevant clauses of the technical specification and not specifically mentioned in the BOQ shall be deemed to be included in the Quoted rates, unless specifically excluded.									
	All equipment, instrument, Gas Cylinder, Gas et. Must comply with the requirement of NFPA-2001 or latest NFPA.									
	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.									
	Providing, Installation, Testing and Commissioning of Clean agent panel flooding system complete in following respect clean agent for each Transformer of Auxillary Sub station completed in all aspects.	Lot		1	1	2				
	TOTAL OF SH18									
19	FIRE ALARM AND DETECTION SYSTEM									
	The Fire Alarm and Detection System specified herein, must conform to Section E35 of the M & W Specifications, in addition to the description given in respective items of BOQ, whether explicitly specified or not. In case of contradiction between E 22 M & W specification and description in BOQ, the most stringent of the condition will prevail.									
	All the items / parts mentioned in relevant clauses of the M & W 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 M & W Specifications and Drawings will be deemed to be included in the quoted prices									
19.1	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 M & W Specifications & Drawings but not limited to the following:	Set		1	1	2				
19.1.1	8 Loop Panel									
19.1.2	Repeater Driver Board									
19.1.3	Communication Board									
19.1.4	Software & Graphics									

S.No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
19.1a	Supply, Installation, Testing and Commissioning of 2 Loop Addressable Main Fire Alarm Control Panel (MFACP) complete with capacity to connect Devices & Detectors (in zoned manner) as per M & W Specifications & Drawings but not limited to the following:	Set		1		1				
19.1a.1	2 Loop Panel									
19.1a.2	Repeater Driver Board									
19.1a.3	Communication Board									
19.1a.4	Software & Graphics									
19.1.5	PC with 21" TFT + A4 Dot matrix Printer. PC shall be minimum 3.0 G Hz or above and complete with minimum standard 3 GB RAM, Min 320 GB Hard Disk especially with high speed disk access, high speed HDD-R/RW and 32 key sculpted keyboard (101 key compatible), USB mouse, USB port with licensed software and all other required hardware / software to complete the system.									
19.1.6	Lead Acid maintenance free Batteries & Battery Charger. And wall mounted cabinet.									
19.1.7	Amplifier card									
19.1.8	Provision for interfacing with other systems such as SCADA / BMS with all required Hardware & Software.									
	All relay / control module of SCR shall be in lockable cabinet									
19.2	Supply, Installation, Testing and Commissioning of Repeater Annunciator Panel with Mimic panel as per M & W Specifications and Drawings. Mimic panel shall be of min. 900 x 900 size with powder coated 2 mm thick back cabinet and hinged acrylic sheet cover. Station drawing shall be screen printed on acrylic sheet.	Set		1	1	2				
19.3	Supply, Installation, Testing & Commissioning of Signal Initiating (Intelligent Analogue Addressable) devices complete with Detector Base etc. as per M & W Specifications.									
19.3.1	Intelligent Addressable Multi Sensor Smoke Detector.	Nos.		339	339	678				
19.3.2	Addressable Fault Isolator Base	Nos.		21	21	42				
19.3.3	Addressable Fault Isolator	Nos.		21	21	42				
19.3.4	Addressable Mannual Glass Break Unit	Nos.		20	20	40				
19.3.5	Sounder with strobe light	Nos.		20	20	40				
19.3.6	Response Indicator	Nos.		10	10	20				

S.No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
19.3.7	Intelligent Addressable Duct Detector.	Nos.		8	8	16				
19.3.8	Intelligent Addressable Control Module.	Nos.		23	23	46				
19.3.9	Intelligent Addressable Monitoring Modules	Nos.		71	71	142				
19.3.10	Intelligent Addressable water Flow Monitoring Modules	Nos.		32	32	64				
19.3.11	Magnetic Lock Assembly for minimum 400 Kg. Load	Nos.		3	3	6				
19.3.12	Magnetic Contact	Nos.		3	3	6				
19.3.13	Emergency Door Release Switch	Nos.		3	3	6				
19.3.14	Power supply unit (SMPS) for Powering Magnetic Door Lock as per approved scheme.	Nos.		3	3	6				
19.3.15	High Temperature (min. 80 C degree trip) Heat detector	Nos.		8	8	16				
19.4	Supplying, Laying, Termination, Testing & Commissioning of Fire Survival Cables (confirming to BS: 7846 and Section E02, 22 of M & W specifications for performance requirements of Fire Survival Cables) armoured, 1 pair 2.5 sq.mm, screened / shielded, <u>Copper conductor (one pair shielded) cable</u>	Metre		1500	1500	3000				
19.5	Supplying, Laying, Termination, Testing & Commissioning of Fire Survival Cables (confirming to BS: 7846 and Section E02, 22 of M & W specifications for performance requirements of Fire Survival Cables) armoured, 1 twisted pair 1.5 sq.mm, screened / shielded <u>copper conductor cable</u>	Metre		6500	6500	13000				
	TOTAL OF SH19									

SCHEDULE OF QUANTITIES FOR PART-D MISC. CIVIL WORKS							
S.No.	Description	Unit	Country of Origin	Total Quantity	Total amount of estimated work as per State PWD Rates in (Lacs.) INR	% quote above or below the State PWD Rates	Total Amount in INR
1	LATEST STATE PWD RATES FOR CIVIL WORKS						
	Works in this Schedule shall be done under State PWD Rates as per latest CPWD Specifications for Civil Works						
	It may be noted that Part of those Civil Works relating to E&M Works which are covered in Scope of work else where, will be the responsibility of the contractor. Actual work order will be issued by JMRC towards this items of BOQ as per requirement. Measurement will be made as per the units of items of State PWD Rates operated and payment will be made after applying the accepted rate of Bid (in percentage) above/ below to the rates given in items of State PWD Rates . Amount given in Schedule for this item is the total amount, which is estimated towards Civil Works for which work order will be issued. This may also vary by + 25 percent. the amount after adding % above or below is to be quoted as amount. Any item of State PWD Rates. Seperate work order will be issued for this item as per Note above.	L/S		2 stations Works	23.355		
	Total Amount in INR for Part-D						

SCHEDULE OF QUANTITIES FOR PART-E ADDITIONAL MISCELLANEOUS ITEMS

S.No.	Description	Unit	Country of Origin	Qty.	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
1	Fire Sealing							
1.1	Supply, laying & testing of the Fire sealant materials complete as per below descriptions & confirming to Section 30 of Technical specification.							
(i)	Closing a larger shaft using CS-195+ INTUMSCENT COMPOSITE SHEET of approved equivalent. Sheet is made up of 28 guage galvanised sheet on one side and the other side reinforced with hexagonal shaped steel wire mesh and covered with aluminium foil.The nominal 7.62mm thick composite sheet provides minimum fire rrating of 2 hour. The maximum temperature that can be withstand is 1200 deg C (Hydro Carbon Fire) as per ASTM Standards E814 & E119. Composite sheet must be capable of passing ASTM E814,ANS1/1479 Standard methods of fire tests for through penetration fire stops upto the desired fire resistant rrating, It should also meets the summary of the fire tests results per ES1Tlv814. Electrical circuits protection systems for cable trays besides meeting surface burning characteristics ASTM E84.(ANSIUL723)	Sq.m		10				
(ii)	Sealing of construction gaps using MPP-1+ TUMESCENT MOLDABLE PUTTY PADS of 3mm or approved equivalent for cables including fibre optic inner duct and cable, insulated pipe electrical conduits, metal pipes, penetrations against air drafts,smoke,noxius gas and flame propagation The product shall be one part intumescent elastomers provides a minimum fire rating of 2 hours. The maximum temperature that can be withstand is 1200 deg C (hydro Carbon Fire) as per ASTM Standards E814 & E 119. Under normal enviourmental condition, the materials shall be non-corrosive to metal and compatible with synthetic cable jackets When exposed to flame & heat it shall be capable of expanding and comply with paragraph 300-21 of NCE (NEPA 17) and requirments of UL 1479,E814.	Sq. Mtr.		40				

SCHEDULE OF QUANTITIES FOR PART-E ADDITIONAL MISCELLANEOUS ITEMS

S.No.	Description	Unit	Country of Origin	Qty.	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
(iii)	Sealing penetration in the wall and floor assemblies using FIRE, BARRIER ENDOTHERMIC MOTAR (with 3" depth) or approved equivalent Fire barrier motar shall be a light weight cementitious product. The product should have fire rating and capable a minimum the rating of 2HRS.The maximum temperature that can be withstand is 1200 deg C (Hydro Carbon Fire) as per ASTM Standards E814 & EI19.The material should be free of Asbestos or MMMF (Made made mineral fibre) the product shall have characteristic of self levelling and shall not sag. It should accountdate re-entry ability without the use of power tools.The products must be tested as per ASTM E& 14 and OANLWC S115 for apt 2 hours tire resistance F& T (F1, F, FH and FTH).	Sq. Mtr.		60				
(iv)	EPDM modular based cable and pipe sealing system for sealing of critical area. The EPDM modules shall be Low Smoke Index Halogen Free cross linkable rubber compound based on EPDM(Ethylene-Propylene Diene Terapolymer). The system shall ensure foolproof protection against hazards induced by water, dust, humidity, fire, vibration, pull tension, noise as well as rodent	Sq. Mtr.		40				
1	Supply, Installation & Testing of 2 hours Fire rated system for closing the openings between rooms with help of Rock wool, G.I Sheet and Hilti or equivalent Sealants(Qty measured will be the size of opening)	Sq. Mtr.		40				
2	Supply & installation Checker Plate 6mm thickness with anchor & fastners to cover the openings left out on the floor for Nozzle, Electrical panels and other equipments etc.	Sq.m		40				
3	Supply installation testing & commissioning of power quality monotoring , logging, analysis and fault recording system in electrical panels as per specifications attached.	nos.		2				

SCHEDULE OF QUANTITIES FOR PART-E ADDITIONAL MISCELLANEOUS ITEMS

S.No.	Description	Unit	Country of Origin	Qty.	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
4	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.	mtr		40				
5	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.	mtr		40				
6	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.	no.		2				
	TOTAL AMOUNT FOR PART-E							

SCHEDULE OF QUANTITIES FOR PART-F SUPPLY OF SPARES

S.No.	Description	Unit		Qty.	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
1	Supply of spares as per the spares provision in Appendix -B2 of PREAMBLE.	LS		1				
	TOTAL AMOUNT FOR PART-F							

SCHEDULE OF QUANTITIES FOR PART-G TRAINING AND TRAINING MANUALS

S.No.	Description	Unit	Country of Origin	Qty.	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	TRAINING & TRAINING MANUAL							
1	Providing training and training manuals as per scope and specifications given in the contract Including all necessary expenses and training materials and working models as in Contract	LS		1				
	TOTAL AMOUNT FOR PART-G	0						

SCHEDULE OF QUANTITIES FOR PART-H OPERATION & MAINTENANCE MANUALS

S.No.	Description	Unit		Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
1	Operation and Maintenance Manuals							
	Providing Operation & Maintenance, interactive manuals as per scope and specifications given in the contract	LS		1				
	TOTAL AMOUNT FOR PART-H							

Appendix B2**1.1 General**

1.1.1 The Contractor shall supply the following spares:-

I. Consumable Spares

- (i) The '**consumable spares**' shall include items such as lubricants, oils, greases, sealants, filter Medias, gaskets, lamps and wearable parts etc. whose declared life is less than one year. This will not include the consumables like Diesel Salt etc. required for operation of the equipment.
- (ii) The Bidder shall quote for the minimum list of consumable spares required during DLP as attached at Annexure-1 for maintenance and repairs of equipment in technical package. Any consumable item if required but not included in the above list will be deemed to have been included and shall be supplied as per the provisions of this contract without any extra financial implication to the Employer. Contractor will be required to supply the requisite quantity of spares, as required irrespective of the quantities indicated by the contractor in the recommended list. Employer's decision in determining any particular item(s) as consumable in line with above guideline will be final and binding. In case any changes are required in the supply of consumables on account of changes at design stage, the contractor shall have to supply the required consumables also.
- (iii) List of consumable spares furnished in the technical package shall be updated during the execution of Contract and following information as minimum shall be provided.
 - (a) Names, addresses, telephone numbers and other particulars of manufacturers and their local representatives;
 - (b) Procuring Specification
 - (c) Full description of spares including a note whether it is sealed unit or an assembly or sub-assembly which can be broken down into component parts;
 - (d) Quantity installed in the system;
 - (e) Expected consumption rates;
 - (f) Overall dimensions and weight including minimum packing (if any) for shelf space purposes;
 - (g) Inter-changeability or otherwise with similar parts;
 - (h) Normal manufacturing and shipment lead times; and
 - (i) Shelf life.
- (iv) The consumable spares shall be stored at the location agreed to by the Engineer.
- (v) It shall be the responsibility of the contractor to maintain sufficient stock of consumable spares till the end of DLP. These spares will be utilized by the Contractor during the maintenance etc. and its consumption to be countersigned with Operation & Maintenance of JMRC and the old replaced parts shall be destroyed in the presence of JMRC representative. Unused spares, if any, by the end of DLP shall be handed over to JMRC and it will become property of employer.
- (vi) Recommended list shall be furnished by the contractor as part of design submission / vendor approval for respective systems and subsystems.

(The price of these spares will be part of Bid evaluation while assessing the L-1 bidders).

II. Unit Exchange Spares

The Contractor shall supply the Unit Exchange Spares as listed in the Annexure-2 of this Chapter on Employer's Requirements. The Unit Exchange Spares shall be supplied in the Store nominated by the Engineer. The delivery requirements of different lots are mentioned in the Annexure-2. These shall be delivered before ROD. Any delay in this regard will make the Contractor liable for liquidated damages as per Bid conditions. This will be part of Bid evaluation while assessing the L-1 bidder.

III. Commissioning And DLP Spares

- (i) The Contractor shall submit to the Engineer for review a list of minimum spare parts that he intends to make available during the installation, erection, commissioning and defect liability periods. The minimum list of DLP spares is enclosed as Annexure 1.
- (ii) The Contractor shall keep on Site, at his own cost, throughout the installation, erection, commissioning and defect liability periods, stocks of spare parts, as per the list to enable rapid replacement of any item found to be defective or in any way in non-conformance with the Specification.
- (iii) The Contractor shall generally not be entitled to use any of the Employer's spare parts during the installation, erection and commissioning periods or during the Defects Liability Period.
- (iv) Contractor shall not be permitted to remove any working/healthy equipment / components / sub-systems / systems for any reason whatsoever without specific approval in writing from JMRC's Engineer or Engineer's authorised representative.
- (v) Spares as per the agreed list shall be supplied at least three months before ROD. Stocks of such spares as available in Contractor stores will be jointly checked with Engineer every three months. Certificate by Engineer confirming availability of the spares in contractor stores / in Depots as per agreed list will be a pre-requisite for release of interim payments of the Contractor. However, this condition will not be applicable for six months before the expected expiry of the DLP period.
- (vi) The Contractor shall include the price of this item in cost of DLP in their Financial bid. This will be part of Bid evaluation while assessing the L-1 bidder.

IV. Mandatory spares

- (i) The Contractor shall supply the Mandatory Spares as listed in the Annexure-3 of this Chapter of Employer's Requirements. The Spares shall be supplied at the location nominated by the Engineer. The price of these spares shall be quoted at actual and will also be part of the evaluation for assessing L-1 bidder.
- (ii) No change in quoted price of any spare will be allowed even when there is change in design of any equipment/sub-system during the execution of the contract.
- (iii) Contractor will furnish complete details during contract execution (detailed design stage) as noted below for the listed spares;
 - (a) Names, addresses, telephone numbers and other particulars of

manufacturers and their local representatives;

- (b) Procuring Specification
- (c) Full description of spares including a note whether it is sealed unit or an assembly or sub-assembly, which can be broken down into component parts;
- (d) Quantity installed in the system;
- (e) Overall dimensions and weight including minimum packing (if any) for shelf space purposes;
- (f) Designed and shelf life;
- (g) Interchangeability or otherwise with similar parts;
- (h) Normal manufacturing and shipment lead times;
- (i) Purchase Technical Specification with relevant drawings.

The information as above shall also be given for all other components/equipment etc. which may have to be changed / replaced during maintenance as decided by the Engineer based on the proposed maintenance practices.

V. Recommended Spares

- (i) The Bidder shall furnish priced list of the 'recommended spares' not covered under 'Unit Exchange Spares', 'consumables' and 'mandatory' spares but the Contractor expects them to be required during **three years after expiry of defect liability period**, along with the bid as per format enclosed in **Annexure-4** of this Chapter of Employer's Requirements. The prices should be proportionate and reasonable. Employer may decide to procure any number of these spares at quoted / negotiated rates before the end of DLP. The Spares shall be supplied at a location nominated by the Engineer.
- (ii) Contractor shall supply all the spares recommended by equipment/sub-system manufacturers within the quoted cost for recommended spares. Contractor shall update list of spares recommended by equipment/sub-system manufacturers at design submission stage.
- (iii) This will not be part of Bid evaluation while assessing the L-1 bidder.

VI. 10 years spares beyond DLP (Purchase of spares from Vendors)

- (i) The Contractor shall ensure availability of spare parts for a period of ten years from the last date of taking over of whole of Works. The Bidder shall furnish an unpriced list of spares for maintenance and repair for a period of ten years from the date of taking over in the Technical Package in Annexure-5. The spares shall be in kit form/ items. The Bidder shall also quote unit prices for the kit / items, spare item with escalation clause in the Financial Package. The Employer at his discretion, during a period of ten years from the date of taking over of the whole works, purchase as many kits / items of spare parts as required by him, at the rates indicated in this schedule.
- (ii) If during the period of ten years, the manufacturer / vendor intends to discontinue the manufacture of spare or replacement parts, the manufacturer / Contractor shall immediately give notice to the Employer of such intention. The Employer shall be given the opportunity of ordering at contracted prices such quantities of such spare or replacement parts as the Employer shall reasonably require in relation to the anticipated life of the equipment.
- (iii) In the event of Vendor / manufacturer / Contractor failing to supply the

spare parts in accordance with this Clause, he shall in respect of each item of spare, furnish free of cost to the Employer, the drawings, specifications, patterns and other information to enable the Employer to make or have made such spare parts. The Employer shall be entitled to retain the aforesaid drawings etc., for such time only as is necessary for the exercise by the Employer of his rights under this clause and the drawings, if the Manufacturer / Contractor so requires, shall be returned by the Employer to the Contractor in good order and condition (fair wear and tear excepted). Also in the event of vendor / manufacturer / contractor failing to supply the spare parts in accordance with this clause are liable to be blacklisted.

- (iv) Under such circumstances, the Contractor shall also grant to the Employer, without payment of any royalty or charge, full right and liberty to make or have made spare or replacement parts as aforesaid and for such purposes only to use, make and have made copies of all drawings, patterns, specifications and other information supplied by the Contractor to the Employer pursuant to the Contract.
- (v) The Contractor will, so far as he is reasonably able to bind his sub-contractors / vendors to conform with the requirements of this Clause and shall, prior to entry into any sub-contracts, provide the Employer with full details of any sub-contractor / vendor who will not so conform in which event the Employer may direct the Contractor to seek an alternative sub-contractor/vendor.
- (vi) If the Contractor fails to provide spare or replacement parts as described in this Sub-clause and these are available from the Contractor's sub-contractor, the Employer shall have the right to obtain such spare and replacement parts from the sub-contractor or any other supplier. (and any additional cost incurred by the Employer shall be recoverable from the Contractor)
- (vii) In case the Contractor is unable to supply spares in accordance with Clause above, he shall furnish procuring specification, free of cost to the Employer, the drawings, specifications, and other technical details, to enable the Employer to manufacture parts, or have them manufactured. Such drawings and technical data shall be provided free of any charge or royalty, on the understanding that the Employer will use such data and drawings, only for the manufacture of parts for his own use.
- (viii) The foregoing shall hold equally good for the Contractor, any or all of his sub-contractors, and vendors.
- (ix) In the event that technological progress results in improved versions of spares and replacement parts, the latest version shall have the same plug compatibility, and spatial needs of its predecessor, to avoid modifications being required, to accept the up-graded version of the part.

1.2 Manufacture, Delivery and Warranty

- (i) The major spare parts ordered under the Contract shall be manufactured, tested and inspected in accordance with the relevant quality system, suitably packed and labelled. All spares shall be subject to inspection by the Engineer. In the event that any item is known to be going out of production, then the Contractor shall give advance notice to the Engineer.
- (ii) The warranty period of '**unit exchange**' and '**mandatory spares**', delivered shall be:

- (a) Either 24 months from the date of acceptance or
- (b) Upto expiry of the defect liability period, whichever is later.

1.3 Purchase of Spares from Vendors

- (iii) The Contractor shall furnish an undertaking that he has no objection whatsoever to and shall not in any way deter or obstruct the Employer, its licensee or its representative from dealing directly with the Contractor's Vendors for the purchase of the spares during the Contract period. The spares purchased shall be subject to inspection by the Engineer.
- (iv) Contractor shall obtain an undertaking from vendors, OEMs etc. at detailed design submission stage that they will deal directly with Employer for supply of spares, equipment and/or sub-systems.

1.4 The relevant list of the spares mentioned above shall be submitted in the technical bids after blanking the prices, where applicable. The financial bid shall have the price details.

1.5 Contractor shall submit technical specifications of the items used in this project for the purpose of purchasing. Engineer's views, if any, shall be suitably incorporated.

Annexure-1

<u>MINIMUM LIST OF DLP SPARES</u>		
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 (AUX 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 MECHANISM	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 RECOMMENDED 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 CONTACT 1NO+1NC	2 nos. for each rating for each make
4	ANY OTHER PART OF SIMILAR NATURE RECOMMENDED 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	40 nos.
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	8 nos.
8	GREEN PUSH BUTTON WITH NC	8 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 TIMER	10 nos.
4	S/D TIMER	10 nos.
5	HOUR METER	10 nos.
6	MOISTURE PROTECTION RELAY 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	8 nos.
2	LOCAL/REMOTE WITH SWITCH 2 STAY PUT, LOCKABLE	8 nos.
3	AUTO/LOCAL/REMOTE WITH SWITCH 3 STAY PUT, LOCKABLE	8 nos.
4	INTERLOCKING BYPASS S/SWITCH 2 STAY PUT, LOCKABLE	8 nos.
5	WORK STAND BY S/S 1P2W, LOCKABLE	8 nos.
I	CAPACITORS	
1	7% HARMONIC D- TUNED FILTER	10 nos.
2	3P 415V CAPACITOR HERMATICALLY SEALED METALISED POLYPROPYLENE HEAVY DUTY	10 nos.
J	MCB & RCCB	
1	MCB	4 nos. of each rating of each make
2	RCCB	4 nos. of each rating of each make
3	RCCB AUX CONTACT	8 nos.

K	CONTACTORS	
1	AUX CONTACTOR	4 nos. of each rating of each make
2	POWER CONTACTOR 3P	4 nos. of each rating of each make
3	CAP. DUTY CONTACTOR 3P	4 nos. of each rating of each make
4	ADD ON BLOCK 2NO+2NC	4 nos. of each rating of each make
5	ADD ON BLOCK1NO+1NC	4 nos. of each rating of each make
L	HEATER & FAN & HUMIDISTAT	
1	HUMIDISTAT	8 nos. of each rating of each make
2	SPACE HEATER	8 nos. of each rating of each make
3	CFL WITH DOOR SWITCH	8 nos. of each rating of each make
4	CONTROL TERMINAL	8 nos. of each rating of each make
M	FUSES	
1	FUSES	8 nos. of each rating
N	LIGHTS	
1	LIGHT FIXTURES (COMPLETE ASSEMBLY WITH FIXTURE, BALLAST, LAMP etc.)	5% spare quantity of each type of light
2	BALLAST	10 nos. of each type
3	LAMP	10% spare quantity of each type of light
4	HOLDER	10 nos. of each type
O	ATS	
1	ATS (COMPLETE ASSEMBLY)	4 nos. of each type
2	CONTROLLER	4 nos. of each type
3	AUXILLARY CONTACT BLOCK	4 nos. of each type
4	MOTOR MECHANISM/MOTOR	4 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 ALARM SYSTEM	
1	CARDS	2 nos. of each type
2	ADDRESSABLE POWER SUPPLY,240VAC	2 nos. of each type
3	INTELLIGENT PHOTO THERMAL DETECTOR	50 nos. of each type
4	INTELLIGENT DETECTOR BASE	50 nos. of each type
5	INTELLIGENT ADDRESSABLE DUCT PHOTO DETECTOR	4 nos. of each type
6	LOOP ISOLATOR MODULE	4 nos. of each type
7	ADDRESSABLE CONTROL MODULE	4 nos. of each type
8	ADDRESSABLE RELAY MODULE	4 nos. of each type

9	ADDRESSABLE MONITOR MODULE	4 nos. of each type
10	ADDRESSABLE PULL STATION	4 nos. of each type
11	HOOTER STROBE	4 nos. of each type
12	FLOW SWITCHES	4 nos. of each type for each pipe size
13	ISOLATOR BASE	8 nos. of each type
14	RESPONSE INDICATOR	8 nos. of each type
15	CPU OF FACP	2 nos. of each type
R	PANEL GAS FLOODING SYSTEM	
1	FILLING ADAPTER	8 nos.
2	OUTLET ADAPTER	8 nos.
3	END OF LINE ADAPTER	8 nos.
4	PRESSURE SWITCH	8 nos.
5	DETECTION TUBE	40 meters
6	MASTER CONTROL UNIT	2 nos.
7	AUTO WEIGHT MEASURING UNIT	2 nos.
S	PUMPS	
1	JOCKEY PUMP HYDRANT	1 nos.
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
4	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	4 nos. of each type
2	LEVEL CONTROLLER	4 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	4 nos. of each type
10	PRESSURE RELIEF VALVE (PRV)	5 nos. of each type
11	GLOBE VALVE	5 nos. of each type
12	GASKETS	50 nos. for each type of valve
13	AUTO COUPLING	5 nos. of each type
V	PRESSURE GAUGE/SWITCH	
1	PRESSURE GAUGE	5 nos. of each type
2	PRESSURE SWITCH	5 nos. of each type
W	POWER/CONTROL CABLE	
1	POWER CABLE AS PER BOQ	10% Spare quantity for each size
2	CONTROL CABLE	5% Spare quantity for each size

NOTE:

The above list is indicative and not exhaustive. Any additional spares 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.

We hereby confirm that:

1. The cost of items listed above, for maintenance during DLP have been included in our quoted prices. Nothing extra will be payable for such spare parts.
2. 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.
3. This will not absolve us of the responsibility to fulfill the DLP obligations as per relevant clauses of tender conditions.
4. We certify that the availability of above spares along with the required skilled personnel, T&Ps, M&P, Testing Instruments, Material Handling Equipments, Jigs & Fixtures and ladder etc. will be ensured in desired location at specified intervals as approved by the employer during DLP to ensure that maintenance of Equipment is not affected.

Signature and Stamp of tenderer

Annexure-2**Unit Exchange Spares**

S.No.	Item	Unit	Country of Origin	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							

Annexure-3**Mandatory Spares**

S.No	Item	Unit	Country of Origin	Quantity	Unit Price		Total Amount	
					INR	Foreign Currency	INR	Foreign Currency
1	Butterfly Valve (65mm, 80mm, 100mm, 150mm, 200mm dia etc. – 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.		2				
7	Fire Hydrant Valve (Single & Double Headed both type)	Nos.		2				
8	Vertical Air Vessel	Nos.		1				
9	Sprinkler (Pendant Type)	Nos.		2				
10	Sprinkler (Side wall Type)	Nos.		1				
11	Level Sensor (Each type)	Set		1				
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.		2				
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		1				

S.No	Item	Unit	Country of Origin	Quantity	Unit Price		Total Amount	
					INR	Foreign Currency	INR	Foreign Currency
17	Pressure Relief Valve (1 set comprising of 1 valve of each size)	Sets		1				
18	Filter for Y-Strainer (1 set comprising of 1 Filter of each size)	Sets		3				
19	Expansion Bellow (1 set comprising of 1 bellow of each size)	Sets		1				
20	Rubber make roll for Gasket	Nos.		1				
21	Auto coupling for Sewage Pump	Nos.		3				
22	Gasket for valves (1 set comprising of 1 gasket of each type)	Sets		4				
23	Pressure Switch for Fire Pumps (1 set comprising of 1 pressure switch of each type)	Sets		4				
24	Pressure Gauges for fire pumps (1 set comprising of 1 gauge of each type)	Sets		4				
25	<u>Gas Mask</u>	Nos.		20				
26	<u>Fire Axe</u>	Nos.		8				
27	<u>Fire Hook</u>	Nos.		4				
28	<u>Gumboots</u>	Nos.		20				
29	<u>Helmets</u>	Nos.		20				
		TOTAL AMOUNT FOR MANDATORY SPARES						

Annexure-4

Recommended Spares for three years After DLP

[illegible]

Contractor need to submit the unpriced list in the technical package.

List of Spares for 10 years beyond the DLP

[illegible]

BID TOTAL PART-III (Diesel Generators Sets-Optional)

(JMRC reserves the right to operate the part III (DG works) as per their Discretion)

In accordance with the accompanying and signed form of bid, we (the Bidder) offer to supply, install, test, commission, and remedy at any defects of the whole said works, in conformity with the said drawings, particular specifications, conditions of contracts and other contract documents of **bid of Jaipur for DIESEL GENERATOR (DG Sets) System for Chhoti Chaupar and Badi Chaupar** for the following sums:

PRICES FOR WORKS CHHOTI CHAUPAR & BADI CHAUPAR U/G STATIONS AND ASSOCIATE FOR TUNNEL SECTION.

Section No.	DESCRIPTION	Total Brought From below Bills	
		INR	Foreign Currency
SUB HEAD-I	BOQ for DG Sets		
SUB HEAD-II	BOQ for INSTALLATION of DG Sets		
SUB HEAD-III	BOQ for DG Dismantling, Installation & Acoustics Treatment		
SUB HEAD-IV	BOQ for Optional Items:- Operation & Maintenance works (Before ROD)		
TOTAL SUM			

TOTAL SUM IN WORDS, OF INDIAN RUPEES
TOTAL SUM IN WORDS, OF FOREIGN CURRENCY

Note:-1.

All Sections will be part of evaluation. Employer reserves the rights not to award the any or all Items in BOQ. Additional items need to be operated with prior approval of employer.

Note:-2.

For items in BOQ, price shall be quoted considering that price will be inclusive of all related equipments, parts/ accessories if not covered in BOQ elsewhere and required for successful installation, testing & commissioning of that item for its proper uses.

Note:-3.

The rates quoted against the rate only (RO) items shall not be unbalanced. The same shall be executed with prior approval of the employer.

Bid Total- Part-III (OPTIONAL)

In accordance with the accompanying and signed form of Bid, we (the Bidder) offer to supply, install, test, commission, and remedy at any defects of the whole said works, in conformity with the said drawings, particular specifications, conditions of contracts and other contract documents of Bid of Jaipur for DIESEL GENERATOR (DG Sets) for Chhoti Chaupar and Badi Chaupar for the following sums: Prices for works Chhoti Chaupar & Badi Chaupar U/G Stations and Associate for Tunnel Section. JMRC reserve the right to operate the part III (DG works) as per their discretion.

SECTION No.	DESCRIPTION	TOTAL Brought from above Bills	
		INR	Foreign Currency
SUB HEAD-I	DG Sets		
SUB HEAD-II	INSTALLATION of DG Sets		
SUB HEAD-III	DG Dismantling, Installation & Acoustics Treatment		
SUB HEAD-IV	Optional Items:- Operation & Maintenance works Before ROD)		
TOTAL SUM			
TOTAL SUM IN WORDS, OF INDIAN RUPEES			
TOTAL SUM IN WORDS, OF FOREIGN CURRENCY			

PART-III DIESEL GENERATOR (DG SET)

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	SUB HEAD-I									
1	Silent DG sets									
1.1	Design, Manufacture & Supply of Silent DG set (Radiator cooled - cooling system designed for 50°C ambient) of following aggregate capacity / rating, comprising of Diesel Engines coupled to Alternator both mounted on common base frame suitable for 3-phase, 415 volts, 50 Hz, 1500 RPM, Standby Power rated output with other standard accessories i.e. Fuel tank (990 Litres) with necessary medium class M.S. fuel piping (25mm size) with necessary fittings from DG set to Fuel Tank, automotive Batteries with leads as per manufacturer recommendations. 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. The DG set shall comply to latest CPCB Norms									
	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) ammended 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.									
	Power cabling / Control wiring, its termination inside the DG set from alternator to the DG isolation panel if any will be on part of the DG set contractor (no seperate measurements will be made.)									
	Power Cables from the DG Isolation Panel to the DG Power Panel (in scope of E&M contractor) shall be supplied and laid by E&M contractor. Necessary interfacing for the same with E&M contractor shall be done by DG set contractor for evacuation of 100% of Output power. Nothing extra shall be payable for the same. However, control cabling from DG set and its load management cum synchronising Panel with DG Power panel shall be in the scope of DG set contractor									
(a)	1800 KVA (comprising of 2 DG sets. Minimum capacity of each DG set should be 900 kVA).	No.		1	1	2				
(b)	2700 KVA (comprising of 3 DG sets. Minimum capacity of each DG set should be 900 kVA).	No.		0						

PART-III DIESEL GENERATOR (DG SET)

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
(c)	2000 KVA (comprising of 2 DG sets of minimum 1000 kVA capacity each).	No.		0						
	SUB HEAD- I(Total to be Carried Over to Summary)									
	SUB HEAD-II INSTALLATION of DG sets									
2	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.									
(a)	1800 KVA (comprising of 2 DG sets. Minimum capacity of each DG set should be 900 kVA).	No.		1	1	2				
(b)	2700 KVA (comprising of 3 DG sets. Minimum capacity of each DG set should be 900 kVA).	No.		0		0				
(c)	2000 KVA (comprising of 2 DG sets of minimum 1000 kVA capacity each).	No.		0		0				
3	Exhaust System									
3.1	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.									
a	350mm (NB) MS ERW pipe 4.85 mm	RM		0		0				
b	250mm (NB) MS ERW pipe 4.85 mm	RM		30	30	60				
	Note:-									
a	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.									
b	Measurement for MS Exhaust piping will be taken excluding the length of Expansion Joints (SS bellows) and silencer.									
3.2	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.									
a	350mm (NB)	RM		0		0				
b	250mm (NB)	RM		30	30	60				
3.3	Supply & Fixing of miscellaneous structural support for horizontal / vertical exhaust piping including fabrication, hardwares and painting as per requirement.	KG		5000	5000	10000				

PART-III DIESEL GENERATOR (DG SET)

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
3.4	Portable Oil Filling pump- Electrical Type necessary to deliver the oil upto height of 10 mtrs.	No		1	1	2				
3.5	<u>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.</u>	<u>sqm</u>		<u>30</u>		30				
4	EARTHING									
4.1	Providing Earth pits with 600 X 600 X 6.3 mm GI plate electrode complete as per IS: 3043. (For Body Earthing).	No		2	2	4				
4.2	Providing Earth pits with 600 X 600 X 3 mm Copper plate electrode complete as per IS: 3043. (For Neutral Earthing).	No		4	4	8				
4.3	Supply, laying, testing and commissioning of Copper / GI strips for interconnecting the earthing station, panels, DG set etc. of following sizes in trench/surface/wall/ground complete with holes and fxing, jointing/termination accessories with holes and fixing, jointing/termination accessories .									
(a)	50 mm x 5 mm GI strip (For Body Earthing).	RM		100	100	200				
(b)	50 mm x 5 mm Copper strip (For Neutral Earthing).	RM		120	120	240				
	SUB HEAD- II (Total to be Carried Over to Summary)									
	SUB Head-III DG Dismantaling, Installation & Acoustics Treatment									
5	Civil works									
	Civil works assciated with the DG set dismentalling and its re- installation at the other station.									
5.1	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				
5.2	Civil foundation for 750 to1010 KVA DG set (only PCC raft of 300 mm) for the existing site condition.	Cum		1	1	2				
5.3	Provision of making cable trenches, cut outs, finshing works etc as per the works required for the DG sets Installation	Cum		1	1	2				
5.4	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.	M		2	2	4				
6	ELECTRICALS									
6.1	Power and control cables									

PART-III DIESEL GENERATOR (DG SET)

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	Supply and Laying of following size cables as per List of approved makes									
a	4C X 240 Sq mm Copper conductor outer sheath LSZH	M		5	5	10				
b	4C X 6 Sq mm LT Cu conductor outer Sheath LSZH	M		5	5	10				
c	4C X 2.5 Sq mm cu conductor control cable LSZH	M		5	5	10				
d	12C X 2.5 Sq mm copper control cables LSZH	M		5	5	10				
e	DATA Cable CAT 4	M		5	5	10				
f	24 core x 0.75 sq. mm screen Cable	M		5	5	10				
6.2	END TERMINATION									
	Providing and fixing of following End terminations									
a	4C X 240 Sq mm Copper conductor outer sheath LSZH	No		1	1	2				
b	4C X 6 Sq mm LT Cu conductor outer Sheath LSZH	No		1	1	2				
c	4C X 2.5 Sq mm cu conductor control cable LSZH	No		1	1	2				
d	12C X 2.5 Sq mm copper control cables LSZH	No		1	1	2				
e	24 core x 0.75 sq. mm screened Cable	No		1	1	2				
7	Dismantling of all existing Electrical system, including 750 kVA to 1250 kVA DG Sets , Exhaust Pipe, Day Fuel Tank, Fuel pipe, Panels, Cables, etc installed in DG Room of a Station and shfiting (including Loading, Transportation and Unloading) them to alternative location within Jaipur as suggested by JMRC.	Job				1				
8	ACOUSTIC TREATMENT FOR DG ROOM									
8.1	Providing and fixing Acoustic Treatment lining on walls and ceiling of DG room by means of Mineral rock wool slab of minimum density 64 Kgs/m3, confirming to IS 8183 and with minimum thickness of 75mm covered by fire resistant fiber tissue confirming to AWWA C – 203, specifications and with inside cover of 0.6 mm thick perforated Aluminium sheet, complete as required. The Rock wool shall be laid on a 600 X 600 mm grid, 50 mm GI channel frame work fixed to walls and ceiling.	Sq mtr		50	50	100				
9.2	Acoustically Lined Louvers as per above material specifications	Sq mtr		2	2	4				

PART-III DIESEL GENERATOR (DG SET)

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
9.3	Providing and fixing Acoustic Doors for DG room comprising of ISMC 100 frame, cladded on both side of 0.5 mm thick MS sheets with cavity fill of required thickness (minimum 75 mm thickness) of resin bonded 64 kg/m ³ density glass wool to acheive noise levels, as specified in the specifications including Nitrile ruber / Neoprene rubber gasket between MS sheet cladding and frame, heavy Duty Hardware / Locking mechanism complete as required. Note:- 1. Payment will be based on per Sq mtr size of the Door. 2. Sliding Door with Self lubricating sliding mechanism (Roller ball Bearing) in MS channels in floor to be proposed only after suitable consideration to noise criteria.	Sq mtr		4	4	8				
9.4	Supply, Installation, Testing and commissioning of Intake / Exhaust Fans complete, as required of suitable sizes <u>for ventilation</u> of Air requirements of DG Sets <u>of following sizes</u> (Calculations to prove adequacy of the rating of the selected Fans must be submitted). The system should be designed to provide suitable ventilation for efficient air circulation, to ensure that the temperature rise in the DG room with respect to the ambient is less than 5°C. There should be specially designed circuitry to ensure that the fan(s) starts when the Genset is in operation and when the Genset has been switched off the fan(s) automatically switch over to main supply and run for 5 – 15 minutes (programmable) before stopping to ensure that set is ready to start in case of another failure.									
a.	2x750 KVA	Job		0		0				
b.	2x1000 KVA	Job		1	1	2				
c.	2x1250 KVA	Job		0		0				
	Note:-									
	Drawing for the acoustic treatment of room to be submitted for approval of Engineer - in - charge before procuring the material for Acoustic treatment.									
9.5	Providing noise barrier of suitable inclination and projected length, for installation around DG set installation in the Ancillary building, fabricated out of 2 mm thick polycarbonate sheet with minimum surface density of 10 kg/Sqm. to ensure adequate transmission loss of sound to achieve noise control as per CPCB norms for public area, including saturatory of Installation, complete as per required as per specifications	Sq mtr		1	1	2				
10	Operation & Maintenance Training for the Staff complete as per the clause 14.3 of the Particular specifications.	Job				1				

PART-III DIESEL GENERATOR (DG SET)

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
	SUB HEAD- III (Total to be Carried Over to Summary)									
	SUB HEAD-IV OPTIONAL ITEM*									
11	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 JMRC).									
11.1	1800 KVA (comprising of 2 DG sets. Minimum capacity of each DG set should be 900 kVA).	Days		30	30	60				
11.2	2700 KVA (comprising of 3 DG sets. Minimum capacity of each DG set should be 900 kVA).	Days		0	0	0				
11.3	2000 KVA (comprising of 2 DG sets of minimum 1000 kVA capacity each).	Days		0	0	0				
	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 JMRC). 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 JMRC/Employer. 4. Permission for Operating the DG set and period of its operation will be specifically approved by Engineer- In- Charge.									
12	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 Deffect Liability period for different capacities of DG sets for the capacities of DG sets as specified below.									

PART-III DIESEL GENERATOR (DG SET)

S. No.	Description	Unit	Country of Origin	Qty. Chhoti Chaupar	Qty Badi Chaupar	Total Quantity	Rate in INR	Rate in Foreign Currency	Amount in INR	Amount in Foreign Currency
12.1	1800 KVA (comprising of 2 DG sets. Minimum capacity of each DG set should be 900 kVA).	No.		1	1	2				
12.21	2700 KVA (comprising of 3 DG sets. Minimum capacity of each DG set should be 900 kVA).	No.		0	0	0				
12.3	2000 KVA (comprising of 2 DG sets of minimum 1000 kVA capacity each).	No.		0	0	0				
	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 equiped"24- hour Complaint Centre" in Delhi and after receiving the Compaint the site should be attended by the maintenance staff witin one hour.									
	SUB HEAD- IV (Total to be Carried Over to Summary)									
	Grand Total SUB HEAD (I , II, III & IV)									