

ABSTRACT ELECTRICAL		
S.No	Description	Cost
1	Under Ground Electrification Work at Smart Road Phase 1	259179614.00
2	SITC of Side Lighting work at Smart Road Phase - I	29983655.00
TOTAL		289163269.00

Estimate of Under Ground Electrification Work at Smart Road Phase 1

S.No.	Description of Items	Unit	Rate	Qty	Amount
1	Supply, Installation, Testing and Commissioning of 3C x 300 Sq. mm. Al. conductor, armoured, XLPE insulated, PVC sheathed, 11KV cable in ready made underground trench / duct / pipe etc and refilling of trench with river sand as per site requirement. The cable should conform to IS: 7098 Part-2, 2011 with up to date amendment. The item includes providing of necessary clamps and hardware for cable laying.	Meter	1550.00	15600	24180000.00
2	Supply, installation, testing and commissioning of indoor termination of 11KV cable with heat shrinkable termination kit complete with lugs and other accessories for 3Cx 300 Al conductor armoured, XLPE insulated cable.	Each	9000.00	252	2268000.00
3	Supply, installation, testing and commissioning of outdoor termination of 11KV cable with heat shrinkable termination kit complete with lugs and other accessories for 3Cx 300 Al conductor armoured, XLPE insulated cable	Each	8000.00	128	1024000.00
4	Supply, installation, testing and commissioning of straight through joint of 11KV cable with heat shrinkable straight through termination kit complete with lugs and other accessories for 3Cx 300 Al conductor armoured, XLPE insulated cable.	Each	11000.00	56	616000.00
5	Supply, Installation, Testing and Commissioning of Al. conductor, armoured, XLPE insulated, PVC sheathed, 1.1KV cable in ready made underground trench / duct / pipe etc and refilling of trench with river sand as per site requirement. The cable should conform to IS: 7098 Part-2, 2011 with up to date amendment. The item includes providing of necessary clamps and hardware for cable laying. The cable size is as mentioned below:				
a	3.5Cx300 Sq.mm cable	Meter	1200.00	17500	21000000.00
b	3.5Cx150 Sq.mm cable	Meter	590.00	20000	11800000.00
c	3.5Cx 35 Sq.mm cable	Meter	210.00	8200	1722000.00
d	4 Cx 25 Sq.mm cable	Meter	180.00	17000	3060000.00
e	4 Cx 16 Sq.mm cable	Meter	135.00	34000	4590000.00
f	4 Cx 10 Sq.mm cable	Meter	113.00	20000	2260000.00
g	4 Cx 6 Sq.mm cable	Meter	96.00	26000	2496000.00
h	2 Cx 6 Sq.mm cable	Meter	64.00	21125	1352000.00
i	2 Cx 4 Sq.mm cable	Meter	52.00	14000	728000.00
6	Supply, Installation, Testing and Commissioning of termination of Al. conductor, armoured, XLPE insulated, PVC sheathed, 1.1KV cable with double compression chrome plated brass cable gland and heavy duty tubular lugs of following size:				
a	3.5Cx300 Sq.mm cable	Each	2500.00	400	1000000.00

b	3.5Cx150 Sq.mm cable	Each	1200.00	300	360000.00
c	3.5Cx 35 Sq.mm cable	Each	400.00	1000	400000.00
d	4 Cx 25 Sq.mm cable	Each	260.00	1200	312000.00
e	4 Cx 16 Sq.mm cable	Each	210.00	1500	315000.00
f	4 Cx 10 Sq.mm cable	Each	150.00	1000	150000.00
g	4 Cx 6 Sq.mm cable	Each	125.00	1500	187500.00
h	2 Cx 6 Sq.mm cable	Each	85.00	1500	127500.00
i	2 Cx 4 Sq.mm cable	Each	60.00	1400	84000.00
7	Supplying and erecting earth pit of minimum bore dia 150 mm size, approved make safe earthing electrode consisting pipe in pipe technology as per IS 3043-1987 made of corrosion free GI pipes having outer pipe dia of 50 mm having 80-200 micron galvanising, inner pipe dia of 25 mm having 20-250 micron galvanising, connection terminal dia of 12 mm with content OHMIC value surrounded by highly conductive compound with high charge dissipation suitable for effective and maintenance free earthing.				
I	with 2 mtr. Pipe in normal soil with 25 kg (one bag) back filling compound	Each	8000.00	200	1600000.00
II	with 2 mtr. Pipe of 80 mm outer dia, 40 mm inner dia and 14 mm terminal dia, in soft rock/marshy soil with 25 kg (one bag) back filling compound	Each	9500.00	400	3800000.00
8	Supplying and laying 50mm X 6mm G.I. strip at 0.5 metre below ground level / surface as strip earth electrode including jointing etc. as required.	Meter	165.00	2000	330000.00
9	Providing and fixing 6 SWG (5.6mm) G.I. wire on surface or in recessed/concealed for loop earthing as required.	Meter	17.00	2500	42500.00
10	Supply, installation, testing and commissioning of feeder pillar panels suitable for AC 440 V , 50 HZ supply, fabricated with 14 gauge galvanised steel sheet duly pre-treated and pure polyester thick powder coated 80 micron thickness using Siemens grey colour shade no. RAL-7032 / any other colour if required by client. The feeder pillar shall be double door in cubical formation, compartmentalized in form with front open able doors. The door shall be provided with concealed hinges and with brazing wherever required to avoid deformation and shall be earthed. All the door shall have heavy duty door locks, and shall be sealed with neoprene gaskets. The feeder pillar shall be IP 55, outdoor type weather , dust and vermin proof having canopy type tapered roof self-standing type as per approved GA diagram. Panels shall have lifting hooks and base channel of size 50 x 40 x 6 mm				

	The feeder pillar shall be complete with bus bars, wiring, cabling of proper ratings (not less than 1.5 times the rating of respective switchgears, control gear etc.) for inter connection between switch gear, control gear, metering , safety relays, indicators etc. as per the approved single line diagram. The feeder pillar shall have proper arrangement for termination of all incoming and out goings cables. All the bus bars shall be supported on epoxy supports and shall be insulated with colour coded heat shrinkable sleeves. Feeder pillar shall be as per the space available at site. It shall have earthing bolts at both sides inter connected with 50x5 mm Al earthing bus along the width of feeder pillar. Note:- The GA drawing for panel should be approved by consultant / engineer in charge before fabrication. The feeder pillar shall have space and proper arrangements for installation of incoming and outgoing MCCBs with R,Y,B LED type indicating lamps.				
	HRC fuse bases, MCBs etc. complete with interconnection provisions with providing wiring and bus bars with required hardware, sleeves, ferrules, supporters, locks etc. Panel shall have proper space and arrangements for termination of incomer loop in loop out cables, outgoing service cables, with proper offsets in bus bars for cable terminations. Feeder Pillar shall be comprising of following items:				
I	TYPE-A	Each	95000.00	90	8550000.00
	Rating of incomer MCCB TPN 250 A, 35KA (Adjustable thermal O/L with Ics = 100% Icu).				
	Outgoing Bakelite fuse base and holder type HRC fuses, 80KA, of 40A rating.....54 nos. (18 sets of 3nos each)				
	The feeder pillar should have anti-theft tamper proof feature to automatically send SMS alert if door opening is attempted by unauthorised person.				
II	TYPE-B	Each	70000.00	60	4200000.00
	Rating of incomer MCCB TPN 125 A, 35KA (Adjustable thermal O/L with Ics = 100% Icu)				
	Outgoing Bakelite fuse base and holder type HRC fuses, 80KA, of 40A rating.....27 nos. (9 sets of 3nos each)				
	The feeder pillar should have anti-theft tamper proof feature to automatically send SMS alert if door opening is attempted by unauthorised person				
11	Construction of foundation etc with M20 grade RCC complete with centering, shuttering and reinforcement as per design	Cu. Meter	6800.00	650	4420000.00
12	Supply and installation of MS Hot dip galvanised 14 SWG thick perforated cable trays complete with jointing accessories and hardware in underground cable tranches of following sizes:				
I	width 600 mm x height 100 mm	Meter	750.00	1500	1125000.00
II	width 450 mm x height 100 mm	Meter	600.00	1800	1080000.00
III	width 300 mm x height 75 mm	Meter	500.00	1200	600000.00
13	Providing, laying and jointing non pressure (NP2) RCC socket and spigot pipes with rubber gasket jointing including testing of joints.				
I	300 mm dia	Meter	598.00	1500	897000.00
II	225 mm dia	Meter	390.00	1000	390000.00
III	150 mm dia	Meter	339.00	900	305100.00

14	Supplying and installing double wall corrugated pipes (DWC) of HDPE (IS 14930 Part-II marked) for cable laid underground with necessary connecting sockets / couplings, tees below road / ground surface, including excavation, back filling with excavated material with ramming and making the surface good				
I	50 mm outside dia	Meter	207.00	30000	6210000.00
II	63 mm outside dia	Meter	210.00	25000	5250000.00
III	110 mm outside dia	Meter	309.00	15000	4635000.00
15	Supply of support for overhead line RS joist / H-beam of I.S. standard including welding, drilling of required hole etc. complete as required.				
	H-Beam 152x152mm , Std weight 37.1 kg per meter	Meter	1977.00	1006	1988862.00
16	Erection of steel tubular or steel rail pole or H-Beam of length exceeding 10 meters but not exceeding 13 meters in cement concrete 1:3:6 (1 cement :3 coarse sand: 6 graded stone aggregate 40mm nominal size) foundation , base padding & muffing including excavation and refilling etc. as required.(4.55 bags of cement/cmt.)	Each	2563.00	82	210166.00
17	Supplying and erection of 11kV pin insulator complete with large steel head G.I. pin, nut, washer etc. as required.	Set	375.00	120	45000.00
18	Supplying and erection of 11kV disc insulator for 11kV overhead lines with galvanised insulator fittings, ball and socket type, and complete with galvanised strain clamp, bolts, nuts washer etc. as required.	Set	1089.00	120	130680.00
19	Painting of Pole Bracket cable Protecting Pipe and its clamps in two coatings of All enamel based Primer as directed by Engineer-Charge.				
	Primer Cost over new Steel and other metallic surface with red oxide/zinc chromide paint complete with supply of material labour etc. Including preparation of Surface.	Sqm	21.00	200	4200.00
20	Primer cost with aluminium paint, brushing complete with material and labour including preparation of surface.	Sqm	28.00	200	5600.00
21	Supplying installing and testing of AB isolating switch assembly set gang operated suitable for 11/0.4 KV, DP structure with brass part contacts, operating rod with required GI pipe, handle locking arrangement on On-Off position conforming to IS complete with required material and installing on existing structure to complete the job as required as per specification.				
a	11 kV	Set	7099.00	10	70990.00
22	Supplying and erection of three piece nonlinear resistor type lighting arrester suitable for 3 wire, 11kV overhead lines with rated voltage of 9kV (rms) with a nominal discharge current rating of 5 KA and complete with galvanised clamping arrangement, G.I. bolts, nuts, washer etc. as required.	Set	4284.00	25	107100.00
23	Supplying and drawing All Aluminium Alloy conductor (AAAC) of approved make confirming to IS 398-1979 Pt. IV, including binding at existing insulator, jointing, jumpering, tearing off, connecting etc. as required including clearing of obstacles (if any)				
a	0.075 sq.inch / 48 sq.mm Alloy Aluminium Conductor	KM	59138.00	1	59138.00

24	Supplying and erection of stay set complete (Galvanized) with 19mm.dia 1.8 meter long stay rod, anchor plate of size 300mm x 300 mm x 6.4mm thimble stay clamps, bow tightener, 7/3.15 dia G.I. stay wire and strain insulator etc. in cement concrete 1:3:6 (1 Cement : 3 Coarse and : 6 graded stone aggregate 40mm nominal size) foundation including excavation and refilling etc. as required.	Each	2634.00	42	110628.00
25	Supplying of angle/channel flat iron fitting for overhead lines such as cross arms, clamps, brackets, welding and other necessary materials as per specifications.	KG	54.00	4500	243000.00
26	Supply, installation, testing and commissioning of set of two nos VCBs type, 1000A, 11KV, 20KA, SF6 insulated Ring Main unit for supplying ring feeders for 11KV with o/c, s/c and e/f protection relays, metering unit complete with motorised remote operation through SCADA	Each	900000.00	1	900000.00
27	Dismantling of existing HT/ LT overhead power system lines complete with all associated items like poles, conductors, insulators, overhead cables, wires, stay , studs, MS structure, transformers, AB sw, DO fuse, LA, LT box, street lights, switching box etc and depositing the same in MPPKVCL / IMC stores	KM	250000.00	6.2	1550000.00
28	Supply and installation of approved type precast RCC cable cover class HV / LV of size 300x180x40 mm	Each	31.00	4000	124000.00
29	Supply, installation, testing and commissioning of SF6 insulated 11KV T type Ring Main Unit having Three nos. load break isolators with Earth switch suitable for termination of 11KV cable on each isolator.	Each	300000.00	5	1500000.00
30	Supply, installation, testing and commissioning of SF6 insulated 11KV T type Ring Main Unit having one no vacuum circuit breaker 630 amp rating and Three nos. load break isolators with Earth switch suitable for termination of 11KV cable on each isolator.	Each	498000.00	20	9960000.00
31	Supply, installation, testing and commissioning of SF6 insulated 11KV T type Ring Main Unit having Two nos. vacuum circuit breaker 630 amp rating and Two nos. load break isolators with Earth switch suitable for termination of 11KV cable on each isolator.	Each	619000.00	5	3095000.00
32	MS fabrication work complete with primer and two coats of final paint in MS sheet, angle, channel, strip inclusive of supply of all material, hardware and installation at site.	KG	65.00	3200	208000.00
33	Soil excavation for laying of HT/LT cable at the depth of 0.9 to 1.2 mtrs and refilling the same after cable laying.	Meter	100.00	16010	1601000.00
34	Supply & Fixing of 11KV Danger Plates as per Specification of Discom on the existing Poles in all respect as per discom specification.	Each	41.00	400	16400.00

35	Yad fencing (5X5 Meter) with chain link mesh conform ISI 2721/1989 size (75X75)mm & 8mm gauge of chain link wire with 4mm thick GI wire on top & bottom of mash, on main bracket of Angel (65X65X5)mm & Bracing with angel (50X50X6)mm of 2.5 Meter long 3 Meter with bracket gate & murrom gravel filling all on A class civil work construction with accessories, hardwares etc. required for completeness, as per attached Specification drawing JSCL Standards and direction of DISCOM.	Rmt	2600.00	1680	4368000.00
36	Horizontal Drilling : Horizontal directional drilling along roads for laying XLPE HT/LT UG Cable for Communication Cable along with Suitable HDPE Duct at various locations as pointed out by departmental officers, includes survey of site information collection regarding underground utilities, sensing of utilities by sensing equipment, pit making, pilot drilling, pre reaming pulling HDPE duct of suitable size in single roll, pulling HT/LT UG Cable though installed HDPE duct, providing barricades and necessary signal lights, closing of pits with excavated earth including cost of HDPE pipe, consolidating pit are, including road restoration/Supervision departments, cost of all materials, labour, conveyance, hire charges etc. complete preparation of pit by excavated soil/ hard mourt & refilling compacting surface as it is position/horizontal drilling across road for cable laying propose with disturbing present installation as per instruction, guide line detail technical specifications as per direction of engineer in charge	Rmt	2000.00	700	1400000.00
37	Supply, Installation, Testing and Commissioning 11kV, 630KVA, Outdoor Package / compact Sub-Station (in compliance IEC 62271-202) shall be consisting of following	Each	3086150.00	35	108015250.00
A	HT SWITCHGEAR				
	11kV 630Amps 21KA/3 sec. Non-Extensible Ring Main Unit Compact switchgear with Copper busbar (Type CCV) consisting of Two Nos. Fixed Motorized Load Break switches and One No. Fixed Motorized Vacuum Circuit Breaker in robotically welded having IP67 in SF6 encapsulated stainless steel enclosure of thickness 2.5mm . with series trip, self powered microprocessor based numerical over current and earth fault relay protection.	1 No.			
	Relay shall be of Ashida make of Model No: ADR241S	1 No.			
	Protection CT shall be 40/1A 2.5VA 5P10.	3 Nos.			
	Fault Passage Indicator for LBS with Short Circuit and Earth Fault Indication	2 No.			
	Manometer and signal (1NO) from pressure indicator	1 No.			
	Voltage Presence Indicator (L1, L2, L3) for each Module	3 Nos.			
	Operating Handle	1 No.			
	24V DC battery & Charger 12Ah Capacity	1 No.			
	FRTU for SCADA (Make: Chemtrol/ABB)				
	Digital Inputs 32 Nos. , DI card 16 Channels- 2 Nos.	1 Set			
	Digital Outputs 13 Nos. , DO card 8 Channels- 2 Nos.	1 Set			
	Datapoints - 15 Nos. approx.	1 Set			
	Modem	1 No.			
	Pls refer the attached BOM of FRTU	1 No.			
	Space Heater in HT compartment	1 No.			
B	TRANSFORMER				

	630 KVA 11KV/433V DYn11 dry type transformer with off circuit tap links of rating +5% to -5% @2.5%. class of Insulation H, Temp Rise shall be 115 Deg cel. Losses: No Load Losses - 1750Watts (IS Tol), Load Losses - 6600 Watts, Impedance 5% (IS Tol) along with WTI scanner	1 No.			
C	LVS PANEL - 1000AMPS ALUMINUM BUSBAR (100% FOR PHASE & 50% FOR NEUTRAL, CURRENT DENSITY- 0.8AMP/SQMM)				
	INCOMER FROM TRANSFORMER				
	1000Amps 433V 50KA 4P Electrical Draw Out (EDO) Air Circuit breaker(ACB) with microprocessor based release for over current ,short circuit and earth fault protection.- PR 121 .	1 No.			
	Digital Multifunction Meter with Class 1.0 Accuracy with RS 485 port (Make: Rishabh/Secure/Elmeasure)	1 No.			
	R,Y,B,ON/OFF/TRIP Indications.	1 set			
	Outgoing				
	200Amps 433V 36KA 3P+ N Fixed manual Molded Case Circuit breaker (MCCB) with microprocessor based release for over current ,short circuit and earth fault protection.Digital Multifunction Meter with Class 1.0 Accuracy with RS 485 port (Make: Rishabh/Secure/Elmeasure)	4 No			
	125Amps 433V 36KA 3P+ N Fixed manual Molded Case Circuit breaker (MCCB) with thermal Magnetic based release for over current & short circuit fault protectionDigital Multifunction Meter with Class 1.0 Accuracy with RS 485 port (Make: Rishabh/Secure/Elmeasure).	2 No			
D	OUTDOOR ENCLOSURE				
	Outdoor type enclosure having construction of Galvanised Sheet Steel with combination of 2mm thickness for load bearing member and 1.5mm with Non Load bearing member with 4mm HRCA base frame. The Enclosure shall have IP54 degree of protection for HT & LT switchgear compartment & IP23 degree of protection for Transformer compartment. The enclosure shall be Powder Coated (Colour Light Gray & D.A.Gray). Each compartment will be provided with the door and pad locking arrangement. The Compartment illumination lamp with door operated switch shall be provided for MV & LV compartment.	1 Set			
E	INTERCONNECTION AND EARTHING				
	Interconnection Between HT switchgear & Transformer using 1Cx3x95 Sq.mm XLPE Single core Aluminium cable & Interconnection between Transformer & LT switchgear using AL. Busbars. Internal earthing connections by using 50 x 6mm GI strips including Transformer neutral.	1 Set			
Total					259179614.00

Estimate

Name of work :- SITC of Side Lighting work at Smart Road Phase - I

S.No.	Description of Items	Unit	Rate	Qty	Amount
1	CIRCUIT WIRING IN EXISTING CONDUIT / PVC CASING CAPPING Supplying and drawing single core PVC insulated cable FR with copper multi strand conductor ISI marked in existing rigid conduit in surface or concealed as per specification.				
a	1.5 Sq mm cable Make: Havells/Polycab/Finolex				
	3 X 1.5 sq mm	Meter	72.00	5490	395280.00
2	Supplying of ISI Marked and accepted standard of Miniature Circuit Breaker (MCB) of 'C' series suitable for 240/415 Volts, 50 Cycle , 10 kA Value AC supply confirming to IS : 8828 : 1996, IEC : 60898:2002 but without enclosures :-				
a	SINGLE POLE (SP)				
	0.5 Amp to 5 Amp Rating Make : Havells/Legrand/L&T	Each	243.00	610	148230.00
3	Supplying of angle/channel flat iron fitting for overhead lines such as cross arms, clamps, brackets, welding and other necessary materials as per specifications.	KG	54.00	340	18360.00
4	Supplying & installing G.I. Pipe for protection of underground cable fixed on wall/support/in trench/fixed between two rigid existing support of wall/beam for erection of ceiling Fan/down rod for stiff pendent for light luminaries /fan/protective for earthing, lightning conductor down strip/overhead service line/for submer cable or centrifugal pump for water supply with necessary iron clamp coupler, bend, te, elbow, nuts and bolts etc. complete in an approved manner as required to complete the job excluding cost of excavation/dismanteling & other finished masonry Item complete.				
	For 'B' Class G.I.pipe ISI Marked (IS-1161-68)				
	50.00mm Make : Tata/Swastik/Jindal	Meter	285.00	270	76950.00
5	Supplying and installing Double wall corrugated pipes (DWC) of HDPE (IS 14930 Part II -marked) for cable laid under ground with necessary connecting sockets/ couplings,tees of same material and at required depth upto 90cm. below road/ground surface,including excavation, back filling with excavated material with ramming and making the surface good				
	50.00mm outside dia.	Meter	207.00	11000	2277000.00
6	Providing and fixing earthing arrangement with 38.1mm dia 2.5 meter long galvanized iron pipe electrode including packing of charcoal powder and salt as per specification watering pipe 19mm dia G.I. Connection etc. complete with refilling the pit as required, but excluding the excavation of earth pit.	Each	1002.00	305	305610.00

7	Providing and erecting of 10m height hot dip galvanized conical PU painted poles. Major dimensions are as follows bottom dia 165-185mm sheet. Top dia 75mm sheet. Thickness 3mm along with HT sheet with base plate of size 275X275X16mm 4 no's of M24X750mm long J type EN 8 grade foundation anchor bolts along with template for 10 meter pole with foundation & compatible with PCD Plat 270mm thik having 500mm door opening Hing type (Reinforced & Weather proof) with bakelite sheet with 16 sqmm stud type connector. Including up-to 1.5 meter Differential Double arm galvanized decorative PU painted Differential type for 8 & 10 Meter bracket for 10 meter pole with the specification 100 angle with Differential Double arm top of arm with 3.2 mm thickness having 10mm pinch bolt 3 nos. as per directed by Engineer in charge. Make : valmont/ bajaj/Transrail	Each	34355.00	305	10478275.00
8	Designing & casting with M-20 cement concrete foundation suitable for 10 mtrs. Conical poles considering the safe soil bearing capacity at site as 10 T/sqm at 2 mtrs. Depth including excavation, foundation nut bolts in an approved manner.	Each	13500.00	305	4117500.00
9	Supply,installation,testing& Commissioning, of system which includes LED street light luminaire having an IP66 optic compartment and IP 66 control gear compartment, efficacy of the luminaire should be more than 90lm/W, a die cast extruded aluminium painted housing, roboticaaly dispenca silicon sealed removable control gear plate with lensoflex 2 technology, a toughened glass protector having impact resistance of IK08, universal electronic dimmable driver having operating voltage of 110-300V lifetime residual flux @ Tq 35o @ 50,000 hours = 70%, Ta = 50o, surge protection of 10 KV, Power Factor > 0.95, Colour Rendering Index >70 and neural white (4000-4200K), Fitting should be installed propely as per directed by Engineer-Incharge. Guarantee of the LED Street light luminaire will be Five year.Make :Keselec Schreder, Ligman,Neri				
a	150 Watt	Each	27495.00	305	8385975.00
b	60 watt	Each	12395.00	305	3780475.00
Total					29983655.00