

**MADHYA PRADESH POWER TRANSMISSION CO. LTD.
SHAKTI BHAWAN RAMPUR: JABALPUR**



VOLUME-VI

**Bid Identification Number: JICA-II/MPPTCL/TR-206
(Package No-6)**

**“ADDITIONAL SCHEDULES, ANNEXURES AND BID
FORMATS”**

**O/o CHIEF ENGINEER (PROCUREMENT)
MPPTCL, JABALPUR.**

Volume-VI

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Volume-VI
SCHEDULE-8

**QUANTITY OF EQUIPMENTS AND MATERIALS TO BE SUPPLIED
FOR SUB-STATIONS, AUGMENTATION AND FEEDER BAYS.**

| s.no | Particulars | Unit | Qty |
|-------------|-------------------------------------------------------------------------------------------------------------------------------|-------------|------------|
| 1 | 2 | 3 | 4 |
| A | 400 KV EQUIPMENTS | | |
| 1 | 400KV SF6 Gas Circuit Breaker With PIR | Nos. | 2 |
| 2 | 400KV SF6 Gas Circuit Breaker Without PIR | Nos. | 3 |
| 3 | 400KV CT (multi core) 2000-1000-500/1-1-1-1-1 Amp. | Nos. | 15 |
| 4 | 400KV Pantograph Isolators (set of three) with ES complete with Structure and insulators | Set | 13 |
| 5 | 400KV Horizontal Centre Break single phase Isolator (set of Three) with ES complete with structure and solid core insulators' | Nos. | 0 |
| 6 | 400KV Horizontal Centre Break three phase Isolator without ES complete with structure and solid core insulators | Nos. | 4 |
| 7 | 400KV Horizontal Centre Break three phase Isolator with ES complete with structure and solid core insulator | Nos. | 2 |
| 8 | 400KV Solid Core Insulators for Substation work | Nos. | 130 |
| 9 | 400KV Operating Rod Insulator for Pantograph Isolators | Nos. | 39 |
| 10 | 400KV Capacitive Voltage Transformer | Nos. | 6 |
| 11 | 400KV Wave Trap pedestal mounting with support insulator and structure | Nos. | 4 |
| 12 | 400KV Las | Nos. | 12 |
| 13 | C&R Panel For Transformer | Nos. | 1 |
| 14 | C&R Panel for Feeders | Nos. | 2 |
| 15 | C&R Panel for Bus Coupler | Nos. | 0 |
| 16 | C&R Panel for Bus Tie | Nos. | 0 |
| 17 | C&R Panel for Reactors | Nos. | 1 |
| 18 | 125 MVAR 3 Phase 400KV Shunt Reactor | Nos. | 1 |
| 19 | 145 KV neutral reactor | Nos | 0 |
| 20 | Bus Differential Protection Panel | Nos. | 0 |
| 21 | Telemetry | Nos | 0 |
| | | | |
| B | 220KV EQUIPMENTS | | |
| 1 | Circuit Breaker | Nos. | 1 |
| 2 | 220 KV CT 1200/1-1-1-1-1 Amp. | Nos. | 3 |
| 3 | 220 KV CT 800/1-1-1-1-1 Amp. | Nos. | 0 |
| 4 | Isolator (with E/S) (with structure and Solid core Insulator) | Nos. | 0 |
| 5 | Isolator (without E/S) (with structure and Solid core Insulator) | Nos. | 4 |
| 6 | Single phase Isolators (with structure and Solid core Insulator) | Nos. | 0 |
| 7 | LA | Nos. | 3 |
| 8 | Solid Core Insulators for substation work | Nos. | 27 |
| 9 | C&R Panel for Feeder | Nos. | 0 |
| 10 | C&R Panel for BC | Nos. | 0 |
| 11 | C&R Panel for 220 KV Side of 315MVA Transformer | Nos. | 1 |
| 12 | C&R Panel for 220/132kv Transformer | Nos. | 0 |

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| s.no | Particulars | Unit | Qty |
|-------------|-----------------------------------------------------------------------------|-------------|------------|
| 1 | 2 | 3 | 4 |
| 13 | C&R Panel (Bus Tie) | Nos. | 0 |
| 14 | PT | Nos. | 0 |
| 15 | Bus Differential Protection Panel | Nos. | 0 |
| 16 | Synchronization Trolley | Nos. | 0 |
| C | 132KV EQUIPMENTS | | |
| 1 | Circuit Breaker | Nos | 0 |
| 2 | 132KV CT 800/1-1-1 Amp. | Nos. | 0 |
| 3 | 132KV CT 400/1-1-1Amp | Nos. | 0 |
| 4 | 132KV CT 200/1-1-1Amp | Nos. | 0 |
| 5 | Isolator (with E/S) (with structure and Solid core Insulator) | Nos. | 0 |
| 6 | Isolator (without E/S) (with structure and Solid core Insulator) | Nos. | 0 |
| 7 | Single phase Isolators (with structure and Solid core Insulator) | Nos. | 0 |
| 8 | PT | Nos. | 0 |
| 9 | LA | Nos. | 0 |
| 10 | C&R Panel (for 220/132KV Xmer) | Nos. | 0 |
| 11 | C&R Panel (for 132/33KV Xmer) | Nos. | 0 |
| 12 | C&R Panel (for Feeder) | Nos. | 0 |
| 13 | C&R Panel (for Bus coupler) | Nos. | 0 |
| 14 | Solid Core Insulators for substation work | Nos. | 0 |
| D | 33KV EQUIPMENTS | | 0 |
| 1 | Vacuum Circuit Breaker | Nos. | 1 |
| 2 | 33KV CT 1200/1-1-1-1 Amp. | Nos | 0 |
| 3 | 33KV CT 800/1-1-1-1 Amp. | Nos. | 0 |
| 4 | 33KV CT 400/1-1 Amp | Nos | 3 |
| 5 | 33KV CT 10/1-1 Amp. | Nos. | 3 |
| 6 | NCT | Nos. | 0 |
| 7 | LA 36kV | Nos. | 3 |
| 8 | LA 33kV | Nos. | 3 |
| 9 | PT | Nos. | 3 |
| 10 | Isolator (with E/S) (with structure and Solid core Insulator) | Nos. | 0 |
| 11 | Isolator (without E/S) (with structure and Solid core Insulator) | Nos. | 2 |
| 12 | Isolator (without E/S) 1200 Amps. (with structure and Solid core Insulator) | Nos. | 0 |
| 13 | C&R Panel (for 1T+1F) | Nos. | 0 |
| 14 | C&R Panel (for 3 F) | Nos. | 0 |
| 15 | C&R Panel (for 1 F) | Nos. | 1 |
| 16 | C&R Panel for CAP BANK | Nos. | 0 |
| 17 | Solid Core Insulators for substation work | Nos. | 7 |
| 18 | Solid Core Insulator special set with structures | Nos. | 0 |
| 19 | 36kV 12MVAR Capacitor Bank with structures and accessories(SET) | Nos. | 0 |
| E | TRANSFORMER & ASSOCIATED EQUIP. | | |
| 1 | 315 MVA 400/220/33 KV Auto Transformer (with Oil and associated equipments) | Nos. | 1 |

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| s.no | Particulars | Unit | Qty |
|-------------|-------------------------------------------------------------------------------|-------------|--------------|
| 1 | 2 | 3 | 4 |
| 2 | 100MVA 400/132KV Transformer (with Oil and associated equipments) | Nos. | 0 |
| 3 | 160MVA 220/132KV Transformer (with Oil and associated equipments) | Nos. | 0 |
| 4 | 50MVA 220/33KV Transformer (with Oil and associated equipments) | Nos. | 0 |
| 5 | 40MVA 132/33KV Transformer (with Oil and associated 5equipments) | Nos | 0 |
| 6 | Oil filtration Machine (6000 Lt..per Hr.) | Nos. | 0 |
| 7 | Oil filtration Machine (2250 Lt..per Hr.) | Nos | 0 |
| 8 | Oil Storage Tank (10 KL) | Nos. | 0 |
| F | 400KV,220KV & 132KV CARRIER COMMUNICATION EQUIPMENT | . | |
| 1 | Carrier Cabinet With Protection coupler | Nos | 4 |
| 2 | Coupling Devices (LMU) | Nos. | 4 |
| 3 | Carrier Cabinet Without Protection coupler | Nos. | 2 |
| 4 | RTU & Telemetry (SET) | Nos. | 0 |
| 5 | EPAX (32/16) | Nos. | 0 |
| 6 | Telephone Sets | Nos. | 0 |
| 7 | Coaxial Cable | KMs | 1 |
| 8(a) | Telephone Cable (10 Pair armoured) | KMs | 0 |
| 8(b) | Telephone Cable (06 Pair armoured) | KMs | 0 |
| 9 | 220kV Wave Trap | Nos. | 0 |
| 10 | 132kV Wave Trap | Nos. | 0 |
| 11 | 220kV CVT | Nos. | 0 |
| 12 | 132kV Coupling Capacitors | Nos. | 0 |
| 13 | Jointing Box (splice enclosure) | Set | 1 |
| 14 | Approach Cable | Mtr. | 500 |
| 15 | Fiber optical distribution panel | Nos. | 1 |
| 16 | Terminal equipment for optical fiber | Nos. | 0 |
| 17 | GPS System with accessories (1 Set) | | 0 |
| 18 | CCTV (Electronic Surveillance System) (1 Set) | | 0 |
| (G) | 400 KV, 220kV, 132kV and 33kV Fabricated, Galvanised Steel Structures. | | |
| i | Total weight of Fondation bolts,Nut bolt & washers | MT | 26.59 |
| ii | Total weight of structures (In MT) | MT | 266 |
| H | BUSBAR, EARTHING MATERIAL | | |
| 1 | ACSR Moose Conductor | Kms | 11 |
| 2 | Zebra Conductor | Kms | 0 |
| 3 | 4" IPS Allu.Tubes | Mtrs | 1400 |
| 4 | MS Flat for 400 KV S/s Earth mat (100 x12) | MT | 120 |
| 5 | M.S.Flat for earthing (75 x 8) | MT | 17 |
| 6 | M.S.Flat for earthing (65 x 8) | MT | 0 |
| 7 | M.S.Flat for earthing (50 x 6) | MT | 34 |

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| s.no | Particulars | Unit | Qty |
|-------------|--------------------------------------------------------------------------------------|-------------|------------|
| 1 | 2 | 3 | 4 |
| 8 | Earthing rods (25mm x 3000mm) | Nos. | 160 |
| 9 | GI Pipe 40 mm Dia., 4mm Thk along with clamp for Earth Pit | Mtrs | 235 |
| 10 | Power Cable 3.5 core 300sq.mm | KMs | 0.5 |
| 11 | Screening conductor / O.H. Shield wire (7/3.66 sq mm) | KMs | 5 |
| 12 | Junction Box (36 Ways) | Nos. | 5 |
| 13 | Junction Box (64 Ways) | Nos. | 7 |
| 14 | Junction Box (128 Ways) | Nos. | 9 |
| 15 | Fire fighting equipments set | | |
| (i) | Dry-Chemical Powder (DCP) Type, Capacity-75Kg, Trolley Mounted | Nos. | 0 |
| (ii) | CO ₂ Type , Capacity-22.5Kg, Trolley Mounted | Nos. | 0 |
| (iii) | Mechanical Foam Type, Capacity-50Ltr, Trolley Mounted (Cylinder Type) | Nos. | 0 |
| (iv) | Set Of Fire Buckets Comprising 6 Nos Buckets, Capacity-9Kg , Each with Stand (Set) | Nos. | 0 |
| 16 | Rail 52 Kg 3 Mtr Long for Power Transformer | Nos. | 4 |
| 17 | R.S. Joist 175x85 ,11 Mtr for Station Transformer | Nos | 2 |
| 18 | MS Chhanel 100x50x6 Mtr Long for station Transformer | Nos. | 2 |
| 19 | PT Distribution Box | Nos. | 0 |
| I | Disc insulators & Substation Hardware | | |
| 1 | 400 KV 160KN Double tension with Quadruple Moose | Nos. | 48 |
| 2 | 400 KV 160KN Double tension with Twin Moose | Nos. | 30 |
| 3 | 400 KV 160KN Suspension with Twin Moose with Through Clamp (450 mm) | Nos. | 9 |
| 4 | 400 KV160KN Suspension with Twin Moose with drop Clamp (450 mm) | Nos. | 12 |
| 5 | 220 KV 120 KN Single Tension with Twin Moose Hardware | Nos. | 24 |
| 6 | 220 KV 120 KN Single Tension with Single Moose Hardware | Nos. | 0 |
| 7 | 220 KV 120 KN Suspension with Twin Moose with Through Clamps (300 mm) | Nos. | 6 |
| 8 | 220 KV 120 KN Suspension with Twin Moose with Drop Clamps (300 mm) | Nos. | 6 |
| 9 | 220 KV 120 KN Suspension with Single Moose with drop Clamps (300 mm) | Nos. | 0 |
| 10 | 220 KV 120 KN Single Tension string for single Zebra | Nos. | 0 |
| 11 | 220 KV 120 KN Single Tension string for twin Zebra | Nos. | 0 |
| 12 | 220 KV 90 KN Single Suspension string single Zebra | Nos. | 0 |
| 13 | 220 KV 90 KN Single Suspension string twin Zebra | Nos. | 0 |
| 14 | 132 KV 90 KN Single Tension string for single Zebra | Nos. | 0 |
| 15 | 132 KV 90 KN Single Tension string for twin Zebra | Nos. | 0 |
| 16 | 132 KV 90 KN Single Tension string for single Panther | Nos. | 0 |
| 17 | 132 KV 70KN Single Suspension string single Zebra | Nos. | 0 |
| 18 | 132 KV 70 KN Single Suspension string twin Zebra | Nos. | 0 |
| 19 | 33 KV 70 KN Single Tension string for single Zebra | Nos. | 0 |
| 20 | 33 KV 70 KN Single Tension string for twin Zebra | Nos. | 0 |
| 21 | 33 KV 70 KN Single Suspension string single Zebra | Nos. | 0 |

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| s.no | Particulars | Unit | Qty |
|-------------|--------------------------------------------------------------------------------|-------------|------------|
| 1 | 2 | 3 | 4 |
| 22 | 33 KV 70 KN Single Suspension string twin Zebra | Nos. | 0 |
| J | AC/DC SUPPLY | | |
| 1 | L T Distribution Box | Nos. | 1 |
| 2 | 200 KVA DG Set Complete with all accessories. | Nos. | 0 |
| 3 | 25 KVA DG Set Complete with all accessories. | Nos. | 0 |
| 3 | Station Transformer, 200KVA, 33/0.4KV | Nos. | 0 |
| 4 | Station Transformer, 500KVA, 33/0.4KV | Nos. | 1 |
| 5 | 220Volt 600Ah Battery | Nos. | 0 |
| 6 | 220Volt 600Ah Battery Charger | Nos. | 0 |
| 7 | 110Volt 300Ah Battery | Nos. | 0 |
| 8 | 110Volt 300Ah Battery Charger | Nos. | 0 |
| 9 | 48Volt 300Ah Battery | Nos. | 0 |
| 10 | 48Volt 300Ah Battery Charger | Nos | 0 |
| 11 | AC Distribution Boxes 415Volt | Nos. | 0 |
| 12 | DC Distribution Boxes 110 Volts | Nos. | 0 |
| 13 | Lighting Fixtures with HPSV/ HPMH (250 Watt) | Nos. | 40 |
| 14 | Lighting Fixtures complete with fitting arrangement (CFL 36 Watt) | Nos. | 50 |
| 15 | 3 Phase ICTP MCB (32 Amp) for No. of difference circuit | Nos. | 6 |
| 16 | 1 Phase Main switch with fuse, link and 4 connectors | Nos. | 60 |
| 17 | Tubular Pole For Lighting Fixtures | Nos. | 60 |
| 18 | D.O.Set | Nos. | 1 |
| 19 | Aluminium /Red oxide Paints and Nuts and Bolts washers and other misc material | LS | LS |
| 20 | Roof Top Solar System(25KW) | SET | 0 |
| K | Control cable | | |
| 1 | 2Core 2.5 Sq.mm Unarmoured | Kms | 5 |
| 2 | 4Core 2.5 Sq.mm Unarmoured | Kms | 3 |
| 3 | 8Core 2.5 Sq.mm Unarmoured | Kms | 0 |
| 4 | 12Core 2.5 Sq.mm Unarmoured | Kms | 0 |
| 5 | 19 Core 2.5 Sq.mm Unarmoured | Kms | 0 |
| 6 | 4Core 4 Sq.mm Armoured | Kms | 6 |
| 7 | 4Core 10 Sq.mm Armoured | Kms | 8 |
| 8 | 4Core 2.5 Sq.mm Armoured | Kms | 6 |
| 9 | 12Core 2.5 Sq.mm Armoured | Kms | 6 |
| 10 | 19 Core 2.5 Sq.mm Armoured | Kms | 8 |
| 11 | 2Core 2.5 Sq.mm Armoured | Kms | 4 |
| L | SUB STATION CLAMPS | | |
| 1 | T CLAMPS | | |
| a. | TWIN ZEBRA RUN-ZEBRA TAP | Nos | 0 |
| b. | ZEBRA RUN-ZEBRA TAP | Nos. | 0 |
| 2 | P.G.CLAMPS | | |
| a. | ZEBRA –ZEBRA | Nos. | 0 |

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| s.no | Particulars | Unit | Qty |
|-------------|----------------------------------------------------|-------------|------------|
| 1 | 2 | 3 | 4 |
| b. | ZEBRA –PANTHER | Nos. | 0 |
| c. | ZEBRA –RECOON | Nos. | 0 |
| 3 | P.I. CLAMPS 220 KV | | |
| a. | SINGLE ZEBRA /MOOSE | Nos. | 3 |
| b. | TWIN ZEBRA / MOOSE | Nos. | 18 |
| 4 | P.I. CLAMPS 132 KV | | |
| a. | SINGLE ZEBRA | Nos. | 0 |
| b. | TWIN ZEBRA | Nos. | 0 |
| 5 | P.I. CLAMPS 33 KV | | |
| a. | SINGLE ZEBRA | Nos. | 7 |
| b. | TWIN ZEBRA | Nos. | 0 |
| 6 | SPACERS FOR TWIN ZEBRA | Nos | 0 |
| 7 | T Clamp | | |
| a | TWIN MOOSE RUN –MOOSE TAP | Nos | 0 |
| b | MOOSE RUN –MOOSE TAP | Nos | 24 |
| C | 4" IPS Run –MOOSE TAP | Nos | 12 |
| d | Quartz moose to twin moose | Nos | 12 |
| 8 | PG CLAMP | | |
| a | MOOSE- MOOSE | Nos | 606 |
| b | MOOSE-ZEBRA | Nos | 0 |
| 9 | Bus Post Clamp | | |
| a | Rigid--TYPE FOR 4" IPS | Nos | 81 |
| b | Sliding type for 4" IPS tube | Nos | 27 |
| c | Flexible type 4" IPS tube & Twin Moose | Nos. | 0 |
| d | BUS POST CLAMPS FOR TWIN MOOSE | Nos | 14 |
| 10 | Coupling sleeves for tubular bus conductor | Nos. | 90 |
| 11 | Spacer | | |
| a | TWIN MOOSE FOR 400 KV | Nos. | 198 |
| b | TWIN MOOSE for 220KV | Nos. | 300 |
| C | QUADRA MOOSE | Nos. | 282 |
| 12 | Sag Comp. Spring | Nos. | 54 |
| 13 | Earth wire clamps | Nos | 108 |
| 14 | P G Clamp for earth wire | Nos | 54 |
| 15 | Clamp for Conn. Of Earth Wire with M S Flat (50X6) | Nos | 64 |

SCHEDULE - 9

**QUANTITY OF MATERIALS TO BE SUPPLIED FOR
TRANSMISSION LINES.**

| S. No. | PARTICULARS | Unit | QTY |
|---------------|------------------------------------------------------------------------------------------------------------------|-------------|------------|
| 1 | 2 | 3 | 4 |
| 1 | SUPPLY OF TOWERS | | |
| | Fabricated & galvanized Towers and their extension Gantry structures complete with Stubs & Cleats, Gusset plates | | |
| (i) | HT Steel sections | MT | 185 |
| (ii) | MS Steel sections | MT | 135 |
| (iii) | Bolts & Nuts, step bolts, Spring & pack washers for tower parts as per Sl. no. 1 above | MT | 12 |
| | | | |
| 2 | ACSR Conductor : | | |
| (i) | ACSR Moose | Kms | 37 |
| (ii) | ACSR Zebra | Kms | 0 |
| (iii) | ACSR Panther | Kms | 0 |
| | | | |
| 3.(i) | Earth wire (7/3.66mm, 95 kg/mm ² quality) | Kms | 3.1 |
| (ii) | OPGW wire | Kms | 3.2 |
| | | | |
| 4 | Disc Insulator Strings/ Long Rod Porcelain Insulators/ Long Rod Polymer Insulators | | |
| (i) | Single suspension string for ACSR Twin Moose Conductor (equivalent to 23 disc of 120kN) | Nos | 11 |
| (ii) | Double suspension string for ACSR Twin Moose Conductor (equivalent to 2X23 disc of 120kN) | Nos | 1 |
| (iii) | Single tension string for ACSR Moose Twin Conductor (equivalent to 24 disc of 160kN) | Nos | 0 |
| (iv) | Double tension string for ACSR Twin Moose Conductor (equivalent to 2X24 disc of 160kN) | Nos | 98 |
| (v) | Single suspension pilot string for ACSR Twin Moose Conductor (equivalent to 23 disc of 120kN) | Nos | 24 |
| (vi) | Single suspension string for ACSR Zebra Conductor (equivalent to 13 disc of 70kN) | Nos | 0 |
| (vii) | Double suspension string for ACSR Zebra Conductor (equivalent to 2X13 disc of 70kN) | Nos | 0 |
| (viii) | Single tension string for ACSR Zebra Conductor (equivalent to 14 disc of 160kN) | Nos | 0 |
| (ix) | Double tension string for ACSR Zebra Conductor (equivalent to 2X14 disc of 160kN) | Nos | 0 |
| (x) | Single suspension string for ACSR Panther Conductor (equivalent to 9 disc of 70kN) | Nos | 0 |
| (xi) | Double suspension string for ACSR Panther Conductor (equivalent to 2X9 disc of 70kN) | Nos | 0 |
| (xii) | Single tension string for ACSR Panther Conductor (equivalent to 10 disc of 90kN) | Nos | 0 |
| (xiii) | Double tension string for ACSR Panther Conductor (equivalent to 2X10 | Nos | 0 |

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| S. No. | PARTICULARS | Unit | QTY |
|---------------|-------------------------------------------------------------|-------------|------------|
| 1 | 2 | 3 | 4 |
| | disc of 90kN) | | |
| 5 | Hardwares fittings of ACSR Twin Moose Conductor for: | | |
| (i) | 23 disc single suspension string | Sets | 11 |
| (ii) | 23 disc double suspension string | Sets | 1 |
| (iii) | 24 disc single tension string | Sets | 0 |
| (iv) | 24 disc double tension string | Sets | 98 |
| (v) | Pilot String for ACSR Twin Moose | Sets | 24 |
| 6 | Hardwares fittings of ACSR Zebra Conductor for: | | |
| (i) | 13 disc single suspension string | Sets | 0 |
| (ii) | 13 disc double suspension string | Sets | 0 |
| (iii) | 14 disc single tension string | Sets | 0 |
| (iv) | 14 disc double tension string | Sets | 0 |
| 7 | Hardwares fittings of ACSR Panther Conductor for: | | |
| (i) | 9 disc single suspension string | Sets | 0 |
| (ii) | 9 disc double suspension string | Sets | 0 |
| (iii) | 10 disc single tension string | Sets | 0 |
| (iv) | 10 disc double tension string | Sets | 0 |
| 8 | Conductor Accessories of ACSR Moose Conductor: | | |
| (i) | Midspan joints | Nos | 34 |
| (ii) | Vibration damper | Nos | 490 |
| (iii) | Repair sleeve | Nos | 9 |
| (iv) | AG Spacer for Span for ACSR twin Moose | Nos | 428 |
| (v) | Compression type T Clamp | Nos | 0 |
| (vi) | Central Hanger Anchor Shackle | Nos | 12 |
| (vii) | Rigid Spacer for Jumper for ACSR twin Moose | Nos | 144 |
| 9 | Conductor Accessories of ACSR Zebra Conductor: | | |
| (i) | Midspan joints | Nos | 0 |
| (ii) | Vibration damper | Nos | 0 |
| (iii) | Repair sleeve | Nos | 0 |
| 10 | Conductor Accessories of ACSR Panther Conductor: | | |
| (i) | Midspan joints | Nos | 0 |
| (ii) | Vibration damper | Nos | 0 |
| (iii) | Repair sleeve | Nos | 0 |
| 11 | Earthwire Accessories: | | |
| (i) | Suspension Assembly | Sets | 2 |
| (ii) | Tension Assembly with jumper cone | Sets | 16 |
| (iii) | Midspan joint | Nos | 1 |
| (iv) | Vibration damper for earthwire | Nos | 41 |
| (v) | Repair sleeve | Nos | 1 |
| (vi) | Copper earth bond | Nos | 18 |

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| S. No. | PARTICULARS | Unit | QTY |
|---------------|-----------------------------------------------------------------------------------------------------------|-------------|------------|
| 1 | 2 | 3 | 4 |
| (vii) | G.I. earth bond | Nos | 0 |
| 12 | OPGW Accessories: | | |
| (i) | Suspension Assembly | Sets | 2 |
| (ii) | Tension Assembly with Joint box | Sets | 1 |
| (iii) | Tension Assly pass through type | Sets | 16 |
| (iv) | Down lead clamp | Sets | 51 |
| (v) | Vibration damper | Nos | 41 |
| (vi) | Splice enclosure | Nos | 1 |
| (vii) | Earth bond and PG clamp | Nos | 18 |
| 13 | Tower Accessories | | |
| (i) | Earthing set – 4 sets (As per drawing of Tower) | Sets | 10 |
| (ii) | Earthing set – 2 sets (As per drawing for Gantry Column) | Sets | 0 |
| (iii) | Danger Board – 1 No. | Nos | 10 |
| (iv) | Number Plate – 1 No. | Nos | 10 |
| (v) | Phase Plate (set of 3 No.-each R/Y/B) | Sets | 20 |
| (vi) | Anticlimbing Device including Barbed wire –1 set (As per requirement brought out in the bidding document) | Sets | 10 |

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SCHEDULE-10

**QUANTITY FOR ERECTION, TESTING & COMMISSIONING OF
OUTDOOR & INDOOR EQUIPMENTS**

| S No. | PARTICULARS | Unit | Qty |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|
| 1 | 2 | 3 | 4 |
| A | 400 KV EQUIPMENTS | | |
| (A) | Structures : | | |
| i) | Erection of structures including tightening and punching of nuts, bolts. | MT. | 266 |
| (B) | Stringing of overhead gantries, vertical droppers with ACSR conductor including fixing of insulator string, spacers, clamps etc. | | |
| i) | 4" IPS allu. Tube | Mtr | 1400 |
| ii) | Quad moose | Mtr | 3760 |
| iii) | Twin Moose | Mtr | 3980 |
| iv) | Twin Zebra | Mtr | 0 |
| v) | Single Zebra | Mtr | 500 |
| vi) | Stringing of overhead shield wire with 7/3.66 mm standard galvanized steel complete with fixing of strain clamps at the structures. | Mtr | 5000 |
| C | Installation of transformers | | |
| I. | Complete assembly and erection of power transformer with connections etc including installation of marshalling boxes, control cabinets, air sealing radiators, cooling fans, all accessories etc for transformer including their preliminary checks. Unloading /handling of transformer accessories, handling and filling of transformer oil along with associated equipments. | | |
| i) | 315 MVA 400/220/33 KV Auto Transformer (with Oil and associated equipments) | Nos | 1 |
| ii) | 160MVA 220/132KV Transformer (with Oil and associated equipments) | Nos | 0 |
| iii) | 100MVA 400/33KV Transformer (with Oil and associated equipments) | Nos | 0 |
| iv) | 50MVA 220/33KV Transformer(with Oil and associated equipments) | Nos | 0 |
| v) | 63MVA 132/33KV Transformer(with Oil and associated equipments) | Nos | 0 |
| vi) | 40/50MVA 132/33KV Transformer (with Oil and associated equipments) | Nos | 0 |
| vii) | 125 MVAR 400 KV Reactor(with Oil and associated equipments) | Nos | 1 |
| II. | STATION TRANSFORMER | | |
| i) | Shifting of 33/0.4 KV Station transformer up to plinth and placing on plinth & connection to bushing & earth connection alongwith associated work etc. | Nos | 1 |
| (D) | Installation and erection of out-door equipments. | | |
| I. | CIRCUIT BREAKERS | | |
| I) | 400 KV SF-6 circuit breaker (3 Phase) with PIR | | |
| a) | Erection of structures and alignment, shifting of breaker upto the place and placement of all 3 circuit breaker poles on structure and | | |

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| S No. | PARTICULARS | Unit | Qty |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|
| 1 | 2 | 3 | 4 |
| | alignment. | | |
| b) | Complete assembly of circuit breaker including erection of control cabinet & mechanism box, interconnecting piping work, erection of all accessories for the equipment. | | |
| c) | SF-6 gas filling for which gas cylinder & filling equipments shall be provided by Company. | | |
| d) | Preliminary check, test including test for leakage of air/gas. | | |
| | Total quantity of item (i) | No | 2 |
| ii) | 400 KV SF-6 circuit breaker (3 Phase) without PIR | | |
| a) | Erection of structures and alignment, shifting of breaker upto the place and placement of all 3 circuit breaker poles on structure and alignment. | | |
| b) | Complete assembly of circuit breaker including erection of control cabinet & mechanism box, interconnecting piping work, erection of all accessories for the equipment. | | |
| c) | SF-6 gas filling for which gas cylinder & filling equipments shall be provided by Company. | | |
| d) | Preliminary check, test including test for leakage of air/gas. | | |
| | Total quantity of item (ii) | No | 3 |
| iii) | 220 KV SF-6 circuit breakers (3 phase) | | |
| a) | Erection of structures and alignment, shifting of breaker upto the place and placement of all 3 circuit breaker poles on structure and alignment. | | |
| b) | Complete assembly of circuit breaker including erection of control cabinet & mechanism box, interconnecting piping work, erection of all accessories for the equipment. | | |
| c) | SF-6 gas filling for which gas cylinder & filling equipments shall be provided by Company. | | |
| d) | Preliminary check, test including test for leakage of air/gas. | | |
| | Total quantity of item (iii) | No | 1 |
| iv) | 132 KV SF-6 circuit breakers (3 phase) | | |
| a) | Erection of structures and alignment, shifting of breaker upto the place and placement of all 3 circuit breaker poles on structure and alignment. | | |
| b) | Complete assembly of circuit breaker including erection of control cabinet & mechanism box, interconnecting piping work, erection of all accessories for the equipment. | | |
| c) | SF-6 gas filling for which gas cylinder & filling equipments shall be provided by Company. | | |
| d) | Preliminary check, test including test for leakage of air/gas. | | |
| | Total quantity of item (iv) | No | 0 |
| v) | 33 KV Vacuum circuit breakers (3 Phase) | | |
| a) | Erection of structures and alignment, shifting of breaker upto the place and placement of circuit breaker on structure and alignment. | | |
| b) | Complete assembly of circuit breaker including erection of control cabinet & mechanism box, interconnecting piping work erection of all accessories for the equipment. | | |
| c) | Preliminary check, test including test for leakage of air/gas. | | |
| | Total quantity of item (v) | No | 1 |
| 2 | Isolators | | |
| i) | 400 KV Pantograph Isolator (with one earth switch) | | |
| a) | Shifting upto civil foundation & placements of complete isolator in | | |

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| S No. | PARTICULARS | Unit | Qty |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|
| 1 | 2 | 3 | 4 |
| | all 3 phase of isolator structure. | | |
| b) | Erection/ mounting of mechanism box, interconnection, pipings, alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | |
| | Total quantity of item (i) | No | 13 |
| 3 | Isolators without earth switch (3 Phase) | | |
| i) | 400 KV isolators (3 Phase) | | |
| a) | Shifting upto civil foundation & placements of complete isolator in all 3 phase of isolator structure. | | |
| b) | Erection/ mounting of mechanism box, interconnection, pipings, alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | |
| | Total quantity of item (i) | No | 4 |
| ii) | 220 KV isolators (1 Phase set of three) | | |
| a) | Shifting up to civil foundation & placements of complete isolator in all 3 phase of isolator structure. | | |
| b) | Erection/ mounting of mechanism box, interconnection, pipings, alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | |
| | Total quantity of item (ii) | No | 0 |
| iii) | 220 KV isolators (3 Phase) | | |
| a) | Shifting upto civil foundation & placements of complete isolator in all 3 phase of isolator structure. | | |
| b) | Erection/ mounting of mechanism box, interconnection, pipings, alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | |
| | Total quantity of item (iii) | No | 4 |
| iv) | 132 KV isolators (3 Phase) | | |
| a) | Shifting up to civil foundation & placements of complete isolator in all 3 phase of isolator structure. | | |
| b) | Erection/ mounting of mechanism box, interconnection, piping, alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | |
| | Total quantity of item (iv) | No. | 0 |
| v) | 132 KV isolators (Single Phase set of three) | | |
| a) | Shifting upto civil foundation & placements of complete isolator in all Single phase of isolator structure. | | |
| b) | Erection/ mounting of mechanism box, interconnection, piping, alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | |
| | Total quantity of item (v) | No. | 0 |
| vi) | 33 KV isolators (3 phase) | | |
| a) | Shifting up to civil foundation & placement of complete isolator in all 3 phase of isolator structure. | | |
| b) | Erection/mounting of mechanism box, interconnection, piping alignment of contacts & all associated activities to make the | | |

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| S No. | PARTICULARS | Unit | Qty |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|
| 1 | 2 | 3 | 4 |
| | installation complete including checking of successful mechanical and electrical operation. | | |
| | Total quantity of item (vi) | No. | 0 |
| 4 | Isolators with earth switch (3 Phase) | | |
| i) | 400 KV HCB isolators (3 phase) | | |
| a) | Shifting up to civil foundation & placement of complete isolator in all 3 phase of isolator structure. | | |
| b) | Erection/ mounting of mechanism box, interconnection, piping alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | |
| | Total quantity of item (i) | No. | 2 |
| ii) | 400 KV isolators (1 phase)(set of Three) | | |
| a) | Shifting up to civil foundation & placement of complete isolator in all 3 phase of isolator structure. | | |
| b) | Erection/ mounting of mechanism box, interconnection, piping alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | |
| | Total quantity of item (ii) | No. | 0 |
| iii) | 220 KV isolators (3 phase) | | |
| a) | Shifting upto civil foundation & placement of complete isolator in all 3 phase of isolator structure. | | |
| b) | Erection/ mounting of mechanism box, interconnection, piping alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | |
| | Total quantity of item (iii) | No. | 0 |
| iv) | 132 KV isolators (3 phase) | | |
| a) | Shifting up to civil foundation & placement of complete isolator in all 3 phase of isolator structure. | | |
| b) | Erection/ mounting of mechanism box, interconnection, piping alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | |
| | Total quantity of item (iv) | No. | 0 |
| v) | 33 KV isolators (3 Phase) | | |
| a) | Shifting upto civil foundation & placement of complete isolator in all 3 phase of isolator structure. | | |
| b) | Erection/ mounting of mechanism box, interconnection, piping alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | |
| | Total quantity of item (v) | No. | 0 |
| 5 | Shifting of current X'mer up to civil foundation and placement on structure and fixing of junction box including all accessories etc. | | |
| a) | 400 KV | No. | 15 |
| b) | 220 KV | No. | 3 |
| c) | 132 KV | No. | 0 |
| d) | 33 KV | No. | 6 |
| 6 | Shifting of CC/CVT/P.T. up to civil foundation & placement on structure and fixing of junction box including all accessories etc. | | |

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| S No. | PARTICULARS | Unit | Qty |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------|
| 1 | 2 | 3 | 4 |
| a) | 400 KV | No. | 6 |
| b) | 220 KV | No. | 0 |
| c) | 132 KV | No. | 0 |
| d) | 33 KV | No. | 3 |
| e) | Dismantling of 400KV Bus CVTs | No. | 2 |
| 7 | Erection of lightning arrestors : | | |
| i. | Shifting of surge/lightening arrestors & placement of equipments on structure including all accessories and making all connections also include checking & installation of insulator base and surge counters. | | |
| a) | 400 KV | No. | 12 |
| b) | 220 KV | No. | 3 |
| c) | 132 KV | No. | 0 |
| d) | 33 KV | No. | 6 |
| 8 | Erection of Solid Core Insulators (PI): | | |
| a) | 400 KV | No. | 130 |
| b) | 220 KV | No. | 27 |
| c) | 132 KV | No. | 0 |
| d) | 33 KV | No. | 7 |
| 9 | Wave trap with overhead suspension and other accessories. | | |
| a) | 400 KV | No | 4 |
| b) | 220 KV | No. | 0 |
| c) | 132 KV | No. | 0 |
| 10 | Set of coupling devices line matching unit for PLCC purposes. | Set | 4 |
| 11 | Erection of Fiber optics Tele communication equipments | set | 0 |
| 12 | Erection of 36 kV 12 MVAR Capacitor bank with structures and accessories complete in all respect. | No. | 0 |
| (E) | Earthing Installation : | | |
| | Installation & testing of the following including jointing, equipment termination, fixing & clamping with accessories & hardware required such as saddle, clamps, cleats, plugs, screws, nuts, bolts, washers and welding, brazing etc. | | |
| i) | 25 mm dia X 3000 mm long M.S. rod earth electrodes installation directly driven/drilled (40 to 50 mm dia) into earth including excavation (irrespective of type of soil encountered) backfilling with betonite soil (to be arranged by contractor) welding to earth conductor etc. | No. | 160 |
| ii) | Providing of steel risers and making earth mat (duly buried at a depth of 0.5 mtrs) including backfilling with black cotton soil (to be arranged by the contractor) welding etc. and bolting of risers to the structure at desired place. | | |
| a) | MS Round 40 mm Dia for 400 KV S/s Earth mat | Mtr | 12000 |
| b) | MS flat 75 X 8 mm | Mtr | 3400 |
| c) | MS flat 65X 8 mm | Mtr | 0 |
| d) | MS flat 50X 6 mm | Mtr | 13600 |
| (F) | Preparation of earthing pits (1.5X1.5.X3 Mtrs.) as per drawing attached with bid document, which includes excavation (Irrespective of the soil encountered) embedding of 4 No. GI Pipes of size 40 mm dia, 3 Mtrs. Long, back filling with B.C. soil (to be arranged by the contractor) free from boulders and harmful | No. | 16 |

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| S No. | PARTICULARS | Unit | Qty |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|
| 1 | 2 | 3 | 4 |
| | mixture. These GI pipes are to be welded with MS flats by making mesh frame and cutting of pipes as also making holes in the pipe for water seepage. The earth pit is to be connected with earth mesh of MS flat. | | |
| (G) | Yard Lighting : | | |
| i) | Erection of pole for yard lighting and fitting of fixtures. | No. | 60 |
| ii) | Installation of light fixtures on gantry columns, supply connections to the light fitting from the nearest lighting board in the yard etc. | No. | 40 |
| (H) | Erection of DO fuse set | No. | 1 |
| (I) | Erection of junction box | No. | 21 |
| (J) | Erection of PT Junction Box | NO | 0 |
| (K) | For installation and erection of indoor equipments in the Control-Room building. : | | |
| (i) | 415V AC Distribution Board | | |
| | Shifting up to control room (including storage, if required), placement in AC/DC room. The AC Distribution Board to be suitably grouted in AC/DC room as per drawing. Proper alignment of AC Board to be done and earthing to be done. Making of all 3 Phase and Single phase AC connections in terminal block as per drawing. | NO. | 0 |
| (ii) | 220V DC Distribution Board | | |
| | Shifting up to control room (including storage, if required), placement in AC/DC room. The DC Distribution Board to be suitably grouted in AC/DC room as per drawing. Proper alignment of DC Board to be done and earthing to be done. Making of all 110V DC connections in terminal block as per drawing. | NO. | 0 |
| (iii) | 110V DC Distribution Board | | |
| | Shifting up to control room (including storage, if required), placement in AC/DC room. The DC Distribution Board to be suitably grouted in AC/DC room as per drawing. Proper alignment of DC Board to be done and earthing to be done. Making of all 110V DC connections in terminal block as per drawing. | NO. | 0 |
| (iv) | Control and Relay Panel for 400KV Feeder/X-mer/Bus coupler/Bus tie/Bus Diff. Protection : | | |
| | Shifting up to control room (including storage if required) and placement complete with all relays & accessories. The placement of C&R panel to be done on MS channel frame and MS Channel frame will suitable grouted in control room as per drawing. The cutting, welding & fabrication of of MS channel frame is to be done as per drawing. Proper alignment of C&R panel to be done. The earthing of C&R Panel to be done. Making of all interconnections for the control & relay panel on terminal block as per drawing including all AC & DC connections. | NO. | 4 |
| (v) | Control and Relay Panel for 220KV Feeder/X-mer/Bus coupler/Bus tie/Bus Diff. Protection : | | |
| | Shifting up to control room (including storage if required) and placement complete with all relays & accessories. The placement of C&R panel to be done on MS channel frame and MS Channel frame will suitable grouted in control room as per drawing. The cutting, welding & fabrication of of MS channel frame is to be done as per drawing. Proper alignment of C&R panel to be done. The earthing of C&R Panel to be done. Making of all interconnections | NO. | 1 |

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| S No. | PARTICULARS | Unit | Qty |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|
| 1 | 2 | 3 | 4 |
| | for the control & relay panel on terminal block as per drawing including all AC & DC connections. | | |
| (vi) | Control and Relay Panel for 132KV Feeder/X-mer/Bus coupler | | |
| | Shifting up to control room (including storage if required) and placement complete with all relays & accessories. The placement of C&R panel to be done on MS channel frame and MS Channel frame will suitable grouted in control room as per drawing. The cutting, welding & fabrication of MS channel frame is to be done as per drawing. Proper alignment of C&R panel to be done. The earthing of C&R Panel to be done. Making of all interconnections for the control & relay panel on terminal block as per drawing including all AC & DC connections. | NO. | 0 |
| (vii) | C&R Panel for 33KV Feeder/X-mer/Bus coupler: | | |
| | Shifting up to control room (including storage if required) and placement complete with all relays & accessories. The placement of C&R panel to be done on MS channel frame and MS Channel frame will suitable grouted in control room as per drawing. The cutting, welding & fabrication of MS channel frame is to be done as per drawing. Proper alignment of C&R panel to be done. The earthing of C&R Panel to be done. Making of all interconnections for the control & relay panel on terminal block as per drawing including all AC & DC connections. | NO. | 1 |
| (viii) | RTU & Telemetry (Set): | | |
| | Shifting up to control room (including storage if required) and placement complete with all relays & accessories. The placement of RTU to be done on MS channel frame and MS Channel frame will suitable grouted in control room as per drawing. The cutting, welding & fabrication of MS channel frame is to be done as per drawing. Proper alignment of RTU to be done. The earthing of RTU to be done. Making of all interconnections for the RTU on terminal block as per drawing including all AC & DC connections. | NO. | 0 |
| (ix) | CARRIER CABINET: | | |
| | Shifting up to control room (including storage if required) and placement in control room. The cabinet will be suitably grouted in control room as per drawing. The proper alignment of panel to be done on MS channel frame and MS Channel frame will be suitably grouted in control room. The earthing of panel to be done. Making of all AC/DC connections in terminal block as per drawing. | NO. | 6 |
| (x) | EPAX: | | |
| | Shifting up to control room (including storage if required) and placement in control room with all accessories. | No. | 0 |
| (xi) | 220V Battery | | |
| a) | Shifting of 220V Battery set (having 110 cells of 1.2 V) up to control room along with battery stand & electrolyte containers shifting up to control room with all accessories. Checking of breakage and condition of cover seals. | | |
| b) | Erection of mounting racks, placement of battery cells (after proper cleaning of cells) on battery set including their interconnections and connections to their battery chargers. Providing number | | |

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| S No. | PARTICULARS | Unit | Qty |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|
| 1 | 2 | 3 | 4 |
| | identification sticker / plates for each cell. | | |
| c) | Charging of batteries as per manufacturer's recommendation under guidance of engineer incharge including two to three charge/discharge cycle complete with maintaining record of battery charging. This work includes initial filling of electrolyte topping up of electrolyte/distilled water during charge/discharge cycle. | | |
| | Total quantity of (xi) | No | 0 |
| (xii) | 110V Battery | | |
| a) | Shifting of 110V Battery set (having 55 cells of 1.2 V) up to control room along with battery stand & electrolyte containers shifting up to control room with all accessories. Checking of breakage and condition of cover seals. | | |
| b) | Erection of mounting racks, placement of battery cells (after proper cleaning of cells) on battery set including their interconnections and connections to their battery chargers. Providing number identification sticker / plates for each cell. | | |
| c) | Charging of batteries as per manufacturers recommendation under guidance of engineer incharge including two to three charge/discharge cycle complete with maintaining record of battery charging. This work includes initial filling of electrolyte topping up of electrolyte/distilled water during charge/discharge cycle. | | |
| | Total quantity of (xii) | No | 0 |
| (xiii) | 220/110V Battery Charger | | |
| | Shifting up to control room & placement in AC/DC room with all accessories. The grouting of charger to be done as per drawings. Proper alignment and earthing of Charger to be done. Making of all AC/DC connection in terminal block as per drawing. | No | 0 |
| (xiv) | 48V Battery | | |
| a) | Shifting of 48V Battery set (having 24 cells of 1.2 V) up to control room along with battery stand & electrolyte containers shifting up to control room with all accessories. Checking of breakage and condition of cover seals. | | |
| b) | Erection of mounting racks, placement of battery cells (after proper cleaning of cells) on battery set including their interconnections and connections to their battery chargers. Providing number identification sticker / plates for each cell. | | |
| c) | Charging of batteries as per manufacturers recommendation under guidance of engineer incharge including two to three charge/discharge cycle complete with maintaining record of battery charging. This work includes initial filling of electrolyte topping up of electrolyte/distilled water during charge/discharge cycle. | | |
| | Total quantity of (xiv) | NO. | 0 |
| (xv) | 48V Battery Charger | | |
| | Shifting up to control room & placement in AC/DC room with all accessories. The grouting of charger to be done as per drawings. Proper alignment and earthing of Charger to be done. Making of all AC/DC connection in terminal block as per drawing. | NO. | 0 |
| (N) | Cable terminations including fixing of cable glands, lugs etc. for each type of control/ power cables, including terminations at both ends. I.R. value between cores and I.R. value with respect to its armouring is to be verified. The continuity of all cores is also to be verified. Both work to be done before connecting cable to the | | |

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| S No. | PARTICULARS | Unit | Qty |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------|
| 1 | 2 | 3 | 4 |
| | terminal block. Making suitable hole in bottom/side plate of C&R panel, AC/DC Board, Marshaling box, CT/PT sec box and CB mechanism box for fixing cable glands in addition to cable gland holes already provided. The hole should be free from burrs. Fixing all cables in respective cable glands and refixing gland plate to its original place. All cable identification plate is to be provided on both ends of each cable. Stripping of outer insulation cover, armouring etc. of cable, fixing ferrules on each core at both ends. Stripping all cores to suitable length, making eye, crimping terminal lugs (as the case may be) and fixing it to terminal block as per drawing followed by proper bending/ dressing of all cores. | | |
| | Details of cables to be provided: | | |
| a | 2 Core x 2.5 Sq.mm.(Unrmoured) | NO. | 250 |
| b | 4 Core x 2.5 Sq.mm.(Unrmoured) | NO. | 150 |
| c | 8 Core x 2.5 Sq.mm. (Unrmoured) | NO. | 0 |
| d | 12 Core x 2.5 Sq.mm. (Unrmoured) | NO. | 0 |
| e | 19 Core x 2.5 Sq.mm. (Unrmoured) | NO. | 0 |
| f | 2 Core x 2.5 Sq.mm.(Armoured) | NO | 50 |
| g | 4 Core x 2.5 Sq.mm.(Armoured) | NO | 130 |
| h | 12 Core x 2.5 Sq.mm. (Armoured) | NO | 80 |
| i | 19 Core x 2.5 Sq.mm. (Armoured) | NO | 50 |
| j | 4 Core x 4 Sq.mm.(Armoured) | NO | 150 |
| k | 4 Core x 10 Sq.mm.(Armoured) | NO | 130 |
| l | Coaxial Cable | NO. | 0 |
| m | 3.5 Core x 70 /300 Sq.mm.Power Cable | NO. | 0 |
| (n) | Laying of copper cables (armoured/unarmoured) on racks/cable trays/ angle support overhead racks conduits including dressing of cables with accessories for copper conductor & armoured control cables. | | |
| | Details of cables to be provided are as under: | | |
| a | 2 Core x 2.5 Sq.mm. (Unrmoured) | Mtr. | 5000 |
| b | 4 Core x 2.5 Sq.mm. (Unrmoured) | Mtr. | 3000 |
| c | 8 Core x 2.5 Sq.mm. (Unrmoured) | Mtr. | 0 |
| d | 12 Core x 2.5 Sq.mm. (Unrmoured) | Mtr. | 0 |
| e | 19 Core x 2.5 Sq.mm. (Unrmoured) | Mtr. | 0 |
| f | 4Core 4 Sq.mm Armoured | Mtr. | 6000 |
| g | 4Core 10 Sq.mm Armoured | Mtr. | 8000 |
| h | 4Core 2.5 Sq.mm Armoured | Mtr. | 6000 |
| i | 12Core 2.5 Sq.mm Armoured | Mtr. | 6000 |
| j | 19 Core 2.5 Sq.mm Armoured | Mtr. | 8000 |
| k | 2Core 2.5 Sq.mm Armoured | Mtr. | 4000 |
| l | Coaxial Cable | Mtr. | 27000 |
| m | 3.5 Core x 300 Sq.mm.Power Cable | Mtr. | 500 |
| n | Lying of optic Approach cable | Km | 0.5 |

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| S No. | PARTICULARS | Unit | Qty |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|
| 1 | 2 | 3 | 4 |
| O | Erection Testing & commissioning of OFTE including termination of optical Fiber Approach Cables , fixing of jointing Box (splicing),fixing of FODP etc | set | 0 |
| (P) | Erection & Commissioning of 200KVA DG Set | No. | 0 |

SCHEDULE- 11

**QUANTITY FOR ERECTION, TESTING & COMMISSIONING OF
TRANSMISSION LINES**

| S. No. | PARTICULARS | Unit | Qty |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------|----------|------|
| 1 | 2 | 3 | 4 |
| 1 | Soil Investigation charges | No. | 0 |
| 2 | Detail Survey | Kms. | 3 |
| 3.1 | Check survey (required for verification of detailed survey for DCSS/DCDS line) | Kms. | 3 |
| 3.2 | Check survey (required for verification of shortages on towers & ground clearances, tree counting, TFR measurement etc.) | Kms. | 0 |
| 4 | Foundation work for Towers | | |
| 4.1 | Excavation for foundation work including dewatering shoring-shuttering backfilling etc. | | |
| (i) | Dry soil | Cum. | 378 |
| (ii) | Wet soil | Cum. | 881 |
| (iii) | Soft rock | Cum. | 4536 |
| (iv) | Hard rock | Cum. | 0 |
| 4.2 | Setting of Template & Stub : | | |
| (i) | Setting of Template & Stub (Special River Crossing tower) | Per Loc. | 0 |
| (ii) | Setting of Template & Stub (220kV MC Type towers) | Per Loc. | 0 |
| (iii) | Setting of Template & Stub (132kV MD Type towers) | Per Loc. | 0 |
| (iv) | Setting of Template & Stub (400kV NFD Type towers) : | | |
| a | NFD0 Type towers | Per Loc. | 2 |
| b | NFD0+20M Type towers | Per Loc. | 0 |
| c | NFD30 Type towers | Per Loc. | 0 |
| d | NFD60 Type towers | Per Loc. | 7 |
| e | NFD60+20/35M Type towers | Per Loc. | 1 |
| (v) | Setting of Template & Stub (220kV B Type towers) : | | |
| a | B0 type tower | Per Loc. | 0 |
| b | B30 type tower | Per Loc. | 0 |
| c | B60 type tower | Per Loc. | 0 |
| (vi) | Setting of Template & Stub (132kV E-type / ND-Type towers) | | |
| a | E0 / ND0 type tower | Per Loc. | 0 |
| b | E30 / ND30 type tower | Per Loc. | 0 |
| c | E60 / ND60 type tower | Per Loc. | 0 |
| 4.3 (A) | Earthing of tower at all the four legs | Per Loc. | 10 |
| 4.3 (B) | Earthing of Gantry Column by providing two earth sets | Per Loc. | 0 |
| 4.4 | Cost of Concreting (1:1½:3) including back filling, muffing, coaping & curing including cost of material (cement, metal, sand etc.) | Cum. | 1047 |
| 4.5 | Cost of Concreting (1:2:4) including back filling, muffing, coaping & curing including cost of material (cement, metal, sand etc.) | Cum. | 0 |
| 4.6 | Cost of Concreting (1:3:6) including cost of material (cement, metal, sand etc.) | Cum. | 198 |
| 4.7 | Cost of laying reinforcement steel including cost of material (steel, binding wire etc) | MT | 77 |

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| S. No. | PARTICULARS | Unit | Qty |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------|
| 1 | 2 | 3 | 4 |
| 5 | Tower Erection | | |
| (i) | Erection of super structure for double circuit normal tower/ Multicircuit tower/ Gantry Structure including all work above ground level including tightening, punching of bolts & nuts. | MT | 270 |
| (ii) | Erection of super structure for Special River Crossing Towers including all work above ground level including tightening, punching of bolts & nuts. | MT | 0 |
| (iii) | All round Peripheral welding of nuts & bolts of conventional towers | Nos. | 35845 |
| (iv) | All round Peripheral welding of nuts & bolts of Special River crossing towers & M/C towers | Nos. | 0 |
| (v) | Fixing of tower accessories like Danger Board, Number plate, Phase plate and Anticlimbing device | Per Loc | 10 |
| (vi) | Fixing of tower accessories like Danger Board, Number plate, Phase plate and Anticlimbing device on Special River Crossing towers | Per Loc | 0 |
| (vii) | Fixing of Phase plate only (in case of 2 nd circuit stringing) | Per Loc | 0 |
| 6 | Stringing: | | |
| (i) | Stringing of Twin Moose ACSR conductor, OPGW & Earth Wire including jointing & hoisting of insulator strings, armour rods dampers and other accessories and final jumpering for complete route kM with: | | |
| a. | 3 Twin Moose bundle conductor (03 bundle cond. per circuit for 01 circuits) on NFD-series towers | Kms. | 0 |
| b. | 6 Twin Moose bundle conductor (03 bundle cond. per circuit for 02 circuits) on NFD- series towers | Kms. | 3 |
| c. | 6 Twin Moose bundle conductor (03 bundle cond. per circuit for 02 circuits) on special river crossing towers | Kms. | 0 |
| d. | EARTH WIRE size 3.66MM, 95KG/SQM quality | Kms. | 3 |
| e. | OPGW | Kms. | 3 |
| f. | 12 CONDT. & EARTH WIRE | Kms. | 0 |
| (ii) | Stringing of Zebra ACSR conductor & earth wire including jointing & hoisting of insulator strings, armour rods dampers and other accessories and final jumpering for complete route kM with : | | |
| a. | 3 CONDT. & OPGW | Kms. | 0 |
| b. | 6 CONDT. & OPGW | Kms. | 0 |
| c. | 12 CONDT. & OPGW | Kms. | 0 |
| (iii) | Stringing of ACSR Panther conductor & earth wire including jointing & hoisting of insulator strings, armour rods dampers and other accessories and final jumpering for complete route kM with : | | |
| a. | 3 CONDT. & OPGW | Kms. | 0 |
| b. | 6 CONDT. & OPGW | Kms. | 0 |
| c. | 12 CONDT. & OPGW | Kms. | 0 |
| (iv) | Second circuit stringing with 3 Power conductors (ACSR Zebra) while first circuit is charged. | Kms. | 0 |
| (v) | Second circuit stringing with 3 Power conductors (ACSR Panther) while first circuit is charged. | Kms. | 0 |
| (vi) | Stringing: OPGW with one ckt. live (for replacement of E/W) | Kms. | 0 |
| 7 | MISCELLANEOUS WORKS : | | |
| (i) | Excavation (for tower site leveling and revetment work). | | |
| | (a) Dry soil | Cum. | 75 |
| | (b) Wet soil | Cum. | 75 |
| | (c) Soft rock | Cum. | 150 |
| | (d) Hard rock | Cum. | 0 |

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| S. No. | PARTICULARS | Unit | Qty |
|---------------|---------------------------------------------------------------------------------------------------|------------------|------------|
| 1 | 2 | 3 | 4 |
| (ii) | (a) Cost of building revetment with stones with 1:5 cement mortar per Cum of stone masonry. | Cum. | 60 |
| | (b) Cost of top seal cover of revetment wall with 1:2:4 mix concrete. | Cum. | 2 |
| | (c) Back filling and levelling of the volume enclosed by revetment walls in Cum. | Cum. | 15 |
| | (d) Cost of concrete 1:3:6 mix required for base padding including all material including cement. | Cum. | 6 |
| (iii) | (a) Erection of counterpoise earthing including all material, excavation and back filling. | Per laying Meter | 0 |
| | (b) Cost of providing additional earthing at the each counterpoise wire incl.cost of material. | Per Loc. | 0 |
| 8 | Dismantling of towers | MT | 81 |
| 9.1 | De-stringing: DCSS line | Km | 0 |
| 9.2 | Dismantling: DCSS line | Km | 0.4 |
| 9.3 | Dismantling: Earthwire with one circuit live | Km | 0 |
| 10 | Transportation of dismantled material | MT | 84 |

SCHEDULE-12A
COMPLETION SCHEDULE FOR SUPPLY OF PLANTS, EQUIPMENTS
& OTHER MATERIALS

be submitted separately for each work supported with Bar Chart

| S. No. | Description of work | Period in weeks from the effective date |
|------------|-----------------------------------------------------------|-----------------------------------------|
| [A] | Proto type of substation structures | |
| i. | 400 kV | |
| ii. | 220 kV | |
| iii. | 132 kV | |
| iv. | 33 kV | |
| [B] | Supply of sub-station structures | |
| i. | 400 kV | |
| ii. | 220 kV | |
| iii. | 132 kV | |
| iv. | 33 kV | |
| [C] | Supply of indoor equipments along with accessories | |
| i. | 400 kV | |
| ii. | 220 kV | |
| iii. | 132 kV | |
| iv. | 33 kV | |
| [D] | Supply of outdoor equipments along with accessories | |
| i. | 400 kV | |
| ii. | 220 kV | |
| iii. | 132 kV | |
| iv. | 33 kV | |
| [E] | Supply of earthing materials | |
| i. | Supply of 40 MM round bars | |
| ii. | MS FLAT (75X8 MM) | |
| iii. | MS FLAT (50X6 MM) | |
| iv. | Hot dip galvanized earthing rods 25 mm dia, 3 Mtr length. | |

Date:

Signature:

Name:

Seal:

SCHEDULE- 12B
COMPLETION SCHEDULE FOR CIVIL, ERECTION TESTING & COMMISSIONING OF SUB-STATION AND FEEDER BAYS

To be submitted separately for each work supported with Bar Chart

| S. No. | Description of work | Period in weeks from effective date | |
|------------|---------------------------------------------------------------------------------------------------------|-------------------------------------|------------|
| | | Commencement | Completion |
| [A] | Civil work: | | |
| i. | Control room | | |
| ii. | Structure/equipment foundations | | |
| iii | Cable trenches | | |
| iv | Yard area fencing | | |
| v | Yard leveling, metaling/ construction of BMW road/ culvert | | |
| [B] | Erection of structure: | | |
| i. | Gantry column | | |
| ii. | Gantry beam. | | |
| iii | Erection of Equipment structure, Busbar and gantry structure & Earth wire stringing. | | |
| iv | Erection of bus bar and its auxiliaries including commissioning from the date of receipt of Transformer | | |
| v | Equipments. | | |
| vi | Erection of Outdoor Equipments and Inter connection of equipment including jumpering. | | |
| vii | Erection of Indoor Equipments including A/C, D/C board, Battery & Battery charger C&R Panels etc. | | |
| viii | Laying of control cable & its termination | | |
| ix | Laying of earth mat & risers | | |
| x | Erection of Transformer | | |
| xi | Testing & Commissioning | | |

Date:

Signature:

Name:

Seal :

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SCHEDULE- 12C

**COMPLETION SCHEDULE FOR ERECTION TESTING AND COMMISSIONING
OF TRANSMISSION LINES**

(be submitted separately for each work supported with Bar Chart)

| S. No. | Description of work | Period in months from Effective date |
|-------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| 1 | Opening of site office & store | |
| 2 | Detailed/Check survey | |
| a | Commencement | |
| b | Completion | |
| 3 | Inspection of proto assemblies. | |
| a | Commencement | |
| b | Completion | |
| 4 | Manufacturing and supply of stub & cleats | |
| a | Commencement | |
| b | Completion | |
| 5 | Manufacturing and supply of tower parts | |
| a | Commencement | |
| b | Completion | |
| 6 | Supply of Conductor, Earth wire, disc Insulators, Hardware & Accessories for Conductor & Earth wire | |
| a | Commencement | |
| b | Completion | |
| 7 | Foundation of towers | |
| a | Commencement | |
| b | Completion | |
| 8 | Erection of towers | |
| a | Commencement | |
| b | Completion | |
| 9 | Stringing | |
| a | Commencement | |
| b | Completion | |
| 10 | Pre commissioning | |
| a | Commencement | |
| b | Completion | |
| 11 | Final commissioning | |

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SCHEDULE-13

LIST OF TOOLS AND PLANTS AVAILABLE FOR CONSTRUCTION OF FACILITIES

Under this schedule, list of tools and plants required for execution of various activities excavation, structure foundation, concreting and erection, testing & commissioning etc. available with the Contractor should be indicated.

| S. No. | Name of activity | List of tools and plants with quantity. |
|-------------------|-------------------------|------------------------------------------------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Date:

Signature:

Name:

Seal :

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SCHEDULE - 14

COMMERCIAL QUESTIONNAIRE

Note: Bidders may please note that submission of this questionnaire duly and properly filled in is essential. Non-submission of this document duly filled in will make the bid non-responsive. It may be noted by the bidders that all replies should be clear and affirmative without any confusion and without mentioning that the cross reference may be made to the bid document submitted by the bidder. To clarify, the details furnished in this questionnaire should be clear and complete in itself. Bidders have to be careful in furnishing all details clearly in this questionnaire.

1. (a) Name and address of Bidder
(b) Contact Person(s)
(c) Contact Nos.
2. Whether copy of following documents (duly validated) has been furnished;
 - (i) "A" Class Electrical contractor certificate:
 - (ii) EPF Account No:
 - (iii) GST Registration No:
3. Please indicate whether bidder has participated on individual basis or Joint Venture (JV) basis.
4. (a) In case of participation on JV basis, please indicate the name, address & other details of Lead Partner and also of Member Partners of the JV.

(b) Name, designation & contact nos. of authorised signatory of JV.
5. Please refer clause ITB 1.1 Section-II Bid Data Sheet and confirm that you have noted the details of works. Please also confirm that you have participated for the complete scope of Bid. The bid received for a part of total scope of work covered under Bid, shall be treated as non-responsive.
6. Please refer Section-II Bid Data sheet clause ITB 4.1 and confirm that in case of participation in the Bid on JV basis,
 - (a) All parties/ partners shall be jointly and severally liable.
 - (b) Supporting legal documents and Power of Attorney have been enclosed

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- (c) The Lead Partner has signed each & every document in the bid submitted.
 - (d) The Lead Partner shall be responsible for timely execution & completion of all the activities according to the Bid Document.
 - (e) An agreement for authorizing one partner to act as Lead partner in prescribed format (form of power of attorney for Joint Venture enclosed in Section-IV have been provided with the bid).
 - (f) Once contract is awarded on a company participating as Joint Venture concern, it may be explicitly noted that leader of the Joint Venture after award of contract shall not be permitted to change his status or any of the responsibilities on the basis of which the leader of Joint Venture has participated against bid invitation.
7. Please confirm that you have gone through all the requirements conditions stipulated under ITB 7.1 to 7.6 of Section-II Bid Data Sheet have been furnished with the Bid.
 8. Please confirm that all documents as per ITB11.1 (1) of Section-II Bid Data Sheet have been furnished with the Bid and uploaded in the web site as per the procedure and steps of E-Tender portal stipulated therein.
 9. In accordance with ITB 13.1, Section-II, Bid Data Sheet alternative bid are not permitted, please confirm that you have noted and bid has been submitted accordingly.
 10. In accordance with ITB 13.2, Section-II, Bid Data Sheet alternative to the Time Schedule are not permitted, please confirm that you have noted and bid has been submitted accordingly.
 11. In accordance with ITB 13.4, Section-II, Bid Data Sheet alternative technical solutions are not permitted, please confirm that you have noted and bid has been submitted accordingly.
 12. Please confirm that in compliance to ITB 16.1(b), Section-II, Bid Data Sheet, spare

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parts shall be made available for 5 years of time the Goods are expected to be functioning.

13. Please confirm that you have noted and agreed to stipulations made in ITB 18.4, Section-II, Bid Data Sheet.
14. Please refer Section-II, Bid Data Sheet, ITB 18.5 (a), (b) (Incoterm) & (c) and confirm that you have noted and agreed to stipulations made there in and your bid is based on the requirement.
15. Please refer clause ITB 18.7(a) Section-II Bid Data Sheet and confirm that the offered prices of for all items of supply of Plants (except the prices of Power Transformer, Reactor, Circuit Breakers, Control & Relay Panels, Tower and Substation Switchyard Structures) and each activity of civil works & Installation Services are FIXED. The prices of Circuit Breakers, Control & Relay Panels and Substation Switchyard Structures are adjustable/ variable. In case of any deviation in the above, the bid shall be treated as non-responsive.
16. Please refer clause ITB 19.1 Section-II Bid Data Sheet and confirm that you have noted the conditions mentioned therein;
 - (a) Indicate currency of bid for supply of Plants
 - (b) Indicate currency of bid for civil works & Installation Services
17. Please refer clause ITB 20.1 Section-II Bid Data Sheet and confirm that the bid validity period shall be 150 days. In case, validity is found to be short, bid will be rejected.
18. (a) Please confirm that the requirement of bid security to be furnished as given in Section-II the Bid Data Sheet clause ITB 21.1 has been noted & accepted, and bid security for correct amount has been furnished.
 - (b) Please indicate in which form Bid Security is submitted.
 - (c) In case Bank Guarantee (BG) is submitted towards bid security please confirm that the same has been issued by a reputed Bank.

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(d) Please confirm that validity of bid security is 178 days i.e., 150 days (validity period from the date of bid opening) plus 28 days (to sign the contract agreement). In case, validity is found to be short, bid will be rejected.

(e) Please confirm that you have noted that, in case any discrepancy is noticed in the amount of bid security mentioned in figures and in words, the amount mentioned in words shall be considered to verify adequacy of bid security.

19. Please confirm that bid in two copies (Original + 1) have been submitted as per as per ITB 22.1.
20. Please refer clause ITB 23 Section-II Bid Data Sheet and confirm that you have noted & accepted the methodology for Submission of Bid.
21. Please confirm you have noted that conditional bid of any nature is not acceptable & in case any condition has been mentioned by you, the same may be specified here.
22. Please confirm that all details and the conditions mentioned in the Section-I & Section-II of Volume-I have been carefully gone through, noted & accepted to you.
23. Please refer clause 1.1 'Technical Evaluation' of Section-III & confirm that the conditions mentioned therein have been noted in regard to the minimum required technical level for the Goods/plants and Services and shall be evaluated on a pass-fail system with minimum acceptable level.
24. Please refer clause 1.2 'Economic Evaluation' of Section-III & confirm that the conditions mentioned therein have been noted & accepted to you.
25. Please refer clause 1.2.1 of Section-III & confirm that the conditions mentioned therein have been noted & agreed to, also in regard to loading for all quantifiable nonmaterial nonconformities or omissions (minor omissions or missing items).
26. Please refer clause 1.2.3 of Section-III & confirm that the conditions mentioned therein have been noted in regard to time

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for completion as also specified in Section-IX (**Appendix 4 of Contract Agreement**).

27. Please confirm that the conditions mentioned in clause 1.2.3 of Section-III have been noted & accepted in regard to bids offering late contract time schedule and Deviation from terms of payment will be treated as non-responsive.
28. Please refer clause 2.1 'Eligibility' of Section-III & confirm that the conditions mentioned therein have been noted & agreed.
29. Please specifically confirm condition of History of non-performing Contracts & litigation as per clause 2.2 of Section-III has been noted, agreed by you and necessary documentation has been given.
30. Please refer clause 2.3 'Financial Situation' of Section-III & confirm that the conditions mentioned therein have been noted, agreed and necessary documentation to this effect has been submitted as per prescribed format.
31. Please refer clause 2.4.1 & 2.4.2 of Section-III & confirm that the conditions mentioned therein have been noted, agreed and necessary documentation to this effect has been submitted.
32. Please refer clause 2.6 of Section-III and confirm that (a) you have noted & agreed to our requirements of losses of Transformer & Reactor for performance and productivity of equipment. Bids offering with losses in excess of ceiling limit mentioned therein shall be treated as non-responsive and rejected.
33. Please confirm that all details and the conditions mentioned in the Section-III of Volume-I have been carefully noted by you.
34. Please confirm Letter of Technical Bid in prescribed format, duly filled of Section-IV of Volume-I have been submitted.
35. Please confirm Letter of Price Bid in prescribed format, duly filled of Section-IV of Volume-I have been submitted.
36. Please confirm Schedule-1, 2, 3, 4, 5, 6 & Schedule-7 have been submitted as per conditions mentioned therein.

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37. Please confirm for the purpose of offering prices, you have strictly followed the Schedules/ formats furnished under Section-IV without any deviation. Please confirm you have noted that no modification in the proforma is to be done.
38. Please confirm that all requirement of Section-IV have been carefully noted by you.
39. Please refer clauses for Scope of works, Safety Plan, Equipment, Experience requirement for manufacturer, Bar Charts, Labour Laws, Protection of Environment, Safety Precautions & Conditions of Non Responsiveness of Bids etc of Section-6 "Employer's Requirement" of Volume-I & confirm that the details mentioned therein regarding have been noted & agreed.
40. Please confirm you have noted all conditions detailed under clause 1 'Definition' of Section-VIII "Particular Conditions of Contract".
41. Please confirm you have noted that the Contract shall be governed by and interpreted in accordance with laws of Union of India as stipulated under clause 5.1 of Section-VIII "Particular Conditions of Contract".
42. As stipulated under clause 8.1 of Section-VIII "Particular Conditions of Contract", Please confirm, you have noted that you shall commence work on the Facilities as specified in the Contract Agreement.
43. Time for Completion of the whole of the Facilities shall be the essence of the contract. Please refer clause 8.2 of Section-VIII "Particular Conditions of Contract" & confirm that the total completion period is acceptable to you.
44. Please refer clause 13 'Securities' of Section-VIII "Particular Conditions of Contract" of Volume-I and confirm that condition stipulated therein are noted & agreed to you.
45. Please confirm you have noted all conditions mentioned under clause 14 'Taxes and Duties' of Section-VIII "Particular Conditions of Contract" of Volume-I.
46. Please refer clause 18 'Work Program' of Section-VIII "Particular Conditions of

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Contract” of Volume-I and confirm that condition stipulated therein are noted & agreed to you.

47. Please confirm you have noted all conditions mentioned under clause 21 of Section-VIII “Particular Conditions of Contract” of Volume-I, regarding customs duty.
48. Please confirm you have noted all conditions mentioned under clause 22 of Section-VIII “Particular Conditions of Contract” for carrying out various activities for execution of work based on approved design and other details given in technical specification.
49. Please confirm you have noted all conditions mentioned under clause 22.2.1 of Section-VIII “Particular Conditions of Contract” regarding use of contract labour for carrying out various activities for execution of work.
50. Please confirm you have noted & agreed for all conditions mentioned under clause 26 “Completion Time Guarantee” of Section-VIII “Particular Conditions of Contract”.
51. Please confirm you have noted & agreed for all conditions mentioned under clause 27 of Section-VIII “Particular Conditions of Contract” regarding Defect Liability of the facility.
52. Please confirm you have noted & agreed all conditions mentioned under clause 39 “Change in Facility” of Section-VIII “Particular Conditions of Contract”.
53. Please confirm you have noted & agreed for all conditions mentioned under clause 45 “Disputes and Arbitration” of Section-VIII “Particular Conditions of Contract”.
54. Please confirm that all requirement of Section-VIII have been carefully noted by you.
55. Please confirm that ‘Terms and Procedure for Payment’ as per Appendix-1 of Section-IX, without any deviation is acceptable to you. Please note in case any deviation; your bid will be treated as non-responsive.
56. Please confirm that ‘Price Adjustment’ as per Appendix-2 of Section-IX, without any

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deviation is acceptable to you. Please note in case any deviation; your bid will be treated as non-responsive.

57. Please confirm that 'Insurance Requirements' as per Appendix-3 of Section-IX is acceptable to you.
58. Please confirm that 'Time Schedule' as per Appendix-4 of Section- IX, without any deviation is acceptable to you.
59. Please confirm that all requirement of Section- IX have been carefully noted by you.
60. Please confirm you have furnished required Form of Undertaking by the Joint Venture Partners or similar instrument in line with Format prescribed in Section-IV.
61. Please confirm you have furnished required notarized Power of Attorney for authorized signatory or similar instrument in line with Format prescribed in Section-IV.
62. Please confirm that all details and requirements of Section-I, II, III, IV, V, VI, VII, VIII & IX of Volume-I and conditions mentioned in Volume-II to Volume-VI of Bid document have been carefully noted & agreed to you.

Date:

Signature:

Name:

Seal:

SCHEDULE- 15

DEVIATION FROM TERMS & CONDITIONS OF BID DOCUMENT

The bidder shall state under this schedule, how his offer deviates, varies or departs from the Employer's Specification.

| S. No. | Subject | Employer's Specification Clause reference and page | Proposed deviation by the bidder | Reasons for such deviations |
|--------|---------|----------------------------------------------------------|----------------------------------------|-----------------------------------|
| 1. | 2. | 3. | 4. | 5. |

Date:

Signature:

Name :

Status :

Seal :

IT MAY BE NOTED THAT IN CASE OF ANY DEVIATIONS, EMPLOYER RESERVES THE RIGHT TO REJECT THE BID IN WHICH CASE PRICE BIDS OF SUCH BIDDERS WILL NOT BE OPENED THEREFORE THE BIDDERS SHOULD FURNISH THEIR OFFER EXACTLY IN LINE WITH ALL OUR BID CONDITIONS PROVIDED THEY QUALIFY AS PER REQUIREMENT SPECIFIED IN THE SPECIFICATION.

SCHEDULE- 16

QUALITY ASSURANCE PROGRAMME

The Bidder shall submit here complete details of Quality Assurance Program required as per terms of the Specification.

Date:

Signature :

Name :

Designation:

Seal :

SCHEDULE – 17

**UNDER TAKING FOR CONFIRMATION IN REGARD TO
GUARANTEED TECHNICAL PARTICULARS OF EQUIPMENTS
(Including 400KV Reactor and Power Transformer)**

- (i) We have noted all the technical requirements and make of various plants/equipments/materials to be supplied against this tender. We have also noted that the plants/equipments/materials, as per the list of ANNEXURE –1(A) "LIST OF PREFERRED EXPERIENCED MANUFACTURERS FOR EQUIPMENTS" are acceptable to EMPLOYER.

We hereby confirm that we will supply the plants/equipments/materials meeting all the technical requirement and of make as per the list given in Annexure-1 or otherwise we shall supply the plants/ equipments/ materials complying all the criteria prescribed in the tender document such as experience/ performance/ supply capacity/ type test/ technical & guaranteed particulars etc. We shall furnish all necessary particulars/ details in this respect to analyze and take a decision for acceptance of alternative make equipment by EMPLOYER.

The decision of EMPLOYER in this regard shall be final and binding on us. We further confirm that in case the alternative make equipment is not acceptable to EMPLOYER, we shall supply the equipment from the preferred experienced manufacturers only indicated in Annexure-1.

Date:

Signature :

Name :

Seal :

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SCHEDULE- 18

Progress of works being executed for Employer

| S.No. | Name of Work | Target as per contract | Progress as on last day of month one month prior to the date of opening |
|--------------|---------------------|-------------------------------|--------------------------------------------------------------------------------|
| | | | |
| | | | |
| | | | |
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| | | | |

**Signature of Authorised
Signatory with seal
of the Company**

Place:-

Date:-

SCHEDULE – 19

IMPORTANT TECHNICAL PARTICULARS OF 400KV 125MVAR SHUNT REACTORS AND POWER TRANSFORMERS

(A) 400KV 125MVAR SHUNT REACTORS

| S. No. | Particulars | Offered Make 1 (name of manufacturer) | Offered Make 2 (name of manufacturer) | Offered Make 3 (name of manufacturer) |
|--------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|
| | | | | |
| 1 | Maximum Losses (at rated output, rated voltage and rated frequency at 75°C) (max ceiling limit 185KW) | | | |
| | Values | | | |

(B) 400KV 315MVA POWER TRANSFORMERS

| S. No. | Particulars | Offered Make 1 (name of manufacturer) | Offered Make 2 (name of manufacturer) | Offered Make 3 (name of manufacturer) |
|---------------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|
| | | | | |
| Values | | | | |
| 1 | Losses (at rated output, rated voltage and rated frequency at 75°C) | | | |
| | a. No load Losses (KW) (max ceiling limit 70 KW) | | | |
| | b. Load Losses including stray losses (KW) | | | |
| | c. Auxiliary losses (KW) | | | |
| | d. Load including Stray Losses + Aux. Losses (i.e total losses – no load losses) (KW) (max ceiling limit 425KW) | | | |
| 2 | Impedance voltage (Percentage) | | | |

Signature of Authorised Signatory with seal of the Company

Place:-

Date:-

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SCHEDULE- 20
CHECK LIST

| S. No. | Items | Reference | Declaration strike out whichever not applicable |
|---------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------|
| 1. | Bid Security and Cost of the Bid document (if downloaded the document) enclosed in Technical Bid | | Yes/No |
| 2. | Letter of Technical Bid enclosed duly filled in | | Yes/No |
| 3. | Price Schedules enclosed in separate envelope | Schedule-1 to 7 (Section IV, Volume-I) | Yes/No |
| 4. | Details of Nationality in accordance with ITB Sub-Clause 4.2, Volume-I of Bid document and compliance to ITB Sub-Clause 4.5. | Forms ELI - 1; ELI – 2 (Section IV, Volume-I) with attachments | Yes/No |
| 5. | JICA Eligibility (Not having been declared ineligible by JICA, as described in ITB Sub-Clause 4.4.) | Letter of Bid and Form ACK (Section IV, Volume-I) with attachments | Yes/No |
| 6. | Historical Poor Performance of Bidders | Form CON (Section IV, Volume-I) with attachments | |
| 7. | Details of Pending Litigation | Form CON (Section IV, Volume-I) with attachments | Yes/No |
| 8. | Financial data for last 5 Years | Form FIN-1 (Section IV, Volume-I) | Yes/No |
| 9. | Average annual turn Over | Form FIN-2 (Section IV, Volume-I) | Yes/No |
| 10. | Financial resources | Form FIR-1 (Section IV, Volume-I) | Yes/No |
| 11. | Current Contract Commitments | Form FIR-2 (Section IV, Volume-I) | Yes/No |
| 12. | Qualification & Experience Criteria (For transmission lines) | Form EXP-1, EXP-2(a), EXP-2(b) (Section IV, Volume-I) | Yes/No |
| 13. | Completion Schedules | Schedule-12A, 12B, and 12-C | Yes/No |
| 14. | List of tools and plants available for construction of facilities | Schedule-13 | Yes/No |
| 15. | Commercial Questionnaire | Schedule-14 | Yes/No |
| 16. | Deviation from terms & conditions of Bid Document | Schedule-15 | Yes/No |
| 17. | Quality Assurance Plan | Schedule-16 | Yes/No |
| 18. | Under taking for confirmation in regard to guaranteed technical particulars of equipments and Power Transformers | Schedule-17 | Yes/No |
| 19. | Progress of works being executed for Employer | Schedule-18 | Yes/No |
| 20. | Important Technical Particulars of 400kV 125MVAR Shunt reactors and Power Transformers | Schedule-19 | Yes/No |

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ANNEXURE -1

LIST OF PREFERRED EXPERIENCED MANUFACTURERS FOR OTHER EQUIPMENTS

| S.No. | Equipment | Approved Makes |
|-------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------|
| 1 | 400 KV Power Transformer | BHEL/CGL /EMCO/TELK/ALSTOM/ABB |
| 2 | 400 KV Reactor | BHEL/ ALSTOM/ CGL |
| 3 | 220 KV Power Transformer | BHEL/BBL/EMCO /CGL /TELK/ALSTOM/ABB |
| 4 | 132 KV Power Transformer | BHEL/BBL/EMCO /CGL /TELK/ALSTOM/ABB |
| Circuit Breakers | | |
| 5 | 400KV SF6 | ABB/ALSTOM/ SIEMENS |
| | 220KV SF6 | ABB/ ALSTOM / CGL/ SIEMENS |
| | 132KV SF6 | ABB/ ALSTOM / CGL/Siemens |
| | 33KV Vacuum | BHEL/ ABB/ MEGAWIN/ ALSTOM / CGL/ ANDREW YULE/ STELMEC |
| C&R Panels | | |
| 6 | 400KV & 220KV | ABB/ VENSON/ ALSTOM /GE |
| | 132KV | ABB/ VENSON/ ALSTOM /GE/ UNIVERSAL CONTROLS/SIEMENS/DANISH/MAKTEL |
| | 33KV | HERTZ/ SYSTEM/ VENSON/ MAKTEL/ GE/ ALSTOM /ABB/ POPULAR/ UNIVERSAL CONTROLS/AARTEK SOLONIKS/ DANISH |
| Instrument Transformer | | |
| 7 | 400 KV Current Transformer | BHEL/ABB/ALSTOM/TELK/CGL |
| | 220 KV Current Transformer | ABB/BHEL /TELK/ ALSTOM/MEHRU/CGL |
| | 132 KV Current Transformer | ABB/BHEL /TELK/ MEHRU/ HEPTACARE/CGL |
| | 33 KV Current Transformer | UNIVERSAL /VISHAL/ LAMCO/ LAXMI ENGG /AMBARNATH / HEPTACARE/MEHRU/VIDYUT |
| | 400 KV CVT | BHEL / ABB / ALSTOM / CGL/SIEMENS |
| | 220 KV CVT | BHEL / ALSTOM / CGL/SIEMENS/ABB |
| | 220 KV Potential Transformers | BHEL/ CGL /MEHRU |
| | 132 KV Potential Transformers | BHEL / MEHRU / CGL/HEPTACARE |
| | 33 KV Potential Transformers | UNIVERSAL / VISHAL / LAMCO / AMBARNATH / LAXMI ENGG/ HEPTACARE/MEHRU/VIDYUT/ KAPCO |
| | Lightning Arrester | |
| 8 | 390 KV | OBLUM/ CGL / LAMCO / ELPRO |
| | 198 KV | OBLUM/ CGL / LAMCO/ ELPRO |
| | 120 KV | OBLUM/ CGL / LAMCO/ ELPRO |
| | 30 KV | OBLUM/ CGL / LAMCO/ ELPRO |
| Isolators | | |
| 9 | 400 KV | HIVELM / SIEMENS / BIMCO/SWITCHGEAR & STRUCTURALS /CGL/ALSTOM |

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| S.No. | Equipment | Approved Makes |
|--------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | 220 KV | HIVELM / GR POWER / STERLING / SWITCHGEAR & STRUCTURALS/ ELEKTROLITES / UNIVERSAL / BIMCO/SIEMENS/ CGL/ALSTOM |
| | 132KV | GR POWER / UNIVERSAL / STERLING / BIMCO/ELEKTROLITES /SIEMENS/ SWITCHGEAR & STRUCTURALS / ALSTOM/CGL |
| | 33 KV | ELEKTROLITES / G.NANDY / GR POWER / ROMA / UNIVERSAL / SIEMENS/ SWITCHGEAR & STRUCTURALS /RAMA ENGG/ CGL/ ALSTOM |
| | Solid Core Insulators | |
| 10 | 400 KV | WS INDUSTRIES/ADITYA BIRLA / MODERN/SARAVANA/ BHEL/IEC |
| | 220 KV | WS INDUSTRIES / ADITYA BIRLA / MODERN / IEC/ SARAVANA/ BHEL |
| | 132 KV | WS INDUSTRIES/ADITYA BIRLA /IEC/MODERN// SARAVANA/ BHEL |
| | 33 KV | WS INDUSTRIES / ADITYA BIRLA / MODERN/ IEC/ SARAVANA/ BHEL |
| | Coupling Capacitor | |
| 11 | 132KV | CGL/ABB/AREVA/BHEL/SIEMENS/ ENERGY CAPACITORS |
| | Wave Traps | |
| 12 | 400 KV | ALSTOM /BPL / ABB |
| | 220 KV | ALSTOM /BPL / ABB |
| | 132KV | ALSTOM /BPL/ ABB/ QUALITY |
| | Power Line Carrier Communication Equipments | |
| 13 | Carrier Cabinet | ABB / BPL / PUNCOM |
| | Protection Coupler | ABB / BPL / ALSTOM /PUNCOM |
| | Coupling Devices | ABB / BPL / ALSTOM |
| | EPAX & Telephone sets | |
| 14 | EPAX | MATRIX / BPL / INTELLICON |
| | Telephone sets | BPL / BEETEL /CGL |
| | Coaxial & Telephone Cables | |
| 15 | Coaxial Cable | RUCHIKA/ALFA COMMUNICATION/ BHANSALI/MAHARAJA/ AJANTA/ KEI |
| | Telephone Cables | RUCHIKA/ALFA COMMUNICATION/BHANSALI /BPL |
| 16 | Station Batteries | EXIDE/ TEJA/ POWER BATTERIES/AAJ |
| 17 | Battery Chargers | HERTZ/ SYSTEM / AZ /ARMO/STATCON |
| 18 | AC/DC Board | HERTZ/ SHRI RAM/ POPULAR/SHREEM |
| 19 | Station Transformer | STAR DELTA/TELAWANE/ARYA/ABB |
| 20 | Junction Boxes | HERTZ/ SHRI RAM/ RMC/ PYROTECH/ POPULAR/ELEKTROCARE |
| 21 | LT Distribution Board | HERTZ/ SYSTEM/ SHRI RAM/ R.K. INDUSTRIES/ RMC /ELEKTROCARE |
| 22 | D.O Fuse | G.K.ELECTRICAL/ELECTROLITE |
| 23 | Lighting Equipments | BAJAJ/ SURYA/ CGL/PHILIPS/HEVELLS |
| 24 | Transmission line towers and Substation Structures | L&T/ GAMMON/ ASSOCIATED POWER/ SHRI ASHUTOSH/ NL ENGINEERS / ASTER / ICOMM/ SUJANA / VARSANA / UNIQUE / VIJAY TRANSMISSION / AMITASHA / GURPREET GALVANISING |
| 25 | MS Flats & MS Round | SAIL/ RINL/ KARAM/ UNIQUE/ PUSHPAK / ANKIT STEEL /KONTINENTAL/ MAHADEVA |

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| S.No. | Equipment | Approved Makes |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| 26 | Copper Control & Aluminium Power Cable | PARAMOUNT/ UNIVERSAL CABLES/ PASONDIA/MAHARAJA/AJANTA/KEI |
| 27 | Clamps & Connectors | PEE VEE/ RASHTRAUDHYOG/ EMI / AFLON/ EXACT/ELECTROMECH/ PRECIECAST /UTSAV |
| 28 | IPS Tube | HINDALCO/ SUDAL/ RASHTRAUDHYOG/ UTSAV |
| 29 | Sag compensating Spring | PIPE HANGERS/ COVENTRY SPRINGS |
| 30 | Hardware FITTINGS | EMI/ IAC/ ERITECH/ RUPL/KTHL/RAJSTHAN TRANSMAT /AUMNI/ TLP |
| 31 | ACSR Conductors | APAR/ STERLITE/ JSK/ HVPNL/ SAVITA/LUMINO |
| 32 | Screening Conductor (Earth Wire) | RATLAM WIRES/ GEEKAY/ BEDMUTHA / UIC UDYOG |
| 33 | OPGW | STERLITE TECHNOLOGIES / LS CABLES |
| 34 | Long Rod Polymer Insulator | ADITYA BIRLA / DECCAN / GOLDSTONE |
| 35 | Disc Insulators | ADITYA BIRLA / WS INDUSTRIES / BHEL / IEC / INDIA POTTERY |
| 37 | GI Bolts & Nuts | AR FASTENRS / REMAX / NEXO /GARG FASTERNERS / ANAND BOLTS/ROSHAN/ RAVI /TECHMAN |
| Note | <p>Make of various equipments and materials indicated above are on the basis of past supplies received by EMPLOYER and also past performance of various suppliers. As a special case, EMPLOYER may also examine and consider to accept alternative make equipments and materials provided that the same are type tested, proven for quality, must have been supplied to other Electricity Boards / PGCIL/ Transmission Utilities and also subject to the condition that the supplier/ manufacturer meets the requirement of experience as per clause-2.7 of Section III Volume-I. In case of some items required in small quantity like rails, lighting fixtures, we may consider procurement from authorised dealers.</p> | |

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ANNEXURE-2

WORK WISE QUANTITY OF EQUIPMENTS AND MATERIALS TO BE SUPPLIED FOR SUBSTATIONS AND FEEDER BAYS (PACKAGE- 6)

| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|----------|-------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------|-------|
| A | 400 KV EQUIPMENTS | | | | | |
| 1 | 400KV SF6 Gas Circuit Breaker With PIR | Nos. | 2 | | | 2 |
| 2 | 400KV SF6 Gas Circuit Breaker Without PIR | Nos. | | 1 | 2 | 3 |
| 3 | 400KV CT (multi core) 2000-1000-500/1-1-1-1-1 Amp. | Nos. | 6 | 3 | 6 | 15 |
| 4 | 400KV Pantograph Isolators (set of three) with ES complete with Structure and insulators | Set | 6 | 3 | 4 | 13 |
| 5 | 400KV Horizontal Centre Break single phase Isolator (set of Three) with ES complete with structure and solid core insulators' | Nos. | | | | 0 |
| 6 | 400KV Horizontal Centre Break three phase Isolator without ES complete with structure and solid core insulators | Nos. | | 2 | 2 | 4 |

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| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|-------------|-------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| 7 | 400KV Horizontal Centre Break three phase Isolator with ES complete with structure and solid core insulator | Nos. | 2 | | | 2 |
| 8 | 400KV Solid Core Insulators for Substation work | Nos. | 60 | 36 | 34 | 130 |
| 9 | 400KV Operating Rod Insulator for Pantograph Isolators | Nos. | 18 | 9 | 12 | 39 |
| 10 | 400KV Capacitive Voltage Transformer | Nos. | 6 | | | 6 |
| 11 | 400kV Wave Trap pedestal mounting with support insulator and structure | Nos. | 4 | | | 4 |
| 12 | 400KV Las | Nos. | 6 | 3 | 3 | 12 |
| 13 | C&R Panel For Transformer | Nos. | | | 1 | 1 |
| 14 | C&R Panel for Feeders | Nos. | 2 | | | 2 |
| 15 | C&R Panel for Bus Coupler | Nos. | | | | 0 |
| 16 | C&R Panel for Bus Tie | Nos. | | | | 0 |
| 17 | C&R Panel for Reactors | Nos. | | 1 | | 1 |
| 18 | 125 MVAR 3 Phase 400KV Shunt Reactor | Nos. | | 1 | | 1 |
| 19 | 145 KV neutral reactor | Nos | | | | 0 |
| 20 | Bus Differential Protection Panel | Nos. | | | | 0 |
| 21 | Telemetry | Nos | | | | 0 |
| | | | | | | |
| B | 220KV EQUIPMENTS | | | | | |
| 1 | Circuit Breaker | Nos. | | | 1 | 1 |
| 2 | 220 KV CT 1200/1-1-1-1-1 Amp. | Nos. | | | 3 | 3 |

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| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|-------------|------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| 3 | 220 KV CT 800/1-1-1-1 Amp. | Nos. | | | | 0 |
| 4 | Isolator (with E/S) (with structure and Solid core Insulator) | Nos. | | | | 0 |
| 5 | Isolator (without E/S) (with structure and Solid core Insulator) | Nos. | | | 4 | 4 |
| 6 | Single phase Isolators (with structure and Solid core Insulator) | Nos. | | | | 0 |
| 7 | LA | Nos. | | | 3 | 3 |
| 8 | Solid Core Insulators for substation work | Nos. | | | 27 | 27 |
| 9 | C&R Panel for Feeder | Nos. | | | | 0 |
| 10 | C&R Panel for BC | Nos. | | | | 0 |
| 11 | C&R Panel for 220 KV Side of 315MVA Transformer | Nos. | | | 1 | 1 |
| 12 | C&R Panel for 220/132kv Transformer | Nos. | | | | 0 |
| 13 | C&R Panel (Bus Tie) | Nos. | | | | 0 |
| 14 | PT | Nos. | | | | 0 |
| 15 | Bus Differential Protection Panel | Nos. | | | | 0 |
| 16 | Synchronization Trolley | Nos. | | | | 0 |
| C | 132KV EQUIPMENTS | | | | | |
| 1 | Circuit Breaker | Nos | | | | 0 |
| 2 | 132KV CT 800/1-1-1 Amp. | Nos. | | | | 0 |
| 3 | 132KV CT 400/1-1-1Amp | Nos. | | | | 0 |
| 4 | 132KV CT 200/1-1-1Amp | Nos. | | | | 0 |
| 5 | Isolator (with E/S) (with structure and | Nos. | | | | 0 |

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| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|-------------|------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| | Solid core Insulator) | | | | | |
| 6 | Isolator (without E/S) (with structure and Solid core Insulator) | Nos. | | | | 0 |
| 7 | Single phase Isolators (with structure and Solid core Insulator) | Nos. | | | | 0 |
| 8 | PT | Nos. | | | | 0 |
| 9 | LA | Nos. | | | | 0 |
| 10 | C&R Panel (for 220/132KV Xmer) | Nos. | | | | 0 |
| 11 | C&R Panel (for 132/33KV Xmer) | Nos. | | | | 0 |
| 12 | C&R Panel (for Feeder) | Nos. | | | | 0 |
| 13 | C&R Panel (for Bus coupler) | Nos. | | | | 0 |
| 14 | Solid Core Insulators for substation work | Nos. | | | | 0 |
| D | 33KV EQUIPMENTS | | | | | 0 |
| 1 | Vacuum Circuit Breaker | Nos. | | | 1 | 1 |
| 2 | 33KV CT 1200/1-1-1-1 Amp. | Nos | | | | 0 |
| 3 | 33KV CT 800/1-1-1-1 Amp. | Nos. | | | | 0 |
| 4 | 33KV CT 400/1-1 Amp | Nos | | | 3 | 3 |
| 5 | 33KV CT 10/1-1 Amp. | Nos. | | | 3 | 3 |
| 6 | NCT | Nos. | | | | 0 |
| 7 | LA 36kV | Nos. | | | 3 | 3 |
| 8 | LA 33kV | Nos. | | | 3 | 3 |
| 9 | PT | Nos. | | | 3 | 3 |

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| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|-------------|-----------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| 10 | Isolator (with E/S) (with structure and Solid core Insulator) | Nos. | | | | 0 |
| 11 | Isolator (without E/S) (with structure and Solid core Insulator) | Nos. | | | 2 | 2 |
| 12 | Isolator (without E/S) 1200 Amps. (with structure and Solid core Insulator) | Nos. | | | | 0 |
| 13 | C&R Panel (for 1T+1F) | Nos. | | | | 0 |
| 14 | C&R Panel (for 3 F) | Nos. | | | | 0 |
| 15 | C&R Panel (for 1 F) | Nos. | | | 1 | 1 |
| 16 | C&R Panel for CAP BANK | Nos. | | | | 0 |
| 17 | Solid Core Insulators for substation work | Nos. | | | 7 | 7 |
| 18 | Solid Core Insulator special set with structures | Nos. | | | | 0 |
| 19 | 36kV 12MVAR Capacitor Bank with structures and accessories(SET) | Nos. | | | | 0 |
| E | TRANSFORMER & ASSOCIATED EQUIP. | | | | | |
| 1 | 315 MVA 400/220/33 KV Auto Transformer (with Oil and associated equipments) | Nos. | | | 1 | 1 |
| 2 | 100MVA 400/132KV Transformer (with Oil and associated equipments) | Nos. | | | | 0 |
| 3 | 160MVA 220/132KV Transformer (with Oil and associated equipments) | Nos. | | | | 0 |
| 4 | 50MVA 220/33KV Transformer (with Oil and associated equipments) | Nos. | | | | 0 |

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| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|-------------|--------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| 5 | 40MVA 132/33KV Transformer (with Oil and associated 51 equipments) | Nos | | | | 0 |
| 6 | Oil filtration Machine (6000 Lt..per Hr.) | Nos. | | | | 0 |
| 7 | Oil filtration Machine (2250 Lt..per Hr.) | Nos | | | | 0 |
| 8 | Oil Storage Tank (10 KL) | Nos. | | | | 0 |
| F | 400KV,220KV & 132KV CARRIER COMMUNICATION EQUIPMENT | . | | | | |
| 1 | Carrier Cabinet With Protection coupler | Nos | 4 | | | 4 |
| 2 | Coupling Devices (LMU) | Nos. | 4 | | | 4 |
| 3 | Carrier Cabinet Without Protection coupler | Nos. | 2 | | | 2 |
| 4 | RTU & Telemetry (SET) | Nos. | | | | 0 |
| 5 | EPAX (32/16) | Nos. | | | | 0 |
| 6 | Telephone Sets | Nos. | | | | 0 |
| 7 | Coaxial Cable | KMs | 1.0 | | | 1 |
| 8(a) | Telephone Cable (10 Pair armoured) | KMs | | | | 0 |
| 8(b) | Telephone Cable (06 Pair armoured) | KMs | | | | 0 |
| 9 | 220kV Wave Trap | Nos. | | | | 0 |
| 10 | 132kV Wave Trap | Nos. | | | | 0 |
| 11 | 220kV CVT | Nos. | | | | 0 |
| 12 | 132kV Coupling Capacitors | Nos. | | | | 0 |
| 13 | Jointing Box (splice enclosure) | Set | 1 | 0 | 0 | 1 |

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| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|--------------|-------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| 14 | Approach Cable | Mtr. | 500 | 0 | 0 | 500 |
| 15 | Fiber optical distribution panel | Nos. | 1 | 0 | 0 | 1 |
| 16 | Terminal equipment for optical fiber | Nos. | 0 | 0 | 0 | 0 |
| 17 | GPS System with accessories (1 Set) | | 0 | 0 | 0 | 0 |
| 18 | CCTV (Electronic Surveillance System) (1 Set) | | 0 | 0 | 0 | 0 |
| (G) | 400 KV, 220kV, 132kV and 33kV Fabricated, Galvanised Steel Structures. | | | | | |
| (G-I) | 400 KV STRUCTURE | | | | | |
| 1 | FGC-1 Column | Nos. | 2 | 2 | 4 | 8 |
| 2 | FBC-2 Column | Nos. | 1 | 1 | 4 | 6 |
| 3 | FBC-1 Column | Nos. | 1 | 1 | | 2 |
| 4 | FGC-2 Column | Nos. | 1 | | 7 | 8 |
| 5 | FTC Column | Nos. | 1 | 1 | | 2 |
| 6 | FBB Beam | Nos. | 2 | 2 | 4 | 8 |
| 7 | FGB-1M Beam | Nos. | | | 4 | 4 |
| 8 | FGB-2 Beam | Nos. | 2 | | | 2 |
| 9 | FTB Beam | Nos. | 1 | | | 1 |
| 10 | Centre Break Isolator Structure | Nos. | | 1 | | 1 |
| 11 | CT Structure | Nos. | 6 | 3 | 6 | 15 |
| 12 | Solid Core Structure | Nos. | 60 | 36 | 34 | 130 |

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| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|---------------|---------------------------------------------------------|------|------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------|----------------|
| 13 | CVT Structure | Nos. | 6 | | 6 | 12 |
| 14 | LA Structure | Nos. | 6 | 3 | 3 | 12 |
| | Sub-Total | | | | | |
| | Total weight of structures (In MT)(GI) | MT | 58.22 | 37.576 | 124.564 | 220.355 |
| | weight of Fondation bolts,Nut bolt & washers | MT | 5.82 | 3.7576 | 12.4564 | 22.036 |
| (G-II) | 220KV STRUCTURE | | | | | |
| 1 | Gantry Column(AAGT) | Nos. | | | 4 | 4 |
| 2 | Gantry Column(AGT) | Nos. | | | 2 | 2 |
| 3 | Gantry Beam(AGB) | Nos. | | | 5 | 5 |
| 4 | Main Busbar Structure(ABM) | Nos. | | | 2 | 2 |
| 5 | Auxiliary Busbar Structure(ABA) | Nos. | | | 1 | 1 |
| 6 | CT Structure | Nos. | | | 3 | 3 |
| 7 | LA Structure | Nos. | | | 3 | 3 |
| 8 | Solid Core Structure | Nos. | | | 15 | 15 |
| 9 | PT/CVT Structure | Nos. | | | | 0 |
| | Sub-Total | Nos. | | | | |
| | Total weight of structures (In MT)(GII) | Nos. | | | 44.066 | 44.066 |
| | weight of Fondation bolts,Nut bolt & washers | Nos. | | | 4.4066 | 4.407 |

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| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|----------------|-------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------------------|--------------|
| (G-III) | 132KV STRUCTURE | | | | | |
| 1 | Gantry Column | Nos. | | | | 0 |
| 2 | Gantry Beam | Nos. | | | | 0 |
| 3 | Main Busbar Structure | Nos. | | | | 0 |
| 4 | Aux. Busbar Structure | Nos. | | | | 0 |
| 5 | CT Structure | Nos. | | | | 0 |
| 6 | LA Structure | Nos. | | | | 0 |
| 7 | Solid Core Structure | Nos. | | | | 0 |
| 8 | Isolator Structure | Nos. | | | | 0 |
| 9 | Coupling Capacitor | Nos. | | | | 0 |
| 10 | PT Structure | Nos. | | | | 0 |
| | Sub-Total | | | | | 0 |
| | Total weight of structures (In MT)(G-III) | | | | | 0 |
| | weight of Fondation bolts,Nut bolt & washers | | | | | 0 |
| (G-IV) | 33KV STRUCTURE | | | | | |
| 1 | Gantry Column | Nos. | | | 6 | 6 |
| 2 | Gantry Beam | Nos. | | | 3 | 3 |
| 3 | Main Busbar Structure | Nos. | | | | 0 |

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| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|--------------|-------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| 4 | Aux. Busbar Structure | Nos. | | | 3 | 3 |
| 5 | CT/NCT Structure | Nos. | | | 7 | 7 |
| 6 | LA Structure | Nos. | | | | 0 |
| 7 | Isolator Structure | Nos. | | | | 0 |
| 8 | PT Structure | Nos. | | | | 0 |
| 9 | Solid Core Structure | Nos. | | | | 0 |
| | Sub-Total | | | | | |
| | Total weight of structures (In MT) (G-IV) | MT | | | 1.653 | 1.653 |
| | weight of Fondation bolts,Nut bolt & washers | MT | | | 0.1653 | 0.165 |
| (G-V) | Total weight of Fondation bolts,Nut bolt & washers | MT | 5.82 | 3.75 | 17.02 | 26.59 |
| | Total weight of structures (In MT) G(I)+G(II)+G(III)+G(IV) | MT | 58.22 | 37.58 | 170.28 | 266 |
| H | BUSBAR, EARTHING MATERIAL | | | | | |
| 1 | ACSR Moose Conductor | Kms | 3 | 2 | 6 | 11 |
| 2 | Zebra Conductor | Kms | | | | 0 |
| 3 | 4" IPS Allu.Tubes | Mtrs | 600 | 400 | 400 | 1400 |
| 4 | MS Flat for 400 KV S/s Earth mat (100 x12) | MT | 40 | 20 | 60 | 120 |
| 5 | M.S.Flat for earthing (75 x 8) | MT | 5 | 2 | 10 | 17 |

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| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|-------------|--------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| 6 | M.S.Flat for earthing (65 x 8) | MT | | | | 0 |
| 7 | M.S.Flat for earthing (50 x 6) | MT | 10 | 4 | 20 | 34 |
| 8 | Earthing rods (25mm x 3000mm) | Nos. | 50 | 50 | 60 | 160 |
| 9 | GI Pipe 40 mm Dia., 4mm Thk along with clamp for Earth Pit | Mtrs | 75 | 40 | 120 | 235 |
| 10 | Power Cable 3.5 core 300sq.mm | KMs | | | 0.5 | 0.5 |
| 11 | Screening conductor / O.H. Shield wire (7/3.66 sq mm) | KMs | 1 | 2 | 2 | 5 |
| 12 | Junction Box (36 Ways) | Nos. | 2 | 1 | 2 | 5 |
| 13 | Junction Box (64 Ways) | Nos. | 4 | 1 | 2 | 7 |
| 14 | Junction Box (128 Ways) | Nos. | 4 | 1 | 4 | 9 |
| 15 | Fire fighting equipments set | | | | | |
| (i) | Dry-Chemical Powder (DCP) Type, Capacity-75Kg, Trolley Mounted | Nos. | | | | 0 |
| (ii) | CO ₂ Type , Capacity-22.5Kg, Trolley Mounted | Nos. | | | | 0 |
| (iii) | Mechanical Foam Type, Capacity-50Ltr, Trolley Mounted (Cylinder Type) | Nos. | | | | 0 |
| (iv) | Set Of Fire Buckets Comprising 6 Nos Buckets, Capacity-9Kg , Each with Stand (Set) | Nos. | | | | 0 |
| 16 | Rail 52 Kg 3 Mtr Long for Power Transformer | Nos. | | | 4 | 4 |
| 17 | R.S. Joist 175x85 ,11 Mtr for Station Transformer | Nos | | | 2 | 2 |
| 18 | MS Chhanel 100x50x6 Mtr Long for | Nos. | | | 2 | 2 |

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| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|-------------|-----------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| | station Transformer | | | | | |
| 19 | PT Distribution Box | Nos. | | | | 0 |
| 1 | Disc insulators & Substation Hardware | | | | | |
| 1 | 400 KV 160KN Double tension with Quadruple Moose | Nos. | 12 | 12 | 24 | 48 |
| 2 | 400 KV 160KN Double tension with Twin Moose | Nos. | 12 | 6 | 12 | 30 |
| 3 | 400 KV 160KN Suspension with Twin Moose with Through Clamp (450 mm) | Nos. | 3 | 3 | 3 | 9 |
| 4 | 400 KV 160KN Suspension with Twin Moose with drop Clamp (450 mm) | Nos. | 6 | | 6 | 12 |
| 5 | 220 KV 120 KN Single Tension with Twin Moose Hardware | Nos. | | | 24 | 24 |
| 6 | 220 KV 120 KN Single Tension with Single Moose Hardware | Nos. | | | | 0 |
| 7 | 220 KV 120 KN Suspension with Twin Moose with Through Clamps (300 mm) | Nos. | | | 6 | 6 |
| 8 | 220 KV 120 KN Suspension with Twin Moose with Drop Clamps (300 mm) | Nos. | | | 6 | 6 |
| 9 | 220 KV 120 KN Suspension with Single Moose with drop Clamps (300 mm) | Nos. | | | | 0 |
| 10 | 220 KV 120 KN Single Tension string for single Zebra | Nos. | | | | 0 |
| 11 | 220 KV 120 KN Single Tension string for twin Zebra | Nos. | | | | 0 |
| 12 | 220 KV 90 KN Single Suspension string single Zebra | Nos. | | | | 0 |

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| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|-------------|-------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| 13 | 220 KV 90 KN Single Suspension string twin Zebra | Nos. | | | | 0 |
| 14 | 132 KV 90 KN Single Tension string for single Zebra | Nos. | | | | 0 |
| 15 | 132 KV 90 KN Single Tension string for twin Zebra | Nos. | | | | 0 |
| 16 | 132 KV 90 KN Single Tension string for single Panther | Nos. | | | | 0 |
| 17 | 132 KV 70KN Single Suspension string single Zebra | Nos. | | | | 0 |
| 18 | 132 KV 70 KN Single Suspension string twin Zebra | Nos. | | | | 0 |
| 19 | 33 KV 70 KN Single Tension string for single Zebra | Nos. | | | | 0 |
| 20 | 33 KV 70 KN Single Tension string for twin Zebra | Nos. | | | | 0 |
| 21 | 33 KV 70 KN Single Suspension string single Zebra | Nos. | | | | 0 |
| 22 | 33 KV 70 KN Single Suspension string twin Zebra | Nos. | | | | 0 |
| J | AC/DC SUPPLY | | | | | |
| 1 | L T Distribution Box | Nos. | | | 1 | 1 |
| 2 | 200 KVA DG Set Complete with all accessories. | Nos. | | | | 0 |
| 3 | 25 KVA DG Set Complete with all accessories. | Nos. | | | | 0 |
| 3 | Station Transformer, 200KVA, 33/0.4KV | Nos. | | | | 0 |

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| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|-------------|--------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| 4 | Station Transformer, 500KVA, 33/0.4KV | Nos. | | | 1 | 1 |
| 5 | 220Volt 600Ah Battery | Nos. | | | | 0 |
| 6 | 220Volt 600Ah Battery Charger | Nos. | | | | 0 |
| 7 | 110Volt 300Ah Battery | Nos. | | | | 0 |
| 8 | 110Volt 300Ah Battery Charger | Nos. | | | | 0 |
| 9 | 48Volt 300Ah Battery | Nos. | | | | 0 |
| 10 | 48Volt 300Ah Battery Charger | Nos. | | | | 0 |
| 11 | AC Distribution Boxes 415Volt | Nos. | | | | 0 |
| 12 | DC Distribution Boxes 110 Volts | Nos. | | | | 0 |
| 13 | Lighting Fixtures with HPSV/ HPMH (250 Watt) | Nos. | 15 | 10 | 15 | 40 |
| 14 | Lighting Fixtures complete with fitting arrangement (CFL 36 Watt) | Nos. | 10 | | 40 | 50 |
| 15 | 3 Phase ICTP MCB (32 Amp) for No. of difference circuit | Nos. | 2 | 2 | 2 | 6 |
| 16 | 1 Phase Main switch with fuse, link and 4 connectors | Nos. | 10 | 10 | 40 | 60 |
| 17 | Tubular Pole For Lighting Fixtures | Nos. | 10 | 10 | 40 | 60 |
| 18 | D.O.Set | Nos. | | | 1 | 1 |
| 19 | Aluminium /Red oxide Paints and Nuts and Bolts washers and other misc material | LS | | | | LS |
| 20 | Roof Top Solar System(25KW) | SET | | | | 0 |
| K | Control cable | | | | | |

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| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|-------------|------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| 1 | 2Core 2.5 Sq.mm Unarmoured | Kms | 2.00 | 1.00 | 2.00 | 5 |
| 2 | 4Core 2.5 Sq.mm Unarmoured | Kms | 1.00 | 1.00 | 1.00 | 3 |
| 3 | 8Core 2.5 Sq.mm Unarmoured | Kms | | | | 0 |
| 4 | 12Core 2.5 Sq.mm Unarmoured | Kms | | | | 0 |
| 5 | 19 Core 2.5 Sq.mm Unarmoured | Kms | | | | 0 |
| 6 | 4Core 4 Sq.mm Armoured | Kms | 2.00 | 1.00 | 3.00 | 6 |
| 7 | 4Core 10 Sq.mm Armoured | Kms | 3.00 | 2.00 | 3.00 | 8 |
| 8 | 4Core 2.5 Sq.mm Armoured | Kms | 2.00 | 1.00 | 3.00 | 6 |
| 9 | 12Core 2.5 Sq.mm Armoured | Kms | 2.00 | 1.00 | 3.00 | 6 |
| 10 | 19 Core 2.5 Sq.mm Armoured | Kms | 3.00 | 2.00 | 3.00 | 8 |
| 11 | 2Core 2.5 Sq.mm Armoured | Kms | 1.00 | 1.00 | 2.00 | 4 |
| L | SUB STATION CLAMPS | | | | | |
| 1 | T CLAMPS | | | | | |
| a. | TWIN ZEBRA RUN-ZEBRA TAP | Nos | | | | 0 |
| b. | ZEBRA RUN-ZEBRA TAP | Nos. | | | | 0 |
| 2 | P.G.CLAMPS | | | | | |
| a. | ZEBRA –ZEBRA | Nos. | | | | 0 |
| b. | ZEBRA –PANTHER | Nos. | | | | 0 |
| c. | ZEBRA –RECOON | Nos. | | | | 0 |
| 3 | P.I. CLAMPS 220 KV | | | | | |

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| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|-------------|----------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| a. | SINGLE ZEBRA /MOOSE | Nos. | | | 3 | 3 |
| b. | TWIN ZEBRA / MOOSE | Nos. | | | 18 | 18 |
| 4 | P.I. CLAMPS 132 KV | | | | | |
| a. | SINGLE ZEBRA | Nos. | | | | 0 |
| b. | TWIN ZEBRA | Nos. | | | | 0 |
| 5 | P.I. CLAMPS 33 KV | | | | | |
| a. | SINGLE ZEBRA | Nos. | | | 7 | 7 |
| b. | TWIN ZEBRA | Nos. | | | | 0 |
| 6 | SPACERS FOR TWIN ZEBRA | Nos | | | | 0 |
| 7 | T Clamp | | | | | |
| a | TWIN MOOSE RUN –MOOSE TAP | Nos | | | | 0 |
| b | MOOSE RUN –MOOSE TAP | Nos | | | 24 | 24 |
| C | 4" IPS Run –MOOSE TAP | Nos | 6 | | 6 | 12 |
| d | Quartz moose to twin moose | Nos | 6 | | 6 | 12 |
| 8 | PG CLAMP | | | | | |
| a | MOOSE- MOOSE | Nos | 216 | 60 | 330 | 606 |
| b | MOOSE-ZEBRA | Nos | | | | 0 |
| 9 | Bus Post Clamp | | | | | |
| a | Rigid--TYPE FOR 4" IPS | Nos | 46 | 29 | 6 | 81 |
| b | Sliding type for 4" IPS tube | Nos | 14 | 7 | 6 | 27 |
| c | Flexible type 4" IPS tube & Twin Moose | Nos. | | | | 0 |
| | Twin moose | | | | | |

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| s.no | Particulars | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|-------------|----------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------------------|--------------|
| d | BUS POST CLAMPS FOR TWIN MOOSE | Nos | 8 | | 6 | 14 |
| 10 | Coupling sleeves for tubular bus conductor | Nos. | 45 | 15 | 30 | 90 |
| 11 | Spacer | | | | | |
| a | TWIN MOOSE FOR 400 KV | Nos. | 54 | 48 | 96 | 198 |
| b | TWIN MOOSE for 220KV | Nos. | | | 300 | 300 |
| C | QUADRA MOOSE | Nos. | 60 | 72 | 150 | 282 |
| 12 | Sag Comp. Spring | Nos. | 15 | 15 | 24 | 54 |
| 13 | Earth wire clamps | Nos | 24 | 24 | 60 | 108 |
| 14 | P G Clamp for earth wire | Nos | 12 | 12 | 30 | 54 |
| 15 | Clamp for Conn. Of Earth Wire with M S Flat (50X6) | Nos | 12 | 12 | 40 | 64 |

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ANNEXURE-3

WORK WISE QUANTITY OF MATERIALS TO BE SUPPLIED FOR TRANSMISSION LINES(Package- 6)

| S. No. | PARTICULARS | Unit | 400 KV DCDS Line for LILO of one circuit of 400KV DCDS Khandwa-Rajgarh Line | Total |
|--------------|------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------|------------|
| | | | QTY | |
| 1 | 2 | 3 | 4 | 5 |
| 1 | SUPPLY OF TOWERS | | | |
| | Fabricated & galvanized Towers and their extension Gantry structures complete with Stubs & Cleats, Gusset plates | | | |
| (i) | HT Steel sections | MT | 185 | 185 |
| (ii) | MS Steel sections | MT | 135 | 135 |
| (iii) | Bolts & Nuts, step bolts, Spring & pack washers for tower parts as per Sl. no. 1 above | MT | 12 | 12 |
| | | | | |
| 2 | ACSR Conductor : | | | |
| (i) | ACSR Moose | Kms | 37 | 37 |
| (ii) | ACSR Zebra | Kms | 0 | 0 |
| (iii) | ACSR Panther | Kms | 0 | 0 |
| | | | | |
| 3.(i) | Earth wire (7/3.66mm, 95 kg/mm ² quality) | Kms | 3.1 | 3.1 |
| (ii) | OPGW wire | Kms | 3.2 | 3.2 |
| | | | | |
| 4 | Disc Insulator Strings/ Long Rod Porcelain Insulators/ Long Rod Polymer Insulators | | | |
| (i) | Single suspension string for ACSR Twin Moose Conductor (equivalent to 23 disc of 120kN) | Nos | 11 | 11 |

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| S. No. | PARTICULARS | Unit | 400 KV DCDS Line for LILO of one circuit of 400KV DCDS Khandwa-Rajgarh Line | Total |
|---------------|-----------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------|--------------|
| | | | QTY | |
| 1 | 2 | 3 | 4 | 5 |
| (ii) | Double suspension string for ACSR Twin Moose Conductor (equivalent to 2X23 disc of 120kN) | Nos | 1 | 1 |
| (iii) | Single tension string for ACSR Moose Twin Conductor (equivalent to 24 disc of 160kN) | Nos | 0 | 0 |
| (iv) | Double tension string for ACSR Twin Moose Conductor (equivalent to 2X24 disc of 160kN) | Nos | 98 | 98 |
| (v) | Single suspension pilot string for ACSR Twin Moose Conductor (equivalent to 23 disc of 120kN) | Nos | 24 | 24 |
| (vi) | Single suspension string for ACSR Zebra Conductor (equivalent to 13 disc of 70kN) | Nos | 0 | 0 |
| (vii) | Double suspension string for ACSR Zebra Conductor (equivalent to 2X13 disc of 70kN) | Nos | 0 | 0 |
| (viii) | Single tension string for ACSR Zebra Conductor (equivalent to 14 disc of 160kN) | Nos | 0 | 0 |
| (ix) | Double tension string for ACSR Zebra Conductor (equivalent to 2X14 disc of 160kN) | Nos | 0 | 0 |
| (x) | Single suspension string for ACSR Panther Conductor (equivalent to 9 disc of 70kN) | Nos | 0 | 0 |
| (xi) | Double suspension string for ACSR Panther Conductor (equivalent to 2X9 disc of 70kN) | Nos | 0 | 0 |
| (xii) | Single tension string for ACSR Panther Conductor (equivalent to 10 disc of 90kN) | Nos | 0 | 0 |
| (xiii) | Double tension string for ACSR Panther Conductor (equivalent to 2X10 disc of 90kN) | Nos | 0 | 0 |
| 5 | Hardwares fittings of ACSR Twin Moose Conductor for: | | | |
| (i) | 23 disc single suspension string | Sets | 11 | 11 |
| (ii) | 23 disc double suspension string | Sets | 1 | 1 |

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| S. No. | PARTICULARS | Unit | 400 KV DCDS Line for LILO of one circuit of 400KV DCDS Khandwa-Rajgarh Line | Total |
|---------------|---------------------------------------------------------|-------------|------------------------------------------------------------------------------------|--------------|
| | | | QTY | |
| 1 | 2 | 3 | 4 | 5 |
| (iii) | 24 disc single tension string | Sets | 0 | 0 |
| (iv) | 24 disc double tension string | Sets | 98 | 98 |
| (V) | Pilot String for ACSR Twin Moose | Sets | 24 | 24 |
| 6 | Hardware fittings of ACSR Zebra Conductor for: | | | |
| (i) | 13 disc single suspension string | Sets | 0 | 0 |
| (ii) | 13 disc double suspension string | Sets | 0 | 0 |
| (iii) | 14 disc single tension string | Sets | 0 | 0 |
| (iv) | 14 disc double tension string | Sets | 0 | 0 |
| 7 | Hardware fittings of ACSR Panther Conductor for: | | | |
| (i) | 9 disc single suspension string | Sets | 0 | 0 |
| (ii) | 9 disc double suspension string | Sets | 0 | 0 |
| (iii) | 10 disc single tension string | Sets | 0 | 0 |
| (iv) | 10 disc double tension string | Sets | 0 | 0 |
| 8 | Conductor Accessories of ACSR Moose Conductor: | | | |
| (i) | Midspan joints | Nos | 34 | 34 |
| (ii) | Vibration damper | Nos | 490 | 490 |
| (iii) | Repair sleeve | Nos | 9 | 9 |
| (iv) | AG Spacer for Span for ACSR twin Moose | Nos | 428 | 428 |
| (v) | Compression type T Clamp | Nos | 0 | 0 |
| (vi) | Central Hanger Anchor Shackle | Nos | 12 | 12 |

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| S. No. | PARTICULARS | Unit | 400 KV DCDS Line for LILO of one circuit of 400KV DCDS Khandwa-Rajgarh Line | Total |
|---------------|---------------------------------------------------------|-------------|------------------------------------------------------------------------------------|--------------|
| | | | QTY | |
| 1 | 2 | 3 | 4 | 5 |
| (vii) | Rigid Spacer for Jumper for ACSR twin Moose | Nos | 144 | 144 |
| 9 | Conductor Accessories of ACSR Zebra Conductor: | | | |
| (i) | Midspan joints | Nos | 0 | 0 |
| (ii) | Vibration damper | Nos | 0 | 0 |
| (iii) | Repair sleeve | Nos | 0 | 0 |
| 10 | Conductor Accessories of ACSR Panther Conductor: | | | |
| (i) | Midspan joints | Nos | 0 | 0 |
| (ii) | Vibration damper | Nos | 0 | 0 |
| (iii) | Repair sleeve | Nos | 0 | 0 |
| 11 | Earthwire Accessories: | | | |
| (i) | Suspension Assembly | Sets | 2 | 2 |
| (ii) | Tension Assembly with jumper cone | Sets | 16 | 16 |
| (iii) | Midspan joint | Nos | 1 | 1 |
| (iv) | Vibration damper for earthwire | Nos | 41 | 41 |
| (v) | Repair sleeve | Nos | 1 | 1 |
| (vi) | Copper earth bond | Nos | 18 | 18 |
| (vii) | G.I. earth bond | Nos | 0 | 0 |
| 12 | OPGW Accessories: | | | |
| (i) | Suspension Assembly | Sets | 2 | 2 |

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| S. No. | PARTICULARS | Unit | 400 KV DCDS Line for LILO of one circuit of 400KV DCDS Khandwa-Rajgarh Line | Total |
|---------------|-----------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------|--------------|
| | | | QTY | |
| 1 | 2 | 3 | 4 | 5 |
| (ii) | Tension Assembly with Joint box | Sets | 1 | 1 |
| (iii) | Tension Assly pass through type | Sets | 16 | 16 |
| (iv) | Down lead clamp | Sets | 51 | 51 |
| (v) | Vibration damper | Nos | 41 | 41 |
| (vi) | Splice enclosure | Nos | 1 | 1 |
| (vii) | Earth bond and PG clamp | Nos | 18 | 18 |
| 13 | Tower Accessories | | | |
| (i) | Earthing set – 4 sets (As per drawing of Tower) | Sets | 10 | 10 |
| (ii) | Earthing set – 2 sets (As per drawing for Gantry Column) | Sets | 0 | 0 |
| (iii) | Danger Board – 1 No. | Nos | 10 | 10 |
| (iv) | Number Plate – 1 No. | Nos | 10 | 10 |
| (v) | Phase Plate (set of 3 No.-each R/Y/B) | Sets | 20 | 20 |
| (vi) | Anticlimbing Device including Barbed wire –1 set (As per requirement brought out in the bidding document) | Sets | 10 | 10 |

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ANNEXURE-4

BILL OF QUANTITY FOR CIVIL WORKS

**Please refer Volume-III for
Bill of quantity for civil works**

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ANNEXURE-5

WORKWISE QUANTITY FOR ERECTION, TESTING & COMMISSIONING OF OUTDOOR & INDOOR EQUIPMENTS (Package- 6)

| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------|-------------|
| A | 400 KV EQUIPMENTS | | | | | |
| (A) | Structures : | | | | | |
| i) | Erection of structures including tightening and punching of nuts, bolts. | MT. | 58.22 | 37.58 | 170.28 | 266 |
| (B) | Stringing of overhead gantries, vertical droppers with ACSR conductor including fixing of insulator string, spacers, clamps etc. | | | | | |
| i) | 4" IPS allu. Tube | Mtr | 600 | 400 | 400 | 1400 |
| ii) | Quad moose | Mtr | 400 | 360 | 3000 | 3760 |
| iii) | Twin Moose | Mtr | 700 | 280 | 3000 | 3980 |
| iv) | Twin Zebra | Mtr | 0 | 0 | 0 | 0 |
| v) | Single Zebra | Mtr | 0 | 0 | 500 | 500 |
| vi) | Stringing of overhead shield wire with 7/3.66 mm standard galvanized steel complete with fixing of strain clamps at the structures. | Mtr | 1000 | 2000 | 2000 | 5000 |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| C | Installation of transformers | | | | | |
| I. | Complete assembly and erection of power transformer with connections etc including installation of marshalling boxes, control cabinets, air sealing radiators, cooling fans, all accessories etc for transformer including their preliminary checks. Unloading /handling of transformer accessories, handling and filling of transformer oil along with associated equipments. | | | | | |
| i) | 315 MVA 400/220/33 KV Auto Transformer (with Oil and associated equipments) | Nos | 0 | 0 | 1 | 1 |
| ii) | 160MVA 220/132KV Transformer (with Oil and associated equipments) | Nos | 0 | 0 | 0 | 0 |
| iii) | 100MVA 400/33KV Transformer (with Oil and associated equipments) | Nos | 0 | 0 | 0 | 0 |
| iv) | 50MVA 220/33KV Transformer(with Oil and associated equipments) | Nos | 0 | 0 | 0 | 0 |
| v) | 63MVA 132/33KV Transformer(with Oil and associated equipments) | Nos | 0 | 0 | 0 | 0 |
| vi) | 40/50MVA 132/33KV Transformer (with Oil and associated equipments) | Nos | 0 | 0 | 0 | 0 |
| vii) | 125 MVAR 400 KV Reactor(with Oil and associated equipments) | Nos | 0 | 1 | 0 | 1 |
| II. | STATION TRANSFORMER | | | | | |
| i) | Shifting of 33/0.4 KV Station transformer up to plinth and placing on plinth & connection to bushing & earth connection alongwith associated work etc. | Nos | 0 | 0 | 1 | 1 |
| (D) | Installation and erection of out-door equipments. | | | | | |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| I. | CIRCUIT BREAKERS | | | | | |
| i) | 400 KV SF-6 circuit breaker (3 Phase) with PIR | | | | | |
| a) | Erection of structures and alignment, shifting of breaker upto the place and placement of all 3 circuit breaker poles on structure and alignment. | | | | | |
| b) | Complete assembly of circuit breaker including erection of control cabinet & mechanism box, interconnecting piping work, erection of all accessories for the equipment. | | | | | |
| c) | SF-6 gas filling for which gas cylinder & filling equipments shall be provided by Company. | | | | | |
| d) | Preliminary check, test including test for leakage of air/gas. | | | | | |
| | Total quantity of item (i) | No | 2 | 0 | 0 | 2 |
| ii) | 400 KV SF-6 circuit breaker (3 Phase) without PIR | | | | | |
| a) | Erection of structures and alignment, shifting of breaker upto the place and placement of all 3 circuit breaker poles on structure and alignment. | | | | | |
| b) | Complete assembly of circuit breaker including erection of control cabinet & mechanism box, interconnecting piping work, erection of all accessories for the equipment. | | | | | |
| c) | SF-6 gas filling for which gas cylinder & filling equipments shall be provided by Company. | | | | | |
| d) | Preliminary check, test including test for leakage of air/gas. | | | | | |
| | Total quantity of item (ii) | No | 0 | 1 | 2 | 3 |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| iii) | 220 KV SF-6 circuit breakers (3 phase) | | | | | |
| a) | Erection of structures and alignment, shifting of breaker upto the place and placement of all 3 circuit breaker poles on structure and alignment. | | | | | |
| b) | Complete assembly of circuit breaker including erection of control cabinet & mechanism box, interconnecting piping work, erection of all accessories for the equipment. | | | | | |
| c) | SF-6 gas filling for which gas cylinder & filling equipments shall be provided by Company. | | | | | |
| d) | Preliminary check, test including test for leakage of air/gas. | | | | | |
| | Total quantity of item (iii) | No | 0 | 0 | 1 | 1 |
| iv) | 132 KV SF-6 circuit breakers (3 phase) | | | | | |
| a) | Erection of structures and alignment, shifting of breaker upto the place and placement of all 3 circuit breaker poles on structure and alignment. | | | | | |
| b) | Complete assembly of circuit breaker including erection of control cabinet & mechanism box, interconnecting piping work, erection of all accessories for the equipment. | | | | | |
| c) | SF-6 gas filling for which gas cylinder & filling equipments shall be provided by Company. | | | | | |
| d) | Preliminary check, test including test for leakage of air/gas. | | | | | |
| | Total quantity of item (iv) | No | 0 | 0 | 0 | 0 |
| v) | 33 KV Vacuum circuit breakers (3 Phase) | | | | | |
| a) | Erection of structures and alignment, shifting of breaker upto the place and placement of | | | | | |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| | circuit breaker on structure and alignment. | | | | | |
| b) | Complete assembly of circuit breaker including erection of control cabinet & mechanism box, interconnecting piping work erection of all accessories for the equipment. | | | | | |
| c) | Preliminary check, test including test for leakage of air/gas. | | | | | |
| | Total quantity of item (v) | No | 0 | 0 | 1 | 1 |
| 2 | Isolators | | | | | |
| i) | 400 KV Pantograph Isolator (with one earth switch) | | | | | |
| a) | Shifting upto civil foundation & placements of complete isolator in all 3 phase of isolator structure. | | | | | |
| b) | Erection/ mounting of mechanism box, interconnection, pipings, alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | | | | |
| | Total quantity of item (i) | No | 6 | 3 | 4 | 13 |
| 3 | Isolators without earth switch (3 Phase) | | | | | |
| i) | 400 KV isolators (3 Phase) | | | | | |
| a) | Shifting upto civil foundation & placements of complete isolator in all 3 phase of isolator structure. | | | | | |
| b) | Erection/ mounting of mechanism box, interconnection, pipings, alignment of contacts & all associated activities to make the installation complete including checking | | | | | |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| | of successful mechanical and electrical operation. | | | | | |
| | Total quantity of item (i) | No | 0 | 2 | 2 | 4 |
| ii) | 220 KV isolators (1 Phase set of three) | | | | | |
| a) | Shifting up to civil foundation & placements of complete isolator in all 3 phase of isolator structure. | | | | | |
| b) | Erection/ mounting of mechanism box, interconnection, pipings, alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | | | | |
| | Total quantity of item (ii) | No | 0 | 0 | 0 | 0 |
| iii) | 220 KV isolators (3 Phase) | | | | | |
| a) | Shifting upto civil foundation & placements of complete isolator in all 3 phase of isolator structure. | | | | | |
| b) | Erection/ mounting of mechanism box, interconnection, pipings, alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | | | | |
| | Total quantity of item (iii) | No | 0 | 0 | 4 | 4 |
| iv) | 132 KV isolators (3 Phase) | | | | | |
| a) | Shifting up to civil foundation & placements of complete isolator in all 3 phase of isolator structure. | | | | | |
| b) | Erection/ mounting of mechanism box, interconnection, piping, alignment of contacts | | | | | |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| | & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | | | | |
| | Total quantity of item (iv) | No. | 0 | 0 | 0 | 0 |
| v) | 132 KV isolators (Single Phase set of three) | | | | | |
| a) | Shifting upto civil foundation & placements of complete isolator in all Single phase of isolator structure. | | | | | |
| b) | Erection/ mounting of mechanism box, interconnection, piping, alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | | | | |
| | Total quantity of item (v) | No. | 0 | 0 | 0 | 0 |
| vi) | 33 KV isolators (3 phase) | | | | | |
| a) | Shifting up to civil foundation & placement of complete isolator in all 3 phase of isolator structure. | | | | | |
| b) | Erection/mounting of mechanism box, interconnection, piping alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | | | | |
| | Total quantity of item (vi) | No. | 0 | 0 | 0 | 0 |
| 4 | Isolators with earth switch (3 Phase) | | | | | |
| i) | 400 KV HCB isolators (3 phase) | | | | | |
| a) | Shifting up to civil foundation & placement of | | | | | |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| | complete isolator in all 3 phase of isolator structure. | | | | | |
| b) | Erection/ mounting of mechanism box, interconnection, piping alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | | | | |
| | Total quantity of item (i) | No. | 2 | 0 | 0 | 2 |
| ii) | 400 KV isolators (1 phase)(set of Three) | | | | | |
| a) | Shifting up to civil foundation & placement of complete isolator in all 3 phase of isolator structure. | | | | | |
| b) | Erection/ mounting of mechanism box, interconnection, piping alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | | | | |
| | Total quantity of item (ii) | No. | 0 | 0 | 0 | 0 |
| iii) | 220 KV isolators (3 phase) | | | | | |
| a) | Shifting upto civil foundation & placement of complete isolator in all 3 phase of isolator structure. | | | | | |
| b) | Erection/ mounting of mechanism box, interconnection, piping alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | | | | |
| | Total quantity of item (iii) | No. | 0 | 0 | 0 | 0 |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| iv) | 132 KV isolators (3 phase) | | | | | |
| a) | Shifting up to civil foundation & placement of complete isolator in all 3 phase of isolator structure. | | | | | |
| b) | Erection/ mounting of mechanism box, interconnection, piping alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | | | | |
| | Total quantity of item (iv) | No. | 0 | 0 | 0 | 0 |
| v) | 33 KV isolators (3 Phase) | | | | | |
| a) | Shifting upto civil foundation & placement of complete isolator in all 3 phase of isolator structure. | | | | | |
| b) | Erection/ mounting of mechanism box, interconnection, piping alignment of contacts & all associated activities to make the installation complete including checking of successful mechanical and electrical operation. | | | | | |
| | Total quantity of item (v) | No. | 0 | 0 | 0 | 0 |
| 5 | Shifting of current X'mer up to civil foundation and placement on structure and fixing of junction box including all accessories etc. | | | | | |
| a) | 400 KV | No. | 6 | 3 | 6 | 15 |
| b) | 220 KV | No. | 0 | 0 | 3 | 3 |
| c) | 132 KV | No. | 0 | 0 | 0 | 0 |
| d) | 33 KV | No. | 0 | 0 | 6 | 6 |
| 6 | Shifting of CC/CVT/P.T. up to civil foundation & placement on structure and fixing of | | | | | |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| | junction box including all accessories etc. | | | | | |
| a) | 400 KV | No. | 6 | 0 | 0 | 6 |
| b) | 220 KV | No. | 0 | 0 | 0 | 0 |
| c) | 132 KV | No. | 0 | 0 | 0 | 0 |
| d) | 33 KV | No. | 0 | 0 | 3 | 3 |
| e) | Dismantling of 400KV Bus CVTs | No. | 0 | 0 | 2 | 2 |
| 7 | Erection of lightning arrestors : | | | | | |
| i. | Shifting of surge/lightening arrestors & placement of equipments on structure including all accessories and making all connections also include checking & installation of insulator base and surge counters. | | | | | |
| a) | 400 KV | No. | 6 | 3 | 3 | 12 |
| b) | 220 KV | No. | 0 | 0 | 3 | 3 |
| c) | 132 KV | No. | 0 | 0 | 0 | 0 |
| d) | 33 KV | No. | 0 | 0 | 6 | 6 |
| 8 | Erection of Solid Core Insulators (PI): | | | | | |
| a) | 400 KV | No. | 60 | 36 | 34 | 130 |
| b) | 220 KV | No. | 0 | 0 | 27 | 27 |
| c) | 132 KV | No. | 0 | 0 | 0 | 0 |
| d) | 33 KV | No. | 0 | 0 | 7 | 7 |
| 9 | Wave trap with overhead suspension and other accessories. | | | | | |
| a) | 400 KV | No | 4 | 0 | 0 | 4 |
| b) | 220 KV | No. | 0 | 0 | 0 | 0 |
| c) | 132 KV | No. | 0 | 0 | 0 | 0 |
| 10 | Set of coupling devices line matching unit for PLCC purposes. | Set | 4 | 0 | 0 | 4 |
| 11 | Erection of Fiber optics Tele | set | 0 | 0 | 0 | 0 |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| | communication equipments | | | | | |
| 12 | Erection of 36 kV 12 MVAR Capacitor bank with structures and accessories complete in all respect. | No. | 0 | 0 | 0 | 0 |
| (E) | Earthing Installation : | | | | | |
| | Installation & testing of the following including jointing, equipment termination, fixing & clamping with accessories & hardware required such as saddle, clamps, cleats, plugs, screws, nuts, bolts, washers and welding, brazing etc. | | | | | |
| i) | 25 mm dia X 3000 mm long M.S. rod earth electrodes installation directly driven/drilled (40 to 50 mm dia) into earth including excavation (irrespective of type of soil encountered) backfilling with betonite soil (to be arranged by contractor) welding to earth conductor etc. | No. | 50 | 50 | 60 | 160 |
| ii) | Providing of steel risers and making earth mat (duly buried at a depth of 0.5 mtrs) including backfilling with black cotton soil (to be arranged by the contractor) welding etc. and bolting of risers to the structure at desired place. | | | | | |
| a) | MS Round 40 mm Dia for 400 KV S/s Earth mat | Mtr | 4000 | 2000 | 6000 | 12000 |
| b) | MS flat 75 X 8 mm | Mtr | 1000 | 400 | 2000 | 3400 |
| c) | MS flat 65X 8 mm | Mtr | 0 | 0 | 0 | 0 |
| d) | MS flat 50X 6 mm | Mtr | 4000 | 1600 | 8000 | 13600 |

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|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| (F) | Preparation of earthing pits (1.5X1.5.X3 Mtrs.) as per drawing attached with bid document, which includes excavation (Irrespective of the soil encountered) embedding of 4 No. GI Pipes of size 40 mm dia, 3 Mtrs. Long, back filling with B.C. soil (to be arranged by the contractor) free from boulders and harmful mixture. These GI pipes are to be welded with MS flats by making mesh frame and cutting of pipes as also making holes in the pipe for water seepage. The earth pit is to be connected with earth mesh of MS flat. | No. | 5 | 5 | 6 | 16 |
| (G) | Yard Lighting : | | | | | |
| i) | Erection of pole for yard lighting and fitting of fixtures. | No. | 10 | 10 | 40 | 60 |
| ii) | Installation of light fixtures on gantry columns, supply connections to the light fitting from the nearest lighting board in the yard etc. | No. | 15 | 10 | 15 | 40 |
| (H) | Erection of DO fuse set | No. | 0 | 0 | 1 | 1 |
| (I) | Erection of junction box | No. | 10 | 3 | 8 | 21 |
| (J) | Erection of PT Junction Box | NO | 0 | 0 | 0 | 0 |
| (K) | For installation and erection of indoor equipments in the Control-Room building. : | | | | | |
| (i) | 415V AC Distribution Board | | | | | |
| | Shifting up to control room (including storage, if required), placement in AC/DC room. The AC Distribution Board to be suitably grouted in AC/DC room as per drawing. Proper alignment of AC Board to be done and | NO. | 0 | 0 | 0 | 0 |

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|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| | earthing to be done. Making of all 3 Phase and Single phase AC connections in terminal block as per drawing. | | | | | |
| (ii) | 220V DC Distribution Board | | | | | |
| | Shifting up to control room (including storage, if required), placement in AC/DC room. The DC Distribution Board to be suitably grouted in AC/DC room as per drawing. Proper alignment of DC Board to be done and earthing to be done. Making of all 110V DC connections in terminal block as per drawing. | NO. | 0 | 0 | 0 | 0 |
| (iii) | 110V DC Distribution Board | | | | | |
| | Shifting up to control room (including storage, if required), placement in AC/DC room. The DC Distribution Board to be suitably grouted in AC/DC room as per drawing. Proper alignment of DC Board to be done and earthing to be done. Making of all 110V DC connections in terminal block as per drawing. | NO. | 0 | 0 | 0 | 0 |
| (iv) | Control and Relay Panel for 400KV Feeder/X-mer/Bus coupler/Bus tie/Bus Diff. Protection : | | | | | |
| | Shifting up to control room (including storage if required) and placement complete with all relays & accessories. The placement of C&R panel to be done on MS channel frame and MS Channel frame will suitable grouted in control room as per drawing. The cutting, welding & fabrication of of MS channel frame is to be done as per drawing. Proper alignment of C&R panel to be done. The | NO. | 2 | 1 | 1 | 4 |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------|-------|
| | earthing of C&R Panel to be done. Making of all interconnections for the control & relay panel on terminal block as per drawing including all AC & DC connections. | | | | | |
| | | | | | | |
| | | | | | | |
| (v) | Control and Relay Panel for 220KV Feeder/X-mer/Bus coupler/Bus tie/Bus Diff. Protection : | | | | | |
| | Shifting up to control room (including storage if required) and placement complete with all relays & accessories. The placement of C&R panel to be done on MS channel frame and MS Channel frame will suitable grouted in control room as per drawing. The cutting, welding & fabrication of of MS channel frame is to be done as per drawing. Proper alignment of C&R panel to be done. The earthing of C&R Panel to be done. Making of all interconnections for the control & relay panel on terminal block as per drawing including all AC & DC connections. | NO. | 0 | 0 | 1 | 1 |
| (vi) | Control and Relay Panel for 132KV Feeder/X-mer/Bus coupler | | | | | |
| | Shifting up to control room (including storage if required) and placement complete with all relays & accessories. The placement of C&R panel to be done on MS channel frame and MS Channel frame will suitable grouted in control room as per drawing. The cutting, | NO. | 0 | 0 | 0 | 0 |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------|-------|
| | welding & fabrication of of MS channel frame is to be done as per drawing.Proper alignment of C&R panel to be done.The earthing of C&R Panel to be done.Making of all interconnections for the control & relay panel on terminal block as per drawing including all AC & DC connections. | | | | | |
| (vii) | C&R Panel for 33KV Feeder/X-mer/Bus coupler: | | | | | |
| | Shifting up to control room (including storage if required) and placement complete with all relays & accessories. The placement of C&R panel to be done on MS channel frame and MS Channel frame will suitable grouted in control room as per drawing.The cutting,welding & fabrication of of MS channel frame is to be done as per drawing.Proper alignment of C&R panel to be done. The earthing of C&R Panel to be done. Making of all interconnections for the control & relay panel on terminal block as per drawing including all AC & DC connections. | NO. | 0 | 0 | 1 | 1 |
| (viii) | RTU & Telemetry (Set): | | | | | |
| | Shifting up to control room (including storage if required) and placement complete with all relays & accessories. The placement of RTU to be done on MS channel frame and MS Channel frame will suitable grouted in control room as per drawing. The cutting, welding & fabrication of of MS channel frame is to be done as per drawing. Proper alignment of | NO. | 0 | 0 | 0 | 0 |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------|-------|
| | RTU to be done. The earthing of RTU to be done. Making of all interconnections for the RTU on terminal block as per drawing including all AC & DC connections. | | | | | |
| | | | | | | |
| (ix) | CARRIER CABINET: | | | | | |
| | Shifting up to control room (including storage if required) and placement in control room .The cabinet will be suitably grouted in control room as per drawing.The proper alignment of panel to be done on MS channel frame and MS Channel frame will be suitably grouted in control room.The earthing of panel to be done. Making of all AC/DC connections in terminal block as per drawing. | NO. | 6 | 0 | 0 | 6 |
| (x) | EPAX: | | | | | |
| | Shifting up to control room (including storage if required) and placement in control room with all accessories. | No. | 0 | 0 | 0 | 0 |
| (xi) | 220V Battery | | | | | |
| a) | Shifting of 220V Battery set (having 110 cells of 1.2 V) up to control room along with battery stand & electrolyte containers shifting up to control room with all accessories. Checking of breakage and condition of cover seals. | | | | | |
| b) | Erection of mounting racks, placement of battery cells (after proper cleaning of cells) on battery set including their interconnections and connections to their battery chargers. Providing number identification sticker / plates for each cell. | | | | | |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------|-------|
| c) | Charging of batteries as per manufacturer's recommendation under guidance of engineer incharge including two to three charge/discharge cycle complete with maintaining record of battery charging. This work includes initial filling of electrolyte topping up of electrolyte/distilled water during charge/discharge cycle. | | | | | |
| | Total quantity of (xi) | No | 0 | 0 | 0 | 0 |
| (xii) | 110V Battery | | | | | |
| a) | Shifting of 110V Battery set (having 55 cells of 1.2 V) up to control room along with battery stand & electrolyte containers shifting up to control room with all accessories. Checking of breakage and condition of cover seals. | | | | | |
| b) | Erection of mounting racks, placement of battery cells (after proper cleaning of cells) on battery set including their interconnections and connections to their battery chargers. Providing number identification sticker / plates for each cell. | | | | | |
| c) | Charging of batteries as per manufacturers recommendation under guidance of engineer incharge including two to three charge/discharge cycle complete with maintaining record of battery charging. This work includes initial filling of electrolyte topping up of electrolyte/distilled water during charge/discharge cycle. | | | | | |
| | Total quantity of (xii) | No | 0 | 0 | 0 | 0 |
| (xiii) | 220/110V Battery Charger | | | | | |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| | Shifting up to control room & placement in AC/DC room with all accessories. The grouting of charger to be done as per drawings. Proper alignment and earthing of Charger to be done. Making of all AC/DC connection in terminal block as per drawing. | No | 0 | 0 | 0 | 0 |
| (xiv) | 48V Battery | | | | | |
| a) | Shifting of 48V Battery set (having 24 cells of 1.2 V) up to control room along with battery stand & electrolyte containers shifting up to control room with all accessories. Checking of breakage and condition of cover seals. | | | | | |
| b) | Erection of mounting racks, placement of battery cells (after proper cleaning of cells) on battery set including their interconnections and connections to their battery chargers. Providing number identification sticker / plates for each cell. | | | | | |
| c) | Charging of batteries as per manufacturers recommendation under guidance of engineer incharge including two to three charge/discharge cycle complete with maintaining record of battery charging. This work includes initial filling of electrolyte topping up of electrolyte/distilled water during charge/discharge cycle. | | | | | |
| | Total quantity of (xiv) | NO. | 0 | 0 | 0 | 0 |
| (xv) | 48V Battery Charger | | | | | |
| | Shifting up to control room & placement in AC/DC room with all accessories. The grouting of charger to be done as per | NO. | 0 | 0 | 0 | 0 |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------|------------|
| | drawings. Proper alignment and earthing of Charger to be done. Making of all AC/DC connection in terminal block as per drawing. | | | | | |
| (N) | Cable terminations including fixing of cable glands, lugs etc. for each type of control/ power cables, including terminations at both ends. I.R. value between cores and I.R. value with respect to its armouring is to be verified. The continuity of all cores is also to be verified. Both work to be done before connecting cable to the terminal block. Making suitable hole in bottom/side plate of C&R panel, AC/DC Board, Marshaling box, CT/PT sec box and CB mechanism box for fixing cable glands in addition to cable gland holes already provided. The hole should be free from burrs. Fixing all cables in respective cable glands and refixing gland plate to its original place. All cable identification plate is to be provided on both ends of each cable. Stripping of outer insulation cover, armouring etc. of cable, fixing ferrules on each core at both ends. Stripping all cores to suitable length, making eye, crimping terminal lugs (as the case may be) and fixing it to terminal block as per drawing followed by proper bending/ dressing of all cores. | | | | | |
| | Details of cables to be provided: | | | | | |
| a | 2 Core x 2.5 Sq.mm.(Unrmoured) | NO. | 100 | 50 | 100 | 250 |

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|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| b | 4 Core x 2.5 Sq.mm.(Unrmoured) | NO. | 50 | 50 | 50 | 150 |
| c | 8 Core x 2.5 Sq.mm. (Unrmoured) | NO. | 0 | 0 | 0 | 0 |
| d | 12 Core x 2.5 Sq.mm. (Unrmoured) | NO. | 0 | 0 | 0 | 0 |
| e | 19 Core x 2.5 Sq.mm. (Unrmoured) | NO. | 0 | 0 | 0 | 0 |
| f | 2 Core x 2.5 Sq.mm.(Armoured) | NO | 20 | 10 | 20 | 50 |
| g | 4 Core x 2.5 Sq.mm.(Armoured) | NO | 50 | 30 | 50 | 130 |
| h | 12 Core x 2.5 Sq.mm. (Armoured) | NO | 30 | 20 | 30 | 80 |
| i | 19 Core x 2.5 Sq.mm. (Armoured) | NO | 20 | 10 | 20 | 50 |
| j | 4 Core x 4 Sq.mm.(Armoured) | NO | 50 | 50 | 50 | 150 |
| k | 4 Core x 10 Sq.mm.(Armoured) | NO | 50 | 30 | 50 | 130 |
| l | Coaxial Cable | NO. | 0 | 0 | 0 | 0 |
| m | 3.5 Core x 70 /300 Sq.mm.Power Cable | NO. | 0 | 0 | 0 | 0 |
| (n) | Laying of copper cables (armoured/unarmoured) on racks/cable trays/ angle support overhead racks conduits including dressing of cables with accessories for copper conductor & armoured control cables. | | | | | |
| | Details of cables to be provided are as under: | | | | | |
| a | 2 Core x 2.5 Sq.mm. (Unrmoured) | Mtr. | 2000 | 1000 | 2000 | 5000 |
| b | 4 Core x 2.5 Sq.mm. (Unrmoured) | Mtr. | 1000 | 1000 | 1000 | 3000 |
| c | 8 Core x 2.5 Sq.mm. (Unrmoured) | Mtr. | 0 | 0 | 0 | 0 |
| d | 12 Core x 2.5 Sq.mm. (Unrmoured) | Mtr. | 0 | 0 | 0 | 0 |
| e | 19 Core x 2.5 Sq.mm. (Unrmoured) | Mtr. | 0 | 0 | 0 | 0 |
| f | 4Core 4 Sq.mm Armoured | Mtr. | 2000 | 1000 | 3000 | 6000 |

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| S No. | PARTICULARS | Unit | 2 Nos 400KV Feeder Bays for LILO of 400 KV Khandwa-Rajgarh at 400 KV Substation Chhegaon | 125 MVAR Reactor at 400 KV Substation Chhegaon | Additional 315 MVA 400/220 KV Transformer at 400 KV Substation Bina | Total |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------|--------------|
| g | 4Core 10 Sq.mm Armoured | Mtr. | 3000 | 2000 | 3000 | 8000 |
| h | 4Core 2.5 Sq.mm Armoured | Mtr. | 2000 | 1000 | 3000 | 6000 |
| i | 12Core 2.5 Sq.mm Armoured | Mtr. | 2000 | 1000 | 3000 | 6000 |
| j | 19 Core 2.5 Sq.mm Armoured | Mtr. | 3000 | 2000 | 3000 | 8000 |
| k | 2Core 2.5 Sq.mm Armoured | Mtr. | 1000 | 1000 | 2000 | 4000 |
| l | Coaxial Cable | Mtr. | 11000 | 5000 | 11000 | 27000 |
| m | 3.5 Core x 300 Sq.mm.Power Cable | Mtr. | 0 | 0 | 500 | 500 |
| n | Lying of optic Approach cable | Km | 0.5 | 0 | 0 | 0.5 |
| O | Erection Testing & commissioning of OFTE including termination of optical Fiber Approach Cables , fixing of jointing Box (splicing),fixing of FODP etc | set | 0 | 0 | 0 | 0 |
| (P) | Erection & Commissioning of 200KVA DG Set | No. | 0 | 0 | 0 | 0 |

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ANNEXURE-6

**WORKWISE QUANTITY FOR ERECTION, TESTING & COMMISSIONING OF TRANSMISSION LINES
(Package-6)**

| S. No. | PARTICULARS | Unit | 400 KV DCDS Line for LILO of one circuit of 400KV DCDS Khandwa-Rajgarh Line | Total |
|--------|--------------------------------------------------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------------|-------|
| | | | QTY | |
| 1 | Soil Investigation charges | No. | 0 | 0 |
| 2 | Detail Survey | Kms. | 3 | 3 |
| 3.1 | Check survey (required for verification of detailed survey for DCSS/DCDS line) | Kms. | 3 | 3 |
| 3.2 | Check survey (required for verification of shortages on towers & ground clearances, tree counting, TFR measurement etc.) | Kms. | 0 | 0 |
| 4 | Foundation work for Towers | | | |
| 4.1 | Excavation for foundation work including dewatering shoring-shuttering backfilling etc. | | | |
| (i) | Dry soil | Cum. | 378 | 378 |
| (ii) | Wet soil | Cum. | 881 | 881 |
| (iii) | Soft rock | Cum. | 4536 | 4536 |
| (iv) | Hard rock | Cum. | 0 | 0 |
| 4.2 | Setting of Template & Stub : | | | |
| (i) | Setting of Template & Stub (Special River Crossing tower) | Per Loc. | 0 | 0 |

Volume-VI

| S. No. | PARTICULARS | Unit | 400 KV DCDS Line for LILO of one circuit of 400KV DCDS Khandwa-Rajgarh Line | Total |
|---------------|------------------------------------------------------------|-------------|------------------------------------------------------------------------------------|--------------|
| | | | QTY | |
| (ii) | Setting of Template & Stub (220kV MC Type towers) | Per Loc. | 0 | 0 |
| (iii) | Setting of Template & Stub (132kV MD Type towers) | Per Loc. | 0 | 0 |
| (iv) | Setting of Template & Stub (400kV NFD Type towers) : | | | |
| a | NFD0 Type towers | Per Loc. | 2 | 2 |
| b | NFD0+20M Type towers | Per Loc. | 0 | 0 |
| c | NFD30 Type towers | Per Loc. | 0 | 0 |
| d | NFD60 Type towers | Per Loc. | 7 | 7 |
| e | NFD60+20/35M Type towers | Per Loc. | 1 | 1 |
| (v) | Setting of Template & Stub (220kV B Type towers) : | | | |
| a | B0 type tower | Per Loc. | 0 | 0 |
| b | B30 type tower | Per Loc. | 0 | 0 |
| c | B60 type tower | Per Loc. | 0 | 0 |
| (vi) | Setting of Template & Stub (132kV E-type / ND-Type towers) | | | |

Volume-VI

| S. No. | PARTICULARS | Unit | 400 KV DCDS Line for LILO of one circuit of 400KV DCDS Khandwa-Rajgarh Line | Total |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------|--------------|
| | | | QTY | |
| a | E0 / ND0 type tower | Per Loc. | 0 | 0 |
| b | E30 / ND30 type tower | Per Loc. | 0 | 0 |
| c | E60 / ND60 type tower | Per Loc. | 0 | 0 |
| 4.3 (A) | Earthing of tower at all the four legs | Per Loc. | 10 | 10 |
| 4.3 (B) | Earthing of Gantry Column by providing two earth sets | Per Loc. | 0 | 0 |
| 4.4 | Cost of Concreting (1:1½:3) including back filling, muffing, coaping & curing including cost of material (cement, metal, sand etc.) | Cum. | 1047 | 1047 |
| 4.5 | Cost of Concreting (1:2:4) including back filling, muffing, coaping & curing including cost of material (cement, metal, sand etc.) | Cum. | 0 | 0 |
| 4.6 | Cost of Concreting (1:3:6) including cost of material (cement, metal, sand etc.) | Cum. | 198 | 198 |
| 4.7 | Cost of laying reinforcement steel including cost of material (steel, binding wire etc) | MT | 77 | 77 |
| 5 | Tower Erection | | | |
| (i) | Erection of super structure for double circuit normal tower/ Multicircuit tower/ Gantry Structure including all work above ground level including tightening, punching of bolts & nuts. | MT | 270 | 270 |
| (ii) | Erection of super structure for Special River Crossing Towers including all work above ground | MT | 0 | 0 |

Volume-VI

| S. No. | PARTICULARS | Unit | 400 KV DCDS Line for LILO of one circuit of 400KV DCDS Khandwa-Rajgarh Line | Total |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------|--------------|
| | | | QTY | |
| | level including tightening, punching of bolts & nuts. | | | |
| (iii) | All round Peripheral welding of nuts & bolts of conventional towers | Nos. | 35845 | 35845 |
| (iv) | All round Peripheral welding of nuts & bolts of Special River crossing towers & M/C towers | Nos. | 0 | 0 |
| (v) | Fixing of tower accessories like Danger Board, Number plate, Phase plate and Anticlimbing device | Per Loc | 10 | 10 |
| (vi) | Fixing of tower accessories like Danger Board, Number plate, Phase plate and Anticlimbing device on Special River Crossing towers | Per Loc | 0 | 0 |
| (vii) | Fixing of Phase plate only (in case of 2 nd circuit stringing) | Per Loc | 0 | 0 |
| 6 | Stringing: | | | |
| (i) | Stringing of Twin Moose ACSR conductor, OPGW & Earth Wire including jointing & hoisting of insulator strings, armour rods dampers and other accessories and final jumpering for complete route kM with: | | | |
| a. | 3 Twin Moose bundle conductor (03 bundle cond. per circuit for 01 circuits) on NFD-series towers | Kms. | 0 | 0 |
| b. | 6 Twin Moose bundle conductor (03 bundle cond. per circuit for 02 circuits) on NFD- series towers | Kms. | 3 | 3 |

Volume-VI

| S. No. | PARTICULARS | Unit | 400 KV DCDS Line for LILO of one circuit of 400KV DCDS Khandwa-Rajgarh Line | Total |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------|--------------|
| | | | QTY | |
| c. | 6 Twin Moose bundle conductor (03 bundle cond. per circuit for 02 circuits) on special river crossing towers | Kms. | 0 | 0 |
| d. | EARTHWIRE size 3.66MM, 95KG/SQM quality | Kms. | 3 | 3 |
| e. | OPGW | Kms. | 3 | 3 |
| f. | 12 CONDT. & EARTH WIRE | Kms. | 0 | 0 |
| (ii) | Stringing of Zebra ACSR conductor & earth wire including jointing & hoisting of insulator strings, armour rods dampers and other accessories and final jumpering for complete route kM with : | | | |
| a. | 3 CONDT. & OPGW | Kms. | 0 | 0 |
| b. | 6 CONDT. & OPGW | Kms. | 0 | 0 |
| c. | 12 CONDT. & OPGW | Kms. | 0 | 0 |
| (iii) | Stringing of ACSR Panther conductor & earth wire including jointing & hoisting of insulator strings, armour rods dampers and other accessories and final jumpering for complete route kM with : | | | |
| a. | 3 CONDT. & OPGW | Kms. | 0 | 0 |
| b. | 6 CONDT. & OPGW | Kms. | 0 | 0 |
| c. | 12 CONDT. & OPGW | Kms. | 0 | 0 |
| (iv) | Second circuit stringing with 3 Power conductors (ACSR Zebra) while first circuit is charged. | Kms. | 0 | 0 |
| (v) | Second circuit stringing with 3 Power conductors (ACSR Panther) while first circuit is charged. | Kms. | 0 | 0 |
| (vi) | Stringing: OPGW with one ckt. live (for | Kms. | 0 | 0 |

Volume-VI

| S. No. | PARTICULARS | Unit | 400 KV DCDS Line for LILO of one circuit of 400KV DCDS Khandwa-Rajgarh Line | Total |
|----------|----------------------------------------------------------------------------------------------------------|------------------|-----------------------------------------------------------------------------|------------|
| | | | QTY | |
| | replacemenr of E/W) | | | |
| 7 | MISCELLANEOUS WORKS : | | | |
| (i) | Excavation (for tower site leveling and revetment work). | | | |
| | (a) Dry soil | Cum. | 75 | 75 |
| | (b) Wet soil | Cum. | 75 | 75 |
| | (c) Soft rock | Cum. | 150 | 150 |
| | (d) Hard rock | Cum. | 0 | 0 |
| (ii) | (a) Cost of building revetment with stones with 1:5 cement mortar per Cum of stone masonry. | Cum. | 60 | 60 |
| | (b) Cost of top seal cover of revetment wall with 1:2:4 mix concrete. | Cum. | 2 | 2 |
| | (c) Back filling and levelling of the volume enclosed by revetment walls in Cum. | Cum. | 15 | 15 |
| | (d) Cost of concrete 1:3:6 mix required for base padding including all material including cement. | Cum. | 6 | 6 |
| (iii) | (a) Erection of counterpoise earthing including all material, excavation and back filling. | Per laying Meter | 0 | 0 |
| | (b) Cost of providing additional earthing at the each counterpoise wire incl.cost of material. | Per Loc. | 0 | 0 |
| 8 | Dismantling of towers | MT | 81 | 81 |
| 9.1 | De-stringing: DCSS line | Km | 0 | 0 |

Volume-VI

| S. No. | PARTICULARS | Unit | 400 KV DCDS Line for LILO of one circuit of 400KV DCDS Khandwa-Rajgarh Line | Total |
|---------------|----------------------------------------------|-------------|------------------------------------------------------------------------------------|--------------|
| | | | QTY | |
| 9.2 | Dismantling: DCSS line | Km | 0.4 | 0.4 |
| 9.3 | Dismantling: Earthwire with one circuit live | Km | 0 | 0 |
| 10 | Transportation of dismantled material | MT | 84 | 84 |

Volume-VI
Modifications in Technical Specifications

There is no modification in technical specifications