

| Modernization, Up-Gradation & Expansion of existing Plant Facilities at Indian Medicines Pharmaceutical Corporation Limited (IMPCL) - Mohan, District: Almora (Uttarakhand) |                                     |                       |                      |
|---|-------------------------------------|-----------------------|----------------------|
| Summary of External Electrical Works  |                                     |                       |                      |
| S.Nos   | Description                         | Amount in Figure(Rs.) | Amount in Words(Rs.) |
| 1   | HT SWITCHGEAR & SAFETY EQUIPMENT    |                       |                      |
| 2   | MAIN LT PANEL & MISC. PANEL         |                       |                      |
| 3   | LT CABLE & TERMINATIONS             |                       |                      |
| 4   | EARTHING                            |                       |                      |
| 5   | DG & PANEL                          |                       |                      |
| 6   | YARD & HT METERING PANEL            |                       |                      |
| 7   | MCCB, MCB & DB'S for internal works |                       |                      |
|   | <b>GRAND TOTAL</b>                  |                       |                      |

| Modernization, Up-Gradation & Expansion of existing Plant Facilities at Indian Medicines Pharmaceutical Corporation Limited (IMPCL) - Mohan, District: Almora (Uttarakhand) |              |  |      |     |            |                        |                       |
|---|--------------|--|------|-----|------------|------------------------|-----------------------|
| BILL OF QUANTITY - EXTERNAL ELECTRICAL WORKS  |              |  |      |     |            |                        |                       |
| S. No   | DSR-2012/NSR | Name of item   | Unit | Qty | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
| 1   |              | <b>HT SWITCHGEAR &amp; SAFETY EQUIPMENTS</b>   |      |     |            |                        |                       |
| 1.1   | NSR          | <b>H.T.PANEL</b>   |      |     |            |                        |                       |
|   |              | The scope of supply shall include design, manufacture, testing and supply of the 11kV 4way, 11kV , 3Phase, 50Hz, 3 wire , earthed neutral, Indoor type floor mounted ,extensible ,having hinged arc proof cable doors ,Cable termination from the front, breaking capacity 21kA/3 Sec.   | Each | 1   |            |                        |                       |
|   |              | <b>TECHNICAL SPECIFICATIONS</b>  |      |     |            |                        |                       |
|   |              | Supply, installation, testing and commissioning of 11 KV Insulated Indoor type manual operated compact SF6 circuit breakers with load break switches and 1 no. 630 A SF6 circuit breakers (VVVV+M) with ring core CTs and Air Insulated PT module with transformer auxiliary protection and 3 Nos.O/G SF6 breakers Extendable, O/C + E/F relay for controlling the local transformer fitted with fixed type voltage indicator device and as per IEC 61958. Electronic fault passage indicators (one on each phase each SF6 circuit breaker). |      |     |            |                        |                       |
|   |              | Metal Enclosed switchgear: IEC 60298   |      |     |            |                        |                       |
|   |              | General Purpose switches: IEC 60265  |      |     |            |                        |                       |
|   |              | Disconnectors and Earthing switches: IEC 60129   |      |     |            |                        |                       |
|   |              | Circuit Breakers: IEC 60056  |      |     |            |                        |                       |
|   |              | Common clauses: IEC 60694  |      |     |            |                        |                       |
|   |              | Cable bushings: DIN 47636  |      |     |            |                        |                       |
|   |              | Temperature class: -25 qC to 40 qC   |      |     |            |                        |                       |
|   |              | Degree of protection:  |      |     |            |                        |                       |
|   |              | Front cover: IP 2X   |      |     |            |                        |                       |

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|-------|--------------|--|------|-----|------------|------------------------|-----------------------|
|       |              | Cable cover: IP 3X   |      |     |            |                        |                       |
|       |              | Busbars: 240 mm <sup>2</sup> Cu  |      |     |            |                        |                       |
|       |              | Earth bar (external): 50*6 mm <sup>2</sup> GI - Bolt dimension: M10  |      |     |            |                        |                       |
|       |              | Thickness of Stainless Steel Tank: 2.5 mm  |      |     |            |                        |                       |
|       |              | Colours:   |      |     |            |                        |                       |
|       |              | Front cover: RAL 7035  |      |     |            |                        |                       |
|       |              | Side and cable cover: RAL 7035   |      |     |            |                        |                       |
|       |              | <b>ELECTRICAL DATA – 12 kV - 28kV-1min</b>   |      |     |            |                        |                       |
|       |              | Rated current busbars: 630 A   |      |     |            |                        |                       |
|       |              | Short time withstand current (3 sec)SF6 circuit breaker: 21 kArms  |      |     |            |                        |                       |
|       |              | Rated current for transformer T-off : 630 A  |      |     |            |                        |                       |
|       |              | Impulse withstand voltage:   |      |     |            |                        |                       |
|       |              | To earth and between phases: 75 kV   |      |     |            |                        |                       |
|       |              | Insulation level:  |      |     |            |                        |                       |
|       |              | Power frequency 1 min: 28 kV   |      |     |            |                        |                       |
|       |              | <b>SF6 circuit Breaker - Incomer Panel</b>   |      |     |            |                        |                       |
|       |              | Safe Plus V is a SF6 module with SF6 circuit breaker, three position isolator/earthing switch, busbars, interlocking, earthbar and stored spring energy mechanism (A-mech.). |      |     |            |                        |                       |
|       |              | 1 SafePlus type V:SF6 circuit breaker 12kV, 630A, 21kA for 3 sec   |      |     |            |                        |                       |
|       |              | 1 Stored energy mech. for manual operation   |      |     |            |                        |                       |
|       |              | 1 Bushings for connection of external Busbar   |      |     |            |                        |                       |
|       |              | 1 Busbar cover for module right side of M-module   |      |     |            |                        |                       |
|       |              | 1 Optical indication of latch function   |      |     |            |                        |                       |
|       |              | 1 Self Powered Numerical Protection relay with Over Current & Earth Fault Protection   |      |     |            |                        |                       |
|       |              | 3 Cast Resin Ring Core CTs 120/1A for protection.  |      |     |            |                        |                       |
|       |              | 3 Cast Resin Ring Core CTs 120/1A for metering.  |      |     |            |                        |                       |
|       |              | 1 Digital Multifunction Meter.   |      |     |            |                        |                       |
|       |              | 1 Cable bushings 400 series bolted   |      |     |            |                        |                       |
|       |              | 1 Arc proof cable cover complete incl. Interlocking  |      |     |            |                        |                       |
|       |              | 1 Capacitive voltage indication fixed type VPIS 9-15 kV  |      |     |            |                        |                       |
|       |              | <b>SF6 Circuit Breaker - Outgoing Panel (1, 2 &amp; 3)</b>   |      |     |            |                        |                       |

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|       |              | Safe Plus V is a SF6 module with SF6 circuit breaker, three position isolator/earthing switch, busbars, interlocking, earthbar and stored spring energy mechanism (A-mech.). |      |     |            |                        |                       |
|       |              | 1 SafePlus type V: SF6 circuit breaker 12kV, 630A, 21kA for 3 sec  |      |     |            |                        |                       |
|       |              | 1 Stored energy mech. for manual operation   |      |     |            |                        |                       |
|       |              | 1 Bushings for connection of external Busbar   |      |     |            |                        |                       |
|       |              | 1 Busbar cover for module right side of M-module   |      |     |            |                        |                       |
|       |              | 1 Optical indication of latch function   |      |     |            |                        |                       |
|       |              | 1 Self Powered Numerical Protection relay with Over Current & Earth Fault Protection   |      |     |            |                        |                       |
|       |              | 3 Cast Resin Ring Core CTs 40/1A for protection.   |      |     |            |                        |                       |
|       |              | 3 Cast Resin Ring Core CTs 40/1A for metering.   |      |     |            |                        |                       |
|       |              | 1 Digital Multifunction Meter.   |      |     |            |                        |                       |
|       |              | 1 Master Trip Relay  |      |     |            |                        |                       |
|       |              | 1 Cable bushings 400 series bolted   |      |     |            |                        |                       |
|       |              | 1 Arc proof cable cover complete incl. Interlocking  |      |     |            |                        |                       |
|       |              | 1 Capacitive voltage indication fixed type VPIS 9-15 kV  |      |     |            |                        |                       |
|       |              | 6 Auxiliary relays for Transformer auxiliary protection  |      |     |            |                        |                       |
|       |              | 1 6-window annunciation for Trafo. auxiliary fault indication – WTI A/T, OTI A/T Etc.  |      |     |            |                        |                       |
|       |              | <b>Metering</b>  |      |     |            |                        |                       |
|       |              | SafePlus M is an air insulated metering module.  |      |     |            |                        |                       |
|       |              | 1 SafePlus type M: Air insulated metering module 12kV, 630A, 21kA for 3 sec  |      |     |            |                        |                       |
|       |              | 3 Bushings for connection of external Busbar   |      |     |            |                        |                       |
|       |              | 1 3 voltage transformers 11KV/ ¥3/110/ ¥3, 25 VA, Class 1.0 with HV fuse on primary side and MCB on secondary side.  |      |     |            |                        |                       |
|       |              | 1 Digital Voltmeter.   |      |     |            |                        |                       |
|       |              | 1 Busbar cover   |      |     |            |                        |                       |
|       |              | 1 Space heater with thermostat [230 Vac]   |      |     |            |                        |                       |
|       |              | 1 Illumination lamp  |      |     |            |                        |                       |
|       |              | 1 R Y B Phase Indication   |      |     |            |                        |                       |
|       |              | <b>Additional equipment delivered separately or mounted in respective panel.</b>   |      |     |            |                        |                       |

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|-------|--------------|--|------|-----|------------|------------------------|-----------------------|
|       |              | 1 Busbar with 6 pcs end adapters for right side of M-module  |      |     |            |                        |                       |
|       |              | 1 Cable support bars, standard for 1-way unit  |      |     |            |                        |                       |
|       |              | 1 Manometer  |      |     |            |                        |                       |
|       |              | 1 Operating handle   |      |     |            |                        |                       |
| 1.2   |              | <b>Distribution Transformer</b>  |      |     |            |                        |                       |
|       | NSR          | Supply, installation, testing and commissioning of Oil type , 1000 KVA, 11 KV/433V, 3 phase, 50 HZ, outdoor type , Distribution Transformer conforming to IS:11171 & IEC:726 & as detailed below with transformer filtering machine. The Transformer shall be rated for 11kv,3Ph, 350 MVA,UE system & conforming to Green House requirement, Energy Efficient with Low Power Losses. The Efficiency of the Transformer shall be more than 98.2% & Impedance Voltage(%Z) shall be less than 5%  | Each | 2   |            |                        |                       |
|       |              | 11/0.433 KV, 1000 KVA, 3 phase, Oil type, Copper wound, Dyn11 having on load tap changer in the range of + 5% to -15% in steps +/-1.25%, impedance of 4.50 to 5%, HT side cable box suitable upto 11 KV, 3Cx185 sq mm XLPE cable, LT side cable box suitable suitable for 5 runs of 1.1 KV Grade 3.5 C x 300 sq mm conforming to IS 2026 etc. complete as required the temperature rise shall not exceed the limit of 55 degree centigrade ( measured by resistance) for T/F winding and 45 degree centigrade measured by thermometer when tested in accordance with IS: 2026.on suitable foundation as per direction of engineer incharge. The Transformer shall conform to ECBC/GRIHA Guidelines with respect to losses etc. |      |     |            |                        |                       |
| a     |              | Oil Conservator With oil level indicator, minimum marking level and drain plug.  |      |     |            |                        |                       |
| b     |              | On load circuit type tap changer with position indicator locking arrangement.  |      |     |            |                        |                       |
| c     |              | Thermometer pocket with plug.  |      |     |            |                        |                       |
| d     |              | 100 mm dial type thermometer with metalguard having max. temperature indicator and resetting device.   |      |     |            |                        |                       |
| e     |              | Lifting lugs.  |      |     |            |                        |                       |

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|-------|--------------|---|------|-----|------------|------------------------|-----------------------|
| f     |              | Bi-directional rollers.   |      |     |            |                        |                       |
| g     |              | Rating diagram and terminal marking plate.  |      |     |            |                        |                       |
| h     |              | Explosion vent.   |      |     |            |                        |                       |
| i     |              | Additional seperately brought out on a bushing for earthing.  |      |     |            |                        |                       |
| j     |              | Earthing terminals 2 nos. for body earthing.  |      |     |            |                        |                       |
| k     |              | Valves for filtration, drainage and filling etc.  |      |     |            |                        |                       |
| l     |              | Silica gel breather.  |      |     |            |                        |                       |
| m     |              | Air release plug.   |      |     |            |                        |                       |
| n     |              | First filling of oil as per IS 335/1993.  |      |     |            |                        |                       |
| o     |              | Bucholz relay with alarm and trip contacts.   |      |     |            |                        |                       |
| p     |              | Marshling box.  |      |     |            |                        |                       |
| q     |              | Inspection cover on tank cover for access to terminal connection.   |      |     |            |                        |                       |
| r     |              | H.T.cable termination boxes & LV cable termination arrangement as per requirement.  |      |     |            |                        |                       |
| S     |              | Necessary hardwares, clamps, lugs etc.for termination on HV/LV etc.   |      |     |            |                        |                       |
|       |              | <b>TESTS:</b>   |      |     |            |                        |                       |
|       |              | All routine test as per IS 2026/1977 will be conducted on the unit  |      |     |            |                        |                       |
|       |              | Type Test certificate shall be furnished for reference.   |      |     |            |                        |                       |
|       |              | 1. Polarity test  |      |     |            |                        |                       |
|       |              | 2. Voltage ratio test   |      |     |            |                        |                       |
|       |              | 3. No load current test   |      |     |            |                        |                       |
|       |              | 4. Full load current test   |      |     |            |                        |                       |
|       |              | 5. Windings insulation resistance test  |      |     |            |                        |                       |
|       |              | 6. Winding resistance test  |      |     |            |                        |                       |
|       |              | 7. Copper loss and magnetizing current test   |      |     |            |                        |                       |
|       |              | 8. Short circuit test at normal tap.(Type Test)   |      |     |            |                        |                       |
|       |              | 9. Alarm and trip device operation check.   |      |     |            |                        |                       |
|       |              | 10.Functional Test for RTCC AVR   |      |     |            |                        |                       |
| 1.3   |              | <b>HT CABLES &amp; TERMINATIONS</b>   |      |     |            |                        |                       |
| 1.3.1 |              | Supply of the following 11 KV(UE) XLPE Insulated Armoured cable with stranded Compact Circular Aluminium Conductor,XLPE Insulated with Semi conducting Compound in combination with Copper Tape, core laid-up, inner PVC sheathed,,GI Flat Strip Armoured, outer PVC Sheathed(PVC ST-2 Type), conforming to IS:7098-part-II . |      |     |            |                        |                       |

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|-------|--------------|--|------|-----|------------|------------------------|-----------------------|
|       |              | a) 3 C x 300 sq.mm [ From DP structure to HT breaker Panel]  | Mtr  | 50  |            |                        |                       |
|       |              | b) 3C x 185 Sq.mm [ From HT breaker Panel to Transformers]   | Mtr  | 170 |            |                        |                       |
| 1.3.2 | 8.1.2        | Laying of one number PVC insulated and PVC sheathed / XLPE power cable above 120 mm <sup>2</sup> and up to 400 mm <sup>2</sup> , 3 core, 11 KV grade direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required.         | Mtr. | 170 |            |                        |                       |
| 1.3.3 |              | Supplying and making cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for the following size of HT XLPE aluminium conductor cable of 11 kV grade as required.   |      |     |            |                        |                       |
| a     | 10.5.4       | 3 Core 300 Sq. mm Outdoor ( Metering Palel)  | Each | 1   |            |                        |                       |
| b     | 10.4.4       | 3 Core 300 Sq. mm Indoor ( HT Panel)   | Each | 1   |            |                        |                       |
| c     | 10.4.3       | 3 Core 240 Sq. mm Indoor (HT Panel)  | Each | 3   |            |                        |                       |
| d     | 10.5.3       | 3 Core 240 Sq. mm Outdoor ( Transformers)  | Each | 3   |            |                        |                       |
| 1.4   | NSR          | Misc. safety equipment   |      |     |            |                        |                       |
| a     |              | Providing and fixing H.T danger notice plate of 250 mm x 200 mm, made of mild steel, at least 2 mm thick, and vitreous enamelled white on both sides, and with incscription in single red color on front side as required.( Yard Fancing, Transformers, HT/LT Panels)              | Each | 10  |            |                        |                       |
| b     |              | Supply & fixing of fire extinguisher, dry chemical type 5.00 kg. capacity (ISI) complete with initial charge and wall bracket, along with supply of all materials and labour proper completion of work.(Substation)  | Each | 6   |            |                        |                       |
| c     |              | Supply and fixing of fire bucket, round bottom, made of G.I. sheet 9-11 litres capacity duly painted as per fire brigade design, supported on hanging bracket, chain and locked, initially filled with fine river sand, water as per directions of Engineer-in-charge.(Substation) | Each | 12  |            |                        |                       |

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|-------|--------------|--|------|-----|------------|------------------------|-----------------------|
| d     |              | Supply and fixing of shock treatment chart(prescribed under I.E. Rules) duly framed with glass and supported from back with hard board or soft board with supply of all material, labour, T & P for proper completion of work.(Substation) | Each | 2   |            |                        |                       |
| e     |              | Supply and laying of 1000 mm wide x 12 mm thick chequered rubber matting to with stand 15 kV dielectric strength as per IS 5424-1969 ( HT Panel)   | Each | 1   |            |                        |                       |
| f     |              | Supply and laying of 1000 mm wide x 6 mm thick chequered rubber matting to with stand 3.3 kV dielectric strength as per IS 5424-1969 ( LT Panel & DG Panel)  | Each | 5   |            |                        |                       |
| 1.5   |              | RCC / HUME PIPES   |      |     |            |                        |                       |
|       |              | Providing, laying and fixing following dia RCC pipe NP2 class  |      |     |            |                        |                       |
|       |              | (light duty) in ground complete with RCC collars, jointing with  |      |     |            |                        |                       |
|       |              | cement mortar 1:2 (1 cement : 2 fine sand) including trenching   |      |     |            |                        |                       |
|       |              | (75 cm deep) and refilling etc as required.  |      |     |            |                        |                       |
| a     | 14.14.4      | 12"( 300 mm ) Dia  | Mtr. | 200 |            |                        |                       |
| b     | NSR          | S/F of G I Pipe 100 mm dia 'B' Class ISI for cable support & lay in ground after bore the road complete with all accessories.  | Mtr. | 50  |            |                        |                       |
|       |              | <b>Total of H T installation and safety equipments work carried over to summary of costs</b>   |      |     |            |                        |                       |
|       |              |  |      |     |            |                        |                       |
| 2     |              | <b>MAIN LT PANEL &amp; MISC. PANEL</b>   |      |     |            |                        |                       |
| 2.1   |              | <b>Main L T Panel Board</b>  |      |     |            |                        |                       |



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|-------|--------------|---|------|-----|------------|------------------------|-----------------------|
|       | NSR          | Supply, erection, testing commissioning and designing of Factory fabricated metal clad dust and vermin proof- floor mounted 1600A cap 440 V, 50 HZ,3 phase and neutral electric panel single door 1000 mm depth duly powder coated spray painted with separate chamber for instruments and switching and shall be comprise of ampere meter, volt meter, frequency meter, KWH meter, I/C & O/G switches MCB's / MCCB's, C/o switch with extentionable/rotary handle etc. The panel have 1600Amp, 415V TPN Aluminium bus bar electrolyte as per IS 8623 insulated with heat shrink sleeve and mounted nonhygroscopic supports with detachable side with hinge and locking. The switches shall be completed with lug and cable gland of suitable size of cables. The panel should be made with 2 mm CRCA sheet and rest on 75 mm ms channel. The panel shall include the following switch gears and accessories as per SLD & specification. panel manufacturers must process CPRI type test certificate. | Each | 1   |            |                        |                       |
|       |              | The Panel shall have Bottom cable Entry. Suitable Support shall be provided in Cable Alley for Cable fixing.  |      |     |            |                        |                       |
|       |              | Hinged door with Neoprene gaskets for doors & Door Interlock for feeders shall be provided.   |      |     |            |                        |                       |
|       |              | All feeders shall be provided with Inscription Plates & Suitable Danger Boards in 3 Languages(Hindi/English)  |      |     |            |                        |                       |
|       |              | <b>Incomer :-</b>   |      |     |            |                        |                       |
| a     |              | Supply, installation, commissioning and testing of Air circuit breaker (ACB) 1600A (Type SR18G), 4P, 65KA Electrical drawout type includes 6NO+6NC Aux. Contact, 240V ac shunt trip coil, Closing coil and Motor for electrical charging) with microprocessor based O/L, E/F, O/C & S/C protection with TVM metering with CT's suitable for SCADA compatible with safety shutter assembly racking handle, racking interlocking arrangement.- 03 Nos.(02 Nos I/C & 01 No B/C)  |      |     |            |                        |                       |

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|-------|--------------|--|------|-----|------------|------------------------|-----------------------|
| b     |              | Supply, installation, commissioning and testing of Air circuit breaker (ACB) 800A (Type SR18G), 4P, 65KA Electrical drawout type includes 6NO+6NC Aux. Contact, 240V ac shunt trip coil, Closing coil and Motor for electrical charging) with microprocessor based O/L, E/F, O/C & S/C protection with TVM metering with CT's suitable for SCADA compatible with safety shutter assembly racking handle, racking interlocking arrangement.- 02 Nos.(For D G) |      |     |            |                        |                       |
|       |              | The above Breakers shall be Electrically & Mechanically Interlocked as per SLD( DG & EB Power Interlock)   |      |     |            |                        |                       |
|       |              | Also door Interlocks to be provided.   |      |     |            |                        |                       |
|       |              | <b>INSTRUMENTS,INDICATIONS,AUXILIARIES ETC</b>   |      |     |            |                        |                       |
|       |              | <b>For all Incomers</b>  |      |     |            |                        |                       |
|       |              | 3 phase Micro-Processor based Digital Multi function meter /Power Analyser with LED Display to read V, A, F, kW, PF, kWh,KVAr.etc Accuracy class 1,pass word Protected, Site Programmable and with RS-485 communication port( Compatible for BMS)  |      |     |            |                        |                       |
|       |              | 1 Set of phase indicating lamps, LED type, RYB.  |      |     |            |                        |                       |
|       |              | 1 Set of ON, OFF, Trip indicating lamps, LED type.   |      |     |            |                        |                       |
|       |              | 1 Set of 2A ,10kA , C curve , control MCB  |      |     |            |                        |                       |
|       |              | 1 Set of 1600/5A(For Tr.ACB),800/5A (For DG ACB) Class 1.0, 15VA, Cast Resin CT for metering.  |      |     |            |                        |                       |
|       |              | 1 Set of 1250/5A, Class 1.0, 15VA, Cast Resin CT for connection to APFC panel.   |      |     |            |                        |                       |
|       |              | 1 Set of 1250/5 A CTs for APFC Panel ( To be mounted in Main LT Panel)   |      |     |            |                        |                       |
|       |              | 1 no. low set earth fault relay for connecting to the transformer neutral with 200/5A, class 5P10, 15VA, resin cast CT with necessary control cable.   |      |     |            |                        |                       |
|       |              | 1 Nos Micro-processor based,site programmable,Auto- Manual reset,.CBCT with EFR  |      |     |            |                        |                       |

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|-------|--------------|--|------|-----|------------|------------------------|-----------------------|
|       |              | 1 Nos.Voltage Monitors for Interlock with DG AMF operation,REF relays suitable for Neutral CT  |      |     |            |                        |                       |
|       |              | <b>OUTGOING FEEDERS</b>  |      |     |            |                        |                       |
|       |              | <b>All ACBs &amp; MCCBs shall be rated for 415V,3Ph, 4 Pole, MCCB, Fixed TYPE, SC withstad capacity of 16 KA upto 63 A ,25 KA upto 125 A,36 KA upto 400A &amp; 50/65 KA for 630, 800A rating. Following shall be included for all feeders.</b> |      |     |            |                        |                       |
|       |              | a) built in microprocessor control unit for MCCB   |      |     |            |                        |                       |
|       |              | b) ON, OFF, Trip indicating lamps, LED type.   |      |     |            |                        |                       |
|       |              | c)2Amps, 10kA , C curve , control MCB  |      |     |            |                        |                       |
|       |              | d)Appropriate Ratio CT ( as per SLD)   |      |     |            |                        |                       |
|       |              | f) Digital KWH Meter( For Working Feeders only & Dummy Space for Spare feeders) with CTs & with RS-485 communication port  |      |     |            |                        |                       |
|       |              | <b>The Rating of Feeders shall be as below.</b>  |      |     |            |                        |                       |
| a     |              | Air circuit breaker(ACB) 800A, 4P  |      |     |            |                        |                       |
|       |              | AC Plant - 01 No.  |      |     |            |                        |                       |
|       |              | Interlinking with existing LT Panel i/c busbar etc.- 01 No.  |      |     |            |                        |                       |
| b     |              | Moulded Case Circuit Breaker (MCCB), 800 A, 4P   |      |     |            |                        |                       |
|       |              | APFC Panel - 02 Nos.   |      |     |            |                        |                       |
|       |              | Spair - 02 Nos.  |      |     |            |                        |                       |
| c     |              | Moulded Case Circuit Breaker (MCCB), 400 A, 4P   |      |     |            |                        |                       |
|       |              | Air Compressor & Fire fighting Panel - 01 No.  |      |     |            |                        |                       |
|       |              | Boiler, Water Pump, DM Plant and L&F Panel - 01 No.  |      |     |            |                        |                       |
|       |              | Spair - 02 Nos.  |      |     |            |                        |                       |
| d     |              | Moulded Case Circuit Breaker (MCCB), 250 A, 4P   |      |     |            |                        |                       |
|       |              | RM - 01 No.  |      |     |            |                        |                       |
|       |              | Bhasam - 01 No.  |      |     |            |                        |                       |
|       |              | Capsul - 01 No.  |      |     |            |                        |                       |
|       |              | Tablet -1) - 01 No.  |      |     |            |                        |                       |
|       |              | Tablet -2) - 01 No.  |      |     |            |                        |                       |
|       |              | Chawayanprash - 01 No.   |      |     |            |                        |                       |
|       |              | Staff & Worker Facility - 01 No.   |      |     |            |                        |                       |
|       |              | Asva - 01 No.  |      |     |            |                        |                       |

| S. No | DSR-2012/NSR | Name of item  | Unit | Qty | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|-------|--------------|---|------|-----|------------|------------------------|-----------------------|
|       |              | Spair - 02 Nos.   |      |     |            |                        |                       |
|       |              | <b>Note :</b>   |      |     |            |                        |                       |
| a     |              | ACBs Marked A1 & A2 i.e. from Transformer to LTpanel for EB Supply and from Generator to LTpanel for DG Supply are both electrically and mechanically interlocked |      |     |            |                        |                       |
| b     |              | Panels shall undergo Routine Tests. Type Test certificate for S.C.rating & Temperature Rise shall be furnished for similar panels.                                |      |     |            |                        |                       |
|       |              | <b>AT UTILITY BLOCK</b>   |      |     |            |                        |                       |
| 2.2   |              | <b>Sub Panel -1</b>   | Each | 1   |            |                        |                       |
|       |              | 400A cap 440 V, 50 HZ,3 phase and neutral electric panel single door 400 mm depth, 400Amp, 415V TPN Aluminium bus bar.  |      |     |            |                        |                       |
|       |              | incomer :-  |      |     |            |                        |                       |
| a     |              | Moulded Case Circuit Breaker (MCCB), 400A, 4P-01 No.  |      |     |            |                        |                       |
|       |              | Outgoing :-   |      |     |            |                        |                       |
| b     |              | Moulded Case Circuit Breaker (MCCB), 163A, 4P   |      |     |            |                        |                       |
|       |              | Air Compressor Panel - 01 No.   |      |     |            |                        |                       |
|       |              | Spair - 01 No.  |      |     |            |                        |                       |
| c     |              | Moulded Case Circuit Breaker (MCCB), 163A, 4P   |      |     |            |                        |                       |
|       |              | Fire fighting Panel - 01 No.  |      |     |            |                        |                       |
| 2.3   |              | <b>Sub Panel -2</b>   | Each | 1   |            |                        |                       |
|       |              | 400A cap 440 V, 50 HZ,3 phase and neutral electric panel single door 400 mm depth, 400Amp, 415V TPN Aluminium bus bar.  |      |     |            |                        |                       |
|       |              | incomer :-  |      |     |            |                        |                       |
| a     |              | Moulded Case Circuit Breaker (MCCB), 400A, 4P-01 No.  |      |     |            |                        |                       |
|       |              | Outgoing :-   |      |     |            |                        |                       |
| b     |              | Moulded Case Circuit Breaker (MCCB), 163A, 4P   |      |     |            |                        |                       |
|       |              | Boiler Panel - 01 No.   |      |     |            |                        |                       |
|       |              | Spair - 01 No.  |      |     |            |                        |                       |
| c     |              | Moulded Case Circuit Breaker (MCB), 63A, 4P   |      |     |            |                        |                       |
|       |              | Water Pump Panel - 01 No.   |      |     |            |                        |                       |
|       |              | L&F Panel - 01 No.  |      |     |            |                        |                       |
|       |              | DM Plant Panel - 01 No.   |      |     |            |                        |                       |
| 2.4   |              | <b>I/L PANEL for Existing 400 kVA Transformer LT Main Panel</b>   |      |     |            |                        |                       |

| S. No | DSR-2012/NSR | Name of item  | Unit | Qty | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|-------|--------------|---|------|-----|------------|------------------------|-----------------------|
|       | NSR          | Supply, installation , commissioning and testing of Air circuit breaker (ACB) 800A, 4P, 50/65KA Electrical fixed type with microprosesser based O/L, E/F, O/C & S/C protection and TVM metering and CT's suitable for SCADA compatible with data receiving port (RS485) in encloser & extended Bus bar 800A capacity connected with the existing panel as required at site.- 01 Nos.  | Each | 1   |            |                        |                       |
| 2.5   |              | <b>CAPACITOR PANEL</b>  |      |     |            |                        |                       |
|       | NSR          | Supply Erection, testing, and commissioning of 350 KVAR Automatic Power Factor correction capacitor panel with MPPH /CLMD Series capacitors 350 KVAR in ratio of (1*100+3*50+4*25) and 800 A Switch MCCB as incomer Auto / Manual option type with metering selector switch, indicating light set, fuse internal wiring with suitable capacity of copper bus/ wires, front and back openable with hinges & lockable. The Switch shall be completed with cable end boxes, reserve entry boxes, cables lead lug socket compression cable gland of cable size etc. | Each | 2   |            |                        |                       |
|       |              | <b>Capacitor Panel Details- (350 KVAR)</b>  |      |     |            |                        |                       |
| a)    |              | <b>INCOMER</b>  |      |     |            |                        |                       |
| i)    |              | 1No. 800A TPN MCCB  |      |     |            |                        |                       |
| b)    |              | METERING & INDICATION   |      |     |            |                        |                       |
| i)    |              | 1 set of phase indicating lamps   |      |     |            |                        |                       |
| ii)   |              | 1 No. (0-500V) Voltmeter with VSS with 3 nos. 2A SP MCB   |      |     |            |                        |                       |
| iii)  |              | 1 No. 8 steps APFC relay  |      |     |            |                        |                       |
| c)    |              | BUS-BAR   |      |     |            |                        |                       |
| i)    |              | 1 Set of 800A TPN Aluminium Bus Bar with colour coded PVC Sleeves   |      |     |            |                        |                       |
| d)    |              | <b>OUTGOINGS</b>  |      |     |            |                        |                       |
| i)    |              | 1 No.of 250A TP MCCB (35 KA) with 265A TP contactor (AC-3 duty)   |      |     |            |                        |                       |
| ii)   |              | 3 Nos. of 125A TP MCCB (35 KA) with 140A TP contactor (AC-3 duty)   |      |     |            |                        |                       |
| iii)  |              | 4Nos. of 63A TP MCCB (35KA) with 70A TP contactor (AC-3 duty)   |      |     |            |                        |                       |

| S. No    | DSR-2012/NSR | Name of item  | Unit | Qty  | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|----------|--------------|---|------|------|------------|------------------------|-----------------------|
| iv)      |              | 1 Nos. of 20A TP MCB with 25A TP contactor (AC-3 duty)  |      |      |            |                        |                       |
| v)       |              | 9 Sets self-Illuminated Red-Green (ON-OFF) push buttons.  |      |      |            |                        |                       |
| vi)      |              | 1 Nos. 100 (2x50) KVAR capacitor Bank with 7% detuned harmonic filter & discharge resistor.   |      |      |            |                        |                       |
| vii)     |              | 3Nos. 50 (2x25) KVAR capacitor Bank with 7% detuned harmonic filter & discharge resistor.   |      |      |            |                        |                       |
| viii)    |              | 4 Nos. 25 KVAR capacitor Bank with 7% detuned harmonic filter & discharge resistor.   |      |      |            |                        |                       |
|          |              | Supply installation, testing & commissioning of Capacitor panel as described above  |      |      |            |                        |                       |
|          |              | A-M Selector Switch & on/off indication for Each Feeder   |      |      |            |                        |                       |
|          |              | <b>Digital Display - Relay :</b>  |      |      |            |                        |                       |
|          |              | The relay shall have the following parameters with LCD display for showing:   |      |      |            |                        |                       |
|          |              | Voltage - 3 phase and per phase   |      |      |            |                        |                       |
|          |              | Current - 3 phase and per phase   |      |      |            |                        |                       |
|          |              | Power Factor - 3 phase and per phase  |      |      |            |                        |                       |
|          |              | Active Power - 3 phase and per phase  |      |      |            |                        |                       |
|          |              | Reactive Power - 3 phase and per phase  |      |      |            |                        |                       |
|          |              | Capacitor current - 3phase and per phase  |      |      |            |                        |                       |
|          |              | <b>Protection to be provided as below</b>   |      |      |            |                        |                       |
|          |              | Under and over voltage  |      |      |            |                        |                       |
|          |              | Temperature rise  |      |      |            |                        |                       |
|          |              | Decreases in set power factor level-Alarm.  |      |      |            |                        |                       |
|          |              | Harmonics distortion  |      |      |            |                        |                       |
|          |              | Phase reversal  |      |      |            |                        |                       |
|          |              | Voltage imbalance and failure of any phase  |      |      |            |                        |                       |
|          |              | <b>Total of Main LT Panel &amp; Misc. Panels work carried over to summary of costs</b>  |      |      |            |                        |                       |
|          |              |   |      |      |            |                        |                       |
| <b>3</b> |              | <b>LT Cable &amp; Terminations</b>  |      |      |            |                        |                       |
| 3.1      | NSR          | Supply of following sizes of XLPE/ PVC insulated Aluminum/ Copper conductor strip/ wire Armoured, overall PVC sheathed 1.1 KV grade cables conforming to relevant IS code and technical specifications. |      |      |            |                        |                       |
| 3.1.1    |              | XLPE cable 3.5 core 400 sq mm ( DG Panel to LT Panel)   | Mtr. | 200  |            |                        |                       |
| 3.1.2    |              | XLPE cable 3.5 core 300 sq mm   | Mtr. | 2360 |            |                        |                       |

| S. No | DSR-2012/NSR | Name of item   | Unit | Qty  | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|-------|--------------|--|------|------|------------|------------------------|-----------------------|
|       |              | Transformer to LT Panel - 02 Nos. x 5 R x 50 M = 500   |      |      |            |                        |                       |
|       |              | APFC Panel - 02 Nos.x 2 R x10 M =40  |      |      |            |                        |                       |
|       |              | Inter link New Panel to Existing Panel - 2R x 10 M =20   |      |      |            |                        |                       |
|       |              | AC Plant - 3R x 350 M =1050  |      |      |            |                        |                       |
|       |              | Air Compressor - 350 M   |      |      |            |                        |                       |
|       |              | Boiler and L&F - 350 M   |      |      |            |                        |                       |
| 3.1.3 | NSR          | XLPE cable 3.5 core 185 sq mm  | Mtr. | 370  |            |                        |                       |
|       |              | Bhasam - 220 M   |      |      |            |                        |                       |
|       |              | RM - 150 M   |      |      |            |                        |                       |
| 3.1.4 | NSR          | XLPE cable 3.5 core 120 sq mm  | Mtr. | 500  |            |                        |                       |
|       |              | Asva - 30 M  |      |      |            |                        |                       |
|       |              | Capsul - 150 M   |      |      |            |                        |                       |
|       |              | Chawayanprash - 90 M   |      |      |            |                        |                       |
|       |              | Tablet -1) - 110 M   |      |      |            |                        |                       |
|       |              | Tablet -2) - 110 M   |      |      |            |                        |                       |
| 3.1.5 | NSR          | XLPE cable 3.5 core 70 sq mm   | Mtr. | 80   |            |                        |                       |
|       |              | Air compressure (Utility) - 20 M   |      |      |            |                        |                       |
|       |              | Fire Fighting (Utility) - 30 M   |      |      |            |                        |                       |
|       |              | Boiler (Utility) - 30 M  |      |      |            |                        |                       |
| 3.1.6 | NSR          | XLPE cable 4 core 25 sq mm (Worker Facility)   | Mtr. | 80   |            |                        |                       |
|       |              | Worker Facility - 60 M   |      |      |            |                        |                       |
|       |              | Water Pump (Utility) - 20 M  |      |      |            |                        |                       |
| 3.1.7 | NSR          | XLPE cable 4 core 16 sq mm   | Mtr. | 110  |            |                        |                       |
|       |              | Staff Facility - 70 M  |      |      |            |                        |                       |
|       |              | D M Plant (Utility) - 20 M   |      |      |            |                        |                       |
|       |              | L & F (Utility) - 20 M   |      |      |            |                        |                       |
| 3.1.8 | 7.1          | Laying of one number PVC insulated & PVC sheathed/ XLPE Power cable of 1.1 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc. as required. |      |      |            |                        |                       |
|       | 7.1.1        | Upto 35 sq.mm.   | Mtr. | 190  |            |                        |                       |
|       | 7.1.2        | Above 35 sq.mm. and upto 95 sq.mm.   | Mtr. | 80   |            |                        |                       |
|       | 7.1.3        | Above 95 sq.mm. and upto 185 sq.mm.  | Mtr. | 870  |            |                        |                       |
|       | 7.1.4        | Above 185 sq.mm. and upto 400 sq.mm.   | Mtr. | 2560 |            |                        |                       |
| 3.2   |              | <b>CABLE TERMINATIONS</b>  |      |      |            |                        |                       |

| S. No    | DSR-2012/NSR | Name of item  | Unit | Qty | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|----------|--------------|---|------|-----|------------|------------------------|-----------------------|
| 3.2.1    | 9.1          | Supplying and making indoor end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.  | Each |     |            |                        |                       |
|          | 9.1.23       | 3.5C X 70 sq mm   | Each | 15  |            |                        |                       |
|          | 9.1.25       | 3.5 C X 120 sq mm   | Each | 10  |            |                        |                       |
|          | 9.1.27       | 3.5 C X 185 sq mm   | Each | 10  |            |                        |                       |
|          | 9.1.30       | 3.5 C X 300 sq mm   | Each | 15  |            |                        |                       |
|          | 9.1.31       | 3.5 C X 400 sq mm   | Each | 4   |            |                        |                       |
|          | 9.1.33       | 4 C X 16 sq mm  | Each | 10  |            |                        |                       |
|          | 9.1.34       | 4 C X 28 sq mm  | Each | 5   |            |                        |                       |
| 3.2.3    | 7.10         | Supplying and fixing cable route marker with 10cm x 10cm x 5mm thick G.I.plate with inscription there on, bolted/ welded to 35mm x 35mm x 6mm angle iron, 60 cm long and fixing the same in ground as required.   | Each | 50  |            |                        |                       |
| 3.2.4    | 4.1          | Supplying and installing following size of perforated pre-painted M.S. cable trays with perforation not more than 17.5 %, in convenient section, jointed with connectors, suspended from the ceiling with MS suspenders including bolts and nuts, painting susp |      |     |            |                        |                       |
| a        | 4.1.2        | 150 mm width x 50 mm depth x 1.6 mm thickness   | Mtr. | 250 |            |                        |                       |
| b        | 4.1.4        | 300 mm width x 50 mm depth x 1.6 mm thickness   | Mtr. | 10  |            |                        |                       |
|          |              | <b>Total of Main LT Cable &amp; Terminations work carried over to summary of costs</b>  |      |     |            |                        |                       |
| <b>4</b> |              | <b>Earthing</b>   |      |     |            |                        |                       |
| 4.1      | 5.4          | Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.               | Set  | 18  |            |                        |                       |
|          |              | HT Metering Panel - 02 Nos.   |      |     |            |                        |                       |
|          |              | HT Panel - 02 Nos.  |      |     |            |                        |                       |
|          |              | Transformer Body - 02 Nos. x 02 Nos. Each = 04  |      |     |            |                        |                       |
|          |              | DG Body - 02 Nos. x 02 Nos. Each = 04   |      |     |            |                        |                       |



| S. No | DSR-2012/NSR | Name of item  | Unit | Qty | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|-------|--------------|---|------|-----|------------|------------------------|-----------------------|
|       |              | LT Panel - 02 Nos.  |      |     |            |                        |                       |
|       |              | DG Panel - 02 Nos.  |      |     |            |                        |                       |
|       |              | Yard Fencing - 02 Nos.  |      |     |            |                        |                       |
| 4.2   | 5.6          | Earthing with Copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required. | Set  | 8   |            |                        |                       |
|       |              | Transformer Neutral - 02 Nos. x 02 Nos. Each = 04   |      |     |            |                        |                       |
|       |              | DG Neutral - 02 Nos. x 02 Nos. Each = 04  |      |     |            |                        |                       |
| 4.3   | 5.14         | Providing and fixing 25 mm X 5 mm copper strip on surface or in recess for connections etc. as required.(For S.No.4.2)  | Mtr. | 100 |            |                        |                       |
| 4.4   | 5.15         | Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.(For S.No.4.1)  | Mtr. | 200 |            |                        |                       |
|       |              | <b>Total of Main Earthing work carried over to summary of costs</b>   |      |     |            |                        |                       |
| 5     |              | <b>DG &amp; PANEL</b>   |      |     |            |                        |                       |

| S. No | DSR-2012/NSR | Name of item  | Unit | Qty | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|-------|--------------|---|------|-----|------------|------------------------|-----------------------|
| 5.1   | NSR          | Design, manufacture, supply, installation, testing & commissioning of following rating of DG Sets in Accoustic Enclosure, having self excited & self regulated 415 V, 3 Phase, 4-Wire, 50 Hz, 0.8 p.f. Alternator coupled with multi-cylinder, turbo-charged/ turbo-charged after cooled as called for, Diesel Engine capable to generate the power not less than the required BHP to achieve the alternator capacity as given below, with Air-cooled radiator, Hospital grade silencers and Electronic governor suitable for Synchronised Operation & Engine control panel, & quadrature Droop Kit for Reactive power balancing, 24V batteries of suitable rating, battery-charger with battery leads and complete with all standard accessories & protection as required and as per specifications, including first filling of lube oil providing common base plate, anti vibration pads, drip trays, foundation bolts, nuts, bolts, cable termination/adopter box suitable to terminate upto required nos. of suitable size XLPE cables, as required for a complete installation , |      |     |            |                        |                       |
|       |              | including initial filling of fuel and lubricants required during trial run of DG sets on full load for 12 hours followed by 10% overload for one hour in any 12 hours duration, as per specifications & drawings complete with RCC/PCC foundation for DG set as per the structural detail for Dynamic Load submitted by the Vendor and approve by the Consultant/Engineer in-Charge. The set shall be complete with the following:  |      |     |            |                        |                       |
|       |              | Base frame and DG shall have radiator.  |      |     |            |                        |                       |
|       |              | Gerb make antivibration pads.   |      |     |            |                        |                       |
|       |              | Hot air canopy from DG to outside in open.  |      |     |            |                        |                       |
|       |              | Day tank of 990 Litre for fuel with level markings inside canopy  |      |     |            |                        |                       |
|       |              | All lockable doors having brass handles.  |      |     |            |                        |                       |
|       |              | Front shall have perspex sheet to indicate fuel guage & ECP Panel along with one emergency push button out side canopy.   |      |     |            |                        |                       |

| S. No | DSR-2012/NSR | Name of item   | Unit | Qty | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|-------|--------------|--|------|-----|------------|------------------------|-----------------------|
|       |              | Fuel piping from internal tank shall be brought O/side canopy & connected for gravity feed/manual feed from external drum/tank.  |      |     |            |                        |                       |
|       |              | Lub oil drain arrangement.   |      |     |            |                        |                       |
|       |              | Canopy to have required size blower for cooling as well as air combustion. (Calculation for blower shall be submitted along with drawing)  |      |     |            |                        |                       |
|       |              | Canopy shall be reducing the noise to 75 db at a distance of 1meter as per specifications.   |      |     |            |                        |                       |
|       |              | Canopy temperature shall not rise beyond 7 <sup>0</sup> C above ambient and necessary temperature gauges will be installed.  |      |     |            |                        |                       |
|       |              | Provision in the canopy for taking out silencer, control cables & power cables.  |      |     |            |                        |                       |
|       |              | Suitable self priming pump with engine (if inbuilt by the manufacturer).   |      |     |            |                        |                       |
| a     |              | 500 KVA D.G.set with PCC 3.3 (equvi. Controller for makes other than Cummins) (With Acoustic Enclosure)  | Set  | 2   |            |                        |                       |
| 5.2   | NSR          | Exhaust Piping   |      |     |            |                        |                       |
|       |              | Supply, installation, testing & commissioning of Class 'C' M.S. pipe including bends, flanges, supports etc. as required complete with 75 mm dia fibre glass wool insulation with 26 swg aluminium sheet cladding.   |      |     |            |                        |                       |
| a     |              | 125 mm dia pipe  | Mtrs | 30  |            |                        |                       |
| b     |              | 200 mm dia pipe  | Mtrs | 30  |            |                        |                       |
| 5.3   | NSR          | Fuel Day Oil Tank  |      |     |            |                        |                       |
|       |              | Supply, fabrication, installation testing & commissioning of M.S. day oil tanks of following capacity fabricated out of min. 3mm thick sheet installed on steel frame with all associated accessories, filters, breathers and fittings including levelindicator, complete as required, including level controller for automatic operation of pumps. The tank shall be suitably treated with anti corrosive treatment on inside & outside surface complete with PCC foundation 75mm thick (1:3:6) |      |     |            |                        |                       |
| a     |              | 990 Litre  | Sets | 2   |            |                        |                       |
| 5.4   | NSR          | Fuel Oil Piping  |      |     |            |                        |                       |

| S. No | DSR-2012/NSR | Name of item   | Unit | Qty   | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|-------|--------------|--|------|-------|------------|------------------------|-----------------------|
|       |              | Supply, installation, testing and commissioning of following 'C-class' M.S. piping conforming to IS:1239 for fuel piping complete with all necessary fittings and valves between day oil storage tanks & DG sets/ priming motor including jointing of pipes, painting of pipes with two coats of red oxide & two coats of black enamel paint.  |      |       |            |                        |                       |
| a     |              | 25 mm dia Pipe   | Mtrs | 60    |            |                        |                       |
| b     |              | 20 mm dia Pipe   | Mtrs | 40    |            |                        |                       |
| c     |              | 25 mm dia Ball valves  | Nos. | 6     |            |                        |                       |
| d     |              | 20 mm dia Ball valves  | Nos. | 4     |            |                        |                       |
| e     |              | Y-strainer suitable for 25mm dia. pipe.  | Nos. | 2     |            |                        |                       |
| f     |              | Y-strainer suitable for 20mm dia. pipe.  | Nos. | 2     |            |                        |                       |
| 5.5   | NSR          | Design, assemble, erection of 6 Meter high Lattice structure fabricated from ISMB, ISMC & ISA section as required complete with providing of Iron & steel and all hardware as required for fixing including two coats of red oxide primer & epoxy painted with approved colour as required. (excluding foundation work but design & drg. of the foundation has to be provided by the vendor) | Kg.  | 90.00 |            |                        |                       |
| 5.6   | NS           | <b>DG Synchronization cum AMF Panel</b>  |      |       |            |                        |                       |
|       |              | <b>The contractor shall consider the following details in their item rates, wherever required:</b>   |      |       |            |                        |                       |
|       |              | Supporting rigid steel framework.  |      |       |            |                        |                       |
|       |              | Cubicle types 2mm thick CRCA   |      |       |            |                        |                       |
|       |              | Complete with inter connections and distribution busbars.  |      |       |            |                        |                       |
|       |              | Proper bonding to earth.   |      |       |            |                        |                       |
|       |              | Embossed PVC plates on boards, showing circuit diagrams.   |      |       |            |                        |                       |
|       |              | Padlocking of panel doors.   |      |       |            |                        |                       |
|       |              | Padlocking of MCCB's handle in off position.   |      |       |            |                        |                       |
|       |              | Providing cable supports within cable Alley.   |      |       |            |                        |                       |
|       |              | ACBs for all incomers shall have LED indication for fault type, Microprocessor failure and LCD display for curves & parameters.  |      |       |            |                        |                       |
|       |              | TPN ACB mean 3 pole & neutral  |      |       |            |                        |                       |
|       |              | TPN MCCB mean 3 pole & neutral   |      |       |            |                        |                       |

| S. No | DSR-2012/NSR | Name of item  | Unit | Qty | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|-------|--------------|---|------|-----|------------|------------------------|-----------------------|
|       |              | ACB's shall have minimum 35 MVA breaking capacity.  |      |     |            |                        |                       |
|       |              | MCB's shall have 10 KA breaking capacity.   |      |     |            |                        |                       |
|       |              | All motor feeders' MCCB / MCB shall be suitable for motor duty application.   |      |     |            |                        |                       |
|       |              | All DOL & Star-Delta Starters shall be provided with SPPR (single phase preventor relay) and 2 nos. of Aux.Contacts for Remote operation/monitor.   |      |     |            |                        |                       |
|       |              | All MCCB's shall be provided with Extended Rotatry operating handle.  |      |     |            |                        |                       |
|       |              | The Panel fabricator shall provide Al./ Copper Bus-bars link from Breakers wherever more than two nos. of cables are terminated in the breakers.  |      |     |            |                        |                       |
|       |              | All breakers in panels shall have a fault level as indicated in BoQ.  |      |     |            |                        |                       |
|       |              | All MCBs in Panel shall be suitable for motor duty application.   |      |     |            |                        |                       |
|       |              | Design, Fabrication, Supply, Erection,Testing and commisioning of Powder coated Main Distribution Panel fabricated out of 14 guage CRCA sheet steel in cubical, compartmentalised, free standing floor /wall mounted, dust and vermin proof, with reinforcement of suitable size angle iron, channel, T - iron or flats as required. Cable gland plates shall be provided on top as well as bottom of the panels. Panels shall be treated with all anti-corrosive process before painting as per specification. Panels shall be suitable for 415V, 3-Phase, Four wire, 50 Hz supply complete with earth bus and lifting hooks as required in case of large panels.Approval shall be taken for each panel before fabrication. (All hardwares like nuts and bolts used shall be Galvanized and Zinc passivated) |      |     |            |                        |                       |
|       |              | Description -   |      |     |            |                        |                       |
|       |              | Synchronising Module Easygen3200 with Woodward -2 Nos   |      |     |            |                        |                       |
|       |              | Following features:   |      |     |            |                        |                       |
|       |              | AMF   |      |     |            |                        |                       |
|       |              | Automatic Synchronising   |      |     |            |                        |                       |
|       |              | Automatic Load Sharing  |      |     |            |                        |                       |

| S. No | DSR-2012/NSR | Name of item                                       | Unit | Qty | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|-------|--------------|--|------|-----|------------|------------------------|-----------------------|
|       |              | Over/Under Voltage Protection                      |      |     |            |                        |                       |
|       |              | Over/Under Frequency Protection                    |      |     |            |                        |                       |
|       |              | Over Load Protection                               |      |     |            |                        |                       |
|       |              | Over Current Protection Instantaneous              |      |     |            |                        |                       |
|       |              | Over Current Protection Time                       |      |     |            |                        |                       |
|       |              | Reverse/Reduced Power Protection                   |      |     |            |                        |                       |
|       |              | Unbalance Load Protection                          |      |     |            |                        |                       |
|       |              | Ground Fault Protection                            |      |     |            |                        |                       |
|       |              | Gen. Phase Rotation Protection                     |      |     |            |                        |                       |
|       |              | Master Trip Relay Areva - 2 Nos.                   |      |     |            |                        |                       |
|       |              | Trip Ckt Supervision Relay Areva- 2 Nos.           |      |     |            |                        |                       |
|       |              | Generator Protection Relay MFR 13 Woodward- 2 Nos. |      |     |            |                        |                       |
|       |              | Differential Relay XD1G Woodward- 2 Nos.           |      |     |            |                        |                       |
|       |              | 12 Window Alarm Annunciator Minilec/JVS- 2 Nos.    |      |     |            |                        |                       |
|       |              | Temperature Scanner 8 Ch. Masibus/JVS- 2 Nos.      |      |     |            |                        |                       |
|       |              | MIMIC Diagram Reputed- 1 Nos.                      |      |     |            |                        |                       |
|       |              | SMPS 14A MW- 2 Nos.                                |      |     |            |                        |                       |
|       |              | Orring Diode Reputed- 1 Nos.                       |      |     |            |                        |                       |
|       |              | MCB DP 25A MG- 1 Nos.                              |      |     |            |                        |                       |
|       |              | MCB DP 20A MG- 2 Nos.                              |      |     |            |                        |                       |
|       |              | MCB DP 10A MG- 4 Nos.                              |      |     |            |                        |                       |
|       |              | MCB DP 6A MG- 8 Nos.                               |      |     |            |                        |                       |
|       |              | MCB SP 6A MG- 14 Nos.                              |      |     |            |                        |                       |
|       |              | CT Shorting Links Phoenix- 36 Nos.                 |      |     |            |                        |                       |
|       |              | Push Button MG- 6 Nos.                             |      |     |            |                        |                       |
|       |              | Indicating Light R & Y MG- 4 Nos.                  |      |     |            |                        |                       |
|       |              | Indicating Light Blue MG- 2 Nos.                   |      |     |            |                        |                       |
|       |              | Em Stop MG- 2 Nos.                                 |      |     |            |                        |                       |
|       |              | Control Relay Omron/weidmullar- 40 Nos.            |      |     |            |                        |                       |
|       |              | Control Contactor MG - 6 Nos.                      |      |     |            |                        |                       |
|       |              | Multi Function Meter Konzerv/Enersol- 2 Nos.       |      |     |            |                        |                       |
|       |              | Digital Voltmeter Konzerv/Enersol- 2 Nos.          |      |     |            |                        |                       |
|       |              | Digital Ammeter Konzerv/Enersol- 2 Nos.            |      |     |            |                        |                       |
|       |              | Digital Freq. Meter Konzerv/Enersol- 2 Nos.        |      |     |            |                        |                       |
|       |              | Battery Charger 20A MMC- 2 Nos.                    |      |     |            |                        |                       |
|       |              | DOL Starter 3 HP L&T- 2 Nos.                       |      |     |            |                        |                       |
|       |              | TNC Switch Salzer- 2 Nos.                          |      |     |            |                        |                       |
|       |              | Fuse terminal Block Phoenix- 40 Nos.               |      |     |            |                        |                       |
|       |              | Terminal Block Phoenix- 200 Nos.                   |      |     |            |                        |                       |

| S. No          | DSR-2012/NSR | Name of item   | Unit | Qty | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|----------------|--------------|--|------|-----|------------|------------------------|-----------------------|
|                |              | Wire 1.5mm Finolex- 8 Nos.   |      |     |            |                        |                       |
|                |              | Wire 2.5mm Finolex- 80 Nos.  |      |     |            |                        |                       |
|                |              | Shielded Cable Lapp- 80 Nos.   |      |     |            |                        |                       |
|                |              | DIN Rail Reputed - 12 Nos.   |      |     |            |                        |                       |
|                |              | PVC Channel Reputed- 15 Nos.   |      |     |            |                        |                       |
|                |              | Sleeves, Ferrule Thimble LS- 1 Nos.  |      |     |            |                        |                       |
|                |              | Fan with Filter Reputed- 2 Nos.  |      |     |            |                        |                       |
|                |              | Misc. Items- 1 Nos.  |      |     |            |                        |                       |
|                |              | Switch Socket Reputed- 1 Nos.  |      |     |            |                        |                       |
|                |              | Panel Light Reputed- 1 Nos.  |      |     |            |                        |                       |
|                |              | MS Enclosure- 1 Nos.   |      |     |            |                        |                       |
|                |              | Panel Wiring- 1 Nos.   |      |     |            |                        |                       |
|                |              | Supply, Receiving, Installation, testing & Commissioning for Microprocessor based Synchronisation cum AMF Panel as described above   | set  | 1   |            |                        |                       |
|                |              | <b>Total of DG synchronization cum AMF Panel work carried over to summary of costs</b>   |      |     |            |                        |                       |
| <b>6</b>       |              | <b>HT METERING PANEL</b>   |      |     |            |                        |                       |
| 6.1            |              | Supply and erection of Outdoor HT metering panel in a suitable weather proof enclosure with all accessories as per CEIG rules and regulations conforming to Electricity Board Norms, complete suitable for transformers. The Panel shall be Pedestal mounted in H.T.Yard with HT Cable connections as specified. Panel consisting of -   | Set  | 1   |            |                        |                       |
| a              |              | Current Transformers, Resin Cast, 3.75VA, Class : 0.5, 125/5 Amps or Suitable Ratio.1 No.  |      |     |            |                        |                       |
| b              |              | Draw out type 3 limb 11 KV/110V, 100VA, class 0.5, epoxy cast resin Potential transformer with necessary H.T. & LT fuses.  |      |     |            |                        |                       |
| c              |              | Trivector Meter as approved by UPEB  |      |     |            |                        |                       |
|                |              | <b>Total of HT Metering panel carried over to summary of costs</b>   |      |     |            |                        |                       |
| <b>Note :-</b> |              |  |      |     |            |                        |                       |
|                | <b>a</b>     | <b>Unless otherwise specified, switch boards/ panels etc. will be fabricated by a fabricating workshop preferably having a CPRI Certificate for short circuit withstand capability for manufacture/ fabrication for the rating of Switchboards specified. The workshop also should have reasonable quality control, and testing facilities, besides, having a proper 7-tank process for treatment and painting of metal parts.</b> |      |     |            |                        |                       |

| S. No | DSR-2012/NSR | Name of item   | Unit | Qty | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|-------|--------------|--|------|-----|------------|------------------------|-----------------------|
|       | b            | <b>The Contractor shall take measurement at site before Procuring /fabricating all type of cables/ Bus Ducts etc &amp; shall include all the Items as required for completion.Measurement shall be as per unit rate &amp; actual quantity of item installed at site.</b> |      |     |            |                        |                       |
| 7     |              |  |      |     |            |                        |                       |
| 7.1   |              | Providing and fixing following rating and breaking capacity MCCB in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required   |      |     |            |                        |                       |
| a     | 2.2.6        | MCCB 250A, 4 P, 25 KA  | Each | 2   |            |                        |                       |
|       |              | Tablet - 1 No  |      |     |            |                        |                       |
|       |              | RM - 1 No  |      |     |            |                        |                       |
| 7.2   |              | Supplying and fixing 5 amps to 32 amps rating, 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.                          |      |     |            |                        |                       |
| 1.2   | 2.10.4       | MCB 30A,TP 10 KA 415V  | Each | 170 |            |                        |                       |
|       |              | Asava - 37 Nos   |      |     |            |                        |                       |
|       |              | Bhasm - 38 Nos   |      |     |            |                        |                       |
|       |              | Tablet - 34 Nos  |      |     |            |                        |                       |
|       |              | Capsul - 19 Nos  |      |     |            |                        |                       |
|       |              | Chaywanprash - 21 Nos  |      |     |            |                        |                       |
|       |              | RM - 21 Nos  |      |     |            |                        |                       |
| 7.3   |              | Supplying and fixing 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.  |      |     |            |                        |                       |
| a     | NSR          | MCB 40A,TP 10 KA   | Each | 3   |            |                        |                       |
|       |              | Asava - 3 Nos  |      |     |            |                        |                       |
| b     | NSR          | MCB 63A,TP 10 KA   | Each | 10  |            |                        |                       |
|       |              | Capsul - 3 Nos   |      |     |            |                        |                       |
|       |              | Chaywanprash - 3 Nos   |      |     |            |                        |                       |
|       |              | Asava - 4 Nos  |      |     |            |                        |                       |



| S. No | DSR-2012/NSR | Name of item  | Unit | Qty | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|-------|--------------|---|------|-----|------------|------------------------|-----------------------|
| 7.4   | NSR          | Supplying, installation, testing and commissioning of surface/ recess mounting, Double Door, vertical type, 415 volts, prewired, TPN MCB distribution board of sheet steel, dust protected, duly phosphatized and powder painted, inclusive of 200 amps tinned copper busbar, common neutral link, earth bar, din bar for mounting MCB's, detachable gland / knock out plate, and with built in loose wire box, and superior make terminal connectors for all incoming and outgoing circuits, duly prewired with adequate size of FR PVC insulated copper conductor upto the terminal connector/ neutral link and ready for installation of following ways (but with out MCB's and incommer) as required. (Note: prewired vertical type MCCB TPDB is normally used where 3 phase outlets are required.) |      |     |            |                        |                       |
| a     |              | 8 way TPN MCB distribution board  | Each | 1   |            |                        |                       |
|       |              | Capsul - 1 Nos  |      |     |            |                        |                       |
| b     |              | 12 way TPN MCB distribution board   | Each | 3   |            |                        |                       |
|       |              | Chaywanprash - 1 No   |      |     |            |                        |                       |
|       |              | Asava - 1 No  |      |     |            |                        |                       |
|       |              | Bhasm - 1 No  |      |     |            |                        |                       |

| S. No | DSR-2012/NSR | Name of item   | Unit       | Qty | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|-------|--------------|--|------------|-----|------------|------------------------|-----------------------|
| 7.5   | NSR          | Supply, installation, testing' commissioning and designing of Factory fabricated metal clad dust and vermin proof- floor mounted 440 V, 50 HZ,with 50KA fault level for 1 second 3 phase and neutral electric panel duly powder coated spray painted with separate chamber for instruments and switching and shall be comprise of ampere meter, volt meter, frequency meter, KWH meter, I/C & O/G switches MCB's / MCCB's, C/o switch with extentionable/rotary handle etc. The panel have 500A, 415V TPN copper bus bar electrolyte as per IS 8623 insulated with heat shrink sleeve and mounted nonhygroscopic supports with detachable side with hinge and locking. The switches shall be completed with lug and cable gland of suitable size of cables. The panel should be made with 2 mm CRCA sheet.The palel should be rest on MS chanel 75x50x5 mm size. |            |     |            |                        |                       |
| 7.5.1 |              | <b>Tablet - 1 No</b>   | <b>Set</b> | 1   |            |                        |                       |
|       |              | Incomer :-   |            |     |            |                        |                       |
| a     |              | Moulded Case Circuit Breaker (MCCB), 250A, 4P- 01 No.  |            |     |            |                        |                       |
|       |              | Outgoing :-  |            |     |            |                        |                       |
| b     |              | Moulded Case Circuit Breaker (MCCB), 63A, 4P- 05 Nos.  |            |     |            |                        |                       |
|       |              | PDB 1 - 01 No.   |            |     |            |                        |                       |
|       |              | PDB 2 - 01 No.   |            |     |            |                        |                       |
|       |              | PDB 4 - 01 No.   |            |     |            |                        |                       |
|       |              | Spair - 02 No.   |            |     |            |                        |                       |
| c     |              | Mineture Circuit Breaker (MCB), 40A, 4P  |            |     |            |                        |                       |
|       |              | DB SF - 01 No.   |            |     |            |                        |                       |
| d     |              | Mineture Circuit Breaker (MCB), 63A, 4P  |            |     |            |                        |                       |
|       |              | LDB GF - 01 No.  |            |     |            |                        |                       |
| 7.5.2 |              | <b>Tablet - 2 No</b>   | <b>Set</b> | 1   |            |                        |                       |
|       |              | Incomer :-   |            |     |            |                        |                       |
| a     |              | Moulded Case Circuit Breaker (MCCB), 250A, 4P- 01 No.  |            |     |            |                        |                       |
|       |              | Outgoing :-  |            |     |            |                        |                       |
| b     |              | Moulded Case Circuit Breaker (MCCB), 63A, 4P- 04 Nos.  |            |     |            |                        |                       |

| S. No | DSR-2012/NSR | Name of item  | Unit | Qty | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|-------|--------------|---|------|-----|------------|------------------------|-----------------------|
|       |              | PDB 3 - 01 No.  |      |     |            |                        |                       |
|       |              | Blister - 01 No.  |      |     |            |                        |                       |
|       |              | Granulation 1 (15 HP) - 01 No.                          |      |     |            |                        |                       |
|       |              | Granulation 2 (20 HP) - 01 No.                          |      |     |            |                        |                       |
| c     |              | Moulded Case Circuit Breaker (MCCB), 125A, 4P-03 Nos.   |      |     |            |                        |                       |
|       |              | Granulation 1 (50 HP) - 01 No.                          |      |     |            |                        |                       |
|       |              | Granulation 2 (60 HP) - 01 No.                          |      |     |            |                        |                       |
|       |              | Spair - 01 No.  |      |     |            |                        |                       |
| 7.5.3 |              | <b>Raw material</b>                                     | Set  | 1   |            |                        |                       |
|       |              | Incomer :-  |      |     |            |                        |                       |
| a     |              | Moulded Case Circuit Breaker (MCCB), 250A, 4P-01 No.    |      |     |            |                        |                       |
|       |              | Outgoing :-   |      |     |            |                        |                       |
| b     |              | Moulded Case Circuit Breaker (MCCB), 63A, 4P- 15 Nos.   |      |     |            |                        |                       |
|       |              |   |      |     |            |                        |                       |
| 7.5.4 |              | <b>Unani</b>  | Set  | 1   |            |                        |                       |
|       |              | Incomer :-  |      |     |            |                        |                       |
| a     |              | Moulded Case Circuit Breaker (MCCB), 100A, 4P-02 No.    |      |     |            |                        |                       |
|       |              | Outgoing :-   |      |     |            |                        |                       |
| b     |              | Moulded Case Circuit Breaker (MCCB), 32 A, 4P- 20 Nos.  |      |     |            |                        |                       |
|       |              |   |      |     |            |                        |                       |
| 7.6   | NSR          | On Line UPS i/c 30 min. battery backup of approved make |      |     |            |                        |                       |
|       |              | 1 kVA   | Set  | 1   |            |                        |                       |
|       |              | Staff Facility -01 No                                   |      |     |            |                        |                       |
|       |              | 2 kVA   | Set  | 3   |            |                        |                       |
|       |              | Bhasm - 01 No   |      |     |            |                        |                       |
|       |              | Utility - 01 No   |      |     |            |                        |                       |
|       |              | Worker Facility - 01 No                                 |      |     |            |                        |                       |
|       |              | 3 kVA   | Set  | 2   |            |                        |                       |
|       |              | Capsul - 01 No  |      |     |            |                        |                       |
|       |              | Chaywanprash - 01 No                                    |      |     |            |                        |                       |
|       |              | 5 kVA   | Set  | 3   |            |                        |                       |
|       |              | Asawa - 01 No   |      |     |            |                        |                       |
|       |              | Tablet - 01 No  |      |     |            |                        |                       |

| S. No | DSR-2012/NSR | Name of item   | Unit | Qty | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|-------|--------------|--|------|-----|------------|------------------------|-----------------------|
|       |              | RM - 01 No   |      |     |            |                        |                       |
| 7.7   | 2.19         | Supplying and fixing 20 amps, 415 volts, TPN industrial type, socket outlet, with 4 pole and earth, metal enclosed plug top along with 20 amps "C" curve, TPMCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required. | Each | 20  |            |                        |                       |
| 7.8   | 2.20         | Supplying and fixing 30 amps, 415 volts, TPN industrial type, socket outlet, with 4 pole and earth, metal enclosed plug top along with 30 amps "C" curve, TPMCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required. | Each | 15  |            |                        |                       |
| 7.9   | NSR          | <b>Light Fixtures</b>  |      |     |            |                        |                       |
|       |              | Supply of following fans & Light fittings with <b>Electronic Ballast (THD&lt;10%, HF-P)</b> , starter, control gears, lamps holder, transformer etc. as called for and flexible wires as required for fixing <b>including providing of Lamps</b> as required.  |      |     |            |                        |                       |
| a     |              | 2 x 36W mirror optic recessed luminaire with clear acrylic sheet cover, steel housing CRCA sheet finished with powder coated ,electronic ballast with 36W CFL 36W lamp 2'x2' size complete.cat no. CIF09136 Jabla make or equivalent.  | No.  | 481 |            |                        |                       |
| b     |              | 2 x 36W mirror optic recessed luminaire with clear toughened glass cover, steel housing CRCA sheet finished with powder coated ,electronic ballast with 36W CFL lamp 1'x2' size complete.cat no. CIF11236 Jabla make or equivalent.  | No.  | 250 |            |                        |                       |
| c     |              | Surface mounted 2 x 11 Watt CFL luminaire including providing of 2 nos. 18W CFL complete.( Philips Cat. No. FCS 518/218 or equivalent)   | No.  | 17  |            |                        |                       |

| S. No  | DSR-2012/NSR | Name of item  | Unit | Qty | Rate (Rs.) | Amount in figure (Rs.) | Amount in Words (Rs.) |
|--|--------------|---|------|-----|------------|------------------------|-----------------------|
| d  |              | Angle/ Batten holder with 1x18 W CFL Lamp of approved make.   | No.  | 2   |            |                        |                       |
| e  |              | Flood Light Luminaire with 70W MHN-TD lamp complete with mounting bracket. (Philips Cat. No. RVP339 1xCDMTD70W or equivalent) | No.  | 20  |            |                        |                       |
| f  |              | 1200mm sweep 3 blade Ceiling fan complete with assembling of blades, down rod, shackle insulator, canopy of approved make.    | No.  | 2   |            |                        |                       |
| g  |              | Exhaust fan light duty 250 mm sweep in P.V.C. body enclosed shutter with connection of approved make.                         | No.  | 6   |            |                        |                       |
| h  |              | Exhaust fan 1HP 1 Phase heavy duty with heavy gauge sheet M.S. shutter complete of approved make.                             | No.  | 14  |            |                        |                       |
| <b>Grand Total</b>   |              |   |      |     |            |                        |                       |
| <p>Note: An Electrical Tool Kit of approved make shall be provided by the contractor at the time of handing over of the work . This tool kit shall comprise standard tools required for Electrical works e.g. Earth tester, Multimeter,tapes, screw drivers etc. The cost of this kit shall not be paid extra.Its cost shall be inclusive in the items of BOQ.</p> |              |   |      |     |            |                        |                       |