
STANDARD BIDDING DOCUMENT FOR Full Turnkey Contract (Design, Supply and Installation)

WBSEDCL

Request for Bids

FOR

CONSTRUCTION OF 283 NOS BACKEND
INFRASTRUCTURE FOR LIGHT ELECTRIC VEHICLE
CHARGING STATIONS / BATTERY SWAPPING
STATIONS TO THE PREMISES OF
WBSEDCL/WBSETCL/PATHASATHIS/UD & MA UNDER
REVAMPED REFORMS-BASED AND RESULTS-LINKED,
DISTRIBUTION SECTOR SCHEME

Key Dates

Date of Release of RFB/ NIT	23th August 2023
Date & Time of Pre-bid Meeting	31th August 2023 at 11:30 Hrs. (IST)
Deadline for Submission of Bid	20th September 2023 at 12:00 Hrs. (IST)
Date & Time of Opening of Technical Part of Bid	22th September 2023 at 12:00 Hrs. (IST)

Regd. Office: West Bengal State Electricity Distribution Company Limited
Vidyut Bhawan, Block-DJ, Sector-II, Bidhannagar, Kolkata-700091
CIN No. U40109WB2007SGC113473
Tel (O) : 033-2359 1927/1971, 23197 252 Fax : (033) 2359 1976
Website: www.wbsedcl.in, Email: ceprojiii@wbsedcl.in

SUMMARY

PART I – BIDDING PROCEDURES AND REQUIREMENTS

Section 1: Request for Bids Notice /Notice Inviting Tender

This Section includes Request for Bids (RFB)/ Notice Inviting Tender (NIT)

Section 2: Eligibility and Qualification Requirements

This Section contains information regarding specific eligibility and qualification requirements applicable for prospective bidders to be considered for further evaluation of their bids.

Section 3: Instructions to Bidders (ITB) and Bid Data Sheet (BDS)

This Section consists of two parts: “Instructions to Bidders” and “Bid Data Sheet (BDS)”. “Bid Data Sheet” contains information specific to procurement that corresponds to and/or supplements and/or modifies “Instructions to Bidders”. This Section provides information to help prospective bidders prepare their bids. Information is also provided on the bidding process - **Single Stage Two-Envelope Bidding Process with e-Procurement**, submission, opening, and evaluation of bids, selection of successful bidder and on the award of contract.

Section 4: Bidding Forms - Technical Part of the Bid

This Section includes the forms for Technical Part of the bid, that are to be completed by the Bidders and submitted in accordance with the requirements of Section 3.

Section 5: Bidding Forms - Financial Part of the Bid

This Section includes the forms for Financial Part of the bid including Price Schedules, that are to be completed the Bidders and submitted in accordance with the requirements of Section 3.

PART 2 – EMPLOYER’S REQUIREMENTS

Section 6: Employer’s Requirements

This Section specifies the Scope of Work, Specification, the Drawings, and supplementary information that describe the Plant and Installation Services to be procured.

PART 3 – CONDITIONS OF CONTRACT AND CONTRACT FORMS

Section 7: Conditions of Contract

This Section consists of two parts: General Conditions of Contract (GCC) and Special Conditions of Contract (SCC). GCC includes general clauses to be applicable to the Contract and the contents of SCC modify or supplement GCC.

Section 8 - Contract Forms

This Section contains the Letter of Acceptance/ Notification of Award, forms which, once completed, will form part of the Contract. The forms for Performance Security and Advance Payment Security, when required, shall only be completed by the successful Bidder after contract award.

Table of Contents

Section - 1 : Request for Bids Notice.....	8
Section – 2 : Eligibility and Qualification Requirements.....	13
Section - 3 : Instructions to Bidders and Bid Data Sheet.....	22
I. Instructions to Bidders.....	22
1. Scope of Bid and Definitions.....	22
2. Fraud and Corruption.....	25
3. Eligibility, Qualification Requirements.....	25
4. Conflict of Interest.....	25
5. Sections of Bidding Document.....	27
6. Bidding Process Management, Clarification of the Bidding Document, Site Visit and Pre-Bid Meeting.....	27
7. Addenda/ Corrigendum/Amendment of Bidding Document.....	29
8. Cost of Bidding.....	29
9. Language of Bid.....	30
10. Documents comprising Bid.....	30
11. Process of Bid Submission.....	32
12. Alternative Bids.....	32
13. Bid prices and Discounts.....	32
14. Currencies of Bid and Payment.....	37
15. Documents Establishing the Conformity of the Plant and Installation Services/ Works	37
16. Documents Establishing the Eligibility and Qualifications of the Bidder and Eligibility of Plant and Installation Services.....	39
17. Period of Validity of Bids.....	39

17. Bid Security/ Bid Securing Declaration.....	40
18. Format and Signing of Bid.....	41
19. Submission of Bids.....	42
20. Deadline for Submission of Bids.....	43
21. Late Bids.....	43
22. Withdrawal, Substitution, and Modification of Bids.....	43
23. Public Opening of Technical Parts of Bids.....	44
24. Confidentiality.....	45
25. Clarification of Bids.....	45
26. Deviations, Reservations, and Omissions.....	45
27. Nonmaterial Nonconformities, Errors and Omissions.....	46
28. Evaluation of Technical Parts.....	46
29. Determination of Responsiveness.....	48
30. Public Opening of Financial Parts.....	49
31. Evaluation of Financial Parts.....	50
32. Correction of Arithmetical Errors.....	51
33. Comparison of Financial Parts.....	51
34. Preference.....	51
35. Abnormally Low Bids.....	51
36. Unbalanced or Front Loaded Bids.....	52
37. Most Advantageous Bid.....	52
38. Employer's Right to Accept Any Bid, and to Reject Any or All Bids.....	53
39. Award Criteria.....	53
40. Employer's Right to make minor adjustments at the time of Award.....	54
41. Notification of Award.....	54

42. Signing of Contract.....	54
43. Performance Security.....	55
44. Source of Funds.....	55
45. Dedicated bank account of Contractor/Bidder.....	55
II. Bid Data Sheet (BDS).....	57
Section - 4 : Bidding Forms - Technical Part of the Bid.....	66
Form 1.....	67
Letter of Bid – Technical Part.....	67
Form 2.....	72
Format for Bidder Information Sheet.....	72
Form 3A.....	75
Format of Bid Securing Declaration (if applicable).....	75
Form 3B.....	77
Format of Bank Guarantee for Bid Security.....	77
Form 4.....	79
Format of Power of Attorney of designated Bid Signatory by sole bidder/ lead joint venture member.....	79
Form 5.....	81
Format of Declaration of conformance of the Bidder and the Facilities offered, to the specified eligibility requirement.....	81
Form 6.....	81
Format for Affidavit of Self certification regarding Local Content in line with PPP-MII order and #MoP Order/DoT order.....	82
Form 7.....	85
Format Of Power of Attorney by Each Member/ Partner of The Joint Venture in favour of Lead Member/ Partner.....	85
Form 8.....	88
Format of Joint Deed of Undertaking by the Joint Venture Partners/ Members.....	88
Joint Venture Agreement.....	92
Form 9.....	93
Format for Details/ Data and Documentary Evidence in support of meeting the Qualification Requirement.....	93
Form 10.....	99
Format of Bought-out & Sub-contracted Items.....	99
Form 11.....	101

Format of Undertaking on Compliance of Terms & Conditions of the Bidding

Documents including Scope of Work and other related requirements.....	101
Form 12.....	104
Format of Alternative, Deviations and Exceptions to the Provisions of RFB Document	104
Form 13.....	107
Format of Work Completion Schedule.....	107
Form 14.....	110
Format of Guarantee Declaration.....	110
Form 15.....	112
Format of Information regarding Ex-employees.....	112
Form 16.....	114
Format for Price Adjustment Data.....	114
Form 17.....	116
Format of Option for Initial Advance (either Interest Bearing Initial Advance or No Initial Advance) and Information for E-payment, PF details and declaration regarding Micro/Small & Medium Enterprises.....	116
Form 18.....	120
FORMAT OF Declaration for tax exemptions, reductions, allowances or benefits)....	120
Form 19.....	122
Format of Bank Guarantee verification Check list.....	122
Form 20.....	127
Format of Additional Information.....	127
Form 21.....	131
Format of Integrity Pact.....	131
Section - 5 : Bidding Forms - Financial Part of the Bid.....	139

PART 1

BIDDING PROCEDURES AND REQUIREMENTS

Section - 1: Request for Bids Notice/Notice Inviting Tender

West Bengal State Electricity Distribution Company Limited

NATIONAL OPEN COMPETITIVE PROCUREMENT

Request for Bids (RFB)/ Notice Inviting Tender (NIT) (Single Stage Two-Envelope Bidding Process with e-Procurement)

Contract Title: Construction of 283 nos backend infrastructure for light electric Vehicle Charging Stations / Battery Swapping Stations to the premises of WBSEDCL/WBSETCL/PATHASATHIS/UD & MA under Revamped Reforms-Based and Results-Linked, Distribution Sector Scheme.

NIT/RFB No: WBSEDCL/Dist. Project-III/RDSS/EVCS/Tender/2023-24/07

Issued on: 23th August 2023

The Project shall be executed (in Turnkey mode) under the following packages (Table-A) for which, WBSEDCL invites sealed bids in two part (Part I: Techno-Commercial, Part II: Price) under the Domestic Competitive bidding :-

TABLE-A			
Package No.	Name of District	Estimated Project Cost (in ₹)	Amount of Bid Security (in ₹)
Package No. -PK-2	All District	271187617.00	5423753.00

West Bengal State Electricity Distribution Company Limited (hereinafter also referred to as the **Employer** or the **Utility**) invites online Bids for “**Construction of 283 nos backend infrastructure for light electric Vehicle Charging Stations / Battery Swapping Stations to the premises of WBSEDCL/WBSETCL/PATHASATHIS/UD & MA under Revamped Reforms-Based and Results-Linked, Distribution Sector Scheme**” on behalf of WBSEDCL. Bidders are advised to note the clauses on eligibility and qualification requirements in Section 2, to be eligible and qualify for being considered for the award of the contract.

1. Bidding will be conducted through national open competitive e-procurement.
2. The RFB document (hereinafter also referred to as bidding document) is available online, free of cost, for downloading on www.wbtenders.gov.in from **23th August 2023 to 20th September 2023**. The bidder would be responsible for ensuring that any addenda/ corrigendum/ amendment etc. available on the website/ portal is also downloaded and incorporated.
3. The bidding shall be conducted **under Single Stage Two-Envelope Bidding process with e-Procurement** as specified in Section 3.
4. Under the Single Stage Two-Envelope Bidding process, the Bidder shall not quote, disclose, or submit its price in the Technical Part (First Envelope) of its bid or in any

other manner, whatsoever, except as part of the Financial Part (Second Envelope) of its bid. In case of any non-compliance in this regard, the bids shall be out-rightly / summarily rejected.

5. An incomplete and/or ambiguous and/or conditional bid and/or bid submitted late is liable to be ignored/ summarily rejected.
6. Bid must be submitted online through the e-Procurement/ e-Tendering process specified in Section 3. Any bid or modifications to bid received outside the e-Procurement system will not be considered, unless otherwise specified in Section 3. The Utility shall not be held liable for any delays due to e-Procurement/ e-Tendering system failure beyond its control. Even though the system will attempt to notify the bidders of any bid updates, The Utility shall not be liable for any information not received by the bidder. It is the bidders' responsibility to verify the website for the latest information related to this RFB.
7. Salient details pertaining to this RFB Notice including submission and opening of bid, bid security, cost of documents/ tender fee, if any, for downloading the bidding document, address for communication, etc., are given in the TABLE below.
8. If the Utility office happens to be closed on the specified date of opening of the bids, the bids will be opened on the next working day at the same time and venue or as may be notified by the Utility.
9. Other details can be seen in the RFB document.

TABLE

RFB Notice/ NIT No.	WBSEDCL/Dist. Project-III/RDSS/EVCS/Tender/2023-24/07 Dt. 23.08.2023
Contract Title for the Procurement	Construction of 283 nos backend infrastructure for light electric Vehicle Charging Stations / Battery Swapping Stations to the premises of WBSEDCL/WBSETCL/PATHASATHIS/UD & MA under Revamped Reforms-Based and Results-Linked, Distribution Sector Scheme.
Brief description of Scope of Works	The scope of work under the subject package includes site survey, planning, design, engineering, assembly manufacturing, testing, supply, loading, transportation, unloading, insurance, delivery at site, handling, storage, installation, testing, commissioning, and documentation of all items/material required to complete the following works for “Construction of 283 nos backend infrastructure for light electric Vehicle Charging Stations / Battery Swapping Stations to the premises of WBSEDCL/WBSETCL/PATHASATHIS under Revamped Reforms-Based and Results-Linked, Distribution Sector Scheme” in the Howrah, South 24 Pargana, North 24 Pargana, Nadia, Mursidabad, Birbhum, Hooghly, Bankura, Paschim Medinipur including, Jhargram, Purba Medinipur, Purulia, Burdwan East & West, Birbhum, Uttar Dinajpur, Dakshin Dinajpur, Alipurduar, Malda, Jalpaiguri, Coochbehar & Darjeeing District Of West Bengal
Mode of Procurement/Bidding	Singe Stage Two-Envelope Bidding Process with e-Procurement/ e-Tendering
Date of Release of RFB Notice/ NIT	23.08.2023
Date & Time of Pre-Bid Meeting	31/08/2023 at 11:30 Hours (IST)
Last date of Bid Submission	20/09/2023, up to 12:00 Hours (IST)

Date of Opening of Technical Part (First Envelope) of the bid	22/09/2023, at 12:00 Hours (IST)
Opening of Financial Part (Second Envelope) of the Bid	To be notified later. Financial Part of bids from only those bidders shall be opened who, upon evaluation of Technical Part of the bids, are found eligible and qualified, and whose bids are found responsive to bidding documents.
Location of Submission/Opening of Bids, as applicable	Chief Engineer (Project-III) WBSEDCL Vidyut Bhawan, 2nd Floor, C-Block, Block-DJ, Sector-II, Bidhannagar, Kolkata-700091 Website: www.wbsedcl.in, Email: ceprojiii@wbsedcl.in
Type of Procurement	Plant (Design, Supply, and Installation)
FEMD/ Bid Security	All bids must be accompanied by a bid security as per Table A at Section –I (RFB)
Performance Security	The Performance Security amount is 10% of Contract Price
Bid Validity period	The bid validity period will be 180 days from date of Opening of Technical Part of the Bid.
Time for Completion	The Time for Completion of the works is: 06 (Six Months) from the Effective Date of the Contract.
Address for Correspondence	Chief Engineer (Project-III) WBSEDCL Vidyut Bhawan, 2nd Floor, C- Block, Block-DJ, Sector-II, Bidhannagar, Kolkata-700091 Contact no.:- 8900793566/8900793561 Website: www.wbsedcl.in, Email: ceprojiii@wbsedcl.in
Contact Details of E- Procurement Portal Support Team:	Chief Engineer (Project-III) WBSEDCL Vidyut Bhawan, 2nd Floor, C- Block, Block-DJ, Sector-II, Bidhannagar, Kolkata-700091 Contact no.:- 8900793566/8900793561 Website: www.wbsedcl.in, Email: ceprojiii@wbsedcl.in

TABLE- B

SL. No.	Package/ Spec. No.	Package Name	EV Charging Station Location Details.	WBSEDCL Divisions Involved	Remarks
1	Package No- PK-2.	Construction of 283 nos backend infrastructure for light electric Vehicle Charging Stations / Battery Swapping Stations to the premises of WBSEDCL/WBSETCL/PATHA SATHIS/UDMA under Revamped Reforms-Based and Results-Linked, Distribution Sector Scheme.	As Per Annexure-L	As Per Annexure-L	Nos of locations may be increased & tentative location may be changed/alter to nearby location.

Annexure- L

Sl.No	Sub SI no	Name of Existing Sub-Station/Location	Name Of Region/Division/AO/ Municipality	Name Of District	Owner of the Premises
1	1	FALAKATA-SS398	ALIPURDUAR	ALIPURDUAR	WBSEDCL
2	2	KARTIKA-SS400	ALIPURDUAR	ALIPURDUAR	WBSEDCL
3	3	TARUI-SS127	ARAMBAGH	MIDNAPORE (W)	WBSEDCL
4	4	CHOA-SS320	BAHARAMPUR	MURSHIDABAD	WBSEDCL
5	5	BELDANGA-SS317	BAHARAMPUR	MURSHIDABAD	WBSEDCL
6	6	REJINAGAR-SS328	BAHARAMPUR	MURSHIDABAD	WBSEDCL
7	7	CHHATNA-SS261	BANKURA	BANKURA	WBSEDCL
8	8	MANJURA-SS266	BANKURA	BANKURA	WBSEDCL
9	9	NANDANPUR-SS267	BANKURA	BANKURA	WBSEDCL
10	10	GANGAJALGHATI-SS262	BANKURA	BANKURA	WBSEDCL
11	11	HASNABAD-SS085	BASIRHAT	NORTH 24 PARGANAS	WBSEDCL
12	12	SERAPOLE-SS086	BASIRHAT	NORTH 24 PGS	WBSEDCL
13	13	HANROA-SS084	BASIRHAT	NORTH 24 PGS	WBSEDCL
14	14	HINGALGANJ-SS087	BASIRHAT	NORTH 24 PGS	WBSEDCL
15	15	NAZAT-SS669	BASIRHAT	NORTH 24 PGS	WBSEDCL
16	16	BADURIA -SS727	BASIRHAT	NORTH 24 PGS	WBSEDCL
17	17	KHANDARUI -SS580	BELDA	MIDNAPORE (W)	WBSEDCL
18	18	SARASANKA-SS204	BELDA	MIDNAPORE (W)	WBSEDCL
19	19	MOHANPUR-SS227	BELDA	MIDNAPORE (W)	WBSEDCL
20	20	KESHIARY-SS212	BELDA	MIDNAPORE (W)	WBSEDCL
21	21	NAYAGRAM-SS576	BELDA	MIDNAPORE (W)	WBSEDCL
22	22	SANKRAIL-SS220	BELDA	MIDNAPORE (W)	WBSEDCL

23	23	LAVPUR-SS178	BOLPUR	BIRBHUM	WBSEDCL
24	24	ILLAMBAJAR-SS176	BOLPUR	BIRBHUM	WBSEDCL
25	25	JOYDEB (BHALUKA) -SS720	BOLPUR	BIRBHUM	WBSEDCL
26	26	HATIA -SS848	BOLPUR	BIRBHUM	WBSEDCL
27	27	THENGAPARA -SS733	BUNIADPUR	UTTAR DINAJPUR	WBSEDCL
28	28	ORGRAM-SS148	BURDWAN (NORTH)	BURDWAN(E)	WBSEDCL
29	29	BOLGONA-SS135	BURDWAN (NORTH)	BURDWAN(E)	WBSEDCL
30	30	NASIGRAM-SS561	BURDWAN (NORTH)	BURDWAN(E)	WBSEDCL
31	31	MIYERGERI (JIBANTALA)-SS014	CANNING	SOUTH 24 PGS	WBSEDCL
32	32	POLBA-SS117	CHANDANNAGAR	HOOGHLY	WBSEDCL
33	33	KHARIPUKURIA-SS582	CONTAI	MIDNAPORE (E)	WBSEDCL
34	34	RAMNAGAR-SS253	CONTAI	MIDNAPORE (E)	WBSEDCL
35	35	MALDA-SS252	CONTAI	MIDNAPORE (E)	WBSEDCL
36	36	JINANDAPUR -SS638	CONTAI	MIDNAPORE (E)	WBSEDCL
37	37	SAKTIA (UDBADAL) -SS684	CONTAI	MIDNAPORE (E)	WBSEDCL
38	38	NIRMALBAZAR-SS234	GHATAL	MIDNAPORE (W)	WBSEDCL
39	39	KHUDIRAMNAGAR-SS257	HALDIA	MIDNAPORE (E)	WBSEDCL
40	40	GOPALPUR-SS239	HALDIA	MIDNAPORE (E)	WBSEDCL
41	41	REYAPARA-SS243	HALDIA	MIDNAPORE (E)	WBSEDCL
42	42	MANIKPARA-SS214	JHARGRAM	MIDNAPORE (W)	WBSEDCL
43	43	BORIA-SS226	JHARGRAM	MIDNAPORE (W)	WBSEDCL
44	44	CHILKIGARH-SS569	JHARGRAM	MIDNAPORE (W)	WBSEDCL
45	45	LALGOLA-SS326	JIAGANJ	MURDIDABAD	WBSEDCL
46	46	RUDRANAGAR-SS485	KAKDWIP	SOUTH 24 PARGANAS	WBSEDCL
47	47	DAKSHIN SHIBGANJ -SS687	KAKDWIP	SOUTH 24 PARGANAS	WBSEDCL
48	48	ACHINTYANAGAR -SS756	KAKDWIP	SOUTH 24 PARGANAS	WBSEDCL
49	49	MADHUPUR-SS152	KALNA	BURDWAN(E)	WBSEDCL
50	50	WBIDC PH-III-SS352	KALYANI	NADIA	WBSEDCL
51	51	SHAKTIPUR-SS329	KANDI	MURDIDABAD	WBSEDCL
52	52	BHABANINAGAR-SS333	KANDI	MURDIDABAD	WBSEDCL
53	53	JAGGESWARDIHI-SS158	KATWA	BURDWAN(E)	WBSEDCL
54	54	PACHUNDI-SS157	KATWA	BURDWAN(E)	WBSEDCL
55	55	SABONG-SS221	KHARAGPUR	MIDNAPORE (W)	WBSEDCL
56	56	PINGLA-SS217	KHARAGPUR	MIDNAPORE (W)	WBSEDCL
57	57	INDPUR-SS263	KHATRA	BANKURA	WBSEDCL
58	58	RANIBANDH-SS268	KHATRA	BANKURA	WBSEDCL
59	59	SIMLAPAL-SS279	KHATRA	BANKURA	WBSEDCL
60	60	TALDANGRA-SS281	KHATRA	BANKURA	WBSEDCL
61	61	KHATRA-SS265	KHATRA	BANKURA	WBSEDCL
62	62	KRISHNAGANJ-SS363	KRISHNANAGAR	NADIA	WBSEDCL
63	63	SHIBNAGAR-SS315	MALDA (NORTH)	MALDA	WBSEDCL

64	64	HABIBPUR-SS307	MALDA (SOUTH)	MALDA	WBSEDCL
65	65	MANIKCHAK-SS311	MALDA (SOUTH)	MALDA	WBSEDCL
66	66	GOLAPGANJ -SS984	MALDA (SOUTH)	MALDA	WBSEDCL
67	67	AKRAHAT-SS405	MATHABHANGA	COOCHBEHAR	WBSEDCL
68	68	MEKHLIGANG -SS526	MATHABHANGA	COOCHBEHAR	WBSEDCL
69	69	JAMALPUR-SS134	MEMARI	BURDWAN(E)	WBSEDCL
70	70	BAGILA-SS149	MEMARI	BURDWAN(E)	WBSEDCL
71	71	PAHARHATI-SS195	MEMARI	BURDWAN(E)	WBSEDCL
72	72	PIRAKATA -SS721	MIDNAPORE	MIDNAPORE (W)	WBSEDCL
73	73	INCHURA-SS110	MOGRA	HOOGHLY	WBSEDCL
74	74	PALASSY-SS370	NAKASHIPARA	NADIA	WBSEDCL
75	75	AKANDABERIA-SS365	NAKASHIPARA	NADIA	WBSEDCL
76	76	DAFAHAT (AURANGABAD)-SS332	RAGHUNATHGANJ	PURULIA	WBSEDCL
77	77	MOREGRAM -SS985	RAGHUNATHGANJ	PURULIA	WBSEDCL
78	78	HEMTABAD-SS438	RAIGANJ (U/DINAJPUR)	UTTAR DINAJPUR	WBSEDCL
79	79	PAIKAR-SS449	RAMPURHAT	BIRBHUM	WBSEDCL
80	80	GANGNAPUR-SS347	RANAGHAT	NADIA	WBSEDCL
81	81	BADKULLA-SS356	RANAGHAT	NADIA	WBSEDCL
82	82	KPS-SS310	SOUTH MALDA	MALDA	WBSEDCL
83	83	BAISHNABNAGAR-SS331	SOUTH MALDA	MALDA	WBSEDCL
84	84	NARAYANPUR-SS038	SOUTH MALDA	MALDA	WBSEDCL
85	85	DUBRAJPUR-SS175	SURI	BIRBHUM	WBSEDCL
86	86	PANRUI-SS185	SURI	BIRBHUM	WBSEDCL
87	87	GOPALNAGAR-SS476	TAMLUK	MIDNAPORE (E)	WBSEDCL
88	88	THEKUACHAK (KHANCHI) -SS649	TAMLUK	MIDNAPORE (E)	WBSEDCL
89	89	NEW TOWN AA-IIB -SS625	NEW TOWN	SOUTH 24 PGS	WBSEDCL
90	90	MAHINAGAR-SS015	Baruipur	NORTH 24 PGS	WBSEDCL
91	91	TAMNA-SS299	PURULIA	PURULIA	WBSEDCL
92	92	BALARAMPUR SS659,	PURULIA	PURULIA	WBSEDCL
93	93	WILCOX ROAD, TELIDIH SS853,	PURULIA	PURULIA	WBSEDCL
94	94	HURA SS293,	RAGHUNATHPUR	PURULIA	WBSEDCL
95	95	MANBAZAR SS296,	RAGHUNATHPUR	PURULIA	WBSEDCL
96	96	BORO (MANBAZAR-II) SS572,	RAGHUNATHPUR	PURULIA	WBSEDCL
97	97	GOBAG SS292,	RAGHUNATHPUR	PURULIA	WBSEDCL
98	98	KASHIPUR SS295,	RAGHUNATHPUR	PURULIA	WBSEDCL
99	99	KENDA SS712	RAGHUNATHPUR	PURULIA	WBSEDCL
100	100	SARBARI SS748	RAGHUNATHPUR	PURULIA	WBSEDCL
101	101	HATIGHISHA SS519	SILIGURI SUB-URBAN	DARJEELING	WBSEDCL
102	102	KAYNAPUR-II SS165	ASANSOL	BURDWAN(W)	WBSEDCL
103	103	GUSHKARA SS132	BURDWAN (NORTH)	BURDWAN(E)	WBSEDCL
104	104	C.K.TOWN SS229	GHATAL	MIDNAPORE (W)	WBSEDCL
105	105	CHANDIPUR SS484	HALDIA	MIDNAPORE (E)	WBSEDCL
106	106	NEW NIMPURA SS615	KHARAGPUR	MIDNAPORE (W)	WBSEDCL

107	107	MIRIK SS381	KURSEONG	DARJEELING	WBSEDCL
108	108	FULIA SS357	RANAGHAT	NADIA	WBSEDCL
109	109	GHOSHPUKUR SS386	SILIGURI SUB-URBAN	DARJEELING	WBSEDCL
110	110	DABGRAM SS384	SILIGURI TOWN	DARJEELING	WBSEDCL
111	111	MECHOGRAM SS241	TAMLUK	MIDNAPORE (E)	WBSEDCL
112	1	Dinhata 132KV GIS	Alipurduar AO	ALIPURDUAR	WBSETCL
113	2	Hamiltongunj 66KV	Alipurduar AO	ALIPURDUAR	WBSETCL
114	3	Hasimara 66KV	Alipurduar AO	ALIPURDUAR	WBSETCL
115	4	Coochbehar 132KV	Alipurduar AO	ALIPURDUAR	WBSETCL
116	5	Arambagh 400KV	Arambagh AO	MIDNAPORE (W)	WBSETCL
117	6	Bishnupur 132KV	Bankura AO	BANKURA	WBSETCL
118	7	Khatra 132KV	Bankura AO	BANKURA	WBSETCL
119	8	Bongaon 132KV	Barasat AO	NORTH 24 PGS	WBSETCL
120	9	Mohispota 132KV	Barasat AO	NORTH 24 PGS	WBSETCL
121	10	Asokenagar 132KV	Barasat AO	NORTH 24 PGS	WBSETCL
122	11	Lalgola 132KV	Berhampore AO	MURSHIDABAD	WBSETCL
123	12	Raghunathganj 132KV	Berhampore AO	MURSHIDABAD	WBSETCL
124	13	Bolpur 132KV	Birbhum AO	BIRBHUM	WBSETCL
125	14	Sadaipur 220KV	Birbhum AO	BIRBHUM	WBSETCL
126	15	Rampurhat 132KV	Birbhum AO	BIRBHUM	WBSETCL
127	16	Kalna 132KV	Burdwan AO	BURDWAN(E)	WBSETCL
128	17	Katwa 132Kv	Burdwan AO	BURDWAN(E)	WBSETCL
129	18	Mankar 132KV	Burdwan AO	BURDWAN(E)	WBSETCL
130	19	Raina 132KV	Burdwan AO	BURDWAN(E)	WBSETCL
131	20	Adisaptagram 132KV	Chandannagar AO	HOOGHLY	WBSETCL
132	21	Belmuri 220 KV	Chandannagar AO	HOOGHLY	WBSETCL
133	22	Bighati 132KV	Chandannagar AO	HOOGHLY	WBSETCL
134	23	Chanditala 132KV	Chandannagar AO	HOOGHLY	WBSETCL
135	24	Khanyan 132KV	Chandannagar AO	HOOGHLY	WBSETCL
136	25	Ukhra 132KV	Durgapur 400 KV AO	BURDWAN(W)	WBSETCL
137	26	DPL B-Zone 132KV	Durgapur Tr AO	BURDWAN(W)	WBSETCL
138	27	DPL AB-Zone 132KV	Durgapur Tr AO	BURDWAN(W)	WBSETCL
139	28	Nagrakatta 66KV	Jalpaiguri AO	JALPAIGURI	WBSETCL
140	29	Birpara 132KV	Jalpaiguri AO	JALPAIGURI	WBSETCL
141	30	Jeerat 400KV	Jeerat 400KV AO	NORTH 24 PGS	WBSETCL
142	31	Dharampur 220KV GIS	Jeerat 400KV AO	NORTH 24 PGS	WBSETCL
143	32	Kalyani 132KV	Jeerat 400KV AO	NADIA	WBSETCL
144	33	Minakha 132 KV GIS	Kasba AO	NORTH 24 PGS	WBSETCL
145	34	Subhasgram 220KV	Kasba AO	SOUTH 24 PGS	WBSETCL
146	35	Debagram 132KV	Krishnanagar AO	NADIA	WBSETCL
147	36	Krishnagar 220KV	Krishnanagar AO	NADIA	WBSETCL
148	37	Ranaghat 132KV	Krishnanagar AO	NADIA	WBSETCL
149	38	Rejinagar 220KV	Krishnanagar AO	NADIA	WBSETCL

150	39	Midnapore 220KV	Midnapore AO	MIDNAPORE (W)	WBSETCL
151	40	C K Road 132KV	Midnapore AO	MIDNAPORE (W)	WBSETCL
152	41	Chanditala 400KV	New Chanditala 400KV AO	HOOGHLY	WBSETCL
153	42	Jangipara 132KV	New Chanditala 400KV AO	HOOGHLY	WBSETCL
154	43	Balurghat 132KV	Raiganj AO	UTTAR DINAJPUR	WBSETCL
155	44	Gangarampur 132KV	Raiganj AO	UTTAR DINAJPUR	WBSETCL
156	45	Islampur 132KV	Raiganj AO	UTTAR DINAJPUR	WBSETCL
157	46	New Town AA-III 220KV	SaltLake AO	NORTH 24 PGS	WBSETCL
158	47	NBU 132KV	Siliguri AO	DARJEELING	WBSETCL
159	48	Manbazar 132 KV GIS	Purulia AO	PURULIA	WBSETCL
160	49	Hura 220KV	Purulia AO	PURULIA	WBSETCL
161	50	Sonarpur 132KV	Kasba AO	SOUTH 24 PGS	WBSETCL
162	51	New Jalpaiguri 220KV	Siliguri AO	DARJEELING	WBSETCL
163	52	Barasat 220KV	Barasat AO	NORTH 24 PGS	WBSETCL
164	53	Asansol 220KV	Durgapur 400 KV AO	BURDWAN(W)	WBSETCL
165	54	Durgapur 400KV	Durgapur 400 KV AO	BURDWAN(W)	WBSETCL
166	55	Uluberia 132KV	Howrah AO	HOWRAH	WBSETCL
167	56	Kharagpur 400KV	Kharagpur 400KV AO	MIDNAPORE (W)	WBSETCL
168	57	Domjur 220KV	New Chanditala 400KV AO	HOOGHLY	WBSETCL
169	58	New Town AA-I 132KV	SaltLake AO	NORTH 24 PGS	WBSETCL
170	59	Saltlake 132KV AIS	SaltLake AO	NORTH 24 PGS	WBSETCL
171	60	Titagarh 132KV	SaltLake AO	NORTH 24 PGS	WBSETCL
172	61	Kasba 220KV	Kasba AO	SOUTH 24 PGS	WBSETCL
173	1	BANGOAN	NORTH 24 PARGANAS	NORTH 24 PARGANAS	PATHASATHI
174	2	GAIGHATA	NORTH 24 PARGANAS	NORTH 24 PARGANAS	PATHASATHI
175	3	BASIRHAT	NORTH 24 PARGANAS	NORTH 24 PARGANAS	PATHASATHI
176	4	NARAYANGARH	PASCHIM MEDINJPORE	PASCHIM MEDINJPORE	PATHASATHI
177	5	CANNING	SOUTH 24 PARGANAS	SOUTH 24 PARGANAS	PATHASATHI
178	6	OLD MALDA	MALDA	MALDA	PATHASATHI
179	7	RANAGHAT-II	NADIA	NADIA	PATHASATHI
180	8	BISHNUBATI	HOOGHLY	HOOGHLY	PATHASATHI
181	9	SAGRAI MORE	PURBA BARDHAMAN	PURBA BARDHAMAN	PATHASATHI
182	10	BUDBUD	PURBA BARDHAMAN	PURBA BARDHAMAN	PATHASATHI
183	11	ASHOKENAGAR	NORTH 24 PARGANAS	NORTH 24 PARGANAS	PATHASATHI
184	12	KAMARPUKUR	HOOGHLY	HOOGHLY	PATHASATHI
185	13	NIMPURA	PASCHIM MEDINIPORE	PASCHIM MEDINIPORE	PATHASATHI
186	14	SHANTIPUR	NADIA	NADIA	PATHASATHI
187	15	HARINGHATA	NADIA	NADIA	PATHASATHI

188	16	NANDAKUMAR	PURBA MEDINIPORE	PURBA MEDINIPORE	PATHASATHI
189	17	PETRAPOLE	NORTH 24 PARGANAS	NORTH 24 PARGANAS	PATHASATHI
190	18	MEMARY	PURBA BARDHAMAN	PURBA BARDHAMAN	PATHASATHI
191	19	KODALIA	HOOGHLY	HOOGHLY	PATHASATHI
192	20	BARAKAR	PASCHIM BARDHAMAN	PASCHIM BARDHAMAN	PATHASATHI
193	21	KALNA	PURBA BARDHAMAN	PURBA BARDHAMAN	PATHASATHI
194	22	MAKRAMPUR	BOLPUR BIRBHUM	BOLPUR BIRBHUM	PATHASATHI
195	23	ISLAMPUR	UTTAR DINAJPUR	UTTAR DINAJPUR	PATHASATHI
196	24	FULBAR	JALPAIGURI	JALPAIGURI	PATHASATHI
197	25	KAKDWIP (KULPI)	SOUTH 24 PARGANAS	SOUTH 24 PARGANAS	PATHASATHI
198	26	DALAN GHATA	SOUTH 24 PARGANAS	SOUTH 24 PARGANAS	PATHASATHI
199	27	VASA	SOUTH 24 PARGANAS	SOUTH 24 PARGANAS	PATHASATHI
200	28	CANNING,II	SOUTH 24 PARGANAS	SOUTH 24 PARGANAS	PATHASATHI
201	29	KHAYRABUNI ILLAMBAZAR-I	BIRBHUM	BIRBHUM	PATHASATHI
202	30	LODHASULI	JHARGRAM	JHARGRAM	PATHASATHI
203	31	DEBGRAM	NADIA	NADIA	PATHASATHI
204	32	SEPOYDHURA	DARJEELING	DARJEELING	PATHASATHI
205	33	ITAHAR	UTTAR DINAJPUR	UTTAR DINAJPUR	PATHASATHI
206	34	CHALSA	JALPAIGURI	JALPAIGURI	PATHASATHI
207	35	SWARUP NAGAR	NORTH 24 PARGANAS	NORTH 24 PARGANAS	PATHASATHI
208	36	MALANCHHA	NORTH 24 PARGANAS	NORTH 24 PARGANAS	PATHASATHI
209	37	SAGAR	SOUTH 24 PARGANAS	SOUTH 24 PARGANAS	PATHASATHI
210	38	KANDI	MURSIDABAD	MURSIDABAD	PATHASATHI
211	39	JALANGI	MURDIDABAD	MURDIDABAD	PATHASATHI
212	40	AMJHORA	SOUTH 24 PARGANAS	SOUTH 24 PARGANAS	PATHASATHI
213	41	KHOYRAKURI MD BAZAR	BIRBHUM	BIRBHUM	PATHASATHI
214	42	NALHATI	BIRBHUM	BIRBHUM	PATHASATHI
215	43	TAPAN	DAKSHIN DINAJPUR	DAKSHIN DINAJPUR	PATHASATHI
216	44	MITHA PUKUR	HOOGHLY	HOOGHLY	PATHASATHI
217	45	SALGARA, BORJORE	BANKURA	BANKURA	PATHASATHI
218	46	BIRPARA	ALIPURDUAR	ALIPURDUAR	PATHASATHI
219	47	KARJONA	PURBA BARDHAMAN	PURBA BARDHAMAN	PATHASATHI
220	48	SAMUDRAGARH	PURBA BARDHAMAN	PURBA BARDHAMAN	PATHASATHI
221	49	JAMALDA	COOCHBEHAR	COOCHBEHAR	PATHASATHI
222	50	HILLI	DAKSHIN DINAJPUR	DAKSHIN DINAJPUR	PATHASATHI

223	51	PATIRAM	DAKSHIN DINAJPUR	DAKSHIN DINAJPUR	PATHASATHI
224	52	RAGHUNATHPUR, PURULIA	PURULIA	PURULIA	PATHASATHI
225	53	SARBARI, PURULIA	PURULIA	PURULIA	PATHASATHI
226	54	CHASMORE, JOYPUR PURULIA	PURULIA	PURULIA	PATHASATHI
227	55	HURA, PURULIA	PURULIA	PURULIA	PATHASATHI
228	56	JHAPRA, PURULIA	PURULIA	PURULIA	PATHASATHI
229	57	SIMULBARI, DARJEELING	DARJEELING	DARJEELING	PATHASATHI
230	58	FARAKKA , MURSIDABAD	MURSIDABAD	MURDIDABAD	PATHASATHI
231	59	SIMANA MIRIK , DARJEELING	DARJEELING	DARJEELING	PATHASATHI
232	60	DALKHOLA, UTTAR DINAJPUR	UTTAR DINAJPUR	UTTAR DINAJPUR	PATHASATHI
233	61	DEBRA ,PASCHIM MEDINIPORE	MIDNAPORE	MIDNAPORE (W)	PATHASATHI
234	62	KRISHANAGAR, NADIA	KRISHNANAGAR	HOOGHLY	PATHASATHI
235	63	LATAGURI , JALPAIGURI	JALPAIGURI	JALPAIGURI	PATHASATHI
236	64	SAKTIGARH , PURBA BARDHAMAN	Burdwan	BURDWAN(E)	PATHASATHI
237	65	BARUIPUR, SOUTH 24 PARGANAS	Baruipur	SOUTH 24 PARGANAS	PATHASATHI
238	66	BAGDOGRA, DARJEELING	SILIGURI SUB-URBAN	DARJEELING	PATHASATHI
239	67	MECHEDA, PURBA MEDINIPORE	TAMLUK	MIDNAPORE (E)	PATHASATHI
240	68	GUSKORA, PURBA BARDHAMAN	Burdwan	BURDWAN(E)	PATHASATHI
241	69	MUNSIRHAT, HOWRAH	Howrah	HOWRAH	PATHASATHI
242	1	Opposite of Big Bazar over Hare Krishna Konar Sarani	Durgapur Municipality	Paschim Bardhaman	UD & MA
243	2	Beside Durgapur Muslim Welfare Society	Durgapur Municipality	Paschim Bardhaman	UD & MA
244	3	Infront of ADDA Land over Abanindranath Bithi	Durgapur Municipality	Paschim Bardhaman	UD & MA
245	4	Near Bidisha More over Abanindranath Bithi	Durgapur Municipality	Paschim Bardhaman	UD & MA
246	5	2 Wheeler Parking at City Centre Bus Stand	Durgapur Municipality	Paschim Bardhaman	UD & MA
247	6	Juncture of Nazrul Sarani and Ambedkar Sarani	Durgapur Municipality	Paschim Bardhaman	UD & MA
248	7	Infront of Commercial Building of Bengal Ambuja over Ambedkar Sarani	Durgapur Municipality	Paschim Bardhaman	UD & MA
249	8	Beside More Super Market over Tara Sankar Sarani	Durgapur Municipality	Paschim Bardhaman	UD & MA
250	9	Beside State Excise adjacent to Satyajit Roy Sarani	Durgapur Municipality	Paschim Bardhaman	UD & MA
251	10	Opposite of Food Mart over Satyajit Roy Sarani	Durgapur Municipality	Paschim Bardhaman	UD & MA
252	11	Opposite of Mangalik and Hotel Luxor	Durgapur Municipality	Paschim Bardhaman	UD & MA
253	12	Western Side of Anand Amusement Park	Durgapur Municipality	Paschim Bardhaman	UD & MA
254	13	Beside Commercial Market over Satyajit Roy Sarani	Durgapur Municipality	Paschim Bardhaman	UD & MA
255	14	Near Disha Eye Hospital	Durgapur Municipality	Paschim Bardhaman	UD & MA
256	15	East Side of Parashmani Medical Centre Pvt. Ltd	Durgapur Municipality	Paschim Bardhaman	UD & MA
257	16	Opposite of Rose Valley Hotel	Durgapur Municipality	Paschim Bardhaman	UD & MA

258	17	Over the Strip of Land bounded by IOC Corner & 12.5 m wide road cutting junction mall, City Centre, Durgapur	Durgapur Municipality	Paschim Bardhaman	UD & MA
259	18	Over the Strip of Land bounded by IOC Corner & 12.5 m wide road cutting junction mall, City Centre, Durgapur	Durgapur Municipality	Paschim Bardhaman	UD & MA
260	19	On East-West (Bypass) Road (Opposite the backside of Bantra Rajlakshmi Balika Bidyalaya)	Howrah Municipality	Howrah	UD & MA
261	20	Ramsundarchak & Mahaprabhuchak, Central Bus Stand, Haldia Township	Haldia Municipality	Purba Medinipur	UD & MA
262	21	Bhabanipur, (Near Bhabanipur Police Station, Haldia)	Haldia Municipality	Purba Medinipur	UD & MA
263	22	Priyambada Housing Complex at Kumarchak, Haldia	Haldia Municipality	Purba Medinipur	UD & MA
264	23	Near Eco-Health park, Durgachak, Haldia	Haldia Municipality	Purba Medinipur	UD & MA
265	24	Inside of truck Terminal of Budge Budge Municipality, Holding No 25, AM Ghosh Road, Budge Budge, ward no-19	Budge Budge Municipality	South 24 Parganas	UD & MA
266	25	Maitree Path Garage under Rishra Municipality	Rishra Municipality	Hoogly	UD & MA
267	26	Vivekananda Bus Terminus Ramjibanpur, Chandrakona	Ramjibanpur Municipality	Paschim Medinipur	UD & MA
268	27	Sonar Tari Complex, City Centre Morh	Haldia Municipality	Purba Medinipur	UD & MA
269	28	Station Bazar Road near statue of Mahatma Gandhi, ward no -07	Katwa Municipality	Purba Bardhaman	UD & MA
270	29	Katwa Bus stand, katwa, ward no -20	Katwa Municipality	Purba Bardhaman	UD & MA
271	30	Trenching ground near the Bhagirathi Health Centre, ward no -07	Katwa Municipality	Purba Bardhaman	UD & MA
272	31	Chandrakona, Jayantipur, ward no-08, near Chandraketu park	Chandrakona Municipality	Paschim Medinipur	UD & MA
273	32	Chandrakona, Gosaibazar, ward no-5, near Kangsaboti Office	Chandrakona Municipality	Paschim Medinipur	UD & MA
274	33	Municipal Garage, Ward No-06, Opposite Municipal Main Building	Kanchrapara Municipality	North 24 Parganas	UD & MA
275	34	Dumping ground, ward no-12, 500m away from Main Road(KGR Path)	Kanchrapara Municipality	North 24 Parganas	UD & MA
276	35	Municipal Bus Stand, ward no-04, on the north side of Kalyani Barrackpore Express way	Kanchrapara Municipality	North 24 Parganas	UD & MA
277	36	Rabindranagar Main Road, opposite christian burial ground under ward 7	Maheshtala Municipality	South 24 Parganas	UD & MA
278	37	Akra Natun Pole, near 259 bus stand under ward 7	Maheshtala Municipality	South 24 Parganas	UD & MA
279	38	Janapara Gangabadh Road, Janapara ward 20	Maheshtala Municipality	South 24 Parganas	UD & MA
280	39	Sarangabad, within SWM plant abutting BBT road	Maheshtala Municipality	South 24 Parganas	UD & MA

281	40	Sidhu Kanu Bus Stand, Near chatapata fly over, Mouza-asansol J.I-35	Asansol Municipality	Paschim Bardhaman	UD & MA
282	41	Nibedita bus stand, Opposite of ram krishan mission, Mouza-Govindpur J.I-35	Asansol Municipality	Paschim Bardhaman	UD & MA
283	42	Barakar bus stand, Barakar road, Mouza-barakar	Asansol Municipality	Paschim Bardhaman	UD & MA

Section – 2: Eligibility and Qualification Requirements

1. Eligibility Requirements:

Technical Part of the Bid shall be evaluated, interalia, as per **Section 3** based on their responsiveness to and Bidder's compliance with the Eligibility Requirements specified herein below:

- 1.1. Only firm that is a private entity, a state-owned entity, or an institution, legally established in India to undertake design, supply and installation of the works mentioned in the scope of works under this RFB Document/ bidding document are eligible to bid (submit their Bid in response to RFB Notice/ NIT). The Bidder (alternatively referred to as the Contractor/Bidder) may be a proprietorship concern or a partnership firm operating in India, or a registered entity in India under the Companies Act, 1956, 2013 or LLP Act.
- 1.2. Any combination of such entities eligible as per 1.1 above, is also eligible to bid in the form of a joint venture (JV) as defined in **Section 3**, under an existing agreement. In the case of a joint venture, the number of members of the JV shall not exceed 03 (Three) and all members shall be jointly and severally liable for the execution of the entire Contract in accordance with the Contract terms. The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of all the members of the JV during the Bidding process and, in the event the JV is awarded the Contract, during contract execution.
In case of JV, the bidding JV (also referred to as the Bidder) shall submit a Joint Deed of Undertaking in Technical Part of its bid, as per the format enclosed in **Section 4** of the RFB/ bidding document. No change in the structure / constitution of the JV shall be permitted at any stage during bidding or execution of the Contract in the event of award.
- 1.3. As an exception to the foregoing Clause 1.1 & 1.2 above:
 - a. **Sanctions:** Firms, which includes any of the JV members in case of bidding Joint Venture as per Clause 1. 2 above, blacklisted by the Employer/ CPSEs or any of their subsidiaries / Government of India/ Government of WEST BENGAL / any Regulatory Authority, as on the date of submission of Bid, are not eligible to bid.
 - b. **Suspension:** Firm, which includes any of the JV members in case of bidding Joint Venture as per Clause 1. 2 above, under suspension by the Employer as the result of the operation of a Bid-Securing Declaration or Proposal-Securing Declaration, shall not be eligible to bid.
 - c. **Prohibitions:** Firms, which includes any of the JV members in case of bidding Joint Venture as per Clause 1. 2 above, and individuals of a country or goods/ works/

services manufactured/ produced in a country shall be ineligible, if as a matter of law or official regulations, the Government of India prohibits commercial relations with that country.

- 1.4. To be eligible to bid, the Bidders must ensure compliance to the following, failing which they shall not be eligible:

Restrictions under Rule 144 (xi) of GFR 2017: Restrictions on procurement from a bidder of a country which shares a land border with India

I. Any bidder from a country which shares a land border with India will be eligible to bid only if the bidder is registered with the Competent Authority.

II. "Bidder" (Seller / Service Provider) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.

III. "Bidder from a country which shares a land border with India" for the purpose of this Order/ Rule means: -

- a. An entity incorporated, established, or registered in such a country; or*
- b. A subsidiary of an entity incorporated, established, or registered in such a country; or*
- c. An entity substantially controlled through entities incorporated, established, or registered in such a country; or*
- d. An entity whose beneficial owner is situated in such a country; or*
- e. An Indian (or other) agent of such an entity; or*
- f. A natural person who is a citizen of such a country; or*
- g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above*

IV. The beneficial owner for the purpose of (iii) above will be as under:

1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means. Explanation—

- a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five percent of shares or capital or profits of the company;*
- b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;*

2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has

ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;

4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;

5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

V. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.

VI. The successful bidder shall not be allowed to sub-contract works to any Contractor/Bidder from a country which shares a land border with India unless such Contractor/Bidder is registered with the Competent Authority.

1.5. Only **‘Class –I local supplier’** are eligible to bid in line with the following:

- (i) Public Procurement (Preference to Make in India) Order, 2017 issued by Department for promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry, Government of India vide order dated 15/06/2017, its revision dated **16/09/2020** (PPP-MII Order),
- (ii) #‘Public Procurement (Preference to Make in India) to provide for Purchase Preference (linked with local content) in respect of Power Sector’ order dated 28/07/2020 issued by Ministry of Power (MoP Order)

and any subsequent modifications/Amendments, if any.

As per the aforesaid orders:

‘Class –I local supplier’ means a supplier or service provider, whose goods, services or works offered for procurement, meets the minimum local content as prescribed for ‘Class-I local supplier’. Presently, the local content requirement to categorize a supplier as ‘Class-I local supplier’ is minimum 50%*.

Further, for the purpose of purchase preference under the PPP-MII Order:

‘Local Content’ means the amount of value added in India which shall be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent.

The [‘Class –I local supplier’ shall give a self-certification in its Technical part of the Bid in the format given in **Section 4** of RFB document, indicating the percentage of Local Content and certifying that the item offered meets the Local Content requirement for ‘Class –I local supplier’, as the case may be, and shall give details of the location(s) at which value addition is made. Further, in case of procurement above Rs. 10 Crore, the ‘Class –I local supplier’ shall provide a certificate from statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of Local Content. False declaration regarding Local Content by the bidder shall be a transgression of Integrity Pact, if applicable, and as per clause ITB 2 of Section, RFB document, and action shall be taken in accordance therewith and in line with the provisions of the above Orders. Further, in case of price reduction during e-Reverse Auction, if envisaged as per Section 3 of RFB document, or for any other reason including matching L1 price pursuant to the purchase preference extended, the revised prices shall be so as to ensure that classification of the bidder ‘Class –I local supplier’ remains unchanged.

- 1.6. Employer reserves the right to request for any additional information and reserves the right to reject the Proposal of any Bidder, if in the opinion of Employer, the qualification data is incomplete, or the Bidder is found not qualified to satisfactorily perform the Contract.
- 1.7. For the purposes of these Bidding Documents, the words “facilities,” “plant and equipment,” “installation services,” etc., shall be construed in accordance with the respective definitions given to them in the General Conditions of Contract.

2. Qualification Requirements

2.1. Technical:

2.1.1. For the purpose of this particular bid, bidder shall meet the following minimum criteria in past 7 years (**up to last completed financial year, i.e 31st March 2023**):

- i. Experience in similar work (as per clause 2.1.3 mentioned below) under **single** contract, costing not less than **70% of the estimated amount of the respective package as mentioned in Table A at Section-I (RFB)**. The works under the above contract should be completed works only.

Or

- ii. Experience in similar works (as per clause 2.1.3 mentioned below) under **two contracts**, each costing not less than **40% of the estimated amount of the respective package as mentioned in Table A at Section-I (RFB)**. The works under the above two contracts should be completed works only.

Or

- iii. Experience in similar works (as per clause 2.1.3 mentioned below) under **three contracts**, each costing not less than **30% of the estimated amount of the respective package as mentioned in Table A at Section-I (RFB)**. The works under the above three contracts should be completed works only.

2.1.2. Collectively the JV partners should meet the criteria of projects mentioned in 2.1.1 above. However, each JV partner should have completed at least 1 (one) contract costing not less than **30% of the estimated amount of the respective package as mentioned in Table A at Section-I (RFB)**. The works under the contracts should be completed works only.

For illustration, the various cases possible, along with the number of contracts and the minimum amounts for each of scenarios are shown below:

Case 1: JV of two (2) partners

Scenario		Partner 1	Partner 2
1. One partner fully meets the qualification requirements	A)	1 contract of minimum 70% of the cost	1 contract of minimum 30% of the cost
	B)	2 contracts, each of minimum 40% of the cost	1 contract of minimum 30% of the cost
	C)	3 contracts, each of minimum 30% each of the cost	1 contract of minimum 30% of the cost
	A)	1 contract of minimum 40% of the cost	1 contract of minimum 40% of the cost

Scenario		Partner 1	Partner 2
2. Both partners put together meet the qualification requirements	B)	2 contracts of minimum 30% of the cost	1 contract of minimum 30% of the cost

Case 2: JV of three (3) partners

Scenario		Partner 1	Partner 2	Partner 3
1. One partner fully meets the qualification requirements	A)	1 contract of minimum 70% of the cost	1 contract of minimum 30% of the cost	1 contract of minimum 30% of the cost
	B)	2 contracts, each of minimum 40% of the cost	1 contract of minimum 30% of the cost	1 contract of minimum 30% of the cost
	C)	3 contracts, each of minimum 30% each of the cost	1 contract of minimum 30% of the cost	1 contract of minimum 30% of the cost
2. All partners put together meet the qualification requirements	A)	1 contract of minimum 40% of the cost	1 contract of minimum 40% of the cost	1 contract of minimum 30% of the cost
	B)	1 contract of minimum 30% of the cost	1 contract of minimum 30% of the cost	1 contract of minimum 30% of the cost

2.1.3. For the purposes of satisfaction of Technical Requirement, similar works refers to:

- a) Project(s) execution in one or more sectors below :-
 - 1) Electrical Transmission sector
 - 2) Sub-transmission sector
 - 3) Electrical distribution sector

In above sectors, type of construction works undertaken should be of the nature of one or more of the following:-

- 1) EHT lines
- 2) HT lines
- 3) LT lines
- 4) Distribution transformers
- 5) Substations

- b) Notwithstanding the clause 2.1.3(a) above, experience in only LT lines would not be considered eligible.

2.1.4. The experience of the bidder as part of Joint venture or consortium or a sub-Contractor/Bidder will be considered for the purpose of evaluation as per the clause 2.1.1, 2.1.2 and 2.1.3 above only in case where the bidder is able to provide approval/acceptance of the mentioned works from the end-customer or the distribution company whichever is applicable.

2.2. Financial/ Commercial:

2.2.1. The Net Worth of the bidder must be positive for the each of the last three Financial Years. Net worth means the sum total of the paid up capital and free reserves (excluding reserves created out of revaluation) reduced by aggregate value of accumulated losses (including debit balance in profit and loss account for current year) and intangible assets.

2.2.2. Minimum Average Annual Turnover (MAAT) of the Bidder for best three years out of last five financial years of the bidder should not be less than 30% of the estimated cost of the respective package rounded off upto two decimal places.

2.2.3. Bidder must have liquid assets (LA) and/ or evidence of access to or availability of fund-based credit facilities of not less than 10% of the estimated cost of the respective package rounded off upto two decimal places and the Banker should confirm that the Credit facility is earmarked for the Works specified under Bid on receipt of the Bid. Liquid Assets would include un-incumbered cash (and equivalents), bank deposits with maturity less than 365 days, securities that can be freely traded or maturity less than 365 days and receivables which has general certainty of getting received minus payables which has general certainty of getting paid.

2.2.4. In case a bid is submitted by a Joint Venture (JV), all the partners of the JV shall meet, individually, the qualification set forth at para 2.2.1 above and collectively the requirement of para 2.2.2 & 2.2.3 above. The figures for each of the partner of the joint venture shall be added together to determine the bidder's compliance with the minimum qualifying criteria set out in para 2.2.2 & 2.2.3 above; however in order for a joint venture to qualify, the partner(s) of joint venture must meet the following minimum criteria:

2.2.4.1. At least one partner (lead partner) shall meet, not less than 40% of the minimum criteria given at Para 2.2.2 & 2.2.3 above.

AND

2.2.4.2. Each of the other partner(s) shall meet not less than 25% of the criteria given at Para 2.2.2 & 2.2.3 above.

2.2.5. Failure to comply with requirement mentioned in 2.2.4 will result in rejection of the Joint Venture's bid.

2.2.6. The lead partner shall be authorized to incur liabilities and receive instruction for and on behalf of any and all partners of the joint venture and the entire execution

of the contract including receipt of payment shall be done exclusively through the lead partner. This authorization shall be evidenced by submitting in Technical Part of its bid, a power of attorney signed by legally authorized signatories of all the partners as per proforma in Section 4 of the RFB/ bidding documents

2.2.7. All partners of the joint venture shall be liable jointly and severally for the execution of the contract in accordance with the contract terms and a copy of the agreement entered into by the Joint Venture partners having such a provision shall be submitted with the Technical Part of the bid. A statement to this effect shall be included in the authorization mentioned under para 2.2.6 above as well as in the Bid Form and in the Contract Form (in case of a successful bid);

2.2.8. The Bidder shall also furnish following documents/details with Technical Part of its bid:

2.2.8.1. A certificate from banker (as per specified format) indicating various fund-based limits sanctioned to the bidder and the extent of utilization as on date. Such certificate should have been issued not earlier than three months prior to the date of bid opening. Wherever necessary, the employer may make queries with the Bidders' bankers.

2.2.8.2. The complete annual reports together with Audited statement of accounts of the company for last five years of its own (separate) immediately preceding the date of submission of bid. In case audited statements of the last financial year are not available the audited statements of the preceding five years can be submitted.

2.2.8.3. Note:

2.2.8.3.1. In the event the bidder is not able to furnish the information of its own (i.e. separate), being a subsidiary company and its accounts are being consolidated with its group/holding/parent company, the bidder should submit the audited balance sheets, income statements, other information pertaining to it only (not of its group/Holding/Parent Company) duly certified by any one of the authority [(i) Statutory Auditor of the bidder /(ii) Company Secretary of the bidder or (iii) A certified Public Accountant] certifying that such information/documents are based on the audited accounts as the case may be.

2.2.8.3.2. Similarly, if the bidder happens to be a Group/Holding/Parent Company, the bidder should submit the above documents/information of its own (i.e., exclusive of its subsidiaries) duly certified by any one of the authority mentioned in Note - 2.2.8. 3.1 above certifying that these information/ documents are based on the audited accounts, as the case may be.

- 2.2.8.4. Subcontractors' technical experience and financial resources shall not be taken into account in determining the Bidder's compliance with the qualifying criteria.
- 2.2.8.5. Work experiences of the bidder as per above shall be considered only if the works have been executed under Govt./Semi-Govt./autonomous body of Central/State Govt./Electricity Power Utility/ Power Deptt. in India only.
- 2.2.8.6. The bidder should meet the necessary license class requirements as applicable for the execution of works in this RFB.
However in case the bidder does not hold the license for the given State, then the bidder should possess the equivalent license for any one State in India and post-award the bidder is required to acquire the necessary license for the given State within a period of two months.
In case bid is submitted by Joint Venture, all partners whose scope as per the delineation of responsibilities amongst JV partners includes execution of Works or part thereof at Site, should possess and/or acquire the necessary license as stated above.

Section - 3: Instructions to Bidders and Bid Data Sheet

A. Instructions to Bidders General

1. Scope of Bid and Definitions

- 1.1 In connection with the Notice Inviting Tenders (NIT)/ Request for Bids (RFB) Notice specified in **Bid Data Sheet**, the Employer (named in the **Bid Data Sheet**) issues this RFB/ Bidding Document for the Design, Supply, and Installation of Plant (also referred to as the Scope of Work), as specified in **Section 6**, Employer's Requirement. The name and identification of the package for award of contract under this NIT/RFB is specified in **Bid Data Sheet**.
- 1.2 Throughout this bidding document:
 - (a) **"Affiliate(s)"** means an individual or an entity that directly or indirectly controls, is controlled by, or is under common control with the Bidder.
 - (b) **"Applicable Law"** means the laws and any other instruments having the force of law in India, as may be issued and in force from time to time.
 - (c) **"Employer"/ "Utility"** means the entity, as briefly described in **Bid Data Sheet**, that has issued the Request for Bids for award of the Contract for the Design, Supply, and Installation of Plant (also referred to as the Scope of Work), as specified in **Section 6**, Employer's Requirement.
 - (d) **"Bid"** means the Technical Part (first Envelope) and the Financial Part (Second Envelope) of its bid submitted by the Bidder who participates in the bidding in response to Notice Inviting Tenders (NIT)/ Request for Bids (RFB) Notice. It is alternatively also referred to as the tender.
 - (e) **"Bid Data Sheet (Z)"** means an integral part of the **Instructions to Bidders (ITB)**

Section 3, that is used to reflect issues, details and conditions specific to the procurement, to supplement and/or modify the provisions of ITB.

- (f) **“Bidder”** means a legally established professional firm or an entity that may submit its Bid to the Employer in response to the RFB Notice/ NIT issued by the Employer, to provide/ provision the Plant to the Employer.
- (g) **“Contract”** means a legally binding written instrument entered between the Employer/ Utility and the successful Bidder, in the manner and in accordance with the RFB document/ bidding documents, for the Design, Supply and Installation of Plant (also referred to as the Scope of Work), and includes the Letter of Acceptance/ Notification of Award, the Contract Agreement, the General Conditions of Contract (GCC), the Special Conditions of Contract (SCC), and the Appendices and the documents attached thereto.
- (h) **“Day”** means a calendar day, unless otherwise specified as **“Business Day”**. A Business Day is any day that is an official working day of Employer. It excludes Employer’s official public holidays.
- (i) **“Government”** means the government of India, State Government or Local Government as applicable.
- (j) **“in writing”** means communicated in written form (e.g. by mail, e-mail, fax, including that distributed or received through the electronic-procurement system used by Employer).
- (k) **“Plant”, “Installation Services”, “Facilities” (also referred hereinafter as “Works”)** used herein shall have the same meaning as ascribed to them in **Section 7**.
- (l) **“ITB”** (this **Section 3** of the RFB/ Bidding Documents) means the Instructions to

Bidders that, along with other Sections, provides the Bidders with all information needed to prepare and submit their Bids.

- (m) **“Joint Venture (JV)”** means an association with or without a legal personality distinct from that of its members, of more than one entity/ firm where one member has the authority to conduct all business for and on behalf of any and all the members of the JV, and where the members of the JV are jointly and severally liable to Employer for the performance of the Contract. Whether or not bidding by Joint Venture is permitted, is specified in **BDS** and in **Section 2**.
- (n) **“RFB”** means the Request for Bids issued by Employer for the selection of the successful Bidder from amongst the bids submitted by bidders(s) who bid against and in response to the Request for Bids Notice (alternatively referred to as **Notice Inviting Tenders (NIT)**) under Two Envelope Single Stage Bidding Process.
- (o) **“Sub-contractor”** means an entity to whom the Contractor subcontracts any part of the Works as per the applicable provisions of the Contract while the Contractor remains responsible to Employer for the whole and successful performance of the Contract.
- (p) Capitalised terms used herein but not defined specifically shall have the meaning as ascribed to them in Section 5 and Section 6, and elsewhere in RFB/bidding Document.
- (q) if the context so requires, “singular” means “plural” and vice versa.
- (r) **“TPQMA”** means a “Third Party Quality Monitoring Agency” that the Nodal Agency for RDSS (REC/PFC) engages to carry out Pre-Dispatch inspection of materials at manufacturing facilities of Contractor or Sub Contractor / Sub-Vendors of the Contractor and to carry out

the inspection in the field of the works carried out in the RDSS scheme.

2. Fraud and Corruption

- 2.1 The Employer requires compliance with the Anti-Corruption Guidelines/ Laws in force of the relevant Government/ its instrumentalities/ Utility.
- 2.2 Bidders are also required to sign and furnish in the Bid, duly signed Integrity Pact if so specified in **ITB 10.2.8**.

3. Eligibility, Qualification Requirements

- 3.1 The eligibility and qualification requirements against the RFB are given in **Section 2**, for the Bidders and the Plant/ Installation Services/ Works . Bids, if any, from Bidders and/or offering Plant/ Installation Services/ Works not complying with the same shall be outrightly rejected and shall not be considered for evaluation
- 3.2 Bids submitted by the Bidders shall be evaluated to ascertain their compliance with Eligibility and Qualification Requirements, based on the details/ information/ documentary evidence pertaining to the same to be submitted in the Technical Part, as specified in ITB. All Bidders shall provide in **Section 4**, Bidding Forms, requisite details, and documents in support of meeting the Eligibility and Qualification Requirements. A Bid shall be rejected if the Bidder submitting the Bid, fails to meet the Eligibility and Qualification Requirements. Bids submitted by those Bidders who meet the Eligibility and Qualification Requirements shall be shortlisted for further evaluation of their bids.
- 3.3 A Bidder shall provide such additional documentary evidence of eligibility and/or qualification satisfactory to the Employer, as the Employer shall reasonably request.

4. Conflict of Interest

- 4.1 A Bidder shall not have a conflict of interest. Any Bidder found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest for the purpose of this Bidding process, if the Bidder:

- (a) directly or indirectly controls, is controlled by or is under common control with another Bidder; or
 - (b) receives or has received any direct or indirect subsidy from another Bidder; or
 - (c) has the same legal representative as another Bidder; or
 - (d) has a relationship with another Bidder, directly or through common third parties, that puts it in a position to influence the Bid of another Bidder, or influence the decisions of the Employer regarding this Bidding process; or
 - (e) any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the works that are the subject of the Bid; or
 - (f) any of its affiliates has been hired (or is proposed to be hired) by the Employer for the Contract implementation; or
 - (g) has a close business or family relationship with a professional staff of the Utility (or of the project implementing agency) who: (i) are directly or indirectly involved in the preparation of the bidding document or specifications of the Contract, and/or the Bid evaluation process of such Contract; or (ii) would be involved in the implementation or supervision of such Contract unless the conflict stemming from such relationship has been resolved in a manner acceptable to the Employer throughout the Bidding process and execution of the Contract.
- 4.2 A firm that is a Bidder (either individually or as a JV member) shall not participate as a Bidder or as JV member in more than one Bid. Such participation shall result in the disqualification of all Bids in which the firm is involved. However, this does not limit the participation of a Bidder as subcontractor in another Bid or of a firm as a subcontractor in more than one Bid.

B. Contents of Bidding Document

5. Sections of Bidding Document

5.1 The bidding document (also referred to as the RFB document) consist of Parts 1, 2, and 3, which include all the sections indicated below, and should be read in conjunction with any Addenda/ Corrigenda/ Amendments issued in accordance with **ITB 7**.

PART 1 Bidding Procedures and Requirements

- Section 1 - Request for Bids Notice
- Section 2 - Eligibility and Qualification Requirements
- Section 3 - Instructions to Bidders and Bid Data Sheet
- Section 4 - Bidding Forms - Technical Part of the Bid
- Section 5- Bidding Forms - Financial Part of the Bid

PART 2 Employer's Requirements

- Section 6 – Employer's Requirement

PART 3 Conditions of Contract and Contract Forms

- Section 7 - Conditions of Contract
- Section 8 - Contract Forms

5.2 The Bidder is expected to examine all instructions, forms, terms, and specifications in the bidding document and to furnish with its Bid, all information or documentation as is required by the RFB/ bidding document.

6. Bidding Process Management, Clarification of the Bidding Document, Site Visit and Pre-Bid Meeting

a) Electronic Procurement

6.1 Electronic- Bidding System (also referred to as e-Procurement or e- Tendering system) as specified in the **BDS** shall be used to manage the bidding

process. Only the Bids which are submitted and received through the specified system in conformity with the procedures and requirements specified of **ITB** and **BDS** shall be considered.

b) Clarifications to Bidding Documents

6.2 The electronic- bidding system specified in the **ITB 6.1** provides for online clarifications. A Bidder requiring any clarification of the bidding document may notify the Employer online or through any other mode if so specified in **BDS**. Clarifications requested through any other mode shall not be considered by the Employer. The Employer will respond to any request for clarification, provided that such request is received prior to the deadline for submission of Bids within a period specified in the **BDS**. Description of clarification sought, and the response of the Employer shall be uploaded for information of all Bidders without identifying the source of request for clarification. Should the clarification result in changes to the essential elements of the bidding document, the Employer shall amend the bidding document following the procedure under **ITB 7** and **ITB 21.2**.

c) Site Visit

6.3 The Bidder is advised to visit and examine the Site where the Plant is to be installed/ Works are to be provided, and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the Bid and entering into a contract for provision of Plant and Installation Services/ construction of the Works. The costs of visiting the Site shall be at the Bidder's own expense.

6.4 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.

d) Pre-Bid Meeting

6.5 If so specified in the **BDS**, the Bidder's designated representative is invited to attend a pre-Bid meeting. The purpose of the meeting will be to clarify issues

and to answer questions on any matter that may be raised at that stage.

6.6 The Bidder is requested to submit any questions in writing, to reach the Employer not later than one day before the meeting.

6.7 Minutes of the pre-Bid meeting, including the text of the questions raised without identifying the source, and the responses given, together with any responses prepared after the meeting, will be notified online through electronic-bidding system. Any modification to the bidding document that may become necessary as a result of the pre-Bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to **ITB 7** and not through the minutes of the pre-Bid meeting. Nonattendance at the pre-Bid meeting will not be a cause for disqualification of a Bidder.

7. Addenda/Corrigendum/ Amendment of Bidding Document

7.1 At any time prior to the deadline for submission of Bids, the Employer may amend the bidding document by issuing addenda/ corrigendum/ amendment. The addendum/ corrigendum/ amendment will be in writing and appear on the e-procurement system and through email notification automatically sent to those bidders who have started working on the procurement, or as otherwise specified in **BDS**.

7.2 Any addendum/ corrigendum/ amendment issued shall be part of the bidding document and shall be deemed to have been communicated to all the bidders.

7.3 To give prospective Bidders reasonable time in which to take an addendum/ corrigendum/ amendment into account in preparing their Bids, the Employer may, at its discretion, extend the deadline for the submission of Bids, pursuant to **ITB 21.2**.

C. Preparation of Bids

8. Cost of Bidding

8.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

9. Language of Bid

9.1 The Bid, as well as all correspondence and documents relating to the Bid exchanged by the Bidder and the Employer, shall be written in English. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages into English, in which case, for purposes of interpretation of the Bid, such translation shall govern.

10. Documents comprising Bid

10.1 Under the Single Stage Two Envelope bidding process, the Bid shall comprise two Parts, namely the Technical Part and the Financial Part. These two Parts shall be submitted by the Bidder simultaneously.

10.2 The **Technical Part** shall contain the following:

10.2.1 **Letter of Bid - Technical Part:** prepared in accordance with **ITB 11**;

10.2.2 **Bid Security or Bid-Securing Declaration:** in accordance with **ITB 18**, prepared using the relevant form furnished in **Section 4 - Bidding Forms - Technical Part of the Bid**

10.2.3 **Authorization:** Document authorizing the signatory of the Bid to commit the Bidder, in accordance with **ITB 19.3 or ITB 19.4**, as may be applicable, prepared using the bidder's own format;

10.2.4 **Bidder's Eligibility:** documentary evidence in accordance with **ITB 16.1** establishing the Bidder's eligibility to Bid as per the requirements specified in Section2/ Section3;

10.2.5 **Qualifications:** documentary evidence in accordance with **ITB 16.2** establishing the Bidder's compliance to the Qualifications Requirements specified in Section 2/ Section 3, along with duly filled in form for compliance of Qualification Requirements, furnished in Section 4 - Bidding Forms - Technical Part of the Bid;

10.2.6 **Eligibility of Goods/ Works/ Plant and Installation Services:** documentary evidence in accordance with **ITB 16.1**, establishing the

eligibility of the Works to be supplied by the Bidder;

10.2.7 **Conformity:** Undertaking on Compliance of terms & conditions of the Bidding Documents including Scope of Services and other related requirements, towards documentary evidence in accordance with **ITB 15.1**, prepared using the relevant form furnished in **Section 4 - Bidding Forms - Technical Part of the Bid**; and

10.2.8 any other document if required as per **BDS**.

10.2.9 In addition to the requirements as aforesaid, Bids submitted by a JV shall include a copy of the Joint Venture Agreement entered into by all members, a Joint Deed of Undertaking and Power of Attorney. The Joint Deed of Undertaking and the Power of Attorney shall be prepared using the relevant form furnished in **Section 4 - Bidding Forms - Technical Part of the Bid**

10.3 The **Financial Part** shall contain the following:

10.3.1 Deleted

10.3.2 **Price Schedules:** completed prepared in accordance with **ITB 11, ITB 13 and ITB 14**;

10.3.3 any other document if required in **BDS**.

10.4 The Technical Part shall not include any financial information related to the Bid price. Where material financial information related to the Bid price is contained in the Technical Part the Bid shall be declared non-responsive.

11. Process of Bid Submission

- 11.1 The Letter of Bid – Technical Part shall be prepared using the relevant forms furnished in **Section 4 - Bidding Forms - Technical Part** of the Bid. The priced Schedules for the Plant and Installation Services/ Works shall be prepared using the relevant forms furnished in **Section 5 - Bidding Forms - Financial Part** of the Bid. The forms must be completed without any alterations to the text, except as provided under **ITB 19.3** for which the bidder can use its own format. All blank spaces shall be filled in with the information requested.
- 11.2 Entire Bid as per **ITB 10** including the Letters of Bid and filled-up priced Schedules for the Plant and Installation Services/ Works, shall be submitted online on e-procurement system specified in **ITB 6.1**. Details and process of online submission of the Bid/ tender and relevant documents are given in **ITB 6.1** and the concerned website referred therein.
- 11.3 **Submission of Original Documents:** The Bidders are also required to separately submit the hard copy of the documents, if any mentioned in **BDS**, at Employer's address specified in **BDS**, so as to reach the office before the opening of the Technical Part of the Bid, either by registered/speed post/courier or by hand, failing which the bids are liable to be declared non-responsive.
- 11.4 Hard copy of rest of the Bid or any document, other than those specified in **ITB 11.3** are not to be submitted. Employer may, however, seek submission of hard copy of any of the other documents forming part of the Bid or any other supporting/ related document from any of the bidders during the process of evaluation of the Bids, without permitting change in substance of the Bid.

12. Alternative Bids

- 12.1 Alternative Bids are not permitted and shall not be considered.

13. Bid prices and Discounts

- 13.1 Unless otherwise specified in the **BDS**, Bidders shall quote for the entire Plant and Installation Services on a "single responsibility" basis. The total Bid price shall include all the Contractor's obligations mentioned in or to be reasonably inferred from the bidding document in respect of the design, engineering, manufacture, including procurement and

subcontracting (if any), delivery, construction, installation and completion of the Plant. This includes all requirements under the Contractor's responsibilities for testing, pre-commissioning and commissioning of the plant and, where so required by the bidding document, the acquisition of all permits, approvals and licenses, etc.; the operation, maintenance and training services and such other items and services as specified in the bidding document, all in accordance with the requirements of the bidding documents.

13.2 Bidders are required to quote the price for the commercial, contractual and technical obligations outlined in the bidding document.

13.3 Bidders shall give a breakdown of the prices in the manner and detail called for in the Price Schedules included in **Section 5**. Bidding Forms – Financial Part of the Bid.

13.4 Depending on the Scope of the Work and the Contract, the Price Schedules shall comprise the schedules listed below. Bidders shall note that the plant and equipment included in Schedule Nos. 1 exclude materials used for civil, building and other construction works. All such materials shall be included and priced under Schedule No. 2, Installation Services. The Schedules comprise:

Schedule No. 1: Supply of Plant (including Mandatory Spare Parts)

Schedule No. 2: Supply of Installation Services

Schedule No. 3: Grand Summary (Schedule Nos.1 and 2)

Schedule No. 4: Recommended Spare Parts

13.5 In the Schedules, Bidders shall give the required details and a breakdown of their prices as follows:

13.5.1 Supply of Plant (Schedule No. 1):

- (i) The price of the plant shall be quoted on FOR (final place of destination (Site/ Project Site) as specified in **BDS**) basis, and shall be inclusive of all costs, expenses, duties, taxes, and

other levies incidental thereto interalia including design, engineering, manufacture, testing, transportation, insurance etc. and other services, incidental thereto, as applicable, and taking into account any input tax credit except (ii) below;

- (ii) GST as percentage of the price as per (i) above, payable additionally by the Utility, applicable on the plant/goods/ material, if the contract is awarded to the Bidder, is pre-specified in Schedule No.1 and bidders are not required to quote the same separately anywhere in the bid. (Basis the same and the price quoted as per (i) above, the amount towards GST against each item shall get calculated accordingly); and
- (iii) The total price for the item i.e. (i) plus (ii) above.

13.5.2 Supply of Installation Services (Schedule No. 2):

- (i) The price of Installation Services {excluding the incidental services included in 13.5.1 (ii)} shall be quoted separately and shall be inclusive of all costs, expenses, duties, taxes, and other levies related, interalia, to unloading and handling of plant, all labor, contractor's equipment, temporary works, materials, consumables, design and preparation of layout, engineering drawings, and all matters and things of whatsoever nature, including testing, pre-commissioning and commissioning, operations and maintenance services, the provision of as-built drawings, operations and maintenance manuals, training, etc., applicable and necessary for the proper execution of the installation

and other services, at final destination (Site/ Project Site) as specified in the **BDS**, related to and incidental to successful installation of the Plant, except (ii) below;

- (ii) GST as percentage of the price as per (i) above, payable additionally by the Utility, applicable on the Installation Services, if the contract is awarded to the Bidder, is pre-specified in Schedule No.2 and bidders are not required to quote the same separately anywhere in the bid (Basis the same and the price quoted as per (i) above, the amount towards GST against each item shall get calculated accordingly); and
- (iii) The total price for the item i.e. (i) plus (ii) above.

13.5.3 Grand Summary (Schedule No. 3):

The total amount of each of the components from each of Schedule No.1 and Schedule No. 2 corresponding to the Plant and Installation Services, shall be summarized in the schedule titled Grand Summary, (Schedule 3). Aggregate of the total amount as per **ITB 13.5.1 (i)** and **ITB 13.5.2 (i)**, giving the total **Bid price**, excluding GST, is to be entered in the Letter of Bid. The total amount towards GST, that is aggregate of the total amount as per **ITB 13.5.1 (ii)** and **ITB 13.5.2 (ii)** is to be indicated separately in Schedule No. 3 and entered separately in the Letter of Bid .

13.5.4 Recommended Spare Parts (Schedule No. 4)

Recommended spare parts shall be quoted separately (Schedule 4) in the

manner and as specified in subparagraph 13.5.1 above.

13.5.5 The terms CIP, CIF, EXW, FOR and other similar terms shall be governed by the rules prescribed in the current edition of Incoterms, published by the International Chamber of Commerce.

13.5.6 Items against which no rate or price is entered by the Bidder shall be deemed covered by the rates for other items in the Price Schedule and will not be paid for separately by the Employer. An item not listed in the price schedule shall be assumed to be not included in the Bid, and provided that the Bid is determined substantially responsive notwithstanding this omission, the price as specified in **ITB 28.3**, will be added to the Bid price and the equivalent total cost of the Bid so determined will be used for price comparison.

13.6 The prices shall be either fixed or adjustable as specified in the **BDS**.

13.7 In the case of **Fixed Price**, prices quoted by the Bidder shall be fixed during the Bidder's performance of the contract and not subject to variation on any account. A Bid submitted with an adjustable price quotation will be treated as non-responsive and rejected.

13.8 In the case of **Adjustable Price**, prices quoted by the Bidder shall be subject to adjustment during performance of the contract to reflect changes in the cost elements such as labor, material, transport and Contractor/Bidder's equipment in accordance with the procedures specified in the corresponding **Appendix to the Contract Agreement**. A Bid submitted with a fixed price quotation will not be rejected, but the price adjustment will be treated as zero. If not already specified in **Appendix to the Contract Agreement stated above**, bidders are required to indicate the source of labor and material indices in the corresponding Form in **Section 4. Bidding Forms – Technical Part of the Bid**.

13.8.1 the Bidder shall be free to use transportation through carriers registered in India. Similarly,

the Bidder may obtain insurance services from India.

- 13.9 Bidders wishing to offer any unconditional price reduction (discount) for the award of the package (Contract), shall specify in their Letter of Bid the price reduction applicable to such package, and the manner in which the price reductions will apply. Any conditional discount shall not be considered for evaluation, however, the Employer may consider the same in case of award of Contract on the Bidder.

13.10 The total amount as per **ITB 13.5.1 (i)** and **ITB 13.5.2 (i)**, from each of Schedule No.1 and Schedule No. 2, corresponding to the Plant and Installation Services, respectively, which shall be summarized in the schedule titled Grand Summary, (Schedule 3), and aggregated giving the total **Bid price(s)** of the Bidder, excluding GST and excluding any reduction/ discount offered, shall be brought/ carried forward and entered in the Letter of Bid. Considering reduction/ discount as per **ITB 13.9 and ITB 13.10** (if applicable), if offered, it shall constitute the quoted Bid price of the Bidder, excluding GST.

- 13.11 The total amount towards GST, that is aggregate of the amount quoted separately by the bidder as per **ITB 13.5.1 (ii)** and **ITB 13.5.2 (ii)**, shall be considered for evaluation and comparison of bids if so specified in ITB 32.1 (e), and it shall be payable/ reimbursable to the Bidder, in the event of award of contract, as specified in **BDS**.

14. Currencies of Bid and Payment

- 14.1 The prices shall be quoted by the Bidder, and shall be paid for by the Employer, entirely in Indian Rupees.

15. Documents Establishing the Conformity of the Plant and Installation Services/ Works

- 15.1 To establish the conformity of the Plant and Installation Services/ Works to the bidding document, the Bidder shall furnish as part of its Bid an Undertaking on Compliance of terms & conditions of the Bidding Documents including Scope of Work, conformance of Plant and Installation Services/ Works to the technical specifications and standards specified in **Section 6**, Employer's Requirement as well as other related requirements, in the Technical

Part of the bid as specified in **ITB 10.2.7**, as per the format given in **Section 4 - Bidding Forms - Technical Part of the Bid**.

- 15.2 Wherever and if specified in **Section 6 - Employer's Requirement**, the bidder shall also submit documentary evidence in the form of literature, drawings or data, and a detailed item by item description of the essential technical characteristics of the Plant and Installation Services/ Works, demonstrating substantial responsiveness of the Plant and Installation Services/ Works to the technical specification.
- 15.3 Wherever and if specified in **Section 6** , Employer's Requirement, the Bidder shall furnish in technical proposal a statement of work methods, equipment, personnel, schedule and any other information as stipulated in **Section 4, Bidding Forms – Technical Part of the Bid**, in sufficient detail to demonstrate the adequacy of the Bidder's proposal to meet the Employer's Requirements and the Time for Completion of the Plant and Installation Services/ Works.
- 15.4 Standards for workmanship, process, material, and equipment, as well as references to brand names or catalogue numbers specified by the Employer in the Employer's Requirement, are intended to be descriptive only and not restrictive. The Bidder may offer other standards of quality, brand names, and/or catalogue numbers, provided that it demonstrates, to the Employer's satisfaction, that the substitutions ensure substantial equivalence or are superior to those specified in the **Section 6, Employer's Requirement**.
- 15.5 For major items of Plant and Installation Services if and as listed by the Employer in **Section 2, Eligibility and Qualification Requirements and Section 6, Employer's Requirement**, which the Bidder intends to purchase or subcontract, the Bidder shall give details of the name and nationality of the proposed Subcontractors, including manufacturers, for each of those items. In addition, the Bidder shall include in its Bid information establishing compliance with the requirements specified by the Employer for these items. Quoted rates and prices will be deemed to apply to

whichever Subcontractor is appointed, and no adjustment of the rates and prices, on this account, will be permitted.

- 15.6 The Bidder shall be responsible for ensuring that any Subcontractor proposed complies with the requirements of **Section 2** and **Section 6**.

16. Documents Establishing the Eligibility and Qualifications of the Bidder and Eligibility of Plant and Installation Services

- 16.1 To establish Bidder's eligibility and eligibility of Plants and Installation Services/ Works in accordance with **ITB 3** and **Section 2**, Eligibility Requirements, Bidders shall complete the Letter of Bid – Technical Part, and other forms included in **Section 4 - Bidding Forms - Technical Part of the Bid**.

- 16.2 The documentary evidence of the Bidder's eligibility and qualifications, and eligibility of Plant and Installation Services, to be furnished as per **Section 4 - Bidding Forms - Technical Part of the Bid**, for the Bidder to be considered for award of the Contract, shall establish to the Employer's satisfaction that the Bidder meets each of the Eligibility and Qualification Requirements and establishes eligibility of Plant and Installation Services/ Works, specified in **ITB 3** and **Section 2**.

17. Period of Validity of Bids

- 17.1 Bids shall remain valid until the date specified in the **BDS** or any extended date if amended by the Employer in accordance with **ITB 7**. The Bid Validity period starts from the Bid submission deadline (as prescribed by the Employer in accordance with **ITB 21.1**). A Bid that is not valid until the date specified in the **BDS**, or any extended date if amended by the Employer in accordance with **ITB 7**, shall be rejected by the Employer as nonresponsive.

- 17.2 In exceptional circumstances, prior to the expiry of the Bid validity, the Employer may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. If a Bid Security is requested (in accordance with **ITB 18**), it shall also be extended for a corresponding period. A Bidder may refuse the request without forfeiting its Bid Security. A Bidder granting the request shall not

be required or permitted to modify its Bid, except as provided in this **ITB 17.2**.

18. Bid Security/ Bid Securing Declaration

18.1 Unless otherwise the provision for submission of Bid Securing Declaration is specified in the **BDS**, the Bidder shall furnish as part of the Technical part of its Bid, a Bid security in original form, and in the amount specified in the BDS.

18.2 If a Bid Security is specified pursuant to **ITB 18.1**, the Bid Security shall be a demand guarantee, and in any of the following forms at the Bidder's option:

- (a) an unconditional guarantee issued by a nationalized/ scheduled commercial bank located in India;
- (b) a cashier's or certified check or demand draft from a Nationalized/ Scheduled commercial bank located in India; or
- (c) another form security, if specified in the BDS.

In the case of a bank guarantee, the Bid security shall be submitted using the Bid Security Form included in Section 4, Bidding Forms - Technical Part of the Bid. The form must include the complete name of the Bidder. The Bid Security shall be valid for ninety (90) days beyond the original validity period of the Bid, or beyond any period of extension if requested under **ITB 17.2**.

18.3 If a Bid Security is specified pursuant to **ITB 18.1**, any Bid not accompanied by a substantially responsive Bid Security shall be rejected by the Employer as non-responsive.

18.4 If a Bid Security is specified pursuant to **ITB 18.1**, the Bid Security of unsuccessful Bidders shall be returned as promptly as possible upon the successful bidder's signing the contract and furnishing the Performance Security pursuant to **ITB 43** and **ITB 45**.

18.5 The Bid Security of the successful bidder shall be returned as promptly as possible once the

successful bidder has signed the Contract and furnished the required Performance Security.

18.6 The Bid Security may be forfeited, or action may be taken as per the Bid Securing Declaration:

- (a) if a Bidder withdraws/modifies/substitutes its Bid during the period of Bid validity specified by the Bidder in the Letter of Bid - Technical Part, or any extension thereto provided by the Bidder; or if the Bidder does not accept the correction of its Bid Price pursuant to **ITB 33**; or
- (b) if the successful Bidder fails to:
 - (i) sign the Contract in accordance with **ITB 43**; or
 - (ii) furnish a performance security in accordance with **ITB 44**.

18.7 The Bid Security or the Bid-Securing Declaration of a JV shall be in the name of the JV that submits the Bid.

18.8 If a Bid Security is not specified pursuant to **ITB 18.1** and Bid Securing Declaration is specified: and

- (a) if a Bidder withdraws its Bid during the period of Bid validity specified by the Bidder on the Letter of Bid Form, except as provided in **ITB 17.2**; or
- (b) if the successful Bidder fails to:
 - (i) sign the Contract in accordance with **ITB 43**; or
 - (ii) furnish a Performance Security in accordance with **ITB 44**;

the Employer may, declare the Bidder disqualified to be awarded a contract by the Employer for a period of time as stated in the **BDS**.

19. Format and Signing of Bid

19.1 The Bidder shall prepare the Bid, in accordance with **ITB 10** .

19.2 Bidders shall mark as “CONFIDENTIAL” information in their Bids which is confidential to their business. This may include proprietary information, trade

secrets, or commercial or financially sensitive information.

19.3 The Bid shall be signed by a person or persons duly authorized to sign on behalf of the Bidder. This authorization shall be in the form of the document as specified in **BDS** and shall be submitted/ uploaded along with the Bid as per **ITB 11**.

19.4 In the case that the Bidder is a JV, the Bid shall be signed by an authorized representative of the JV on behalf of the JV, and so as to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives, which shall be submitted/ uploaded along with the Bid as per **ITB 11**.

19.5 Corrections, if any, can be carried out by editing the information before electronic submission on e-procurement portal.

D. Submission of Bids

20. Submission of Bids

20.1 Bids, both Technical and Financial Parts, shall be submitted online on the e-procurement system specified in **ITB 6.1**. Detailed guidelines for viewing bids and submission of online bids are as per **ITB 6.1** and the website referred therein. A prospective bidder can submit its bid online only for which the bidder (in case of JV, the authorised representative of the JV as per **ITB 19.4**) is required to have enrolment/registration and should have valid Digital Signature Certificate (DSC) as specified in **ITB 6.1** in **BDS**. The Bidder should go through them carefully and submit its bid, along with the specified documents failing which the bid is liable to be rejected.

20.2 The completed Bid comprising of documents indicated in **ITB 10**, should be uploaded on the e-procurement portal along with scanned copies of requisite certificates/ documents as are mentioned in different sections in the bidding document. Further, if so specified in **ITB 11.3**, the Bidders shall ensure submission of hard copy of documents as mentioned therein.

20.3 All the uploaded documents are required to be signed digitally by the bidder.

20.4 Physical, e-mail, Telex, Cable or Facsimile bids will be rejected as non-responsive.

21. Deadline for Submission of Bids

21.1 Bids must be uploaded online, and if so specified in **ITB 11.3**, the hard copy of specified documents must be delivered at the address mentioned therein, no later than the deadline for submission of Bids i.e. the date and time specified in the **BDS**.

21.2 The Employer may, at its discretion, extend the deadline for the submission of Bids by amending the bidding document in accordance with **ITB 7**, in which case all rights and obligations of the Employer and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.

22. Late Bids

22.1 The electronic bidding system would not allow any late submission of bids after due date & time as per server time.

23. Withdrawal, Substitution, and Modification of Bids

23.1 Bidders may modify their bids by using the appropriate option for bid modification on e-procurement portal before the deadline for submission of bids. For this the bidder need not make any additional payment towards the cost of bid document, if applicable. For bid modification and consequential re-submission, the bidder is not required to withdraw his bid submitted earlier. The last modified bid submitted by the bidder within the bid submission time shall be considered as the Bid. For this purpose, modification/withdrawal by other means will not be accepted. In online system of bid submission, the modification and consequential re-submission of bids is allowed any number of times. A bidder may withdraw his bid by using the appropriate option for bid withdrawal, before the deadline for submission of bids, however, if the bid is withdrawn, re-submission of the bid is allowed only upto the deadline for submission of bids as specified in **ITB 21**.

23.2 Bids requested to be withdrawn in accordance with **ITB 23.1** shall not be opened.

23.3 No Bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of Bids and the expiration of the period of Bid validity specified by the Bidder on the Letter of Bid (Technical Part), or any extension thereof. This will result in the forfeiture of the Bid Security or be sufficient ground for action by Employer against the bidder under the Bid Securing Declaration, as may be applicable pursuant to **ITB 18**.

E. Public Opening of Technical Parts of Bids

24. Public Opening of Technical Parts of Bids

24.1 The Employer shall, at the Bid opening, publicly open online the Technical Parts of all Bids, except as in the cases specified in **ITB 22** and **ITB 23.2**, received by the deadline of bid submissions as specified in **ITB 21**, at the date, time and place specified in the **BDS** in the presence of Bidders' designated representatives who choose to attend, and this could also be viewed by the bidders online. The Financial Parts of the bids shall remain unopened in the e-procurement system, until the subsequent public opening, following the evaluation of the Technical Parts of the Bids. Bidder's names, and such other details as the Employer may consider appropriate will be notified by the Employer at the time of bid opening.

24.2 Only Technical Parts of Bids that are opened at Bid opening of Technical Parts shall be considered further for evaluation.

24.3 At the Bid opening the Employer shall neither discuss the merits of any Bid nor reject any Bid (except the cases, in accordance with **ITB 22** and **ITB 23.2**).

24.4 The Employer shall prepare a record of the Bid opening, that shall include, as a minimum:

- (a) the name of the Bidder; and
- (b) the presence or absence of a Bid Security or a Bid-Securing Declaration.

24.5 The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.

F. Evaluation of Bids - General Provisions

25. Confidentiality

- 25.1 Information relating to the evaluation of Bids and recommendation of contract award, shall not be disclosed to Bidders, or any other persons not officially concerned with the Bidding process.
- 25.2 Any effort by a Bidder to influence the Employer in the evaluation or contract award decisions may result in the rejection of its Bid.
- 25.3 Notwithstanding **ITB 25.1**, from the time of Bid opening to the time of Contract Award, if any Bidder wishes to contact the Employer on any matter related to the Bidding process, it should do so in writing.

26. Clarification of Bids

- 26.1 To assist in the examination, evaluation, comparison of the Bids, and eligibility or qualification of the Bidders, the Employer may, at its discretion, ask any Bidder for a clarification of its Bid and/or seek information related to historical data/ documents pertaining to credentials of the Bidders and the Bids, that the Employer may require. Any clarification submitted by a Bidder in respect to its Bid and that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change, including any voluntary increase or decrease, in the prices or substance of the Bid shall be sought, offered, or permitted.
- 26.2 If a Bidder does not provide clarifications of its Bid or data/ documents sought, by the date and time set in the Employer's request for clarification/ data/ document, its Bid may be rejected.

27. Deviations, Reservations, and Omissions

- 27.1 During the evaluation of Bids, the following definitions apply:
- (a) "Deviation" is a departure from the requirements specified in the bidding document;
 - (b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the bidding document; and

- (c) "Omission" is the failure to submit part, or all of the information or documentation required in the bidding document.

**28. Nonmaterial
Nonconformities, Errors
and Omissions**

- 28.1 Provided that a Bid is substantially responsive, the Employer may waive any nonconformities in the Bid, which do not constitute a material deviation, reservation or omission.
- 28.2 Provided that a Bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities or omissions in the Bid related to documentation requirements. Requesting information or documentation on such nonconformities and/or omissions shall not be related to any aspect of the price of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.
- 28.3 Provided that a Bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component in the manner specified in **BDS**.

G. Evaluation of Technical Parts of Bids

**29. Evaluation of Technical
Parts**

- 29.1 In evaluating the Technical Parts of each Bid, the Employer shall use the requirements, criteria and methodologies mentioned and specified in **Section 2, Section 3** and **Section 6**.
- 29.2 The Employer shall, interalia, carry out the Technical Evaluation as per **ITB 29.3**, and determine to its satisfaction:
- (a) whether the Bidders comply with the Eligibility Requirements, have offered eligible Plant and Installation Services in their Bids, as specified in **ITB 3** and **Section 2**;
 - (b) whether the Bidders meet the Qualification Requirement as specified in **ITB 3** and **Section 2**. (The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder,

pursuant to **ITB 16** read in conjunction with **ITB 26**. The determination shall not take into consideration the qualifications of other firms such as the Bidder's subsidiaries, parent entities, affiliates, subcontractor/Bidders (other than specialized subcontractor/Bidders if permitted in the bidding document), or any other firm different from the Bidder that submitted the Bid except if provided in the specified Qualification Requirement itself.); and

- (c) whether the Bids submitted by the Bidders complying with the requirements specified in (a), and (b) above have been determined to be substantially responsive to the RFB/bidding document, as per **ITB 30**.

29.3 Technical Evaluation. The Employer will carry out a detailed technical evaluation of the Bids not previously rejected to determine whether the technical aspects are in compliance with the bidding document. The Bid that does not meet minimum acceptable standards of completeness, consistency and detail, and the specified minimum (or maximum, as the case may be) requirements for specified functional guarantees, will be rejected for non-responsiveness. In order to reach its determination, the Employer will examine and compare the technical aspects of the Bids on the basis of the information supplied by the Bidders, taking into account the following:

- (a) overall completeness and compliance with the Employer's Requirements; conformity of the Plant and Installation Services offered with specified performance criteria, including conformity with the specified minimum (or maximum, as the case may be) requirement corresponding to each functional guarantee, as indicated in **Section 2** and/ or **Section 6**; suitability of the Plant and Installation Services offered in relation to the environmental and climatic conditions prevailing at the site; and quality, function and operation of any process control concept included in the Bid;

- (b) type, quantity and long-term availability of mandatory and recommended spare parts and maintenance services; and
- (c) other relevant factors, if any, listed in the RFB/ bidding document.

29.4 At this stage, a Bid shall be rejected if the determination on any one of the aspects listed in ITB 29.2 (a), (b) and (c) above, is not in the affirmative. All other Bids shall be considered for further evaluation.

30. Determination of Responsiveness

30.1 The Employer's determination of a Bid's responsiveness is to be based on the contents of the Bid itself, as defined in **ITB 10** read in conjunction with **ITB 26** and submitted as per **ITB 11**.

30.2 A substantially responsive Bid is one that meets the requirements of the bidding document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that:

- (a) if accepted, would:
 - (i) affect in any substantial way the scope, quality, or performance of the Works specified in the Contract; or
 - (ii) limit in any substantial way, inconsistent with the bidding document, the Employer's rights or the Bidder's obligations under the Contract; or
- (b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive Bids.

30.3 The Employer shall examine the technical aspects of the Bids, in particular, to confirm that all requirements of **Section 6**, Employer's Requirement have been met without any material deviation or reservation, or omission.

30.4 If a Bid is not substantially responsive to the requirements of bidding document, it shall be rejected by the Employer and may not subsequently be made responsive by correction

of the material deviation, reservation, or omission.

H. Public Opening of Financial Parts of Bids

31. Public Opening of Financial Parts

31.1 Following the completion of the evaluation of the Technical Parts of the Bids, the Employer shall notify in writing those Bidders whose Bids were considered non-responsive to the bidding document / RFB Document or failed to meet the Eligibility Requirements or Qualification Requirement or any other specified requirement, advising them of the following information:

(a) the grounds on which their Technical Part of Bid failed to meet the requirements of the bidding document; and

(b) Financial Part of their Bid will not be opened.

31.2 The Employer shall, simultaneously, notify in writing those Bidders whose Technical Parts have been evaluated as substantially responsive to the bidding document and met the Eligibility Requirement, Qualification Requirement and other specified requirement, advising them of the following information:

(a) their Bid has been evaluated as substantially responsive to the requirements of bidding document and the specified requirements;

(b) Financial Part of their Bid will be opened online at the public opening of the Financial Parts; and

(c) notify them of the date, time and location of the second public opening of the Financial Parts of bid, and the address thereof. In the event of the specified date of bid opening being declared a holiday for the Employer, the bids will be opened at the appointed time and location on the next working day.

31.3 All efforts may be made to have the opening date that should allow Bidders sufficient time to make arrangements for attending the opening if they so choose, however as the opening is in online mode and bidder's get due notification of bid opening and can witness the opening online, the date of opening may be set accordingly based on

Employer's requirements. The Financial Part of the Bids shall be opened publicly in the presence of Bidders' designated representatives who chooses to attend, and this could also be viewed by the bidders online. The bidder's names, the Bid prices, the total amount of each bid, and such other details as the Employer may consider appropriate, will be announced by the Employer at the time of bid opening.

31.4 The Employer shall prepare a record of the Bid opening, that shall include, as a minimum:

- (c) the name of the Bidder; and
- (d) the Bid price, for the package, including any discounts

31.5 Only Financial Parts of Bids that are opened at Bid opening shall be considered for further evaluation.

I. Evaluation of Financial Parts of Bids

32. Evaluation of Financial Parts

32.1 To evaluate the Financial Part of each Bid, the Employer shall consider the following:

- (a) Bid price, as quoted in accordance with **ITB 13.5**;
- (b) price adjustment for correction of arithmetic errors in accordance with **ITB 33**;
- (c) price adjustment due to discounts offered in accordance with **ITB 13.9**;
- (d) price adjustment due to quantifiable nonmaterial nonconformities in accordance with **ITB 28.3**;
- (e) GST, quoted separately as per **ITB 13.12**, adjusted for correction of arithmetic errors in accordance with **ITB 33**, shall be considered for arriving at the evaluated Bid cost/ price and comparison of Bids, except if otherwise specified in **BDS**.

- (f) the additional evaluation factors if specified in **BDS** and/ or **Section 6**.
- 32.2 If price adjustment is allowed in accordance with **ITB 13.6**, the estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in Bid evaluation.
- 32.3 The Employer's evaluation of a Bid may require the consideration of other factors if specified in **BDS**, in addition to the Bid price quoted, in accordance with **ITB 33.1 (e)**.
- 33. Correction of Arithmetical Errors**
- 33.1 The e-procurement system automatically calculates the total amount from unit rates and quantities, and the system also automatically populates the amount in words from the amount in figures, and therefore there is no scope of discrepancy and need for arithmetic correction. However there would be a manual recalculation and in the case of discrepancy between system generated and manual prices, the manually calculated prices shall prevail.
- 33.2 Any bid which is found to have tampered or modified the electronic logic of the e- procurement system for calculating the total amount from unit rates and quantities, and/ or in populating the amount in words from the amount in figures, is liable to be rejected and the case shall be dealt against the bidder under the Integrity Pact and conditions of the RFB/ bidding documents including those regarding fraud etc..
- 34. Comparison of Financial Parts**
- 34.1 The Employer shall compare the evaluated price/costs of all substantially responsive Bids, to determine the Bid that has the lowest evaluated cost/ price.
- 35. Preference**
- 35.1 Purchase Preference shall apply for award of contract if so specified in the **BDS**, as per the guidelines, instruction and methodology indicated therein.
- 36. Abnormally Low Bids**
- 36.1 An Abnormally Low Bid is one where the Bid price, in combination with other elements of the Bid, appears so low that it raises material concerns

with the Employer as to the capability of the Bidder to perform the Contract for the offered Bid Price.

36.2 In the event of identification of a potentially Abnormally Low Bid, the Employer, unless otherwise specified in **BDS**, may seek written clarification from the Bidder, including a detailed price analyses of its Bid price in relation to the subject matter of the contract, scope, delivery schedule, allocation of risks and responsibilities and any other requirements of the bidding document.

36.3 After evaluation of the price analyses, in the event that the Employer determines that the Bidder has failed to demonstrate its capability to perform the contract for the offered Bid price, the Employer shall reject the Bid.

37. Unbalanced or Front Loaded Bids

37.1 The Bid that is evaluated as the lowest evaluated cost/price, shall be considered by the Employer as unbalanced or front loaded, if the quoted price of supply portion exceeds the percentage specified in **BDS** of the total quoted **Bid price**, after evaluation and excluding GST. In such a case, The bidder shall be required to furnish an additional performance security pursuant to **ITB 44.1** as contract.

38. Most Advantageous Bid

38.1 Having compared the evaluated cost/price of Bids as per **ITB 34**, and applying the provisions of **ITB 35**, the Employer shall determine the Most Advantageous Bid (alternatively referred to as **L1 Bid**). The Most Advantageous Bid is the Bid of the Bidder (also referred to as the **successful bidder**) who meets the specified requirements as per **Section 2** and **Section 3**, and whose Bid has been determined to have the lowest evaluated price/cost subject to **ITB 35**.

38.2 The capabilities of the manufacturers and subcontractors proposed in its Bid to be used by the Bidder with the Most Advantageous Bid for identified major items of supply or services may also be evaluated for acceptability in accordance with **Section 2 / Section 6**. Their participation should be confirmed with a letter of intent between

the parties, as needed. Should a manufacturer or subcontractor be determined to be unacceptable, the Bid will not be rejected, but the Bidder will be required to substitute an acceptable manufacturer or subcontractor without any change to the Bid price. Prior to signing the Contract, the corresponding **Appendix** to the Contract Agreement shall be completed, listing the approved manufacturers or subcontractors for each item concerned.

38.3 Price Negotiation - Usually, there shall be no price negotiations. However, in case the Employer identifies exceptional reasons due to which negotiation is required, the Employer reserves its right to negotiate with the lowest acceptable bidder (L-1).

39. Employer's Right to Accept Any Bid, and to Reject Any or All Bids

39.1 The Employer reserves the right to accept or reject any Bid, and to annul the Bidding process and reject all Bids at any time prior to Contract Award, without thereby incurring any liability to Bidders. In case of annulment, all Bids submitted and specifically, Bid securities, if applicable as per **ITB 18** and submitted, shall be promptly returned to the Bidders.

J. Award of Contract

40. Award Criteria

40.1 The Employer shall award the Contract to the successful Bidder. This is the Bidder whose Bid has been determined to be the Most Advantageous Bid as specified in **ITB 38**.

40.2 The mode of contracting with the successful bidder will be as indicated below:

40.2.1 The award shall be made as follows:

(i) Contract Part I: for Supply of Plant on FOR (final place of destination Site/ Project Site) basis.

(ii) Contract Part II: for Supply of Installation Services {excluding the incidental services included in (i) above}

40.3 Both the parts of the Contract will contain a cross fall breach clause specifying that breach of one will constitute breach of the other.

41. Employer's Right to make minor adjustments at the time of Award

41.1 At the time the Contract is awarded, the Employer reserves the right to invite the Bidder whose Bid is determined to be the Most Advantageous Bid as per **ITB 38**, for discussions if any minor adjustments in the Contract are required, without any substantial change in the terms and conditions of the bidding document.

42. Notification of Award

42.1 Prior to the date of expiry of the Bid validity, the Employer shall notify the successful Bidder, in writing, that its Bid has been accepted. The Notification of Award (hereinafter and in the Contract Forms also called the "**Letter of Acceptance**") shall specify the sum that the Employer will pay the Contractor in consideration of the execution of the Contract (hereinafter and in the Conditions of Contract and Contract Forms called "the Contract Price").

42.2 Until a formal Contract is prepared and executed, the Letter of Acceptance/ Notification of Award shall constitute formation of a binding Contract.

43. Signing of Contract

43.1 Promptly upon issue of Letter of Acceptance/ Notification of Award, the Employer shall prepare the Contract Agreement, and keep it ready in the office of the Employer for the signature of the Employer and the successful Bidder, within twenty-one (21) days following the date of Letter of Acceptance. The Contract Agreement shall incorporate all agreements including L2 schedule between the Employer and the successful Bidder. L-2 schedule should be submitted, discussed, amended (if so required) within overall L-1 schedule and accepted by owner before signing of contract agreement. Also, CPG should be submitted, verified from issuing bank legally vetted and approved before signing of contract agreement.

43.2 Within twenty-one (21) days of receipt of Letter of Acceptance, the successful Bidder shall (a) furnish the performance security in accordance with **ITB Clause 44**; and (b) shall sign, date and return the Agreement to the Employer along with the documents stated at (a) above.

44. Performance Security

44.1 Within twenty-one (21) days of the receipt of the Letter of Acceptance/ Notification of Award from the Employer, the successful Bidder shall furnish the Performance Security & Additional performance security (if applicable), in Indian Rupees, in accordance with the GCC and in the amount, form and details specified in the **BDS**, further subject to **ITB 37**.

44.2 Failure of the successful Bidder to submit the above-mentioned Performance Security & Additional performance security (if applicable) or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security or be sufficient ground for action by the Employer against the bidder under the Bid Securing Declaration, as may be applicable as per **ITB 18**.

45. Source of Funds

45.1 The Employer named in the Bidding Documents intends to use the capital subsidy {60% of cost of the infrastructures in the project} under Revamped Reforms-based and Results- linked, Distribution Sector Scheme (RDSS), a Government of India flagship program for bringing down the costs and improve the efficiency of supply of the electricity in the states, 40% to be arranged by the State Government/Employer through loans from REC/PFC/or other FIs/own resources. However, the payment as per the contract payment terms will be released timely by the Employer, without any linkage to disbursement of the funds under RDSS scheme.

46. Dedicated bank account of Contractor

~~46.1 If required by the Employer, the Contractor may be required to create a dedicated bank account for usage of the funds under the project, the Contractor may be required to provide the details of the transactions under this account to the Employer at the time of key milestones as defined by the employer. Deleted.~~

I. Bid Data Sheet (BDS)

The following specific data for the Plant and Installation Services/ Works to be procured shall complement, supplement, and/or amend the provisions in the Instructions to Bidders (ITB). Whenever there is a conflict, the provisions herein shall prevail over those in ITB.

ITB Reference	A. General
ITB 1.1	<p>The reference number of the Notice Inviting Tenders (NIT/Request for Bids (RFB) is : WBSEDCL/Dist. Project-III/RDSS/EVCS/Tender/2023-24/07</p> <p>Dated: 23/08/2023</p> <p>The Employer is: WBSEDCL</p> <p>The name and identification of the package under this RFB is: As per Table A at Section –I (RFB).</p>
ITB 1.2 (c)	<p>The Government of West Bengal unbundled the erstwhile West Bengal State Electricity Board (WBSEB) into two companies viz., West Bengal State Electricity Distribution Company Limited (WBSEDCL) and West Bengal State Electricity Transmission Company Limited (WBSETCL).</p> <p>The main business of WBSEDCL is distribution and hydro generation of electricity. It is also the nodal Agency of the Government of West Bengal for undertaking Rural Electrification task in the State with objective of providing access of electricity to all rural households in the state in line with the National Rural Electrification Policy.</p>
ITB 1.2 (m)	<p>Bidding/ Bids by/ from Joint Venture (JV) is “permitted”.</p> <p>In case Bidding/ Bids by/ from Joint Venture is permitted, the number of members/ partners of the JV shall not exceed 03 (three)</p>
	B. Contents of Bidding Document
ITB 6.1	<p>Bidding against RFB shall be conducted through/ with Electronic – Procurement (e- Procurement/ e- Tendering) System.</p> <p>Employer shall use the following Electronic-Procurement system to manage this Request for Proposal (RFP) process:</p> <p>www.wbtenders.gov.in</p> <p>The electronic-procurement system shall be used to manage the following part of the bidding process under the RFB:</p> <p>Issuing RFB/ Bidding document, amendments/ corrigendum/ addendums/ clarifications, etc., submissions of bids, opening of Bids, etc.</p>

	To aid and facilitate the Bidders on e-Procurement/ e-Tendering process a detailed manual on the same titled Bidder Help Manual for e-Bidding has been provided annexed to the Bid Data Sheet as Annexure I (BDS) . The same may be utilized by the Bidders.
ITB 6.2	<p>A Bidder requiring any clarification of the bidding document may notify the Employer online through the electronic bidding system if provisioned/ permitted or through e-mail at the following e-mail address:</p> <p>ceprojiii@wbsedcl.in</p> <p>Requests for clarification should be received by the Employer no later than: 10 days from date of issue of NIT/RFB.</p>
ITB 6.5	<p>Pre-Bid meeting shall take place at the following date, time and place:</p> <p>Date: 31th August 2023</p> <p>Time : 11:30 Hours (IST).</p> <p>Place : Conference Room, Chief Engineer (Distribution) WBSedCL Vidyut Bhawan, 1st Floor, D-Block, Block-DJ, Sector-II, Bidhannagar, Kolkata-700091 Website: www.wbsedcl.in, Email: ceprojiii@wbsedcl.in</p>
ITB 7.1	The addendum/corrigendum/ amendment will appear on the e-procurement system specified in ITB 6.1 and email notification is also automatically sent through the system to those bidders who have started working on this procurement.
	C. Preparation of Bids
ITB 10.2.8	<p>The Bidder shall submit the following additional documents in Technical Part of its Bid :</p> <p>(i) Integrity Pact, prepared using the relevant form furnished in Section 4 - Bidding Forms - Technical Part of the Bid.</p>

	<p>(ii) Self-certified copy of the document to establish legal status of the firm viz. Certificate of Incorporation issued under The Companies Act / The Limited Liability Partnership Act / Partnership deed etc. as applicable;</p> <p>(iii) Self-certified copy of PAN;</p> <p>(iv) Self-certified copy of GST Registration;</p> <p>(v) Self-certified copy in support of MSME, if applicable.</p> <p>(vi) Bank Guarantee (BG) for Bid security</p> <p>(vii) Power of Attorney</p>
ITB 10.3.3	<p>The Bidder shall submit the following additional documents in its- Financial Part of its Bid. Deleted.</p>
ITB 11	<p>Note for Bidders: Bidders have to submit the bids on the e-procurement portal along with the relevant required documents. For this purpose, the bidders shall fill up online, the forms that are available for online filling on the e-portal. The rest of the forms shall be download by the bidders and filled up. The filled up pages shall then be scanned and uploaded on the e-procurement portal along with the scanned copies of the supporting documents. The bid shall be digitally signed.</p>
ITB 11.3	<p>The bidders are required to submit hard copy of the documents listed below in original along with the Technical part of their Bid within 2 working days after the last date of the bid submission.</p> <p>i) Integrity Pact, prepared using the relevant form furnished in Section 4 - Bidding Forms - Technical Part of the Bid.</p> <p>ii) Self-certified copy of the document to establish legal status of the firm viz. Certificate of Incorporation issued under The Companies Act / The Limited Liability Partnership Act / Partnership deed etc.as applicable</p> <p>iii) Self-certified copy of PAN.</p> <p>iv) Self-certified copy of GST Registration.</p> <p>v) Self-certified copy in support of MSME, if applicable.</p> <p>vi) Bank Guarantee (BG) for Bid security.</p> <p>vii) Power of Attorney.</p> <p>For submission of original documents, the Employer's address is: Chief Engineer (Project-III) WBSEDCL Vidyut Bhawan, 2nd Floor, C-Block, Block-DJ, Sector-II, Bidhannagar, Kolkata-700091 Website: www.wbsedcl.in, Email: ceprojiii@wbsedcl.in</p>

ITB 13.5.1(i), ITB 13.5.2 (i)	Final Destination (Site/ Project Site) is: <i>As per the Table- B of Section-I (RFB) for respective package.</i>
ITB 13.6	<p>The prices quoted by the Bidder shall be subject to adjustment during the performance of the Contract.</p> <p>The adjustment of contract price, if provided, will be done in accordance with Appendix to Contract Form.</p>
ITB 13.11	GST applicable in India, on the Plant and Installation Services provided/ supplied by the Contractor to the Employer under the Contract shall be paid/ reimbursed by Employer against requisite documents, at actuals.
ITB 17.1	The Bid shall remain valid until i.e. upto and including 180 days reckoned from the deadline for Submission of Bids specified in ITB 21.1, as may be extended by the Employer from time to time in accordance therewith.
ITB 18.1	A Bid Security <i>shall be</i> required. The amount of the Bid Security shall be as specified in Table A of Section-I (RFB) of the respective package.
ITB 18.2 (c)	<p>Other forms of acceptable Bid securities:</p> <p>...None.....</p>

ITB 19.3	The written confirmation of authorization to sign on behalf of the Bidder shall consist of: <i>Legally valid Power of Attorney demonstrating the authority of the signatory to sign the Bid.</i>
D. Submission of Bids	
ITB 21.1	<p>The Deadline for Submission of Bids by uploading on e- Procurement system specified in ITB 6.1 and ITB 11 is:</p> <p>Date : 20th September 2023</p> <p>Time: 12:00 Hours (IST).</p> <p>The Deadline for Submission of documents in hard copy as specified in ITB 11.3 is :</p> <p>Date : 22th September 2023</p> <p>Time: 12: 00 Hours (IST).</p>
E. Public Opening of Technical Parts of Bids	
ITB 24.1	<p>The online opening of Technical Part of Bids, shall take place at:</p> <p>Office of Chief Engineer (Project-III) WBSEDCL Vidyut Bhawan, 2nd Floor, C-Block, Block-DJ, Sector-II, Bidhannagar, Kolkata-700091 Website: www.wbsedcl.in, Email: ceprojiii@wbsedcl.in</p> <p>Date: 22th September 2023</p> <p>Time: 12: 30 Hours (IST).</p> <p>In the event of the specified date of bid opening being declared a holiday for the Employer, the bids will be opened at the appointed time and location on the next working day.</p>

F. Evaluation of Bids - General Provisions	
ITB 28.3	The adjustment shall be based on the average price of the item or component as quoted in other substantially responsive Bids. If the price of the item or component cannot be derived from the price of other substantially responsive Bids, the Employer shall use its best estimate.
I. Evaluation of Financial Part of Bids	
ITB 32.1 (e)	GST, quoted separately as per ITB 13.12 , shall be considered for arriving at the evaluated Bid cost/ price and comparison of Bids.
ITB 32.1(f)	<p>The Employer's evaluation of a Bid shall also require the consideration of factors listed herein below. Wherever specified, the adjustments shall be determined using the criteria and methodology mentioned in Section 6. Employer's Requirement:</p> <p>(a) Time for Completion: The Plant and Installation Services specified in Employer's Requirement are required to be supplied / provided within the specified Time for Completion. No credit will be given if provided/ supplied before the specified date or period, and Bids offering supply/ completion after the final date/ specified period shall be treated as nonresponsive;</p> <p>(b) Deviation in payment schedule/ terms and conditions of payment: Bidders shall state their Bid price for the payment schedule outlined in the Conditions of Contract. Bids shall be evaluated on the basis of this base price. If a Bid deviates from the specified payment schedule/ terms and conditions of payment, it shall be treated as non-responsive;</p> <p>(c) Life cycle costs: the projected operating and maintenance costs during the life of the Plant, goods or equipment /NO/</p> <p>(d) Functional Guarantees of the Facilities /NO/</p> <p>(e) Cost of withdrawal of deviations: -(as per Attachment 6 in Section 4)</p>

ITB 35.1	<p>Only Class -I suppliers are eligible for the bid</p> <p>‘Class –I local supplier’ means a supplier or service provider , whose goods , services or works offered for procurement, meets the minimum local content as prescribed for ‘Class-I local supplier’. The local content requirement to categorize a supplier as ‘Class-I local supplier’ is minimum 50%.</p>
ITB 36	Provisions related to Abnormally Low Bids will apply.
ITB 37	The percentage is 70%
	J. Award of Contract
ITB 44.1	<p>The Performance Security amount is 10% of Contract Price</p> <p>The Additional Performance Security amount is 10%percentage of the level of unbalancing i.e. (actual value of supply part of contract) minus (x% of overall contract price). x% is to be defined as per ITB 37 under BDS.</p> <p>The Standard Form of Performance Security acceptable to the Employer shall be as specified in Section 8. Contract Forms.</p> <p>Performance security can also be submitted in Demand Draft (DD) in favour of WBSEDCL payable at Kolkata.</p>
Bank details for preparation of Bank Guarantee only (EMD/Performance Security):-	<p>The bidder should pay the Earnest Money Deposit (EMD) in the portal (www.wbtenders.gov.in) using any of the following payment modes:</p> <ol style="list-style-type: none"> 1. Net Banking through payment gateway 2. RTGS/ National Electronic Fund Transfer(NEFT) 3. Bank Guarantee
	<p>Bank Details for Bank Guarantee Preparation:</p> <p>Name of Bank:- Punjab National Bank</p> <p>Branch:-Mayukh Bhavan(North 24 Parganas), WB</p> <p>Bank Account No.:-1096050103428</p> <p>IFS Code:-PUNB0109620</p> <p>Bank Account Name : WBSEDCL</p>

Annexure I (BDS)

Bidder Help Manual for E-Bidding

Guideline for e-Tendering : Instructions/Guidelines for electronic submission of the tenders have been mentioned below for assisting the bidders to participate in e-Tendering.

Registration of bidder : Any bidder willing to take part in the process of e-Tendering will have to be enrolled & registered with the e-Procurement system, through logging on to <https://wbtenders.gov.in>. Bidder has to log into the portal giving user id / password chosen during enrollment.

Digital Signature certificate (DSC) : Each bidder is required to obtain a class-II or Class-III Digital Signature Certificate (DSC) for submission of tenders. DSC is given as a USB e-Token. After obtaining the Class-II or Class-III Digital Signature Certificate (DSC) from approved Certifying Authority they are required to register the fact of processing the Digital Signature Certificates through the registration system available in the website. DSC once mapped to an account cannot be remapped to any other account. It can only be Inactivated. The e-token that is registered should be used by the bidder and should not be misused by others.

Downloading of Bid : The bidder can search and download NIT & Tender Documents electronically from the <https://wbtenders.gov.in> using the Digital Signature Certificate. This is the only mode of collection of Tender Documents

Submission of Bid: Bids shall be submitted as under:

1. Tenders are to be submitted online through the website <https://wbtenders.gov.in> only and no other mode of submission of bid will be accepted. All the documents uploaded by the Tender Inviting Authority form an integral part of the contract. Tenderers are required to upload all the tender documents along with the other documents, as asked for, in the tender, through the above website within the stipulated date and time as given in the Tender. Tenders are to be submitted in two folders - one is Technical Proposal and the other is Financial Proposal. The tenderer shall carefully go through the documents and prepare the required documents and upload the scanned documents in Portable Document Format (PDF) to the portal in the designated locations of Technical Bid.

2. The bidder needs to download the Forms / Annexure, fill up the particulars in the designated Cell and upload the same in the designated location of Technical Bid

3. The documents uploaded shall be virus scanned and digitally signed using the Digital Signature Certificate (DSC). Tenderers should take note of all the addendum/corrigendum related to the tender and upload the latest documents as part of the tender

4. Technical Proposal:

The Technical Proposal shall contain scanned copies and/or declarations in the following standardized formats in three covers (folders).

Folder-1 : NIT& any Corrigendum & Scanned copy of Bank Guarantee (BG) towards Bid Security as prescribed in NIT along with under takings and also original Bid proposal are to be submitted in details in folder-1.

Folder-2: Credentials and documents must be filled & submitted in folder-2

5. Financial Proposal:

The financial proposal should contain the following documents in one cover (folder) named as Financial Proposal Folder. A pro-forma is enclosed as Annexure-VI for reference; please do not quote in the pro-forma.

6. Bill of Quantities(BOQ):

The bidder is to quote the Price online through computer in the space marked for quoting Price in the BOQ for each respective zone

7. At the time of freezing the bid, the eProcurement system will give a successful bid updation message after uploading all the bid documents submitted and then a bid summary will be shown with the bid no, date & time of submission of the bid with all other relevant details. The documents submitted by the bidders will be digitally signed using the e-token of the bidder and then submitted.

8. After the bid submission, the bid summary has to be printed and kept as an acknowledgement as a token of the submission of the bid. The bid summary will act as a proof of bid submission for a tender floated and will also act as an entry point to participate in the bid opening event.

9. The bidders are requested to submit the bids through online eProcurement system to the TIA well before the bid submission end date and time (as per Server System Clock).

ASSISTANCE TO BIDDERS:

- There is no limit on the size of the file uploaded at the server end. However, the upload is decided on the Memory available at the Client System as well as the Network bandwidth available at the client side at that point of time. In order to reduce the file size, bidders are suggested to scan the documents in 75-100 DPI so that the clarity is maintained and also the size of file also gets reduced. This will help in quick uploading even at very low bandwidth speeds.
- Successful bid submission from the system means, the bids as uploaded by the bidder is received and stored in the system. System does not certify for its correctness.
- The bidder should see that the bid documents submitted should be free from virus and if the documents could not be opened, due to virus, during tender opening, the bid is liable to be rejected.
- The time that is displayed from the server clock at the top of the tender Portal, will be valid for all actions of requesting bid submission, bid opening etc., in the e-Procurement portal. The Time followed in this portal is as per Indian Standard Time (IST) which is GMT+5:30. The bidders should adhere to this time during bid submission.
- Bidders are requested to visit e-procurement portal, The details and relevant links are available in the Bidders Manual Kit on the right pane of website which is furnished here:-

Section - 4 : Bidding Forms - Technical Part of the Bid

Form 1**Letter of Bid – Technical Part**

Date of this Bid submission: *[insert date (as day, month and year) of Bid submission]*

NIT/RFB No.: *[insert number of Bidding process]*

Title of Procurement/ Contract: *[Insert here the title]*

To:

Chief Engineer (Project-III)

WBSEDCL

Vidyut Bhawan, 2nd Floor, C-Block, Block-DJ, Sector-II,

Bidhannagar, Kolkata-700091

Website: www.wbsedcl.in, Email: ceprojiii@wbsedcl.in

1.0 We, the undersigned Bidder, hereby submit our Bid, in two parts, namely:

- (a) the Technical Part, and
- (b) the Financial Part.

2.0 In submitting our Bid we make the following declarations:

- (a) **No reservations:** We have examined and have no reservations to the bidding document (ITB5), including addenda issued in accordance with Instructions to Bidders (ITB 7);
- (b) **Eligibility:** We meet the eligibility requirements and have no conflict of interest in accordance with ITB 3 and Section 3;
- (c) **Bid/Proposal-Securing Declaration:** We have not been suspended nor declared ineligible by the Purchaser based on execution of a Bid Securing Declaration by the Purchaser in accordance with ITB 10.2.2;
- (d) **Conformity:** We offer to supply in conformity with the bidding document and in accordance with the Delivery Schedules specified in the Schedule of Requirements the all the Goods and Related Services as per the scope mentioned in Part 2, Section 6.;
- (e) **Bid Validity Period:** Our Bid shall be valid for the period specified in BDS 17.1 (as amended if applicable) from the date fixed for the deadline for submission of Bids (specified in BDS 21.1 (as amended if applicable), and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (f) **Performance Security:** If our Bid is accepted, we commit to obtain a performance security in accordance with the bidding document;
- (g) **One Bid per Bidder:** We are not submitting any other Bid(s) as an individual Bidder, and meet the requirements of ITB 4.2;
- (h) **Suspension:** We, along with any of our subcontractors, suppliers, consultants, manufacturers, or service providers for any part of the contract, are not subject to, and not controlled by any entity or individual that is subject to, a temporary suspension or a blacklist as specified in Section 2, Clause 1.3. Further, we are not ineligible under the Purchaser's country laws or official regulations or pursuant to a decision of the United Nations Security Council;
- (i) **Binding Contract:** We understand that this Bid, together with your written acceptance

thereof included in your Letter of Acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed;

- (j) **Not Bound to Accept:** We understand that you are not bound to accept the lowest evaluated cost/price Bid, the Most Advantageous Bid or any other Bid that you may receive;
- (k) **Fraud and Corruption:** We hereby certify that we have taken steps to ensure that no person acting for us, or on our behalf, engages in any type of Fraud and Corruption;
- (l) **(applicable only if the bidder is a Joint Venture as per Section 2 of RFB/ bidding document)** We have bid as a Joint Venture as per Section 2 of RFB/ bidding document) and in accordance with Clause 2.2.7 of Section 2 we declare and confirm that all partners of the joint venture shall be liable jointly and severally for the execution of the contract in accordance with the contract terms;
- (m) We submit appended herewith, as integral part of the Technical Part of our bid, the details/ documents as listed in the table below in the Forms duly filled, as prescribed, along with supporting documentary evidence as required/ specified. We understand and confirm that we would be solely responsible for any errors or omissions in our Bid and your decision in regard to sufficiency and/ or adequacy of the details/ documents comprising our Bid for determining its completeness shall be final and binding.

Sr.	Document	Status (Submitted/ Not Submitted/ Not Applicable)
1.	This Letter of Bid as per format prescribed in Form 1 given in Section 4 of RFB/ bidding document	
2	Bidder Information as per the format prescribed in Form 2 given in Section 4 of RFB/ bidding document	
3	Bid Security or Bid Securing Declaration , as may be specified in ITB 18 Section 3 of RFB/ bidding document, in the form of specified in ITB . Bid Securing Declaration in format prescribed in Form 3A given in Section 4 and Bid Security in the form of Bank Guarantee in format prescribed in Form 3B given in Section 4 of RFB/ bidding document.	
4.	Power of Attorney by Lead Joint Venture Member/ Sole Bidder authorizing an Individual Designated Representative for the Joint Venture Bidder/ Sole Bidder as per the format prescribed in Form 4 given in Section 4 of RFB/ bidding	

Sr.	Document	Status (Submitted/ Not Submitted/ Not Applicable)
	document	
5.	Declaration of conformance of the Bidder and the Facilities offered, to the specified eligibility requirement specified in Section 2 and Section 3, as per the format prescribed in Form 5 given in Section 4 of RFB/ bidding document	
6.	Local Content Certificate for Class I Local Supplier, as specified in Clause 1.5 of Section 2 of RFB/ bidding document, Affidavit of Self certification as per the format prescribed in Form 6 given in Section 4 of RFB/ bidding document or by certificate (format not specified) of Statutory Auditor, as may be applicable	
7	Power of Attorney by each member/ partner of the Joint Venture in favour of Lead member/ partner as per format prescribed in Form 7 given in Section 4 of RFB/ bidding document (<i>applicable only for Joint Venture Bidder</i>)	
8 A	Joint Deed of Undertaking (JDU) signed by each member/ partner of the Joint Venture, as per format prescribed in Form 8 given in Section 4 of RFB/ bidding document (<i>applicable only for Joint Venture Bidder</i>)	
8 B	Joint Venture Agreement entered amongst all the partners/ members of the Joint Venture in their own format but without violating any of the requirements of the bidding documents and necessarily including the confirmation as specified in Clause 2.2.7 of Section 2 of RFB/ bidding document (<i>applicable only for Joint Venture Bidder</i>)	
9	Details/ Data and documentary evidence in support of meeting the Qualification Requirement specified in Section 2 of RFB/ bidding document, as per the format prescribed in Form 9 given in Section 4 of RFB/ bidding document	
10.	The details of all major items of Plant and Installation Services proposed to be subcontracted in case of award, indicating name and nationality of the proposed subcontractor/sub-vendor for each item, as per the format prescribed in Form 10 given in Section 4 of RFB/ bidding document. as per the format prescribed in Form 1 given in Section 4	
11.	Form of Undertaking on Compliance of Terms & Conditions of the RFB/ bidding document including Scope of Work and other related requirements, as per the format prescribed in Form 11 given in Section 4 of RFB/ bidding document, <i>subject to Sl No. 12 below of this table</i>	

Sr.	Document	Status (Submitted/ Not Submitted/ Not Applicable)
12	Statement of Deviation from the requirements specified in the RFB/ bidding documents including Conditions of Contract, Employer's Requirement/ Specification and Drawings etc, including, inter alia, the cost of withdrawal thereof, as per the format prescribed in Form 12 given in Section 4 of RFB/ bidding document	
13	Work Completion Schedule, as per the format prescribed in Form 13 given in Section 4 of RFB/ bidding document	
14	Guarantee Declaration, as per the format prescribed in Form 14 given in Section 4 of RFB/ bidding document	
15	Information regarding ex-employees of Employer in our firm, as per the format prescribed in Form 15 given in Section 4 of RFB/ bidding document	
16	Filled up information regarding Price Adjustment Data, as per the format prescribed in Form 16 given in Section 4 of RFB/ bidding document	
17	Option for Interest bearing Initial Advance payment and Information for E-payment, PF details and declaration regarding Micro/Small & Medium Enterprises, as per the format prescribed in Form 17 given in Section 4 of RFB/ bidding document	
18	Declaration for tax exemptions, reductions, allowances or benefits, as per the format prescribed in Form 18 given in Section 4 of RFB/ bidding document	
19	Bank Guarantee verification checklist, as per the format prescribed in Form 19 given in Section 4 of RFB/ bidding document	
20	Additional Information, if any, as per the format prescribed in Form 20 given in Section 4 of RFB/ bidding document	
21	Integrity Pact, duly signed on each page by the person signing the bid, as per the format prescribed in Form 21 given in Section 4 of RFB/ bidding document	

- (n) We are also submitting herewith the Financial Part of our Bid, online separately, as per the prescribed Forms given in Section 5 of RFB/ bidding document, complete in all respects in electronic form only, as per the requirements of RFB/ bidding document. We

confirm that the same does not contain any deviation, reservation or omission, failing which it is liable to be rejected.

(o) Contact Person

Details of the contact person representing us supported by the Power of Attorney, as prescribed, are furnished as under:

Name:
 Designation:
 Company:
 Address:
 Mobile:
 Phone:
 Fax:
 Email:

Dated the *[Insert date of the month]* day of.....*[Insert month, year]*
 at..... *[Insert place]*.

Signature {(of Bidder's authorized Bid Signatory (ies))[#] {In full and initials}}:

Full name: {insert full name of authorized Bid Signatory }
 Title: {insert title/position of authorized Bid Signatory }
 Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):
 Capacity: {insert the person's capacity to sign for the Bidder}
 Address: {insert the authorized Bid Signatory's address}
 Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}
 Email: {insert the authorized Bid Signatory's email address} _____

[#]{*For a joint venture, either all members shall sign or only the authorized signatory as per ITB 19.4, in either case the power of attorney of the authorized bid signatory (signatories) must be attached*}

Form 2**(Appendix to Technical Part of the Bid)****Format for Bidder Information Sheet**

[The Bidder shall fill in this Form in accordance with the instructions indicated below. No alterations to its format shall be permitted and no substitutions shall be accepted.]

NIT/RFB No.: *[insert details]*Package Name/ Contract Title: *[insert details]*

Page _____ of _____ pages

1. Bidder's Legal Name
2. Legal Status of the Bidder
3. Bidder's Country of Registration:
4. Bidder's Year of Registration:
5. Bidder's Legal Address in Country of Registration:
6. Bidder's Authorized Representative Information Name: Address: Telephone/Fax numbers: Email Address:
7. Attached are copies of original documents of <i>[check the box(es) of the attached original documents]</i> <ul style="list-style-type: none">○ Self certified copy of the document to establish legal status of the firm viz. Certificate of Incorporation issued under the Companies Act / The Limited Liability Partnership Act / Partnership deed etc. as applicable;○ Self certified copy of PAN○ Self certified copy of GST Registration;○ Self certified copy in support of MSME, if applicable○ Organizational chart including a list of Board of Directors/ Key Management Personnels..

Note : In case of JV/ Consortium, the afore details/ documents are to be furnished for each of the JV/ Consortium Members

Dated the *[Insert date of the month]* day of.....*[Insert month, year]*
at..... *[Insert place]*.

Signature {(of Bidder's authorized Bid Signatory (ies))}# {In full and initials}:

Full name: {insert full name of authorized Bid Signatory }

Title: {insert title/position of authorized Bid Signatory }

Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):

Capacity: {insert the person's capacity to sign for the Bidder}

Address: {insert the authorized Bid Signatory's address}

Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}

Email: {insert the authorized Bid Signatory's email address}_____

{For a joint venture, either all members shall sign or only the authorized signatory as per ITB 19.4, in either case the power of attorney of the authorized bid signatory (signatories) must be attached}

Form 3A**(Appendix to Technical Part of the Bid)****Format of Bid Securing Declaration
(if applicable)****BID SECURING DECLARATION**

Whereas, I/We (name of Bidder) ----- have submitted Bid for -----
 ----- (name of Package) in response to Request For Bid (RFB) no: -----
 dated -----.

I/We hereby submit following declaration in lieu of Bid Security/ Earnest Money Deposit:

1. If after the opening of Proposal, I/We withdraw and/or modify my/our Proposal during its period of validity (including extended validity) as specified in the RFB document,
Or
2. If, after the issue of Notification of Award of the Contract, I/We fail to sign the Contract, or to submit Contract Performance Guarantee before the deadline specified in the RFB document,
Or
3. If, in case of I/ we fail to ensure that the Contract becomes Effective as specified in the RFB document.

I/we shall be suspended from and shall not be eligible to participate for a period of [... to be filled in by the Utility as per ITB 18.8....] year from date of issue of the suspension order, in the bidding against any of the Notice Inviting Tenders/ Invitation For Bids/ Request for Proposal/ Bid etc. issued by WBSIEDCL during that period .

Dated the [Insert date of the month] day of.....[Insert month, year]
 at..... [Insert place].

Signature {(of Bidder's authorized Bid Signatory (ies))}# {In full and initials}:

Full name: {insert full name of authorized Bid Signatory }

Title: {insert title/position of authorized Bid Signatory }

Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):

Capacity: {insert the person's capacity to sign for the Bidder}

Address: {insert the authorized Bid Signatory's address}

Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}

Email: {insert the authorized Bid Signatory's email address} _____

[#]{For a joint venture, either all members shall sign or only the authorized signatory as per ITB 19.4, in either case the power of attorney of the authorized bid signatory (signatories) must be attached}

Form 3B**(Appendix to Technical Part of the Bid)****Format of Bank Guarantee for Bid Security**

{To be on non-judicial stamp paper of Rupees One Hundred Only (INR 100/-) or appropriate value as per Stamp Act relevant to place of execution, duly signed on each page.}

Reference No.
.....

Bank Guarantee No.

Dated:

To:

Chief Engineer (Project-III)
WBSEDCL
Vidyut Bhawan, 2nd Floor, C-Block,
Block-DJ, Sector-II,
Bidhannagar, Kolkata-700091

Dear Sir/ Madam,

WHEREAS..... [Insert name of the Sole Bidder] / [insert name of the Lead Joint Venture Member followed by the words “representing Joint Venture of [insert names of all the members of Joint Venture]”] with address [Insert address of Sole Bidder /Lead Joint Venture Member] having its registered office at [Insert address of the Sole Bidder /Lead Joint Venture Member] (Hereinafter, the “Bidder”) wishes to participate in Tender No. [Tender Details] (the “RFB”) issued by **WBSEDCL** for **[name of the Package/ Contract title]**.

And WHEREAS a Bank Guarantee for [Amount] valid till [Date] is required to be submitted by the Bidder along with the RFB.

We,.....[Insert name of the Bank and address of the Branch giving the Bank Guarantee] having our registered office at.....[Insert address of the registered office of the Bank] hereby give this Bank Guarantee No.....[Insert Bank Guarantee number] dated[Insert the date of the Bank Guarantee], and hereby agree unequivocally and unconditionally to pay immediately on demand in writing from the Utility any officer authorized by it in this behalf any amount not exceeding [Amount] to the said Utility on behalf of the Bidder.

We.....[Insert name of the Bank] also agree that withdrawal of the Bid or part thereof by the Bidder within its validity or not signing the Contract Agreement or non-submission of Performance Security by the Bidder within the stipulated time of the Letter of Award to the Bidder or any violation to the relevant terms stipulated in the RFB would constitute a default on the part of the Bidder and that this Bank Guarantee is liable to be invoked and encashed within its validity

by the Utility in case of any occurrence of a default on the part of the Bidder and that the amount is liable to be forfeited by the Utility.

This Guarantee shall be valid and binding on this Bank up to and inclusive of
[Insert the date of validity of the Bank] and shall not be terminable by notice or by Guarantor for the reason of change in the constitution of the Bank or the firm of the Bidder or by any reason whatsoever and our liability hereunder shall not be impaired or discharged by any extension of time or variations or alternations made, given, conceded with or without our knowledge or consent by or between the Bidder and the Utility.

NOTWITHSTANDING anything contained hereinbefore, our liability under this guarantee is restricted to [Amount]. Our Guarantee shall remain in force till [Date]. Unless demands or claims under this Bank Guarantee are made to us in writing on or before [Date], all rights of the Beneficiary under this Bank Guarantee shall be forfeited, and we shall be released and discharged from all liabilities there under. **The letter/Email can also be made at local branch _____ of Kolkata having email id _____ and contact no _____ etc.**

<i>[Insert the address of the Bank with complete postal branch code, telephone and fax numbers, and official round seal of the Bank]</i>	<i>[Insert signature of the Bank's Authorized Signatory]</i>
<i>Attested</i>	
..... [Signature] (Notary Public)	
Place:	Date:

INSTRUCTIONS FOR SUBMITTING BANK GUARANTEE

1. Bank Guarantee to be executed on non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution.
2. The Bank Guarantee by Bidder shall be given from any Scheduled Commercial Bank.
3. The full address along with the Telex/Fax No. and e-mail address of the issuing bank to be mentioned.

Form 4**(Appendix to Technical Part of the Bid)****Format of Power of Attorney of designated Bid Signatory by sole bidder/ lead joint venture member**

[To be on non-judicial stamp paper of Rupees One Hundred Only (INR 100/-) or appropriate value as per Stamp Act relevant to place of execution.]

Know all men by these presents, we.....*[Insert name and address of the registered office of the Lead Consortium Member of the Bidding Consortium/ Sole Bidder]* do hereby constitute, appoint, nominate and authorize Mr./Ms. *[Insert name and residential address]*, who is presently employed with us and holding the position of.....as our true and lawful attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to submission of our Bid in response to RFB/ Tender No. **[RFB/ Tender Details]** for **[Insert name of Package/ Contract title]** (the “Project”) issued by WBSEDCL, including signing and submission of the Bid and all other documents related to the Bid, including but not limited to undertakings, letters, certificates, acceptances, clarifications, guarantees or any other document which Utility may require us to submit. The aforesaid attorney is further authorized for making representations to Utility, and providing information / responses to Utility, representing us in all matters before Utility, and generally dealing with Utility in all matters in connection with our Bid till the completion of the bidding process as per the terms of the RFB.

We hereby agree to ratify all acts, deeds and things done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall be binding on us and shall always be deemed to have been done by us.

All the terms used herein but not defined shall have the meaning ascribed to such terms under the RFB.

Signed by the within named.....*[Insert the name of the executant company]* through the hand of Mr./ Mrs.....duly authorized by the Board/ Owner to issue such Power of Attorney dated this day of

Accepted

..... (Signature of Attorney)
[Insert Name, designation and address of the Attorney]

Attested

.....
(Signature of the executant)
(Name, designation and address of the executant)

.....
Signature and stamp of Notary of the place of execution

Common seal of.....has been affixed in my/our presence pursuant to Board of Director's Resolution dated..../ Owner

1. WITNESS 1..... (Signature)
Name
Designation.....
2. WITNESS 2..... (Signature)
Name
Designation....._

Notes:

- a. The mode of execution of the power of attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s).*
 - b. In the event, power of attorney has been executed outside India, the same needs to be duly notarized by a notary public of the jurisdiction where it is executed.*
 - c. Also, wherever required, the executant(s) should submit for verification the extract of the charter documents and documents such as a Board resolution / power of attorney, in favor of the person executing this power of attorney for delegation of power hereunder on behalf of the executant(s).*
-

Form 5**(Appendix to Technical Part of the Bid)****Format of Declaration of conformance of the Bidder and the Facilities offered, to the specified eligibility requirement**NIT/RFB No.: *[insert details]*Package Name/ Contract Title: *[insert details]*

To:

Chief Engineer (Project-III)
WBSEDCL
Vidyut Bhawan, 2nd Floor, C-Block,
Block-DJ, Sector-II,
Bidhannagar, Kolkata-700091

Bidder's Name and Address:

*{In case of JV bidder, mention name
and address of all the Joint Venture members}*

We hereby certify that Plant and Installation Services offered to be supplied by us fully comply with all the eligibility and other requirements specified in Section 2 and Section 3 of RFB/ bidding documents.

We hereby certify that our firm is legally established in India and we fully comply with the eligibility and other requirements specified in Section 2 and Section 3 of RFB/ bidding documents,

Dated the *[Insert date of the month]* day of.....*[Insert month, year]*
at..... *[Insert place]*.

Signature {(of Bidder's authorized Bid Signatory (ies))[#] {In full and initials}}:

Full name: {insert full name of authorized Bid Signatory }

Title: {insert title/position of authorized Bid Signatory }

Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):

Capacity: {insert the person's capacity to sign for the Bidder}

Address: {insert the authorized Bid Signatory's address}

Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}

Email: {insert the authorized Bid Signatory's email address} _____

[#]*{For a joint venture, either all members shall sign or only the authorized signatory as per ITB 19.4, in either case the power of attorney of the authorized bid signatory (signatories) must be attached}*

Form 6**(Appendix to Technical Part of the Bid)****Format for Affidavit of Self certification regarding Local Content in line with PPP-MII order and #MoP Order/DoT order***[if applicable, to be provided on a non-judicial stamp paper of Rs. 100/-]*NIT/RFB No.: *[insert details]*Package Name/ Contract Title: *[insert details]***To:****Chief Engineer (Project-III)****WBSEDCL****Vidyut Bhawan, 2nd Floor, C-Block****Block-DJ, Sector-II,****Bidhannagar, Kolkata-700091**

Bidder's Name and Address:

*{In case of JV bidder, mention name
and address of all the Joint Venture members}*

I We _____ S/o, D/o, W/o, _____ Resident
of _____, on behalf of the
firm(s) named above, hereby solemnly affirm and declare as under:

That we will agree to abide by the terms and conditions of the Public Procurement (Preference to Make in India) Order, 2017 of Government of India issued vide Notification No:P-45021/2/2017 -BE-II dated 15/06/2017, its revision dated **04/06/2020** (hereinafter **PPP-MII order**),

#‘Public Procurement (Preference to Make in India) to provide for Purchase Preference (linked with local content)’ order dated 28/07/2020 issued by Ministry of Power (hereinafter MoP order)

and any subsequent modifications/Amendments, if any and

That the information furnished hereinafter is correct to the best of my knowledge and belief and I undertake to produce relevant records before the procuring entity/POWERGRID or any other Government authority for the purpose of assessing the local content of plant/goods/material/ services/works supplied by me for..... *[insert the reference of RFB and name of Package/ Contract title]*.

That the local content for all inputs which constitute the said plant/ goods/material/ services/works has been verified by me and I am responsible for the correctness of the claims made therein.

That the ‘Local Content ‘as defined in the PPP-MII order and #MoP order /DoT order in the plant/goods/material/ services/works supplied by me for (insert the name of the package) is percent (%).

That the value addition for the purpose of meeting the ‘Local Content ‘has been made by me at..... **(insert the details of the location(s) at which value addition is made).**

That in the event of the local content of the plant/goods/material/ services/works mentioned herein is found to be incorrect and not meeting the prescribed Local Content criteria, based on the assessment of procuring agency (ies)/ **WBSEDCL** /Government Authorities for the purpose of assessing the local content, action shall be taken against me in line with the PPP-MII order, **MoP order** and provisions of the Integrity pact/ Bidding Documents.

I agree to maintain the following information in the Company's record for a period of 8 years and shall make this available for verification to any statutory authority.

- i Name and details of the Local Supplier
(Registered Office, Manufacturing unit location, nature of legal entity)
- ii. Date on which this certificate is issued
- iii. Plant/goods/services/works for which the certificate is produced
- iv. Procuring entity to whom the certificate is furnished
- v. Percentage of local content claimed and whether it meets the Local Content prescribed for ‘**Class –I local supplier**’/‘**Class-II Local supplier** (*choose as applicable*)
- vi. Name and contact details of the unit of the Local Supplier (s)
- vii. Sale Price of the product
- viii Ex-Factory Price of the product
- ix. Freight, insurance and handling
- x. Total Bill of Material

- xi List and total cost value of input used to manufacture the Goods/to provide services/in construction of works
- xii. List and total cost of input which are domestically sourced. Value addition certificates from suppliers if the input is not in-house to be attached
- xiii. List and cost of inputs which are imported, directly or indirectly

Dated the *[Insert date of the month]* day of.....*[Insert month, year]*
at..... *[Insert place]*.

Signature {(of Bidder's authorized Bid Signatory (ies))[#] {In full and initials}}:

Full name: {insert full name of authorized Bid Signatory }

Title: {insert title/position of authorized Bid Signatory }

Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):

Capacity: {insert the person's capacity to sign for the Bidder}

Address: {insert the authorized Bid Signatory's address}

Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}

Email: {insert the authorized Bid Signatory's email address} _____

[#]*{For a joint venture, or only the authorized signatory as per ITB 19.4, in either case the power of attorney of the authorized bid signatory (signatories) must be attached}*

choose as applicable while preparing bidding documents

Form 7

(Appendix to Technical Part of the Bid)

Format of Power of Attorney by Each Member/ Partner of The Joint Venture in favor of Lead Member/ Partner

KNOW ALL MEN BY THESE PRESENTS THAT WE , the Partners whose details are given hereunder have formed a Joint Venture under the laws of and having our Registered Office(s)/Head Office(s) at (hereinafter called the 'Joint Venture' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) acting through M/s being the Partner in-charge, do hereby constitute, nominate and appoint M/s..... a Company incorporated under the laws of and having its Registered/Head Office at..... as our duly constituted lawful Attorney (hereinafter called "Attorney" or "Authorized Representative" or "Partner In-charge" or "Lead Partner" or "Lead Member" or "Leader") to exercise all or any of the powers for and on behalf of the Joint Venture in regard to Request for Bids (RFB)/ Request for Proposals (RFP) No. for Package..... the bids for which have been invited by **The Chief Engineer (Project-III), WBSEDCL, Vidyut Bhawan, C-Block, 2nd Floor, Block-DJ, Sector-II, Bidhannagar, Kolkata-700091** (hereinafter called the 'Employer') to undertake the following acts :

- i) To submit proposal/ Bid and participate in the aforesaid Bidding, against the RFB/ RFP issued of the Employer, on behalf of the "Joint Venture".
- ii) To negotiate with the Employer the terms and conditions for award of the Contract pursuant to the aforesaid Bid and to sign the Contract with the Employer for and on behalf of the "Joint Venture".
- iii) To do any other act or submit any document related to the above.
- iv) To receive, accept and execute the Contract for and on behalf of the "Joint Venture".

It is clearly understood that the Partner In-charge (Lead Partner/ Lead Member) shall ensure performance of the Contract(s) and if one or more Partner fail to perform their respective portions of the Contract(s), the same shall be deemed to be a default by all the Partners.

It is expressly understood that this Power of Attorney shall remain valid binding and irrevocable till completion of the Defect Liability Period in terms of the Contract.

The Joint Venture hereby agrees and undertakes to ratify and confirm all and whatsoever the said Attorney/Authorized Representatives/Partner in-charge/ Lead Partner/ Lead Member quotes in the bid, negotiates and signs the Contract with the Employer and/or proposes to act or acts on behalf of the Joint Venture by virtue of this Power of Attorney and the same shall bind the Joint Venture as if done by itself.

IN WITNESS THEREOF the Partners Constituting the Joint Venture as aforesaid have executed these presents on this day of..... under the Common Seal(s) of their respective Companies.

for and on behalf of the
Partners of Joint Venture

.....

.....

.....

The Common Seal of the above Partners of the Joint Venture:

The Common Seal has been affixed there unto in the presence of:

WITNESS

1. Signature.....

Name

Designation

Occupation

2. Signature.....

Name

Designation

Occupation

Note:

1. For the purpose of executing the power of attorney , the non-judicial stamp papers of appropriate value shall be purchased in the name of Joint Venture.

2. The power of attorney shall be signed on all the pages by the authorized representatives of each of the partners and should invariably be witnessed and notarized.

Form 8

(Appendix to Technical Part of the Bid)

Format of Joint Deed of Undertaking by the Joint Venture Partners/ Members

THIS JOINT DEED OF UNDERTAKING executed on this..... day of..... Two Thousand and..... bya company incorporated under the laws of and having its Registered Office at(hereinafter called the "Party No.1" which expression shall include its successors, executors and permitted assigns) and M/s.....a company incorporated under the laws of and having its Registered Office at (hereinafter called the "Party No.2" which expression shall include its successors, executors and permitted assigns). and M/s.. a Company incorporated under the laws of and having its Registered Office at (hereinafter called the "Party No.3" which expression shall include its successors, executors and permitted assigns) for the purpose of making a bid and entering into a contract [hereinafter called the "Contract" {in case of award}] against the Request For Bids (RFB)/ Request for Proposal (RFP) No..... for (*insert name of the package along with project name*) of **Chief Engineer, Project-III, WBSEDCL** a Company incorporated under the Companies Act of 1956 having its registered office at **Vidyut Bhawan, 2nd Floor, C-Block, Block-DJ, Sector-II, Bidhannagar, Kolkata-700091.**

WHEREAS the Party No.1, Party No.2 and Party No.3 have entered into an Agreement dated.....

AND WHEREAS the Employer invited bids as per the above mentioned Package for the design, supply and installation of the Plant as stipulated in the Bidding Documents for (*insert name of the package along with project name*)

AND WHEREAS as per Section 2/ Section 3 of the Bidding Documents, inter-alia stipulates that a Joint Venture, as specified therein, may bid, provided, the Joint Venture and the partners/ members in/ of the Joint Ventures fulfill all the specified requirements of the Bidding Documents and that , in such a case, the Bid shall be signed by all the partners so as to legally bind all the Partners of the Joint Venture, who will be jointly and severally liable to perform the Contract and all obligations hereunder.

AND WHEREAS the bid is being submitted to the Employer vide proposal No.....dated.....by Party No.1 based on this Undertaking between all the parties; under these presents and the bid in accordance with the requirements of Section 2/

Section 3 of the Bidding Documents, has been signed in accordance with the provisions contained therein.

NOW THIS UNDERTAKING WITNESSETH AS UNDER:

In consideration of the above premises and agreements all the parties of this Deed of Undertaking do hereby declare and undertake:

1. In requirement of the award of the Contract by the Employer to the Joint Venture Partners, we, the Parties do hereby undertake that M/s..... the Party No.1, shall act as Lead Partner/ Lead Member/ Authorized Representative/ Partner-in- Charge of the Joint Venture, and further declare and confirm that we the parties to the Joint Venture shall jointly and severally be bound unto the Employer for the successful performance of the Contract and shall be fully responsible for the design, supply and installation of the Plant and for successful performance of the Contract in the event of award and performance of equipment in accordance with the Contract:
2. In case of any breach or default of the said Contract by any of the parties to the Joint Venture, the party(s) do hereby undertake to be fully responsible for the successful performance of the Contract and to carry out all the obligations and responsibilities under the Contract in accordance with the requirements of the Contract.
3. Further, if the Employer suffers any loss or damage on account of any breach in the Contract or any shortfall in the performance of the equipment in meeting the performances guaranteed as per the specification in terms of the Contract, the Party(s) of these presents undertake to promptly make good such loss or damages caused to the Employer, on its demand without any demur. It shall not be necessary or obligatory for the Employer to proceed against Lead Partner to these presents before proceeding against or dealing with the other Party(ies), the Employer can proceed against any of the parties who shall be jointly and severally liable for the performance and all other liabilities/obligations under the Contract to the Employer.
4. The financial liability of the Parties of this Deed of Undertaking to the Employer, with respect to any of the claims arising out of the performance or non-performance of the obligations set forth in this Deed of Undertaking, read in conjunction with the relevant conditions of the Contract shall, however, not be limited in any way so as to restrict or limit the liabilities or obligations of any of the Parties of this Deed of Undertaking.
5. It is expressly understood and agreed between the Parties to this Undertaking that the responsibilities and obligations of each of the Parties shall be as delineated in **Appendix – I** (*to be suitably appended by the Parties along with this Undertaking in its bid*) to this Deed of Undertaking. It is further undertaken by the parties that the above sharing of responsibilities and obligations shall not in any way be a limitation of joint and several responsibilities of the Parties under the Contract.

6. It is also understood that this Undertaking is provided for the purposes of undertaking joint and several liabilities of the partners to the Joint Venture for submission of the bid and performance of the Contract and that this Undertaking shall not be deemed to give rise to any additional liabilities or obligations, in any manner or any law, on any of the Parties to this Undertaking or on the Joint Venture, other than the express provisions of the Contract.
7. This Undertaking shall be construed and interpreted in accordance with the provisions of the Contract.
8. In case of an award of a Contract, we the parties to this Deed of Undertaking do hereby agree that we shall be jointly and severally responsible for furnishing a Contract performance security from a bank in favor of the Employer in the currency/currencies of the Contract.
9. It is further agreed that this Deed of Undertaking shall be irrevocable and shall form an integral part of the bid and shall continue to be enforceable till the Employer discharges the same or upon the completion of the Contract in accordance with its provisions, whichever is earlier. It shall be effective from the date first mentioned above for all purposes and intents.

IN WITNESS WHEREOF, the Parties to this Deed of Undertaking have through their authorized representatives executed these presents and affixed Common Seals of their companies, on the day, month and year first mentioned above.

Common Seal of
has been affixed in my/ our
presence pursuant to Board of
Director's Resolution dated

For Lead Partner (Party No.-1)
For and on behalf of M/s
.....

Name

Designation

Signature

(Signature of the authorized
representative)

WITNESS :

I.

II.

Common Seal of

For Party No.-2

has been affixed in my/ our
presence pursuant to Board of
Director's Resolution dated

For and on behalf of
M/s.....

Name

(Signature of the authorized
representative)

Designation

Signature

WITNESS :

I.

II.

Common Seal of
has been affixed in my/ our
presence pursuant to Board of
Director's Resolution dated

For Party No.-3
For and on behalf of M/s.
.....

Name

Designation

Signature

(Signature of the authorized
representative)

WITNESS :

I.

II.

Note:

1. For the purpose of executing the Joint Deed of Undertaking, the non-judicial stamp papers of appropriate value shall be purchased in the name of Joint Venture.
2. The Undertaking shall be signed on all the pages by the authorised representatives of each of the partners and should invariably be witnessed.
3. Appendix 1 must be enclosed

(Appendix to Technical Part of the Bid)

Joint Venture Agreement

(no specified format, bidders to use own format)

Form 9

(Appendix to Technical Part of the Bid)

Format for Details/ Data and Documentary Evidence in support of meeting the Qualification Requirement

Notes on Form of Qualification Information

The information is to be filled in by individual bidders. The following pages will be used for purposes of post-qualification as provided for in Section 2 / Section 3 of RFB/ bidding documents. This information will not be incorporated in the Contract. Attach additional pages as necessary.

NIT/RFB No.: *[insert details]*

Package Name/ Contract Title: *[insert details]*

Page _____ of _____ pages

(Qualifying Requirement Data)

To:

Chief Engineer (Project-III)

WBSEDCL

Vidyut Bhawan, 2nd Floor, C-Block

Block-DJ, Sector-II,

Bidhannagar, Kolkata-700091

Bidder's Name and Address:

*{In case of JV bidder, mention name
and address of all the Joint Venture members}*

Dear Ladies and/or Gentlemen,

In support of the Qualification Requirements (QR) for bidders, stipulated in Section-2 of the bidding documents, we furnish herewith our QR data/details/documents etc., along with other information, as follows (The QR stipulations have been reproduced in italics for ready reference, however, in case of any discrepancy the QR as given in Section-2 shall prevail).

* We have submitted bid as individual firm.

* We have submitted bid as joint venture of following firms:

(i)

(ii)

(* *Strike-off whichever is not applicable*)

[For details regarding Qualification Requirements of a Joint Venture, please refer para 4.0 below.]

We are furnishing the following details/document in support of Qualifying requirement for the subject project.

I. Attached copies of original documents defining:

- a) The constitution or legal status;
- b) The principal place of business;
- c) The place of incorporation (for bidders who are corporations); or the place of registration and the nationality of the Owners (for applicants who are partnerships or individually-owned firms).

II. Attached original & copies of the following documents.

- a) Written power of attorney of the signatory of the Bid to commit the bidder.
- b)** Joint Venture Agreement

*[** To be submitted only in case of Joint Ventures. Strike off in case of individual firms.]*

III. Technical Experience QR Data/ Details/ Document

Format A: Format for the Bidder (Single Firm / Partner(s) in case of Joint Venture) for technical experience in compliance to para 2.1 of Section-2 [In case of Joint Venture bidder, the QR data of each of the partner (in support of meeting the requirement of para 2.1.2 of Section-2)] is also is to furnished, as applicable, using this format. The bidder (Single Firm / Partner(s) in case of Joint Venture) who is willing to qualify in compliance to para 2.1 of Section-2 shall fill below format for two or all three contracts.

A1.	Name of Bidder/Lead Partner of JV/other partner(s) of JV	
A2.	Name of Contract (executed during the last 7 years up to 31.03.2023):	
A3.	Contract Reference No. & Date of Award	
A4	Name and Address of the Employer/Utility by whom the Contract was awarded e-mail ID _____ Telephone No. _____ Fax No. _____	
A5(i)	Name of completed work of project execution in electrical Transmission or sub-transmission & distribution sector	_____
(ii)	Cost of the project	_____
(iii)	% of cost w.r.t. estimated cost of this bid (in %)	
A6(i)	Date of successful execution of the Contract/Date of commissioning	_____
A7.	Capacity in which the Contract was undertaken (Check One) _____	<input type="checkbox"/> Prime Contractor <input type="checkbox"/> Partner of JV <input type="checkbox"/> Subcontractor <i>(Tick whichever is applicable)</i>
A8.	Details/documentary evidence submitted in support of stated experience/Contract	

(Documentary evidence, such as copies of contract agreement/ letter of award/ utility certificates etc., in support of its experience shall be attached with the filled-up format for each experience/Contract)

IV. Financial/ Commercial QE Data/ Details/ Documents

Format B: Format for the Bidder (Single Firm / Partner(s) in case of Joint Venture) for financial/ commercial experience in compliance to para 2.2.1, 2.2.2, 2.2.3 of Section-2 [In case of Joint Venture bidder, the QR data of each of the partner (in support of meeting the requirement of para 2.2.4 of Section-2) is also to furnished, as applicable, using this format.

A1.	Name of Bidder/Lead Partner of JV/other partner(s) of JV	
A2.	Net-worth in last three years 1. Financial Year 2020-21 2. Financial Year 2021-22 3. Financial Year 2022-23	: Rs-----lakhs : Rs-----lakhs : Rs-----lakhs
A3.	Minimum Average Annual Turnover (MAAT) 1. Financial Year 2018-19 2. Financial Year 2019-20 3. Financial Year 2020-21 4. Financial Year 2021-22 5. Financial Year 2022-23	 : Rs-----lakhs : Rs-----lakhs : Rs-----lakhs : Rs-----lakhs : Rs-----lakhs
A4	liquid assets (LA) and/ or evidence of access to or availability of credit facilities	: Rs-----lakhs
A4.	Details/documentary evidence submitted in support of stated details	

V. We understand that:

- i. . Sub contractors' experience and resources shall not be taken into account in determining the bidder's compliance with qualifying criteria.
- ii. One of the partners shall be nominated as lead partner, and the lead partner shall be authorized to incur liabilities and receive instruction for and on behalf of any and all partners of the joint venture and the entire execution of the contract including receipt of payment shall be done exclusively through the lead partner. This authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the partners as per specified format.
- iii. All partner of the joint venture shall be liable jointly and severally for the execution of the contract in accordance with the contract terms and a copy of the agreement entered into by the joint venture partners having such a provision shall be submitted with the bid.

VI. We have furnished the following documents/details with Technical Part of our Bid:

- 2.1 A certificate from banker (as per format) indicating various fund based/non fund based limits sanctioned to the bidder and the extent of utilization as on date. Such certificate should have been issued not earlier than three months prior to the date of bid opening. Wherever necessary Employer may make queries with the Bidders' bankers.
- 2.2 The complete annual reports together with Audited statement of accounts of the company for last five years of its own (separate) immediately preceding the date of submission of bid.

Note:

- (a) In the event the bidder is not able to furnish the information of its own (i.e. separate), being a subsidiary company and its accounts are being consolidated with its group/holding/parent company, the bidder should submit the audited balance sheets, income statements, other information pertaining to it only (not of its group/Holding/Parent Company) duly certified by any one of the authority [(i)

Statutory Auditor of the bidder / (ii) Company Secretary of the bidder or (iii) A certified Public Accountant] certifying that such information/documents are based on the audited accounts as the case may be.

(b) Similarly, if the bidder happens to be a Group/Holding/Parent Company, the bidder should submit the above documents/information of its own (i.e. exclusive of its subsidiaries) duly certified by any one of the authorities mentioned in Note – 2.3 above certifying that these information/ documents are based on the audited accounts, as the case may be.

Dated the *[Insert date of the month]* day of.....*[Insert month, year]*
at..... *[Insert place]*.

Signature {(of Bidder's authorized Bid Signatory (ies))}# {In full and initials}:

Full name: {insert full name of authorized Bid Signatory }

Title: {insert title/position of authorized Bid Signatory }

Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):

Capacity: {insert the person's capacity to sign for the Bidder}

Address: {insert the authorized Bid Signatory's address}

Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}

Email: {insert the authorized Bid Signatory's email address}_____

{For a joint venture, either all members shall sign or only the authorised signatory as per ITB 19.4, in either case the power of attorney of the authorized bid signatory (signatories) must be attached}

Form 10**(Appendix to Technical Part of the Bid)****Format of Bought-out & Sub-contracted Items**NIT/RFB No.: *[insert details]*Package Name/ Contract Title: *[insert details]*

Page_____of_____pages

To:**Chief Engineer (Project-III)****WBSEDCL****Vidyut Bhawan, 2nd Floor, C-Block****Block-DJ, Sector-II,****Bidhannagar, Kolkata-700091**

Bidder's Name and Address:

*{In case of JV bidder, mention name
and address of all the Joint Venture members}*

Dear Sir/ Madam,

1.0 We hereby furnish the details of major items/ sub-assemblies, we propose to buy from our proposed sub-vendors/ subcontractors for the purpose of supply of Plant and Installation Services under the subject **Package/ Project:**

Sl. No.	Item Description	Quantity proposed to be bought-out/sub-contracted	Details of the proposed sub-contractor/sub-vendor	
			Name	Nationality
1.				
2.				
3.				
4.				
5.				
6.				

2.0 We hereby declare that, in the event of award of Contract on us, we would not subcontract any portion of Installation Services under Part II of the Contract (Supply of Installation Services) and

any major item other than those mentioned above under Part I of the Contract (Supply of Plant) without the prior approval of Employer as per the provisions of the Contract. We understand that for subcontract related to hiring of labour, prior approval of the Employer is not required.

3.0 We hereby declare that total local content that will be sourced in the bid is more than 50% of the total content required under the project.

Dated the [Insert date of the month] day of.....[Insert month, year]
at..... [Insert place].

Signature {(of Bidder's authorized Bid Signatory (ies))}# {In full and initials}:

Full name: {insert full name of authorized Bid Signatory }

Title: {insert title/position of authorized Bid Signatory }

Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):

Capacity: {insert the person's capacity to sign for the Bidder}

Address: {insert the authorized Bid Signatory's address}

Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}

Email: {insert the authorized Bid Signatory's email address} _____

#{For a joint venture, either all members shall sign or only the authorised signatory as per ITB 19.4, in either case the power of attorney of the authorized bid signatory (signatories) must be attached}

Form 11

(Appendix to Technical Part of the Bid)

Format of Undertaking on Compliance of Terms & Conditions of the Bidding Documents including Scope of Work and other related requirements

UNDERTAKING ON COMPLIANCE OF RFB TERMS & CONDITIONS AND OTHER REQUIREMENTS

(To be submitted on ₹100 Stamp paper issued in the State where Bidder's office is located, duly signed by the authorized signatory)

I/We hereby undertake that I/We have examined/ perused, studied and understood the Request For Bid (RFB) Document in respect of RFB no. _____ dated _____ and any corrigendum/ addendum/ clarification etc. thereto completely and have submitted my/our Proposal/ Bid in pursuance to the said RFB document for [insert Package Name/ Contract Title].

I/We hereby undertake that I/We understand that the scope of Services and other related requirement under and in pursuance of this RFB are indicative only and not exhaustive in any manner. I/We understand that the scope of Services may undergo changes as per emerging requirements of WBSEDCL as specified in the RFB document.

I/We hereby undertake that we shall comply with the scope of Services and other related requirements and the terms and conditions specified in the RFB document completely and except as mentioned in the Form 12 (Alternative, Deviations and Exceptions to the Provisions) hereof, we have no deviations and/or submissions and/or clarifications, whatsoever of any manner and/or sort and/or kind in this regard.

I/We hereby undertake to provide any further clarifications, details, documents etc. as may be required without changing the substance of our Proposal.

I/We understand that the WBSEDCL reserves the right to float a separate Request For Bid/ Notice Inviting Tender/ Invitation for Bids for the scope of Work and related requirements as covered under this RFB, irrespective of the outcome of this RFB, and I/We hereby undertake that we have no objection for the same. I/We understand that in such a case, I/We shall bid separately in response to such Request For Bid/ Notice Inviting Tender/ Invitation for Bids, and in no case our bid/ Proposal in response to this RFB shall be deemed as a Proposal/ Bid in response to such Request For Bid/ Notice Inviting Tender/ Invitation for Bids.

I/We hereby undertake to provide the Plant and Installation Services and undertake to be the single point of contact for WBSEDCL for complete Scope of Work and related

requirements as per the terms and conditions and as specified in this RFB document.

I/We hereby undertake that except as mentioned in the Form 12 (Alternative, Deviations and Exceptions to the Provisions) hereof, my/our bid is/ deemed to be as per the RFB document and is accordingly submitted to the WBSEDCL. In case of a failure to comply and/or variation WBSEDCL has the sole discretion not to consider or disqualify my/our Proposal/ bid for the aforementioned RFB and I/We shall be not have any claim of anysort/kind/form on the same.

I/We agree to be bound by our Proposal for the period of validity as specified in and required as per Section 3 of RFB document and it shall remain binding upon us and may be accepted at any time before the expiration of that validity period as may be extended by us.

I/We hereby attach the duly signed and stamped RFB document as an unconditional acceptance and compliance of RFB specifications and terms & conditions as part of the Technical Part of our Bid without any deviations and/or submissions and/or clarifications of any manner and/or sort and/or kind in this regard, except as indicated in Form 12 (Alternative, Deviations and Exceptions to the Provisions) hereof ~~from my/our side~~.

I/We understand that mentioning of any pre-requisites, presumptions, assumptions, hiding/ twisting/ deletion/ reduction/ manipulation/ disguising of Scope of Works and/or application features and/or infrastructure and/or project deliverables etc. in any form and/or by any means and/or under any head shall not be constituted as a part of the Bid/ Proposal and in case of award of the Contract the same shall not be claimed by me/us while award and/or subsequently providing of Plant and Installation Services/ execution of work. The decision of WBSEDCL on such issues shall be binding on me/us and the same shall not be arbitrated upon by me/us.

I/We hereby undertake that we abide by all the terms and conditions mentioned in the RFB document along with amendment/corrigendum/ clarification, if any, as confirmed herein

We also confirm that in case any discrepancies/ inconsistencies and deviations/ omissions/ reservations, except as indicated in Form 12 (Alternative, Deviations and Exceptions to the Provisions) hereof, is observed in the online Price Part of our Bid, the same shall be deemed as withdrawn/rectified without any financial implication, whatsoever to WBSEDCL.

I/We understand that at any stage during the tenure of the Contract if it is found that any statement or document submitted by us is false/forged/invalid, WBSEDCL has discretion to terminate the Contract and get the Plant and Installation Services delivered / work done through third party.

I/We hereby affirm that the products and/or Plant and Installation Services offered by us against this RFB are in compliance to the latest Government of India Guidelines for Make in

India, Domestically manufactured products, Atmanirbhar Bharat and circulars DIPP Office Memorandum No. P-45021/2/2017-PP (BE-II) date:16th Sept. 2020, & MeitY Circular No.1(10)/2017-CLES dated 06.12.2019 as issued and amended from time to time and will remain complied to the same during the duration and execution of this assignment.

I/We also hereby affirm the following:

- a) I/ we are not insolvent, in receivership, bankrupt or being wound up, not have our affairs administered by a court or a judicial officer, not have our business activities suspended and am/ are not the subject of legal proceedings for any of the foregoing reasons;
- b) I/ we have not, and our directors and officers have not, been convicted of any criminal offence related to our/ their respective professional conduct or the making of false statements or misrepresentations as to our/ their qualifications to enter into a procurement contract within a period of two years preceding the commencement of this procurement process, or have not been otherwise disqualified pursuant to debarment proceedings;
- c) I/ we do not have a Conflict of Interest in the procurement in question as specified in the RFB document.
- d) I/ we comply with the code of integrity and other requirements as specified in the RFB document.

Dated the *[Insert date of the month]* day of.....*[Insert month, year]*
at..... *[Insert place]*.

Signature {(of Bidder's authorized Bid Signatory (ies))}# {In full and initials}:

Full name: {insert full name of authorized Bid Signatory }

Title: {insert title/position of authorized Bid Signatory }

Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):

Capacity: {insert the person's capacity to sign for the Bidder}

Address: {insert the authorized Bid Signatory's address}

Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}

Email: {insert the authorized Bid Signatory's email address}_____

{For a joint venture, either all members shall sign or only the authorised signatory as per ITB 19.4, in either case the power of attorney of the authorized bid signatory (signatories) must be attached}

Form 12**(Appendix to Technical Part of the Bid)****Format of Alternative, Deviations and Exceptions to the Provisions of RFB Document**NIT/RFB No.: *[insert details]*Package Name/ Contract Title: *[insert details]*

Page _____ of _____ pages

To,
Chief Engineer (Project-III)
WBSEDCL
Vidyut Bhawan, 2nd Floor, C-Block,
Block-DJ, Sector-II,
Bidhannagar, Kolkata-700091

Bidder's Name and Address:

*{In case of JV bidder, mention name
and address of all the Joint Venture members}*

Dear Sir/ Madam,

The bidder shall itemize any deviation from the Specifications included in his bid. Each item shall be listed (separate sheets may be used and enclosed with this Attachment) with the following information:

Sl. No.	Reference clause in the Specifications	Deviation	Cost of withdrawal of the deviation

The above deviations and variations are exhaustive. We confirm that we shall withdraw the deviations proposed by us at the cost of withdrawal indicated in this attachment, failing which our bid may be rejected and Bid Security forfeited.

Except for the above deviations and variations, the entire work shall be performed as per your specifications and documents. Further, we agree that any deviations, conditionality or

reservation introduced in this Attachment-6 and/or in the Bid form, Price schedules & Technical Data Sheets and covering letter, or in any other part of the bid will be reviewed to conduct a determination of the substantial responsiveness of the bid.

Dated the *[Insert date of the month]* day of.....*[Insert month, year]*
at..... *[Insert place]*.

Signature {(of Bidder's authorized Bid Signatory (ies))}# {In full and initials}:

Full name: {insert full name of authorized Bid Signatory }

Title: {insert title/position of authorized Bid Signatory }

Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):

Capacity: {insert the person's capacity to sign for the Bidder}

Address: {insert the authorized Bid Signatory's address}

Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}

Email: {insert the authorized Bid Signatory's email address} _____

{For a joint venture, either all members shall sign or only the authorised signatory as per ITB 19.4, in either case the power of attorney of the authorized bid signatory (signatories) must be attached}

Form 13**(Appendix to Technical Part of the Bid)****Format of Work Completion Schedule**NIT/RFB No.: *[insert details]*Package Name/ Contract Title: *[insert details]*

Page _____ of _____ pages

To,
Chief Engineer (Project-III)
WBSEDCL
Vidyut Bhawan, 2nd Floor, C-Block
Block-DJ, Sector-II,
Bidhannagar, Kolkata-700091

Bidder's Name and Address:

Dear Sir/ Madam,

We hereby declare that the following Work Completion Schedule shall be followed by us in furnishing and installation of the subject Project for the period commencing from the effective date of Contract to us:

Sl. No.	Description of Work	Period in months from the effective date of Contract
1.	Detailed Engineering and drawing submission a) commencement b) completion	
2.	Procurement of equipment/ components & assembly a) commencement b) completion	

3.	Type Tests a) commencement b) completion	
----	---	--

Sl. No.	Description of Work	Period in months from the effective date of Contract
4.	Manufacturing a) commencement b) completion	
5.	Shipments & Delivery a) commencement b) completion	
6.	Establishment of site office	
7.	Installation at Site a) commencement b) completion	
8.	Testing & Pre-commissioning a) commencement b) completion	
9.	Trial Operation a) commencement b) completion	

Notwithstanding the above we reiterate our compliance to the Time for Completion of the Facilities/ Works as per the provisions of the RFB document.

Dated the *[Insert date of the month]* day of.....*[Insert month, year]*
at..... *[Insert place]*.

Signature {(of Bidder's authorized Bid Signatory (ies))}# {In full and initials}:

Full name: {insert full name of authorized Bid Signatory }
Title: {insert title/position of authorized Bid Signatory }
Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):
Capacity: {insert the person's capacity to sign for the Bidder}
Address: {insert the authorized Bid Signatory's address}
Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}
Email: {insert the authorized Bid Signatory's email address}_____

{For a joint venture, either all members shall sign or only the authorised signatory as per ITB 19.4, in either case the power of attorney of the authorized bid signatory (signatories) must be attached}

Note: Bidders to enclose a detailed network covering all the activities to be undertaken for completion of the project indicating key dates for various milestones for each phase constituent-wise.

Form 14**(Appendix to Technical Part of the Bid)****Format of Guarantee Declaration**NIT/RFB No.: *[insert details]*Package Name/ Contract Title: *[insert details]*

Page _____ of _____ pages

To,
Chief Engineer (Project-III)
WBSEDCL
Vidyut Bhawan, 2nd Floor, C-Block,
Block-DJ, Sector-II,
Bidhannagar, Kolkata-700091

Bidder's Name and Address:

*{In case of JV bidder, mention name
and address of all the Joint Venture members}*

Dear Sir/ Madam,

We confirm that the plant/ equipment/ goods/ material offered shall have minimum (or maximum, as the case may be) of the performance specified in the RFP document/ Employer's Requirement/ Specification/ Scope of Work. We further guarantee the performance/ efficiency of the plant/ equipment/ goods/ material offered in response to RFP document/ Employer's Requirement/ Specification/ Scope of Work.

Dated the *[Insert date of the month]* day of.....*[Insert month, year]*
at..... *[Insert place]*.

Signature {(of Bidder's authorized Bid Signatory (ies))[#] {In full and initials}}:

Full name: {insert full name of authorized Bid Signatory }

Title: {insert title/position of authorized Bid Signatory }

Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):

Capacity: {insert the person's capacity to sign for the Bidder}

Address: {insert the authorized Bid Signatory's address}

Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}

Email: {insert the authorized Bid Signatory's email address} _____

[#]{For a joint venture, either all members shall sign or only the authorised signatory as per ITB 19.4, in either case the power of attorney of the authorized bid signatory (signatories) must be attached}

Form 15

(Appendix to Technical Part of the Bid)

Format of Information regarding Ex-employees

(The information in similar format should be furnished for each partner of joint venture in case of joint venture bid)

NIT/RFB No.: *[insert details]*Package Name/ Contract Title: *[insert details]*

Page _____ of _____ pages

To,
Chief Engineer (Project-III)
WBSEDCL
Vidyut Bhawan, 2nd Floor, C-Block
Block-DJ, Sector-II,
Bidhannagar, Kolkata-700091

Bidder's Name and Address:
*{In case of JV bidder, mention name
 and address of the concerned Joint Venture member}*

Dear Sir/ Madam,

)

**(Information regarding Ex-employees of *XXXXXX* (Name of Employer) in our
 Organization)**

Dear Sir/ Madam,

We hereby furnish the details of ex-employees of *XXXXXX* (Name of Employer) who had retired/ resigned at the level of *XXXXXX* (Define suitable post) from *XXXXXX* (Name of Employer) and subsequently have been employed by us:

Sl. No.	Name of the person with designation in <i>XXXXXX</i> (Name of Employer)	Date of Retirement/ resignation from <i>XXXXXX</i> (Name of Employer)	Date of joining and designation in our Organization

1.
 2.
 3.
-

Dated the *[Insert date of the month]* day of.....*[Insert month, year]*
 at..... *[Insert place]*.

Signature {(of Bidder's authorized Bid Signatory (ies))[#] {In full and initials}}:

Full name: {insert full name of authorized Bid Signatory }

Title: {insert title/position of authorized Bid Signatory }

Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):

Capacity: {insert the person's capacity to sign for the Bidder}

Address: {insert the authorized Bid Signatory's address}

Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}

Email: {insert the authorized Bid Signatory's email address} _____

[#]{*For a joint venture, either all members shall sign or only the concerned member and authorised signatory as per ITB 19.4, in either case the power of attorney of the authorized bid signatory (signatories) must be attached*}

Note: .

Form 16**(Appendix to Technical Part of the Bid)****Format for Price Adjustment Data**NIT/RFB No.: *[insert details]*Package Name/ Contract Title: *[insert details]*

Page _____ of _____ pages

To,
Chief Engineer (Project-III)
WBSEDCL
Vidyut Bhawan, 2nd Floor, C-Block
Block-DJ, Sector-II,
Bidhannagar, Kolkata-700091

Bidder's Name and Address:
*{In case of JV bidder, mention name
 and address of all the Joint Venture members}*

Dear Sir/ Madam,

We hereby furnish the details of Price Adjustments:

Name of Material***	Price as on 30 days prior to date of bid opening*	Price as on XX days prior to date of shipment*	Variation*
ACSR conductor		NA**	NA**
Power Transformer (aluminum wound)		NA**	NA**
Power Transformer (Copper wound)			
Distribution Transformer (aluminum wound)			
Distribution Transformer (Copper wound)			
Cables		NA**	NA**

*Detailed calculations as per **Appendix-2 of Form 5** to be enclosed

** Not to be filled at the time of bid submission

*** The materials listed are illustrative, a separate row to be created for each material for indicating price adjustment

Dated the *[Insert date of the month]* day of.....*[Insert month, year]*
at..... *[Insert place]*.

Signature {(of Bidder's authorized Bid Signatory (ies))}# {In full and initials}:

Full name: {insert full name of authorized Bid Signatory }

Title: {insert title/position of authorized Bid Signatory }

Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):

Capacity: {insert the person's capacity to sign for the Bidder}

Address: {insert the authorized Bid Signatory's address}

Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}

Email: {insert the authorized Bid Signatory's email address} _____

{For a joint venture, either all members shall sign or only the concerned member and authorised signatory as per ITB 19.4, in either case the power of attorney of the authorized bid signatory (signatories) must be attached}

Form 17**(Appendix to Technical Part of the Bid)****Format of Option for Initial Advance (either Interest Bearing Initial Advance or No Initial Advance) and Information for E-payment, PF details and declaration regarding Micro/Small & Medium Enterprises**NIT/RFB No.: *[insert details]*Package Name/ Contract Title: *[insert details]*

Page _____ of _____ pages

To,
Chief Engineer (Project-III)
WBSIEDCL
Vidyut Bhawan, 2nd Floor, C-Block
Block-DJ, Sector-II,
Bidhannagar, Kolkata-700091

Bidder's Name and Address:
*{In case of JV bidder, mention name
 and address of all the Joint Venture members}*

Dear Sir/ Madam,

- I. We have read the provisions in the Bidding Documents regarding the option for advance payment. Accordingly, we hereby confirm to opt the following:

Interest Bearing Initial Advance

Supply of Plant Portion : Yes* [] No* []

Supply of Installation Services Portion : Yes^ [] No^ []

(*^ tick ONLY ONE of the selected options)

- II. We are furnishing the following details of Statutory Registration Numbers and details of Bank for electronic payment.

1.	Name of the Supplier/ Contractor in whose favour payment is to be made	
----	--	--

2.	Address with PIN Code and State	Registered Office: Branch Office: Correspondence Address:
3.	Status – Company/others [Declaration of Micro/ Small/ Medium Enterprise under Micro/ Small & Medium Enterprises Development Act 2006, if applicable]	
4.	Permanent Account (PAN) No.	
5.	Goods and Services Tax Registration No..	
6.	PF Registration No. of the Company	
7.	PF Regional Office covered (with Address)	
8.	Name of Contact Person	
9.	Telephone No(s). Email	Landline(s): Mobile(s): Email ID :
10.	Bank Details for Electronic Payment	Name of the Bank:

		Address of Branch: Account No.: Type of Account: <input type="checkbox"/> Saving <input type="checkbox"/> Current
11.	9 digit MICR code printed at bottom in middle, next to cheque no.	
12.	IFSC (for RTGS)/NEFT Code <i>(to be obtained from the Bank)</i> <i>Sample Cancelled Cheque to be enclosed</i>	

We hereby declare that the above information is true and correct and we agree that the payment on account of this Contract, in the event of award, be made in the above account maintained in the above mentioned Bank.

Dated the *[Insert date of the month]* day of.....*[Insert month, year]*
 at..... *[Insert place]*.

Signature {(of Bidder's authorized Bid Signatory (ies))}# {In full and initials}:

Full name: {insert full name of authorized Bid Signatory }

Title: {insert title/position of authorized Bid Signatory }

Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):

Capacity: {insert the person's capacity to sign for the Bidder}

Address: {insert the authorized Bid Signatory's address}

Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}

Email: {insert the authorized Bid Signatory's email address}_____

Form 18**(Appendix to Technical Part of the Bid)****FORMAT OF Declaration for tax exemptions, reductions, allowances or benefits)**NIT/RFB No.: *[insert details]*Package Name/ Contract Title: *[insert details]*

Page_____of_____pages

To,
Chief Engineer (Project-III)
WBSEDCL
Vidyut Bhawan, 2nd Floor, C-Block
Block-DJ, Sector-II,
Bidhannagar, Kolkata-700091

Bidder's Name and Address:
*{In case of JV bidder, mention name
 and address of all the Joint Venture members}*

Dear Sir / Madam,

1. We confirm that we are solely responsible for obtaining following tax exemptions, reductions, allowances or benefits in respect of supplies under the subject Package/ Project, in case of award. We further confirm that we have considered the same in our bid thereby passing on the benefit **to the Chief Engineer, Project-III, WBSEDCL** while quoting our prices. In case of our failure to receive such benefits, partly or fully, for any reason whatsoever, the Employer will not compensate us.
2. We are furnishing the following information required by the Employer for issue of requisite certificate if and as permitted in terms of the applicable Govt. of India policies/procedures (in case of award):

Applicable Act, Notification No. and Clause Ref. No.	Sl. No.	Description of item on which applicable	Country of origin	Remarks, if any

(The requirements listed above are as per current Notification of Govt. of India indicated above. These may be modified, if necessary, in terms of the Notifications.)

Dated the *[Insert date of the month]* day of.....*[Insert month, year]*
at..... *[Insert place]*.

Signature {(of Bidder's authorized Bid Signatory (ies))[#] {In full and initials}}:

Full name: {insert full name of authorized Bid Signatory }

Title: {insert title/position of authorized Bid Signatory }

Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):

Capacity: {insert the person's capacity to sign for the Bidder}

Address: {insert the authorized Bid Signatory's address}

Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}

Email: {insert the authorized Bid Signatory's email address} _____

Form 19**(Appendix to Technical Part of the Bid)****Format of Bank Guarantee verification Check list**NIT/RFB No.: *[insert details]*Package Name/ Contract Title: *[insert details]*

Page _____ of _____ pages

To,
Chief Engineer (Project-III)
WBSedCL
Vidyut Bhawan, 2nd Floor, C-Block
Block-DJ, Sector-II,
Bidhannagar, Kolkata-700091

Bidder's Name and Address:

*{In case of JV bidder, mention name
and address of all the Joint Venture members}*

(Bank Guarantee verification Check list)

Dear Sir/ Madam

We have ensured compliance to the following checklist in submission of Bank Guarantee :

S. No.	Checklist	Yes	No
1	Does the bank guarantee compare verbatim with standard proforma for BG?		
2(a)	Has the executing Officer of BG indicated his name designation & Power of Attorney No. / Signing power Number etc. on BG?		
2(b)	Is each page of BG duly Signed/ initialed by the executants and last page is signed with full particulars as required in the standard proforma of BG and under the seal of the bank?		
2(c)	Does the last page of the BG carry the signatures of two witnesses alongside the signature of the executing Bank Manager?		
3(a)	Is the BG on non-judicial stamp paper of appropriate value?		

3(b)	Is the date of sale of non-judicial stamp paper shown on the BG and the stamp paper is issued not more than Six months prior to the date of execution of BG?		
4(a)	Are the factual details such as Bid specification No., LOA No. contract price, etc, correct?		
4(b)	Whether Overwriting /cutting, if any on the BG, authenticated under signature & seal of executants?		
5	Is the amount and validity of BG is in line with contract provisions?		
6	Whether the BG has been issued by a Nationalized bank / Non- Nationalized Bank acceptable to Buyer /Scheduled Bank in India (the applicability of the bank should be in line with the provisions of bidding documents)?		

Dated the *[Insert date of the month]* day of.....*[Insert month, year]*
at..... *[Insert place]*.

Signature {(of Bidder's authorized Bid Signatory (ies))}# {In full and initials}:

Full name: {insert full name of authorized Bid Signatory }

Title: {insert title/position of authorized Bid Signatory }

Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):

Capacity: {insert the person's capacity to sign for the Bidder}

Address: {insert the authorized Bid Signatory's address}

Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}

Email: {insert the authorized Bid Signatory's email address}_____

(Common Seal).....

Appendix to Technical Part
Attachment-4A : List of Special Maintenance Tools & Tackles included in bid price

Electrification works of XXXXXXXXX (name of district) district in West Bengal under Revamped Reforms-Based and Results-Linked, Distribution Sector Scheme (RDSS)

(List of Special Maintenance Tools & Tackles)

To,
Chief Engineer (Project-III)
WBSEDCL
Vidyut Bhawan, 2nd Floor, C-Block
Block-DJ, Sector-II,
Bidhannagar, Kolkata-700091

Bidder's Name and Address:

Dear Sir,

We are furnishing below the list of special maintenance tools & tackles for various equipment under the subject project. The prices for these tools & tackles are included in our lumpsum bid price. We further confirm that the list of special maintenance tools & tackles includes all the items specifically identified in your bidding documents as brought out below:

--

S.No.	For Equipment	Item Description	Unit	Quantity
-------	---------------	------------------	------	----------

--

--

Notwithstanding what is stated above, we further confirm that any additional special maintenance tools and tackles, required for the equipment under this project shall be furnished by us at no extra cost to the employer.

Date:.....

(Signature).....

Place:.....

(Printed Name).....

(Designation).....

(Common Seal).....

Appendix to Technical Part
Attachment-4B : List of Special Maintenance Tools & Tackles not included in bid price

Electrification works of XXXXXXXX (*name of district*) district in West Bengal under Revamped Reforms-Based and Results-Linked, Distribution Sector Scheme (RDSS)

(List of Special Maintenance Tools & Tackles)

To,
Chief Engineer (Project-III)
WBSEDCL
Vidyut Bhawan, 2nd Floor, C-Block
Block-DJ, Sector-II,
Bidhannagar, Kolkata-700091

Bidder's Name and Address:

Dear Sir,

We are furnishing below the list of special maintenance tools & tackles for various equipment under the subject Project. The prices for these tools & tackles which are to be taken back after the completion of the work by us are not included in our lumpsum bid price. We further confirm that the list of special maintenance tools & tackles includes all the items specifically identified in your bidding documents as brought out below:

(a)

(b)

Date:.....

Place:.....

(Signature).....

(Printed Name).....

(Designation).....

(Common Seal).....

Form 20**(Appendix to Technical Part of the Bid)****Format of Additional Information**NIT/RFB No.: *[insert details]*Package Name/ Contract Title: *[insert details]*

Page _____ of _____ pages

To,
Chief Engineer (Project-III)
WBSEDCL
Vidyut Bhawan, 2nd Floor, C-Block
Block-DJ, Sector-II,
Bidhannagar, Kolkata-700091

Bidder's Name and Address:

*{In case of JV bidder, mention name
and address of all the Joint Venture members}*

(Additional Information)

Dear Sir/ Madam,

In support of the additional information required as per the Bidding Documents, we furnish herewith our data/details/documents etc., along with other information, as follows (the stipulations have been reproduced in italics for ready reference):

1.0 *The Bidder shall furnish*

A certificate from their Banker(s) (as per prescribed formats in Form 16, Part -3, Section-8: Contract Forms) indicating various fund based/non fund based limits sanctioned to the Bidder and the extent of utilization as on date. Such certificate should have been issued not earlier than three months prior to the date of bid opening. Wherever necessary the Employer may make queries with the Bidders' Bankers.
[Reference Part -1, Section 2]

1.1 In accordance with 1.0, certificate(s) from banker as per requisite format, indicating various fund based/non fund based limits sanctioned to the bidder or each member of

the joint venture and the extent of utilization as on date is/are enclosed, as per the following details:

Name of the Bidder/partner of Joint Venture	
Name of the Banker by whom certificate issued	
Date of certificate (should not be earlier than 3 months prior to date of bid opening)	
Whether fund based/non fund based limits are indicated in the certificate	
Whether extent of utilization is indicated in the certificate	

*1.2 The Bidder should accordingly also provide the following information/documents (**In case of JV bidders, information should be provided separately for all the Partners of JV in the given format**):*

(i) Details of Banker:

Name of Banker	
Address of Banker	<div></div> <div></div> <div></div>
Telephone No.	<div></div>
Contact Name and Title	<div></div>
Fax No.	<div></div>
E-mail ID	<div></div>

As per para 1.0, Authorization Letter(s) from the bidder (in case of JV bidder, from all the partners) addressed to the Banker(s), authorize **Chief Engineer (Project-III), WBSEDCL**

4. Current Liability										
5. Profit before taxes										
6. Profit after taxes										

3. The information/documentation in support of Bidder's design infrastructure and erection facilities and capacity and procedures including quality control related to the work, are enclosed at _[.....]_____ herewith.
4. The CV and experience details of a project manager with 15 years' experience in executing such contract of comparable nature including not less than five years as manager and the CVs of other employees to be deputed for the subject work, are enclosed at _[.....]_ herewith.

Dated the *[Insert date of the month]* day of.....*[Insert month, year]*
at..... *[Insert place]*.

Signature {(of Bidder's authorized Bid Signatory (ies))[#] {In full and initials}}:

Full name: {insert full name of authorized Bid Signatory }

Title: {insert title/position of authorized Bid Signatory }

Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):

Capacity: {insert the person's capacity to sign for the Bidder}

Address: {insert the authorized Bid Signatory's address}

Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}

Email: {insert the authorized Bid Signatory's email address}_____

(Common Seal).....

Form 21

(Appendix to Technical Part of the Bid)

Format of Integrity Pact

INTEGRITY PACT

PRE-CONTRACT INTEGRITY PACT

GENERAL

This pre-bid contract Agreement (herein after called the Integrity Pact) is made on _____ day of the month of _____ 20... , between, on one hand, the WBSEDCL Acting through Shri....., Designation of the officer, (hereinafter called the "WBSEDCL", which expression shall mean and include, unless the context otherwise requires, his successors in the office and assigns) of the First Part and M/s. _____ represented by Shri _____ (hereinafter called the "BIDDER/SUPPLIER", which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the WBSEDCL propose to procure Plant and Installation Services as per the Scope of Work Mentioned in the RFB document (hereinafter called the "Facilities", against RFB No. [....] for [Package Name/ Contract Title] which expression shall mean and include, unless the context otherwise requires, any additions & deletions in the said "Facilities") and the BIDDER/ Supplier is willing to offer/has offered the said "Facilities".

WHEREAS the BIDDER/ Supplier is a Private Company/Public Company/LLP/ Government Undertaking/ Partnership/Proprietorship, constituted in accordance with the relevant law in the matter and the WBSEDCL is a Ministry /Department of the Government of West Bengal /SPSU performing its function on behalf of the Governor of West Bengal.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the Contract to be entered into with a view to:-

Enabling the WBSEDCL to obtain the desired "Facilities" at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and

Enabling BIDDER/ SUPPLIER to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other practices and the WBSEDCL will commit to prevent corruption, in any form, by its official by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:
Commitments of the WBSEDCL

1.
 - 1.1. The WBSEDCL undertakes that no official of the WBSEDCL, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the BIDDER/SUPPLIER, either for themselves or for any person, organization or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.
 - 1.2. The WBSEDCL will, during the pre-contract stage, treat all BIDDER/SUPPLIER alike, and will provide to all BIDDER/SUPPLIER the same information and will not provide any such information to any particular BIDDER/SUPPLIER which could afford an advantage to that particular BIDDER/SUPPLIER in comparison to the other BIDDER(S)/SUPPLIER(S).
 - 1.3. All the officials of the WBSEDCL will report the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.
2. In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER/SUPPLIER to the WBSEDCL with the full and verifiable facts and the same is prima facie found to be correct by the WBSEDCL, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the WBSEDCL and such a person shall be debarred from further dealings related to the contract process. In such a case, while an enquiry is being conducted by the WBSEDCL, the proceedings under the contract would not be stalled.

Commitments of BIDDERS/SUPPLIERS

3. The BIDDER/SUPPLIER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the following:-
 - 3.1. The will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the WBSEDCL, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.
 - 3.2. The BIDDER/SUPPLIER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any

material or immaterial benefit or other advantage, commission, fees, brokerage, or inducement to any official of the WBSEDCL or otherwise in procuring the Contract of forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract with the Government for showing or forbearing to show favour or disfavor to any person in relation to the contract or any other contract with the Government.

- 3.3. The BIDDER/SUPPLIER shall disclose the name and address of agents and representatives and Indian BIDDERSs shall disclose their foreign principals or associates.
- 3.4. The BIDDER/SUPPLIER shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.
- 3.5. The BIDDER/SUPPLIER further confirms and declares to the WBSEDCL that he BIDDER/SUPPLIER is the original manufacture/Integrator/authorized government sponsored export entity of the defense stores and has not engage any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the WBSEDCL or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER/SUPPLIER, nor has any amount been paid. Promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.
- 3.6. The BIDDER/SUPPLIER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payment he has made, is committed to or intends to make to officials of the WBSEDCL or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.
- 3.7. The BIDDER/SUPPLIER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.
- 3.8. The BIDDER/SUPPLIER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.
- 3.9. The BIDDER/SUPPLIER shall not use improperly, for purpose of competition or personal gain, or pass on to others, any information provided by the WBSEDCL as part of the business relationship, regarding plans, technical proposal and business details, including information contained in any electronic data carrier. The BIDDER/SUPPLIER also undertakes to exercise due and adequate care lest any such information is divulged.
- 3.10. The BIDDER/SUPPLIER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.
- 3.11. The BIDDER/SUPPLIER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.
- 3.12. If the BIDDER/SUPPLIER or any employee of the BIDDER/SUPPLIER or any person acting on behalf of the BIDDER/SUPPLIER, either directly or indirectly, is a relative of any of the officers of the WBSEDCL, or alternatively, if any relatives of an officer of the WBSEDCL had financial interest/stake in the

BIDDER's/SUPPLIER's firm, the same shall be disclosed by the BIDDER/SUPPLIER at the time of filling of tender.

The term 'relative' for this purpose would be as defined in Section 6 of the Companies Act 1956.

3.13. The BIDDER/SUPPLIER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the WBSEDCL.

4. Previous Transgression

4.1. The BIDDER/SUPPLIER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India that could justify BIDDER's/SUPPLIER's exclusion from the tender process.

4.2. The BIDDER/SUPPLIER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5. Earnest Money (Security Deposit) (If applicable as per ITB Clause 18)

5.1. While submitting commercial bid, the BIDDER/SUPPLIER deposit an amount _____ (as specified in TENDER) as Earnest Money/Security, Deposit, with the WBSEDCL through any of the following instruments:

5.1.1. Bank Draft or a Pay Order in favour of 'WBSEDCL' payable at Kolkata.

5.1.2. A confirmed guarantee by an Indian Nationalized Bank, promising payment of the guaranteed sum to the WBSEDCL on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the WBSEDCL shall be treated as conclusive proof of payment.

5.1.3. Any other mode or through any other instrument (to be specified in the TENDER.

5.2. The Earnest Money/ Security Deposit shall be valid as per terms of TENDER.

5.3. In the case of successful BIDDER/SUPPLIER, a clause would also be incorporated in the Article pertaining to Performance Bond in the procurement Contract that the provisions of Sanctions for violation shall be applicable for forfeiture of Performance Bond in case of a decision by the WBSEDCL to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

5.4. No interest shall be payable by the WBSEDCL to the BIDDER/SUPPLIER on Earnest Money/Security Deposit for the period of its currency.

6. Sanctions for Violations

6.1. Any breach of the aforesaid provisions by the BIDDER/SUPPLIER or anyone employed by it or acting on its behalf (whether with or without the knowledge of the

BIDDER/SUPPLIER/SUPPLIER) shall entitle the WBSEDCL to take all or any one of the following actions, wherever required:-

- 6.1.1. To immediately call off the pre contract negotiations without assigning any reason or giving any compensation to the BIDDER/SUPPLIER. However, the proceedings with the other BIDDER(s) would continue.
 - 6.1.2. The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the WBSEDCL and the WBSEDCL shall not be required to assign any reason, therefore.
 - 6.1.3. To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.
 - 6.1.4. To recover all sums already paid by the WBSEDCL, and in case of the Indian BIDDER/SUPPLIER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State of India, while in case of a BIDDER/SUPPLIER from a country other than India with Interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the BIDDER from the WBSEDCL in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest
 - 6.1.5. To encash the advance bank guarantee and performance bond/warranty bond, if furnished by the BIDDER/SUPPLIER, in order to recover the payments, already made by the WBSEDCL, along with interest.
 - 6.1.6. To cancel all or any other contracts with the BIDDER/SUPPLIER. The BIDDER shall be liable to pay compensation for any loss or damage to the WBSEDCL resulting from such cancellation/rescission and the WBSEDCL /PRINCIPAL shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER/SUPPLIER.
 - 6.1.7. To debar the BIDDER/SUPPLIER from participating in future bidding processes of the Government of India WBSEDCL /PRINCIPAL for a minimum period of five years, which may be further extended at the discretion of the WBSEDCL.
 - 6.1.8. To recover all sums paid in violation of this Pact by BIDDER/SUPPLIER (s) to any middlemen or agent or broker with a view to securing the contract.
 - 6.1.9. In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the WBSEDCL with the BIDDER/SUPPLIER, the same shall not be opened.
 - 6.1.10. Forfeiture of performance Bond in case of a decision by the WBSEDCL to forfeit the same without assigning any reason for imposing for sanction for violation of this pact.
- 6.2. The WBSEDCL will be entitled to take all or any of the actions mentioned at para 6.1 (i) to (x) of this Pact also on the Commission by the BIDDER/SUPPLIER or anyone employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER/SUPPLIER), of an offence as defined in Chapter IX of the Indian

Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

- 6.3. The decision of the WBSEDCL to the effect that a breach of the provisions of this pact has been committed by the BIDDER/SUPPLIER shall be final and conclusive on the BIDDER/SUPPLIER. However, the BIDDER/SUPPLIER can approach the Independent Monitor(s) appointed for the purposes of this Pact.

7. deleted

7.1. deleted

8. Independent Monitors

- 8.1. The WBSEDCL has appointed Independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission (Names and Addresses of the Monitors shall be published subsequently by WBSEDCL).
- 8.2. The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.
- 8.3. The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.
- 8.4. Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.
- 8.5. As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the WBSEDCL.
- 8.6. The BIDDER/SUPPLIER(s) accepts that the Monitors has the right to access without restriction to all project documentation of the WBSEDCL including that provided by the BIDDER/SUPPLIER. The BIDDER/SUPPLIER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/SUPPLIER/Subcontractors(s) with confidentiality.
- 8.7. The BUYER will provide to the Monitors sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the monitor the option to participate in such meetings.
- 8.8. The Monitor will submit a written report to the designated Authority of WBSEDCL /Secretary in the Department/ within 8 to 10 weeks from the date of reference or intimation to him by the WBSEDCL /BIDDER/SUPPLIER and, should the occasion arise, submit proposals for correcting problematic situations.

9. Facilitation of Investigation

In case of any allegation of violation of any provisions of this Pact or payment of commission, the WBSEDCL or its agencies shall be entitled to examine all the documents including

the Books of Accounts of the BIDDER/SUPPLIER and the BIDDER/SUPPLIER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

10. Law and Place of Jurisdiction

This Pact is subject to Indian Law. The place of performance and jurisdiction is the seat of the WBSEDCL.

11. Other Legal Actions

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the any extent law in force relating to any civil or criminal proceedings.

12. Validity

12.1. The validity of this Integrity Pact shall be from the date of its signing and extend up to 5 years or the complete execution of the contract to the satisfaction of both the WBSEDCL and the BIDDER/SUPPLIER, including warranty period, whichever is later. In case BIDDER/SUPPLIER is unsuccessful, this Integrity Pact shall expire after six months from the date of the signing of the contract.

12.2. Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intentions.

13. The parties hereby sign this Integrity Pact at _____ on _____

Signed on..... (Insert the Date)

Signature (of Bidder's authorized Bid Signatory)[#] {In full and initials}:

Full name: {insert full name of authorized Bid Signatory }

Title: {insert title/position of authorized Bid Signatory }

Name of Bidder (Sole Bidder's name or Consortium/ JV's name, if applicable):

Capacity: {insert the person's capacity to sign for the Bidder}

Address: {insert the authorized Bid Signatory's address}

Phone/fax: {insert the authorized Bid Signatory's phone and fax number, if applicable}

Email: {insert the authorized Bid Signatory's email address} _____

[#]{For a joint venture, either all members shall sign or only the authorised signatory as per ITB 19.4, in which case the power of attorney to sign on behalf of all members shall be attached}

Witness

1. _____

2. _____

[WBSEDCL]L

Name of the Officer

Designation

Deptt/MINISTRY/PSU

Witness

1. _____

2. _____

* Provision of these clauses would need to be amended/deleted in line with the policy of the [WBSEDCL] in regard to involvement of Indian agents of foreign supplies.

Section - 5 : Bidding Forms - Financial Part of the Bid

INSTRUCTIONS TO BIDDERS: The bidder must fill and submit the price schedules online as specified in BDS.

1. Illustration of Price schedule (Supply of plant):

DEVELOPMENT OF DISTRIBUTION INFRASTRUCTURE AT XXXX [Name of the District] District of West Bengal UNDER REVAMPED REFORMS-BASED AND RESULTS-LINKED, DISTRIBUTION SECTOR SCHEME										
(Schedule of rates and prices)										
Ex-works supply of materials										
Bidder's Name & Address:										
				All prices in Indian Rupees						
A.	Name of Work									
Line Item No.	Description of Goods	Unit	Quantity	Unit Ex-work price	Total Ex-work price	Unit Price for inland transportation and other services required in India to convey the Goods to their	Total Price for inland transportation and other services required in India to convey the Goods to their	GST payable on the price quoted if Contract is	GST payable on the price quoted if Contract is awarded	Total Price per line item

						final destination	final destination	awarded (%)	(Amount)	
1.00	Item no. 1									
1.01	1.....	No								
1.02	2.....	No								
1.03	3.....	No								
1.04	4.....	No								

Similarly, for every work, similar separate formats are provided in the Price Bid Schedules.

2. Illustration of Price schedule (Supply of installation services):

DEVELOPMENT OF DISTRIBUTION INFRASTRUCTURE AT XXXX [Name of the District] District of West Bengal UNDER REVAMPED REFORMS-BASED AND RESULTS-LINKED, (Schedule of rates and prices)							
Bidder's Name & Address:							
Installation / Erection Charges:							
		All prices in Indian Rupees					
G	HIGH VOLTAGE DISTRIBUTION SYSTEM (HVDS)						
Service No.	Description of Related Services (excludes inland transportation and other services required in India to convey the goods to their final destination)	Unit	Quantity	Unit price	GST payable on the price quoted if Contract is awarded (%)	GST payable on the price quoted if Contract is awarded (Amount)	Total Price per line item
1	2	3	4	5	6	7	8
1.00	Item no. 1						
1.01	1.....	No					
1.02	2.....	No					
1.03	3.....	No					

3. Illustration of Price schedule (Grand Summary):

Schedule-3

DEVELOPMENT OF DISTRIBUTION INFRASTRUCTURE AT XXXX [Name of the District] District of WEST BENGAL UNDER REVAMPED REFORMS-BASED AND RESULTS-LINKED,(GRAND SUMMARY)

Bidder's Name and Address:

Sl. No.	Description	Total Price (Rs.)
1	TOTAL SCHEDULE NO. 1	
	Plant and Equipment	
2	TOTAL SCHEDULE NO. 2	
	Installation / Erection Charges	
3	TOTAL [1+2]	
4	Discount offered by Bidder(If any)	
5	Schedule No 3: GRAND TOTAL [3 - 4]	

Date:

Signature:

Place:

Printed Name:

Designation:

Common Seal:

PART 2

EMPLOYER'S REQUIREMENTS

Section - 6 : Employer's Requirements

Table of Contents

PART 2.....	1
Section - 6 : Employer's Requirements.....	2
1. Overview of the Scope of Works.....	2
2. GPS Survey.....	
3. Project Management System.....	6
4. Quality Assurance and Evaluation Mechanism.....	9
Annexure-A.....	26
5. Type and Acceptance test.....	41
6. Type Testing, Inspection, Testing & Inspection Certificate.....	41
7. Pre-Commissioning Tests.....	43
8. Commissioning Tests.....	43
9. GIS mapping & asset tagging.....	44
10. Documentation.....	45
11. Return of replaced old materials to the area stores of Employer.....	48
12. Miscellaneous activities.....	49
13. Individual work components.....	52
13.1. New 33/11 kV Power Substation.....	
13.2. 66/11KV new Substation	60
13.3. New 33/11 kV Power Substation.....	65
13.4. New 11 KV Lines.....	88
13.5. Distribution Transformer Substations.....	96
13.6. New LT Line.....	104
13.7. Augmentation and Renovation.....	111
13.8. High voltage distribution system (HVDS).....	126
13.9. Civil Works And Soil Investigation.....	136
13.10. LT AB Cable Reconductoring Work	169
13.11. Construction of New 11 kV Feeders and Associated Works for Separation of Agricultural Consumers.....	180
13.12. Underground Cabling.....	183
13.13. Specification for erection of 66 kV M/C, D/C tower / H frame line :-	188
13.14. Plinth Mounted Distribution Substations.....	194
14. Index Part A of Technical Specification for UG and Others	
14.01 Annexure to Section VII- Employer's Requirements	

1. Overview of the Scope of Works

The work is to be executed on turnkey basis, the scope of which includes GPS Survey, network design, supply, manufacturer's quality assurance, testing (where specified/ required), transportation, storage, erection, including all civil/ structural works, site testing, commissioning of all items & materials including all associated activities though not exclusively specified herein and are required for the completion and satisfactory performance of the entire works as intended.

The scope of works also include General Technical Instructions enclosed at Annexure-B.

This specification intends to cover but not limited to the following activities, services and works:

- Providing engineering data, and drawing for review, approval and records.
- Supply, testing, packing, transportation and insurance from the manufacturer's work to the site.
- Receipt, storage, insurance, preservation and conservation of equipments at the site.
- Fabrication, pre-assembly (if any), erection, testing and putting into satisfactory operation of all the equipments/ materials including successful commissioning.
- In addition to the requirements indicated in this section, all the requirements as stated in Technical specifications shall also be considered as a part of this specification as if completely bound herewith.
- Providing all materials, equipments and services specified or otherwise, including GPS Survey, which are required to fulfill the intent of ensuring operability, maintainability and the reliability of the complete works covered under this specification.
- During warranty period the bidder is required to provide all the services and activities mentioned in the contract.
- Preparation of project completion report/closure proposal along with a report clearly indicating completion of any outstanding/ remedial work that needs to be carried out.
- Handing over the works to the employer for taking into commercial services.

It is not the intent to specify all aspects of design and construction of equipments mentioned herein. The systems, subsystems and equipments shall conform in all respect to high standards of engineering, design and workmanship and shall be capable of performing in continuous commercial operation. Accordingly, scope of works under this contract is as under:

- 1.1 Execution of all other works as per tender document. All Steel structure except STPs & WPB shall be hot dip galvanized as per relevant Indian Standard.
- 1.2 All the raw materials such as steel, zinc for galvanizing, reinforcement steel and cement for foundation, coke for earthing, bolts, nuts & washers, danger plates, phase plate, number plate etc. required for substations & its structures shall be included in the scope of supply. Bidders shall clearly indicate in their offer, the sources from where they propose to procure the key raw materials and the components.

- 1.3 All the Distribution Transformers procured under RDSS are procured with Standard ratings, meeting at least Energy Efficiency Level-1 as specified in IS 1180 (Part-1):2014 and its Amendment 1, 2, 3 & 4, should be manufactured by an authorised licensee and bear BIS certification standard mark.
- 1.4 A set of drawings are enclosed with this bid document. These are tender drawings and are to be approved by the Employer. These drawings are indicative in nature and therefore, must be referred while preparing drawings for approval.
- 1.5 All the new assets created under RDSS to be properly GIS tagged with the help of mobile App provided by the Employer.
- 1.6 The engraving of word “Developed under RDSS” in materials viz., Poles, Transformers (All types), Cables, Energy Meter etc is mandatory requirement. The Employer shall ensure strict compliance of this requirement. Also, while processing payments to the Contractor, suitable documentary evidence / photographs must be asked by the Employer in support of the compliance.
- 1.7 Major infrastructures like new primary substation, new Distribution Transformer, new lines etc developed under RDSS needs to be clearly denoted by a signboard that should represent
- 1.7.1. About the Work
 - 1.7.2. Date of Commissioning
 - 1.7.3. Estimated cost
 - 1.7.4. Scheme
 - 1.7.5. Employer's details
 - 1.7.6. For Transformers, rating in kVA

The signboard shall comply to the technical specifications of (REC) and shall reflect as a separate billable item in the price schedule. Colour coding of the DTs is essential.

- 1.8 The Manufacturing Quality Plan (MQP) shall be finalized by the Employer in consultation with the contractor/manufacturer in line with the Technical Specifications and as per Employer's practices

Supply of Plant and Services under this tender covers all interventions required for satisfactory operations of the facilities unless specifically excluded. Scope includes Design, Supply, GPS Survey, installation, erection testing and commissioning, on turnkey basis. The types of works envisaged in the RDSS scheme are:

A. Loss Reduction :

➤ **Backend Infrastructure for Light Electric Vehicle Charging Station.**

- DTR Substations
- 11 kV Overhead/UG Line for Distribution Transformers
- ~~Reconductoring works~~
- ~~Cabling in Natural Disaster Prone Areas~~
- ~~HVDS~~
- ~~AB Cabling~~
- ~~Installation of Capacitor Banks~~

~~B. Modernization and system strengthening:~~

- ~~New 66/11 kV, 33/11 kV, 22/11 kV, 33/22 kV, 66/33 kV Primary Substation (as applicable)~~
- ~~New 66 kV Lines~~
- ~~New 33 kV Lines~~
- ~~New 22 KV Lines~~
- ~~New 11 kV Lines~~
- ~~Augmentation of Power Sub station and 66kV, 33kV, 22kV, 11kV line~~
- ~~Renovation~~
- ~~DTR Substations~~
- ~~LT Line~~
- ~~Under ground cabling works~~

All items to be supplied and erected shall be strictly as per the specifications given in the Bid and should comply the relevant standards and any amendments thereof.

Any deviation taken by the bidder and not specifically / clearly brought out in the price schedule will not be considered as a valid deviation.

In addition to the works mentioned above the bidder is required to take care of the activities listed below:-

2. GPS Survey

The Contractor shall carry out, and be responsible for, final design of the works, including any site GPS Surveys, subsoil investigations and all other things necessary for proper planning design and execution. The initial site GPS Surveys will be carried out for tentative freezing of the material requirement and the work content finalization, within one month of commencement of project, and this will be a joint GPS Survey, along with the PMA and sample check by the employer. The same shall be reviewed progressively on quarterly basis for freezing of the material requirement and work content. Design shall be prepared by qualified designers who are engineers and experienced in design of transmission and distribution systems. Employer shall provide all options proposed for loss reductions to the contractor. Contractor, while GPS Surveying the execution of work, shall keep this requirement in view and

suggest best loss reduction options in descending order. Means, maximum loss reduction option shall be proposed on priority. Also, while executing the works, same priority of works must be followed.. The changes in design should be approved by Engineer-in-charge of Employer.

- Based on the finalized network design, the Bidder shall carry out the field GPS Survey for deciding location of poles, distribution transformers etc. Besides, field GPS Survey will also cover the following:
 - a. Proposed route of 33 KV, 11KV and LT Line.
 - b. ~~Proposed location of 33/11 KV sub-stations along with number, capacity of power transformers and number of 11 KV feeders to be taken out.~~
 - c. Locations of new distribution transformers.
- Feeder wise Bill of Quantity (BOQ), for each proposed work will be prepared by the Bidder and submitted to the Employer's Engineer-in-charge for his approval before commencement of actual work.
- ~~All architectural and civil designs such as control room, foundation for equipment, transformer, isolators, VCB shall be approved by the Employer's Engineer-in-charge.~~
- ~~Within substation yard, all clamps and connectors used for bus bar will be crimped. All the clamps and connectors connecting the equipments shall be of bolted type.~~

3. Project Management System

3.1. General

The Contractor shall assign a project manager with the authority to make commitments and decisions that are binding on the Contractor. Employer will designate an officer incharge to coordinate all employer project related activities. All communications between employer and the Contractor shall be coordinated through the project manager and officer incharge of Employer. The project managers shall also be assisting employer in communicating project related information to other stake holders.

Bidder shall submit the manpower deployment plan along with the bids, describing the key roles of each person.

The role and responsibilities of contractor shall be as follows:

- a) To prepare, maintain and update project detailed Work Execution Plan for successful implementation of project like approval of GTP, approval of sub-contractor, approval of drawings, supply of materials, mobilization of men, material and equipment etc. at site for successful completion of works, Compile and up-load physical as well as financial progresses, compile the progress of works at Employer level and to assist in forwarding it to all stake holders.

- b) To actively participate with employer in resolving all issues relating to project implementation including ROW, Forest Clearances and Railway Crossings.
- c) To actively participate in monitoring, reviewing and analysing the physical, financial and quality assurances works' progress of RDSS works and also to take suitable measures on compliance of observations being raised during monitoring/review meetings with employer.
- d) To upload and up-date project wise physical progress in RDSS web portal. Physical as well as financial progresses shall be uploaded in standard Bill of Material format of the contract. Also, to submit invoices as per released RDSS guidelines to Employer for release of payments/funds.
- e) To oversee the progress and compliance of the Quality Assurance Mechanism as per RDSS guidelines.

3.2. Project Schedule

As per the schedule the bidder shall submit a preliminary implementation plan along with the bid. The detailed project implementation schedule shall be submitted by the contractor after the award of contract for employer's approval, which shall include at least the following activities:

- (a) GPS Surveying of site.
- (b) Documents submission and approval schedule
- (c) Pre-Dispatch Inspection schedule
- (d) Dispatch Schedule
- (e) Installation & commissioning schedule
- (f) Training schedule, if any.

The project schedule shall include the estimated period for completion of project and its linkage with other activities etc. It is expected that the contractor should share updated project schedule based on the actual progress done at site, priorities of the employer, availability of material etc once per quarter along with the Progress report.

3.3. Progress Report

A progress report shall be prepared by the Contractor each month against the activities listed in the project schedule. The report shall be made available to employer on a monthly basis, e.g., the 10th of each month. The progress report shall include all the completed, ongoing and scheduled activities.

3.4. Transmittals

Every document, letter, progress report, change order, and any other written transmissions exchanged between the Contractor and employer shall be assigned a unique transmittal number.

The Contractor shall maintain a correspondence index and assign transmittal numbers consecutively for all Contractor documents. Employer will maintain a similar correspondence numbering scheme identifying documents and correspondence that employer initiates.

4. Quality Assurance and Evaluation Mechanism

The Quality Assurance (QA) will be carried out by Employer. The Employer may engage an Authorised representative of employer responsible & accountable for assuring quality in RDSS works. Key activities would include:

- Formulation of a detailed comprehensive Quality Assurance Mechanism (QAM) plan/Guaranteed Technical Particulars as the case may be in the State for the works to be carried out under RDSS scheme with an objective to create quality infrastructure works. The QAM and Inspection Plan shall be integral part of the contract agreement with turnkey contractor or equipment supplier and erection agency as the case may be in case of turnkey/ or departmental execution of works.
- Ensuring that the quality of materials/equipment supplied at site and execution of works carried out at field under RDSS scheme is in accordance to Manufacturing Quality Plan (MQP)/Guaranteed Technical Particulars (GTP) and Field Quality Plan (FQP)/Approved Drawings/Data Sheets respectively.

4.1. Quality checks to be ensured by Turnkey Contractor:

Turnkey Contractor shall strictly ensure QAM checks during the day to day course of project execution, which are as follows:

- a. Pre-dispatch inspections of all materials viz. as per MQP/GTP, Approved Drawings, Technical Specifications, Datasheet, GTP, applicable national & international standards as per GCC Clause 23.
- b. 100% verification of all 66/11 or 33/11 kV sub stations (New & Augmented) for quality of material as per MQP/GTP, Approved Drawings, Technical Specifications, Datasheet and erection works in the field as per FQP/approved drawings.
- c. 100% verification of feeders created under the scheme.
- d. 100% verification of materials utilised under the scheme.
- e. 100% verification of works done in Loss Reduction and Modernization & System Strengthening.

4.1.1. Vendor approval: All the materials procured for RDSS works shall be purchased from the authorised vendors approved by the Quality Assurance Department of Employer. Approved vendors list is uploaded periodically on the Employer web portal.

New vendors/suppliers may be approved by Employer, provided capability of manufacturer(s) is assessed suitably by visiting the factory premises and checking the testing facility available before accepting it as an approved vendor. If required, State Electricity Board/Power Department/ Distribution Companies may adopt vendors already approved by CPSEs.

4.1.2. FQP for Civil works: Employer shall prepare a separate FQP/field execution drawings which shall be approved by their competent authority which shall be uploaded at web portal. The turnkey shall adhere to this FQP/drawings while carrying out physical works. Contractor

4.1.3. FQP for testing & commissioning: Employer shall prepare a comprehensive Pre-commissioning test Check-list for testing & commissioning of 33/11kV or 66/11kV substation, Distribution transformer Substation etc. The electrical system shall be energized only after performing all tests as described in the pre-commissioning test checklist. and inspection from the electrical inspector of the state (or as the practice may be). Proper records in this regard, including tests on earth resistance, insulation resistance of 11 kV line & Distribution Transformer etc. shall be maintained, jointly signed by Employer and turnkey representatives.

4.1.4. Quality Assurance Mechanism (QAM) to be followed by the Contractor is as below:

- a. The Contractor shall be responsible and accountable for assuring quality in the scheme works. Accordingly, the Contractor shall formulate a comprehensive Quality Assurance mechanism (QAM) and Inspection Plan with an objective to build quality infrastructure under the project, which should be approved by the Employer. Alternately, the Employer may also provide its QAM which needs to be complied by the Contractor. The QAM and Inspection Plan shall be an integral Part of the contract agreement with turnkey Contractor or equipment supplier/vendor and erection agency as the case may be in case of partial turnkey and departmental execution of works. Documentation with regard to Quality Assurance and Inspection Plan shall be maintained by the Contractor and kept in proper order for scrutiny during the course of project execution and for future reference. The Contractor has to ensure that the quality of materials/equipment's supplied at site and execution of works carried out at field is in accordance to the Manufacturing Quality Plan (MQP)/Guaranteed Technical Particulars (GTP) and Field Quality Plan (FQP)/Approved Drawings/Data Sheets respectively.
- b. Some key indicative measures for effective implementation of the QAM by the Contractor are given below. However, these are for reference and need to be followed as per relevant provisions of the contract.
 - Supply:
 - Verification of qualifications of the subcontractor / manufacturer for supply of plant / equipment and materials. Factory inspections may be conducted if required.
 - Verification of material data, specifications, drawings and samples submitted by the subcontractor / manufacturer including GTPs.
 - Verification of type test reports including qualifications of the test laboratory, completeness and acceptance of the type test reports.
 - Witnessing acceptance tests carried out by the subcontractor/ manufacturer.

- Carrying out pre-dispatch inspections as per relevant guidelines of this tender/ contract.
- Inspection of storage facilities of the subcontractor/ manufacturer.
- Works:
 - Carry out field inspections on sample basis during implementation to verify works are carried out in compliance to technical specifications and acceptable quality of workmanship.
 - Issue Site Observation Reports (SOR) and follow-up with the subcontractor/ manufacturer for implementation of any remedial actions.
 - Upon completion, carry out joint inspections together with the Employer's staff and for final measurements and quality inspections.
 - Follow-up any on technical issues for corrective action during defects liability period with the subcontractor/ manufacturer.
- c. It should be noted that no functional guarantees are applicable for equipment installed as a part of this contract hence Guarantee Tests are not applicable.
- d. The Employer may identify any third party agency including PMA/ TPQMA etc. who would be responsible to monitor the QAM measures including verifications and inspections mentioned above. The project manager may also engage third party inspectors for this purpose in addition if required.
- e. The Employer or its appointed third party shall design systems and procedures to implement QAM system including formats for submittals by the Contractor in line with the above requirements and provisions of the Contract.
- f. The Contractor shall co-operate with and follow these QAM systems and procedures to ensure proper implementation of an effective quality assurance and evaluation mechanism.

4.1.5. Pre-commissioning test record: All pre-commissioning test check list shall be documented properly and signed by the quality engineer of the turnkey Contractor & countersigned by Employer's representative and shall be kept for future reference. These documents shall be maintained by Employers in proper order and shall be made available at site for verification by Quality Monitors during inspection and finally be handed over to user department (O&M department) at the time of handing over of energized assets.

4.1.6. Roles and responsibility of Contractor in ensuring Quality of Plant and Facilities:

- 1) Turnkey contractor shall be primarily be responsible for supply of quality materials. Hence, turnkey contractor shall take all necessary actions including following:

- a. To assess the capabilities and capacity of manufacturer to whom they intend to appoint as sub-vendor,
 - b. To keep strict control over manufacturing of materials by controlling procurements of right raw materials, periodical stage inspections, to ensure process control and to get the materials invariably inspected in manufacturing stage as well as after manufacturing but before dispatch at the works of manufacturer to ensure quality of materials/equipment.
 - c. To ensure stage inspection and final dispatch inspection, turnkey contractor should deploy his/her quality assurance team to inspect the materials with Employer/third party inspector as well as independently as per requirements.
- 2) Receipt inspection: On receipt of materials at site, it would be the prime responsibility of turnkey contractor to verify materials physically in accordance to agreed technical specifications. Physical parameters like dimensions (length, width, height, area of conductor), weight per unit, Insulation Value, length of cable/conductor in sample drum(s), clear embossing on cables through sequential marking depicting name of manufacturer, size of cable and length in meter. Once the Contractor is satisfied, materials must be offered for joint inspection to Employer.
- 3) Earlier, on receipt of materials at site, dispatch documents shall be verified jointly by Employer, Employer's appointed Third Party, Turnkey Contractor and materials supplier (if representative is full time available at site. During inspection, quantities of items, sealing on the materials, serial numbers of the items, sequential embossing (proper visible/legible without any additional efforts) and name plates on the materials shall be checked. Dispatch challans shall be verified for details of consigner and consignee, materials descriptions, quantities transported, pre-dispatch clearance certificate/waiver of inspection. In case of high value equipment, capacity of equipment in terms of current carrying capacity, operating voltage and KVA ratings should be recorded.
- 4) Clearance for installation: Once, materials on receipt are accepted by turnkey contractor as well as Employer representative, they will be eligible for erection, testing and commissioning.
- 5) Sampling from field: Any material, including materials listed below, may be picked from site for testing at test laboratory chosen by inspecting official. 1. Distribution Transformer, 2. Overhead Conductor, 3. Energy Meter, 4. Pole, 5. Insulators, 6. Cables, 7. Circuit Breaker.

- a. Inspecting official will have right to pick any of the supplied equipment whether it is lying in site stores, is under erection, is under local transportation from site stores to erection location or is already commissioned. The equipment shall be sealed jointly in presence of representatives of Employer, Employer's appointed Third Party, Contractor, and Supplier/manufacturer (if his representative is available at site). Employer at its discretion may invite manufacturer's representative to participate in sealing of materials.
 - b. Sealed equipment, on cost of turnkey contractor shall be sent to test laboratory for verification of routine/type test results. At the time of sealing, details of equipment available at site shall be recorded like cable/conductor drum number, power/distribution

- transformer unique number, status of sequential legible embossing on cables, name of manufacturer etc.
- c. For testing of equipment, Employer/Nodal agency shall empanel test laboratories located in or nearer to the state wherefrom sample is picked up.
 - d. Such picked up materials at a random shall be tested for all routine, acceptance and type tests feasible to conduct in the empaneled laboratory. The laboratory expenses including all other expenditures that shall incurred towards packing, transport, inspection, testing charges etc. are to be borne by the Employer. At least one sample from a lot may be subjected to inspection.
 - e. In cases, where pre-dispatch and factory test results/NABL accredited lab test report are found mismatched with tests results on the sample picked from field; actions shall be taken against willful defaulted manufacturer and turnkey contractor both.
 - f. Willful defaulter shall be those manufacturers and turnkey contractor whose material is found to be manufactured using inferior quality raw materials, second hand core materials, under-size/under-weight of cable/conductor in various parts of cable/conductor drum, not conforming to transformer load losses as defined in agreed technical specifications/contract conditions, improper or no sequential legible embossing on cable etc.
 - g. This mismatch shall generally be, but not limited to the deviations in results from guaranteed technical specifications of materials in terms of capacity (KVA capacity, current carrying capacity, heating capacity, tensile strength, mechanical strength etc., operational efficiencies (errors in measurements of power, power/load losses, power consumption etc., weights of key component materials (aluminum, copper, insulation materials, steel components etc.), sub-standard specifications of key component (measured specifications are in deviation from guaranteed specifications as per technical specifications of the project and inferior/illegible embossing/sequential marking on cables are found, following two actions shall be taken:
 - i. Sub-vendors/vendor registration of the manufacturer shall be discontinued in all the power utilities of the country for a period of 5 years including in power utility concerned where this act is found,
 - ii. Entire lot of materials/equipment supplied by the defaulting manufacturer shall be rejected whether supplied materials/equipment is lying in site-stores, in transit, under erection, testing & commissioning or has already been commissioned. All costs related to removal of such rejected materials and reinstating fresh lot of materials shall be borne by turnkey contractor without any cost implication to power utility.
 - iii. Turnkey contractor shall be responsible for repetitive failures of materials in field testing in a turnkey-contract. In such situations, registration of turnkey contractor firm shall be discontinued in all the power utilities of the country for a period of 5 years including in power utility concerned where this act is found,

- h. In cases, where field testing results are slightly mismatched with factory test results / pre-dispatch test reports/NABL accredited lab test report but are in permissible limits as per GTP/Data Sheet/Technical Specifications, no action shall be taken against the turnkey contractor/manufacturer.
 - i. In cases where turnkey contract is reluctant/not willing to support the Employer in selecting sample for testing by way of non-association in sampling, sampling and testing related activities of equipment, all actions related to sample selection, sealing and testing including dismantling, loading, unloading, transportation etc, will be taken by Employer on risk & cost of the turnkey contractor. The non-cooperative act on part of turnkey contractor shall be circulated amongst all power utilities in the country. In such situations, registration of turnkey contractor firm shall be discontinued in all the power utilities of the country for a period of 5 years including in power utility concerned where this act is found.
- 6) The Contractor should set up at least one testing laboratory under this contract for testing the materials received at site from its subcontractors/ vendors/ manufacturers etc. The testing laboratory thus setup, should have the facility for carrying out basic tests to ascertain the quality of the following equipments/ materials:
 - a. Cables/ Conductors
 - b. Distribution Transformers
 - c. Insulators[100%] quantity of each lot shall be tested by the Contractor at its field test laboratory. Post completion of testing of the above items at its laboratory, the Contractor shall submit a report to the Employer, certifying the satisfactory testing results.
- 7) The Contractor should develop the quality assurance programme which shall generally cover the following:
 - a. Organization structure for the management and implementation of the proposed quality assurance programme :
 - b. Documentation control system;
 - c. Qualification data for bidder's key personnel;
 - d. Procedure for purchases of materials, parts, components and selection of sub-Contractor's services including vendor analysis, source inspection, incoming raw material inspection, verification of material purchases etc.
 - e. System for shop manufacturing and site erection controls including process controls and fabrication and assembly control;
 - f. Control of non-conforming items and system for corrective actions;
 - g. Inspection and test procedure both for manufacture and field activities.
 - h. Control of calibration and testing of measuring instruments and field activities;
 - i. System for indication and appraisal of inspection status;

- j. System for quality audits;
- k. System for authorizing release of manufactured product to the Employer.
- l. System for maintenance of records;
- m. System for handling storage and delivery; and
- n. A manufacturing quality plan detailing out the specific quality control measures and procedures adopted for controlling the quality characteristics relevant to each item of equipment furnished and/or services rendered.
- o. A Field quality Plan covering field activities

8) **Electrical Inspector inspection:** After successful completion of the work permission from State Electrical Inspectorate is required. Necessary fee etc. shall be paid by the Employer. However if Contractor pays such fee it shall be reimbursed on actual basis on documentary evidence. In case of defects / in-complete works notified by Electrical Inspectorate, these shall be completed by the agency at no extra cost implication to Employer.

4.2. Concurrent Quality Monitoring by Nodal agencies: In addition to the in-house quality checks and processes followed by the Employer, the Nodal Agency of RDSS (REC/PFC) shall also carry out concurrent inspection of works through Third Party Quality Monitoring Agency (TPQMA). The Contractor needs to comply with the requirements and cooperate for effective implementation.

4.2.1. Scope of Quality Assurance Mechanism by RDSS Nodal Agency (REC/PFC): The Nodal Agency (REC/PFC) shall carry out concurrent inspection of works through TPQMA. To enable the same, the Employers shall share the physical and financial progress of the works through portal of the scheme or otherwise. In addition to the above, the Nodal Agencies may also carry out concurrent quality monitoring on random sample basis as per the need through its own manpower. TPQMA shall also verify quality of works carried out in the Project, which are as follows:

- 100% New Power Substations or at least one in each district/circle.
- 5% Augmented Substations or at least five in each district/circle.
- 15 to 20 spans of 5% of HT feeders
- 2% of DTR Substations (11/0.4kV).
- 1% of Smart meters or 1,000 Meters in a project, whichever is less
- IT/OT/SCADA/DMS infrastructure primarily at system level for highlevel functional checks.

4.2.2. Field Works Quality Inspection:

(i) **Substation inspection:** 100% New Substations are to be inspected in 2 (two) stages. Stage-I & Stage-II inspections shall cover 50% new substation & 2.5 % of Augmented substations respectively.

- ~~— **Stage-I** Inspection of TPQMA shall commence in a project when 50% New & 30% of Augmentation substation works are completed in all respect.~~
 - ~~— **Stage-II** inspection of TPQMA shall commence in a project when 100% New & 70 % of Augmentation substation works are completed in all respect.~~
- (ii) **HT Feeders:** 5 % HT Feeder are to be inspected in 2 (two) stages. Stage-I & Stage-II inspections shall cover 2.5 % of HT Feeder respectively.
- **Stage-I** Inspection of TPQMA shall commence in a project when 30% of HT Feeder works are completed in all respect.
 - **Stage-III** Inspection of TPQMA shall commence in a project when 70 % of HT Feeder works are completed in all respect.
- (iii) **DTR Substations:** 2% of DTR Substations (11/0.4kV), including few spans of associated LT Lines are to be inspected in 2 (two) stages. Stage-I & Stage-II inspections shall cover 1 % of DTR Substations respectively
- **Stage-II** Inspection of TPQMA shall commence in a project when 30% of DTR Substation including LT Lines works are completed in all respect.
 - **Stage-III** Inspection of TPQMA shall commence in a project when 70% of DTR Substation including LT Lines works are completed in all respect.
- (iv) ~~**IT/OT/SCADA/DMS infrastructure:** IT/OT/SCADA/DMS infrastructure are to be inspected when works is completed in all the respect. For this:~~
- ~~1) TPQMA shall submit the report after inspections on RDSS portal along with all BoQ, Photographs, SLD, etc.~~
 - ~~2) TPQMA also verify the Contract Management Part once for each project and upload deviations, if any observed in respect of the guidelines/ Standard Bidding Document, adherence to QAM, Contractual provisions pertaining to defects identification and rectification. (In this part TPQMA would give thrust on adherence on systems and procedures of RDSS schemes by turnkey contractors during project implementation).~~
 - ~~3) As only random inspections are to be carried out by TPQMA agencies leaving around 90 to 95% materials/works unchecked therefore there should be some stringent penal clause to be made if materials /works verified by TPQMA found faulty/wage. The TKC is required to rectify the observations / defects detected within 7 days of notification. However based on severity the Employer may direct the Contractor on resolution mechanism / process and timeline.~~
- (v) **Deployment of mobile vans for quality inspection:** The Employer/ Nodal Agency reserves the right to also deploy mobile vans with Testing facility to test the plants and facilities by selecting random samples from store or from site. The Employer may take sample from any lot placed in store including the lot on which Pre-Dispatch Inspection was not carried out or from the installed materials which it feels are not performing as it was intended to. In such a case if the material/ facility fails, the same shall be replaced with new material, and one more random sample would be selected from the same batch for testing. If the material fails the test again, then the whole lot shall be replaced by the Contractor at its own risk and cost.

4.2.2. Cross verification of field /TPQMA works by Nodal Agency: The Nodal Agency also reserves the right to monitor the field /materials to the tune of 1% of total inspections carried out by TPQMA.

4.3. Material Inspection:For the purpose of inspection, materials have been segregated into two categories as mentioned below:

4.3.1 Category – A (Pre-Dispatch Inspection & Testing at NABL accredited Labs):

- a) This category shall include high ticket materials (Power Transformers, Distribution Transformers, Circuit Breakers, AB/XLPE Cables, Overhead Conductor (AAAC/ACSR), Insulator etc. which involves more and important testing procedures and hence the inspection of these materials will be carried out in the factory before the dispatch of the material.
- b) In addition, Employer shall also ensure that for major materials as discussed above, samples from 1st lot and one other lot randomly selected by the Employer shall be directly sent to NABL accredited test labs for third party testing. It is also to be noted that material clearance of the lots under testing shall only be given post receipt of successful test results. Contractor shall also mandatorily depute its authorized official for pre – dispatch inspection at manufacturing facility alongwith the Employer officials. The inspection and testing report would be jointly signed by the Employer and the Contractor. All the expenses related to testing would be beared by the Contractor.
- c) Apart from the above mentioned protocol any one power transformer shall be selected by Employer from the supply schedule from the vendor, which shall be jointly sealed and tested for short circuit testing on turnkey-Contractor's expenses.

4.3.2 Category – B (On-site inspection): This category includes the materials for which a factory inspection is not warranted and the material can be inspected upon arrival at the site before the installation. In case the Employer is apprehensive about the quality of the material supplied it reserves the right to send the selected lot to the NABL accredited testing lab for third party testing.

4.3.3 Employer also reserves the right to send any installed equipment / materials to the NABL accredited testinglab for testing. The Employer would have to reimburse the expenses related to transportation of material from site to testing lab and all testing expenses in this regard.

4.3.4 The material which has to be tested at laboratory shall be sealed in the presence of authorized official of Employer and Contractor.

4.3.5 If the materials tested at Laboratory fails then the entire lot would be rejected. Contractor shall bear the responsibility of sending back such failed materials from site. Any subsequent delay in contract performance due to failure of materials in the test laboratory would be on account of

Contractor and no time extension would be provided by the Employer in this regard. Any LD levies in this regard would be borne by the Contractor.

4.3.6 Pre-dispatch Inspection (PDI) for Category-A

4.3.6.1. Pre-dispatch inspection shall be performed on the identified materials at manufacturer's work place for which Contractor shall be required to raise requisition giving at least 10-day time. Depending on requirement, inspection shall be witnessed by representatives of Employer, TPQMA, Contractor and/or representative of the Nodal Agency. TPQMA shall carry out pre-dispatch inspection of major materials randomly in a single lot containing minimum 10% materials at manufacturer works. The TPQMA shall perform pre – dispatch inspection test of below materials:

- 1) **RMU,**
- 2) ~~Circuit Breaker,~~
- 3) Insulators,
- 4) Cables / Conductors
- 5) Distribution Transformer

4.3.6.2. Tests to be conducted during the Pre-dispatch Inspection: All the tests shall be carried out in accordance with the latest relevant IS/IEC published from time to time by BIS. An indicative list of IS specification and tests for some of the materials are given below:

RMU:-

Standards Applicable:-	
Standard	Description
IEC 60529	Classification of degrees of protection provided by enclosures of electrical equipment
IEC 60298	A.C metal-enclosed switchgear and control gear for rated voltages above 1KV and up to and including 72KV
IEC 1330	High voltage/Low voltage prefabricated substations
IEC 60694	Common specification for HV switchgear standards
IEC 60265	High-voltage switches-Part 1: Switches for rated voltages above 1kV and less than 52 kV
IEC 60801	Monitoring and control
IEC 60185	Current Transformers
IEC 60186	Voltage transformers
BS 159	Busbar

IEC 60137	Bushings
CP 1013(British Code of Practice)	Earthing
IEC 60255	Specification for Static Protective Relays
BS 6231	Wires and wiring
IEC 61000	Electromagnetic compatibility
IEC 60129	Alternating current Disconnecter (isolators) and earthing switches
IEC 62271-200	Metal enclosed BS 5311 switchgear
IEC 62271-100	MV AC circuit breaker
IEC 60060-1 BS 923	High Voltage test technique
IEC 60034-1	Motors
IEC 60947-4-1	Control Gears
IEC 60623	Open Ni-Cd prismatic rechargeable cell
IEC 376	Filling of SF6 gas in RMU

Standards Applicable:--	
IS:2026(Part I to IV)	Power Transformer
IS:5	Colour for ready mixed paints
IS:325	Three Phase Induction Motors
IS:335	New insulating oil for transformers, switch gears
IS:1271	Classification of insulating materials for electrical machinery and apparatus in relation to their stability in services
IS:2071	Method of high voltage testing
IS:2099	High voltage porcelain bushings
IS:2147	Degree of protection
IS:2705	Current Transformers
IS:3202	Code of practice for climate proofing of electrical equipment
IS:3347	Dimensions for porcelain Transformer Bushings
IS:3637	Gas operated relays
IS:3639	Fittings and accessories for power Transformers
IS:5561	Electric Power Connectors
IS:6600/BS:CP "10:0	Guide for loading of oil immersed Transformers
IS:10028	Code of practice for selection, installation and maintenance of transformers, Part I, II and III
C.B.I.P. Publication	Manual on Transformers
Proposed Tests as per IS	

1	All standard routine tests in accordance with IS: 2026 with dielectric tests corresponding to latest amendments of IS: 2026 shall be carried out.
2	All auxiliary equipment shall be tested as per the relevant IS. Test certificates shall be submitted for bought out items.
3	High voltage withstand test shall be performed on auxiliary equipment and wiring after complete assembly.
4	Following additional routine tests shall also be carried out on each transformer:- a) Magnetic Circuit Test on each core shall be tested for 1 minute at 2000 Volt DC b) Oil leakage test on transformer

Distribution Transformers

Standards Applicable:-	
IS 2026: (Part 1 to 10) as applicable	General Specification of Transformer
IS 1180 (Part1) (Including Amendment 1, 2, 3 & 4)	Outdoor type oil immersed Distribution transformer upto including 2500 kVA & 33 kV
IS 3347 (Part 1)	Specification upto 1.1 kV Voltage Bushing (for Porcelain)
IS 3347 (Part 3)	Specification upto 17.5 kV Voltage Bushing (for Porcelain)
Type Test	A valid Type test report within 5 years of supply 3 star rated transformer as per BEE
IS -5484	Specification for Aluminum wire rods
IS 12444	Specification for Copper wire Rods
Proposed Tests as per IS	
1	Measurement of Winding resistance at all Tap Positions
2	Ratio of Tap Position Polarity & Phase Position
3	% Impedance at 75 degree Celsius at 50Hz
4	Load losses at 50% and at 100% Loading on Energy efficiency Level -5 as per IS 1980 (Part-1) 2014 and its amendment 1.2. 3 and 4
5	No Load Loss at 50Hz and No load current at rated voltage
6	Insulation Resistance
7	Induced Overvoltage Withstand
8	Separate source voltage Withstand
9	Magnetizing Current at Rated voltage and frequency an 112.5% of rated voltage
10	Temperature rise test
11	Pressure Test
12	Oil Leakage Test

Circuit Breaker

Standards Applicable:-	
IS: 13118	Specification for HV AC Circuit Breaker
IS: 14658	HV AC Circuit Breakers – Guide for Short-circuit and Switching Test Procedures for Metal-enclosed and Dead Tank Circuit Breakers

IS: 2099	Specification for HV porcelain bushings
IS: 5621	Specification for porcelain hollow insulator.
IS: 8603	Specification for Dimension for Porcelain Transformer Bushing for use in heavily polluted area.
IS: 3347	Specification for Dimension for Porcelain Transformer Bushing for use in normal and lightly polluted area.
IS: 2633	Specification for method for testing uniformity of coating On Zinc coated articles.
IS: 5561	Specification for Electrical Power Connectors
IS: 2147	Specification for Degree of Protection

Proposed Tests as per IS	
1	Single Capacitor bank breaking test
2	Short time withstand and Peak Withstand Current Test
3	Wet power frequency withstand voltage test
4	Lightening Impulse voltage withstand test
5	Temperature rise test
6	Mechanical Endurance Test(M2 Class)
7	Degree of Protection test of Control Cubicle

XLPE Cables

Standards Applicable:-	
IS : 7098 (Part-I) : 1988	Specification for Crosslinked Polyethylene Insulated PVC sheathed Cables for working Voltage upto& including 1100 Volt
IS: 8130 : 1984	Specification for Conductors for insulated electric cables and flexible cords
IS:5831 : 1984	PVC insulation & sheath of electric cables
IS: 3975 : 1970	Specification for Low Carbon Galvanized steel wires, Formed Wires and tapes for armouring of Cables
IS:10810 : 1984	Methods of test for Cables.
IS:10418 : 1982	Cable Drums for Electric Cables.
IS : 694 : 2010	PVC unsheathed and Sheathed cables / Chords with rigid and flexible conductor for rated voltages upto and including 450/ 750 V
Proposed Tests as per IS	
1	Resistance Test on conductor
2	Test for thickness of insulation and sheath
3	Tensile strength and elongation at break test for insulation & outer sheath.
4	Hot set test for insulation.
5	Insulation resistance (Volume resistivity) Test
6	High voltage test

Arial Bunched Conductor

Standards Applicable:-

IS 14255 : 1995	Specification for Aerial Bunched Cables for working Voltage up to & including 1100 Volts.
IS : 8130 : 1984	Specification for Conductors for Insulated Electric Cables and flexible Cords.
IS : 398 (Part IV) : 1994	Specification for Aluminum Conductors for overhead transmission purposes: Aluminum Alloy Stranded Conductors (Aluminum Magnesium-Silicon type).
IS:10418:1982	Specification for Drums for Electric Cables
Proposed Tests as per IS	
1	Breaking Load Test for messenger Conductor.
2	Elongation test for messenger conductor.
3	Conductor resistance test for both messenger and XLPE conductor
4	Test for thickness of insulation of XLPE conductor
5	Tensile Strength and Elongation at Break Test for both messenger and XLPE conductor
6	Hot Set Test for XLPE insulation.
7	Insulation resistance test for XLPE conductor
8	High Voltage Test for XLPE conductor

Overhead Conductors AAAC/ACSR

Standards Applicable:-	
IS: 398 (Part I & II) : 1996	Specification for Aluminum Conductors with Steel Re-inforced.
IS: 4826 : 1968	Coating of the galvanized steel wires shall be applied by the hot process or electrolysis process
IS: 398 (Part-IV): 1994	Specification for All Aluminum Alloy Conductor (AAAC)
IS: 1778 : 1980	Packaging of Overhead conductor in Wooden Drum
Proposed Tests as per IS	
1	Measurement of lay ratio.
2	Measurement of diameters of individual wire
3	Measurement of resistance of individual wire.
4	Breaking load test of individual wire.
5	Elongation test of individual wire.

Porcelain Insulators

Standards Applicable:-	
IS 1445 : 1977	Porcelain insulators for overhead power lines with a nominal voltage up to and including 1000 V
IS 2486 (Part 1) : 1993	Metal fittings of insulators for overhead power lines with nominal voltage greater than 1000 V: Part 1 General requirements and tests
IS 2486 (Part 2) : 1989	Insulator fittings for overhead power lines with nominal voltage greater than 1 000 V: Part 2 Dimensional requirements
IS 2486 (Part 4) : 1989	Insulator Fittings for Overhead Power Lines with a Nominal Voltage Greater than 1 000 V - Part IV : Tests for Locking Devices
Proposed Tests as per IS	

1	Resistance Test on conductor
2	Test for thickness of insulation and sheath
3	Tensile strength and elongation at break test for insulation & outer sheath.
4	Hot set test for insulation.
5	Insulation resistance (Volume resistivity) Test
6	High voltage test

The above list of tests is only indicative in nature and if the Employer feels, it can add some tests based on latest IS Standards. If the Employer faces any issues with respect to actual performance of a material then it can issue a notice to the Contractor for testing of that material at its sole discretion.

4.3.6.3. The Contractor shall ensure receipt of material at site within 21 days from date of receipt of dispatch instructions. In case materials are not received within 21 days from date of issue of dispatch instruction, the dispatch instruction shall stand cancelled. All expenditure incurred by Employer in performance of dispatch instruction shall be recovered from turnkey Contractor. A fresh pre – dispatch inspection would be required to issue a dispatch instruction for supplying the same lot at the site.

4.3.6.4. The turnkey Contractor shall ensure that pre-dispatch inspection for materials are intimated only when the material is completely ready for inspection. On due date of inspection, if it is found that materials are not ready in required quantities or the inspection could not be carried out due to non-availability of requisite calibrated certificate of instruments with manufacturer, closing of works on scheduled date of inspection, non-availability of sufficient testing/material handling staff at manufacturer works etc, all expenditures incurred on deployment of various inspecting officials along with a fine of Rs 50,000/- shall be recovered from the bills of the agency and re-inspection shall be carried out on expense of the Contractor. 2nd such situation at same manufacturer/supplier shall result in rejection of name of manufacturer from list of approved vendors/sub-vendors. In case sub-standard materials (old component, re-cycled materials, re-used core material, re-used transformer coil material etc) offered for inspection and are noticed during the inspection, materials shall be rejected and approval of sub-vendor shall also be cancelled for all RDSS projects.

4.4. Implications for not meeting quality requirements by Contractor

4.4.1. In case of failures in testing:

- a) The turnkey Contractor shall ensure that pre-dispatch inspection for materials is intimated only when the material is completely ready for inspection. On due date of inspection, if it is found that materials are not ready in required quantities or the inspection could not be carried out due to non-availability of requisite calibrated certificate of instruments with manufacturer, closing of works on scheduled date of inspection, non-availability of sufficient testing/material handling staff at manufacturer works etc, all expenditures incurred on deployment of various inspecting officials along with a fine of **Rs 50,000/- inclusive of GST** shall be recovered from the bills of the agency and re-inspection shall be carried out on expense of Contractor.
- b) 2nd such situation at same manufacturer/supplier shall result in rejection of name of manufacturer

from list of approved vendors/sub-vendors. In case sub-standard materials (old component, recycled materials, re-used core material, re-used transformer coil material etc) offered for inspection and are noticed during the inspection, materials shall be rejected and approval of sub-vendor shall also be cancelled for all RDSS projects.

- c) In case, a material fails the pre-dispatch inspection as per GCC Clause 23, and also fails the subsequent repeat inspection of the rectified/replaced material, the complete lot of material under inspection will be required to be replaced by the manufacturer/supplier. If in subsequent inspection of the new lot, the material again fails the inspection, then materials shall be rejected and approval of vendor/sub-vendor shall also be cancelled for all RDSS projects. In such scenario any subsequent delay in contract performance due to failure of materials in the test laboratory would be on account of Contractor and no time extension would be provided by the Employer in this regard. Any LD levies in this regard would be borne by the Contractor.
- d) Apart from the above, in case of default by vendors/manufacturers, Contractor shall also be penalized based on the no. of materials/lots get rejected as per below table:

Sr. No.	No. of Material/lot rejected in a project/district	% Penalty imposed on contract price
1	>5	5.0%
2	>3	2.5%
3	>1	1.0%

4.4.2. In case of defects found during Field inspection: There are three categories of defects found in field inspection as defined below:

- a) **CRITICAL DEFECTS:** These defects must be rectified before charging. Critical defects are those which endanger life and property. Dangerous deficiencies on safety, ground clearances, equipment earthing and protection would come this category. These are defects in presence of which the Electrical Inspector would not allow charging of the electrical installation. That is, if equipment are already energized, it should be de-energized and rectified without delay. If critical equipment like distribution transformer HT and LT line have been installed dangerously, the defect type would fall under critical category of defect. *Example : LA is not connected , DT neutral earth is missing , Earth electrodes not installed, Ground clearance not as per IE rule, Oil level low in transformer etc.*
- b) **MAJOR DEFECTS:** These defects must be rectified before operational handover (to Operation and Maintenance wing). These are major deviations from drawing and specification. These are serious deviation with respect to contract. The electrical installation can be charged temporarily. However, the defects should preferably be rectified before charging. *Example : Pole not pitched at proper depth, Brick-bats/ foundation inadequate, use of undersized earth wire, precariously loose electrical connections and mechanical fitting.,*

- c) **MINOR DEFECTS:** These defects are very minor in nature. Such defects in electrical installations keep surfacing during operation and maintenance. The installation may be charged with these defects. However they must be rectified *Example: Danger board not proper, energy meter not installed before contractual handover (before final payment is released and contract is closed), missing barbed wire, stay wire loose, loose fasteners, vegetation too close to HT/Lt line.*

Note:

1. *These defects are broad in nature. Actual field defects need to be defined more accurately by inspectors.*
2. *All pictures depicting defects should be numbered. Their number mentioned in the report shown in the table*
3. *An infrastructure schematic (single line diagram) showing DTRs, HT and LT poles duly numbered by the inspector shall be submitted along with the report. Their number shall be used to describe location of defects to be rectified subsequently.*

The corresponding penalited to be imposed has been captured below:

Sr. No.	Defect criteria	% Penalty imposed of contract cost
1	Critical Defects	1.0%
2	Major Defects	0.5%
3	Minor Defects	0% if rectified within 30 days

Annexure-A

Checklist for Quality Assurance**Distribution Transformer Substation**

S. No	Description	Status (Yes/No)	Observations	Location	Picture No.
1	Record capacity of DTR transformer used				
2	Record S. No., make and year of manufacturing of DTR transformer				
3	Safe and adequate access to distribution transformer (DTR) substation				
4	Availability of approved GPS Survey report				
5	Proper load GPS Survey is performed of the locality for perspective consumers while deciding capacity and location of DTR				
6	Expected loading of transformer using 5 years growth is performed in GPS Survey report				
7	Proper alignment of substation structure with 11 KV line				
8	Record type of poles/support used for DTR substation				
9	Record type of foundation used				
10	Proper muffing is provided on steel supports of DTR substation				
11	If DTR substation is in water logging area, its foundation is grouted in cement concrete				
12	Proper verticality of substation supports				
13	Proper pole to pole distance of substation supports.				
14	Proper erection of jumpers and connection to DTR transformers without any bent				
15	Proper binding of insulators				
16	Stay plates are properly grouted in cement concrete mixture to support DTR substation structure (if erected)				
17	Proper tensioning is there on stay set				

S. No	Description	Status	Observations	Location	Picture
18	Proper alignment of stay wire with overhead conductor				
19	Proper erection of stay clamp using 12 mm dia nuts and bolts				
20	Proper galvanization of stay wire				
21	Thimble is provided on turn buckle of stay set				
22	Stay set installation is provided with guy insulator				
23	Proper phase to phase and phase to ground clearances maintained on the substation jumpers				
24	Steel overhead structure is properly earthed using 6 SWG wire/G.I. flat?				
25	Each 11 kV overhead equipment including transformer are individually earthed using 6 SWG Earth wire/ GI flat				
26	Danger plate is installed at appropriate height using proper size clamp. Record type and size of clamp				
27	Proper anti-climbing device (barbed wire/spike) installed at appropriate height on individual support. Record quality of wrapping of barbed wire				
28	Substation is numbered				
29	Individual substation pole is imposed/painted with the name of scheme				
30	Surface of the PCC poles is finished and there are no steel wire visible				
31	No physical damages appeared on PCC pole surface				
32	GI flat to GI flat connection using at least 2 sets of GI nut bolts and washers				
33	6 SWG GI wire/GI Flat is properly dressed with support				
34	GI wire to GI wire jointing is provided using 12 SWG GI nut bolts and washers				
35	GI wire connection to earth pit is using GI nut bolt and washer				

S. No	Description	Status	Observations	Location	Picture
36	GI earth pipe is properly inserted inside earth without hammering				
37	Number of earth pit used for substation earthing.				
38	Pit to pit distance in meters. Is it adequate?				
39	Masonry enclosure is provided over individual earth pits				
40	Funnel is provided over earth pit				
41	Proper jumpering using binding practices/PG clamp				
42	Proper clearances to avoid bird fault on conductors of substation supports				
43	Type and size of overhead conductors used in the substation				
44	Cement-concrete grouting foundation of substation supports				
45	Measure quantum of cement concreting in any one sample support				
46	Measure cement concreting foundation in any one sample of stay set pit				
47	Proper painting/galvanizing done on steel structure				
48	Any sign of rusting found on substation structure/hardware				
49	Any broken insulator found in the substation				
50	Disc Insulators installed precariously (loose bolts/ missing cotter pins)				
51	Separate individual earth connection using GI wire/GI flat is used for neutral earthing with separate pit				
52	Dedicated transformer body earthing using GI wire/GI flat				
53	Bimetallic clamps are provided on 11 kV bushing				
54	No gap between busing seat and bimetallic clamp on LT as well as HT bushing while connecting conductor/cable				
55	Proper lugs are provided on termination of				

S. No	Description cables	Status	Observations	Location	Picture
56	Oil is filled in cup of silica gel breather				
57	Silica gel is blue in colour				
58	Oil control valves are open between transformer tank and breather (wherever used)				
59	Oil leakage from the body/gasket of transformer and from conservator tank				
60	Record level of oil in conservator tank				
61	Transformer installed precariously (Nut / bolts / side bracing missing)				
62	Transformer is fitted with 12 mm dia nut bolts on its base channel				
63	Transformer belting is provided				
64	Dimension of transformer base channel				
65	Individual lightening arrestor are earthed with dedicated separate earth pit				
66	LA jumper connections is missing/ not proper				
67	LA is charged/ installed but not meggared				
68	Isolators/AB switch are properly aligned and its operation is smooth				
69	Operating handle (not missing eye bolt) of isolator/AB switch is earthed using flexible cable				
70	No joint in between entire length of operating pipe of isolator/AB switch				
71	Guiding hook is provided for isolator pipe movement				
72	Alignment of male and female contacts of isolators/AB switch and no spark during normal use				
73	Proper fuse wire is used in HG Fuse/HG fuse				
74	Arching Horn is missing/ not aligned / not proper				
75	Proper size of LT cable are used between transformer and LTDB/SMC LTDB/SMC LTDB/SMC LTDB				

S. No	Description	Status	Observations	Location	Picture
76	lockability and proper closing of door of LTDB/SMC LTDB				
77	Gland plate and glands are used for cable entry in LTDB/SMC LTDB				
76	No unused holes on gland plates				
77	Availability of LTDB/SMC LTDB equipment as per approved drawing and scope of work like isolator, fuse, switch, bus bar, MCCB, MCB etc.				
78	Installation of DTR as per BIS specification				
79	LTDB/SMC LTDB earthing at different points using 6 SWG GI wire				
80	Proper painting and No physical damages on LTDB/SMC LTDB				
81	Suitable loop length of cables in LTDB/SMC LTDB				
82	3 Nos earthing pit and earth mat /risers using 50X6mm GI Flat are used as under:				
a	Earth Pit – 1 for Transformer Neutral,				
b	Earth pit - 2 for Lightening Arrester,				
c	Earth pit – 3 for Equipment body earthing				
83	Deleted				
84	Deleted				
85	Quality of painting/galvanizing on substation structure				
86	DTR is newly supplied				
87	PG Clamps are used (wherever needed as per drwg- Jumper etc)				
88	Deleted				
89	Earthing Electrodes short/missing				
90	Commissioning Defect: DT charged/installed but not merged				
91	Fasterers (Nuts/ Bolt/ Clamps /Connector) size not as per drawing /specification				
92	Fasteners (Nuts / bolts/ Clamps / connectors) in precarious state				
93	Poles not erected properly (inadequate or missing brick bat/ foundation)				

S. No	Description	Status	Observations	Location	Picture
94	Stay installation is not proper : guy insulator missing ;inadequate depth				
95	Earthing wire diameter undersize				
96	Danger plate missing/improper				
97	Earthing wire not secured / not dressed				
98	Barbed wire missing/improper				
99	DTR ground electrodes far too close				
100	Earth pit to earth pit clearance not maintained				
101	HT Fuse not provided				
102	HT fuse unit jumpering not connected properly				
103	MCCB of lower rating than specified in LOA				
104	MCCB not installed				
105	Inferior quality of Distribution Board used (makeshift, locally fabricated DBs)				

LT Line

S.No	Description	Status- (Yes/No)	Observations	Location	Picture- No.
1	Availability of approved GPS Survey report with Single line diagram	-	-	-	-
2	Correct alignment of LT line	-	-	-	-
3	Type of poles used as per scope of the work	-	-	-	-
4	Type of foundation used as per scope of work	-	-	-	-
5	If line is passing through water logging area and its foundation is grouted in cement concrete	-	-	-	-
6	Proper verticality of poles	-	-	-	-
7	Any deflecting tension on LT pin insulator	-	-	-	-
8	Proper tensioning of overhead conductor/LT cable/ABC Cable	-	-	-	-
9	Any knot/wrapping of overhead conductor /LT cable /ABC Cable is there during erection	-	-	-	-
10	Proper binding of insulators cable both /	-	-	-	-

S. No	Description	Status	Observations	Location	Picture
	tension work is done				
11	Stay plates are properly grouted in cement concrete mixture				
12	Proper tensioning is there on stay set				
13	Proper alignment of Stay wire and stay set with overhead conductor is there to nullify tension				
14	Proper erection of stay clamp using 12 mm dia nuts and bolts and 50x6 mm (or more) size clamp				
15	If every 6th pole in a section of line is provided with stay sets to avoid line deflection				
16	Proper galvanization of stay wire/stay set				
17	Thimble is provided on turn buckle of stay set				
18	Proper phase to phase clearances are maintained on the line				
19	Steel overhead structure is properly earthed using 6 SWG wire				
20	Each LT pole individually earthed using 6 SWG Earth wire and separate Earth pit/Earthing coil/Earth spike				
21	Quality and size of danger plates is as per scope of work				
22	Danger plate is installed at appropriate height using proper clamp as per scope of work				
23	Anti-climbing device (barbed wire/spike) are installed at appropriate height on individual support				
24	Individual pole is numbered				
25	Individual pole is imposed/painted with the name of scheme				
26	Surface of the PCC poles is finished and there are no steel wire visible				
27	No physical damages appeared on PCC pole surface				
28	Cradle guard earthing is provided on each				

S. No	Description	Status	Observations	Location	Picture
	road crossing or on each LT line crossing				
29	Proper tensioning of the cradle guard wires-				
30	Separate earthing on both the sides of road/line for cradle guarding are there				
31	6 SWG G.I. wire is properly dressed with support for V-Cross arm/Channel/Top clamp earthing				
32	GI wire to GI wire jointing is provided using 12 SWG GI nut bolts and washers-				
33	GI wire connection to earth pit is using 12-mm GI nut bolt and washer-				
34	Earth pipe is properly inserted inside earth without pipe hammering				
35	Masonry enclosure is provided over individual pipe earth pits				
36	Funnel is provided over pipe earth pit				
37	Jumpering using best binding practices/PG-clamp-				
38	Proper conductor clearances to ground is there to avoid bird fault on end sectionizer support where disc insulator are used				
39	Average pole to pole span length in the line. It should not be less than 50 m.				
40	If Pole to pole span is less than 50 m, record the reason with pole numbers				
41	Number of poles used per kilometre of the line				
42	Type and size of overhead conductors/ABC cable used in the line				
43	Shuttering is used during casting of cement concrete foundation				
44	Cement-concrete grouting foundation of end supports-				
45	Quantum of cement concreting in any one sample support				
46	Cement concreting foundation in any one sample of stay set pit-				
47	Proper painting is done on steel structure				
48	Any broken insulator found in the line				

S. No	Description	Status	Observations	Location	Picture
49	Surface finish of painting on Steel tubular pole/RSJ/H Pole/Rail pole about 2 m from bottom and above 2 m				
50	Possible damage on ABC cable surface				
51	Piercing connections are used to take-off connection from ABC cable				
52	Muffing is used in steel steel tubular poles, rail pole, RS joint/H beam Supports				
53	Adequate tree cutting on either side of line done				
54	Pole to pole schedule enclosed with profarma				

11 KV Line

S. No	Description	Status (Yes/No)	Observations	Location	Picture No.
1	Availability of approved GPS Survey report with single line diagram				
2	Correct alignment of 11 kV line				
3	Type of poles used as per scope of the work				
4	Type of foundation used as per scope of work				
5	Record whether line is passing through water logging area and its foundation is grouted in cement concrete				
6	Proper verticality of poles				
7	Cross-bracing on Double poles are provided				
8	Conductors are passing through the top groove of the insulator (creepage distance compromised)				
9	More than one joint in one span				
10	Any deflecting tension on 11 KV pin insulator				
11	Proper tensioning of overhead conductor				
12	Any knot/wrapping of overhead conductor is there during erection				
13	Proper binding of insulators is done				
14	Stay plates are properly grouted in cement concrete mixture				
15	Proper tensioning is there on stay set				
16	Proper alignment of Stay wire with overhead				

S. No	Description	Status	Observations	Location	Picture
	conductor is there to nullify tension				
17	Guy insulator, anchor plate/ thimble/ hardware are provided with stay set				
18	Proper erection of stay clamp using 12 mm dia nuts and bolts and 50x6 mm (or more) size clamp				
19	If every 6th pole in a section of line is provided with stay sets to avoid line deflection				
20	Proper galvanization of stay wire and stay set				
21	Thimble is provided on turn buckle of stay set				
22	Proper phase to phase clearances are maintained on the line				
23	Steel overhead structure is properly earthed using 6 SWG wire				
24	Each 11 kV pole individually earthed using 6 SWG Earth wire and separate Earth pit/Earthing coil/Earth spike				
25	Quality and size of danger plates is as per scope of work				
26	Danger plate is installed at appropriate height using proper clamp as per scope of work				
27	Anti-climbing device (barbed wire/spike) are installed at appropriate height on individual support				
28	Individual pole is numbered				
29	Individual pole is imposed/painted with the name of scheme				
30	Surface of the PCC poles is finished and there are no steel wire visible				
31	No physical damages appeared on PCC pole surface				
32	Cradle guard earthing is provided on each road crossing or on each LT line crossing				
33	Proper tensioning of the cradle guard wires				
34	Proper Guard wires are provided in case of Road crossing as per drawing specification				
35	6 SWG G.I. wire is properly dressed with support for V-Cross arm/Channel/Top clamp earthing				

S. No	Description	Status	Observations	Location	Picture
36	GI wire to GI wire jointing is provided using 12 SWG GI nut bolts and washers				
37	GI wire connection to earth pit is using 12 mm GI nut bolt and washer				
38	Earth pipe is properly inserted inside earth without pipe hammering				
39	Masonry enclosure is provided over individual pipe earth pits				
40	Funnel is provided over pipe earth pit				
41	Proper jumpering using binding practices/PC clamp				
42	If under sized conductor used				
43	Proper conductor clearances to ground is there to avoid bird fault on end sectionizer support where disc insulator are used				
44	Proper pole to pole span length in the line. It should not be less than 50 m.				
45	If Pole to pole span is less than 50 m, record the reason with pole numbers				
46	Number of poles used per kilometre of the line				
47	Record type and size of overhead conductors used in the line				
48	Shuttering is used during casting of cement concrete foundation				
49	Cement-concrete grouting foundation of end supports				
50	Measure quantum of cement concreting in any one sample support				
51	Measure cement concreting foundation in any one sample of stay set pit				
52	Proper painting is done on steel structure				
53	Disc Insulators are installed precariously (loose bolts/ missing cotter pins)				
54	D -shaped loop for jumpers are maintained				
55	Any broken insulator found in the line				
56	Surface finish and painting on Steel tubular pole/RSJ/H Pole/Rail pole				
57	Adequate tree cutting on either side of line done				

S. No	Description	Status	Observations	Location	Picture
58	Pole to pole schedule enclosed with proforma				
59	Pole numbering with "RDSS " inscription not done (properly)				
60	Engraving of poles (Name of Manufacturer, SI Nos etc.) not done				
61	Line Spacers not used				
62	Guy insulator not used in stay wire				
63	Inadequate length of barbed wire				

Checklist for inspection of REDB (Substation)

S.N.	Description	Status (Yes/No)	Observation	Picture No.	Location as per SLD
1	Major Materials (CT/PT/CB/X'mer/Battery/ Panels /Structures/Conductor) as per specifications				
2	Record S. No., make and year of manufacturing of Power transformer				
3	Major Materials dispatched without inspection				
4	Construction as per Approved Drawing				
5	Civil works FQP documentation maintained during construction				
6	Equipment (name it) provided in the BOQ/ drawing but not installed				
7	Verification of pre-commissioning and commissioning testes of substation equipment i.e. Circuit Breaker, CT, PT, transformer, Charger, Battery, Relays, Control Panels, Switchgear, 11 KV cable etc				
8	Present condition of main equipment				
9	Functional Status of Transformer: WTI, OTI etc, Relays, Battery Charger, Battery, CB, CT, PT, Energy Meter, Control & Relay panel				
10	Transformer oil tested				

11	Transformer Relays, CT, PT , CB , Switchgears, battery sets, etc charged after test				
12	Equipment charged after commissioning test				
13	Gravel size proper				
14	Earthing of main equipment, fence etc done properly				
15	Sub Station fencing provided				
16	Cable trench made with cable trays – or cables lying on trench floor				
17	Whether Cable trenches have suitable slope to ensure automatic draining of rainwater				
18	Proper storage of equipment				
19	Cables tied on cable trays				
20	Glands, lugs used (wherever need - at cable entries)				
21	Dead end marking for cables is done				
22	Earth mat provided				
23	Undersized conductor/ cables used				
24	Correct size of earthing conductor - flats, GI wires etc used				
25	Acid proof floor used in battery room				
26	Fasteners (nut, bolts, clamps connectors, hardware etc) as per specification				
27	Switchgear rubber mats, chequer plates not provided				
28	FQP for material receipt and storage maintained by Employer				
29	Name of Feeder on Control Panel.				
30	Name of Feeder on Outgoing DP structure				
31	Working platform on 33 KV and 11 KV outdoor VCB				
32	Name of Substation board on the entrances				
33	Painting of control room, water supply position in Substation				
34	General sanitation arrangement in the control room building				

35	Internal Lighting in the substation control room				
36	Closed fencing of the substation yard				
37	Approach road to Power Transformer foundation				
38	Water logging/ Earth filling in the yard trench				
39	Partition wall between two Power Transformers				
40	Availability of Earthing Rod in the substation				
41	Availability of Permit & Work Book				
42	Tracing of Earth connection of Power/ Distribution Transformer up to Earth Pit				
43	Connection at Earth Pit				
44	Jointing & Clamping of Earth Conductors				
45	All Terminal Blocks at CTs/PTs/Breaker/Panels/Junction Box				
46	Earthing& Fencing is as per specification				
47	Cable trench cover inside the control room and in the yard.				
48	Exhaust Fan in the Battery Room				
49	Inter Battery connections				
50	Battery Charger connection				
51	Earthing of Control Panel				
52	Termination of power cables at 11 KV sides/LT sides of Power and Station Transformer.				
53	Inside pic of distribution board of station transformer				
54	Take Overall picture of station transformer				
55	Connection of Lightning arrestor				
56	Approximate clearance of live part in the substation				
57	Oil leakage in Power/Station Transformer				
58	Area lighting in the substation				
59	Material diagram of substation in the control room				
60	List of authorized operational personnel in				

	the substation				
61	Connection at the bus-bar jumpers				
62	Loop cables LT/HT/Control				
63	Tagging on cable terminals				
64	Work clearance on control panels and sufficient lightening on the control panel				

5. Type and Acceptance test

The following type, acceptance and routine tests and tests during manufacture shall be carried-out on the material. For the purpose of this clause:

- 5.1. Contractor shall supply the materials of type & design which has already been Type Tested. Contractor shall provide copy of such tests at site in support of type-tested materials supplied under the contract. No extra payment or time shall be granted for type testing of materials. In exceptional case to case basis, employer will decide to permit type testing of material at Contractor's cost.
- 5.2. Acceptance Tests shall mean those tests which are to be carried out on samples taken from each lot offered for pre-dispatch inspection, for the purposes of acceptance of that lot.
- 5.3. Routine Tests shall mean those tests, which are to be carried out on the material/equipment to check requirements which are likely to vary during production.
- 5.4. Tests during Manufacture shall mean those tests, which are to be carried out during the process of manufacture and end inspection by the Contractor to ensure the desired quality of the end product to be supplied by him.
- 5.5. The norms and procedure of sampling for these tests will be as per the Quality Assurance Programme to be mutually agreed to by the Contractor and the Employer.
- 5.6. The standards and norms to which these tests will be carried out are listed against them. Where a particular test is a specific requirement of this Specification, the norms and procedure of the tests shall be as per IS/IEC Standard this specification or as mutually agreed to between the Contractor and the Employer in the Quality Assurance Programme.
- 5.7. For all type test and acceptance tests, the acceptance values shall be the values specified in this Specification, Approved Quality Plan or guaranteed by the Bidder, as applicable.

6. Type Testing, Inspection, Testing & Inspection Certificate

- 6.1 All equipment being supplied shall conform to type tests including additional type tests, if any as per technical specification and shall be subject to routine tests in accordance with requirements stipulated under respective sections. The Contractor shall intimate the Employer the detailed program about the tests at least three (3) weeks in advance in case of domestic supplies & six (6) weeks in advance in case of foreign supplies.
- 6.2 The reports for all type tests and additional type tests as per technical specification shall be furnished by the Contractor along with equipment/material drawings. The type tests conducted earlier should have either been conducted in accredited laboratory (accredited based on ISO/IEC

Guide 25/17025 or EN 45001 by the national accreditation body of the country where laboratory is located) or witnessed by the representative(s) of Employer or Utility. The test-reports submitted shall be of the tests conducted within last 5 (five) years prior to the date of bid opening. In case the test reports are of the test conducted earlier than 5 (five) years prior to the date of bid opening, the Contractor shall repeat these test(s) at no extra cost to the Employer, however the delay in supply due to type-test will not be acceptable during the project.

- 6.3 In the event of any discrepancy in the test reports i.e. any test report not acceptable due to any design/manufacturing changes (including substitution of components) or due to non-compliance with the requirement stipulated in the Technical Specification or any/all additional type tests not carried out, same shall be carried out without any additional cost implication to the Employer.
- 6.4 The Employer, his duly authorized representative and/or outside inspection agency acting on behalf of the Employer shall have at all reasonable times free access to the Contractor's/sub-vendors premises or Works and shall have the power at all reasonable times to inspect and examine the materials and workmanship of the Works during its manufacture or erection if part of the Works is being manufactured or assembled at other premises or works, the Contractor shall obtain for the Engineer and for his duly authorized representative permission to inspect as if the works were manufactured or assembled on the Contractor's own premises or works. Inspection may be made at any stage of manufacture, dispatch or at site at the option of the Employer and the equipment if found unsatisfactory due to bad workmanship or quality, material is liable to be rejected.
- 6.5 The Contractor shall give the Employer/Inspector ten (10) days written notice of any material being ready for joint testing including Contractor and Employer. Such tests shall be to the Contractor's account except for the expenses of the Inspector. The Employer/Inspector, unless witnessing of the tests is virtually waived, will attend such tests within thirty (30) days of the date of which the equipment is notified as being ready for test /inspection, failing which the Contractor may proceed alone with the test which shall be deemed to have been made in the Inspector's presence and he shall forthwith forward to the Inspector duly certified copies of tests in triplicate.
- 6.6 The Employer or Inspector shall, within seven (07) days from the date of inspection as defined herein give notice in writing to the Contractor, of any objection to any drawings and all or any equipment and workmanship which in his opinion is not in accordance with the Contract. The Contractor shall give due consideration to such objections and shall either make the modifications that may be necessary to meet the said objections or shall confirm in writing to the Employer/Inspector giving reasons therein, that no modifications are necessary to comply with the Contract. If any modification is made on the equipment on the basis of test results not in conformity with the contract, the modified equipment shall be subject to same sequence of test again without any additional cost to Employer.
- 6.7 When the factory tests have been completed at the Contractor's or Sub-Contractor's works, the Employer/Inspector shall issue a certificate to this effect within seven (07) days after completion of

tests but if the tests are not witnessed by the Employer/Inspector, the certificate shall be issued within seven (07) days of receipt of the Contractor's Test certificate by the Engineer/Inspector. Failure of the Employer/Inspector to issue such a certificate shall not prevent the Contractor from proceeding with the Works. The completion of these tests or the issue of the certificate shall not bind the Employer to accept the equipment should, it, on further tests after erection, be found not to comply with the Contract. The equipment shall be dispatched to site only after approval of test reports and issuance of dispatch instruction by the Employer.

- 6.8 In all cases where the Contract provides for tests whether at the premises or at the works of the Contractor or of any Sub-Contractor, the Contractor except where otherwise specified shall provide free of charge such items as labour, materials, electricity, fuel, water, stores, transport, loading & unloading, packing, apparatus and instruments as may be reasonably demanded by the Employer/Inspector or his authorized representative to carry out effectively such tests of the equipment in accordance with the Contract and shall give facilities to the Employer/Inspector or to his authorized representative to accomplish testing. Contractor Contractor Contractor.
- 6.9 The inspection by Employer and issue of Inspection Certificate thereon shall in no way limit the liabilities and responsibilities of the Contractor in respect of the agreed quality assurance programme forming a part of the Contract.
- 6.10 The Employer will have the right of having at his own expenses any other test(s) of reasonable nature carried out at Contractor's premises or at site or in any other place in addition of aforesaid type and routine tests, to satisfy that the material comply with the specification.
- 6.11 The Employer reserves the right for getting any field tests not specified in respective sections of the technical specification conducted on the completely assembled equipment at site. The testing equipment for these tests shall be provided by the Employer.

7. Pre-Commissioning Tests

On completion of erection of the equipment and before charging, each item of the equipment shall be thoroughly cleaned and then inspected jointly by the Employer and the Contractor for correctness and completeness of installation and acceptability for charging, leading to initial pre-commissioning tests at Site. The list of pre-commissioning tests shall be provided by the Employer as per its standard practices. or as included in the Contractor's quality assurance programme.

8. Commissioning Tests

All required instrumentation and control equipment will be used during such tests and the Contractor will use all such measuring equipment and devices duly calibrated as far as practicable. However, the Contractor, for the requirement of these tests, shall take immeasurable parameters

into account in a reasonable manner. The tests will be conducted at the specified load points and as near the specified cycle condition as practicable. The Contractor will apply proper corrections in calculation, to take into account conditions, which do not correspond to the specified conditions.

- 8.1 Any special equipment, tools and tackles required for the successful completion of the Commissioning tests shall be provided by the Contractor, free of cost.
- 8.2 The specific tests to be conducted on equipment have been brought out in the respective chapters of the technical specification. However where the pre-commissioning tests have not been specified specifically they shall be as per relevant IS code of practice or as mutually agreed.
- 8.3 The Contractor shall be responsible for obtaining statutory clearances from the concerned authorities for commissioning and operation of the equipment including the Electrical Inspector. Necessary fee to perform these works shall be paid by Employer.

9. GIS mapping & asset tagging

9.1 General Information

The State owned power distribution utilities have implemented GIS based asset tagging activities in the past and migrated asset information into GIS platform. Bidder should update various attributes of new / upgraded infrastructure created under RDSS over the same platform. Various electrical assets i.e Power Transformers, Distribution Transformer, HT & LT lines with over head conductor, poles, insulators, stay wire etc and Underground distribution system consists of Feeder pillar, UG cable etc; automation devices like RMU's FPI, Auto-reclosures etc needs to be updated in the existing GIS platform. The GIS platform and the associated mobile-app will be provided by the Employer. The scope of the bidder is limited to updating the GIS co-ordinates and the associated mapping information of the new assets created/upgraded on the platform provided by the Employer using the mobile app. However no additional payment shall be made to the Contractor for these works.

9.2 Key activities under the scope:

1. After successful award of the contract and finalization of Bill of Quantity (BoQ), the TKC should collect list of attributes (Data Model) for each of the assets purposed under the scheme from the project nodal / GIS incharge of the Utility.
2. The purposed methodology for delivery of these attributes as well as GPS coordinates of the assets up to the defined accuracy level to be decided mutually so that updating the same in existing GIS platform would not be a challenges at the later stage. A point of contact (PoC) is recommended at this stage to avoid any future complicity.
3. The vendor should create a physical marking procedure with consultation and approval of Employer and mark each assets and consumer that have been GPS Surveyed

4. Vendor will start collecting intended data from newly commissioned and / or upgraded infrastructure commissioned in RDSS and submit the same with the Employer nodal / team for approval.
5. The Employer's project in charge would get these data verified through their team, once completed they will get duly verified by Executive Engineer and circle SE and shall submit same to IT office for further review.
6. It is to be noted that updating of GIS asset information is mandatory requirement for the issuance of completion certificate by the employer.

10. Documentation

10.1. General

- 10.1.1. To ensure that the proposed systems conform to the specific provisions and general intent of the Specification, the Contractor shall submit documentation describing the systems to employer for review and approval. The Contractor shall obtain approval of employer for the relevant document at each stage before proceeding for manufacturing, system development, factory testing, site testing, training etc. The schedule for submission/approval of each document shall be finalised during the discussions before placement of the contract, this schedule shall be in line to overall project schedule.
- 10.1.2. Each document shall be identified by a Contractor document number, the employer document number, and the employer purchase order number. Where a document is revised for any reason, each revision shall be indicated by a number, date, and description in a revision block along with an indication of official approval by the Contractor's project manager. Each revision of a document shall highlight all changes made since the previous revision.
- 10.1.3. All technical description, specifications, literature, correspondence, prints, drawings, instruction manuals, test reports(both factory and at site), progress photographs, booklets, schedules and all supplementary data or documents furnished in compliance with the requirements of the Contract, shall become the property of the Employer and the costs shall be considered as included in the Contract price.
- 10.1.4. The Contractor shall be responsible for any time delay, misinterpretation, error and conflict during design, manufacturing, testing and erection of the Works resulting from non-compliance with the requirements of this Specification.
- 10.1.5. The Employer shall have the right to make copies of any documents, data, reports, information etc. supplied by the Contractor in connection with the Works. The Employer shall not impart the information of these documents to any other manufacturer or competitor but he shall be free to use these for preparation of technical papers, reports etc.

10.1.6. All documentation shall be in English language.

10.2. Requirements for submission of documents, information and data by the Contractor

- 10.2.1. The Contractor shall submit to the Employer all documents in accordance with an approved schedule of submissions and shall submit any further information (in the form of drawings, documents, manuals, literature, reports etc.) when asked by the Employer while commenting/approving any drawings/documents etc.
- 10.2.2. The documents which are subject to the approval of the Employer shall be identified by the Contractor with the stamp "FOR APPROVAL". All other documents shall be submitted to the Employer for information and shall be identified by the Contractor with the stamp "FOR INFORMATION".
- 10.2.3. The sequence of submission of the documents shall be subject to the approval of the Employer. The sequence of submissions of all documents shall be such that the necessary information is available to enable the Employer to approve or comment the document.
- 10.2.4. The Contractor shall supply 4 hard copies of all drawings and documents.
- 10.2.5. In case a "SUBSEQUENT" revision of any document is made due to any reason whatsoever, a revision of the same, highlighting the changes shall be resubmitted for the Employer's specific approval/ information.

10.3. Documents for approval

- 10.3.1. The Employer shall be allowed fifteen (15) calendar days to approve the Contractor's submissions. The submissions for approval, shall be returned to the Contractor marked in one of the following ways :

Category I:	Approved
Category II:	Approved with Comments.
Category III:	Returned for correction.
Category IV :	For information

- 10.3.2. The first notations "I" or "II" shall be deemed to permit the Contractor to proceed with the work shown on the document, except in the case of notation "III" the work shall be done subject to the corrections indicated thereon and/or described in the letter of transmittal. The Contractor shall bear the full responsibility for proceeding with the Works prior to receipt of the release in notation "I" from the Employer.

- 10.3.3. In case of notation "II", the Contractor shall include the alterations required & resubmit the document within fifteen (15) days from date of Employer's letter of transmittal.
- 10.3.4. In case of notation "III", the Contractor shall include the alterations required and resubmit the document to the Employer, within fifteen (15) days, from date of letter of transmittal, so that such document can be returned with the notation "I" or "II".
- 10.3.5. It may also be noted that the approval/commenting by the Employer does not relieve the Contractor of any of his contractual obligations and his responsibilities for correctness of dimensions, materials, weights quantities or any other information contained therein, as well as the conformity of designs with Indian Statutory Laws and the Technical Specifications as may be applicable. The approval also does not limit the Employer's rights under the Contract.
- 10.3.6. The approved documents shall be considered as the working documents. However the Technical Specification and connected documents shall prevail over these documents in case a decision is required on interpretation.

10.4. Documents for information

The Contractor shall not delay the Works pending the receipt by the Contractor of the comments on documents submitted to the Employer for information. However, the Employer shall have the right to comment on all the documents submitted by the Contractor, when, in the opinion of the Employer the document does not comply with the Contract or otherwise. The Contractor shall satisfactorily demonstrate that the information contained in the aforesaid document does meet the requirements of the Contract or revise the document in order that the information shall comply with the requirements of the Contract.

10.5. Basic reference drawings

- 10.5.1. The reference drawings are enclosed with the bid document, which forms a part of the specification. The Contractor shall develop a new layout in line with the specification and take the approval of the EMPLOYER. The Contractor shall maintain the overall dimensions of the substation, buildings, bay length, bay width, phase to earth clearance, phase to phase clearance and sectional clearances, clearances between buses, bus heights but may alter the locations of equipment to obtain the statutory electrical clearances as required for the substation.
- 10.5.2. All drawings submitted by the Contractor including those submitted at the time of bid shall be in sufficient detail to indicate the type, size, arrangement, material description, Bill of Materials, weight of each component, break-up for packing and shipment, dimensions, internal & the external connections, fixing arrangement required and any other information specifically

requested in the specifications.

- 10.5.3. Each drawing submitted by the Contractor shall be clearly marked with the name of the Employer, the unit designation, the specifications title, the specification number and the name of the Project. If standard catalogue pages are submitted, the applicable items shall be indicated therein. All titles, noting, markings and writings on the drawing shall be in English. All the dimensions should be in metric units.
- 10.5.4. Further work by the Contractor shall be in strict accordance with these drawings and no deviation shall be permitted without the written approval of the Employer, if so required.
- 10.5.5. The review of these data by the Employer will cover only general conformance of the data to the specifications and documents interfaces with the equipment provided under the specifications. This review by the Employer may not indicate a thorough review of all dimensions, quantities and details of the equipment, materials, any devices or items indicated or the accuracy of the information submitted. This review and/or approval by the Employer shall not be considered by the Contractor, as limiting any of his responsibilities and liabilities for mistakes and deviations from the requirements, specified under these specifications and documents.
- 10.5.6. All manufacturing and fabrication work in connection with the equipment prior to the approval of the drawings shall be at the Contractor's risk. The Contractor may make any changes in the design which are necessary to make the equipment conform to the provisions and intent of the Contract and such changes will again be subject to approval by the Employer. Approval of Contractor's drawing or work by the Employer shall not relieve the Contractor of any of his responsibilities and liabilities under the Contract.
- 10.5.7. All engineering data submitted by the Contractor after final process including review and approval by the Employer shall form part of the Contract Document and the entire works performed under these specifications shall be performed in strict conformity, unless otherwise expressly requested by the Employer in Writing.

11. Return of replaced old materials to the area stores of Employer

- Old PVC wire will be rolled into bundles. The bundles should be tightened firmly and properly with PVC sticker strip or string. A tag should be attached with each bundle to indicate the weight of the bundle. As far as possible, bundle should consist of wire of the same size and same metal. Similar action is required to be taken in case of GI wire.
- Old conductor of same size shall be rolled into bundles. Bundles should be tightened firmly and PVC sticker strip or string regarding size of conductor shall be mentioned. Size, type & Weight of each bundle shall also be indicated on the sticker strip.

- Materials released due to bay capacity augmentation and/or due to replacement like power transformers, distribution transformers, insulator, meter board, cut outs etc are also required to be returned to Employer's stores through proper documentation.
- All other line materials released like, conductors, poles, cross arms; fabricated material, etc. shall be properly accounted for and returned to Employers store after recording all necessary details including weight, length etc. wherever necessary. A detailed procedure for return of the old materials shall be prescribed by Project Management Agency.
- In respect of accountal of devolution of released material, the process as formulated by Employer time to time shall be followed by the Contractor

12. Miscellaneous activities

- Commencement of Supply & Works: The Contractor shall ensure that the supply and installation of material and service under the contract is as per approved PERT / completion schedule of works. The Contractor is to commence supply with the type tested materials with necessary routine test/ acceptance test certificates for a particular lot duly approved by EMPLOYER or the EMPLOYER's authorized agencies.
- The Contractor shall submit Type test and routine test certificates as applicable, issued by NABL accredited / third party independent standard laboratories like CPRI, NPL etc.
- Unit rates: The unit rates quoted shall include details which are obviously and fairly intended, and which may not have been included in these documents but are essential for the satisfactory completion of work. The unit rate quoted shall be inclusive of deployment of all plants, equipments, men, materials, skilled & unskilled labour etc. essential for satisfactory completion of work.
- The prices for fabricated materials shall include all works relating to fabrication, galvanizing, insurance, storage and delivery ex-Contractors stores, unloading and loading. The quoted prices shall also include the cost of necessary quantity of steel and zinc, freight charges up to site store and other indirect charges incurred in connection with supply of finished materials.
- Quantities/ length of 33 KV, 11 KV line and LT line, distribution transformers sub stations, 33/11 KV sub-station etc. indicated in the price schedules are provisional. Any quantity variation in individual item and in contract value shall be governed as per GCC clause 39. The Contractor shall execute the work based on the actual GPS Survey and as approved by the Engineer-in-charge or person authorized by him.
- RCC slabs (600x600x100) mm to be used for 9 mtr PCC pole and 13/11 mtr WPB (160x160)mm, 30.44.
- RCC slabs (450x450x75) mm to be used for 8 mtr PCC pole and Steel Tubular Pole.
- The scope of work also covers supply of other items, not specifically mentioned in this specification and/or bill of materials but are required for the successful installation, testing, commissioning and satisfactory performance of the 33 KV & 11 KV lines, 33/11 KV sub stations, distribution transformer sub stations, LT lines, service lines etc.

The following works & services shall also be provided by the Contractor.

- a) Unloading the equipments from the rail or road transport and moving those to storage area. Damorage/wharfage charge,if any incurred,shall be paid by the Contractor
- b) Opening of packing cases,inspection and checking of materials for any damage or loss in transit shall be the responsibility of the Contractor. All claims with the concerned authorities e.g. rail, transport, insurance etc. shall be lodged by the Contractor.
- c) Complete erection of equipments, etc covered under the contract, final preparation for testing, commissioning, final run and acceptance tests and putting the sub-station/ plant/line etc. into operation.
- d) All consumable, stores required for the above erection and commissioning works.
- e) All erection tools, lifting tackles, and all equipments, tools & tackles for transportation at site.
- f) Workshop, as required within the work area.
- g) Third party insurance ^[1]at site and insurance of personnel employed at site as required under Workman's Compensation Act. Secur ity arrangement for watch and guardas required shall be made by Bidder at his own cost.
- h) All the technical/skilled staff deployed for the job must possess the required qualifications and necessary licenses and permits.
- i) Contractor shall take all safety precautions during work and the workmen must use safetybelts, handgloves, masks and other safety devices as may be necessary for safety of the personnel.
- j) The Contractor shall provide operating personnel during trial tests and till the PSS, DSS, lines and equipments etc.are taken over by EMPLOYER as specified in taking over Clause, defined later.
- k) Any other work not covered above but required for successful completion of the project has to be carried out by the Contractor at his own cost.

^[1] **Note:** Before receipt of equipment at site but without limiting his obligations and responsibilities under this clause hereof, the Contractor shall insure against his liability for any equipment, material or physical damage, loss or injury which may occur to any property, including that of EMPLOYER and project management agency, or to any person including employee of the EMPLOYER, by or arising out of the execution of the contract or in the carrying out of contract. The third party insurance cover shall be provided for the period from date of Ex-factory dispatch till taking over of the entire equipment after testing, commissioning and trial operation, if any.

Third party insurance shall be affected for an adequate amount to cover for all marine, transportation, field transportation, erection, testing and commissioning till handing over to Employer,. Terms shall include a provision whereby, in the event of any claim being brought or made against EMPLOYER in respect of which the Contractor would be entitled to receive indemnity under the policy, the insurer will indemnify EMPLOYER and project management agency against such claims and any costs, charges and expenses in respect hereof. Contractor shall lodge the claim if need so arise, the employer shall be the Employer of the equipment/materials and the claims shall be settled in the name of Employer.

13. Individual work components

13.1 ~~New 33 KV Lines~~

1.00 ~~GPS Survey~~

~~Mapping of route of proposed new 33 kV line by foot GPS Survey in rural/urban areas be performed mentioning various milestones. While GPS Surveying, existing electrical infrastructure in the locality should also be mapped. Line alignment (single line diagram) on political map with fair correctness, be prepared. SLD and foot GPS Survey report shall be approved by Project Manager and shall be used as basic document for assessment of works under the contract. On completion of line work, as built Single Line Diagram and pole wise line diagram showing pole wise materials used and pole to pole span should be submitted to Project Manager. This details shall be used as reference documents by Quality and Quantity Inspecting officials to execute inspection works.~~

2.00 ~~Support (pole):-~~

~~Following type of supports are envisaged for new 33 KV overhead lines-~~

- ~~a. 9.1mtr long /280 KG PCC Poles (PCC Pole as per state practice)-~~
- ~~b. 11/13 m long galvenised H Beam 152x152 mm 37.1 kg/m.-~~
- ~~c. 11 M long steel Tubular poles of Designation 540 SP 52 (IS 2713, Pt I, II, III 1980)~~
- ~~d. 13 M long steel Tubular poles of Designation 540 SP 72 (IS 2713, Pt I, II, III 1980)~~
- ~~e. 11/33 m Wide Galvanised Parallel Beam GI Poles (160x160 mm) extendable with jointing plates 30.44kg per meter~~

~~In rural area, PCC poles are to be used. In urban area, PCC or H-Beam or STP or Wide Parallel Beam supports are to be used of suitable length, however the precise utilization will depend on site conditions . In hilly areas where handling of material is a challenge, tubular poles or Wide Parallel Beam poles expandable with jointing plaes may be used. In location specific conditions like forest area, vicinity of other existing overhead lines or permanent structures etc, H beam or tubular poles or Wide Parallel Beam supports may be used of suitable length. Steel bottom plate shall be used in steel tubular poles/H-Beam / Wide parallel Beam and cement concrete reinforced plate shall be used as base plate for PCC poles. Steel tubular poles and WPB poles shall be cleaned till good surface finish and painted with 2 or more coats of red oxide paint and 2 or more coats of aluminium paint till good finish. Steel tubular poles and H Beams shall also be painted with 2 or more coats till good surface finish~~

~~with anti-corrosive paint (in case of tubular poles shall also be painted on the inner walls) which goes in to the foundation. Project Manager shall approved brand and shade of paints.~~

~~Steel tubular poles shall be cleaned till good surface finish and painted with 2 or more coats of red oxide paint and 2 or more coats of aluminium paint till good finish. Steel tubular poles and H Beams shall also be painted with 2 or more coats till good surface finish with anti-corrosive paint (in case of tubular poles shall also be painted on the inner walls) which goes in to the foundation. Project Manager shall approved brand and shade of paints.~~

~~Painting of H Beams and Steel Tubular Poles shall be performed at stores. Before shifting to site for erection, poles shall be offered for inspection and approval by Project Manager. In water bound areas and in NE areas, galvanized poles may be used. The minimum coating of the zinc on steel tubular poles or Wide Parallel Beam supports shall comply with IS: 2629 and IS: 2633 (with latest amendments). Galvanizing shall be checked and tested in accordance with IS: 2633.~~

~~The H beam poles shall be hot-dip galvanized thoroughly internally and externally as per according to IS: 2629 and IS: 2633 (with latest amendments). Galvanizing shall be checked and tested in accordance with IS: 2633.~~

~~Poles and other hollow items shall be galvanized both inside and out. The zinc coating shall be smooth, continuous and uniform. It shall be free from acid spots and shall not scale, blister or be removable by handling or packing. There shall be no impurities in the zinc or additives to the smelter bath that could have a detrimental effect on the durability of the zinc coating. Before pickling, all welding, drilling, cutting and grinding shall be completed and all grease, paint, varnish, oil and welding slag shall be completely removed.~~

~~All protuberances which could affect the life of galvanizing shall also be removed. To avoid the formation of white rust all galvanized material shall be packaged in such a way to ensure adequate ventilation between parts during shipping and storage.~~

~~Testing of galvanizing shall be performed for Uniformity of thickness as per IS 2633/1986, Mass of coating as per IS 6745/1972 and quantity of zinc, water quenching & centrifuging as per IS 2629/1985.~~

~~3.00 — Fabricated steel items:~~

~~The fabricated steel structures materials shall be hot-dip galvanized thoroughly internally and externally according to IS: 2629 and IS: 2633 (with latest amendments). Galvanizing shall be checked and tested in accordance with IS: 2633.~~

~~Fabricated steel structure items shall be galvanized both inside and out. The zinc coating shall be smooth, continuous and uniform. It shall be free from acid spots and shall not scale, blister or be removable by handling or packing. There shall be no impurities in the zinc or~~

~~additives to the smelter bath that could have a detrimental effect on the durability of the zinc coating. Before pickling, all welding, drilling, cutting and grinding shall be completed and all grease, paint, varnish, oil and welding slag shall be completely removed.~~

~~All protuberances which could affect the life of galvanizing shall also be removed. To avoid the formation of white rust all galvanized material shall be packaged in such a way to ensure adequate ventilation between parts during shipping and storage.~~

~~Testing of galvanizing shall be performed for Uniformity of thickness as per IS 2633/1986, Mass of coating as per IS 6745/1972 and quantity of zinc, water quenching & centrifuging as per IS 2629/1985.~~

~~4.00 Hardware:-~~

~~MS Nuts, bolts and washers (Galvanized) — 16 mm dia nuts, bolts & washers shall be used for tying of overhead structure items like cross arms, top clamps, brackets, clamps, bracing, strain plates etc.~~

~~While erecting, proper dimensions of nut bolts and washers must be ensured. 2 to 3 threads only be visible of the bolt after full tightening of nut on requisite torque. The hardware shall be hot dip galvanized. The minimum coating of the zinc shall comply with IS: 2629 and IS: 2633. Galvanizing shall be checked and tested in accordance with IS: 2633. Before shifting them to site for erection, they shall be offered for inspection and approval by Project Manager.~~

~~5.00 Stay Set:-~~

~~Galvanized Stay Set with 50x8 mm stay clamp, guy insulator (2Nos.), anchor plate (300x300x8mm), nut bolts, 2 Nos turn-buckles, 1.8 m long, 20 mm diameter solid GS stay rod & 7/4.00 mm dia GI stranded wire complete.~~

~~Stay set shall be used at all turning locations, conductor dead end location, double pole structure, triple pole structure, four pole structure to nullify the tension of conductor. At dead end locations, stay sets shall be used in pairs in separate foundations. Erection of storm guys at suitable location in straight line may also be provided.~~

~~0.3 cmt cement concreting in mixture 1 part cement, 3 part coarse sand, 6 part 40mm size aggregate stone chips (1:3:6) shall be provided in each stay set foundation. 2 Nos. guy insulator shall be provided in stranded GI wire at middle location between two turn buckles. Shuttering and vibrator shall be used for cement concreting works.~~

6.00—Earthing:-

~~Following earthing arrangements are envisaged for new 33 kV lines:~~

- ~~a. 40 mm dia., 3000 mm long GI pipe earth electrode with test link, RCC pit, RCC cover plate on GI frame, bentonite powder and other accessories complete~~
- ~~b. GI Earthing spike made of 20mm solid rod~~
- ~~c. Chemical rod earthing using Carbon powder/Bentonite powder / Conductive concrete powder including electrode with 2000mm long, 50 mm diameter GI pipe, GI Strip of 24x3mm minimum.~~
- ~~d. 8 SWG GI Earthing Coil.~~
- ~~e. 6 SWG GI wire for earthing and guarding~~
- ~~f. 8 SWG GI wire for earthing and guarding~~

~~Each 33 kV line support shall be provided with one GI earthing spike made of 20 mm solid rod or 8 SWG GI Earthing Coil and connected with 8 SWG GI wire. Overhead line structure shall be connected to GI earthing spike or GI Earthing Coil using 8 SWG GI wire. GI nuts, bolts & washers shall be used to join two GI wires and 20 mm solid spike rod. Project Manager shall decide use of GI Earthing Coil or GI Solid earth Road for earthing of individual poles.~~

~~At railway crossing, line crossing and other specific locations 40 mm dia, 3000 mm long GI pipe earth electrode with test link, RCC pit, RCC cover plate on GI frame, bentonite powder and other accessories shall be used. Overhead line structure at these locations shall be connected to GI earth pipe using 8 SWG GI wire. GI nuts, bolts & washers shall be used to join two GI wires and 40 mm GI earth pipe.~~

~~In rocky soil where getting required earth resistance is a challenge, chemical rod earthing shall be used. Overhead line structure shall be connected to chemical earth electrode using 8SWG GI wire. GI nuts, bolts & washers shall be used to join two GI wires and 20 mm solid spike rod.~~

~~GI flats and GI wires must be properly dressed, bundled and fixed on supporting structure at 1 to 2 feet intervals.~~

7.00—Insulator and hardware—

~~33 KV polymerPin insulator with suitable hardware fittings shall be used. Insulator should be tied properly using binding wire and tape/helical form fitting. In road crossing and line crossing locations bridling cross arms and pin insulator shall be used.~~

~~The individual insulator shall be checked for insulation resistance before overhead line installation. Insulator should properly be cleaned before installation. No damage/crack insulator should be used.~~

~~8.00 — ACSR/AAAC Conductors:-~~

~~Following ACSR Conductors (or equivalent AAAC conductor) are envisaged for new 33 kV lines:-~~

- ~~a. — 6/4.09 + 1/4.09 mm (80 mm² Al. Area) — Raccoon~~
- ~~b. — 6/4.72 mm + 7/1.57 mm (100 mm² Al. Area) — Dog~~
- ~~c. — 30/2.59 mm + 7/2.59 mm (150 mm² Al. Area) — Wolf~~
- ~~d. — 30/3.00 + 7/3.00 mm (200 mm² Al. Area) — Panther~~

~~Care should be taken while drawing conductor from the drum. Proper roller should be used while handling conductors during erection. Jointing sleeves, binding materials, PG clamps, bi-metallic conductor shall be used for conductor jointing, insulators fixing, jumpering and termination at equipment respectively.~~

~~Proper sag should be maintained using sag chart table. While tensioning, care should be taken to avoid tension on pin insulator. Therefore, proper alignment of line to be ensured. Conductor joint should not be in the middle span but may be planned nearer the support.~~

~~At terminal location, care should be taken while connecting two sections to avoid bird faults. Therefore, pin insulator is to be used to handle the conductor on DC cross arm (as per state practice).~~

~~9.00 — Pole numbering:-~~

~~Each support pole should be numbered properly labelled using yellow base and black indication marks (number or digits). 40/50 mm height digits/words should be used for this purpose. Base shall be made using 2 or more coats of yellow enamel paint till good surface finish. Base preparation shall be completed before shifting of poles to site for erection. Base painting and marking of digits should be performed by a skilled and trained painter using branded enamel paint, Project Manager shall approve type and brand of enamel paint.~~

~~Warning instruction, if any, of availability of two sources of 33 kV supply on same structure, at source structure, at cut points should exclusively be provided as per state practice.~~

~~10.00 Anti-climbing device:~~

~~3.5 kgs, 2.5mm dia (12 SWG) galvanized barbed wire shall be used on each 33 kV support. Galvanized barbed wire should be properly dressed and crimped at termination. While wrapping the wire on support, proper tension should be maintained.~~

~~11.00 Danger board:-~~

~~Each support should be provided with a danger board with pole clamps as per approved drawing. Danger board should be in bi-lingual languages (local language and English). Clamp for danger board, nut bolts and washers shall be painted with two or more coats of red-oxide and aluminium paints respectively till smooth surface before installation.~~

~~12.00 33 KV AB Switch:-~~

~~33 kV, 3-ph, 400 A, 3 Pin type, Vertical/Horizontal Mounting type, Gang Operated, AB Switch shall be installed at cut points and at suitable locations as per instructions of Project Manager. B Class GI pipe shall be used (without any joints) for operation of switch. AB Switch structure and handle must be earthed using 8 SWG GI wire.~~

~~13.00 Support foundation:-~~

~~Cement concrete in mixture 1 part cement, 3 part coarse sand, 6 part 40mm size aggregate stone chips (1:3:6) shall be used in all the types of 33 kV line supports.~~

~~While erecting supports (poles), shuttering must be used for concreting so that proper quantity of cement concrete mixture be used and assessed during inspection. During concreting proper compaction by means of mobile vibrator be provided. While starting work of support erection, gang wise shuttering and mobile vibrator shall be offered for inspection to Project Manager. While erecting support, mercury level gauge must be used to ensure vertical erection of support.~~

~~250mm dia X 12" inch size muffing shall be provided on steel tubular/ H Beam poles/wide parallel beam support to prevent direct entry of rain water along the poles. Cement Concrete of 1:2:4 (1 part Cement, 2 parts coarse sand and 4 parts 20mm aggregate stones chips) shall be used for individual poles~~

~~Steel plate shall be used in steel tubular poles/Wide parallel Beam/ H-beam supports and cement concrete reinforced plate shall be used as base plate for PCC poles.~~

~~14.00 33 kV line for underground railway crossing—~~

~~A separate composite item of railway crossing is kept in BoQ. 2 Nos. separate cables shall be laid in separate GI pipe enclosures. At a time, one shall be used and another shall be kept idle as spare in ready to join condition. Cable termination, cable identification, protective covering, laying of jumpering cable etc shall all be completed in this head. This composite item shall contain following key items:~~

- ~~a. 3Cx185Sqmm XLPE armored cable (approx. length is 0.3 km each) — 2 sets~~
- ~~b. 150mm dia GI pipe of A class (red color painted on edges) for cable protection in underground laying — 2 sets~~
- ~~c. 150mm dia GI pipe of B class (blue color painted on edges) for cable support at DP structure — 2 sets~~
- ~~d. Outdoor heat shrinkable cable jointing kits for main cable and jumpering cable — 4 Nos for main cable, 8 Nos for jumpering cables.—~~
- ~~e. 33 kV lightning arrester station class 10kA (6 nos.),~~
- ~~f. 4 Nos GI 3-meters long pipe earthing/chemical earthing,—~~
- ~~g. 6 SWG GI wires with GI nuts, bolts & washers,—~~
- ~~h. Cable markers,—~~
- ~~i. Bi-metallic clamps,—~~
- ~~j. Jumpering with 33 kV Arial Bunched Cables 200 Sqmmdia (10 mtr) etc — 4 sets~~

~~Detail GPS Survey of location of railway crossing be performed by Contractor to avoid multi-crossing at nearby location. Prior railway permission for execution of this work shall be obtained by Project Manager for which necessary technical support shall be provided by Contractor. Line crossing shall be performed using underground cabling. Block on railway traffic shall be arranged by Project Manager. Contractor should ensure timely completion of work during block period by mobilizing requisite man, materials and machine at crossing locations.~~

~~Horizontal drilling machine shall be used for horizontal bore below railway tracks.—~~

~~15.00 Quality & Quantity inspection and compliance to the observation:—~~

~~The line works, before or after commissioning/energisation, shall be inspected by Quality Inspectors and State Inspection Inspectorate. Contractor shall provide all requisite details of line like approved GPS Survey report, as built drawings and joint measurement sheet etc to the inspector. Contractor shall rectify defects/deficiencies and submit compliance to the observations with supporting photographs in digital form within one month from receipt of observations.~~

~~16.00 Tree-cutting/trimming of tree:~~

~~The Contractor shall count, mark and put proper numbers with suitable quality of paint at his own cost on all the trees that are to be cut/trim to obtain required tree clearance. Contractor shall pay compensation for any loss or damage for tree cutting due to Contractor's work. Wherever forest clearance is envisaged for execution of work, clearance of forest department for tree cutting, if required, shall be arranged by the Project Manager and compensation shall also be paid by the Project Manager. Necessary fee if required to pay to Govt. dept. for arranging such clearances shall paid by Project Manager. However, the Contractor would require to provide all necessary assistance for execution of this work.~~

~~17.00 Statutory clearances:~~

~~During execution of 33 KV Line work, all statutory clearances shall be ensured for ground clearance, line-to-line clearance, road crossing clearance, horizontal and vertical clearances from buildings/objects etc. All road crossings and line crossings shall be guarded as per specifications. Conductor joint should not be provided in mid span length. Instead, it should be nearer to the support.~~

13.2.66/11KV new Substation**1.00 Electrical Details of New 66/11 KV Grid Substations**

No	Name of Proposed Substation	Circle/ town	66 KV line LHO or Radial	Capacity in MVA	Nos of proposed 11 KV outgoing feeders

2.00 Following works are in the scope of Employer:

- a) Acquisition of land for the substation and its possession to start constructional activities,
- b) Approach road to the substation land,
- c) Availability of up-stream source and plan for incomer 66KV line (if the same is not part of package)
- d) General layout of the substation
- e) Three (3phase) 415V AC power supply at one point on Contractor's expense & as per prevailing electricity tariff provided LT network is available in the vicinity of the proposed substation.
- f) Space for construction office & store yard for agency provided free of charge provided it is available at site.

Since above works are not covered under substation works, Employer shall provide all above input before start of substation work by turnkey Contractor. A format protocol note for handing over/taking over of sub-station land, approach road, retaining wall(wherever needed) and layout plan shall be signed between Project Manager and authorized representative of Turnkey Contractor.

3.00 Following works are in the scope of Contractor:

The scope of works include on turnkey basis for design, engineering, manufacturing, shop-testing, transportation, supply, storage, erection, testing & commissioning of the following:

- i. 66/11 KV new Sub-station at specified locations with 66 KV outdoor switchyard comprising ofnos. bays withnos. 66/11 KV 16/20/25/30 MVA Power Transformers, 66/11 KV transforms bays, 66 KV bus coupler bay and 11 KV indoor switchgear along with switchyard control room and all associated facilities (to be modified suitably by utility).

The Scope includes:

- a) ~~Complete design and engineering of all the systems, sub-systems, equipment, material and services.~~
- b) ~~Providing engineering data, drawings and O&M manuals for Employer's review, approval and records.~~
- c) ~~Manufacturing, supply, testing, packing, transportation and insurance from the manufacturer's work to the site including port and customs clearance, if required.~~
- d) ~~Receipt, storage, insurance, preservation and conservation of equipment at site.~~
- e) ~~All civil and structural works as required.~~
- f) ~~Fabrication, pre-assembly (if any), erection, testing and putting into satisfactory operation of all the equipment/material including successful commissioning~~
- g) ~~Satisfactory conclusion of the contract.~~
- h) ~~Enabling work as per the site requirement.~~

~~In addition to the requirements indicated herein, all the requirements as stated in other sections shall also be considered as a part of this specification as if completely bound herewith.~~

~~The Bidder shall be responsible for providing all material, equipment and services specified or otherwise which are required to fulfill the intent of ensuring operability, maintainability and the reliability of the complete work covered under this specification.~~

~~It is not the intent to specify all aspects of design and construction of equipment mentioned herein. The systems, sub-systems and equipment shall conform in all respect to high standards of engineering, design and workmanship, and shall be capable of performing in continuous commercial operation.~~

~~Whenever a material or article is specified or described by the name of a particular brand, manufacturer or trade mark, the specific item shall be understood as establishing type, function and quality desired. Products of other manufacturers may also be considered, provided sufficient information is furnished so as to enable the Employer to determine that the products are equivalent to those named.~~

~~The scope of work shall comprise, but not limited to the design, engineering, manufacture, testing and inspection at manufacture's works, packing, supply, transportation, transit insurance, delivery to site, unloading, and storage and equipment erection including associated civil and structural works. Further it shall include the cabling, lighting, earthing, supervision, site testing, inspection and~~

~~commissioning of Sub-Station. The scope shall also include all enabling works required for modification to existing facilities within the project area.~~

~~a. Bay Details:~~

~~The Sub-Station shall comprise ofnos. of 66/11 kV Transformer bay, 1 No. 66 kV Bus-Coupler bay. The Sub-Station shall be with Double Main bus-switching scheme for 66 kV (to be modified suitably by utility).~~

~~66 kV Bus bar shall be of ACSR zebra/..... conductor (to be filled by utility).~~

~~The equipment and materials to be supplied by the Bidder shall form a complete 66 kV Sub-Station.~~

~~Any items though not specifically mentioned but which are required to make the switchyard complete in all respects for its safe, efficient, reliable and trouble free operation shall also be deemed to be included and the same shall be supplied and erected by the Bidder without any additional cost to Employer. The following items of works are covered under scope-~~

- ~~➤ 66 kV equipment including structures: Circuit Breakers, Isolators with/without earth-switch, current transformers, surge arresters, bus-post insulators and capacitor voltage transformers.~~
- ~~➤ Sub-Station Control Room Building or extension of existing one.~~
- ~~➤ —66/11 kV Power Transformer of rating as specified (16/20/25/30 MVA as specified in BOQ)~~
- ~~➤ Structures for supporting XLPE Power Cables connected to Secondary Terminals of Power Transformer.~~
- ~~➤ 11 KV MVAR Capacitor bank, isolator, series reactor & associated equipments forbanks of MVAR with structure (details to be filled by utility).~~
- ~~➤ 100 kVA, 11 kV / 415V Station Transformer.~~
- ~~➤ 11kV metal clad indoor switchgear with draw out type VCB, CT and PT, all control, protection and mimic arrangement.~~
- ~~➤ Vacuum Contactor Panel for capacitor feeder.~~
- ~~➤ DC System: 220V.~~
- ~~➤ 66 kV Sub-Station including internal roads, drains, boundary wall, gates, Barbed wire fencing for complete substation boundary & Chain Link fencing for Switchyard, Borewell, oil sump pit, Geo Technical GPS Survey, soil investigation, Soil filling & compaction including construction of retaining wall for Civil Works as required.~~
- ~~➤ Supply & Erection of material for all Civil Works including equipment & gantry structure~~

~~complete for 66KV outdoor yard equipment for transformer bay & line bay including earthing system & lightening protection etc. Erection including supply of material for transformer foundation, cable trench extension, fire wall for new power transformer.~~

- ~~66 kV Sub-Station Materials.~~
- ~~ACSR Zebra Conductor.~~
- ~~G.S. Earth wire.~~
- ~~Insulators and Hardware.~~
- ~~Clamps, Connectors and Spacers.~~
- ~~Bay Marshalling Box.~~
- ~~Fire Fighting Equipment~~
- ~~Complete earthing grid for a system fault current of 31.5 KA and 1s duration (to be modified suitably by utility if required), earthing of all switchyard equipment including transformers and direct stroke lightning protection system and its connection to earthing grid.~~
- ~~Bidder shall make earth resistivity measurements at site and design the earthing grid as per latest edition of relevant standards.~~
- ~~Complete Direct Stroke Lightning Protection using Lightning Mast and/or shield wire and its connection to earth mat.~~
- ~~Power & Control cables, cabling (including inter pole and inter panel), Cabling between equipment and panels, cable support angles, cable trays and accessories necessary for cable erection such as glands, lugs, clamps for cables, ferrules, cable ties, hume pipe etc., cable route markers for buried cables, cable trench with covers also included in the scope.~~
- ~~Power & Control cable schedule & termination schedules shall be prepared by the Bidder.~~
- ~~Internal and outdoor lighting system for control room building and 66 kV Sub-Station. The substation area inside the fencing should be illuminated provided with 100 Watts LED flood light fittings. Tubular poles 12m high as per IS: 2713 (Latest Version) shall be used for installation of area light fixtures in Urban as well as Rural substations. Internal electrification of the control room includes provision of fans, exhaust fans, LED illumination fixtures, switches and sockets. Control Room lighting shall be designed to ensure 300 lux illumination level through LED lamp fittings. The bidder shall submit calculation for achieving the above illumination before start of lighting work for approval of project manager.~~
- ~~Control, protection and metering system.~~

b. ~~Services and Items:~~

~~The scope includes but not limited to the following services/items described herein and elsewhere in specification:~~

- ~~a) System design and engineering~~
- ~~b) Supply of equipment and material~~
- ~~c) Civil works~~
- ~~d) Structural works~~
- ~~e) Erection works~~
- ~~f) Project management and site supervision~~
- ~~g) Testing and commissioning~~
- ~~h) Clearances from statutory authorities.~~

~~e. System Design and Engineering:~~

- ~~i. The Bidder shall be responsible for detailed design and engineering of overall system, sub-systems, elements, system facilities, equipments, auxiliary services, etc. It shall include proper definition and execution of all interfaces with systems, equipment, material and services of Employer for proper and correct design, performance and operation of the project.~~
- ~~ii. Bidder shall provide complete engineering data, drawings, reports, manuals etc. for Employer's review, approval and records.~~
- ~~iii. The scope shall also include the design and engineering as per details elaborated elsewhere in this specification.~~
- ~~iv. The Bidder shall carry out earth resistivity measurements at the switchyard site~~
- ~~v. Relay setting calculations shall also be submitted by the Bidder for approval.~~
- ~~vi. For all civil and structural works, the Bidder shall carry out design calculations; prepare all the detailed construction and fabrication drawings.~~

~~4.00 Arrangement by the Contractor~~

~~Contractor shall make his own necessary arrangements for the following and for those not listed anywhere else:~~

- ~~1. Distributions of power supply at all work areas in the substation premises.~~
- ~~2. Construction of office and store (open & covered)~~
- ~~3. Construction of workshop and material/field testing laboratory~~
- ~~4. Fire protection and security arrangements during construction stage~~

~~5.00 Civil works:-~~

~~Details scope under civil works have been provided in this Part 2, Section 6 "Civil Works and Soil Investigation" mentioned subsequently.~~

6.00 Basic Reference Drawings

The reference drawings, which are indicative of the type of specifications Employer intends to accept, shall be developed by Contractor and approved by Project Manager. The Contractor shall maintain the overall dimensions of the substation, buildings, bay length, bay width, phase to earth clearance, phase to phase clearance and sectional clearances, clearances between buses, bus heights but may alter the locations of equipment to obtain the statutory electrical clearances required for the substation.

13.3.New 33/11 kV Power Substation

1.00 Electrical Details of New 33/11 KV Grid Substations

No	Name of Proposed Substation	Division	33KV line LLO or Radial	Capacity in KVA	Nos of proposed 11 KV outgoing feeders

2.00 Following works are in the scope of Employer and shall be executed by Project Manager:

- a) Acquisition of land for the substation and its possession to start constructional activities,
- b) Approach road to the substation land,
- c) Leveling of the substation land,
- d) Construction of retaining wall wherever required including cutting, digging or filling of earth as required,
- e) Availability of up stream source and plan for incomer 33 KV line (if the same is not part of package)
- f) General layout of the substation
- g) Three (3phase) 415V AC power supply at one point on Contractor's expense & as per prevailing electricity tariff provided LT network is available in the vicinity of the proposed substation.
- h) Space for construction office & store yard for agency provided free of charge provided it is available at site.

~~Since above works are not covered under substation works, Employer/Employer shall provide all above input before start of substation work by turnkey Contractor. A format protocol note for handing over/taking over of sub-station land, approach road, retaining wall(wherever needed) and layout plan shall be signed between Project Manager and authorized representative of Turnkey Contractor.~~

~~3.00 Types of substation: Two types of substations are envisaged under this head as per following:~~

- ~~a. **Partly-Outdoor substation**—in this type, 33KV section comprising breakers, isolators, 11/0.4 KV station transformer, CTs, PT, Lightning Arrester, Power Transformer& 11 KV Capacitor Bank, 33KV gantry shall be installed in out-door switch yard. Control panels of breakers shall be installed inside the control room. All 11KV equipment like CTs, Breakers and control panels, feeder meter shall be installed inside the control room. 11 KV cables shall be used for connection of power transformer and breaker and Breaker to outgoing isolators. 11KV feeder isolators and 11KV Lightning Arresters shall be installed outdoor.~~
- ~~b. **Fully-Outdoor substation**—in this type, all 33KV and 11 KV equipment comprising Breakers, Isolators, CTs, PT, 11/0.4 KV Station Transformer, Lightning Arrester, Power Transformer, metering equipment and 11 kV capacitor bank shall be installed in substation yard i.e. outdoor. Control panels and feeder meter shall be installed indoor. Fully outdoor substation shall be constructed using H-beam support or gantry structure supports as decided by Project Manager.~~

~~4.00 Power Transformers:-~~

~~Power Transformers shall be 33/11 kV, 3 ph, 50 Hz, ONAN, Cu Wound, Outdoor Conventional type Power Transformer along with transformer oil, Buchholtz relay, breather, OTI & WTI, Marshalling Box, Conservator tank, oil level indicator, valves, Vent explosion plug, control wiring between sensing equipment and marshalling box, cable supporting tray on the body of transformer, transformer wheels, LV/HV bushing etc as required. Following type and capacity of power transformers are envisaged under the scheme:-~~

- ~~a) 1.60 MVA without tap changer~~
- ~~b) 3.15 MVA without tap changer~~
- ~~c) 5.00 MVA with off load / on load tap changer~~
- ~~d) 6.3 MVA with off load / on load tap changer~~
- ~~e) 8.00 MVA with off load / on load tap changer~~
- ~~f) 10.0 MVA with off load / on load tap changer~~
- ~~g) 12.5 MVA with off load / on load tap changer~~

~~Or any other rating as per latest Indian Standard Specification. Corresponding bus conductor, gantry structures, LA, CT, Breaker, Isolators, Earth switch, Power Cables may be added as per the requirement of the equipment.~~

~~Transformer foundations shall be designed by turnkey Contractor considering manufacturer's recommendations. Cement concrete including reinforcement steel shall be used for the foundation. Project Manager shall approved design and drawings of foundations. Proper shuttering, vibrator, curing shall be performed while constructing the foundations. Transformer rails shall also be provided for mounting of transformers on wheels.~~

~~2 sets of 50x8 mm galvanized neutral earthing strips shall be supplied with the transformer along with braided copper conductor links for connections at bushing ends. Two distinct earth connection shall be provided for neutral earthing. The earthing strips shall be mounted on 11KV post insulators. An isolating link shall be provided on individual earth strips for testing purposes.~~

~~Transformer protective equipment like OTI, WTI and Buchholtz relay shall be tested during pre-commissioning stage. Their electric connection upto marshalling box shall be performed as per Original Equipment Manufacturer recommendations. Cable tray shall be installed for laying of control cable shall be laid on cable tray on transformer body so that cable shall not get heated by transformer temperature. While commissioning the transformer tripping of breaker through all these equipment must be checked.~~

~~5.00 Breaker:-~~

~~33 kV & 11 kV Vacuum Circuit Breakers shall be used for protection and control of power circuits. In partly outdoor substation, all 11 KV switchgears shall be indoor mounted type and 33 KV breakers shall be outdoor mounting type whereas in fully outdoor substation, 11 KV as well as 33 KV breakers shall be outdoor mounting type. In both the type of substation, control panels shall be indoor type. Outdoor breakers are to be supplied with Current Transformers. The outdoor mounting type breakers shall be supplied with its mounting galvanized steel structures.~~

~~Detailed cable schedules, termination details and circuit diagrams of control panels, transformer marshalling box, breaker marshalling box, and capacitor banks equipment shall be prepared and submitted by turnkey Contractor for approval of Project Manager before commencing the work.~~

~~Cement concrete including reinforcement steel shall be used for the foundation. Project Manager shall approved design and drawings of foundations. Proper shuttering, vibrator, curing shall be performed while constructing the foundations for breaker.~~

~~Permanent maintenance platform shall be constructed for outdoor breakers and CT. Project Manager shall approve design of platform.~~

~~Control wiring between CT/breaker and control panel for outdoor mounting breakers/CT shall be routed through Junction box. Metallic Junction box shall be installed on support gantry structure of substation or on MS angle (50x50x6 mm) support. The boxes are to be erected, electrically connected with the existing system, properly earthed, and labeled. The test report of pre-commissioning checks shall be prepared and submitted. All CT terminals are to be ring type and other terminals are of fork type. 2.5 sqmm copper multi stands wiring 1.1 KV grade, ISI marked, IS 694 shall be used for control wiring. A terminal block be provided between CT and Meter keeping 20% spare terminals. The Junction box are to be earthed using 8 SWG GI wire direct connection to the earthing. 2 Nos Earthing bolts on the Distribution Box shall be provided of 10mm dia.~~

~~6.00 Station Transformer:-~~

~~100 KVA, aluminium / copper wound, 11/0.4 KV (or 33/0.4 KV) Station Transformers shall be installed on DP structure made of H Beam 152x152 mm 37.1 kg 8 meter long or parallel flanged beams WPB 160X30.44. Outdoor type Distribution Box complying to IS 13410 for station transformer shall be comprising of 200 A switch fuse unit, 6 Nos SP MCCB 90 A, 2 Nos 32 A SP MCCB, 3-ph, 63A, contactor controlled yard lighting timer unit, tri-vector electronic energy meter (mounted in separate metallic LTCT cum meter box) with suitable CT, control/power cabling and terminals, 1 No 20 A Industrial socket and switch for local power supply requirements, mounting channel, clamps and hardware.~~

~~The Station Transformer substation shall be provided with Station Class LA, 33KV / 11KV AB Switch and 33KV / 11KV HG Fuse. Except type of Distribution Board, Lightening Arresters, and DP Structures, all other scope of work as mentioned under 100 KVA capacity Distribution Transformer work shall be the scope of work under 100 KVA Station Transformer on LT side.~~

~~7.00 Gantry structures:~~

~~There are two type of gantry structures envisaged under the scheme.~~

- ~~a) Gantry structures made of H Beam 152x152 mm 37.1 kg 8 meter long or parallel flanged beams WPB 160X30.44 kg/m, double MS Channel 100x50mm for bus bar supports (Beam), 65x65x6mm angle for cross arms/supporting structures and 50x8mm flats for clamps along with hardware items duly painted etc., and~~

- b) ~~Gantry structures made of Lattice structures of equal angles sections, flat as per approved drawings. State practices are to be adopted in the design. All structural steel members and bolts shall be galvanized after fabrication as per IS:4759 and zinc coating shall not be less than 610gm/sq. meter for all structural steel members. All L45x45x5 will have 23 mm back mark. All L50x50x6 will have 28mm back mark. 3.5mm spring washers are to be used under each nut, structural steel shall conform to IS 2026. All weld shall be 6mm filled weld unless specified otherwise. All nuts and bolts shall be of property class 5.6 of IS 1367. Plain washers shall be as per IS 2016 & spring washers shall be IS: 3063.~~

~~The gantry steel structures materials shall be hot dip galvanized thoroughly internally and externally as per according to IS: 2629 and IS: 2633 (with latest amendments). Galvanizing shall be checked and tested in accordance with IS: 2633.~~

~~The gantry steel structure items shall be galvanized both inside and out. The zinc coating shall be smooth, continuous and uniform. It shall be free from acid spots and shall not scale, blister or be removable by handling or packing. There shall be no impurities in the zinc or additives to the smelter bath that could have a detrimental effect on the durability of the zinc coating. Before pickling, all welding, drilling, cutting and grinding shall be completed and all grease, paint, varnish, oil and welding slag shall be completely removed.~~

~~All protuberances which could affect the life of galvanizing shall also be removed. To avoid the formation of white rust all galvanized material shall be packaged in such a way to ensure adequate ventilation between parts during shipping and storage.~~

~~Testing of galvanizing shall be performed for Uniformity of thickness as per IS 2633/1986, Mass of coating as per IS 6745/1972 and quantity of zinc, water quenching & centrifuging as per IS 2629/1985.~~

~~0.5m³ cement concrete in mixture 1 part cement, 3 part coarse sand, 4 part 20mm size aggregate stone chips (1:3:4) shall be used in all the types of gantry supports.~~

~~While erecting supports (poles), shuttering must be used for concreting so that proper quantity of cement concrete mixture be used and assessed during inspection. During concreting proper compaction by means of mobile vibrator be provided. While starting work of support erection, gang wise shutting and mobile vibrator shall be offered for inspection to Project Manager. While erecting support, mercury level gauge must be used to ensure vertical erection of support.~~

~~300x300mm X 12" inch height muffing shall be provided on gantry support to prevent direct entry of rain water along the support. Cement Concrete of 1:2:4 (1 part Cement, 4 parts coarse sand and 4 parts 20mm aggregate stones chips) shall be used for individual poles.~~

8.00 AC Distribution board (ACDB)-

~~415 Volts, ACDB (IP 54 protection) shall be indoor floor mounted with mounting arrangements, three phase neutral voltmeter, three phase ammeter and Selector switches, 63 Amps TPN switch fuse unit in incomer circuit, 32 Amps TPN switches in outgoing circuits equals the number of indoor breaker control panels plus number of outdoor VCB kiosk panel and having 20% spare outgoing circuits, etc. Alternatively, ACDB can also be erected on separate MS frame made of 50x50x6 angle.~~

~~Substation flooring shall be provided with suitable inserts to fix ISMC 75 channel. This channel shall hold ACDB board. The board shall be installed on indoor trench. Cables shall have bottom entry. The board shall be grounded by 50x6mm GI strip at two distinct connections.~~

9.00 DC Distribution board (DCDB)-

~~Indoor floor mounted, IP 54 protection, two pole 100 Amp 2 pole DC Switch Fuse unit as incomer, two pole 40 Amp Switch Fuse units in outgoing circuits equals the numbers of indoor breaker control panels plus numbers of outdoor VCB kiosks panels plus control room lighting panel and 20% spares outgoing circuits. Direct Current Distribution Board shall be installed in each substation. It would comprises of DC volt meter including mounting arrangements etc as required as per technical specifications, approved drawings and scope of works. Alternatively, DCDB can also be erected on separate MS frame made of 50x50x6 angle.~~

~~Substation flooring shall be provided with suitable inserts to fix ISMC 75 channel. This channel shall hold DCDB board. The board shall be installed on indoor trench. Cables shall have bottom entry. The board shall be grounded by 50x6mm GI strip at two distinct connections.~~

10.00 Cables:-

- a. ~~**Control cables:** 1.1 KV grade 2.5 mm² PVC insulated and PVC sheathed, armored, stranded, copper control cable with 2 core, 6 core and 10 core are envisaged in the substation.~~
- b. ~~**HT Power Cables:** In partly outdoor substation, 11KV XLPE Cables shall be used as per following requirements;~~
 - ~~Between Power Transformer and Main transformer breaker~~
 - ~~Between Feeder breaker and outdoor feeder DP structures~~
 - ~~Between capacitor bank switch and capacitor bank~~

c. ~~LT Power cables: 1.1 KV grade, armored, stranded, aluminum power cable PVC insulated and PVC sheathed with complete accessories as per detailed engineering~~

- ~~3.5Cx150mm² (between station transformer & Distribution Box)~~
- ~~3.5Cx70mm² (between Distribution Box & yard receptacles)~~
- ~~3.5Cx35mm² to be used from Station Transformer Distribution Board to:~~
 - ~~Control room building Internal Electrification DB,~~
 - ~~ACDB Board,~~
 - ~~Tube well Start Panel,~~
 - ~~Outdoor area lighting control and distribution panel~~
- ~~2 core x16 mm² for supply to area lighting masts.~~

d. ~~LT cable for Internal Electrification works: following cables shall be used for internal electrification purpose:-~~

- ~~1.1 KV PVC insulated PVC sheathed ISI marked, IS 694, 10mm², copper conductor, stranded, for internal electrification works between main DB and Sub DB or Sub DB to switch board,~~
- ~~1.1 KV PVC insulated PVC sheathed ISI marked, IS 694, 2.5mm² /4.00mm², copper conductor, stranded, for internal electrification works light & Fan and Power circuits respectively,~~
- ~~1.1 KV PVC insulated PVC sheathed ISI marked, IS 694, 4.00mm², copper conductor, stranded weather proof cable for connection between outdoor area lighting luminary fixtures and its junction boxes,~~

~~Power Cables are to be laid as per best engineering practices. Power and control cables are to be laid in different alignments in cable trench. However, in case power/control cable is required to extend up to the equipment where cable trench is not constructed, they shall be laid in underground trench of width 300 mm wide, provided with 2nd-class brick protection (Approx. 10 bricks per meter length of laying) and sand protective covering (200 mm thick) and laid at the depth of 750mm minimum for LT cables and 1000mm for 11 kV cables. Laying specification of cable shall be as detailed in CPWD specification of laying power cables. Suitable loop length of 1.5 meter to be kept at the end points. Excessive loop lengths shall not be paid.~~

11.00 Metering & metering equipment:-

~~Following two types of metering equipment are envisaged in the work comprising of:~~

- a. ~~33 kV/110 V Metering equipment (CTPT unit) with CT of ratio 400-200/5 A~~
- b. ~~11 kV/110 V Metering equipment (CTPT unit) with CT of ratio 300-150/5 A~~

~~Meter shall be HT trivector DLMS compliant category suitable for substation/feeder metering.
Meter shall be 3 ph 4 w 110 V 5 A accuracy class 0.5s with GSM (GPRS compatible) modem.~~

12.00Junction Box and Control Cabling:

~~Junction box is to be installed on support gantry structure of substation or erected on separate galvanized steel structures in the yard nearer to metering equipment. The boxes are to be erected, electrically connected with the existing system, properly earthed, and labeled. The test report of pre-commissioning checks shall be prepared and submitted.~~

~~All CT terminals are to be ring type and other terminals are of fork type. 2.5 sqmm copper multi stands wiring 1.1 KV grade, ISI marked, IS 694 shall be used for control wiring. A terminal block be provided between CT and Meter keeping 20% spare terminals.~~

~~The Meter cum meter box are to be earthed using 8 SWG GI wire direct connection to the earthing. 2 Nos Earthing bolts on the distribution boards shall be provided of 10mm dia.~~

13.00Capacitor banks:-

~~Capacitor banks of 600 KVAR, 1200 KVAR and 1500 KVAR capacity shall be provided with 3.15 MVA, 5.0 MVA and 8.0 MVA capacity power Transformer respectively. Capacitor bank shall comprises of switching vacuum circuit breaker, current transformers (100-50/5-5A), fully automatic control panel mounted inside the substation buildings, 11 KV residual voltage transformer, 11 KV three phase Isolator, Earthing system, capacitor banks complete with individual fuses, interconnection mounting rakes, external fuses mounting arrangement, base insulators & accessories, 3 Nos. 11 KV single phase Metal oxide (Gap less) lightning arresters, isolators etc as per requirements. Hot dip galvanized mounting structure made of sections of 100x50x6 mm channel or 75x40x6 mm channel or 75x75x8 mm equal angles only.~~

14.00DC emergency lighting:

~~At least four Philips make LED bulbs are to be provided of 7 watts {2 Nos in control room, 1 No in station battery room, 1 No in yard area}. These bulbs shall be fed by DC station battery. The wiring of these bulbs shall be so designed that it will automatically turn ON in event of failure of normal power supply. Provision for putting these bulbs OFF by operator is also to be provided. Wiring is to be performed concealed using PVC insulated PVC sheathed 2.5 mm² stranded copper wire. An automatic change over switch is envisaged for this purpose. This may be installed at prominent location, generally easily approachable by operator in the substation control room.~~

15.00 Station Battery and battery Charger:

~~Station battery are to be supplied with wooden racks made of teak/sal wood planks of thickness not less than 25mm, support legs made of size not less than 2 inches X 2 inches. The battery may be placed on two tier formation of stand. The construction of battery rack shall suit site conditions of their placement. The rack shall be painted with three coat of acid proof paint of reputed make as approved by Project Manager. No metal fasteners / nails shall be used for construction of battery racks. The stand shall be supported on insulators to obtain necessary insulation from the earth and there shall be insulators between each cell and stand.~~

~~Initial charging of stationary battery shall strictly be as per Original Equipment Manufacturer (OEM) recommendations. Detail charging and discharging cycle readings shall be recorded and submitted to Project Manager for approval.~~

~~Battery room shall be provided with exhaust fan of air displacement capacity more than six times volume of battery room per hour. Wooden doors and windows shall be provided in the battery room. Anti-acid tiles shall be used in the floor and upto six feet height of the wall of the battery room.~~

~~The battery connections / terminals are to be cleaned and provided with petroleum jelly. Terminals hardware is to be provided with connecting cables. The inter-battery wiring cable shall be neatly dressed using cable ties, clamped and wired using ferrules, tag mark. New battery sets are to be provided with battery chargers as per detail specifications enclosed. Interconnecting cables and power supply cables originating / terminating at the battery charger, shall be neatly dressed using cable ties, clamped and wired using ferrules, tag marks, double compression glands etc as applicable. Connecting cable and associated materials needed for commissioning of charger shall be treated as part of the battery charger. 1.1 KV multi-stands, 30 sqmm, copper conductors, PVC insulated and PVC sheathed cable for DC wiring between DCDB and Battery bank.~~

~~The agency shall provide following equipment at all the substations:-~~

- ~~a) Two copies of battery instruction sheet duly laminated,~~
- ~~b) Two sets of ISI marked electrical hand gloves,~~
- ~~c) One cell testing voltmeter 3 — 0 — 3 volts,~~
- ~~d) Two syringe hydrometers~~
- ~~e) One thermometer with specific gravity correction scale,~~
- ~~f) One set of suitable spanners,~~
- ~~g) Two acid resistant funnel,~~

h) ~~One acid resisting jar of 2 liters capacity,~~

16.00 ~~Outdoor type Current Transformer and Potential Transformer:-~~

~~Outdoor type CTs are to be erected on supporting structure provided on the breaker structure or suitable structure as per state practices. Potential Transformers shall be erected on gantry structures and connected with bus. In both the case, separate metallic Junction Box shall be installed on support gantry structure of substation or erected on separate galvanized steel structures in the yard nearer to equipment. The boxes are to be erected, electrically connected with the existing system, properly earthed, and labeled. The test report of pre-commissioning checks shall be prepared and submitted for approval of Project Manager.~~

~~All CT terminals are to be ring type and other terminals are of fork type. 2.5 sqmm copper multi stands wiring 1.1 KV grade, ISI marked, IS 694 shall be used for control wiring. A terminal block be provided in the junction box keeping 20% each spare ring type/fork type terminals.~~

~~The junction box shall be earthed using 8 SWG GI wire direct connection to the earthing. 2 Nos Earthing bolts on the junction box of 10mm dia.~~

~~Testing and pre commissioning checks shall be conducted in accordance with OEM recommendations and as approved by the Employer. Terminal connectors at HT as well as LT side shall be provided with the CT/PT equipment.~~

17.00 ~~Control Panels:-~~

~~New panels as per the requirement of protection like feeder protection, transformer protection or incomer protection are to be supplied with each newly supplied breaker:-~~

- ~~a. In case of fully outdoor type substation, control Panel to be erected on ISMC75 (75x40x6 mm) MS channel duly welded on MS angle inserted on indoor trench. Panels shall then be properly aligned, Cables shall enter with double compression glands, codified, lugged, and dressed.~~
- ~~b. Breaker cum control panel shall be erected on ISMC 100(75x50x6 mm) MS channel duly welded on MS angle inserted on indoor trench. Panels shall then be properly aligned, Cables shall enter with double compression glands, codified, lugged, and dressed.~~
- ~~c. Functional checks shall be performed on the control panel as per control wiring diagram.~~
- ~~d. All alarm, annunciation and trip circuits / indication & alarm circuits shall be tested and made operative,~~
- ~~e. The indication lamp shall be LED type lamp as per given specifications and shall be made operative,~~
- ~~f. Indicating instruments shall be calibrated,~~

- ~~g. Grounding of panel at two different locations by 50x6mm flat shall be provided.,~~
- ~~h. Control relays shall be calibrated and checked for tripping and closing operations,~~
- ~~i. Pick up time / trip time and tripping at normal and reduced voltages shall be checked, properly adjusted and recorded,~~
- ~~j. Latching arrangement of relays shall be checked for operation,~~

~~18.00 Lightning Arrester:-~~

~~Station Class LAs will be used in 33 KV and 11 KV with base steel structure, terminals bi—metallic connectors / PG clamps and earth connectors. LAs are to be connected with separate earth connection using 50x6mm GS flat. All LA terminals / connections are to be tightened. All lightening arresters installed in grid substations shall be Station Class Lightning Arresters.~~

~~19.00 Internal Electrification:-~~

~~Indoor Distribution Board having 63A TPN MCB, outgoing MCBs of suitable ratings for power and light & fan circuits are to be installed. Internal electrification of the control room includes provision of fans, exhaust fans, LED illumination fixtures, switches and sockets.~~

~~Two nos separate 3 m long 40 mm dia earthing shall be provided for internal electrification works. 8 SWG GI wires shall connect following equipment:~~

- ~~a. Main Distribution Board and Sub-Distribution Boards,~~
- ~~b. ACDB, DCDB, Battery Chargers each at 2 distinct locations~~

~~Internal Electrification works' wiring shall be provided with single core PVC insulated & PVC sheathed 2.5 mm² stranded ISI 694 marked copper flexible wire (for light and fan circuits) and 4.0 mm² stranded ISI 694 marked copper flexible wire (for power points) in conceal arrangement in 25 mm dia 2 mm thick PVC ISI marked pipe and 2.5mm thick switch boards in flash arrangement. Neutral links are to be used in each switchboards. Jointing in neutral conductor other than at switching board shall not be permitted.~~

~~Iron junction box made of 18 gauges CRCA sheet shall be used for switchboard; 2 mm thick cotton impregnated hylum sheet is to be used for the purpose of switch board. ISI marked switched and sockets are to be used for Internal Electrification works. Earth wire must be made available duly connected with earth circuit for Earthing in each and every switchboard.~~

~~Reputed make indoor double door Miniature circuit breaker DB fitted with Miniature Circuit Breakers of MDS/ Havells/ Standard make or equivalent ISI marked shall be used for the protection. Reputed make LED fittings and 5-star energy efficient BLDC fans are to be used~~

~~for the substation. These materials are to be procured from authorized dealer of the materials manufacturers only. Documentary evidence may be submitted for source of supply of all electrical materials. Before procurement of materials Project Manager shall approve make, type and quality of materials.~~

~~Control Room lighting shall be designed to ensure 300 lux illumination level through LED lamp fittings. The bidder shall submit calculation for achieving the above illumination before start of lighting work for approval of project manager.~~

20.00Yard Lighting:

~~The substation area inside the fencing shall be illuminated provided with 100 Watts LED flood light fittings. Each fitting and its Junction box enclosures shall be IP 55 protection type. Water and vermin proof-ness is a must. At least 4 Nos. fittings at all the four corners shall be provided. Acceptable make of fitting, fixtures and lamp are Philips, Crompton, Alstom, and Bajaj only.~~

~~Area light supply from Substation DB to be extended through 2X16 mm² PVC insulated PVC Sheathed aluminum stranded armored power cable laid in underground trench of width 300 mm wide, provided with 2nd class brick protection (Appro. 10 bricks per meter length of laying) and sand protective covering (200 mm thick) and laid at the depth of 750mm minimum. Laying specification of cable shall be as detailed in CPWD specification of laying power cables. Suitable loop length of 1.5 metre to be kept at the end points.~~

~~Pole mounted junction box (and not the Control Gear Box supplied with the fitting) shall be made of 2mm thick CR steel sheet of size 300X300X200mm fitted with SPN terminal block of 32A capacity, 10A SPN miniature circuit breaker of ISI mark and reputed manufacture. The JB shall be hot dip galvanized. The JB shall also conform to IP 55 protection for enclosure. Neoprene gasket shall be used in JB. 2 Nos. earthing terminals of 10 mm dia shall be provided with 25X6mm size of mounting clamps. Bidders shall get JB drawing approved before start of manufacturing.~~

~~4 Sq.mm, 1100V grade, weather proof three core (One core for phase, one core for Neutral and one core for earthing) aluminum stranded flexible conductor PVC sheathed and PVC insulated cable conforming to IS 694 shall be used for connection of fitting and its Control Gear Box from pole mounted Junction Box. Control Gear box must provide ISI approved components. Copper wound heavy chocks shall be acceptable.~~

~~Tubular poles 12m high as per IS: 2713 (Latest Version) or WPB 160x23.83 kg/m parallel flanged beams. embossed with ISI certification mark and pole designation shall be used for~~

~~installation of area light fixtures in Urban as well as Rural substations. Pole shall be designated as 410 — SP — 60. Poles and fitting structures shall be painted with two coat of anti — rusting bitumen paint inside and outside up to the planting depth and two coat zinc oxide paint followed by 2 or more coats of aluminum paint of approved make, brand and shade on portion of pole which will remain above ground level.~~

~~Steel tubular Poles/Wide Parallel Beams shall be hot dip galvanized thoroughly internally and externally as per according to IS: 2629 and IS: 2633 (with latest amendments). Galvanizing shall be checked and tested in accordance with IS: 2633.~~

~~Steel tubular Poles/Wide Parallel Beams shall be galvanized both inside and out. The zinc coating shall be smooth, continuous and uniform. It shall be free from acid spots and shall not scale, blister or be removable by handling or packing. There shall be no impurities in the zinc or additives to the smelter bath that could have a detrimental effect on the durability of the zinc coating. Before pickling, all welding, drilling, cutting and grinding shall be completed and all grease, paint, varnish, oil and welding slag shall be completely removed.~~

~~All protuberances which could affect the life of galvanizing shall also be removed. To avoid the formation of white rust all galvanized material shall be packaged in such a way to ensure adequate ventilation between parts during shipping and storage.~~

~~Testing of galvanizing shall be performed for Uniformity of thickness as per IS 2633/1986, Mass of coating as per IS 6745/1972 and quantity of zinc, water quenching & centrifuging as per IS 2629/1985.~~

21.00 ACSR / AAAC Conductor:

~~Following ACSR conductors (or equivalent AAAC conductor) are envisaged for bus bars, jumpers, droppers:~~

- ~~a. 6/4.72 mm + 7/1.57 mm (100 sqmm Dog conductor),~~
- ~~b. 30/2.59 mm + 7/2.59 mm (150 sqmm Wolf conductor), and~~
- ~~c. 30/3.00 mm + 7/3.00 mm (200 sqmm Panther conductor)~~

~~Conductor shall be provided with hardware fittings, T-clamps, bi-metallic clamps and PG clamps as per requirements. T — Clamps shall be provided on each jumper on bus bars. Line jumpers shall be provided with adequate size of PG Clamps (Two numbers PG Clamps at each end of jumper). Clamp shall be made of aluminium grade T-1F as per IS — 8309 having good~~

~~electrical quality aluminium material and shall not be brittle in nature. Suitable Bi — metallic clamps shall be provided at bushings of transformers and circuit breakers. Also at all those points where joining of two different materials is found, bi — metallic clamps shall be provided.~~

~~Care shall be taken while drawing conductor from the drum. Proper roller shall be used while handling conductors during erection.~~

22.00 ~~Insulator, hardware and connections to equipment:-~~

~~33 KV and 11 KV polymer Pin insulator with suitable hardware fittings shall be used. Insulator shall be tied properly using binding wire/helical form fitting. In road crossing and line crossing locations bridling cross arms and pin insulator shall be used.~~

~~The individual insulator shall be checked for insulation resistance before overhead line installation. Insulator shall properly be cleaned before installation. No damage/crack insulator shall be used.~~

23.00 ~~Power receptacles:-~~

~~Two power receptacles are envisaged in switch yard area to provide power supply to Transformer Oil Filtration machine and other testing and commissioning related works. Each receptacles shall house 63A MCCB as incomer, 40A 3 phase socket/switch and 1 No, 20A single phase Industrial type socket/switch of reputed brand and type.~~

24.00 ~~Tube well:-~~

~~Deep Tube is envisaged for all the substations. Depending on the depth of the bore, suitable capacity of submerged pump shall be installed. Bore diameter shall be 6" which must be penetrated vertically in all type of soil condition. Before digging the bore, soil Resistivity needs to be checked to ascertain the location of the best site for the tube well. Following works are envisaged under this scope:~~

- ~~• Digging bore of diameter six inches. Providing MS casing on bore up to the suitable depth finalized during detailed engineering.~~
- ~~• Providing new 3 phase submersible pump 32 stages or 30 stages depending on technical requirements.~~
- ~~• Providing Start Panel of reputed make like L&T, Havells or equivalent make having single phase protection, Over load protection, Pre — set timer of L&T make, Star Delta Starter, Indications for Load currents in all three phases, Indications for Supply voltages in all three phases etc. Starting panel must conform to IP 52 protection for enclosure. It shall be mounted~~

indoor inside the Control room on 50x50x6 mm GS angle supports. Start panel must be earthed with 2 Nos 8 SWG wires. 4 core 16 Sq mm aluminum armored cable must be used for energizing this Start Panel.

- Three phase, 4 wires, copper flexible supply cables suitable for submersible pump operations, ISI marked, 1100V grade shall be connected to submersible pump through underground trench up to the well as per CPWD specifications duly protected from brick and sand cushioning.
- A Heavy-duty gunmetal wheel valve (tap) may be provided on the discharge line for drinking water requirements.
- Provision for lifting the pump in case of overhauling / breakdown maintenance may also be provided.
- ISI marked PVC or 2nd GI Pipes are to be used for suction as well as discharge water lines.
- An open drain must be provided in the vicinity of the tube well. Detail arrangement shall be finalized in detailed engineering.

25.00Yard Earthing:

Earthing shall be provided with GI earth pipe, GS solid rod 25 mm dia and 75x8mm GS flat forming earth mat. 50x6mm GI flat shall be used for earth-riser along with GI wires / Stay wires as per requirement of Project Manager. Project Manager shall approve arrangement of earthing network. Following arrangement envisaged for grid/earth rod/ earth pipe: (Indicative drawing is enclosed with the document)

Description of equipment	Fully outdoor Substation
Earth Pit made of 3 m long, 40 mm dia GI pipe	2 Nos for power transformer neutral direct connection, 1 No for 33 kV & 11 kV Lightning Arresters direct connection, 3 Nos. for station transformer, 2 Nos. for indoor panels, 2 Nos. for internal electrification works of control room, and 2 Nos. for substation fencing
Earth rod GI solid 25 mm dia	19 Nos (+/-) 20%
Earth mat	75X8 mm GS Flat
Laying of earth mat	Below ground 0.5 meter
Earth riser	50x6mm and 25x3 mm GI Flats

Description of equipment	Partly outdoor Substation
Earth Pit made of 3 m long, 40 mm dia GI pipe//Chemical earthing	2 Nos for power transformer neutral direct connection, 1 No for 33 kV & 11 kV Lightning Arresters direct connection,

	3 Nos. for station transformer, 2 Nos. for indoor panels, 2 Nos. for internal electrification works of control room, and 2 Nos. for substation fencing Earth circuit should not be connected with Grid mesh/other earthing pits.
Earth rod GS solid 25 mm dia	14 Nos (+/-) 20%
Earth mat	75X8 mm GS Flat
Laying of earth mat	Below ground 0.5 meter
Earth riser	50x6mm and 25x3 mm GI Flats

Standard requirements / provisions of earthing are enclosed herewith. Connections of earth-grid / earth pit with Lightning Arrester and Power Transformer Neutral and Transformer body (at two distinct points) are to be made using 50X6mm GS flat. Connections of other equipment may be provided with 8 SWG GI wire or GI Stay wire as per approval of Project Manager. Following arrangements are envisaged for earth connection:

1. Power Transformer Neutral ————— 50x8 mm GS Flat
(Two distinct connections) ————
2. Transformer Body ————— 50x6 mm GS Flat
3. Breaker body / legs (Two distinct connections) — 50x6 mm GS Flat
4. Lightning Arrester ————— 50x6 mm GS Flat
5. Station transformer Neutral ————— 25x3 mm GI flat
(Two distinct connections) ————
6. Fencing ————— 50x6 mm GI Flat
7. Control Panels (Two distinct connections) ——— 50x6 mm GI Flat
8. Isolator structure / handle ————— 50x6 mm GI Flat
9. Steel structure of substation ————— 50x6 mm GI Flat
10. Line meters ————— 25x3 mm GI Flat
11. CT, PT and Cable Tray ————— 25x3 mm GI Flat

Fencing and gate shall be grounded. Moving portion of gate shall be grounded with flexible braided conductors of equivalent aluminum 25 mm² sizes of conductors duly lugged and bolted.

In rocky soil where getting required earth resistance is a challenge, chemical rod earthing shall be used. Overhead line structure shall be connected to chemical earth electrode using 8SWG GI wire. GI nuts, bolts & washers shall be used to join two GI wires and 20 mm solid spike rod.

~~In areas with poor with poor earth resistance where it is generally difficult to perform maintenance activities, maintenance free earth pits shall be provided.~~

~~GI flats and GI wires must be properly dressed, bundled and fixed on supporting structure at 1 to 2 feet intervals.~~

~~26.0033 KV & 11 KV Isolators:-~~

~~33 KV & 11 kV, 3 ph, 3 Pin type, Horizontal Mounting type, Gang Operated, Isolator Switch shall be installed at suitable locations as per instructions of Project Manager to isolate line section, power transformer, bus bars etc. B Class GI pipe shall be used (without any joints) for operation of isolator switch. Isolator Switch structure and handle must be earthed using 50x6 GI flat.~~

~~Isolator cum earth switch—The employer may also opt for 33kV and 11kV Isolator cum earth switch, In this case the Contractor is required to make provision for its power supply, control supply and indications in control panel.~~

~~27.00Fabricated steel items:-~~

~~The fabricated steel structures materials shall be hot dip galvanized thoroughly internally and externally as per according to IS: 2629 and IS: 2633 (with latest amendments). Galvanizing shall be checked and tested in accordance with IS: 2633.~~

~~Fabricated steel structure items shall be galvanized both inside and out. The zinc coating shall be smooth, continuous and uniform. It shall be free from acid spots and shall not scale, blister or be removable by handling or packing. There shall be no impurities in the zinc or additives to the smelter bath that could have a detrimental effect on the durability of the zinc coating. Before pickling, all welding, drilling, cutting and grinding shall be completed and all grease, paint, varnish, oil and welding slag shall be completely removed.~~

~~All protuberances which could affect the life of galvanizing shall also be removed. To avoid the formation of white rust all galvanized material shall be packaged in such a way to ensure adequate ventilation between parts during shipping and storage.~~

~~Testing of galvanizing shall be performed for Uniformity of thickness as per IS 2633/1986, Mass of coating as per IS 6745/1972 and quantity of zinc, water quenching & centrifuging as per IS 2629/1985.~~

~~28.00Hardware:-~~

~~MS Nuts, bolts and washers (Galvanized) — 16 mm dia nuts, bolts & washers shall be used for tying of overhead structure items like cross arms, top clamps, brackets, clamps, bracing, strain plates etc.~~

~~While erecting, proper dimensions of nut bolts and washers must be ensured. 2 to 3 threads only be visible of the bolt after full tightening of nut on requisite torque. The hardware shall be hot dip galvanized. The minimum coating of the zinc shall comply with IS: 2629 and IS: 2633. Galvanizing shall be checked and tested in accordance with IS: 2633. Before shifting them to site for erection, they shall be offered for inspection and approval by Project Manager.~~

29.00 Fire Protection System:-

~~Fire Buckets filled with sand: The fire buckets confirming to IS 2546/1974 filled with sand shall be installed at two places in new s/s — in control room and in switchyard near power transformer. There shall be 4 no. of buckets at each location in a s/s. The buckets shall be hanging on a steel stand. The buckets and the stand shall be as per relevant standards and will be filled with sand.~~

~~In case of 66 kV power substation, The Contractor is required to make the provision of sprinkler system, deluge valves, jockey pumps, Diesel pump etc including oil sock pits etc.~~

30.00 Portable Fire Extinguishers:-

~~Carbon dioxide type and Dry chemical powder type fire extinguishers are also to be installed in newly constructed substation. All the portable extinguishers shall be of free standing type and shall be capable of discharging freely and completely in upright position. Each extinguisher shall have the instructions for operating the extinguishers on its body itself. All extinguishers shall be supplied with initial charge and accessories as required. Portable type extinguishers shall be provided with suitable clamps for mounting on walls or columns. All extinguishers shall be painted with durable enamel paint of fire red color conforming to relevant Indian Standards. Capacities of each type shall be as indicated in the schedule of quantities. Carbon dioxide (CO₂, type) extinguisher shall of 4.5 kg for control room conform to IS:2878. Dry chemical powder type extinguisher shall be of 6 kg capacity for control room conform to IS:2171.~~

31.00 Safety and operation equipment:-

~~The substation shall be equipped with one following equipment for smooth operation and maintenance:~~

- a. ~~Megger 1000 Volt (Electrically as well as manually operated) of Megger/Fluke/Motwane or equivalent make-~~
- b. ~~Earth resistance meter, Megger/Fluke/Motwane or equivalent make~~
- c. ~~Crimping tool for cable from 2.5 sqmm to 185 sqmm,~~
- d. ~~Torque wrench M8 to M16-~~
- e. ~~Multi-meter Motwane make analogue type,~~
- f. ~~Tong tester digital 0-600A capacity,~~
- g. ~~Allen key set,~~
- h. ~~ISI marked, Discharge rod 66 KV rating with discharging copper cables & terminals—6 Nos-~~
- i. ~~Electrician tool box—Taparia standard kit~~
- j. ~~Set of D-spanners~~
- k. ~~12'' size electrical screw driver-~~
- l. ~~12'' size electrical hexagonal head screw driver-~~
- m. ~~Pipe wrench suitable for 2 ½ inch dia pipe-~~
- n. ~~ISI marked rubber mat rated for 11 KV insulation, ¾'' thick, size 1000mm x 2000 mm—in front of all the control panels.~~

~~Project Manager shall approve make and type of equipment.~~

32.00 ~~Following details shall be provided at each substations:~~

~~For suitable information to operating staff or the other related persons visiting the substation, following facilities shall be provided before commissioning of substation or on date of inauguration of the substation.—~~

- ~~Sketch of substations electrical circuit inside the substation in white cotton impregnated 2 mm thick hylum sheet 2x2 feet size installed on the wall,~~
- ~~Notice board 3x3 feet made out of 10 mm thick water proof ply, painted suitably and provided with 1st class teak wood ribs at the sides of 2 x ½ inches size,~~
- ~~Electrical safety charts,~~
- ~~Provision for notifying name, address, telephone numbers, qualification details etc of the operational staff Employer intends to post at the substations and their officials in hierarchy,~~
- ~~Depicting working drawings of cable terminals details and cable laying details in laminated sheets~~
- ~~Color coding of bus bars and terminal conductors of the feeders using enamel painting round marks and labeling name of feeders, equipment, etc as defined.—~~

33.00 ~~Others:-~~

~~Buildings for substation control room shall be 10mx12m size. Details are enclosed in the tender drawing. The buildings should also has provision for dedicated washrooms for female employees in addition to male washrooms.~~

~~Indoor trenches covered with 6 mm thick chequered plates: Concrete trench are required inside control room with 50x50x6 mm GS angle inserted at the edges for erection of control panels. Unused part of cable trench shall be covered with 6mm thick MS chequered plates inside control room. At the entry point of trench in control room, proper sealing arrangement shall be provided so as to stop entry of reptiles and rainwater inside control room through trench.~~

~~Bi-metallic connectors shall be provided wherever there is a connection between two metal parts on all electrical equipment like 33/11 KV Power transformer, 11/0.4 KV station transformer, vacuum circuit breakers, isolators, HG Fuse, Lighting Arrester, etc.~~

~~34.00 Labelling:-~~

~~Each substation equipment shall be labelled using yellow base and black indication marks (number or digits). 40/50 mm height digits/words shall be used for this purpose. Base shall be made using 2 or more coats of yellow enamel paint till good surface finish. Base preparation shall be completed before shifting of poles and equipment to site for erection. Base painting and marking of digits shall be performed by a skilled and trained painter using branded enamel paint. Project Manager shall approve type and brand of enamel paint. The identification of phases through Red, Yellow and Blue circles shall be provided on transformer, CT, PT, 33 KV and 11 KV feeder Double Pole structures.~~

~~Control panels shall be labelled from front as well as from the back by providing serial number and name of feeder/transformer. The color coding sign on two adjacent panels shall also be provided with 100mm dia color circle overlapping two adjacent panel sheet for safety purpose.~~

~~Labeling of following information is intended by the Employer preferably in local HINDI language:~~

- ~~1. Transformer capacity and designated name like T-1 or T-2,~~
- ~~2. VCB designated name~~
- ~~3. Identification of CT & PT~~
- ~~4. Color coding of bus bars, transformer terminals, feeders phases (R-Y-B)~~
- ~~5. Name of incoming / outgoing feeder like 11 KV Nandlapur Feeder I~~
- ~~6. Warning instruction, if any, of availability of two sources of HT supply on same structure.~~

~~7. Earth pit designation and date of checking,~~

~~35.00 Danger board:-~~

~~Each substation equipment and structures shall be provided with a danger board as per approved drawing. Danger board shall be in bi-lingual languages (local language and English). Clamp for danger board, nut bolts and washers shall be painted with two or more coats of red-oxide and aluminium paints respectively till smooth surface before installation.~~

~~36.00 Site Testing and Pre Commissioning Checks:-~~

~~An indicative list of tests is given below. Contractor shall perform any additional test based on specialties of the items as per the Field Quality Plan/ instructions of the equipment manufacturer or Employer without any extra cost to the Employer. The Contractor shall arrange all instruments required for conducting these tests along with calibration certificates and shall furnish the list of instruments to the Employer for approval. Detail test certificates duly signed by Employer's representative & agency representative of tests jointly carried out at site before putting the equipment in use, shall be submitted by the Contractor in three copies.~~

~~Agency shall also be responsible to prepare Single Line Diagram of substations and an overall power distribution network of the circle showing 400KV, 220KV, 132KV, 33 KV network and point of metering. A set of drawings which includes drawing of Single phasing AB Switch, Substation earthing arrangement are enclosed for basic information. These drawings are not necessarily showing the exact dimensions of the substations.~~

~~37.00 Equipment test records, commissioning test records and drawings—~~

~~Factory test certificates of equipment, test certificates at the time of pre-dispatch inspections, pre-dispatch inspection reports, pre-commissioning check results and post commissioning check results shall be compiled and provided in three sets to Project Manager for his approval and records.~~

~~A copy of such test record shall be offered to electrical inspector and other inspecting officials during his/her visit to substation for inspection.~~

~~38.00 Electrical Inspection by state Electrical Inspectorate:~~

~~The substations shall be subjected to the inspection of state-owned Electrical Inspectorate for which payment of fees shall be made by Employer.~~

~~The responsibility of Contractor shall include rectification / alteration / addition of installation as per advice of electrical inspector for successful commissioning of the substations within timelimit.~~

39.00Arrangement by the Contractor:

~~Contractor shall project wise make his own separate arrangements for the following:~~

- ~~1. Opening of a site office cum store,~~
- ~~2. Distributions of power supply at all work areas in the substation premises.~~
- ~~3. Construction of office and store (open & covered)~~
- ~~4. Construction of steel fabrication workshop and material/field testing laboratory~~
- ~~5. Round the clock fire protection and security arrangements for site store cum office during construction stage~~

40.00Civil works:-

~~Details scope under civil works have been provided in “Civil Works and Soil Investigation” at Section 6 of Part 2.~~

~~Foundation design for power transformer, outdoor type vacuum circuit breaker, control room building, fencing, gantry structure etc shall be submitted by Contractor. While designing OEM recommendations must be considered. Foundation for power transformer, outdoor type vacuum circuit breaker, control room building and fencing shall be provided with reinforcement steel. Project Manager shall approve foundation designs.~~

41.00Basic Reference Drawings:

~~The reference drawings, which are indicative of the type of specifications Employer intends to accept, are annexed with the specification. The Contractor shall maintain the overall dimensions of the substation, buildings, bay length, bay width, phase to earth clearance, phase to phase clearance and sectional clearances, clearances between buses, bus heights but may alter the locations of equipment to obtain the statutory electrical clearances required for the substation.~~

~~The enclosed drawings give the basic scheme, layout of substation, associated services, earthing arrangement. These drawings are provided for general information only.~~

~~Note: The insulation and RIV levels of the equipment shall be as per values given in the respective chapter of the equipment.~~

42.00Commissioning spares:

~~The Contractor shall supply spares, which he expects to consume during installation testing and commissioning of system. The quantity of these spares shall be decided based on his previous experience, such that site works shall not be hampered due to non-availability of these spares. Contractor shall submit a complete list of such spares along with the bid, the cost of which shall be deemed to have been included in the lump-sum proposal price of the package. The Contractor, if so agreed at a cost to be negotiated may leave the unused commissioning spares at the site for use of Employer.~~

43.00Recommended spares:

~~The Contractor shall provide a list of recommended spares giving unit prices and total prices for 3 years of normal continuous operation of equipment. This list shall take into consideration and shall be given in a separate list. The Employer reserves the right to buy any or all the recommended spares. The recommended spares parts shall be delivered at the site. The list of recommended spares to be furnished by the Bidder shall also contain the following:~~

- ~~1. Location of each item installed along with reference drawing number.~~
- ~~2. Service life expectancy of each item.~~
- ~~3. Offer validity period~~

~~Price of recommended spares will not be used for evaluation of bids. The prices of these spares will remain valid for a period of not less than 120 days after the date on which the validity of main bid expires. Whenever recommended spares are the same as mandatory spares, then the prices of the mandatory spares and such common recommended spares shall be the same. Further, the prices of any recommended spares shall be subject to review by the Employer and shall be finalized after mutual discussions.~~

13.4.New 11 KV Lines

1.00 GPS Survey

Mapping of route of proposed new 11 kV line by foot GPS Survey in rural/urban areas be performed mentioning various milestones. While GPS Surveying, existing electrical infrastructure in the locality should also be mapped. Line alignment (single line diagram) on political map with fair correctness, be prepared. SLD and foot GPS Survey report shall be approved by Project Manager and shall be used as basic document for assessment of works under the contract. On completion of line work, as built Single Line Diagram and pole wise line diagram showing pole wise materials used and pole-to-pole span should be submitted to Project Manager. This details shall be used as reference documents by Quality Inspecting officials to execute inspection works.

In case of feeder separation, existing agriculture load shall be mapped during GPS Survey. A report to be presented indicating location wise pumps to be fed through separate feeder. Percentage voltage regulation at farthest point on various spur sections shall be examined during GPS Survey and submitted to project manager who will take a decision for feeder separation works.

2.00 Support (pole):

Following types of support are envisaged for 11 KV overhead line:

- a) 8 Mtr/(W.L-200 Kg) and 9 Mtr/(W.L-400Kg) PCC Poles - (PCC Pole as per state practice)
- b) 9Mtr/11 Mtr/13 Mtr long WPB 160x160x30.44 kg/m
- ~~c) 11 Mtr/13 Mtr long Steel Tubular poles of Designation 540 SP 52 (IS 2713, Pt I, II, III 1980)~~
- ~~d) 9 Mtr long Steel Tubular poles of Designation 540 SP 28 (IS 2713, Pt I, II, III 1980)~~
- ~~e) 11 m long WPB 160x23.83 kg/m beams~~
- ~~f) 13 m long WPB 160x23.83 kg/m beams~~

In rural area, PCC poles may be used. In urban area, PCC or H-Beam or STP or Wide Parallel Beam supports may be used of suitable length, however the precise utilization will depend on site conditions . In hilly areas where handling of material is a challenge, tubular poles or Wide Parallel Beam poles expandable with jointing plates may be used. In location specific conditions like forest area, vicinity of other existing overhead lines or permanent structures etc, H- beam or tubular poles or Wide Parallel Beam supports may be used of suitable length. Steel bottom plate shall be used in steel tubular poles/H-Beam / Wide parallel Beam. Cement concrete reinforced plate shall be used as base plate for PCC poles.The size of RCC Base Plate (600x600x100)mm for 9 Mtr PCC Pole & (450x450x75)mm for 8 Mtr PCC

Pole which shall be offered for inspection to WBSEDCL prior to use. After satisfactory inspection DI will be issued from respective Project Office and the material will be entitled to put into use at the site. Steel tubular poles and WPB poles shall be cleaned till good surface finish and painted with 2 or more coats of red oxide paint and 2 or more coats of aluminium paint till good finish. Steel tubular poles and H-Beams shall also be painted with 2 or more coats till good surface finish with anti-corrosive paint (in case of tubular poles shall also be painted on the inner walls) which goes in to the foundation. Project Manager shall approved brand and shade of paints.

3.00 Fabricated steel items:

Fabricated steel items like V cross arm, top clamp, DC cross arm, bracket, clamps, cross bracings, bracings, strain plate, guarding channels, back clamp, transformer mounting structure etc shall be made of MS Channels, MS angle, MS flats as per approved drawings.

While fabricating, good quality electrical cutting tools and drill machine shall be used to ensure no sharp edges and perfect holes as per approved drawings. Gas cutting set should not be used for fabrication of MS steel items. Weld material shall be distributed equally between the two materials that were joined. The weld shall be free of waste materials such as slag. The weld surface should not have any irregularities or any porous holes (called porosity). The joint shall be tight. Most welds need to demonstrate the required strength. One way to ensure proper strength is to start with a filler metal and electrode rating that is higher than your strength requirement.

The fabricated steel structures materials shall be hot-dip galvanized thoroughly internally and externally according to IS: 2629 and IS: 2633 (with latest amendments). Galvanizing shall be checked and tested in accordance with IS: 2633.

Fabricated steel structure items shall be galvanized both inside and out. The zinc coating shall be smooth, continuous and uniform. It shall be free from acid spots and shall not scale, blister or be removable by handling or packing. There shall be no impurities in the zinc or additives to the smelter bath that could have a detrimental effect on the durability of the zinc coating. Before pickling, all welding, drilling, cutting and grinding shall be completed and all grease, paint, varnish, oil and welding slag shall be completely removed.

All protuberances which could affect the life of galvanizing shall also be removed. To avoid the formation of white rust all galvanized material shall be packaged in such a way to ensure adequate ventilation between parts during shipping and storage.

Testing of galvanizing shall be performed for Uniformity of thickness as per IS 2633/1986, Mass of coating as per IS 6745/1972 and quantity of zinc, water quenching & centrifuging as per IS 2629/1985.

4.00 Hardware:

MS Nuts, bolts and washers (Galvanized) – 16 mm dia nuts, bolts & washers shall be used for tying of overhead structure items like cross arms, top clamps, brackets, clamps, bracing, strain plates etc.

While erecting, proper dimensions of nut-bolts and washers must be ensured. 2 to 3 threads only be visible of the bolt after full tightening of nut on requisite torque. The hardware shall be hot dip galvanized. The minimum coating of the zinc shall comply with IS: 2629 and IS: 2633. Galvanizing shall be checked and tested in accordance with IS: 2633. Before shifting them to site for erection, they shall be offered for inspection and approval by Project Manager.

5.00 Stay Set:

Galvanized Stay Set with stay clamp, guy insulator (1 No.), anchor plate (230x230x6mm) , nut-bolts, 1 Nos turn-buckles, 1830 mm long, 20 mm diameter solid GS stay rod & 7/3.15 mm dia GI stranded wire complete.

Stay set shall be used at all turning locations, conductor dead end supports, double pole structure, triple pole structure, four pole structure to nullify the tension of conductor. Erection of storm guys at suitable location in straight line may also be provided. Erection of storm guys at suitable location in straight line may also be provided.

0.2 cmt cement concreting in mixture 1 part cement, 3 part coarse sand, 6 part 40mm size aggregate stone chips (1:3:6). 2 Nos. guy insulator shall be provided in stranded GI wire at middle location between two turn buckles.

6.00 Earthing:

Following earthing arrangements are envisaged for new 11 kV lines:

- a) 40 mm dia., 3000 mm long GI pipe earth electrode with test link, RCC pit, RCC cover plate on GI frame, bentonite powder and other accessories complete.
- b) GI Earthing spike made of 20mm solid rod, Chemical rod earthing using Carbon powder/Bentonite powder / Conductive concrete powder including electrode with

2000mm long, 50 mm diameter GI pipe, GI Strip of 24x3mm minimum. 6 SWG GI wire for earthing and guarding

- c) 6 SWG GI wire for earthing and guarding
- d) Maintenance free type earthing

Each 11 kV line support shall be provided with one GI earthing spike made of 20 mm solid rod or GI Earth Coil and connected with 6 SWG GI wire. Overhead line structure shall be connected to GI earthing spike or GI Earth Coil using 6 SWG GI wire. GI nuts, bolts & washers shall be used to join two GI wires and 20 mm solid spike rod. Project Manager shall decide use of GI Earth Coil or 20mm dia GI Solid Rod for individual pole earthing.

At railway crossing, line crossing and other specific locations 40 mm dia, 3000 mm long GI pipe earth electrode with test link, RCC pit, RCC cover plate on GI frame, bentonite powder and other accessories shall be used. Overhead line structure at these locations shall be connected to GI earth pipe using 6 SWG GI wire. GI nuts, bolts & washers shall be used to join two GI wires and 40 mm GI earth pipe.

In rocky soil where getting required earth resistance is a challenge, chemical rod earthing shall be used. Overhead line structure shall be connected to chemical earth electrode using 6SWG GI wire. GI nuts, bolts & washers shall be used to join two GI wires and 20 mm solid spike rod.

In road crossings and line crossings, 8 SWG GI wire shall be used for cross lacing and ACSR 20 Sqmm wire shall be used for guard wires.

GI flats and GI wires must be properly dressed, bundled and fixed on supporting structure at 1 to 2 feet intervals.

7.00 Insulator and hardware –

11 KV polymer Pin insulator with suitable hardware fittings shall be used. Insulator should be tied properly using binding wire & tape/helical form fitting. In road crossing and line crossing locations bridling cross arms and pin insulator shall be used.

The individual insulator shall be checked for insulation resistance before overhead line installation. Insulator should properly be cleaned before installation. No damage/crack insulator should be used.

8.00 ACSR / AAAC Conductors:

Following ACSR Conductors (or equivalent AAAC Conductor) are envisaged for new 11 kV lines:

- a) 6/2.11 + 1/2.11 mm (20 mm² Al. Area) - Squirrel
- b) 6/2.59 + 1/2.59 mm (30 mm² Al. Area) - Weasel
- c) 6/3.35 + 1/3.35 mm (50 mm² Al. Area) - Rabbit
- d) 6/4.09 + 1/4.09 mm (80 mm² Al. Area) - Raccoon
- e) 6/4.72 mm+7/1.57 mm (100 mm² Al. Area) - Dog

Project Manager shall decide size of conductor on proposed 11 KV line.

Care should be taken while drawing conductor from the drum. Proper roller should be used while handling conductors during erection. Jointing sleeves, binding materials, PG clamps, bi-metallic conductor shall be used for conductor jointing, insulators fixing, jumpering and termination at equipment respectively. There must not be uneven sag between conductor/spans.

Proper sag should be maintained using sag chart table. While tensioning, care should be taken to avoid tension on pin insulator. Therefore, proper alignment of line to be ensured.

At terminal location, care should be taken while connecting two sections to avoid bird faults. Therefore, pin insulator is to be used to handle the conductor on DC cross channel.

9.00 11 KV AB Switch:

11 kV, 3-ph, 400 A, 3 Pin type, Vertical Mounting type, Gang Operated, AB Switch shall be installed at cut points and at suitable locations as per instructions of Project Manager. B Class GI pipe shall be used (without any joints) for operation of switch. AB Switch structure and handle must be earthed using 6 SWG GI wire.

10.00 Pole numbering:

Each support pole shall be numbered properly labelled using yellow base and black indication marks (number or digits). 40/50 mm height digits/words should be used for this purpose. Base shall be made using 2 or more coats of yellow enamel paint till good surface finish. Base preparation shall be completed before shifting of poles to site for erection. Base painting and marking of digits should be performed by a skilled and trained painter using branded enamel paint, Project Manager shall approve type and brand of enamel paint. Warning instruction, if any, of availability of two sources of 33 kV supply on same structure, at source structure, at cut points should exclusively be provided as per state practice.

11.00 Anti-climbing device:

3.5 kgs, 2.5mm dia (12 SWG) galvanized barbed wire shall be used on each 11 kV support. Galvanized barbed wire should be properly dressed and crimped at termination. While wrapping the wire on support, proper tension should be maintained.

12.00 Danger board:

Each support shall be provided with a danger board with pole clamps as per approved drawing. Danger board should be in bi-lingual languages (local language and English). Clamp for danger board, nut-bolts and washers shall be painted with two or more coats of red-oxide and aluminium paints respectively till smooth surface before installation.

13.00 Support foundation:

0.5m³ Cement concrete in mixture 1 part cement, 3 part coarse sand, 6 part 40 mm size aggregate stone chips (1:3:6) shall be used in steel tubular poles and H-Beam 11 kV line supports.

In rural areas, PCC pole pit shall be refilled with 200 mm average size of bolder mixed with excavated earth. Proper ramming shall be performed for better compaction. All Double pole (DP), Triple pole (TP), cut point poles, Distribution Transformer substation poles and poles erected on water logging area shall be grouted using cement concrete mixture similar to H-beams/STP/Wide Parallel Beams . Prior approval of Project Manager shall be obtained for concreting of PCC poles in water logging area. While preparing route GPS Survey report, water logging areas shall be earmarked.

While erecting supports (poles), shuttering must be used for concreting so that proper quantity of cement concrete mixture be used and assessed during inspection. During concreting proper compaction by means of mobile vibrator be provided. While starting work of support erection, gang wise shuttering and mobile vibrator shall be offered for inspection to Project Manager. While erecting support, mercury level gauge must be used to ensure vertical erection of support.

250mm dia X 12" inch size muffing shall be provided on H- beams / STP/ Wide Parallel Beams to prevent direct entry of rain water along the poles. Cement Concrete of 1:2:4 (1 part Cement, 2 parts coarse sand and 4 parts 20mm aggregate stones chips) shall be used for individual poles.

Steel plate shall be used in steel tubular poles and cement concrete reinforced plate shall be used as base plate for PCC poles.

~~14.00 11 kV line for underground railway crossing~~

~~Two separate composite items of 11 kV line railway crossing is kept in BoQ with 185 sq.mm cable.~~

~~2 Nos. separate cables shall be laid in separate GI/HDPE pipe enclosures. At a time, one shall be used and another shall be kept idle as spare in ready to connect condition. Cable termination, cable identification, protective covering, laying of jumpering cable etc shall all be completed in this head. These composite items shall contain following sub-items:~~

- ~~a) 3Cx185 sqmm XLPE armored cable.~~
- ~~b) 150mm dia GI pipe of A class (red color painted on edges)/HDPE 160mm PE 80-PN-6 (IS-4984-1995) Dia for cable protection in underground laying, which will be offered for inspection to WBSEDCL prior to use. **After satisfactory inspection DI will be issued from respective Project Office and the material will be entiteled to put into use at the site.**~~
- ~~c) 150mm dia GI pipe of B class (blue color painted on edges) for cable support at DP structure-~~
- ~~d) Outdoor heat shrinkable cable jointing kits for main cable and jumpering cable~~
- ~~e) 11 kV lightening arrester station class 10kA-~~
- ~~f) GI 3-meters long pipe earthing,-~~
- ~~g) 6 SWG GI wires with GI nuts, bolts & washers,-~~
- ~~h) Cable markers,-~~
- ~~i) Bi-metallic clamps,-~~
- ~~j) Jumpering with 11 kV Arial Bunched Cables-~~
- ~~k) Maintenance free type earthing~~

~~Detail GPS Survey of location of railway crossing be performed by Contractor to avoid multi-crossing at nearby location. Prior railway permission for execution of this work shall be obtained by Project Manager for which necessary technical support shall be provided by Contractor. Line crossing shall be performed using underground cabling. Block on railway traffic shall be arranged by Project Manager. Contractor should ensure timely completion of work during block period by mobilizing requisite man, materials and machine at crossing locations.~~

~~Horizontal drilling machine shall be used for horizontal bore below railway tracks.-~~

~~15.00 Quality & Quantity inspection and compliance to the observation:-~~

~~The line works, before or after commissioning/energisation, shall be inspected by Quality Inspectors and State Inspection Inspectorate. Contractor shall provide all requisite details of line like approved GPS Survey report, as built drawings and joint measurement sheet to the inspector to conduct. Contractor shall rectify defects/deficiencies and submit compliance to the observations with supporting photographs in digital form within one month from receipt of observations.~~

~~16.00 Tree-cutting/trimming of tree:~~

~~The Contractor shall count, mark and put proper numbers with suitable quality of paint at his own cost on all the trees that are to be cut/trim to obtain required tree clearance. Contractor shall pay compensation for any loss or damage for tree cutting due to Contractor's work. Wherever forest clearance is envisaged for execution of work, clearance of forest department for tree cutting, if required, shall be arranged by the Project Manager and compensation shall also be paid by the Project Manager. Necessary fee if required to pay to Govt. dept. for arranging such clearances shall paid by Project Manager. However, the Contractor would require to provide all necessary assistance for execution of this work.~~

~~17.00 Statutory clearances:~~

~~During execution of 11 KV Line work, all statutory clearances shall be ensured for ground clearance, line to line clearance, road crossing clearance, horizontal and vertical clearances from buildings/objects etc. All road crossings and line crossings shall be guarded as per specifications. Conductor joint should not be provided in mid span length. Instead, it should be nearer to the support.~~

13.5. Distribution Transformer Substations

1.00 GPS Survey of Distribution Transformer Substations:

A detailed GPS Survey of existing habitation shall be performed in presentable document showing population residing in the un-electrified area/existing electrified area of habitation, best location of installation of a new distribution transformer substation and the capacity of transformers to be selected for installation. The capacity of DTR shall be governed by following technical aspects:

- a) Optimistic lengths of LT lines needed to feed the beneficiaries,
- b) Space available for installation of support/transformers,
- c) Probable load expected to come on the transformer due to existing BPL beneficiaries /others connected /un-connected probable beneficiaries in the locality taking care of their expected load growth in next 5 years.
- d) Distribution Transformers of capacity 160 KVA (three phase) shall be decided as per standard rating of distribution transformer as depicted in IS specifications. Nonstandard ratings of DTR shall not be installed.
- e) Distribution Transformers of capacity 160 KVA (three phase) shall be installed on double pole structures. Hence, three phase 11 KV OH/UG lines shall be laid for 160 KVA capacity sub-stations.

~~Based on GPS Survey report, Project Manager shall decide type, capacity and location of Distribution Transformer sub-station.~~

2.00 Following types of support are envisaged for 11/0.4 or ~~11/0.25 KV~~ Distribution Transformer Substation support:

- ~~a) 8m/9 m/(W.L-200 KG)/(W.L-400 Kg) PCC Poles -- (PCC Pole as per state practice) -- up to 100 KVA rating only~~
- b) 13 m long WPB 160x160x30.44 kg/m
- c) 11 m long WPB 160x160x30.44 kg/m
- d) 09 m long WPB 160x160x30.44 kg/m
- ~~e) 11 M long Steel Tubular poles of Designation 540 SP 52 (IS 2713, Pt I, II, III 1980)~~
- ~~f) 9 M long Steel Tubular poles of Designation 540 SP 28 (IS 2713, Pt I, II, III 1980)~~
- ~~g) For DTR Substation above 63 KVA up to 315 KVA WPB 160x30.44 kg/m beams of 11 meter or 13meter length~~

In rural area, Employer may use PCC poles are to be used. In urban area, Employer may use PCC or H-Beam or STP or Wide Parallel Beam supports of suitable length. In hilly areas

where handling of material is a challenge, tubular poles or Wide Parallel Beam GI poles expandable with jointing plates may be used. In location specific conditions like forest area, vicinity of other existing overhead lines or permanent structures etc, H- beam or tubular poles or Wide Parallel Beam supports may be used of suitable length. Steel bottom plate shall be used in steel tubular poles/H-Beam / Wide parallel Beam and cement concrete reinforced plate shall be used as base plate for PCC poles. The size of RCC Base Plate (600x600x100)mm for 9 Mtr PCC Pole & (450x450x75)mm for 8 Mtr PCC Pole which will be offered for inspection to WBSEDCL prior to use. After satisfactory inspection DI will be issued from respective Project Office and the material will be entitled to put into use at the site. PCC supports shall be used for distribution transformer substation up to 100 KVA capacity only. Beyond 100 KVA rating, Galvanized Wide parallel beams 160x30.44 kg/m supports shall be used for mounting of distribution transformer.

Steel tubular poles shall be cleaned till good surface finish and painted with 2 or more coats of red oxide paint and 2 or more coats of aluminium paint till good finish. Steel tubular poles and H-Beams shall also be painted with 2 or more coats till good surface finish with anti-corrosive paint (in case of tubular poles shall also be painted on the inner walls) which goes in to the foundation. Project Manager shall approved brand and shade of paints.

PCC supports shall be used for distribution transformer substation up to 100 KVA capacity only. Beyond 100 KVA rating, Galvanized Wide parallel beams 160x30.44 kg/m supports shall be used for mounting of distribution transformer.

3.00 Fabricated steel items:

Fabricated steel items like DC cross arm (65x65x6 mm), back clamps (65x6 mm), pole clamp (65x6 mm), mounting channel (75x40x6 mm), transformer mounting channel (75x40x6 mm), transformer belting set (65x65x6 mm), V cross arm, top clamp, DC cross arm, bracket, clamps, cross bracings, bracings, strain plate, back clamp, transformer mounting structure etc shall be made of MS Channels, MS angle, MS flats as per approved drawings.

While fabricating, good quality electric cutting tools and drill machine shall be used to ensure no sharp edges and perfect holes as per approved drawings. Gas cutting set should not be used for fabrication of MS steel items. Weld material shall be distributed equally between the two materials that were joined. The weld shall be free of waste materials such as slag. The weld surface should not have any irregularities or any porous holes (called porosity). The joint shall be tight. Most welds need to demonstrate the required strength. One way to ensure proper strength is to start with a filler metal and electrode rating that is higher than your strength requirement.

The minimum coating of the zinc on steel tubular poles or Wide Parallel Beam supports shall comply with IS: 2629 and IS: 2633 (with latest amendments). Galvanizing shall be checked and tested in accordance with IS: 2633.

Poles and other hollow items shall be galvanized both inside and out. The zinc coating shall be smooth, continuous and uniform. It shall be free from acid spots and shall not scale, blister or be removable by handling or packing. There shall be no impurities in the zinc or additives to the smelter bath that could have a detrimental effect on the durability of the zinc coating. Before pickling, all welding, drilling, cutting and grinding shall be completed and all grease, paint, varnish, oil and welding slag shall be completely removed.

All protuberances which could affect the life of galvanizing shall also be removed. To avoid the formation of white rust all galvanized material shall be packaged in such a way to ensure adequate ventilation between parts during shipping and storage.

Testing of galvanizing shall be performed for Uniformity of thickness as per IS 2633/1986, Mass of coating as per IS 6745/1972 and quantity of zinc, water quenching & centrifuging as per IS 2629/1985.

4.00 Hardware:

MS Nuts, bolts and washers (Galvanized) – 16 mm dia nuts, bolts & washers shall be used for tying of overhead structure items like cross arms, top clamps, brackets, clamps, bracing, strain plates etc.

While erecting, proper dimensions of nut-bolts and washers must be ensured. 2 to 3 threads only be visible of the bolt after full tightening of nut on requisite torque. The hardware shall be hot dip galvanized. The minimum coating of the zinc shall comply with IS: 2629 and IS: 2633. Galvanizing shall be checked and tested in accordance with IS: 2633. Before shifting them to site for erection, they shall be offered for inspection and approval by Project Manager.

5.00 Stay Set:

Galvanized Stay Set with stay clamp, guy insulator (1 No.), anchor plate (230x230x6mm) , nut-bolts, 1 Nos turn-buckles, 1830 mm long, 20 mm diameter solid GS stay rod & 7/3.15 mm dia GI stranded wire complete.

Stay set shall be used at all sub-station location to nullify the tension of conductor/cable/transformer on the supports. 0.2 cmt cement concreting in mixture 1 part cement, 3 part coarse sand and 6 part 40mm size aggregate stone chips (1:3:6) shall be provided in the foundation of the stay set. 2 Nos. guy insulator shall be provided in 7/3.15 mm dia stranded GI wire at middle locations between two turn buckles.

6.00 Distribution Transformer:

Following type and sizes of minimum 3 star rated {as per Bureau of Energy Efficiency (BEE)}, BIS stamped, distribution transformers are standardized in the project:

- a) ~~25 KVA 3 phase Aluminiumwound DTR~~
 - b) ~~63 KVA 3 phase Aluminiumwound DTR~~
 - c) 100 KVA 3 phase Aluminiumwound DTR
 - d) 160 KVA 3 phase Aluminium / Copper wound DTR
 - e) ~~200 KVA 3 phase Aluminium / Copper wound DTR~~
 - f) ~~250 KVA 3 phase Aluminium / Copper wound DTR~~
 - g) ~~315 KVA 3 phase Aluminium / copper wound DTR~~
- Or any other rating as per latest Indian Standard Specification

~~3ph/4ph~~ Distribution Transformers shall be 11/0.4 KV or ~~11KV/230 V~~ or 22/0.44 KV non-sealed type, ~~type BEE specified minimum 3 Star Distribution Transformers.~~ The transformers shall be double wound, three phase, CRGO or amorphose core type having energy efficiency level 1 as specified in latest IS:1980 (Part-1) 2014 with Amendments 1,2 3 &4.

Distribution Transformers shall be subject to inspection during manufacturing (stage inspection), pre-delivery inspection, and inspection at site during pre-erection/post erection/post commissioning conditions. Project Manager shall select samples from the core laminations and get the same tested in NABL Accredited laboratory to prove the quality of the core material.

The distribution transformers shall be supplied with transformer oil filled up-to maximum permissible level and breather with silica gel.

The distribution transformers must have been successfully type tested within five years from date of Letter of Intent and the designs should have been in satisfactory operation for a period not less than two years as on the date of bid opening. Compliance shall be demonstrated by submitting, (i) authenticated copies of the type test reports and (ii) performance certificates from the users, specifically from Central Govt./State Govt. or their undertakings.

The losses in Distribution Transformer should be as per **Energy Efficiency Level 1 as specified in IS 1180 (Part-1):2014 and amendment 1,2,3 &4** for all kVA ratings of distribution transformers

Bimetallic connectors of suitable capacities are to be provided on LT side and on HT side of the transformer.

Transformers must be of standard preferred ratings as specified in scope of works.

T-Clamps should be provided on each jumper on bus bars. Line jumpers should be provided with adequate size of PG Clamps (Two numbers PG Clamps at each end of jumper). Clamp should be made of aluminum grade T-1F as per IS-8309 having good electrical quality aluminum material and should not be brittle in nature.

Transformers should be tested for pre-commissioning checks which includes Insulation Resistance Test, ratio test and oil breakdown voltage test. Before formal energisation, oil leakages from the parts of the transformer, oil level in conservator tank, condition of silica gel, earth connection (two separate) between neutral and earthing, proper jointing of earth wires/flats at the joints and earth resistance of the individual earthing pits are to be checked and recorded. On commissioning of the transformer, phase current and phase to phase voltage, phase to neutral voltage are to be recorded. The loading on the transformers should be balanced. The quantum of neutral current flowing through neutral shall be recorded. A record of pre-commissioning checks/tests are to be prepared and submitted to the Project Manager.

7.00 ACSR / AAAC Conductor:

ACSR raccoon conductor (or equivalent AAAC Conductor) is to be used for connection between overhead lines to transformer studs/bushing upto 100 KVA ratings. For transformers having ratings more than 100KVA, higher size of conductors matching with its current carrying rating be used.

8.00 Distribution Box CRCA Distribution Box and Power Cabling:

Distribution Box CRCA Distribution Boxes are to be installed as per specifications enclosed. The boxes are to be erected, electrically connected with the existing system, properly earthed, and labeled. The test report of pre-commissioning checks should be prepared and submitted.

All CT terminals are to be ring type and other terminals are fork type. 2.5 sqmm copper multi stands wiring 1.1 KV grade, ISI marked, IS 694 shall be used for control wiring. A terminal block be provided between CT and Meter keeping 20% spare terminals.

The Distribution Box CRCA Distribution Boxes are to be earthed using 6 SWG GI wire direct connection to the earthing. 2 Nos Earthing bolts on the distribution boards should be provided of 10mm dia.

The single core power cables should be terminated with proper size lugs and gland. Necessary tagging, identification of cores and dressing of cables with nylon cable ties shall be in the

scope of work. The unutilized holes in the DBs provided for cable entry needs to be plugged properly in a manner that it must stop access to reptiles, dust and water ingress.

The Low Tension bus bars are to be painted with two or more coats of brush-able epoxy compound suitable to insulate the bus bars for 415 volts exposure.

The Distribution Box CRCA Distribution Box, for transformers upto and including 25 KVA, should also house three phase tri-vector energy meter / single phase meter depending on capacity and type of distribution transformer as per specifications. For higher capacity transformers where CT operated meters are to be installed, separate LTCT cum Meter Box at eye height shall be installed for housing of meter, CTs, terminal block and wiring.

The single core un-armored power cables shall be used for connection from Distribution Transformer to Distribution Box CRCA Distribution Box and Distribution Box CRCA Distribution Box to Outgoing LT lines. Cable should not be used in underground laying arrangement. Cables should be dressed & tied properly using clamps /cable ties at 1 meter intervals and tied with substation structure/poles. At-least one meter cable is to be kept as spare at the individual ends.

Following arrangements shall be made for LT Distribution Transformers and LT Cables:

No	Type of DTR	Incomer		Outgoing	Cable	
		<i>MCB/Isolator</i>	<i>HRC fuse</i>	<i>MCCB</i>	<i>1</i>	<i>2</i>
1	25 KVA 3 Ph	40A TPN MCCB		6x25/40 A SP MCCB	1Cx50sqmm UA	
2	63 KVA 3 Ph	200A TPN Isolator	100 A	6x60A SP MCCB	1Cx50/120sqmm UA	1Cx50 sqmm UA
3	100 KVA 3 Ph	200A TPN Isolator	160 A	6x90A SP MCCB	1Cx50/70 sqmm UA	1Cx150 sqmm UA
4	160 KVA 3 Ph	600A TPN Isolator	315 A	2x120A SP MCCB	1Cx150 sqmm UA	1Cx300 sqmm UA
5	200 KVA 3 Ph	600A TPN Isolator	315 A	9x120A SP MCCB	1Cx150 sqmm UA	1Cx300 sqmm UA
6	315 KVA 3 Ph	600A TPN Isolator	500 A	12X120A SP MCCB	1CX150 sqmm UA	1CX300 sqmm UA

1.1 KV XLPE Aluminium Conductor, Stranded, un-armored cable be used for connection of transformer LV bushing to Distribution Box CRCA Distribution Box and Distribution Box CRCA Distribution Box to overhead line.

9.00 Earthing:

Distribution Transformer Earthing shall be provided with 3 Nos earthing and making earth mat /risers using 50X6mm GI Flat. Earthing should be provided with GI earth pipe or Chemical Earthing depending of strata of soil in the location. Project Manager shall decide the type of earthing.

25x4mm GI Flat and 6 SWG GI shall be used for making earthing connection to various sub-station equipment as per given details. GI Flat and GI wire shall be properly dressed, bunched and clamped with the support at 2 feet intervals. An overlapping of 35mm shall be used at the place of flat to flat joint. Two sets of GI nuts, bolts and washers shall be used for flat-to-flat joints. GI nuts, bolts and washers must be used for GI Flat-to-GI wire & GI wire-to-GI wire joints.

Substation wise measurement of earth resistance of earth pits / mesh and corresponding drawing of existing earthing arrangement shall be recorded and submitted to Project Manager.

Description of equipment	Earth connection
Earthing pits	3 Nos. Earth Pipe 3 m long, 40 mm dia or Chemical Earthing
Earth mat and riser	50X6 mm GI Flat / 6 SWG GI wire
Laying of earth mat	Below ground 0.5 meter

Standard requirements of earthing shall be as under:

- Earth Pit – 1 for Transformer Neutral,
- Earth pit - 2 for Lightening Arrester,
- Earth pit – 3 for Equipment body earthing.
- Maintenance free earthing

Following arrangement is envisaged for various equipment of distribution transformer substation:

- Transformer Neutral (Two distinct connections) : GS Flat 25x4mm
- Transformer Body : GS Flat 25x4mm
- Lightning Arrester : GS Flat 25x4mm
- Fencing (Wherever required) : GI wire 6 SWG
- LT Distribution Box CRCA Distribution Box (Two distinct connections) : GI wire 6 SWG
- AB Switch handle : GI wire 6 SWG
- Steel structure of substation : GI wire 6 SWG
- Line meters : GS wire 6 SWG

The location of earth pits should be at-least 3m apart, so that their earth conductive areas do not overlap. In rocky soil where getting required earth resistance is a challenge, chemical rod earthing shall be used in place of normal GI pipe type earthing. Project Manager shall decide type of earthing pits.

10.00 Insulator and hardware:

11 KV polymer Disc/Pin insulator with suitable hardware fittings shall be used. Insulator should be tied properly using binding wire/helical form fitting. Bi-metallic clamps must be used at terminals.

The individual insulator shall be checked for insulation resistance before overhead line installation. Insulator should properly be cleaned before installation. No damage/crack insulator should be used.

11.00 Substation numbering:

Each Substation should be numbered properly labelled using yellow base and black indication marks (number or digits). 40/50 mm height digits/words should be used for this purpose. Base shall be made using 2 or more coats of yellow enamel paint till good surface finish. Base preparation shall be completed before shifting of poles to site for erection. Base painting and marking of digits should be performed by a skilled and trained painter using branded enamel paint, Project Manager shall approve type and brand of enamel paint.

12.00 Anti-climbing device:

3.5 kgs, 2.5mm dia (12 SWG) galvanized barbed wire shall be used on each sub-station support. Galvanized barbed wire should be properly dressed and crimped at termination. While wrapping the wire on support, proper tension should be maintained.

13.00 Danger board:

Each support should be provided with a danger board **with pole clamps** as per approved drawing. Danger board should be in bi-lingual languages (local language and English). Clamp for danger board, nut-bolts and washers shall be painted with two or more coats of red-oxide and aluminium paints respectively till smooth surface before installation.

14.00 Support foundation:

0.5 m³ Cement concrete in mixture 1 part cement, 3 part coarse sand, 6 part 40 mm size aggregate stone chips (1:3:6) shall be used in PCC Pole, steel tubular poles and H-Beam support foundation.

While erecting supports (poles), shuttering must be used for concreting so that proper quantity of cement concrete mixture be used and assessed during inspection. During concreting proper compaction by means of mobile vibrator be provided. While starting work of support erection, gang wise shuttering and mobile vibrator shall be offered for inspection to Project Manager. While erecting support, mercury level gauge must be used to ensure vertical erection of support.

250mm dia X 12" inch size muffing shall be provided on steel tubular and H-Beam poles to prevent direct entry of rain water along the poles. Cement Concrete of 1:2:4 (1 part Cement, 2 parts coarse sand and 4 parts 20mm aggregate stones chips) shall be used for individual poles.

Steel plate shall be used in steel tubular poles and cement concrete reinforced plate shall be used as base plate for PCC poles.

15.00 11 KV AB Switch:

11 kV, 3-ph, 200 A, 3 Pin type, Vertical Mounting type, Gang Operated, AB Switch shall be installed on 100 KVA and more capacity distribution transformer substation only. B Class GI pipe shall be used (without any joints) for operation of switch. AB Switch structure and handle must be earthed using 6 SWG GI wire.

16.00 ~~11 KV Drop Out Fuses:~~ 11 KV HG Fuse will be used as per approved drawing.

~~11 kV, 3-ph, Drop Out fuse units (set of 3 units) along with Support Insulators, Base Channel, fuse barrel etc. shall be used for all capacity Distribution Transformer Substations. HG Fuse structure shall be earthed using 8 SWG GI wire.~~

17.00 Lighting Arrester:

Sub Station Class LAs on each phase shall be provided in the sub-station with base steel structure, terminals bi – metallic connectors / PG clamps and earth connectors. LAs are to be connected with separate earth connection. 25x3 mm GI flat shall be used for earth connection.

13.6.New LT Line

1. ~~GPS Survey:~~

~~Mapping of route of proposed new LT line by foot GPS Survey in rural/urban areas be performed mentioning various milestones. While GPS Surveying, existing electrical infrastructure in the locality should also be mapped. Line alignment (single line diagram) on political map with fair correctness, be prepared. SLD and foot GPS Survey report shall be approved by Project Manager and shall be used as basic document for assessment of works under the contract. On completion of line work, as built Single Line Diagram and pole wise line diagram showing pole wise materials used and pole-to-pole span should be submitted to Project Manager. This details shall be used as reference documents by Quality & Quantity Inspecting officials to execute inspection works.~~

2. ~~The LT line between distribution transformer and consumers shall be on LT Areal Bunched cables.~~

3. ~~Support for LT overhead Line:~~

- ~~a) 8 M (WL 200 kg) PCC Poles (PCC Pole as per state practice)~~
- ~~b) 11 M long Steel Tubular poles of Designation 540 SP 52 (IS 2713, Pt I, II, III 1980)~~
- ~~c) 9 M long Steel Tubular poles of Designation 540 SP 28 (IS 2713, Pt I, II, III 1980)~~
- ~~d) 11 m Parallel Flanged beams WPB 160x160x30.44 kg/m for hilly and urban areas~~

~~In rural area, Employer may use PCC poles are to be used. In urban area, Employer may use PCC or H-Beam or STP or Wide Parallel Beam supports are to be used of suitable length. In hilly areas where handling of material is a challenge, tubular poles or Wide Parallel Beam GI poles expandable with jointing plaes may be used. In location specific conditions like forest area, vicinity of other existing overhead lines or permanent structures etc, H-beam or tubular poles or Wide Parallel Beam supports may be used of suable length. Steel bottom plate shall be used in steel tubular poles/H-Beam / Wide parallel Beam and cement concrete reinforced plate shall be used as base plate for PCC poles. The size of RCC Base Plate (600x600x100)mm for 9 Mtr PCC Pole & (450x450x75)mm for 8 Mtr PCC Pole which will be offered for inspection to WBS EDC L prior to use. After satisfactory inspection DI will be issued from respective Project Office and the material will be entiteled to put into use at the site. Steel tubular poles shall be cleaned till good surface finish and painted with 2 or more coats of red oxide paint and 2 or more coats of aluminium paint till good finish. Steel tubular poles and H-Beams shall also be painted with 2 or more coats till good surface finish with anti-corrosive paint (in case of tubular poles shall also be painted on the inner walls) which goes in to the foundation. Project Manager shall approved brand and shade of paints.~~

4. — Fabricated steel items:

~~Fabricated steel items like clamps, stay clamp, etc shall be made of MS Channels, MS angle, MS flats as per approved drawings.~~

~~While fabricating, good quality electrical cutting tools and drill machine shall be used to ensure no sharp edges and perfect holes as per approved drawings. Gas cutting set should not be used for fabrication of MS steel items. Weld material shall be distributed equally between the two materials that were joined. The weld shall be free of waste materials such as slag. The weld surface should not have any irregularities or any porous holes (called porosity). The joint shall be tight. Most welds need to demonstrate the required strength. One way to ensure proper strength is to start with a filler metal and electrode rating that is higher than your strength requirement.~~

~~The fabricated steel structures materials shall be hot dip galvanized thoroughly internally and externally according to IS: 2629 and IS: 2633 (with latest amendments). Galvanizing shall be checked and tested in accordance with IS: 2633.~~

~~Fabricated steel structure items shall be galvanized both inside and out. The zinc coating shall be smooth, continuous and uniform. It shall be free from acid spots and shall not scale, blister or be removable by handling or packing. There shall be no impurities in the zinc or additives to the smelter bath that could have a detrimental effect on the durability of the zinc coating. Before pickling, all welding, drilling, cutting and grinding shall be completed and all grease, paint, varnish, oil and welding slag shall be completely removed.~~

~~All protuberances which could affect the life of galvanizing shall also be removed. To avoid the formation of white rust all galvanized material shall be packaged in such a way to ensure adequate ventilation between parts during shipping and storage.~~

~~Testing of galvanizing shall be performed for Uniformity of thickness as per IS 2633/1986, Mass of coating as per IS 6745/1972 and quantity of zinc, water quenching & centrifuging as per IS 2629/1985.~~

5. — Hardware:

~~MS Nuts, bolts and washers (Galvanized) — 16 mm dia nuts, bolts & washers shall be used for tying of overhead structure wherever required.~~

~~While erecting, proper dimensions of nut bolts and washers must be ensured. 2 to 3 threads only be visible of the bolt after full tightening of nut on requisite torque. The hardware shall be hot dip galvanized. The minimum coating of the zinc shall comply with IS: 2629 and IS: 2633. Galvanizing shall be checked and tested in accordance with IS: 2633. Before shifting them to site for erection, they shall be offered for inspection and approval by Project Manager.~~

~~Galvanized Stay Set with stay clamp, guy insulator (1 No.), anchor plate (230x230x6mm) , nut bolts, 1 Nos turn buckles, 1830 mm long, 20 mm diameter solid GS stay rod & ~~7/2.5 mm~~ dia GI stranded wire complete.~~

~~Stay set shall be used at all turning locations, cable dead end locations to nullify the tension of the cable. Erection of storm guys at suitable location in straight line may also be provided. Erection of storm guys at suitable location in straight line may also be provided.~~

~~0.2 cmt cement concreting in mixture 1 part cement, 3 part coarse sand, 6 part 40mm size aggregate stone chips (1:3:6). 2 Nos. guy insulator shall be provided in stranded GI wire at middle location between two turn buckles.~~

~~—~~

~~6. — Following earthing arrangements are envisaged for new LT lines:~~

- ~~6.1.1. 40 mm dia., 3000 mm long GI pipe earth electrode with test link, RCC pit, RCC cover plate on GI frame, bentonite powder and other accessories complete~~
- ~~6.1.2. GI Earthing spike made of 20mm solid rod, 50 turns earthing coil~~
- ~~6.1.3. Chemical rod earthing using Carbon powder/Bentonite powder / Conductive concrete powder including electrode with 2000mm long, 50 mm diameter GI pipe, GI Strip of 24x3mm minimum. 6 SWG GI wire for earthing and guarding. —~~

~~Every sixth LT line support shall be provided with one GI earthing spike made of 20 mm solid rod or GI Earth Coil and connected with 6 SWG GI wire. Overhead steel items shall be connected to GI earthing spike or GI Earth Coil using 6 SWG GI wire. GI nuts, bolts & washers shall be used to join two GI wires and 20 mm solid spike rod. Project Manager shall decide use of GI Earth Coil or 20mm dia GI Solid Rod for individual pole earthing.~~

~~In rocky soil where getting required earth resistance is a challenge, chemical rod earthing shall be used. Overhead line structure shall be connected to chemical earth electrode using 8SWG GI wire. GI nuts, bolts & washers shall be used to join two GI wires and 20 mm solid spike rod.~~

~~GI wires must be properly dressed and fixed on supporting structure at 1 to 2 feet intervals.~~

7.—— LT line shall form following areal bunched XLPE cables:

8.01	1X16 (Ph) + 1X25 (insulated messenger cum neutral) SQ. MM.
8.02	1X16 (Ph) + 1X25 (insulated messenger cum neutral) + 1x16 (insulated Street lighting)SQ. MM.
8.03	3X16(Ph)+1X25 (insulated messenger cum neutral) SQ. MM.
8.04	3 X 16(Ph) +1x25 (insulated messenger cum neutral) + 1x16 (insulated Street lighting) SQ. MM.
8.05	1X25(Ph)+1x25 (insulated messenger cum neutral) SQ. MM.
8.06	1X25(Ph) + 1X25 (insulated messenger cum neutral) + 1x16 (insulated Street lighting) SQ. MM.
8.07	3X25(Ph)+1X25 (insulated messenger cum neutral) SQ. MM.
8.08	3 X 25(Ph) +1x25 (insulated messenger cum neutral) + 1x16 (insulated Street lighting) SQ. MM.
8.09	1X35(Ph)+1X25 (insulated messenger cum neutral) SQ. MM.
8.10	1x35(Ph) + 1X25 (insulated messenger cum neutral) + 1x16 (insulated Street lighting) SQ. MM.
8.11	3X35(Ph)+1X25 (insulated messenger cum neutral) SQ. MM.
8.12	3X35 (Ph) + 1x25 (insulated messenger cum neutral)+ 1x16 (insulated Street lighting) SQ. MM.
8.13	3X50(Ph)+1X35 (insulated messenger cum neutral) SQ. MM.
8.14	3X50 (Ph)+1x35 (insulated messenger cum neutral) +1x16 (insulated Street lighting) SQ. MM.
8.15	3X95(Ph)+1X70 (insulated messenger cum neutral) +1x16 (insulated Street lighting) SQ. MM.

8.—— ~~Distribution Box CRCA sheet Distribution Box:~~

~~Single phase or three phase Distribution Box CRCA sheet Distribution Box CRCA sheet Distribution Box CRCA sheet Distribution Box shall be provided for extending power supply to LT consumers. Distribution Box CRCA sheet Distribution Box (DB) shall be mounted on LT pole with galvanized MS clamp of 50x3 mm size. DB shall be earthed using 6 SWG GI wire.~~

~~Single phase DB shall be suited for two core 25 sqmmaluminium conductor cable as incomer and 8 nos. two core 10 sqmm conductor cables as outgoing cables. Three phase DB shall be~~

~~suited for four core 35 sqmm aluminium conductor cable as incomer and 4 nos. four core 16 sqmm conductor cables as outgoing cables.~~

~~The Distribution Box CRCA sheet Distribution Box shall be installed only at locations where BPL connections are provided.~~

9. ~~Connection from ABC cable:~~

~~T-connector shall be used at LT line for tapping. While tapping connection from ABC cable, highly skilled lineman/wireman shall be deployed along with sophisticated cutting plier/tool so that no damage should result in AB cable conductor. T-connector should be crimped properly for resistance free/maintenance free electric connection. Alternately, piercing type connector may be used for tapping of LT connection from ABC cable conductor.~~

10. ~~Distribution Box CRCA sheet Distribution Box Pole numbering:-~~

~~Each support pole should be numbered properly labelled using yellow base and black indication marks (number or digits). 40/50 mm height digits/words should be used for this purpose. Base shall be made using 2 or more coats of yellow enamel paint till good surface finish. Base preparation shall be completed before shifting of poles to site for erection. Base painting and marking of digits should be performed by a skilled and trained painter using branded enamel paint, Project Manager shall approve type and brand of enamel paint.~~

11. ~~Anti-climbing device:~~

~~3.5 kgs, 2.5mm dia (12 SWG) galvanized barbed wire shall be used on each LT line support. Galvanized barbed wire should be properly dressed and crimped at termination. While wrapping the wire on support, proper tension should be maintained.~~

12. ~~Danger board:-~~

~~Each support should be provided with a danger board with pole clamps as per approved drawing. Danger board should be in bi-lingual languages (local language and English). Clamp for danger board, nut bolts and washers shall be painted with two or more coats of red-oxide and aluminium paints respectively till smooth surface before installation.~~

13. ~~Support foundation:-~~

~~Cement concrete in mixture 1 part cement, 3 part coarse sand, 6 part 40 mm size aggregate stone chips (1:3:6) shall be used in steel tubular poles and H-Beam LT line supports and wide parallel beam supports.~~

~~In rural areas, PCC pole pit shall be refilled with 200 mm average size of bolder mixed with excavated earth. Proper ramming shall be performed for better compaction. PCC pole at cut point and PCC poles erected on water logging area shall be grouted using cement concrete mixture similar to H-Beam & Tubular poles. Prior approval of Project Manager shall be obtained for concreting of PCC poles in water logging area. While preparing route GPS-Survey report, water logging areas shall be earmarked.—~~

~~While erecting supports (poles), shuttering must be used for concreting so that proper quantity of cement concrete mixture be used and assessed during inspection. During concreting proper compaction by means of mobile vibrator be provided. While starting work of support erection, gang wise shuttering and mobile vibrator shall be offered for inspection to Project Manager. While erecting support, mercury level gauge must be used to ensure vertical erection of support.—~~

~~250mm dia X 12" inch size muffing shall be provided on steel tubular and H-Beam poles to prevent direct entry of rain water along the poles. Cement Concrete of 1:2:4 (1 part Cement, 2 parts coarse sand and 4 parts 20mm aggregate stones chips) shall be used for individual poles.—~~

~~Steel plate shall be used in steel tubular poles and cement concrete reinforced plate shall be used as base plate for PCC poles.~~

~~14. —Quality & Quantity inspection and compliance to the observation:-~~

~~The line works, before or after commissioning/energisation, shall be inspected by Quality Inspectors and State Inspection Inspectorate. Contractor shall provide all requisite details of line like approved GPS Survey report, as built drawings and joint measurement sheet to the inspector to conduct. Contractor shall rectify defects/deficiencies and submit compliance to the observations with supporting photographs in digital form within one month from receipt of observations.—~~

~~15. —Tree-cutting/trimming of tree:-~~

~~The Contractor shall count, mark and put proper numbers with suitable quality of paint at his own cost on all the trees that are to be cut/trim to obtain required tree clearance. Contractor shall pay compensation for any loss or damage for tree cutting due to Contractor's work. Wherever forest clearance is envisaged for execution of work, clearance of forest department for tree cutting, if required, shall be arranged by the Project Manager and compensation shall also be paid by the Project Manager. Necessary fee if required to pay to Govt. dept. for~~

~~arranging such clearances shall paid by Project Manager. However, the Contractor would require to provide all necessary assistance for execution of this work.~~

~~16. Statutory clearances:~~

~~During execution of LT Line works, all statutory clearances shall be ensured for ground clearance, line-to-line clearance, road crossing clearance etc.~~

~~17. The earthing point of distribution transformer should be extended to the single phase beneficiary premises having en-route earth connection at every 6th supports. The earth conductor is to be connected with earth point provided in the premises of single phase consumers. The bearer wire shall be earthed at every sixth pole.~~

~~18. Bearer wire of LT AB cable shall be anchored through eyehook or dead end (anchor) clamps.~~

~~19. Extra length of continuous AB cable along with messenger / bearer wire shall be properly dressed and clamped.~~

13.7. Augmentation and Renovation

1. 33/11 kV substation augmentation

Following types of augmentation works are envisaged in 33/11 kV substation:

- ~~a. Installation of additional 3.15 MVA Transformer with two additional bay on 11 KV side.~~
- ~~b. Installation of additional 5 MVA Transformer with two additional bay on 11 KV side.~~
- ~~c. Installation of additional 6.3 MVA Transformer with three additional bay on 11 KV side.~~
- ~~d. Installation of additional 8 MVA Transformer with four additional bay on 11 KV side.~~
- ~~e. Installation of additional 10 MVA Transformer with four additional bay on 11 KV side.~~
- ~~f. 11 KV out door yard extension for additional bay H-beam structure.~~
- ~~g. 11 KV out door yard extension for additional bay by providing PCC support (pole).~~
- ~~h. 33 KV out door yard extension for additional bay by providing H-beam structure.~~
- ~~i. Installation of 33 KV VCB for 1.6 MVA, 3.15 MVA, 5.0 MVA Transformer.~~
- ~~j. Augmentation of Power Transformer without additional bay on 11 KV side 1.65 MVA to 3.15 MVA.~~
- ~~k. Augmentation of Power Transformer without additional bay on 11 KV side 3.15 MVA to 5.0 MVA.~~
- ~~l. Augmentation of Power Transformer without additional bay on 11 KV side 5.00 MVA to 8.0 MVA.~~

- m. ~~Augmentation of Power Transformer without additional bay on 11 KV side with old transformer 1.6 MVA to 3.15 MVA.~~
- n. ~~Augmentation of Power Transformer without additional bay on 11 KV side with old transformer 3.15 MVA to 5.0 MVA.~~
- o. ~~Augmentation of Power Transformer using old transformer with 2 no. additional bay on 11 KV side 1.6 MVA to 3.15 MVA.~~
- p. ~~Augmentation of Power Transformer using old transformer with 2 no. additional bay on 11 KV side 3.15 MVA to 5.0 MVA.~~
- q. ~~Augmentation of Power Transformer with 2 no. additional bay on 11 KV side 1.6 MVA to 3.15 MVA.~~
- r. ~~Augmentation of Power Transformer with 2 no. additional bay on 11 KV side 3.15 MVA to 5.0 MVA.~~
- s. ~~Augmentation of Power Transformer with 2 no. additional bay on 11 KV side 5.00 MVA to 8.0 MVA.~~
- t. ~~Capacitor Bank 600 KVAR—Fixed type.~~
- u. ~~Capacitor Bank 1200 KVAR—Auto type.~~
- v. ~~Capacitor Bank 1500 KVAR—Auto type.~~
- w. ~~Revamping of 33/11 kV substation earth mat.~~

~~Above list is of various options of substation renovation/augmentation. The list of works is indicative. Employer shall provide location wise exact details of works to be executed on existing substation. Accordingly, various BoQ items (extracted from items of new 33/11 kV substations) shall be utilized. Item-wise scope of works under new 33/11 kV substations is detailed out under scope of new substation. It shall be utilized on item to item requirement under renovation/augmentation of 33/11 kV substation also. Under this head, only damaged/defective items with approval of Project Manager shall be replaced by good ones. All removed defective/damaged items and good replaced power transformers received should be returned to employer's stores within a time limit decided by the Project Manager in the same condition as replaced.~~

~~2. Renovation/Augmentation of 33 kV line~~

- 1.00 ~~Augmentation of 3 phase 33 kV line using additional supports matching with length and type of existing support is envisaged on following type of supports:~~
 - i. ~~9.1 meter long /280 KG PCC Poles (PCC Pole as per state practice)~~
 - ii. ~~11 m or 13 m long H-Beam 152x152 mm 37.1 kg/m~~
 - iii. ~~11 M long steel Tubular poles with welded steel base plate of Designation 540 SP 52 (IS 2713, Pt I, II, III 1980)~~
 - iv. ~~13 M long steel Tubular poles with welded steel base plate of Designation 540 SP 72 (IS 2713, Pt I, II, III 1980)~~

~~2.00 — Augmentation of existing conductor with following type of new ACSR conductor including jointing sleeves, binding materials and helical formed fittings etc as required are envisaged under this work—~~

- ~~i. — 6/4.72 mm + 7/1.57 mm (100 mm² Al. Area) — Dog replacing existing raccoon conductor~~
- ~~ii. — 6/4.09 + 1/4.09 mm (80 mm² Al. Area) — Raccoon replacing existing rabbit/weasel conductor~~
- ~~iii. — 30/2.59 + 7/2.59 mm (150 mm² Al. Area) — Wolf replacing existing dog/raccoon conductor~~
- ~~iv. — 30/3.00 + 7/3.00 mm (200 mm² Al. Area) — Panther replacing existing dog/raccoon/wolf conductor~~

~~3.00 — While executing this work, mid span pole with all fittings may be provided matching with existing poles of the line.—~~

~~4.00 — Following works shall also be executed by Contractor under this head—~~

- ~~a. — Replacement of damaged insulators~~
- ~~b. — Straightening of tilted supports by providing additional foundation or by providing boulders etc as required.~~
- ~~c. — Revamping of pole earthing and replacement of GI earth wire.~~
- ~~d. — Labelling, providing danger board, providing anti climbing device and painting of all the poles shall be in the scope of work~~
- ~~e. — Replacement of damaged/bent V-cross arms & top clamps with new ones~~
- ~~f. — Providing of stay set wherever required~~
- ~~g. — Providing of guarding wherever required~~
- ~~h. — Removal of old conductor in coil form, removal of old steel structure, removal of old conductor fittings, removal of any other worn out/defective material and deposit them in Employer's store within a reasonable time as decided by Project Manager~~

~~Item-wise scope of works under renovation/augmentation of 33 kV line is detailed out under scope of new 33 kV line. It shall be utilized on item to item requirement under renovation/augmentation of 33 kV line also.~~

3. — Renovation/Augmentation of 11 kV line

~~1.00 — Augmentation of 3 phase 11 kV line using additional supports matching with length and type of existing support is envisaged on following type of supports:~~

- ~~a. — 8 meter long /140 KG PCC Poles (PCC Pole as per state practice)~~
- ~~b. — 9 m or 11 m or 13 m long H-Beam 152x152 mm 37.1 kg/m~~

- e. ~~11 M long steel Tubular poles with welded steel base plate of Designation 540 SP 52 (IS 2713, Pt I, II, III 1980)~~
- d. ~~13 M long steel Tubular poles with welded steel base plate of Designation 540 SP 72 (IS 2713, Pt I, II, III 1980)~~

—

2.00 ~~Augmentation of existing conductor with following type of new ACSR conductor including jointing sleeves, binding materials and helical formed fittings etc as required are envisaged under this work—~~

- a. ~~6/3.35 + 1/3.35 mm (50 mm² Al. Area) – Rabbit by replacing existing weasel/squirrel conductor~~
- b. ~~6/4.09 + 1/4.09 mm (80 mm² Al. Area) – Raccoon by replacing existing rabbit/weasel/squirrel conductor~~
- c. ~~6/4.72 mm + 7/1.57 mm (100 mm² Al. Area) – Dog by replacing existing raccoon/rabbit conductor~~

3.00 ~~While executing this work, mid span pole with all fittings may be provided matching with existing poles of the line.~~

4.00 ~~Following works shall also be executed by Contractor under this head—~~

- a. ~~Replacement of damaged insulators~~
- b. ~~Straightening of tilted supports by providing additional foundation or by providing boulders etc as required.~~
- c. ~~Revamping of pole earthing and replacement of GI earth wire.~~
- d. ~~Labelling, providing danger board, providing anti climbing device and painting of all the poles shall be in the scope of work~~
- e. ~~Replacement of damaged/bent V-cross arms & top clamps with new ones~~
- f. ~~Providing of stay set wherever required~~
- g. ~~Providing of guarding wherever required~~
- h. ~~Removal of old conductor in coil form, removal of old steel structure, removal of old conductor fittings, removal of any other worn out/defective material and deposit them in Employer's store within a reasonable time as decided by Project Manager~~

~~Item-wise scope of works under renovation/augmentation of 11 kV line is detailed out under scope of new 11 kV line. It shall be utilized on item to item requirement under renovation/augmentation of 11 kV line also.~~

~~4. R & M and augmentation of Distribution Transformer Substations~~

1.00 ~~GPS Survey of Distribution Transformer Substations:-~~

~~A detailed GPS Survey of overloaded Distribution Transformer substation shall be performed. Existing electrical connected loading and habitation shall be GPS Surveyed and a presentable document showing population residing in the un-electrified area/existing electrified area of habitation shall be performed. Based on GPS Survey, best option for augmentation of distribution transformer substation and the capacity of new transformer shall be decided. The capacity of augmented DTR shall be governed by following technical aspects:-~~

- ~~a) Optimistic lengths of LT lines needed to feed the existing consumers, existing un-connected consumers and future growth in electrical loading,~~
- ~~b) Space available for installation of support/transformers,~~
- ~~c) Probable load expected to come on the transformer due to existing BPL beneficiaries /others connected /un-connected probable beneficiaries in the locality taking care of their expected load growth in next 5 years.~~
- ~~d) Distribution Transformers of capacity 16 KVA to 315 KVA (single phase as well as three phase) shall be decided as per standard rating of distribution transformer as depicted in IS specifications. Nonstandard ratings of DTR shall not be installed.~~
- ~~e) Distribution Transformers of capacity 16 KVA to 315 KVA (single phase as well as three phase) shall be installed on existing structures/plinth.~~

~~Based on GPS Survey report, Project Manager shall decide type, capacity and location of Distribution Transformer sub-station for augmentation/R&M works.~~

~~2.00 Following types of works are envisaged for Distribution Transformer sub-station for augmentation/R&M works:-~~

- ~~a. Replacement of defective materials of DTR substations~~
- ~~b. Re-erection/re-concreting of substation supports~~
- ~~c. Dismantling of defective/worn-out steel structure materials, 11 kV/LT equipment like Lightning Arrester, HG Fuse, Distribution Box, LT cable, jumpering conductor, terminal clamps, insulators etc as required. Shifting of dismantled material to Employer's store within reasonable period of time.~~
- ~~d. Installation of stay set for strengthening of DTR substation structure.~~
- ~~e. Topping up of new and filtered transformer oil wherever required.~~
- ~~f. De-moisturizing of silica gel, filling of transformer oil in silica gel breather.~~
- ~~g. Providing new DTR substation equipment like steel structure materials, 11 kV/LT equipment like Lightning Arrester, HG Fuse, Distribution Box, LT cable, jumpering conductor, terminal clamps, insulators etc~~
- ~~h. Renovation of DTR substation earthing by providing new earth pits, inter connection of earth pits and their connection to various equipment~~

- i. ~~Cleaning of metallic structure items by rubbing through emery paper and re-painting using two coats of red oxide paint and two coats of aluminium oxide paints of reputed type and make as approved by Project Manager using painting brush.~~

—

3.00 ~~Fabricated steel items:-~~

~~Fabricated steel items like DC cross arm (100x50x6 mm), back clamps (65x8 mm), pole clamp (65x8 mm), mounting channel (100x50x6 mm), transformer mounting channel (100x50x6 mm), transformer clamping set (50x50x6 mm), transformer belting set (50x50x6 mm), V cross arm, top clamp, DC cross arm, bracket, clamps, cross bracings, bracings, strain plate, back clamp, transformer mounting structure etc shall be made of MS Channels, MS angle, MS flats as per approved drawings.~~

~~While fabricating, good quality electric cutting tools and drill machine shall be used to ensure no sharp edges and perfect holes as per approved drawings. Gas cutting set should not be used for fabrication of MS steel items. Weld material shall be distributed equally between the two materials that were joined. The weld shall be free of waste materials such as slag. The weld surface should not have any irregularities or any porous holes (called porosity). The joint shall be tight. Most welds need to demonstrate the required strength. One way to ensure proper strength is to start with a filler metal and electrode rating that is higher than your strength requirement.~~

~~The fabricated steel structures materials shall be hot-dip galvanized thoroughly internally and externally according to IS: 2629 and IS: 2633 (with latest amendments). Galvanizing shall be checked and tested in accordance with IS: 2633.~~

~~Fabricated steel structure items shall be galvanized both inside and out. The zinc coating shall be smooth, continuous and uniform. It shall be free from acid spots and shall not scale, blister or be removable by handling or packing. There shall be no impurities in the zinc or additives to the smelter bath that could have a detrimental effect on the durability of the zinc coating. Before pickling, all welding, drilling, cutting and grinding shall be completed and all grease, paint, varnish, oil and welding slag shall be completely removed.~~

~~All protuberances which could affect the life of galvanizing shall also be removed. To avoid the formation of white rust all galvanized material shall be packaged in such a way to ensure adequate ventilation between parts during shipping and storage.~~

~~Testing of galvanizing shall be performed for Uniformity of thickness as per IS 2633/1986, Mass of coating as per IS 6745/1972 and quantity of zinc, water quenching & centrifuging as per IS 2629/1985.~~

~~4.00 — Hardware:-~~

~~MS Nuts, bolts and washers (Galvanized) — 16 mm dia nuts, bolts & washers shall be used for tying of overhead structure items like cross arms, top clamps, brackets, clamps, bracing, strain plates etc.~~

~~While erecting, proper dimensions of nut bolts and washers must be ensured. 2 to 3 threads only be visible of the bolt after full tightening of nut on requisite torque. The hardware shall be hot dip galvanized. The minimum coating of the zinc shall comply with IS: 2629 and IS: 2633. Galvanizing shall be checked and tested in accordance with IS: 2633. Before shifting them to site for erection, they shall be offered for inspection and approval by Project Manager.~~

~~5.00 — Stay Set:-~~

~~Galvanized Stay Set with 50x8 mm stay clamp, guy insulator (2Nos.), anchor plate (200x200x6mm), nut bolts, 1 Nos turn buckles, 1.8 m long, 16 mm diameter solid GS stay rod & 7/3.15 mm dia GI stranded wire complete.~~

~~Stay set shall be used at all sub-station location to nullify the tension of conductor/cable/transformer on the supports. 0.2 cmt cement concreting in mixture 1 part cement, 3 part coarse sand and 6 part 40mm size aggregate stone chips (1:3:6) shall be provided in the foundation of the stay set. 2 Nos. guy insulator shall be provided in 7/3.15 mm dia stranded GI wire at middle locations between two turn buckles.~~

~~6.00 — Distribution Transformer:-~~

~~Following type and sizes of Energy efficiency Level 1 rated DT as per IS 1980 (Part-1) 2014 with Amendments 1, 2, 3, & 4. , distribution transformers are standardized in the project for augmentation~~

- ~~a) 5/6 KVA 1 phase Aluminium / Copper wound DTR~~
- ~~b) 10 KVA 1 phase / 3 phase Aluminium / Copper wound DTR~~
- ~~e) 16 KVA 1 phase / 3 phase Aluminium / Copper wound DTR~~
- ~~d) 25 KVA 1 phase / 3 phase Aluminium / Copper wound DTR~~
- ~~e) 63 KVA 3 phase Aluminium / Copper wound DTR~~
- ~~f) 100 KVA 3 phase Aluminium / Copper wound DTR~~
- ~~g) 200 KVA 3 phase Aluminium / Copper wound DTR~~
- ~~h) 250 KVA 3 phase Aluminium / Copper wound DTR~~
- ~~i) 315 KVA 3 phase Aluminium / copper wound DTR~~

~~Or any other rating as per latest Indian Standard Specification~~

~~3ph/1ph Distribution Transformers shall be 11/0.4 KV or 11KV/230 V or 22/0.44 KV non-sealed type, type BEE specified minimum 3 Star Distribution Transformers. The transformers shall be double wound, three phase, CRGO or amorphose core type having energy efficiency level 1 as specified in latest IS:1980 (Part-1) 2014 with Amendments 1,2 3 &4.~~

~~Distribution Transformers shall be subject to inspection during manufacturing (stage inspection), pre-delivery inspection, and inspection at site during pre-erection/post erection/post commissioning conditions. Project Manager shall select samples from the core laminations and get the same tested in NABL Accredited laboratory to prove the quality of the core material.~~

~~The new distribution transformers shall be supplied with transformer oil filled up to maximum permissible level and breather with silica gel.~~

~~The distribution transformers must have been successfully type tested within five years from date of Letter of Intent and the designs should have been in satisfactory operation for a period not less than two years as on the date of bid opening. Compliance shall be demonstrated by submitting, (i) authenticated copies of the type test reports and (ii) performance certificates from the users, specifically from Central Govt./State Govt. or their undertakings.~~

~~.~~

~~The losses in Distribution Transformer should be as per **Energy Efficiency Level 1 as specified in IS 1180 (Part-1):2014 and amendment 1,2,3 &4** for all kVA ratings of distribution transformers~~

~~Bimetallic connectors of suitable capacities are to be provided on LT side and on HT side of the transformer.~~

~~T-Clamps should be provided on each jumper on bus bars. Line jumpers should be provided with adequate size of PG Clamps (Two numbers PG Clamps at each end of jumper). Clamp should be made of aluminum grade T-1F as per IS-8309 having good electrical quality aluminum material and should not be brittle in nature.~~

~~Transformers should be tested for pre-commissioning checks which includes Insulation Resistance Test, ratio test and oil breakdown voltage test. Before formal energisation, oil leakages from the parts of the transformer, oil level in conservator tank, condition of silica gel, earth connection (two separate) between neutral and earthing, proper jointing of earth wires/flats at the joints and earth resistance of the individual earthing pits are to be checked and recorded. On commissioning of the transformer, phase current and phase to phase voltage, phase to neutral voltage are to be recorded. The loading on the transformers should be balanced. The quantum of neutral current flowing through neutral shall be recorded. A record of pre-commissioning checks/tests are to be prepared and submitted to the Project Manager.~~

~~7.00 — ACSR / AAAC Conductor:-~~

~~ACSR-raccoon conductor (or equivalent AAAC conductor) is to be used for connection between overhead lines to transformer studs/bushing.~~

~~8.00 — Distribution Box and Power Cabling:-~~

~~Distribution Boxes are to be installed as per specifications enclosed. The boxes are to be erected, electrically connected with the existing system, properly earthed, and labeled. The test report of pre-commissioning checks should be prepared and submitted.~~

~~All CT terminals are to be ring type and other terminals are fork type. 2.5 sqmm copper multi-stands wiring 1.1 KV grade, ISI marked, IS 694 shall be used for control wiring. A terminal block be provided between CT and Meter keeping 20% spare terminals.~~

~~The Distribution Boxes are to be earthed using 6 SWG GI wire direct connection to the earthing. 2 Nos Earthing bolts on the distribution boards should be provided of 10mm dia.~~

~~The single-core power cables should be terminated with proper size lugs and gland. Necessary tagging, identification of cores and dressing of cables with nylon cable ties shall be in the scope of work. The unutilized holes in the DBs provided for cable entry needs to be plugged properly in a manner that it must stop access to reptiles, dust and water ingress.~~

~~The Low Tension bus bars are to be painted with two or more coats of brush-able epoxy compound suitable to insulate the bus bars for 415 volts exposure.~~

~~The Distribution Box 16 KVA should also house three phase tri-vector energy meter / single phase meter depending on capacity and type of distribution transformer as per specifications. For higher capacity transformers where CT-operated meters are to be installed, separate LTCT-cum Meter Box at eye height shall be installed for housing of meter, CTs, terminal block and wiring.~~

~~The single-core un-armored power cables shall be used for connection from Distribution Transformer to Distribution Box and Distribution Box to Outgoing LT lines. Cable should not be used in underground laying arrangement. Cables should be dressed & tied properly using clamps / cable ties at 1 meter intervals and tied with substation structure/poles. At least one meter cable is to be kept as spare at the individual ends.~~

Following arrangements shall be made for LT Distribution Transformers and LT Cables:-

No	Type of DTR	Incomer		Outgoing	Cable	
		MCB/Isolator	HRC fuse	MCCB	1	2
1	5/6/10 KVA 1 Ph	45A — SPN-MCCB		2x32A — SP-MCCB	1Cx16 sqmm UA	
2	16 KVA 1 Ph	80A — SPN-MCCB		2x50A — SP-MCCB	1Cx16 sqmm UA	
3	16 KVA 3 Ph	25A — TPN-MCCB		6x16A — SP-MCCB	1Cx16 sqmm UA	
4	25 KVA 1 Ph	40A — SPN-MCCB		3x25A — SP-MCCB	1Cx35 sqmm UA	
5	25 KVA 3 Ph	40A — TPN-MCCB		6x25A — SP-MCCB	1Cx35 sqmm UA	
6	63 KVA 3 Ph	200A — TPN-Isolator	100 A	6x60A — SP-MCCB	1Cx50/70-sqmm-UA	1Cx70-sqmm-UA
7	100 KVA 3 Ph	200A — TPN-Isolator	160 A	6x90A — SP-MCCB	1Cx50/70-sqmm-UA	1Cx150-sqmm-UA
8	200 KVA 3 Ph	600A — TPN-Isolator	315 A	9x120A — SP-MCCB	1Cx150-sqmm-UA	1Cx300-sqmm-UA
9	315 KVA 3 Ph	600A — TPN-Isolator	500 A	12X120A — SP-MCCB	1CX150-sqmm-UA	1CX300-sqmm-UA

1.1 KV XLPE Aluminium Conductor, Stranded, un-armored cable be used for connection of transformer LV bushing to Distribution Box and Distribution Box to overhead line.—

9.00 — Earthing:-

Distribution Transformer Earthing shall be provided with 3 Nos earthing and making earth mat/risers using 50X6mm GI Flat. Earthing should be provided with GI earth pipe or Chemical Earthing depending of strata of soil in the location. Project Manager shall decide the type of earthing.—

25x4mm GI Flat and 8 SWG GI shall be used for making earthing connection to various sub-station equipment as per given details. GI Flat and GI wire shall be properly dressed, bunched

and clamped with the support at 2 feet intervals. An overlapping of 35mm shall be used at the place of flat to flat joint. Two sets of GI nuts, bolts and washers shall be used for flat to flat joints. GI nuts, bolts and washers must be used for GI Flat to GI wire & GI wire to GI wire joints.

Substation wise measurement of earth resistance of earth pits / mesh and corresponding drawing of existing earthing arrangement shall be recorded and submitted to Project Manager.

Description of equipment	Earth connection
Earthing pits	3 Nos. Earth Pipe 3 m long, 40 mm dia or Chemical Earthing
Earth mat and riser	50X6 mm GI Flat / 8 SWG GI wire
Laying of earth mat	Below ground 0.5 meter

Standard requirements of earthing shall be as under:

- a) Earth Pit — 1 for Transformer Neutral,
- b) Earth pit — 2 for Lightning Arrester,
- c) Earth pit — 3 for Equipment body earthing.

Following arrangement is envisaged for various equipment of distribution transformer substation:-

- a) Transformer Neutral (Two distinct connections) : GS Flat 25x4mm
- b) Transformer Body : GS Flat 25x4mm
- c) Lightning Arrester : GS Flat 25x4mm
- d) Fencing (Wherever required) : GI wire 8 SWG
- e) LT Distribution Box (Two distinct connections) : GI wire 8 SWG
- f) AB Switch handle : GI wire 8 SWG
- g) Steel structure of substation : GI wire 8 SWG
- h) Line meters : GS wire 8 SWG

The location of earth pits should be at least 3m apart, so that they their earth conductive areas do not overlap. In rocky soil where getting required earth resistance is a challenge, chemical rod earthing shall be used in place of normal GI pipe type earthing. Project Manager shall decide type of earthing pits.

10.00 Insulator and hardware:-

11 KV polymerPin insulator with suitable hardware fittings shall be used. Insulator should be tied properly using binding wire/helical form fitting. Bi-metallic clamps must be used at terminals.

~~The individual insulator shall be checked for insulation resistance before overhead line installation. Insulator should properly be cleaned before installation. No damage/crack insulator should be used.~~

~~11.00 Substation numbering:-~~

~~Each Substation should be numbered properly labelled using yellow base and black indication marks (number or digits). 40/50 mm height digits/words should be used for this purpose. Base shall be made using 2 or more coats of yellow enamel paint till good surface finish. Base preparation shall be completed before shifting of poles to site for erection. Base painting and marking of digits should be performed by a skilled and trained painter using branded enamel paint, Project Manager shall approve type and brand of enamel paint.~~

~~12.00 Anti-climbing device:-~~

~~3.5 kgs, 2.5mm dia (12 SWG) galvanized barbed wire shall be used on each sub-station support. Galvanized barbed wire should be properly dressed and crimped at termination. While wrapping the wire on support, proper tension should be maintained.~~

~~13.00 Danger board:-~~

~~Each support should be provided with a danger board with pole clamps as per approved drawing. Danger board should be in bi-lingual languages (local language and English). Clamp for danger board, nut bolts and washers shall be painted with two or more coats of red-oxide and aluminium paints respectively till smooth surface before installation.~~

~~14.00 Support foundation:-~~

~~Cement concrete in mixture 1 part cement, 3 part coarse sand, 6 part 40 mm size aggregate stone chips (1:3:6) shall be used in PCC Pole, steel tubular poles, WPB Poles and H-Beam support foundation.~~

~~While erecting supports (poles), shuttering must be used for concreting so that proper quantity of cement concrete mixture be used and assessed during inspection. During concreting proper compaction by means of mobile vibrator be provided. While starting work of support erection, gang wise shuttering and mobile vibrator shall be offered for inspection to Project Manager. While erecting support, mercury level gauge must be used to ensure vertical erection of support.~~

~~250mm dia X 12" inch size muffing shall be provided on steel tubular, WPB poles and H-Beam poles to prevent direct entry of rain water along the poles. Cement Concrete of 1:2:4 (1 part Cement, 2 parts coarse sand and 4 parts 20mm aggregate stones chips) shall be used for individual poles.~~

~~Steel plate shall be used in steel tubular poles and WPB poles and cement concrete reinforced plate shall be used as base plate for PCC poles.~~

~~15.00 11 KV AB Switch:-~~

~~11 kV, 3-ph, 200 A, 3 Pin type, Horizontal/Vertical Mounting type, Gang Operated, AB Switch shall be installed on 100 KVA and more capacity distribution transformer substation only. B Class GI pipe shall be used (without any joints) for operation of switch. AB Switch structure and handle must be earthed using 8 SWG GI wire.~~

~~16.00 11 KV Drop Out Fuses:-~~

~~11 kV, 3-ph, Drop Out fuse units (set of 3 units) along with Support Insulators, Base Channel, fuse barrel etc. shall be used for all capacity Distribution Transformer Substations. HG Fuse structure shall be earthed using 8 SWG GI wire.~~

~~17.00 Lighting Arrester:-~~

~~Distribution Class LAs on each phase shall be provided in the sub-station with base steel structure, terminals by metallic connectors / PG clamps and earth connectors. LAs are to be connected with separate earth connection. 25x3 mm GI flat shall be used for earth connection.~~

5. Renovation/Augmentation of LT line

~~1.00 Conversion of LT line using additional supports with all fittings matching with length and type of existing support is envisaged on following type of supports:~~

- ~~a) 8m (WL-200 Kg) PCC Poles (PCC Pole as per state practice)~~
- ~~b) 13 m long galvanized WPB 160x160, 30.44 kg/m~~
- ~~c) 11 m long galvanized WPB 160x160, 30.44 kg/m~~
- ~~d) 11 M long Steel Tubular poles with welded steel base plate of Designation 540 SP 52 (IS 2713, Pt I, II, III 1980)~~
- ~~e) 9 M long pSteel Tubular poles with welded steel base plate of Designation 540 SP 28 (IS 2713, Pt I, II, III 1980)~~
- ~~f) Galvanized Wide parallel beams 160/23.83 kg/m expandable with jointing plates~~

2.00 — Conversion of existing LT line of bare conductor with following type of new ABC cable LT line as required are envisaged under this work—

2.01	1X16 (Ph) + 1X25 (insulated messengercum neutral) SQ. MM.
2.02	1X16 (Ph) + 1X25 (insulated messengercum neutral) + 1x16 (insulated Street lighting)SQ. MM.
2.03	3X16(Ph)+1X25 (insulated messengercum neutral) SQ. MM.
2.04	3 X 16(Ph) +1x25 (insulated messengercum neutral) + 1x16 (insulated Street lighting) SQ. MM.
2.05	1X25(Ph)+1x25 (insulated messengercum neutral) SQ. MM.
2.06	1X25(Ph) + 1X25 (insulated messengercum neutral) + 1x16 (insulated Street lighting) SQ. MM.
2.07	3X25(Ph)+1X25 (insulated messengercum neutral) SQ. MM.
2.08	3 X 25(Ph) +1x25 (insulated messengercum neutral) + 1x16 (insulated Street lighting) SQ. MM.
2.09	1X35(Ph)+1X25 (insulated messengercum neutral) SQ. MM.
2.10	1x35(Ph) + 1X25 (insulated messengercum neutral) + 1x16 (insulated Street lighting) SQ. MM.
2.11	3X35(Ph)+1X25 (insulated messengercum neutral) SQ. MM.
2.12	3X35 (Ph) + 1x25 (insulated messengercumneutral)+ 1x16 (insulated Street lighting) SQ. MM.
2.13	3X50(Ph)+1X35 (insulated messengercum neutral) SQ. MM.
2.14	3X50 (Ph)+1x35 (insulated messengercum neutral) +1x16 (insulated Street lighting) SQ. MM.
2.15	3X70 (Ph)+1x50 (insulated messengercum neutral) +1x16 (insulated Street lighting) SQ. MM.
2.16	3X95(Ph)+1X70 (insulated messengercum neutral) SQ. MM.
2.16	3X95(Ph)+1X70 (insulated messengercum neutral) +1x16 (insulated Street lighting) SQ. MM.

3.00 — While executing this work, mid span pole with all fittings may be provided matching with existing poles of the line or wherever the sag is high and need so arise.

4.00 — Following works shall also be executed by Contractor under this head—

- a) — Straightening of tilted supports by providing additional foundation or by providing boulders etc as required.
- b) — Revamping of pole earthings and replacement of GI earth wire.

- ~~e) Labelling, providing danger board, providing anti climbing device and painting of all the poles shall be in the scope of work~~
- ~~d) Providing of stay set wherever required~~
- ~~e) Removal of old bare conductor and depositing in Employer's store~~

~~Item wise scope of works of LT line is detailed out under scope of new LT line. It shall be utilized on item to item requirement under renovation/augmentation of LT line also.~~

13.8.High voltage distribution system (HVDS)

1.00 — HVDS system shall be used in following three situations:

- a. To provide LT power supply to remote/farthest locations particularly in hilly areas or farthest location in newly developed plain areas. In this case entire work of erecting 11 kV lines, providing Distribution Transformers shall be executed. While executing HVDS scheme, extreme care to be taken to estimate loading on distribution transformer as capacity of distribution transformer shall be between 10 KVA to 25 KVA.
- b. In areas where length of LT line is more than 300 meters causing line losses and in theft prone areas where unauthorized hooking is observed, HVDS is recommended. Existing LT line supports shall be used for erection of 11 kV lines.
- c. To provide dedicated distribution transformer at location of agriculture pump (for maximum two pumps) connections by either extending 11kV new line or by converting existing LT lines to 11 kV line.

2.00 — GPS Survey of 11 kV line:

Mapping of route of proposed new HVDS system or conversion of LT line to 11 kV line by foot GPS Survey in rural/urban areas be performed mentioning various milestones. While GPS Surveying, existing electrical infrastructure in the locality should also be mapped. Line alignment (single line diagram) on political map with fair correctness, be prepared. SLD and foot GPS Survey report shall be approved by Project Manager and shall be used as basic document for assessment of works under the contract. On completion of line work, as built Single Line Diagram and pole wise line diagram showing pole wise materials used and pole-to-pole span should be submitted to Project Manager. This details shall be used as reference documents by Quality Inspecting officials to execute inspection works.

3.00 — GPS Survey of Distribution Transformer Substations:-

A detailed GPS Survey of existing habitation shall be performed in presentable document showing population residing in the un-electrified area/existing electrified area of habitation, best location of installation of a new distribution transformer substation and the capacity of transformers to be selected for installation. The capacity of DTR shall be governed by following technical aspects:-

- a) Optimistic lengths of service lines needed to feed the beneficiaries,
- b) Space available for installation of support/transformers,

- e) ~~Probable load expected to come on the transformer due to existing BPL beneficiaries /others connected /un-connected probable beneficiaries in the locality taking care of their expected load growth in next 5 years.~~
- d) ~~Distribution Transformers of capacity 16 KVA to 25 KVA (single phase as well as three phase as per detailed given) shall be installed on double pole structures. Hence, three phase 11 KV lines shall be laid for 16 KVA to 25 KVA (single phase as well as three phase) capacity sub-stations. Single phase 11 KV lines (2-wire) shall only be permitted for 10 KVA single phase transformers mounted on single pole structure. However, V-cross arms and top clamp shall be used on each line support so that whenever needed, this 2-wire line may be converted to 3-phase 11 kV line by erecting an additional conductor.~~
- e) ~~Double pole support steel structures for 16 KVA and 25 KVA distribution transformers shall be designed in such a way that they can be augmented to 63 KVA transformer structures without any addition in near future on technical requirements.~~
- f) ~~Single phase 10 KVA distribution transformer shall be installed on single pole structure.~~

~~Based on GPS Survey report, Project Manager shall decide type, capacity and location of Distribution Transformer sub-station.~~

4.00 — Existing LT infrastructure:

~~Existing LT lines' conductor and fittings shall be dismantled. Tilted supports, if any, shall be straightened. Poles erected in water logging areas or loose soil areas shall be provided with cement concrete foundation.~~

5.00 — Mid span support:

~~Requirement of mid span pole with all fittings, to suit 11 kV line conductor shall be examined during GPS Survey. Project Manager shall approve requirement of mid span poles and extra concreting on existing poles.~~

~~While deciding mid span poles, project manager shall decide type and length of poles matching with existing supports available in the field. Stay set wherever required in existing line to be converted may be provided.~~

6.00 — Support for conversion of existing LT line into 11 KV overhead line and for new 11 kV line:

- i. ~~8m (WL-200 Kg) PCC Poles (PCC Pole as per state practice)~~
- ii. ~~11 m long H-Beam 152x152 mm, 37.1 kg/mtr~~

- iii. ~~9 M long Steel Tubular poles of Designation 540 SP 28 (IS 2713, Pt I, II, III 1980)WPB-160/30.44kg/m of similar lenth as per existing support in LT line. This will improve mechanical strength of 11 KV line. And also facilitate line to line crossing clearance.~~

~~—~~

~~Steel plate shall be used in steel tubular poles and cement concrete reinforced plate shall be used as base plate for PCC poles.~~

~~7.00 — Fabricated steel items:-~~

~~Fabricated steel items like DC cross arm (100x50x6 mm), back clamps (65x8 mm), pole clamp (65x8 mm), — mounting channel (100x50x6 mm), transformer mounting channel (100x50x6 mm), transformer clamping set (50x50x6 mm), transformer belting set (50x50x6 mm), V cross arm, top clamp, DC cross arm, bracket, clamps, cross bracings, bracings, strain plate, guarding channels, back clamp, transformer mounting structure etc shall be made of MS Channels, MS angle, MS flats as per approved drawings.~~

~~While fabricating, good quality electric cutting tools and drill machine shall be used to ensure no sharp edges and perfect holes as per approved drawings. Gas cutting set should not be used for fabrication of MS steel items. Weld material shall be distributed equally between the two materials that were joined. The weld shall be free of waste materials such as slag. The weld surface should not have any irregularities or any porous holes (called porosity). The joint shall be tight. Most welds need to demonstrate the required strength. One way to ensure proper strength is to start with a filler metal and electrode rating that is higher than your strength requirement.~~

~~The fabricated steel structures materials shall be hot-dip galvanized thoroughly internally and externally according to IS: 2629 and IS: 2633 (with latest amendments). Galvanizing shall be checked and tested in accordance with IS: 2633.~~

~~Fabricated steel structure items shall be galvanized both inside and out. The zinc coating shall be smooth, continuous and uniform. It shall be free from acid spots and shall not scale, blister or be removable by handling or packing. There shall be no impurities in the zinc or additives to the smelter bath that could have a detrimental effect on the durability of the zinc coating. Before pickling, all welding, drilling, cutting and grinding shall be completed and all grease, paint, varnish, oil and welding slag shall be completely removed.~~

~~All protuberances which could affect the life of galvanizing shall also be removed. To avoid the formation of white rust all galvanized material shall be packaged in such a way to ensure adequate ventilation between parts during shipping and storage.~~

~~Testing of galvanizing shall be performed for Uniformity of thickness as per IS 2633/1986, Mass of coating as per IS 6745/1972 and quantity of zinc, water quenching & centrifuging as per IS 2629/1985.~~

8.00 — Hardware:—

~~MS Nuts, bolts and washers (Galvanized) — 16 mm dia nuts, bolts & washers shall be used for tying of overhead structure items like cross arms, top clamps, brackets, clamps, bracing, strain plates etc.~~

~~While erecting, proper dimensions of nut bolts and washers must be ensured. 2 to 3 threads only be visible of the bolt after full tightening of nut on requisite torque. The hardware shall be hot dip galvanized. The minimum coating of the zinc shall comply with IS: 2629 and IS: 2633. Galvanizing shall be checked and tested in accordance with IS: 2633. Before shifting them to site for erection, they shall be offered for inspection and approval by Project Manager.~~

9.00 — Stay Set:—

~~Galvanized Stay Set with 50x8 mm stay clamp, guy insulator (1No.), anchor plate (200x200x6mm), nut bolts, 2 Nos turn-buckles, 1.8 m long, 16 mm diameter solid GS stay rod & 7/3.15 mm dia GI stranded wire complete.~~

~~Stay set shall be used at all sub-station location to nullify the tension of conductor/cable/transformer on the supports. 0.2 cmt cement concreting in mixture 1 part cement, 3 part coarse sand and 6 part 40mm size aggregate stone chips (1:3:6) shall be provided in the foundation of the stay set. 2 Nos. guy insulator shall be provided in 7/3.15 mm dia stranded GI wire at middle locations between two turn buckles. Erection of storm guys at suitable location in straight line may also be provided.~~

10.00 — Distribution Transformer:—

~~Following type and sizes of minimum level 1 {as per Bureau of Energy Efficiency (BEE)}, distribution transformers with all accessories are standardized in the project:~~

- ~~a) 5/6 KVA 1 phase Aluminium / Copper wound DTR~~
- ~~b) 10 KVA 1 phase / 3 phase Aluminium / Copper wound DTR~~
- ~~c) 16 KVA 1 phase / 3 phase Aluminium / Copper wound DTR~~
- ~~d) 25 KVA 1 phase / 3 phase Aluminium / Copper wound DTR~~

- e) ~~63 KVA 3 phase Aluminium / Copper wound DTR~~
 - f) ~~100 KVA 3 phase Aluminium / Copper wound DTR~~
 - g) ~~200 KVA 3 phase Aluminium / Copper wound DTR~~
 - h) ~~250 KVA 3 phase Aluminium / Copper wound DTR~~
 - i) ~~315 KVA 3 phase Aluminium / copper wound DTR~~
- ~~Or any other rating as per latest Indian Standard Specification~~

~~3ph/1ph Distribution Transformers shall be 11/0.4 KV or 11KV/230 V or 22/0.44 KV non-sealed type, type BEE specified minimum 3 Star Distribution Transformers. The transformers shall be double wound, three phase, CRGO or amorphose core type having energy efficiency level 1 as specified in latest IS:1980 (Part-1) 2014 with Amendments 1,2,3 &4.~~

~~Distribution Transformers shall be subject to inspection during manufacturing (stage inspection), pre-delivery inspection, and inspection at site during pre-erection/post erection/post commissioning conditions. Project Manager shall select samples from the core laminations and get the same tested in NABL Accredited laboratory to prove the quality of the core material at any time during pre-dispatch instruction/inspection at site etc.~~

~~The distribution transformers shall be supplied with transformer oil filled up to maximum permissible level and all accessories viz. breather with silica gel etc.~~

~~The distribution transformers must have been successfully type tested within five years from date of Letter of Intent and the designs should have been in satisfactory operation for a period not less than two years as on the date of bid opening. Compliance shall be demonstrated by submitting, (i) authenticated copies of the type test reports and (ii) performance certificates from the users, specifically from Central Govt./State Govt. or their undertakings.~~

~~The losses in Distribution Transformer should be as per **Energy Efficiency Level 1 as specified in IS 1180 (Part-1):2014 and amendment 1,2,3 &4** for all kVA ratings of distribution transformers~~

~~Bimetallic clamps of suitable capacities and size are to be provided on LT side and on HT side of the transformer.~~

~~T-Clamps should be provided on each jumper on bus bars. Line jumpers should be provided with adequate size of PG Clamps (Two numbers PG Clamps at each end of jumper). Clamp should be made of aluminum grade T-1F as per IS-8309 having good electrical quality aluminum material and should not be brittle in nature.~~

~~Transformers should be tested for pre-commissioning checks which includes Insulation Resistance Test, ratio test and oil breakdown voltage test. Before formal energisation, oil leakages from the parts of the transformer, oil level in conservator tank, condition of silica gel, earth connection (two separate) between neutral and earthing, proper jointing of earth wires/flats at the joints and earth resistance of the individual earthing pits are to be checked and recorded. On commissioning of the transformer, phase current and phase to phase voltage, phase to neutral voltage are to be recorded. The loading on the transformers should be balanced. The quantum of neutral current flowing through neutral shall be recorded. A record of pre-commissioning checks/tests are to be prepared and submitted to the Project Manager.~~

~~11.00 — ACSR / AAAC Conductor:-~~

~~ACSR raccoon is to be used for connection between overhead lines to transformer studs/bushing. All road crossings and line crossings shall be guarded as per specifications. Conductor joint should not be provided in mid span length. Instead, it should be nearer to the support. ACSR raccoon conductor (or equivalent AAAC Conductor) is to be used for connection between overhead lines to transformer studs/bushing upto 100 KVA ratings. For transformers having ratings more than 100KVA, higher size of conductors matching with its current carrying rating be used.~~

~~12.00 — 11 KV AB Switch:-~~

~~11 kV, 3-ph, 400 A, 3 Pin type, Vertical/Horizontal Mounting type, Gang Operated, AB Switch shall be installed at cut points and at suitable locations as per instructions of Project Manager. B Class GI pipe shall be used (without any joints) for operation of switch. AB Switch structure and handle must be earthed using 8 SWG GI wire.~~

~~13.00 — Distribution Box and Power Cabling:-~~

~~Distribution Boxes are to be installed as per specifications enclosed. The boxes are to be erected, electrically connected with the existing system, properly earthed, and labeled. The test report of pre-commissioning checks should be prepared and submitted.~~

~~The Distribution Boxes are to be earthed using 6 SWG GI wire direct connection to the earthing. 2 Nos Earthing bolts on the Distribution Box should be provided of 10mm dia.~~

~~The single core power cables should be terminated with proper size lugs and gland. Necessary tagging, identification of cores and dressing of cables with nylon cable ties shall~~

be in the scope of work. The unutilized holes in the DBs provided for cable entry needs to be plugged properly in a manner that it must stop access to reptiles, dust and water ingress.

The Low Tension bus bars are to be painted with two or more coats of brush-able epoxy compound suitable to insulate the bus bars for 415 volts exposure.

The Distribution Box should also house three phase tri-vector energy meter / single phase meter depending on capacity and type of distribution transformer as per specifications.

The single core un-armored power cables shall be used for connection from Distribution Transformer to Distribution Box and Distribution Box to Outgoing LT lines. Cable should not be used in underground laying arrangement. Cables should be dressed & tied properly using clamps /cable ties at 1 meter intervals and tied with substation structure/poles. At least one meter cable is to be kept as spare at the individual ends.

Following arrangements shall be made for LT Distribution Transformers and LT Cables:-

No	Type of DTR	Incomer		Outgoing	Cable	
		MCB/Isolator	HRC fuse	MCCB	1	2
1	5/6/10-KVA 1 Ph	45A SPN-MCCB		2x32A SP-MCCB	1Cx16 sqmm UA	
2	16 KVA 1 Ph	80A SPN-MCCB		2x50A SP-MCCB	1Cx16 sqmm UA	
3	16 KVA 3 Ph	25A TPN-MCCB		6x16A SP-MCCB	1Cx16 sqmm UA	
4	25 KVA 1 Ph	40A SPN-MCCB		3x25A SP-MCCB	1Cx35 sqmm UA	
5	25 KVA 3 Ph	40A TPN-MCCB		6x25A SP-MCCB	1Cx35 sqmm UA	
6	63 KVA 3 Ph	200A TPN-Isolator	100 A	6x60A SP-MCCB	1Cx50/70-sqmm UA	1Cx70-sqmm UA
7	100 KVA 3 Ph	200A TPN-Isolator	160 A	6x90A SP-MCCB	1Cx50/70-sqmm UA	1Cx150-sqmm UA
8	200 KVA 3 Ph	600A TPN-Isolator	315 A	9x120A SP-MCCB	1Cx150-sqmm UA	1Cx300-sqmm UA
9	315 KVA 3 Ph	600A TPN-Isolator	500 A	12X120A SP-MCCB	1CX150-sqmm UA	1CX300-sqmm UA

1.1 KV XLPE Aluminium Conductor, Stranded, un-armored cable be used for connection of transformer LV bushing to Distribution Box and Distribution Box to overhead line.

14.00 — Earthing:-

~~Distribution Transformer Earthing shall be provided with 3 Nos earthing and making earth mat /risers using 50X6mm GI Flat. Earthing should be provided with GI earth pipe or Chemical Earthing depending of strata of soil in the location. Project Manager shall decide the type of earthing.~~

~~25x4mm GI Flat and 8 SWG GI wire shall be used for making earthing connection to various sub-station equipment as per given details. GI Flat and GI wire shall be properly dressed, bunched and clamped with the support at 2 feet intervals. An overlapping of 35mm shall be used at the place of flat to flat joint. Two sets of GI nuts, bolts and washers shall be used for flat to flat joints. GI nuts, bolts and washers must be used for GI Flat to GI wire & GI wire to GI wire joints.~~

~~Substation wise measurement of earth resistance of earth pits / mesh and corresponding drawing of existing earthing arrangement shall be recorded and submitted to Project Manager.~~

Description of equipment	Earth connection
Earthing pits	3 Nos. Earth Pipe 3 m long, 40 mm dia or Chemical Earthing
Earth mat and riser	50X6 mm GI Flat / 8 SWG GI wire
Laying of earth mat	Below ground 0.5 meter

Standard requirements of earthing shall be as under:

- a) Earth Pit — 1 for Transformer Neutral,
- b) Earth pit — 2 for Lightning Arrester,
- c) Earth pit — 3 for Equipment body earthing.

Following arrangement is envisaged for various equipment of distribution transformer substation:-

- a) Transformer Neutral (Two distinct connections) : GS Flat 25x4mm
- b) Transformer Body : GS Flat 25x4mm
- c) Lightning Arrester : GS Flat 25x4mm
- d) Fencing (Wherever required) : GI wire 8 SWG
- e) LT Distribution-cum-meter Box (Two distinct connections) : GI wire 8 SWG
- f) Steel structure of substation : GI wire 8 SWG

~~The location of earth pits should be at least 3m apart, so that their earth conductive areas do not overlap. In rocky soil where getting required earth resistance is a challenge, chemical rod earthing shall be used in place of normal GI pipe type earthing. Project Manager shall decide type of earthing pits.~~

~~15.00 — Insulator and hardware —~~

~~11 KV polymerPin insulator with suitable hardware fittings shall be used. Insulator should be tied properly using binding wire/helical form fitting. Bi-metallic clamps must be used at terminals.~~

~~The individual insulator shall be checked for insulation resistance before overhead line installation. Insulator should properly be cleaned before installation. No damage/crack insulator should be used.~~

~~16.00 — Substation numbering:-~~

~~Each Substation should be numbered properly labelled using yellow base and black indication marks (number or digits). 40/50 mm height digits/words should be used for this purpose. Base shall be made using 2 or more coats of yellow enamel paint till good surface finish. Base preparation shall be completed before shifting of poles to site for erection. Base painting and marking of digits should be performed by a skilled and trained painter using branded enamel paint, Project Manager shall approve type and brand of enamel paint.~~

~~17.00 — Anti-climbing device:~~

~~3.5 kgs, 2.5mm dia (12 SWG) galvanized barbed wire shall be used on each sub-station support. Galvanized barbed wire should be properly dressed and crimped at termination. While wrapping the wire on support, proper tension should be maintained.~~

~~18.00 — Danger board:-~~

~~Each support should be provided with a danger board with pole clamps as per approved drawing. Danger board should be in bi-lingual languages (local language and English). Clamp for danger board, nut-bolts and washers shall be painted with two or more coats of red-oxide and aluminium paints respectively till smooth surface before installation.~~

~~19.00 — Support foundation:-~~

~~0.5 m³ Cement concrete in mixture 1 part cement, 3 part coarse sand, 6 part 40 mm size aggregate stone-chips (1:3:6) shall be used in PCC Pole, steel tubular poles and H-Beam support foundation.~~

~~While erecting supports (poles), shuttering must be used for concreting so that proper quantity of cement concrete mixture be used and assessed during inspection. During concreting proper compaction by means of mobile vibrator be provided. While starting work of support erection, gang wise shutting and mobile vibrator shall be offered for inspection to Project Manager. While erecting support, mercury level gauge must be used to ensure vertical erection of support.~~

~~250mm dia X 12" inch size muffing shall be provided on steel tubular and H-Beam poles to prevent direct entry of rain water along the poles. Cement Concrete of 1:2:4 (1 part Cement, 2 parts coarse sand and 4 parts 20mm aggregate stones chips) shall be used for individual poles.~~

~~Steel plate shall be used in steel tubular poles and cement concrete reinforced plate shall be used as base plate for PCC poles.~~

~~20.00 — 11 KV Drop Out Fuses: HG Fuse~~

~~11 kV, 3-ph, Drop Out fuse units (set of 3 units) along with Support Insulators, Base Channel, fuse barrel etc. shall be used for all capacity Distribution Transformer Substations. HG Fuse structure shall be earthed using 8 SWG GI wire.~~

~~21.00 — Lighting Arrester:~~

~~Distribution Class LAs shall be provided in the sub-station with base steel structure, terminals bi — metallic connectors / PG clamps and earth connectors. LAs are to be connected with separate earth connection. 25x3 mm GI flat shall be used for earth connection.~~

13.9.Civil Works And Soil Investigation

1.00 General

The provisions of this section of specification shall only be applicable to the extent of scope of works indicated in Bid Proposal Sheet (BPS). The intent of specification covers the following:

Design, engineering, and construction of all civil works at power sub-station, 66 kV line, 33 kV line, 11 kV line, DTR substation/RMU, LT line, HVDS, augmentation/renovation of system etc. All civil works shall also satisfy the general technical requirements specified in other Sections of this Specification and as detailed below. They shall be designed to the required service conditions/loads as specified elsewhere in this Specification or implied as per National/ International Standards.

All civil works shall be carried out as per applicable Indian Laws, Standards and Codes. All materials shall be of best quality conforming to relevant Indian Standards and Codes.

The Contractor shall furnish all design, drawings, labour, tools, equipment, materials, temporary works, constructional plant and machinery, fuel supply, transportation and all other incidental items not shown or specified but as may be required for complete performance of the Works in accordance with approved drawings, specifications and direction of Employer.

The work shall be carried out according to the design/drawings to be developed by the Contractor and approved by the Project Manager based on Tender Drawings Supplied to the Contractor by the Project Manager and Original Equipment Manufacturer recommendation. For all buildings, structures, foundations etc. necessary layout and details shall be developed by the Contractor keeping in view the functional requirement of the substation facilities and providing enough space and access for operation, use and maintenance based on the input provided by the Project Manager. Certain minimum requirements are indicated in this specification for guidance purposes only.

In case of R&M of existing substations, Contractor shall visit site to ascertain the amount of repair and strengthening of structures and foundations, dismantling and new construction of structures and foundations works are to be done before quoting. Contractor must furnish the design and drawings in support of the activities mentioned above that are to be carried out in the R&M of existing substation site.

The rate quoted by the bidder for all type of civil work shall be firm irrespective of the type of terrain and depth of filling.

This specification covers all the work required for detailed soil investigation and preparation of a detailed report. The work shall include mobilisation of necessary equipment, providing necessary engineering supervision and technical personnel, skilled and unskilled labour etc. as required to carry out field investigation as well as, laboratory investigation, analysis and interpretation of data and results, preparation of detailed Geo-technical report including specific recommendations for the type of foundations and the allowable safe bearing capacity for different sizes of foundations at different founding strata for the various structures of the substation. The Contractor shall make his own arrangement for locating the co-ordinates and various test positions in field as per the information supplied to him and also for determining the reduced level of these locations with respect to the benchmark indicated by the Project Manager.

All the work shall be carried out as per latest edition of the corresponding Indian Standard Codes.

a. Geotechnical Investigation

The Contractor shall perform a detailed soil investigation to arrive at sufficiently accurate, general as well as specific information about the soil profile and the necessary soil parameters of the site. So that the foundation of the various structures can be designed and constructed safely and rationally.

A report to the effect will be submitted by the Contractor for Project Manager's specific approval giving details regarding data proposed to be utilised for civil structures design.

The Contractor should visit the site to ascertain the soil parameters before submitting the bid. The topography is uneven steeply sloping at few places requiring cutting and filling operations including slope stability and protection measures (if slopes encountered). Any variation in soil data shall not constitute a valid reason for any additional cost & shall not affect the terms & condition of the Contract. Tests must be conducted under all the critical locations i.e. Control Room Building. Tower locations, transformer etc.

b. Bore Holes

Drilling of bore holes of 150 mm dia. in accordance with the provisions of IS: upto 10 m depth or to refusal whichever ever occur earlier. (By refusal it shall mean that a standard penetration blow count (N) of 100 is recorded for 30 cm penetration). For a new substation, minimum three (3) bore holes shall be done to find out the geological profile of the area. If any unconformity encountered then more bore holes shall be drilled with the approval of Project Manager for the new projects. However in case deep pile foundations are envisaged the depths have to be regulated as per codal provisions. In

cases where rock is encountered, coring in one borehole per bay shall be carried out to 1.5 M in bedrock and continuous core recovery is achieved.

Performing Standard Penetration Tests at approximately 1.5 m interval in the borehole starting from 1.5 m below ground level onwards and at every change of stratum. The disturbed samples from the standard penetrometer shall also be collected for necessary tests.

Collecting undisturbed samples of 100/75 mm diameter 450 mm long from the boreholes at intervals of 2.5 m and every change of stratum starting from 1.0 m below ground level onwards in clayey strata.

The depth of Water table shall be recorded in each borehole.

All samples, both disturbed and undisturbed, shall be identified properly with the borehole number and depth from which they have been taken.

The sample shall be sealed at both ends of the sampling tubes with wax immediately after the sampling and shall be packed properly and transported to the Contractor's laboratory without any damage or loss.

The logging of the boreholes shall be compiled immediately after the boring is completed and a copy of the bore log shall be handed over to the Project Manager.

c. Electrical Resistivity Test

This test shall be conducted to determine the Electrical resistivity of soil required for designing safe grounding system for the entire station area. The specifications for the equipments and other accessories required for performing electrical resistivity test, the test procedure, and reporting of field observations shall confirm to IS: 3043. The test shall be conducted using Wagner's four electrode method as specified in IS: 1892, Appendix-B2. Unless otherwise specified at each test location, the test shall be conducted along two perpendicular lines parallel to the coordinate axis. On each line a minimum of 8 to 10 readings shall be taken by changing the spacing of the electrodes from an initial small value of 0.5 m upto a distance of 10.0 m.

d. Water Sample

Representative samples of ground water shall be taken when ground water is first encountered before the addition of water to aid drilling of boreholes. The samples shall be of sufficient quantity for chemical analysis to be carried out and shall be stored in airtight containers.

e. Back Filling of Bore Holes

On completion of each hole, the Contractor shall backfill all bore holes as directed by the Project Manager. The backfill material can be the excavated material and shall be compacted properly.

f. Laboratory Test

1. The laboratory tests shall be carried out progressively during the field work after sufficient number of samples have reached the laboratory in order that the test results of the initial bore holes can be made use of in planning the later stages of the field investigation and quantum of laboratory tests.

2. All samples brought from field, whether disturbed or undisturbed shall be extracted/prepared and examined by competent technical personnel, and the test shall be carried out as per the procedures laid out in the relevant I.S. Codes.

The following laboratory tests shall be carried out

- a) Visual and Engineering Classification
- b) Liquid limit, plastic limit and shrinkage limit for C- soils.
- c) Natural moisture content, bulk density and specific gravity.
- d) Grain size distribution.
- e) Swell pressure and free swell index determination for expansive soil only.
- f) Consolidated un-drained test with pore pressure measurement.
- g) Chemical tests on soil and water to determine the carbonates, sulphates, nitrates, chlorides, Ph value, and organic matter and any other chemical harmful to the concrete foundation.
- h) C.B.R value
 - i) Rock quality designation (RQD), RMR in case of rock is encountered

2.00 Test Results and Reports

1. The Contractor shall submit the detailed report in two (2) copies wherein information regarding the geological detail of the site, summarized observations and test data, bore logs, and conclusions and recommendations on the type of foundations with supporting calculations for the recommendations. Initially the report shall be submitted by the Contractor in draft form and after the draft report is approved, the final report in two (3) copies shall be submitted. The test data shall bear the signatures of the Investigation Agency, Vendor and also site representative of Employer.

2. The report shall include but not limited to the following:

- i. A plan showing the locations of the exploration work i.e. bore holes, dynamic cone penetration tests etc.
- ii. Bore Logs: Bore logs of each bore holes clearly identifying the stratification and the type of soil stratum with depth. The values of Standard Penetration Test (SPT) at the depths where the tests were conducted on the samples collected at various depths shall be clearly shown against that particular stratum.

Test results of field and laboratory tests shall be summarised strata wise as well in combined tabular form. All relevant graphs, charts tables, diagrams and photographs, if any, shall be submitted along with report. Sample illustrative reference calculations for settlement, bearing capacity, pile capacity shall be enclosed.

- a. Recommendations: The report should contain specific recommendations for the type of foundation for the various structures envisaged at site. The Contractor shall acquaint himself about the type of structures and their functions from the Project Manager. The observations and recommendations shall include but not limited to the following:
 - i. Geological formation of the area, past observations or historical data, if available, for the area and for the structures in the nearby area, fluctuations of water table etc. Slope stability characteristics and landslide history of the area shall be specifically highlighted. Remedial measures to be adopted shall also be given.
 - ii. Recommended type of foundations for various structures. If piles are recommended the type, size and capacity of pile and groups of piles shall be given after comparing different types and sizes of piles and pile groups.
 - iii. Allowable bearing pressure on the soil at various depths for different sizes of the foundations based on shear strength and settlement characteristics of soil with supporting calculations. Minimum factor of safety for calculating net safe bearing capacity shall be taken as 3.0 (three). Recommendation of liquefaction characteristics of soil shall be provided.
 - iv. Recommendations regarding slope of excavations and dewatering schemes, if required. Required protection measures for slope stability for cut & fill slopes of switchyard and approach road with stone pitching/retaining walls shall be clearly spelt out. Calculation shall also be provided for stability adequacy.
 - v. Comments on the Chemical nature of soil and ground water with due regard to deleterious effects of the same on concrete and steel and recommendations for protective measures.

- vi. If expansive soil is met with, recommendations on removal or retaining the same under the structure, road, drains, etc. shall be given. In the latter case detailed specification of any special treatment required including specification of materials to be used, construction method, equipment to be deployed etc. shall be furnished. Illustrative diagram of a symbolic foundation showing details shall be furnished.
- vii. Recommendations for additional investigations beyond the scope of the present work, if considered such investigation as necessary.

3.00 Site Preparation

The Employer shall be responsible for proper leveling of switchyard site as per layout and levels of switchyard finalised during detailed engineering stage. The Employer at his own cost shall make the layout and levels of all structure etc from the general grids of the plot and benchmarks set and approved by the Project Manager. The Contractor shall give all help in instruments, materials and personnel to the Project Manager for checking the detailed layout and shall be solely responsible for the correctness of the layout and levels. Site leveling shall be in the scope of the Employer. Bidder may decide the level of the sites. However, the level shall be such that it is 300 mm higher than the highest flood level (HFL) of the site. If HFL is not available, then nearby road level shall be assumed as HFL.

Whenever for bay extension works the existing substation are to be modified or strengthen, Contractor should keep same as EGL of existing sub-station so that FFL shall be same for both and all the necessary arrangements are to be carried out in this regard by the Contractor.

This clause covers the design and execution of the work for site preparation, such as clearing of the site, the supply and compaction of fill material, slope protection by stone pitching/retaining walls depending on the site location & condition, excavation and compaction of backfill for foundation, road construction, drainage, trenches and final topping by brick soling/stone filling.

- 1) The Employer shall develop the site area to meet the requirement of the intended purpose. The site preparation shall conform to the requirements of relevant sections of this specification or as per stipulations of standard specifications. Employer shall also carry out necessary protection of slope of switchyard area and approach road.
- 2) The fill material if required shall be suitable for the above requirement. The fill shall be such material and the site so designed as to prevent the erosion by wind and water of material from its final compacted position or the in-site position of undisturbed soil.

3) Material unsuitable for founding of foundations shall be removed and replaced by suitable fill material and to be approved by the Project Manager.

4) Backfill material around foundations or other works shall be suitable for the purpose for which it is used and compacted to the density described under Compaction. Excavated material not suitable or not required for backfill shall be disposed off in areas as directed by Project Manager upto a maximum lead of 1 km.

a. Excavation and backfill

1. Excavation and backfill for foundations shall be in accordance with the relevant code.

2. Whenever water table is met during the excavation, it shall be dewatered and water table shall be maintained below the bottom of the excavation level during excavation, concreting and backfilling.

3. When embankments are to be constructed on slopes of 15% or greater, benches or steps with horizontal and vertical faces shall be cut in the original slope prior to placement of embankment material. Vertical faces shall measure not more than 1 m in height.

4. Embankments adjacent to abutments, culverts, retaining walls and similar structures shall be constructed by compacting the material in successive uniform horizontal layers not exceeding 20 cm in thickness (of loose material before compaction). Each layer shall be compacted as required by means of mechanical tampers approved by the Project Manager. Rocks larger than 10 cm in any direction shall not be placed in embankment adjacent to structures.

5. Earth embankments of roadways and site areas adjacent to buildings shall be placed in successive uniform horizontal layers not exceeding 20 cm in thickness in loose stage measurement and compacted to the full width specified. The upper surface of the embankment shall be shaped so as to provide complete drainage of surface water at all times.

6. The land required for borrowing earth shall be arranged & selected by Contractor. The identified land shall be got approved by Project Manager. The quoted rates shall include cost of earth, taxes, duties, royalty, compensation for the land identified for borrow earth. The rate shall also be inclusive of all leads, lifts, ascent, descent and testing required for completion of work in all respect.

7. The ground levels for all measurements shall be taken at every 5 meter distance in uniformly sloping ground and at closer distance where pits/undulations are met with. In fairly leveled area, levels shall be taken at 15 mt. apart at the discretion of Project Manager. The ground levels shall be

recorded and plotted on plans. The same shall be recorded by Project Manager before the earth work is started. All labor, material, tool, equipment etc required for the above work shall be arranged by the Employer at his own cost.

b. Compaction

1. The density to which fill materials shall be compacted shall be as per relevant IS and as per direction of Project Manager. All compacted sand filling shall be confined as far as practicable. Backfilled earth shall be compacted to minimum 95% of the Standard Proctor's density at OMC. The sub-grade for the roads and embankment filling shall be compacted to minimum 95% of the Standard Proctor's density at OMC. Cohesion less material sub grade shall be compacted to 70% relative density (minimum).

2. At all times unfinished construction shall have adequate drainage. Upon completion of the road's surface course, adjacent shoulders shall be given a final shaping, true alignment and grade.

3. Each layer of earth embankment when compacted shall be as close to optimum moisture content as practicable. Embankment material, which does not contain sufficient moisture to obtain proper compaction, shall be wetted. If the material contains any excess moisture, then it shall be allowed to dry before rolling. The rolling shall begin at the edges overlapping half the width of the roller each time and progress to the center of the road or towards the building as applicable. Rolling will also be required on rock fills. No compaction shall be carried out in rainy weather.

c. Requirement for fill material under foundation

All foundations shall rest below virgin ground level and the minimum depth of foundation below the virgin ground level shall be at least 500 mm. For small equipment and minor foundations like marshalling kiosk, Switch board stand, earth switch and main box support etc. may be reduced to 300 mm with specific approval of the Project Manager.

4.00 Stone Filling & Antiweed Treatment

The Contractor shall furnish all labour, equipment and materials required for complete performance of the work in accordance with the drawings, specification and direction of the Project Manager.

Stone filling shall be done in the areas of the switchyard wherever equipment and or structures are to be provided under present scope of work covering entire fencing area.

Prevailing practice of stone filling is to be adopted for the bay extension works of existing substations. Contractor shall verify the existing practice prevailing at site before quoting.

Before taking up stone rolling, antiweed treatment shall be applied in the switchyard area where stone filling is to be done and the area shall be thoroughly de-weeded including removal of the roots. The recommendation of local agriculture/horticulture department shall be sought where ever feasible while choosing the type of chemical to be used. Nevertheless the effectiveness of chemical shall be demonstrated by the Contractor in a test area of size 10 meterx 10 meter (approx..). The final approval based on the result shall be given by Project Manager. Antiweed treatment shall be procured from reputed manufacturer. The dosage and application of chemical shall be strictly as per the manufacturer's recommendation. The Contractor shall be requested to maintain the area free of weed for a period of one year from the date of application of the first dose of the chemical.

5.00 General Requirement

a. The material required for site surfacing shall be free from all types of organic materials and shall be of standard quality, and as approved by the Project Manager.

The material to be used for stone filling/ site surfacing shall be uncrushed/ crushed/ broken stone of 20 mm nominal size (single sized) conforming to table 2 of IS: 383- 1970. Hardness, flakiness shall be as required for wearing courses are given below.

(a) Sieve analysis limits/Gradation

Sieve size	% passing by weight
40mm	100
20mm	85-100
10mm	0-20
4.75mm	0-5

(b) Hardness

Abrasion value (IS: 2386 part-IV) not more than 40%

Impact value (IS: 2386 part-IV) not more than 30%

(c) Flakiness Index

As per (IS: 2386 part-IV) and maximum value is 25.

b. After all the structures/equipment are erected, the surface of the switchyard area shall be maintained, rolled/compacted to the lines and grades as decided by Project Manager. De-weeding including removal of roots shall be done before rolling is commenced. Project Manager shall decide

final formation level so as to ensure that the site appears uniform. The final formation level shall however be very close to the formation level indicated in the drawing using half-ton roller with suitable water sprinkling arrangement to form a smooth and compact surface.

c. A base layer of uncrushed/crushed/broken stone of 20 mm nominal size (single sized) shall be spread and rolled/compacted by using half ton roller with 4 to 5 passes and water sprinkling to form a minimum 50 mm layer on the finished ground level of the specified switchyard area excluding roads, drains, cable trench and tower and equipment foundations as indicated in the drawing.

d. Over the base layer of site surfacing material, a final surface course of minimum 50 mm thickness of 20 mm nominal size (single sized) broken stone as specified above shall be spread and compacted by light roller using half tones steel roller (width 30" and 24" dia meter) with water sprinkling as directed by the Project Manager. The water shall be sprinkled in such a way that bulking does not take place.

e. In areas that are considered by the Project Manager to be too congested with foundations and structures for proper rolling of the site surfacing material by normal rolling equipment, the material shall be compacted by hand, if necessary. Due care shall be exercised so as not to damage any foundation structures or equipment during rolling compaction.

6.00 Site Drainage

a. Adequate site drainage system shall be provided by the Contractor in new and existing substation. In case of bay extension of existing substation, drainage layout shall be prepared by the Contractor in such away that it should satisfy the technical parameters stated below while designing the drainage system so that flow of water of the existing part of substation remain uninterrupted and the same should be approved by the Project Manager. The technical parameters stated below also to be taken into account while designing the drainage system for new substation as well.

The Contractor shall obtain rainfall data and design the storm water drainage system, (culverts, ditches, drains etc.) to accommodate run off due to the most intense rainfall that is likely to occur over the catchments area in one hour period on an average of once in ten years. The surface of the site shall be sloped to prevent the ponding of water.

b. The maximum velocity for pipe drains and open drains shall be limited to 2.4m/sec and 1.8m/sec respectively. However, minimum non-silting velocity of 0.6m/sec shall be ensured. Longitudinal bed slope shall not be milder than 1 in 1000.

c. The drains shall be constructed using Brick masonry except at road crossings etc. where RCC pipe shall be used. The RCC pipe for drains and culverts shall be as per IS:456 and IS:783.

- d. The Contractor shall ensure that water drains are away from the site area and shall prevent damage to adjacent property by this water. Adequate protection shall be given to site surfaces, roads, ditches, culverts, etc. to prevent erosion of material by water.
- e. The drainage system shall be adequate without the use of cable/pipe trenches. (Pipe drains shall be provided in areas of switchyard where movement of crane will be necessary in operating phase of the substation).
- f. For pipe drains, concrete pipe of class NP2 shall be used. However, for road crossings etc. higher strength pipe of class NP3 shall be provided. For rail crossings, pipes conforming to railway loading standards or at least NP4 class shall be provided. Manholes shall be provided at every 30m interval, at connection points and at every change of alignment.
- g. Open surface drains for new s/s shall be provided with brick masonry in 1:6 (1 cement: 6 coarse sand) cement mortar with 12 mm thick, 1:4 (1 cement: 4 sand) cement plaster inside and exposed surface of drains as per approved drawing. For bay extension at existing substations, prevailing practice of the respective substation shall be adopted.
- h. Pipe drains shall be connected through manholes at an interval of max. 30m. Effluents shall be suitably treated by the Contractor to meet all the prevalent statutory requirements and local pollution control norms and treated effluents shall be conveyed to the storm water drainage system at a suitable location for its final disposal.
- i. Invert of the drainage system shall be decided in such a way that the water can easily be discharged above the High Flood Level (HFL) outside substation boundary at suitable location upto a maximum 50M beyond boundary wall of substation or actual whichever occurs earlier and approved by Project Manager.
- j. All internal site drainage system, including the final connection/disposal to Project Manager acceptance points shall be part of Supplier's scope including all required civil works. The Contractor shall connect his drain(s) at one or more points to outfall points as feasible at site.
- k. The drainage scheme and associated drawings shall be got approved and constructed as per enclosed tender drawing.

7.00 Roads and Culverts inside substation premises

- a. The main approach road including modification of existing road to meet the site conditions, roads for access to equipment and buildings within substations (including bay extension in existing substations) are in the scope of the Contractor. Layout of the roads shall be based on General detail

& Arrangement drawing for the substation. If extra road is required for functional point of view, which has not been mentioned in the layout drawing, Contractor should provide the same without extra cost to the Project Manager.

- b. All substation roads shall be constructed so as to permit transportation of all heavy equipment. The roads shall have min. 3.0 m wide RCC road as per enclosed tender drawing.
- c. Road construction shall be as per IRC standards.
- d. Adequate provision shall be made for road drainage. Protection of cut and embankment slopes of roads as per slope stability requirement shall be made.
- e. All the culverts and its allied structure (required for road/rail, drain trench crossings etc.) shall be designed for class A loading as per IRC standard / IS code and should be checked for loading.
- f. All roads shall be designed for class 'D' of traffic as per IRC-37 Guide-lines for the design of rigid pavements.

8.00 Transformer Foundation

The Contractor shall provide a road system integrated with the transformer foundation to enable installation and the replacement of any failed unit by the spare unit located at the site. This system shall enable the removal of any failed unit from its foundation to the nearest road.

If existing/failed transformer is required to be replaced by new one in augmentation/bay extension works of existing substations then the foundation supporting that equipment shall be strengthen by modifying the foundation itself or the foundation shall be dismantle and recast new foundation as per site conditions. However, Contractor must furnish the design calculation incorporating all those changes so that safety of the structure and foundation remain adequate.

Similarly all types of equipment foundations with /without supporting structures shall be treated in similar manner as stated for transformer foundations.

Contractor must access the amount of work involve for augmentation/bay extension of existing substations while quoting.

9.00 Cable & Pipe Trenches

- a. The cable trenches and precast removable RCC cover (with lifting arrangement) shall be constructed using RCC of M20 grade for new substation whereas for bay extension of existing

substation size and material of cable trenches shall be same as the existing one and pre-cast removable RCC cover (with lifting arrangement) shall be constructed using RCC of M20 grade. Cable trenches must be designed for the design criteria stated below, whether it is of concrete or brick for both new substations and bay extension works in existing substations.

- b. The cable trench walls shall be designed for the following loads.
 - (i) Dead load of 100 kg/m length of cable support + 75 Kg on one tier at the end.
 - (ii) Triangular earth pressure + uniform surcharge pressure of 1T/m².
- c. Cable trench covers shall be designed for self-weight of top slab + concentrated load of 200 kg at center of span on each panel.
- d. Cable trench crossing the road/rails shall be designed for class A. Loading of IRC/relevant IS Code and should be checked for transformer loading.
- e. Trenches shall be drained. Necessary sumps be constructed and sump pumps if necessary shall be supplied. Cable trenches shall not be used as storm water drains.
- f. The top of trenches shall be kept at least 100 mm above the finished ground level for the new substation. The top of cable trench shall be such that the surface rainwater does not enter the trench.
- g. The top of trench shall be kept same as existing one to maintain uniformity of the cable trenches structure in case of bay extension works of existing substations.
- h. All metal parts inside the trench shall be connected to the earthing system.
- i. Cables from trench to equipment shall run in hard conduit pipes.
- j. Trench wall shall not foul with the foundation. Suitable clear gap shall be provided.
- k. The trench bed shall have a slope of 1/500 along the run & 1/250 perpendicular to the run.
- l. Cable trenches shall be blocked at the ends if required with brick masonry in cement sand mortar 1:6 and plaster with 12mm thick 1:6 cement sand mortar.
- m. Cable trench contains cable tray that shall be supported on ISA. The size and spacing of angle section shall be as per design criteria mentioned above.
- n. Cable trench shall be constructed as per enclosed tender drawing.

10.00 Foundation /RCC Construction

1. Work covered under this Clause of the Specification comprises the design and construction of foundations and other RCC constructions for switchyard structures, equipment supports, trenches, drains, control cubicles, bus supports, transformer, marshalling kiosks, auxiliary equipment & systems, buildings, tanks, boundary wall or for any other equipment or service and any other foundation required to complete the work. This clause is as well applicable to the other RCC constructions.

However, for the augmentation/bay extension works of existing substation, type of RCC structures and foundations etc. shall be similar to one already existing at the existing substation and for which design shall be furnished in support of safety of those RCC structures and foundations etc. Contractor must assess the amount of work involved for the construction of switchyard structures, equipment supports, trenches, drains, control cubicles, bus supports, transformer, marshalling kiosks, auxiliary equipment & systems, buildings, tanks, boundary wall or for any other equipment or service and any other foundation required to complete the work for the existing substations.

2. Concrete shall conform to the requirements mentioned in IS: 456 and all the tests shall be conducted as per relevant Indian Standard Codes as mentioned in Standard field quality plan appended with the specification

A minimum grade for PCC and RCC shall be used for all structural/load-bearing members as per latest IS 456.

3. If the site is sloppy, the foundation height will be adjusted to maintain the exact level of the top of structures to compensate such slopes.

4. The switchyard foundation's plinths and building plinths shall be minimum 300mm and 500 mm above finished ground level respectively.

5. Minimum 75mm thick lean concrete shall be provided below all underground structures, foundations, trenches etc. to provide a base for construction.

6. Concrete made with Portland slag cement shall be carefully cured and special importance shall be given during the placing of concrete and removal of shuttering.

7. The design and detailing of foundations shall be done based on the approved soil data and sub-soil conditions as well as for all possible critical loads and the combinations thereof. The Spread footings foundation or pile foundation as may be required based on soil/sub-soil conditions and superimposed loads shall be provided.

8. If pile foundations are adopted, the same shall be cast-in-situ driven/bored or precast or under reamed type as per relevant parts of IS Code 2911. Only RCC piles shall be provided. Suitability of the adopted pile foundations shall be justified by way of full design calculations. Detailed design calculations shall be submitted by the bidder showing complete details of piles/pile groups proposed to be used. Necessary initial load test shall also be carried out by the bidder at their cost to establish the piles design capacity. Only after the design capacity of piles has been established, the Contractor shall take up the job of piling. Routine tests for the piles shall also be conducted. All the work (design & testing) shall be planned in such a way that these shall not cause any delay in project completion.

a. Design

1. Foundations shall be of reinforced cement concrete for new substation but for the augmentation / bay extension works of existing substation it could be of RCC/ PCC depending on type of structures and materials used for the similar type of structures in those bay extension works of existing substation. Design requirement shall be fulfilled by the Contractor and furnished for approval for both new substation and existing substation (for bay extension works) as specified in the scope of work. The design and construction of RCC/ PCC / Masonry structures shall be carried out as per IS: 456 and relevant IS code/CBIP manual/NBC etc and minimum grade of concrete shall be as per relevant IS code. Higher grade of concrete than specified above may be used at the discretion of Contractor without any additional financial implication to the Project Manager.

2. Limit state method of design shall be adopted unless specified otherwise in the specification.

3. For detailing of reinforcement IS: 2502 and SP: 34 shall be followed. Cold twisted deformed bars ($F_y=415 \text{ N/mm}^2$) conforming to IS: 1786 shall be used as reinforcement. However, in specific areas, mild steel (Grade I) conforming to IS: 432 can also be used. Two layers of reinforcement (on inner and outer face) shall be provided for wall & slab sections having thickness more than 150 mm. Clear cover to reinforcement towards the earth face shall be minimum 40 mm.

4. RCC water retaining structures like storage tanks, etc. shall be designed as un-cracked section in accordance with IS: 3370 (Part I to IV) by working stress method. However, water channels shall be designed as cracked section with limited steel stresses as per IS: 3370 (Part I to IV) by working stress method.

5. The procedure used for the design of the foundations shall be the most critical loading combination of the steel structure and or equipment and/or superstructure and other conditions, which produces the maximum stresses in the foundation or the foundation component and as per the

relevant IS Codes of foundation design. Detailed design calculations shall be submitted by the bidder showing complete details of piles/pile groups or isolated /combined footings proposed to be used.

6. Design shall consider any sub-soil water pressure that may be encountered following relevant standard strictly.

7. Necessary protection to the foundation work, if required shall be provided to take care of any special requirements for aggressive alkaline soil, black cotton soil or any other type of soil which is detrimental/harmful to the concrete/masonry foundations.

8. RCC columns /pedestals shall be provided with rigid connection at the base.

9. All sub-structures shall be checked for sliding and overturning stability during both construction and operating conditions for various combinations of loads. Factors of safety for these cases shall be taken as mentioned in relevant IS Codes or as stipulated elsewhere in the Specifications. For checking against overturning, weight of soil vertically above footing shall be taken and inverted frustum of pyramid of earth on the foundation should not be considered.

10. Earth pressure for all underground structures shall be calculated using co-efficient of earth pressure at rest, co-efficient of active or passive earth pressure (whichever is applicable).

11. In addition to earth pressure and ground water pressure etc., a surcharge load of 1T/Sq.m shall also be considered for the design of all underground structures including channels, sumps, tanks, trenches, substructure of any underground hollow enclosure etc., for the vehicular traffic in the vicinity of the structure.

12. Following conditions shall be considered for the design of water tank in pumps house, channels, sumps, trenches and other underground structures:

- i. Full water pressure from inside and no earth pressure & ground water pressure & surcharge pressure from outside (application only to structures, which are liable to be filled up with water or any other liquid).
- ii. Full earth pressure, surcharge pressure and ground water pressure from outside and no water pressure from inside.
- iii. Design shall also be checked against buoyancy due to the ground water during construction and maintenance stages. Minimum factor of safety of 1.5 against buoyancy shall be ensured ignoring the superimposed loadings.

13. The foundations shall be proportioned so that the estimated total and differential movements of the foundations are not greater than the movements that the structure or equipment is designed to accommodate.

14. The foundations of transformer and circuit breaker shall be of block type foundation. Minimum reinforcement shall be governed by IS: 2974 and IS: 456.

15. The tower and equipment foundations shall be checked for a factor of safety of 2.0 for normal condition and 1.5 for short circuit condition against sliding, overturning and pullout.

b. Admixtures & additives

1. Only approved admixtures shall be used in the concrete for the Works. When more than one admixture is to be used, each admixture shall be batched in its own batch and added to the mixing water separately before discharging into the mixer. Admixtures shall be delivered in suitably labeled containers to enable identification.

2. Admixtures in concrete shall conform to IS: 9103. The water proofing cement additives shall conform to IS: 2645. Project Manager shall approve concrete Admixtures/ Additives.

3. The Contractor may propose and the Project Manager may approve the use of a water-reducing set-retarding admixture in some of the concrete. The use of such an admixture will not be approved to overcome problems associated with inadequate concrete plant capacity or improperly planned placing operations and shall only be approved as an aid to overcoming unusual circumstances and placing conditions.

4. The water-reducing set-retarding admixture shall be an approved brand of Ligno-sulphonate type admixture.

5. The waterproofing cement additives shall be used as required / advised by the Project Manager.

c. Gates and Boundary Wall

1. The Gate frame shall be made of medium duty MS pipe conforming to relevant IS with welded joints.

2. The gates shall be fabricated with welded joints to achieve rigid connections. The gate frames shall be painted with one coat of approved steel primer and two coats of synthetic enamel paint.

3. Gates shall be fitted with approved quality iron hinges, latch and latch catch. Latch and latch catch shall be suitable for attachment and operation of pad lock from either side of gates. Hinges shall permit gates to swing through 180 degree back against fence. Gates shall be earthed by G I wire.
4. Gates shall be fitted with galvanized chain hook or gate hold back to hold gates open. Double gates shall be fitted with centre rest and drop bolt to secure gates in closed position.
5. Gates shall be installed in locations shown on drawings. Next to the main gate, a men gate (1.25 m wide, single leaf) shall also be provided.
6. Bottom of gates shall be set approximately 40mm above ground surface and necessary guiding mechanism shall be fitted.
7. The Contractor shall design and construct boundary wall around substation area as per requirements. The boundary wall shall be of height 2.0M and shall be made of RCC frame construction with RCC column and plinth beam arrangement and panels filled with one brick thick wall in cement sand mortar 1:6. The boundary wall shall be plastered on both external and internal faces with cement and sand plaster 1:6 of thickness 18 mm and 12 mm respectively. An additional barbed Y-shaped arm of MS angle 50x50x6 with 3-rows (6 nos) barbed wire A-4 IS: 278. Expansion joints shall be provided as per codal requirements. MS grating shall be provided at required locations for drainage purposes. The boundary wall shall be painted with minimum two coats of color wash over a base coat of white wash with lime. The front portion of boundary wall shall however be with a RC jail and 12 mm square MS bar top above brick work and pebble dash plaster finish with colour pigment. The steel work shall be given two coats of synthetic enamel paint of approved make over one coat of primer. Boundary wall and gate shall be constructed as per enclosed *tender drawing*.

11.00 — Buildings — General Requirements

~~The scope for new control room building includes the design, engineering and construction including anti-termite treatment, plinth protection, DPC of Building including sanitary, water supply, electrification, false ceiling etc. of control room building. The buildings shall be of RCC framed structure of concrete of M20 grade (Min.). Following design criteria shall be adopted for design purposes for new substation.~~

~~If any extension of the Control Room building is required in augmentation / bay extension works of existing substation then extension part shall be compatible to existing one structurally and architecturally but following design criteria shall be adopted for design purposes for R&M of existing substation.~~

a.— ~~Control room Building~~

~~Minimum floor area requirements shall be 10000×12000 mm excluding space for wash room which may be increased at the time of detailed engineering to suit project requirements. The layout of the control room shall be finalised as per detailed engineering to suit project requirements. The minimum dimension of different rooms required for C.R. building shall be as per drawing. The CR building shall consist of the following:~~

- ~~a.— Control room~~
- ~~b.— S/s In-charge room~~
- ~~c.— Battery room~~
- ~~d.— Store room~~
- ~~e.— Toilet~~

~~An open space of 1 m minimum shall be provided on the periphery of the rows of panel and equipment generally in order to allow easy operator movement and access as well as maintenance.~~

~~Any future possibility of annexe building shall be taken care of while finalizing the layout of the control room building.~~

~~Minimum headroom of 3 M below soffit of beams/false ceiling shall be considered for rooms. The roof shall have four side sloping roof or flat roof as finalised during detailed engineering.~~

i.— ~~Design~~

a) ~~The buildings shall be designed:~~

- ~~1.To the requirements of the National Building Code of India, and the standards quoted therein.~~
- ~~2.For the specified climatic & loading conditions.~~
- ~~3.To adequately suit the requirements of the equipment and apparatus contained in the buildings and in all respects to be compatible with the intended use and occupancy.~~
- ~~4.With a functional and economical space arrangement.~~
- ~~5.For a life expectancy of structure, systems and components not less than that of the equipment, which is contained in the building, provided regular maintenance is carried out.~~

~~6.Be aesthetically pleasing. Different buildings shall show a uniformity and consistency in architectural design.~~

~~7.To allow for easy access to equipment and maintenance of the equipment.~~

~~8.With, wherever required, fire-retarding materials for walls, ceilings and doors, which would prevent supporting or spreading of fire.~~

~~9.Suitable expansion joints shall be provided in the longitudinal direction wherever necessary with provision of twin columns.~~

~~10.Individual members of the buildings frame shall be designed for the worst combination of forces such as bending moment, axial force, shear force, torsion etc.~~

~~11. Permissible stresses for different load combinations shall be taken as per relevant IS Codes.~~

~~12.The building lighting shall be designed in accordance with the requirements of relevant section.~~

~~13.Sesmic considerations as applicable.~~

ii.— Design loads

~~Building structures shall be designed for the most critical combinations of dead loads, super-imposed loads, equipment loads, wind loads, seismic loads, and temperature loads.~~

~~-~~

~~Dead loads shall include the weight of structures complete with finishes, fixtures and partitions and should be taken as per IS: 1911.~~

~~Super-imposed loads in different areas shall include live loads, minor equipment loads, cable trays, small pipe racks/hangers and erection, operation and maintenance loads. Equipment loads shall constitute, if applicable, all load of equipments to be supported on the building frame.~~

~~The wind loads shall be computed as per IS 875, Seismic Coefficient method shall be used for the seismic analysis as per IS 1893 with importance factor 1.5.~~

~~Wind and Seismic forces shall not be considered to act simultaneously.~~

~~Floors/slabs shall be designed to carry loads imposed by equipment, cables piping, equipment and other loads associated with building. Floors shall be designed for live loads as per relevant IS. Cable and piping loads shall also be considered additionally for floors where these loads are expected.~~

~~For consideration of loads on structures, IS: 875 shall strictly adhere to. Any other load coming in the structure, not mentioned in IS 875 shall be calculated as per relevant IS code and NBC.~~

~~iii. Submission~~

~~The following information shall be submitted for review and approval to the Project Manager:~~

- ~~1. Design criteria shall comprise the codes and standards used, applicable climatic data including wind loads, earthquake factors maximum and minimum temperatures applicable to the building locations, assumptions of dead and live loads, including equipment loads, impact factors, safety factors and other relevant information.~~
- ~~2. Structural design calculations and drawing (including construction/fabrication) for all reinforced concrete and structural steel structures.~~
- ~~3. Fully, dimensioned concept plan including floor plans, cross sections, longitudinal sections, elevations and perspective view of each building. These drawings shall be drawn at a scale not smaller than 1:75 and shall identify the major building components.~~
- ~~4. Fully dimensioned drawings showing details and sections drawn to scales of sufficient size to clearly show sizes and configuration of the building components and the relationship between them.~~
- ~~5. Product information of building components and materials, including walls partitions flooring ceiling, roofing, door and windows and building finishes.~~
- ~~6. A detailed schedule of building finishes including colour schemes.~~
- ~~7. A door & window schedule showing door types and locations, door lock sets and latch sets and other door hardware.~~

~~Approval of the above information shall be obtained before ordering materials or starting fabrication or construction as applicable.~~

~~iv. Finish Schedule~~

- ~~1. The finishing schedule is given in subsequent clauses.~~
- ~~2. M.S. Ladder should be provided to access the control room roof from outside. Ladder shall be made up of ISMC 75x40 which will run as beam one meter apart and intermediate steps will be~~

made up of 45x45x5 angle with rise of 300 mm. Red oxide primer shall be applied initially, then two coats of rich zinc paint shall be applied to avoid corrosion.

v. — Flooring

Flooring in various rooms of control room building shall be as for detailed schedules given in Table -1

vi. — Walls

Control room buildings shall be of framed superstructure. All walls shall be non-load bearing walls. Min. thickness of external walls shall be 230 mm (one brick) with 1:6 cement sand mortar.

vii. — Plastering

All internal walls shall have minimum 12mm and 15 mm thick 1:6 cement sand plaster on either side of wall. The ceiling shall have 6mm thick 1:4 cement sand plaster.

viii. — Finishing

All external surfaces shall have 18 mm cement plaster in two coats, under layer 12 mm thick cement plaster 1:5 and finished with a top layer 6 mm thick cement plaster 1:6 (DSR 13.19) with water proofing compound. The paint shall be antifungal quality of reputed brand suitable for masonry surfaces for high rainfall zone. White cement primer shall be used as per manufacturer's recommendation.

Internal finish Schedule is given Table -1 below:

TABLE-1

S.No.	Location	Flooring & Skirting 150mm high	Wall Internal	Ceiling	Doors, Windows, Ventilators
1.	Control Room, Relay Room	Precast Terrazo tiles (DSR'02, item no. 11.29A.2 & 11.31.2	Oil bound washable distemper on smooth surface applied with 2mm thick Plaster of	Oil bound washable distemper on smooth surface applied	1) Standard steel rolled section frames with 5 mm glass. DSR'02 10.12, 10.13 & 10.14 2) Flush door shutters

			Paris putty. (DSR'02 13.40 A & 13.77.2)	with 2mm thick Plaster of Paris putty. (DSR'02 13.40 A & 13.77.2)	DSR'02 9.25.2
2.	Sub-station Incharge, Office, corridor, staff room.	Precast Terrazo tiles (DSR'02, item no. 11.29A.2 & 11.31.2)	Oil bound washable distemper on smooth surface applied with POP putty. (DSR'02 13.40 A & 13.77.2)	Oil bound washable distemper on smooth surface applied with 2mm thick Plaster of Paris putty. (DSR'02 13.40 A & 13.77.2)	1) Standard steel rolled section frames with 5 mm glass. DSR'02 10.12, 10.13 & 10.14 2) Flush door shutters DSR'02 9.25.2
3.	Battery room	Acid and Alkali Resistant tiles. DSR'02 11.36 C. 1 & 11.36 C.1.1	Dado of acid resistant tile 1.2 M high & Paint above 1.2 M to ceiling. DSR'02 11.36 C. 2.1, 11.36C.2 & 13.96.1	Acid resistant Paint. DSR'02 13.96.1	1) Standard steel rolled section frames with 5 mm glass. DSR'02 10.12, 10.13 & 10.14 2) Flush door shutters DSR'02 9.25.2 Painted with acid resistant Paint. DSR'02 13.96.1
4.	Toilet	Ceramic glazed tiles in flooring DSR'02 11.74	DADO glazed tile 2.1M high for toilet (DSR'02 11.73)	Oil bound washable distemper on smooth surface applied with 2mm thick Plaster of	1) Standard steel rolled section frames with 5 mm glass. DSR'02 10.12, 10.13 & 10.14 2) Flush door shutters DSR'02 9.25.2

				Paris putty. (DSR'02 — 13.40 A & 13.77.2)	
5.	Other areas not specified	Terrazo tiles (DSR'02 — 11.29A.2 & 11.31.20	Oil ——— bound distemper, DSR'02 — 13.40A & 13.77	Oil bound washable distemper on smooth surface applied with 2mm thick Plaster of Paris putty. (DSR'02 — 13.40 A & 13.77.2)	

— **Note:** DSR item references (DSR-2002) to be read with WBPWD specifications are only for material and workmanship guidance of the Contractors.

ix. — Roof

Roof of the C.R. Building shall consist of Cast in-situ RCC slab treated with a water proofing system which shall be an integral cement based treatment conforming to CPWD specification (item no. 25.8 of DSR 2002). The water proofing treatment shall be of following operations:

- i. Applying and grouting a slurry coat of neat cement using 2.75 kg/m^2 of cement admixed with proprietary water proofing compounds conforming to IS: 2645 over the RCC slab including cleaning the surface before treatment.
- ii. Laying cement concrete using broken bricks/brick bats 25mm to 100mm size with 50% of cement mortar 1:5 (1 cement: 5 coarse sand) admixed with proprietary water proofing compound conforming to IS: 2645 over 20mm thick layer of cement mortar of min 1:5 (Cement: 5 coarse sand) admixed with proprietary water proofing compound conforming to IS: 2645 to required slope and treating similarly the adjoining walls upto 300mm height including rounding of junctions of walls and slabs.

- iii. ~~After two days of proper curing applying a second coat of cement slurry admixed with proprietary water proofing compound conforming to IS: 2645.~~
- iv. ~~Finishing the surface with 20mm thick joint less cement mortar of mix 1:4 (1 cement: 4 coarse sand) admixed with proprietary water proofing compound conforming to IS: 2645 and finally finishing the surface with trowel with neat cement slurry and making of 300 x 300 mm square.~~
- v. ~~The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Project Manager.~~

~~With average thickness of 120 mm and minimum thickness at khurra at 65 mm.~~

x. — Glazing

~~Minimum thickness of glazing shall be 5.0 mm. as per IS: 2835.~~

xi. — Doors and Windows

~~The details of doors and windows of the control room building shall be as per finish schedule Table-1 and tender drawing with the relevant IS code. Rolling steel shutters and rolling steel grills shall be provided as per layout and requirement of buildings. Paints used in the work shall be of best quality specified in CPWD specification.~~

xii. — Plumbing & Sanitation

1. ~~All plumbing and sanitation shall be executed to comply with the requirements of the appropriate byelaws, rules and regulations of the Local Authority having jurisdiction over such matters. The Contractor shall arrange for all necessary formalities to be met in regard to inspection, testing, obtaining approval and giving notices etc.~~

2. ~~PVC syntax or equivalent make Roof water tank of adequate capacity depending on the number of users for 24 hours storage shall be provided. Minimum 1 Nos. 500 liters capacity shall be provided.~~

3. ~~Galvanized MS pipe of medium class conforming to IS: 1239 shall be used for internal & external piping work for potable water supply.~~

4. ~~Sand CI pipes with lead joints conforming to IS: 1729 shall be used for sanitary works above ground level.~~

5. ~~Each toilet shall have the following minimum fittings.~~

(a) ~~WC (Western type) 390 mm high with toilet paper roll holder and all fittings~~

~~Or~~

~~WC (Indian Type) Orissa Pattern (580 x 440 mm) with all fittings (both types of WCs shall be provided at alternate locations).~~

(b) ~~Urinal (430 x 260 x 350 mm size) with all fittings.~~

(c) ~~Wash basin (550 x 400 mm) with all fittings.~~

(d) ~~Bathroom mirror (600 x 450 x 6 mm thick) hard board backing~~

(e) ~~CP brass towel rail (600 x 20 mm) with C.P. brass brackets~~

(f) ~~Soap holder and liquid soap dispenser.~~

6. ~~All fittings, fastener, grating shall be chromium plated.~~

7. ~~All sanitary fixtures and fittings shall be of approved quality and type manufactured by well known manufacturers. All items brought to site must bear identification marks of the type of the Manufacturer.~~

8. ~~Soil, waste and drain pipes, for underground works shall be stoneware for areas not subject to traffic load. Heavy duty cast iron pipes shall be used otherwise.~~

9. ~~In case of Augmentation/R&M of existing substation, amount of work shall be envisaged by contract for lump sum quotation.~~

12.00 ~~Miscellaneous General Requirements~~

1. ~~Dense concrete with controlled water cement ratio as per IS-code shall be used for all underground concrete structures such as pump house, tanks, water retaining structures, cable and pipe trenches etc. for achieving water tightness.~~

- ~~2. All joints including construction and expansion joints for the water retaining structures shall be made water tight by using PVC ribbed water stops with central bulb. However, kicker type (externally placed) PVC water stops shall be used for the base slab and in other areas where it is required to facilitate concreting. The minimum thickness of PVC water stops shall be 5 mm and minimum width shall be 230 mm.~~
- ~~3. All steel sections and fabricated structures that are required to be transported on sea shall be provided with anti corrosive paint to take care of sea worthiness.~~
- ~~4. All mild steel parts used in the water retaining structures shall be hot double dip galvanised. The minimum coating of the zinc shall be 750 gm/sq. m. for galvanised structures and shall comply with IS: 2629 and IS: 2633. Galvanizing shall be checked and tested in accordance with IS: 2633. The galvanizing shall be followed by the application of an etching primer and dipping in black bitumen in accordance with BS: 3416.~~
- ~~5. A screed concrete layer not less than 100 mm thick and of grade not weaker than M10 conforming to IS: 456-1978 shall be provided below all water retaining structures. A sliding layer of bitumen paper or craft paper shall be provided over the screed layer to destroy the bond between the screed and the base slab concrete of the water retaining structures.~~
- ~~6. Bricks having minimum 75kg/cm² compressive strength can only be used for masonry work. Contractor shall ascertain himself at site regarding the availability of bricks of minimum 75kg/cm² compressive strength before submitting his offer.~~
- ~~7. Doors and windows on external walls of the buildings (other than areas provided, with insulated metal claddings) shall be provided with RCC sunshade over the openings with 300 mm projection on either side of the openings. Projection of sunshade from the wall shall be minimum 450 mm over window openings and 750 mm over door openings.~~
- ~~8. Service ladder shall be provided for access to all roofs.~~
- ~~9. Angles 45x45x5 mm (minimum) with lugs shall be provided for edge protection all round cut-outs/openings in floor slab, edges of drains supporting grating covers, edges of RCC cable/pipe trenches supporting covers, edges of manholes supporting covers, supporting edges of manhole precast cover and any other place where breakage of corners of concrete is expected.~~
- ~~10. Anti termite chemical treatment shall be given to column pits, wall trenches, foundations of buildings, filling below the floors etc. as per IS: 6313 and other relevant Indian Standards.~~
- ~~11. All rungs for ladder shall also be galvanised as per IS: 277 medium classes.~~

12. For all civil works covered under this specification, nominal mix by volume batching as per CPWD specification is intended. The relationship of grade of concrete and ratio of ingredients shall be as below:

Sl.No.	Mix	Cement	Sand	Coarse aggregate of 20 mm down grade as per IS 383
1.	M 10	1	3	6
2.	M 15	1	2	4
3.	M 20	1	1.5	3

The material specification, workmanship and acceptance criteria shall be as per relevant clauses of CPWD specification and approved standard Field Quality Plan.

13. The details given in tender drawings shall be considered along with details available in this section of the specification while deciding various components of the building.

14. Items/components of buildings not explicitly covered in the specification but required for completion of the project shall be deemed to be included in the scope.

13.00 — Interfacing

The proper coordination & execution of all interfacing civil works activities like fixing of conduits in roofs/walls/floors, fixing of foundation bolts, fixing of lighting fixtures, fixing of supports/embedment, provision of cutouts etc. shall be the sole responsibility of the Contractor. He shall plan all such activities in advance and execute in such a manner that interfacing activities do not become bottlenecks and dismantling, breakage etc. is reduced to minimum.

14.00 — Water Supply

- ~~(i) Contractor shall make its own arrangement for construction water.~~
- ~~(ii) The Contractor shall carry out all the plumbing/erection works required for supply of water in control room building.~~
- ~~(iii) The details of tanks, pipes, fittings, fixtures etc for water supply are given elsewhere in the specification under respective sections.~~
- ~~(iv) A scheme shall be prepared by the Contractor indicating the layout and details of water supply which shall be got approved by the Project Manager before actual start of work including all other incidental items not shown or specified but as may be required for complete performance of the works.~~
- ~~(v) Bore wells and pumps for water supply are in the scope of Contractor meeting the day-to-day requirement of the water supply.~~
- ~~(vi) If the water is supplied by Municipal Corporation then bore well for water supply purposes is not required to be carried out by Contractor. Contractor shall also make necessary arrangement /formalities to receive water connection from corporation.~~

15.00 — Sewerage System

- ~~(i) Sewerage system shall be provided for control room building.~~
- ~~(ii) The Contractor shall construct septic tank and soak pit suitable for 5 users if outside of Municipal Corporation zone. Otherwise, all necessary arrangement for the disposal of sewerage to the Municipal Corporation's end shall be arranged by the Contractor at his own cost for regularizing the disposal activity.~~
- ~~(iii) The septic tank and soak pit shall be constructed as per enclosed tender drawing.~~

16.00 — Statutory Rules

- ~~a. Contractor shall comply with all the applicable statutory rules pertaining to factories act (as applicable for the State). Fire Safety Rules of Tariff Advisory Committee, Water Act for pollution control etc.~~

- b. ——— Provisions for fire proof doors, no. of staircases, fire separation wall, plastering on structural members (in fire prone areas) etc. shall be made according to the recommendations of Tariff Advisory Committee.
- c. ——— Statutory clearance and norms of State Pollution Control Board shall be followed as per Water Act for effluent quality from plant.
- d. ——— Requirement of sulphate resistant cement (SRC) for sub structural works shall be decided in accordance with the Indian Standards based on the findings of the detailed soil investigation to be carried out by the Bidder.
- e. ——— Foundation system adopted by Bidder shall ensure that relative settlement and other criteria shall be as per provision in IS: 1904 and other Indian Standards
- f. ——— All water retaining structures designed as un-cracked section shall also be tested for water tightness at full water level in accordance with clause no. 10 of IS: 3370 (Part-I).
- g. ——— Construction joints shall be as per IS: 456.
- h. ——— All underground concrete structures like water retaining structures etc. shall have plasticizer cum water proofing cement additive conforming to IS: 9103. In addition, limit on permeability as given in IS: 2645 shall also be met with. The concrete surface of these structures in contact with earth shall also be provided with two coat of bituminous painting for water/damp proofing. In case of water leakage in the above structures, Injection Method shall be applied for repairing the leakage.
- i. ——— All building/construction materials shall conform to the best quality specified in CPWD specifications if not otherwise mentioned in this specification.
- j. ——— All tests as required in the standard field quality plans have to be carried out.

17.00 — Fencing

a. — Product materials for fencing

————— The minimum requirements are as follows:

i. — Chain Link fence fabric in accordance to IS-2721

—— 1. Size of mesh ————— : — 75 mm

- _____
2. Nominal wire size : 4.0 mm dia
-
3. Width of chain link : 2000 mm
4. Class of zinc coating : medium
5. Zinc coated after weaving.

ii. Posts _____

Angle Section _____

- Intermediate : L 65 x 65 x 6
- Straining posts : L 65 x 65 x 6
- Stay post : L 65 x 65 x 6

1. All structural steel shall conform to IS: 2062 and shall be painted with a coat of approved steel primer and two coats of synthetic enamel paint.
2. The Chain Link fabric shall be fixed to the post at the top and bottom of the fence by welding/fixing 50 mm MS flat all through its length.
3. Fencing top shall be either of galvanised barbed wire or tape. Barbed wire shall conform to IS: 278.
4. The barbed wire may consist of not more than two splices per reel. The barbed wire shall be formed by twisting two line wires, one containing the barbs. The barbed wire shall be designated as A 4 IS: 278 and shall be galvanized.
5. Above chain link, 3 rows (6 nos) of barbed tape/wire shall be provided in each arm of the Y-shaped barbed arm at top.
6. With barbed tape/wire above the chain link fence, the total fence height shall be minimum 2500 mm above finished gravel level.
7. Barbed tape/wire arms shall be same as intermediate and straining post.

- ~~8.— Tension wire: single strand, high tensile, galvanised steel wire, 4 mm diameter.—~~
- ~~9.— Fittings and hardware: cast aluminum alloy or galvanized steel, malleable or ductile cast iron turnbuckles to be drop forged.~~
- ~~10.— GI chain link mesh shall be as per IS: 2721. Mesh size 75 mm and nominal wire size shall be 4.0 mm diameter.~~

~~— On the results of these additional tests, the whole or portion of the barbed wire/tape shall be accepted or discarded by the Purchaser, as the case may be.~~

~~b. Installation~~

- ~~1.— Contractor shall submit the fencing drawing Fence shall be installed along lines shown on approved drawings.—~~
- ~~2.— Post holes shall be excavated by approved methods.~~
- ~~3.— Intermediate posts shall be spaced 2.5 m apart measured parallel to ground surface.~~
- ~~4.— Straining posts shall be installed at equal intervals not exceeding 25.0 m.~~
- ~~5.— Straining posts shall be installed at sharp changes in grade, at corners, at change of direction and where directed.~~
- ~~6.— All corner post will have two stay post and every tenth post will have a transverse stay post.~~
- ~~7.— Posts shall be set in 1:2:4 plain cement concrete Blocks of minimum dimension 400 mm x 400 mm x 1000 mm deep Concrete work shall conform to relevant clause. Post shall be braced and held in plumb position and true alignment and elevation until concrete has set.~~
- ~~8.— Fence fabric shall not be installed until concrete has cured a minimum of 7 days.~~
- ~~9.— Bottom and top of the fence fabric shall be fixed with MS flats of 50 mm x 6mm (min).~~
- ~~10.— Fence fabric shall be laid out with barbed edge on top, stretched tightly and shall be fastened to intermediate, post gate and straining post with 50 x 6 flats.~~

- ~~11. Fabric shall be secured to tension wires with tie wires at 400 mm intervals. Tie wires shall be given not less than two twists.~~
- ~~12. Barbed tape shall be spliced with standard wire splices.~~
- ~~13. Barbed tape shall be stretched to have uniform tension.~~
- ~~14. Barbed tape shall be attached to barbed wire arms with approved metal clips.~~
- ~~15. ——— Toe wall of one Brick/Random Rubble masonry, with notches over 75 mm thick PCC (1:4:8) shall be provided below all fencing and shall be minimum 200 mm above and 200 mm below finished ground level. All exposed surfaces of brick toe wall shall be provided with 1:6 cement sand plaster and coated with two coats of colour wash with a base coat of white wash with lime. Rubble masonry toe wall shall be with raised & cut pointing and 50 mm PCC (1:2:4) band coping.~~
- ~~16. ——— Proper earthing shall be done for fencing also.~~

13.10. — LT AB Cable Reconductoring Work

1. — GPS Survey

1.1. GPS Survey

The Contractor shall carry out a GPS based GPS Survey of existing bare conductor LT distribution lines in the habitation. The GPS Survey should cover Pole by pole GPS Survey of all the bare conductor lines to identify the location of poles and phase configuration, pole condition, Existing stays / struts, Existing street lamp connections, Location and capacity of the connected distribution transformer (DTR) to each LT line, Connection points of any existing ABC lines connected to the bare conductor lines should be identified. The length of such ABC lines and total service connections provided through this line should be indicated on the map at this point, Load readings for each LT feeder. Upon completion of the GPS Survey the Contractor is required to develop the Single Line Diagram (SLD-A) indicating the GPS Survey Information and Schedule of network GPS Survey information (Schedule — A) **alongwith updating the same in WBSEDCL Database.**

1.2. Load Readings-

Load readings of each LT feeder shall be taken before and after proposed ABC conversions. This is required to monitor actual demand reductions achieved following ABC conversions. Load currents on each phase and the neutral in respective LT feeder shall be taken on four different occasions per day before and after completion of ABC conversion work. The load current measurements shall be decided by Engineer in Charge. Load reading before ABC conversions shall be taken when carrying out the GPS Survey and recorded in Schedule A. Load readings after ABC conversions shall be provided to the Project Manager/Engineer in charge within one week from completion of works.

1.3. Network Design for ABC Conversions

Contractor should prepare details of proposed ABC conversions for respective habitation in accordance with these guidelines and prepare Single line diagram indicating proposed ABC conversions (SLD-B) and Schedule of proposed ABC conversions (Schedule — B). while preparing SLD, loading in distribution transformer must be examined. On completion of work, average day loading in distribution transformer should limit 80-85% only. Contractor

1.4. Load Balancing

When preparing ABC conversion schedule (Schedule-B), phase connections for single phase Distribution Boxes shall be determined so that total number of single phase consumers are balanced across the three phases of a given feeder.

2. — Conversion of bare conductor lines to ABC

2.1. AB Cable types and Sizes

1,1 kV voltage grade XLPE insulated aluminum conductor and aluminum alloy bare neutral messenger type cables shall be used for proposed ABC conversions. The AB cables provided shall fully comply with technical specifications provided in this tender document.

The following **standard sizes** of AB cables shall be used:

- ~~ABC16 SP : 1X16 mm² (ph)+1X25 mm² (insulated messengercum neutral) +1x16 mm² (insulated street lighting cable)~~
- ~~ABC50 : 3X50 mm² (ph)+1x35 mm² (insulated messengercum neutral)~~
- ~~ABC50 : 3X70 mm² (ph)+1x50 mm² (insulated messengercum neutral) +1x16 mm² (insulated street lighting)~~
-
- ~~ABC95 : 3X95 mm² (ph)+1x70 mm² (insulated messengercum neutral) +1x16 mm² (insulated street lighting)~~

2.2. Vertical and Horizontal Clearances

all statutory clearances shall be ensured for ground clearance, line-to-line clearance, road crossing clearance, horizontal and vertical clearances from buildings/objects etc. All road crossings and line crossings shall be guarded as per specifications. Conductor joint should not be provided in mid span length. Instead, it should be nearer to the support.

As per ISS 162-1961 minimum electrical clearance from live part to earth and safety clearance in case of different voltage must be kept as follows:

Voltage	Electrical Clearance (mm)		Safety Clearance in SIS (mm)
	Phase – Earth	Phase – Phase	
33kV	381	432	2740
66kV	658	786	3050

Minimum Clearance Between Power Lines (mtr.):

kV	11	33	66
11	2.44	2.44	2.44
33		2.44	2.44
66			2.44

2.3. Installation of AB Cables

3. Prior to installation of AB cables, all pole works including stay/struts works should be completed as per scope of works provided in proceeding sections. (i.e installation of new poles, pole replacements, pole re-alignment, installation of pole supports).

All ABC accessories used for installation works shall conform to technical specification provided in this document.

3.1. ~~Installation of clamp assemblies~~

~~AB cable should be installed on poles using anchoring and suspension clamps according to the approved drawings by the Project Manager. Samples of complete clamp assemblies shall be approved by the Project Manager prior to use.~~

~~Anchoring clamps shall be used at the beginning and end of each cable run, at a major change in direction, terminal poles and at T off points. Suspension clamps shall be used at other intermediate points.~~

~~It should be noted that different clamps are specified for cable ranges 25-50 sqmm and 70-95 sqmm. These have different dimensional and maximum load specifications. If ABC manufacturer recommends any alternate clamps it should be approved by the Project Manager prior to use.~~

~~Stainless steel straps and buckles shall be used for fixing pole brackets to the pole as shown in drawings. Strap binding tool shall be used for tensioning and cutting the straps.~~

~~Separation of neutral messenger for tensioning and fixing to the clamp should be done using plastic phase separators. Weather resistant black nylon ties should be used for tying insulated conductors to the neutral messenger at either side of suspension clamps, to prevent the phase conductors from chafing against suspension clamp.~~

3.2. ~~Stringing of AB cable~~

~~Stringing of AB cables shall be done in a proper manner ensuring insulated conductors do not get damaged during installation. Dragging the ABC on the ground is not permitted. Pulleys installed on poles shall be used to pull AB cables.~~

~~Minimum clearance above ground to line shall be maintained. Sag tension charts for installing AB cables shall be developed by the Contractor taking into consideration of cable characteristics, maximum / minimum temperatures and maximum wind pressure as per service conditions provided by Employer. Based on this clear guidelines shall be provided to linesmen to ensure bare neutral messenger is pulled at appropriate tension so that;~~

~~(a) Required ground clearances are maintained, and~~

~~(b) Messenger conductor tension is maintained well below its breaking load at all temperatures.~~

~~Dynamometer method or sag method may be used to ensure appropriate tension of neutral messenger during installation. Over tensioning of neutral messenger should be avoided to ensure its tension does not exceed permissible loading limits at low temperatures. Loose spans of AB cable should be avoided to maintain permissible maximum sag at high temperatures. Loose spans may only be allowed for short spans in special cases. This applies when there are practical difficulties to install necessary stays or struts as required at a t-off point. A short loose span of AB cable may be used in this case to transfer the stay / strut support point upstream or downstream of the line.~~

~~Stringing of AB cable shall be done using proper equipment such as stringing blocks with plastic coated pulleys, pulling (come along) clamp, cable hoist and pulling tool, dynamometer etc. Proper equipment recommended by the ABC manufacturer shall be used to avoid any damage to the cable during installation. Temporary stays or strut poles shall be employed as necessary during stringing operation to ensure safety of personnel and equipment. Phasing of insulated conductors shall be identified by one, two and three ridges on the XLPE insulation. Same phasing shall be maintained accordingly through the line. Interchanging of phasing at any connection point is not permitted.~~

~~In order to ensure durability of AB cables and to prevent possibility of failures due to effects of water treeing, any exposed parts of phase conductors or open cuts of insulation are strictly not permitted. Hence all connectors to be used in ABC line shall be pre-insulated type or bare connectors covered by heat shrinkable tubing or GelWrap sleeves. For installing connectors proper equipment such as insulation stripping tool, ratchet cable cutter, hydraulic compression tool with compression dies shall be used.~~

~~All cable ends shall be properly sealed by pre-moulded or heat shrinkable type end caps. Samples of all ABC accessories including connectors shall be approved by the Project Manager prior to use.~~

~~Mid-span joints shall be generally avoided by properly planning stringing work. In exceptional cases where mid span joint is required, pre-insulated compression connectors shall be used. The joints for each phase shall be staggered along the cable. No mid span joints are allowed for AB cable sections running across a street.~~

~~Insulated piercing connectors or non-tension mechanical connectors with heat shrinkable tubing shall be used for non-tension inline connections at anchoring points where necessary.~~

3.3. ~~AB cable connections to Distribution Transformers~~

~~AB cables shall be connected to bus bars or protection equipment terminals of the LT feeder Distribution Boards by means of pre-insulated compression lugs and aluminium / bi-metallic strips.~~

~~Where no Distribution Board is available AB cable shall be directly connected to the distribution transformer bushing terminals using insulated compression lugs. In this case additional length of AB cable shall be provided by means of a loop to facilitate future connection to the Distribution Board or fuses.~~

3.4. ~~Earthing of Poles / ABC neutral messenger conductor~~

~~Earthing shall generally be carried out in accordance with the requirements of latest CEA regulations (as amended from time to time) and the relevant regulations of the Electricity Supply Authority~~

~~The Contractor shall ensure every 6th pole of ABC line including neutral messenger and any metallic hardware is earthed with spike earth (20x2500 mm) as per existing practice of Employer. (for normal soil).~~

~~Poles shall be earthed using 6SWG (7/4.0 mm) GI wire with 1 No. Coil/Spike/Pipe earth.~~

~~3.5. Pole Numbering~~

~~Each pole of the existing line shall be uniquely numbered as per pole numbering scheme followed by the Employer. Pole number and other information as required by the Employer should be painted on the pole.~~

~~3.6. Dismantling existing bare conductors and line hardware~~

~~Dismantling existing bare conductors and line hardware. Conductors and other line hardware including insulators, brackets, cross arms and bolts and nuts shall be carefully removed without causing damage to the existing poles. Bare conductors shall be removed in the longest length practicable for future re-use with a metal tag of description/ tag # of conductor, the said conductor shall be wound on empty conductor reels or made up in rolls.~~

~~Following dismantling works affected areas shall be cleaned and reinstated. All dismantled items shall remain the property of Employer and Contractor shall deliver all salvaged materials to the designated Employer warehouse as directed by the Project Manager.~~

~~3.7. Parallel AB Cable lines~~

~~Parallel AB cable lines refers to installation of second ABC cable line on the existing poles as per design requirements approved by Employer.~~

~~The scope of work for this item shall exclude (a) existing bare conductor line dismantling and (b) pole numbering requirements applicable for the scope of works specified above for 'conversion of bare conductor lines to ABC'.~~

~~3.8. Rates for Conversion of bare conductor lines to ABC~~

~~It should be noted that scope of work for this item relates to AB cable installation on existing poles. It excludes any additional works required on the existing poles or installation of new poles, installation of Distribution Boxes, stays etc. Separate BOQ items are provided for work associated with installation of new poles and replacement, re-alignment or relocation of existing poles, installation of stays and struts and installation of Distribution Boxes for AB cables.~~

~~4. Installation of LT Distribution Boxes for ABC~~

~~4.1. Types of LT Distribution Boxes~~

The following types of LT Distribution Boxes (according to number of consumers to be connected) shall be selected:-

- ~~Type A : Single Phase, 1 Incoming (25 mm²)/ 6 outgoing (upto 10 mm²)~~
- ~~Type B : Three Phase, 1 Incoming (35 mm²)/ 4 outgoing (upto 16 mm²)~~

4.2. ~~Mounting Arrangement~~

Distribution Box (DB) shall be mounted on LT pole with galvanized MS clamp ~~of 50x3mm size.~~

4.3. ~~Connection to AB Cable~~

For connection to ABC, insulation piercing connectors (IPC) and PG clamps of appropriate size shall be used.

Single phase Distribution Boxes shall be connected to specified phase as per Schedule-B in order to ensure load balancing in ABC line.

4.4. ~~Connection of Consumer Service Cables~~

All existing consumer service cables shall be re-connected to the Distribution Box by the Contractor. In case existing consumer service connections are to be replaced with armoured service cables in a given habitation as determined by the Project Manager, new armoured cable shall be connected to the Distribution Box.

5. ~~Replacement of Existing Consumer Service Connections~~

5.1. ~~Service Connection Types~~

The applicable service connection types are as follows;

SC Type-	Connected Load- No of Phases / Contract Dmd	Service Cable Size (cores / sqmm)-
SP-1-	Single Phase / upto 4 kW-	2 x 4 mm ² -
TP-1-	Three Phase / upto 4 kW-	4 x 4 mm ² -
TP-2-	Three Phase / above 4 kW-	4 x 4 mm ²

5.2. ~~Service Cable Types~~

The service cable shall be 1.1 KV grade PVC insulated, PVC sheathed, armoured multicore stranded aluminium cable as per sizes indicated in above table

5.3. ~~Service Cable Span~~

Permissible maximum span for service cable shall be 30 m. In isolated cases this limit may be extended with the approval of Project Manager provided that required ground clearance is maintained with additional supports where necessary.

Existing service cables shall be replaced with armored service cables only in certain specified areas which are high theft prone areas. This will be specified by the Project Manger during

~~execution. No service cable replacements shall be carried out without the approval of Project Manager.~~

~~In this case existing service cables shall be replaced with new armoured cables. Existing un-armoured service cables shall be removed and returned to Employer warehouse. Any non-standard supports used as supports for existing service cables shall also be removed.~~

~~New armoured service cables shall be drawn from the LT Distribution Box upto the meter board as shown in drawings. The service wire is to be hanged on supportive GI wire between pole support and the house. 7/3.15 mm (10 SWG) & 7/4.00 mm (8 SWG) GI wires shall be used for single phase and three phase services respectively.~~

~~Before installing service wires and GI wire, GI pipe / MS Angle on the consumer premises is to be erected using clamps/ nails/proper binding etc. In case of hut or poor structure at consumer premises, GI pipe is to clamp on wooden planks/wooden structure existing in the house. The GI pipe should be supported for neutralizing tension by means of GI tie wire support. In pukka/brickwork/cement concrete foundations, house, GI support pipe is to be clamped by means of MS clips.~~

~~New service cable shall be connected to existing consumer meter terminals or incoming fuse / MCB / MCCB terminals. Care should be taken not to damage the existing meters in the process. 20mm dia PVC conduit pipes shall be used to take down service cable from the roof to the meter box along the walls. The service cable shall be drawn inside PVC pipes from roof upto the meter board.~~

~~Terminal cover of the meter or fuses shall be sealed upon connection of new service cable as arranged with the Employer.~~

~~Earth terminal point shall be provided at meter board via bearer GI wire. This point shall be connected with the proper earthing system through GI wire. 10mm diameter earth knob in form of bolt and nut is to be installed on energy meter board.~~

~~All work required to install service cable from LT Distribution Box upto the meter board shall be carried out as per drawings. This includes GI wire for supporting service cables from LT Distribution Box upto the consumer premises, MS angle fixed at roof, clamp with bolts nuts and flat iron for fixing GI wire on pole, clamps for fixing cable to GI wire, PVC conduit pipes and accessories to draw the service cable from roof upto the meter board.~~

Contractor

6. Installation of Poles

6.1. Types of pole installation works for ABC conversions

The following types of pole installation works applicable for ABC conversions as per site requirements specified in the table below;

#	Type	Site Requirements
1	Installation of new poles	<ul style="list-style-type: none"> • New pole to be used as an intermediate pole in the existing line to address excessive spans or other requirements. • When there is a need to do minor extensions to the existing line in order to minimize excessive service cable lengths to existing consumers. • To shift existing lines due to safety/clearance issues.
2	Replacement of existing (unusable) poles	<ul style="list-style-type: none"> • To replace existing poles which are damaged / corroded and cannot be re-used. • To replace of existing non-standard line supports such as temporary structures including supports embedded in buildings.
3	Re-location of existing poles	<ul style="list-style-type: none"> • To shift existing poles • To shift existing lines due to safety/clearance issues
4	Re-alignment of existing poles	<ul style="list-style-type: none"> • To straighten the poles that are inclined in a particular direction but in re-usable condition

6.2. Types of poles

For works relating to new poles and replacement of poles, poles according to Employer specification shall be used.

For works relating to re-location or realignment of existing poles the available existing pole (any type) may be re-used provided that it is in re-usable condition.

7. Erection of Poles

7.1. Removal of existing poles for re-use or disposal

All unusable poles or non-standard line supports in the existing LT lines shall be removed and disposed. If the existing pole is removed for re-use adequate measures should be taken not to damage the pole during removal.

Existing poles shall be removed by pulling the complete pole from the ground; poles shall not be cut off at the ground line. Pole shall be cleaned and any material attached with the pole

~~(including concrete) shall be removed. The RCC base plate may be removed and re-used if it is in re-usable condition.~~

~~Pits shall be backfilled and compacted completely with sufficient added backfill piled above grade to prevent depressions being created by natural compaction.~~

~~Contractor shall be responsible for disposal of unusable poles or non-standard line support structures after taking approval of the Project Manager/ Engineer In-Charge of the Employer.~~

~~7.2. Erection of new or existing poles~~

~~For 8/8.5 m PCC poles pole pit shall be excavated as per details provided in drawing # REC/RDSS/GEN/02. Pole shall be placed on the RCC base pad made as per drawing # REC/RDSS/GEN/05A. PCC pole pit shall be refilled with 200 mm average size of boulder mixed with excavated earth. Proper ramming shall be performed for better compaction. Pole shall be erected fully vertical and firmly fixed to ground and shall not wobble.~~

~~7.3. Erection of poles with concrete foundation~~

~~Concrete foundations shall be used to erect terminal / tension poles and poles in water logged areas or for all locations as instructed by the Project Manager. Details of concrete foundation for PCC poles are provided in drawing # REC/RDSS/GEN/01.~~

~~7.4. Re-alignment of existing pole~~

~~Existing poles that are inclined in a particular direction shall be re-aligned / straightened by pulling, providing additional bouldering, concreting and re-compacting as necessary. Upon re-alignment pole shall be erected fully vertical and firmly fixed to ground and shall not wobble. If necessary pole may be completely removed and re-installed.~~

~~7.5. Earthing of poles~~

~~Earthing of poles shall be carried out as per CEA regulations and existing practice of Employer.~~

~~7.6. Pole Numbering~~

~~Requirements specified in section 3.9 with respect pole numbering shall also be applicable for new poles or pole replacements indicated in this section.~~

~~8. Installation of Stays and Struts~~

~~8.1. Installation of Stays (Guys)~~

~~Stays shall be installed to nullify tension on poles due to tension of AB cable at terminal, angle, cut-point and T-off positions. Stays may also be installed at steep gradient locations as required. Along the straight run stays shall be installed at minimum two locations in 1 km.~~

If there are no existing stays installed at such locations in the existing line, such poles shall be identified and included in Schedule B for installation of new stays. In addition required stays for proposed new and relocated poles shall also be included.

10 SWG stay wire (7/ 3.15 mm) with 20 mm stay rod shall be used for 11 kV and 12 SWG stay wire (7/2.5 mm) with 16mm stay rod for LT lines. Stay shall be installed in the opposite direction of resultant force due to AB cable tension in order to nullify the same.

If the stay wire proves to be hazardous, it should be protected with suitable asbestos pipe filled with concrete of about 2 m length above the ground level, painted with white and black strips so that, it may be visible at night.

8.2. Installation of Struts

The struts may be used only in case where stays cannot be installed due to physical obstacles or limitations. Strut shall be applied in the same direction of resultant force due to AB cable tension in order to nullify the same.

8.3. Installation of Stays

Stay assembly comprising of turn buckle assembly, anchor rod and plate, stay insulator, thimble and GI stay wire shall be supplied and installed as indicated in drawing # EC/RDSS/GEN/09B.

In general, the stay should be applied on the pole as close as possible to the load center. The angle between stay wire and pole shall be between 45°—60°. Where there are issues obtaining specified angle due to physical obstacles, bow (outrigger) stay arrangement may be considered with the approval of the Project Manager. In case of critical space issues, fly stays may also be considered subject to approval of the Project Manager. (Reference : REC Drawing # G4).

Concreting of stay pit shall be done as shown in drawings except for firm soil where compacting with necessary aggregates shall be done.

Stay wire shall be properly tightened after installation and allowing sufficient time for setting concrete. Contractor shall ensure all stays in the existing line are properly tightened including new and existing stays.

8.4. Installation of Strut pole

Installation of strut pole shall be carried out using 8 m PCC pole and pole brackets as shown in drawing # REC/RDSS/GEN/10. Strut pole shall be installed with the RCC base plate. Angle between the line and strut pole shall be 45°.

9. Re-Connecting Existing Street Lamps to ABC

~~If there are existing street lamps connected to the bare conductor line, these street lamps shall be re-connected to ABC line through the street lighting conductor using IPC (for insulated conductor) and PG clamps (for bare neutral messenger). This work scope is limited to providing connection to existing street lamps only.~~

10. Shutdown during execution of works :

The Contractor is required to take shutdown to execute reconductering and all other works wherever needed. During shut down, safety of system and operating manpower shall be ensured by Contractor.

Shut down shall be planned with concerned substation incharge well in advance. This may subject to exigencies leading to cancellation of requisition if situation so desire. Contractor shall be responsible to take advance action on resource mobilization (men, materials and machine) well in advance to perform shut down works. Adequate manpower shall be mobilise so as to take-up the works in parallel at ll supports on given shut-down area. Contractor shall deply well educated and experience engineer to take care of shut down, eand earthing of lines, check clearances on completion of works, return shut down and ensure re-energisation of section/part of line. He shall be available at site for taking shut-down, during execution of works, return of shut down and re-energisation of line. Safety of working crew shall be looked after by him. He must be a trained person having requisite experience of shut-down works. He must be well aware of LT/HT networks and their supply sources.

On completion of work, Contractor shall provide as built GA drawings GPS making of connected consumers and their type of connection (single/three phase), domestic/commercial/agriculture etc. and connected loads.

~~13.11. Construction of New 11 kV Feeders and Associated Works for Separation of Agricultural Consumers~~

~~1. Construction of new 11 kV lines~~

~~1.1. GPS Survey~~

~~Mapping of routes of proposed 11 KV lines shall be done by GPS GPS Survey. While GPS Surveying, existing electrical infrastructure, existing agriculture private tube well (PTW) locations, capacity and load details shall be mapped during GPS Survey.~~

~~Upon completion of the GPS Survey the Contractor shall provide a GPS Survey report with the following information;~~

- ~~• Single line diagram of the route GPS Survey and proposed line alignment details mapped and provided in a standard mapping software. This should also include information such as existing electrical infrastructure and PTW information.~~
- ~~• Road and railway crossing points of the proposed 11 kV line shall be marked on the single line diagram.~~
- ~~• Line sections proposed for 11 kV AB (Ariel Bunched) cables due to vegetation, safety and forest clearance issues (if applicable) shall be marked on the single line diagram. Lengths of proposed AB cable line sections shall be indicated.~~
- ~~• Schedule of location wise pumps to be fed through new feeder or alternatively general consumer distribution transformers to be transferred to new feeder for making dedicated feeder for agricultural consumers. This schedule should include location / capacity of the existing distribution transformers to be transferred and location /capacity and load of agriculture PTWs with reference to the locations of the single line diagram.~~
- ~~• Estimated peak demand on each feeder/s upon implementation and percentage voltage regulation at farthest point on various spur sections.~~
- ~~• Single line diagram of the 33/11 kV substation indicating of 11 kV outgoing feeder to connect the new feeder. If existing spare feeder is unavailable list of works to be performed at the substation to install additional new feeder.~~

~~The GPS Survey report shall be submitted in a suitable format for uploading to the web portal and for printing.~~

~~The GPS Survey report will be used as the basic document for execution of work upon approval by the Project Manager. Upon completion of work, as built single line diagram shall be provided with relevant information of the works carried out.~~

- ~~• On the GPS Survey drawings Line to line crossing (HT/LT, LT/LT, HT/HT/Railways Crossing) details to be marked with available clearances.~~
- ~~• Efforts shall be taken to avoid long zig-zag lines and too many line-to-line crossing while GPS Surveying and finalizing route maps/SLD.~~

~~1.2. Statutory Clearances~~

For execution of new 11 KV line construction work, all statutory clearances shall be obtained by the Contractor coordinating through the Project Manager. These include road crossing clearances, railway crossing approvals, way leave clearance and any approvals needed from local authorities, road authorities and other regulatory authorities. All statutory clearances shall be ensured for ground clearance, line-to-line clearance, road crossing clearance, horizontal and vertical clearances from buildings/objects etc. All road crossings and line crossings shall be guarded as per specifications. Conductor joint should not be provided in mid span length. Instead, it should be nearer to the support.

1.3. Construction of new 11 kV lines

Upon approval from the Project Manager the Contractor shall carry out construction work in full compliance with the technical instructions, specifications and drawings provided in this Volume.

1.4. Stringing of conductors / AB cables

Minimum safety clearances shall be maintained in the 11 kV line. Sag tension charts for installing ACSR conductors or AB cables shall be developed by the Contractor taking into consideration of conductor / cable characteristics, maximum / minimum temperatures and design wind pressure as per service conditions.

Based on this, clear guidelines shall be provided to linesmen to ensure ACSR conductors or bare neutral messenger (for AB cables) are pulled at appropriate tension so that;

- (a) Required ground clearances are maintained and
- (b) Conductor tension is maintained well below its breaking load at all temperatures.

Dynamometer method or sag method may be used to ensure appropriate tensioning of conductors / cables during installation. Over tensioning of conductors should be avoided to ensure its tension does not exceed permissible loading limits at low temperatures. Loose spans of conductors should be avoided to maintain permissible maximum sag at high temperatures. Loose spans may only be allowed for short spans in special cases. This applies when there are practical difficulties to install necessary stays or struts as required at a t-off point. A short loose span may be used in this case to transfer the stay / strut support point upstream or downstream of the line.

Stringing of conductors / AB cable shall be done using proper equipment as recommended by the manufacturer to avoid any damage to the conductor / cable during installation. Temporary stays or strut poles shall be employed as necessary during stringing operation to ensure safety of personnel and equipment.

1.5. 11 kV line for underground railway crossing

~~Detail GPS Survey of location of railway crossing shall be carried out by the Contractor to avoid multi crossing at nearby location. Prior approval from railway authorities for execution of this work shall be obtained by the Contractor through the Project Manager. Contractor should ensure timely completion of work during block period allocated by the railway authority by mobilizing adequate resources.~~

~~2 Nos. separate cables shall be laid in separate HDPE pipe enclosures per crossing. One cable to be kept as a spare. Horizontal Direct Drilling (HDD) shall be used for installation of cables below the railway tracks.~~

~~Contractor Contractor Contractor~~

1.6. Tree Cutting and Trimming

~~The Contractor shall count, mark with suitable quality of paint all the trees that are required to be cut/trimmed to obtain required wayleave clearance. Contractor shall pay compensation for any loss or damage for tree cutting due to Contractor's work. If forest clearance is envisaged for execution of work, clearance of forest department shall be arranged by the Contractor through the Project Manager.~~

1.7. Installation of Distribution Boxes for LT lines

~~3 phase and single phase Distribution Boxes shall be supplied as per specifications and installed on poles according to number service connections for LT AB cable lines. When installing single phase Distribution Boxes they shall be connected to alternate phases of the AB cable in order to obtain adequate level of load balancing.~~

2. Extension of Substation Control Room Building

~~Extension of substation control room building shall be carried out as per instructions of the Project Manager to provide additional space for new outgoing feeder panels if required.~~

~~This work shall be carried out as instructed by the Project Manager under the supervision of civil engineer / technical officer appointed by him. The Contractor shall be responsible to ensure building is extended in the same manner as existing building. The Contractor shall be responsible to provide necessary measures to ensure substation control operations are carried out without disruption during the construction period.~~

13.12. Underground Cabling

1. GPS Survey

The detailed GPS Survey shall be carried out for the approved feeders/spur lines by the Contractor and submitted for Employer's approval. The Successful Tenderer shall carry out radar GPS Survey of the route using Ground penetrating Radar and determine route profile of any other utility cables, pipes etc along the route. The route GPS Survey and drilling profile shall be got approved and finalized by the Engineer-in-Charge prior to commencement of the drilling, HDPE pipe insertion and cable insertion.

2. The scope includes :

- ~~Laying of underground 33 KV, XLPE HT Cable (3Cx185sqmm)~~
- **Laying of underground 11KV, XLPE HT Cable (3Cx95sqmm)**
- ~~Laying of underground 1.1 KV, XLPE, LT Power Cable (3.5Cx240-204.79KM, 3.5Cx 150-227.39KM, 3.5Cx25 sqmm 44.74KM, 1Cx630 Sqmm 1.8KM and 1Cx400 sqmm 2.4KM)~~
- ~~Laying of underground 1.1 KV, PVC, LT armoured Power Cable for Street Light (4Cx25 sqmm)~~
- ~~Laying of underground 1.1 KV,PVC, LT armoured Service Power Cable (4Cx10 sqmm 56KM, 2Cx10 sqmm 247KM)~~

3. Horizontal Direction Drilling

- 3.1. HDD or Horizontal Directional Drilling is a trenchless boring method for installing underground cables, pipes and conduits in a shallow curve along a prescribed bore path with the use of a surface-launched rig / machine, which minimises the disruption of the surrounding area, for example, roads and driveways. The laying of U/G cables shall normally be done direct in ground through trenchless boring by using HDPE pipes. However in exceptional circumstances the cables may have to be laid in covered trenches or in racks fixed to the walls or supported from the ceilings. The scope shall cover supply of all the material as per the BOQ, erection equipments, labour and all the other items required for the laying of the power cables. The cable route markers, at a maximum distance of 200 mtrs, and danger boards shall be provided for the information of all concerned and for their safety. Any additional requirement in terms of safety perspective shall be provided by the Contractor without any extra cost. It is the responsibility of the Contractor to maintain the required statutory clearances from other utility services. Any damage caused to any utility services/ human life / public property etc shall be the sole responsibility of the Contractor. The Contractor will lay the underground power cable in such a fashion that no straight through joints are required and only end terminations joints are required, however wherever the joints are required in HT cable then the same shall be carried out overhead on PCC poles structure. In exceptional circumstances such as where length of line is more than the standard cable length in drum and overhead jointing is not possible then straight through joints will be allowed. The Contractor shall have ISO 9001-2008/18001-2007

- 3.2. The Horizontal drilling shall be for a distance of not less than 90 mts at each stretch and subsequently thereafter. The reinstatement of road dug up for drilling at every 90 mts shall be incorporated in the price for Horizontal Directional Drilling.
- 3.3. Disposal of extra excavated material such as mud, slurry, stones etc shall be also included in the rate per meter of horizontal drilling and shall not be charged extra.
- 3.4. The trenchless technology shall be used with HDPE casing for the portion of the cable route such as road, railway, nullah crossing and without HDPE casing for major portion of the cable route. The outer diameter of the HDPE pipe shall be suitable for insertion in an 8" diameter horizontally drilled bore. The HDPE pipe shall be of PE 80 grade with pressure rating PN6 conforming to IS 4984-2016. The HDPE pipes shall be joined by using Butt welding and a 7/20 G.I wire shall be provided along the entire length of each pipe duct.
- 3.5. The directional drilling equipment shall consist of a directional drilling rig of sufficient capacity to perform the bore and pull back the pipe/cable, a drilling fluid mixing, delivery, and recovery system of sufficient capacity to successfully complete the installation, a drilling fluid recycling system to remove solids from the drilling fluid so that the fluid can be reused (if required), a magnetic guidance system or walk over system to accurately guide boring operations, a vacuum truck of sufficient capacity to handle the drilling fluid volume, and trained and competent personnel to operate the system. All equipment shall be in good, safe condition with sufficient supplies, materials and spare parts on hand to maintain the system in good working order for the duration of this project.
- 3.6. The directional drilling machine shall consist of a hydraulically powered system to rotate and push hollow drilling pipe into the ground at a variable angle while delivering a pressurized fluid mixture to a guidable drill (bore) head. The machine shall be anchored to the ground to withstand the bulling, pushing and rotating pressure required to complete the installation. The hydraulic power system shall be self-contained with sufficient pressure and volume to power drilling operations. Hydraulic system shall be free of leaks. Rig shall have a system to monitor and record maximum pullback pressure during pullback operations.
- 3.7. There shall be a system to detect electrical current from the drill string and an audible alarm which automatically sounds when an electrical current is detected.
- 3.8. The drill head shall be steerable by changing its rotation and shall provide necessary cutting surfaces and drilling fluid jets.
- 3.9. Mud motors shall be of adequate power to turn the required drilling tools.
- 3.10. Drill Pipe shall be constructed of high quality 4130 seamless tubing, grade D or better, with threaded box and pins. Tool joints should be hardened to 32-36 RC.

4. Accessories

- 4.1. This being a Turnkey contract, successful installation, commissioning & integration with existing system, of those equipment/accessories/material not specifically mentioned in the specifications, shall be the responsibility of Contractor. No extra payment shall be made for these inherent works.

- 4.2. He shall also supply all other associated equipment/ material/accessories not specifically mentioned in this tender specification but are required for successful and trouble free operation of the executed work as a whole. For that no extra payment shall be made to the Contractor.

5. Technical Standards

- 5.1. The electrical equipments and materials required during erection should be of high standard. Technical features of these equipments and materials must conform to the technical specification given in this bidding document. Wherever the same is not specified, it must conform to the relevant I.S for that material.
- 5.2. Materials conforming to other international standards, which ensure equal or higher quality than the standards mentioned above, shall also be acceptable. In case the bidders who wish to offer materials conforming to other standards, salient points of difference between standards adopted and specific standards shall be clearly brought out in the respective schedule. Four copies of such standards with authentic English version shall be furnished along with the offer.
- 5.3. Whenever a material or an article is specified or described by the name of a particular brand, manufacturer or trade mark, the specific item shall be understood as establishing type, function and quality desired. Products of other manufacturers may also be considered, provided sufficient information is furnished, so as to enable the Employer to determine that the products are equivalent to those mentioned.
- 5.4. Materials supplied/used shall conform in all respects to the relevant Indian Standard Specification with latest amendments there to.

	Title	IS No.
1.	Cement	IS 269
2.	Steel	IS 6003/1970
3.	Fasteners	IS 6639/1972
4.	Concrete mix	IS 1343
5.	RCC	IS 456
6.	Cable laying and jointing	IS 1255

Installation work pertaining to equipment, cable laying etc should be in accordance with the applicable standards, safety codes etc.

6. Site Storage/ Transportation

- 6.1. It shall be the responsibility of the Contractor to store, move/transport from stores/storage yard etc., relevant items and accessories to the place of installation wherever necessary he will assemble all parts of equipment. In accordance with the specific installation instructions as directed by Site Engineer.
- 6.2. The stores should be dismantled and site cleared after the work is completed

7. Erection, Testing and Commissioning

- 7.1. All the works covered under the scope of the tender shall be done in accordance with the norms defined by the Employer, unless the same is not specifically defined in the specification or with the provisions of Indian Electricity Rules/Acts/Other Government Rules/Regulations as prevalent at the time of execution of the job/work.
- 7.2. Installation shall be carried out strictly in accordance with the approved drawings Modifications, if any, required to suit site conditions, shall be carried out only with the prior approval of the Site Engineer. All such changes shall be incorporated in "As built" drawings to be furnished by the Contractor.
- 7.3. Responsibility for successful installation of other equipment accessories, purchased but not mentioned specifically above, and their commissioning shall be on Contractor. For all such items the Contractor shall be supplying all material and equipment required to accomplish the job complete in all respect.
- 7.4. Installation work pertaining to equipment, cable laying etc should be in accordance with the applicable standards, safety codes etc.
- 7.5. The Contractors shall themselves be responsible for timely arrangement/ procurement of all the raw materials required for the manufacture of all tendered items by them/ their and / or by their vendors.
- 7.6. While Repairing & Replacing the equipment, if any other equipment gets damaged due to negligent handling of the Contractor the same shall be replaced by the Contractor at his cost to the Employer satisfaction.
- 7.7. He shall be responsible for dismantling of defective equipments, there proper handling and shifting.
- 7.8. Also he shall hand over the old & dismantled equipments/ material to the purchaser's local stores or other sites as per instructions of the purchaser for which no extra payment shall be made.
- 7.9. All charges on account of damages/losses/claims/thefts etc. involved under the conditions laid down above shall be borne by the Contractor. It's cost shall be recovered from his bills /security deposits /other assets.
- 7.10. In order to avoid hazards to personnel moving around, the equipment such as Transformer, Capacitor Banks, Switchgears etc. if required to be kept charged after installation till their commissioning, shall be cordoned off by suitable barriers to prevent accidental injury to personnel moving around.
- 7.11. Where the equipments/ assemblies are supplied in more than one part, the Contractor shall make all necessary mechanical and electrical connections between the sections. The Contractor shall also do necessary adjustment in the alignments required for its proper operation.
- 7.12. Care shall be taken in handling instruments relays and other delicate devices where instruments and relays are supplied separately they shall be mounted only after the associated switch gear/control panels are erected and aligned.
- 7.13. Precaution: The Contractor shall exercise all possible care to avoid damage to public utilities e.g. water/ sewage pipes telephone and power lines/cable already existing. In case of any

accidental damage during the work, the Contractor shall be responsible to repair/replace the same at his own cost, and shall ensure that the purchaser is not put to any loss.

- 7.14. The Contractor shall have to provide proper lighting, barricading, signboards etc. at the work site as a necessary precautionary arrangement to avoid accident/ damage/ losses to the public /utilities/properties.
- 7.15. Site Solution: It may be possible due to some reasons or others that it would not be possible to work as per the procedure. In such case/cases, the solution to the problem shall be achieved by the purchaser with the consultation of Contractor, and the Contractor shall work as per procedure proposed by the purchaser. Such cases shall in variably be informed to the engineer of the contract for which no extra payments shall be made.
- 7.16. Space Constraints: While executing the job it is quite possible that some of the specified work may not be carried out due to space/land/ other technical constraints etc. In such case the concerned Employer, if required, may divert this work at some other site or cancel the left over portions of work.
- 7.17. The Contractor shall ensure that the equipment under erection as well as the work area and the site are kept clean to the satisfaction of the Engineer. In case, the Engineer is not satisfied about the cleanliness he will have the right to carry out the cleaning operations and expenditure incurred in this regard will be to Contractor's account. Packing cases and packing materials shall be promptly cleared from sites.

13.13. — Specification for erection of 66 kV M/C, D/C tower / H-frame line :**~~1.1. GENERAL TECHNICAL PARTICULARS FOR ERECTION OF 66 KV LINES.~~****~~1.1.1. — SCOPE :~~**

~~The erection work covered under these sections consists mainly of~~

- ~~• Distribution of all materials to erection site.~~
- ~~• Stub setting.~~
- ~~• Tower Erection.~~
- ~~• Cold line Stringing.~~
- ~~• Testing and commissioning and Guarantee of Line.~~

~~1.1.2. — The Contractor shall be fully responsible for completing all the above works and till them are taken over by the Employer.~~

~~1.1.3. — The methods of erection are dealt within details, but are left to the Contractor who shall exercise his own judgment with regards to actual handling of materials and in deciding upon the best methods to be adopted in the erection of the towers, conductors and other materials.~~

1.2. WAY LEAVE/TREE CUTTING AND OTHER CONSTRUCTION :

1.2.1. The Employer will arrange for write off way and for tree cutting clearance, the Contractor will instruct his laborers & staff to use minimum area while doing the work where there are standing crops. No person of the Contractor should pick in items from standing crops of fruits. The Contractor should take all possible steps to avoid or minimize damage to standing crops etc.

1.2.2. The Contractor should immediately notify and obstruction or hindrance from local community or the local authorities in the prosecution of the work to the concerned Engineer-in-charge, but should not deal directly in the matter. The Engineer-in-charge will arrange to remove the obstacles as soon as possible.

1.3. ACCESS TO LOCATIONS :

1.3.1. It will be the Contractor's sole responsibility to take the materials up to the locations required. Any path way, temporary road or temporary bridge required will have to be provided by the Contractor at his cost. If for any reasons the above is not feasible the Contractor at his own cost shall have to arrange transportation by Head roads.

1.4. DISTRIBUTION OF MATERIALS :

1.4.1. The Contractor has to take delivery of tower materials/lines materials from the Employer's stores and transport it to the respective tower erection sites and will be responsible for any damages to or loss of all materials at any stage during the Transportation or erection. The materials that will be issued by the Employer will be in 'AS IS WHERE IS' conditions at the store centre of the Employer in the area during working hours days. All the materials received by the Contractor shall

be got insured for storages and erection risk by the Contractor at his own cost. An indemnity Bond/Bonds have to be issued by the Contractor for the materials take over by him for erection.

1.4.2. On completion of the work all surplus tower and line materials including the excess Bolts & Nuts and stub materials shall be returned by the Contractor to the nearest respective stores of the Employer as per the instructions of the Engineer-in-charge of the works at no extra cost to the Employer.

1.4.3. The Contractor shall submit the complete material account immediately after the works is completed and in case not late than one month of completion and Handing over of the line.

1.5. STUB SETTING AND FOUNDATIONS :-

1.5.1. The Contractor shall be fully responsible for correct setting of stubs in accordance with approved methods at the exact locations and alignments and in precisely correct level; stub setting templates to the supplied by the Employer should be used for proper setting of stubs. The Contractor will be responsible for constructing the foundations in accordance with the design of each type of foundations supplied to him by the Employer and as per approved final schedules.

1.5.2. The foundation work includes stone revetment, concrete or earth filling above ground level where necessary and stacking and tamping on the site of all surplus excavated soil. Surplus stone should be stacked within the tower base.

1.5.3. Classification of Soil :

1. Normal soil : Which can be readily removed ordinary spades, shovels viz Normal Soil, Black cotton soil, Hard & Soft Morrum and Yellow clay.
2. Soft Rock : Literate, line stone or rock which break away chips or slabs.
3. Hard-Rock : Rock which may need chiseling or blasting.
4. wet Soil : Soil encounters in wet location.

1.5.4. EXCAVATION FOR FOUNDATION :

1.5.4.1. The tenderer should quote different rates for different types of soil. The Contractor will be intimated the alternative that will be operated, the payment for excavation will be limited to guaranteed volume as per approved excavation drawings that will be furnished by the Employer to the Contractor even though the Contractor may excavates more the sake or his own convenience. If the excavated depth is more than the depth shown in approved drawings, the additional depth should be filled in with lean concrete (1:4:8) at Contractor's cost.

1.5.5. CONCRETE :

1.5.5.1. The cement required shall be supplied by the Contractor approved by the Employer

1.5.5.2. All cement is used shall be accountable. If the quantity of cement utilized in the work is observed to be more than the permissible quantities worked out bases on the finally approved foundation drawings and subject to the maximum as per the guaranteed volumes, irrespective of the fact that the cost of cement is recovered from the Contractor's Bills.

The cement consumption for difference types of concrete shall be considered as follows:-

1. M-20 Mix (1:1.5:3) 8.2 bags.

2. M-15 Mix (1:2:4) 6.5 bags.

1.5.5.3. The sand shall be of best quality containing hard siliceous materials, clean and of snap angular grit type and free from earth or organics matter of salts and to the satisfaction of the Engineer-in-charge. The sand shall be washed before use. No. salty or Darkish water shall be used for concreting.

1.5.5.4. The aggregate shall be of the best quality to the satisfaction of the Engineer-in-charge and brakes to maximum size of 40mm for thick concrete and 20mm thin concrete section. It should also be free from grit and dirt.

1.5.5.5. The mixture of concrete to be used shall be such as to produce a sound : compact and water proof concrete and shall not be weaker than 1:2:4 ratio with 20mm stone metal for chimney portion and 40mm stone metal for mass concreting pyramid portion or slab portion, unit rates may be quoted for concrete of M-15 Mix ratio. The concrete shall be mixed as stiff as the requirements of placing the concrete in the form of moulds with case and degree to which concrete resists segregations will permit. Hence the quantity of water used should not be too much.

1.5.5.6. Proper forms or moulds adequately braced to retain proper shape while concreting should be used for chimney or pyramid and slab portions. Form boxes should be water tight so as not to allow cement cream to come out leaving only sand and jelly to form money coml. in concrete. Form excess boxes should be cleaned and oiled before using for concreting.

1.5.5.7. All wet locations must be kept completely dewatered both during the placing of concrete and for 24 hours after completion. There should be no disturbance of concrete by water during this period.

1.5.5.8. Form boxes should not be removed before 24 hours after concreting. Concrete surface where required should be set right with tick cement and mortar immediately after removal of the forms.

1.5.5.9. After 24 hours of pouring, the concrete should be cured by keeping it continuously wet for 14 days. The pit may be back filled with selected earth sprinkled with necessary amount of water and well consolidated layers not exceeding 150mm after 48 hours and thereafter both the exposed top and the fill shall be kept wet for the remainder of the prescribed time.

1.5.5.10. Payment for the quantity of excavation and concreting for each type of tower shall be made on prorate basis of actual work done subject to the maximum of guaranteed volumes as per the approved drawings to be furnished by the purchaser.

1.5.5.11. The supply of steel for reinforcement, if required is to be supplied by the Contractor

1.5.6. EXCAVATION IN ROCK :

1.5.6.1. Where towers are to be planted in rock, suitable holes should be drilled, but if drilling is difficult, blasting may be resorted to, but sufficient care should be taken to eliminate the possibility of serious cracking of the rock.

1.5.6.2. Care should also be taken to minimize the concreting for filling blasted areas. Stubs may be shortened suitably in case of drilled holes as per design drawings.

1.6. ERECTION OF TOWERS :

1.6.1. — The superstructure of towers should be erected on foundations after 14 days of concreting. However, the method adopted for erection of towers is left to the decision of the Contractor subject to the condition that he takes responsibility for any damages to materials. No. tower member should get strained or bent during erection. The tower must be truly vertical after erection and no straining would be allowed to bring it in alignment. Maximum tolerance in verticality that will be permitted is one mm per 360mm of tower height. All bolts and nuts shall be made fully tight and finally the bolt threads shall be centre punched to avoid nuts becoming loose, punching of bolts shall be made by chamfering the threads with centre punch at least at three places equally spaced on contact surface of bolts and nuts.

1.6.2. — Tower erection shall include erection of all accessories and fittings including attachment for step bolts, ladders, platform, 'U' Bolts shackles, Hangers, strain plates etc. and punching of bolts and nuts so that towers are completed in all respect.

1.6.3. Suitable tower extension shall be erected to get desired ground clearance whenever required. Which have been determined at the time of final GPS Survey.

1.7. GROUNDING :

1.7.1. — It is necessary that in no case tower footing resistance should be more than 10 ohms. During dry weather.

1.7.2. PIPE TYPE EARTHING :

1.7.2.1. — At location where footing resistance does not exceeds 10 ohms the pipe type earthing as per method specified by Employer would be followed. The Contractor will have to supply all materials required for grounding including salt, finely broken coke/charcoal, G.I. Pipe G.I. Wire clamp & Nuts-Bolts etc.

1.7.3. COUNTERPOISE EARTHING :

1.7.3.1. — In place of high receptivity soil conditions, counterpoise earthing shall be adopted as per Employer specifications to bring down the tower footing resistance below 10 ohms. The counterpoise earthing shall be buried 600mm below ground level and for this purpose some space should be left out in chimney coping portion at the time of stub setting. Coping should be complete after installation of counterpoise earthing. All materials are to be supplied by the Contractor.

1.8. INSULATOR HOISTINGS:

1.8.1. — Suspension Insulator strings shall be used on all tangent type towers with deviation up to 2 and tension insulator string on all shall medium, large angle and dead end type towers on all lines.

1.8.2. — Insulators string shall be assembled on ground. These shall be cleaned and examined for their cracks chips or defective glazing (not exceeding half centimeter square) and then hoisted by careful handling, the work will include fitting of all hard wares and fitting in their proper places and order.

1.9. STRINGING OF CONDUCTOR AND GROUND WORK:

1.9.1. — Before commencing of stringing work, tower healthiness certificate of each & every tower location must be submitted to Engineer in charge in writing.

1.9.2. — Before commencing of stringing work, Contractor must obtain approval of sag tension charts showing initial and final sags and tensions for various temperature and spans.

1.9.3. — The Contractor shall be responsible and will take care of proper handling of drums from stores to site, sufficient numbers of aluminum sketch blocks shall be used for laying out the A.C.S.R. Conductors. Necessary precautions shall be taken to avoid conductor rubbing on the ground by providing adequate ground rollers on supports. Additional rollers shall also be provided to cross thorny hedges, forcing and other obstructions to avoid scratching of conductors. The conductor and ground wire shall be made to sag correctly as per stringing charts before they are finally transferred to the hard wares for conductors and to clamps for ground wire, No joints should be made at less than 30 meters from the tower and that no joint shall be permitted in Railway, River & Road crossing spans. There shall not be more than one joint in a span of each conductor. All conductors shall be stressed to their maximum working load at the time of stringing.

1.9.4. — The minimum clearance between the lowest point of conductor and ground shall not be less than required those. All compression joints should be carefully made and a record of initial and final length of the joints, jointly signed by Contractor's and Employer's representatives should be maintained. Dynamometer shall be used in tensioning the conductors, check for sag should also be made at intervals when conductors are drawn up. Over stressing, causing damage to towers, should be avoided care should be exercised not to over tension the conductor. An extra sag of 150mm should be allowed at all important tension points like Railway and River crossing. After being pulled the conductor/ground wire shall not be allowed to hang in the stringing sheaves for more than 72 hours before being pulled to the specified sag. During the time the conductor/ground wire is on the stringing sheaves before sagging in, it shall be ensured that the conductors/ground wire is not damaged to wind, vibration vehicles or other causes.

1.9.5. — The conductor shall be pulled up to desired sag, and left in Aerial stringing sheaves for at least one hour after which the sag shall be rechecked and adjusted, if necessary, before clipping in and transferring the conductors from the Aerial stringing sheaves to the suspension clamps.

1.9.6. — Conductor shall be clamped within 24 hours of sagging in. The sag will be checked the first and last span of the section in case of sections up to eight spans and in one intermediate open also for section with more than eight spans.

1.9.7. — The stringing sheaves, when suspended on the transmission structure for sagging, shall be so adjusted that the conductor will be on the sheaves at the same height as the suspension clamp to which it is secured.

1.9.8. — All the line conductors shall be terminated at sub-station structures whose details shall be furnished by the Employer, at the appropriate times, The Contractor shall fix strain insulators on the sub-station structures.

1.9.9. — P.A Rods and Vibration Dampers shall be fitted at each suspension towers before final clamping of conductor with insulator string. Vibration damper are to be fixed using aluminum tape

with each clamping bolt and in correct vertical position in relation to conductor. Compression type joints are to be used for jointing of conductors. Each part connected with joints shall be perfectly cleaned by wire brush and properly greased before final compression. All the joints of conductors and earth wire shall be made in the best workmanship manner and shall be perfectly straight and having maximum possible strength.

1.9.10. — Stringing work includes the hoisting insulators, fixing hardware, lifting anchor rods, and vibration dampers, making joints, repair sleeve etc. All stringing tools and hydraulic compressor machine should be arranged by the Contractor.

1.10. SUPPLY OF MATERIALS BY EMPLOYER :-

1. — G.I. Tower Material & Nut Bolts & ACD excluding barbed wire.
2. — Conductors, Earth Wire, Disc Insulators, Hardware for conductor and Earth Wire as the case may be.
3. — All jointing materials and accessories for ACSR conductor.
4. — Any other items required to complete the work.

1.11. MATERIALS TO BE SUPPLIED BY THE CONTRACTOR:-

1. — Cement, Sand, Stone, and Crusher, metal, gravels and morrum.
2. — DP/NP/PP/CIP Including supply of G.I. Nut Bolts and Barbed wire for fixing of anti-climbing devices complete.
3. — Coke, Salt and G.I. wire and all earthing requirements.
4. — Heavy duty G.I. Earthing pipe 32 mm dia, 3 mtr. Long and 50x6 mm. G.I. Flat with nut-bolt for pipe type earthing and G.S.S. Wire, Lugs, Bolts, Nuts etc for CP type earthing as per specification.
5. — Any other materials which shall be required to complete the work satisfactorily in all respects and not specified in above for supply of materials by the Employer.
6. — Steel bars required for reinforcement.

13.14. Plinth Mounted Distribution Substations

1.0 SCOPE

The specification covers the design, engineering, manufacture, stage inspection, testing, pre-delivery inspection, supply, delivery, loading, unloading and performance requirements of 11/0.433 KV non-sealed type aluminum and copper wound distribution transformers for outdoor use. The transformers shall be double wound, three phase, oil immersed with ONAN cooling. The rating required under this specification is 500 KVA with copper windings.

The equipment offered should have been successfully type tested within five years from date of tender and the designs should have been in satisfactory operation for a period not less than three years as on the date of bid opening. Compliance shall be demonstrated by submitting with the bid, (i) authenticated copies of the type test reports and (ii) performance certificates from the users, specifically from Central Govt./ State Govt. or their undertakings.

The scope of supply should also include the provision of type tests on random samples if desired by the purchaser. In this case the bidder has to bear the charges for conducting such type tests at CPRI or National Govt. approved Laboratory.

The transformer shall conform in all respects to highest standards of engineering, design, workmanship, this specification and the latest revisions of relevant standards at the time of offer and the Purchaser shall have the power to reject any work or material, which, in his judgment, is not in full accordance therewith.

2.0 CODES & STANDARDS

Except where modified by this specification, the transformers shall be designed, manufactured and tested in accordance with the latest editions of the following standards. The Bidder may propose alternative standards, provided it is demonstrated that they give a degree of quality and performance equivalent to or better than the referenced standards. Whether to accept or reject any alternative standard shall be adjudged by the Purchaser. The Bidder shall furnish a copy of the alternative standard proposed along with the bid. If the alternative standard is in a language other than English, an English translation shall be submitted with the standard. In the case of conflict the order of precedence shall be 1) IEC or ISO Standards, 2) Indian Standards, 3) other alternative standards.

IEC/ISO	Indian Standard	Subject
IEC 71		Insulation Coordination
IEC 76	IS 2026	Power Transformers
	IS 1180	Outdoor Three Phase Distribution Transformers up to 500 KVA, 11/ 0.433 KV, Non- Sealed Type
IEC 137	IS 2099	Bushing for Alternating Voltages above 1000V
IEC 156		Method of determining Electric Strength of Insulating Oils.
IEC 296	IS 335	Specification for Unused Mineral Insulating Oils for Transformers and Switchgear
	IS 6792	Method of determination of electric strength of insulating oils.
IEC 354	IS 6600	Loading Guide for oil immersed Transformers
IEC 437		Radio Influence Voltage Measurement
IEC 551		Determination of Transformer and Reactor Sound Levels.
IEC 616		Terminal and Tapping markings for power transformers.
IEC 722		Guide to the Lightning and Switching impulse testing of Power Transformers and Reactors
ISO 1460/BS 729		Galvanizing

This list is not to be considered exhaustive and reference to a particular standard or recommendation in this specification does not relieve the Supplier of the necessity of providing the goods complying with other relevant standards or recommendations.

3.0 SERVICE CONDITIONS

The service conditions shall be as follows:

- maximum altitude above sea level - 1,000m
- maximum ambient air temperature - 50° C
- maximum daily average ambient air temperature - 35° C
- minimum ambient air temperature - 5° C
- maximum temperature attainable by an object exposed to the sun - 60 ° C
- maximum yearly weighted average ambient temperature - 32° C
- maximum relative humidity - 100%
- average number of thunderstorm days per annum (isokeraunic level) - 70
- average number of rainy days per annum - 120
- average annual rainfall - 1500 mm

- maximum wind pressure - 260Kg / m²

Environmentally, the region where the equipment will be installed includes coastal areas, subject to high relative humidity, which can give rise to condensation. Onshore winds will frequently be salt laden. On occasions, the combination of salt and condensation may create pollution conditions for outdoor insulators.

Therefore, outdoor material and equipment shall be designed and protected for use in exposed, heavily polluted, salty, corrosive, tropical and humid coastal atmosphere.

4.0 SYSTEM CONDITIONS:

The equipment shall be suitable for installation in supply systems of the following characteristics.

Frequency		-50 Hz \pm 5%
Nominal system voltages	11 KV System	-11 KV
	LV System	- 433/250 V
Maximum system voltages	11 KV System	- 12 KV
	LV System	- 476 V
Minimum LV voltage	(NEC)	- 392 V
Nominal short circuit apparent power of 11 KV System		- 500 MVA (IS: 2026)
Insulation levels		
1.2/50 μ sec impulse withstand	11 KV System	- 75KV peak (IS:2026)
Power frequency one minute withstand (wet and dry)	11 KV System	- 28 KV (rms)
	LV System	- 3 KV (rms)
Neutral earthing arrangements:	LV System	- Solidly earthed

PART 2: TECHNICAL

SPECIFIC TECHNICAL REQUIREMENTS			
1		Rated KVA (ONAN rating)	500 KVA, 11/0.433 KV
2		No. of phases	3
3		Type of installation	Outdoor
4		Frequency	50 Hz (\pm 5%)
5		Cooling medium	Insulating Oil (ONAN)
6		Type of mounting	for 500 KVA on Wheels, Mounted on rails.

7		Rated voltage	
	a)	High voltage winding	11 KV
	b)	Low voltage winding	0.433 KV
8		Highest continuous system voltage	
	a)	Maximum system voltage ratio (HV/ LV)	12 KV / 0.476 KV
	b)	Rated voltage ratio (HV / LV)	11 KV / 0.433 KV
9		No. of windings	Two winding Transformers
10		Type of cooling	ONAN (Oil natural / Air natural)
11		KVA Rating corresponding to ONAN cooling system	100%
12		Method of connection:	
		HV:	Delta
		LV:	Star
13		Connection symbol	DYN 11
14		System earthing	Neutral of LV side to be solidly earthed.
15		Percentage impedance voltage on normal tap and KVA base at 750 C corresponding to HV/ LV rating and applicable tolerances (Negative tolerance will not be allowed):	% Impedance + Tolerance %
			5.0 + 10% (No Negative Tolerance)
16		Intended regular cyclic overloading of windings	As per IEC –76-1, Clause 4.2
17	a)	Anticipated unbalanced loading	Around 10%
	b)	Anticipated continuous loading of windings (HV / LV)	110 % of rated current
18	a)	Type of tap changer	Off-load tap changer
	b	Range of tapping	+ 2.5% to – 7.5%

)		in 5 equal steps of 2.5% each on HV winding
19		Neutral terminal to be brought out	On LV side only
20		Over Voltage operating capability and duration	112.5 % of rated voltage (continuous)
21		Maximum Flux Density in any part of the core and yoke at rated KVA, rated voltage i.e. 11 KV / 0.433 KV and system frequency of 50 HZ	1.5 Tesla
22		Insulation levels for windings :-	
	a)	1.2 / 50 microsecond wave shape Impulse withstand (KVP)	HV: 28 LV: N.A.
	b)	Power frequency voltage withstand (KV- rms)	HV: 28 LV: 03
23		Type of winding insulation	
	a)	HV winding	Uniform
	b)	LV winding	Uniform
24		Withstand time for three phase short circuit	2 Seconds
25		Noise level at rated voltage and frequency	As per NEMA Publication No. TR-1
26		Permissible Temperature Rise over ambient temperature of 50°C	
	a)	Of top oil measured by thermometer.	35°C
	b)	Of winding measured by resistance.	40°C
27		Minimum HV clearances in air (mm) :-	
	a)	Phase to Phase	280
	b)	Phase to ground	140
28		Terminals	

	a)	HV winding line end	12 KV oil filled porcelain communicating type of bushings (Antifog type)
	b)	LV winding	0.433 KV porcelain type of bushings (Antifog type)
29		Insulation level of bushing	HV LV
	a)	Lightning Impulse withstand (KVP)	75 Not applicable
	b)	1 Minute Power Frequency withstand voltage (KV –rms)	28 3
	c)	Creepage distance (mm) (minimum)	25 mm/ KV
30		Material of HV & LV Conductor	Electrolytic Copper for 500 KVA
31		Maximum current density for HV and LV winding for rated current	1.4 Amp/ mm ² for Aluminum windings and 2.4 Amp/ mm ² for Copper windings.
32		Polarisation index i.e ratio of megger values at 600 sec. to 60 sec for HV to earth, L.V to earth and HV to LV.	Shall be greater than or equal to 1.5, but less than or equal to '5'.
33		Core Assembly	Boltless type
34		Maximum permissible No Load and Load Losses (Watts)	500 KVA
	a)	No Load Losses at rated voltage and rated frequency	- 950
	b)	Load Losses at rated current and at 750 C	- 6500

5.0 TYPE OF TRANSFORMER

The transformers shall be of core type construction, double wound, three phase, oil immersed, 11/0.433KV, 50 Hz with natural oil and air cooling (ONAN) to be used as step down transformers for outdoor use. The design of the tank, fittings, bushings, etc shall be such that it will not be necessary to keep the transformer energized to prevent deterioration as the transformers may be held in reserve, outdoors, for many years.

6.0 PERFORMANCE , CAPACITY AND SHORT CIRCUIT RATINGS

The following ratings are covered under this specification

- 500 KVA, 11/0.433 KV, Copper wound

The transformer shall be capable of supplying a continuous load equal to its KVA rating, under the following conditions:

- continuous steady load;
- design at maximum ambient air temperature of 50°C;
- 40°C average winding temperature rise and 35°C top oil temperature rise for conventional breathing transformers.

The transformer may be overloaded during emergency up to 150% of its continuous rating in accordance with IEC Publication 354 or IS: 6600. Bushings and other current-carrying parts shall also be designed for this condition.

The transformer shall be capable of withstanding for two seconds without damage to any external short circuit, with the short circuit MVA available at the terminals of either winding with rated voltage on the other winding. If short circuit tests have been carried out on the particular design of transformer offered, the test results shall be supplied with the bid.

The thermal ability to withstand short circuit shall be demonstrated by calculation.

The transformer shall be capable of withstanding the thermal and dynamic effects of short circuits, as specified in IEC 76-5 or IS: 2026: Ability to withstand short circuits.

The maximum flux density in any part of the core and yoke at rated KVA, Voltage and frequency shall not exceed 1.5 Tesla.

7.0 VOLTAGE RATIO & TAPPING RANGE

The transformers shall have the following ratio:-

- the nominal voltage ratio shall be 11,000/ 433 V for 500 KVA transformers;
- Tolerance on the voltage ratio shall be $\pm 0.5\%$.
- For transformers of ratings 500 KVA, 11/0.433 KV, Taps shall be provided on the H.V. Windings for voltage variation from tap-1 (+2.5%) to tap-5 (- 7.5%) in equal steps of 2.5 %. Tap No-2 shall be the principal (normal) tap.

The bidder shall state in the technical schedule, the percentage regulation at full load, power factor 1.0 and at full load, power factor 0.8 lagging.

Transformers shall be suitable for parallel operation with each other.

8.0 PERCENTAGE IMPEDANCE

The Percentage of Impedance at 75°C shall be 5% for 500 KVA transformer with positive tolerance of 10%. No negative tolerance on percentage Impedance is allowed.

9.0 LOSSES

The No Load and Load Losses shall not exceed the values given below:-

KVA Rating	Maximum No Load loss in Watts	Maximum Full Load loss in Watts at 75°C.
500 KVA	950	6500

The above losses are maximum allowable and there should not be any positive tolerance.

The offered transformer(s) should have been type-tested at CPRI/ National Govt. approved laboratory. The bid shall be accompanied with type-test reports (short circuit test and Impulse test) conducted at Central Power Research Institute / National Govt. approved laboratory for the offered transformers within five years from date of tender. The short circuit test report(s) must contain the measured no load loss and load loss, determined by CPRI/ National Govt. approved laboratory.

In case of any doubts, <EMPLOYER> reserves the right to verify the original type test reports of CPRI/ National Govt. approved Laboratory or ask the supplier to conduct the type tests at CPRI/ National Govt. approved Laboratory at his (supplier's) cost for re-confirmation of the test results particularly no load losses, load losses and percentage impedance. Bids without type test reports shall not be considered for evaluation.

If the bidder quotes lower values of losses than the CPRI's measured losses, he has to prove the same by conducting the Impulse & short Circuit tests at CPRI/ National Govt. approved laboratory along with measurement of no load losses and load losses at his own cost in presence of EMPLOYER's authorized representative without any financial liability to EMPLOYER.

However, if the loss figures will exceed the stipulated values as per specification, the transformer(s) shall be out rightly rejected.

10.0 VECTOR GROUP

The transformers shall be connected delta-star, in accordance with vector group reference Dyn11 of IEC - 76/ IS - 2026.

The LV neutral shall be brought out to a terminal bushing, which shall be identical to the phase bushings in all respects.

11.0 LOSSES AND CAPITALISATION

Transformers would be out rightly rejected if losses exceed the values indicated at clause-10 above.

12.0 FLUX DENSITY

The flux density at rated voltage & rated frequency shall not exceed. 1.50 Tesla. The transformer must be capable of operating at 10% over voltage and at frequency of 48.5 Hz without saturation.

13.0 INSULATION LEVELS

The insulation levels as defined in IEC 76-C/ IS: 2026 Insulation levels and dielectric test shall apply as per Table.

	HV Winding	LV Winding
Basic Impulse voltage Level (KVp) (1.2/50 micro. sec. Wave)	75	Not Applicable
Power Frequency voltage withstand level, Wet and Dry (KV)	28	3

14.0 NOISE LEVEL

The average noise level of the transformers shall not exceed 51db. The measurement shall be carried out in accordance with IEC 551 at a distance of 300mm from the envelope of the transformer.

15.0 RADIO INFLUENCE VOLTAGE

The maximum radio influence voltage shall be 250 μ V, measured as specified in IEC 437.

16.0 CORE AND WINDINGS

Core

- Stage level inspection for core construction shall be carried out by the Employer.
- Each lamination shall be insulated such that it will not deteriorate due to mechanical pressure and the action of hot transformer oil.
- The core shall be constructed from high grade, non-ageing, Cold Rolled Grain Oriented silicon steel laminations (CRGO or M3 or better) only. No other core materials shall be entertained. Bidders are requested to note that only PRIME CORE materials are to be used. In no case, second grade core material is to be used. The bids should contain copies of invoices towards purchase of core laminations along with test certificates and curves of specific core loss of the laminations proposed to be used.

The purchaser at his discretion, may select samples from the core laminations and get the same tested in CPRI/ Approved National Govt. Laboratory to prove the quality of the core material.

- For the above purpose, the supplier shall have to offer every batch of core laminations received from his Sub-Vendor along with Invoice of the sub-vendor, Mills test certificate, packing list, Bill of lading, Bill of entry certificate to customs etc. towards proof of prime core materials for verification by the Purchaser's representative without any cost to the Purchaser. Besides, the Contractor must mention in his bid about the type of CRGO lamination to be utilized for the offered transformers along with a copy of the specific core loss curve at different flux densities.
- Core materials should be directly procured either from the manufacturer or through their accredited marketing organization of repute, but not through any agent. The core and winding shall be capable of withstanding shocks during transport, installation and service. Provision shall be made to prevent movement of the core and windings relative to the tank during these conditions and also during short circuits.
- The design shall avoid the presence of pockets which would prevent the complete emptying of the tank through the drain valve. The core material offered in the tender to be checked for its correctness before core coil assembly. For this, the tenderer must ask for core and coil inspection before its tanking.
- The laminations shall be free of all burrs and sharp projections. Each sheet shall have an insulating coating resistant to the action of hot oil.

- The insulation structure for the core to bolts and core to clamp plates, shall be such as to withstand 2000 V DC voltage for one minute.
- The completed core and coil shall be so assembled that the axis and the plane of the outer surface of the core assemble shall not deviate from the vertical plane by more than 25mm.
- All steel sections used for supporting the core shall be thoroughly shot or sand blasted, after cutting, drilling and welding.
- The finally assembled core with all the clamping structures shall be free from deformation and shall not vibrate during operation.
- The core clamping structure shall be designed to minimize eddy current loss.
- The framework and clamping arrangements shall be securely earthed.
- The core shall be carefully assembled and rigidly clamped to ensure adequate mechanical strength.
- Oil ducts shall be provided, where necessary, to ensure adequate cooling inside the core. The welding structure and major insulation shall not obstruct the free flow of oil through such ducts.
- The design of magnetic circuit shall be such as to avoid static discharges, development of short circuit paths within itself or to the earth clamping structure and production of flux component at right angle to the plane of the lamination, which may cause local heating. The supporting framework of the cores shall be so designed as to avoid the presence of pockets, which would prevent complete emptying of the tank through the drain valve or cause trapping of air during filling.
- The construction is to be of boltless core type. The core shall be provided with lugs suitable for lifting the complete core and coil assembly. The core and coil assembly shall be so fixed in the tank that shifting will not occur during transport or short circuits.

INTERNAL EARTHING

- All internal metal parts of the transformer, with the exception of individual laminations and their individual clamping plates shall be earthed.
- The top clamping structure shall be connected to the tank by a copper strap. The bottom clamping structure shall be earthed by one or more the following methods:
 - a) By connection through vertical tie-rods to the top structure.
 - b) By direct metal to metal contact with the tank base.
 - c) By a connection to the structure on the same side of the core as the main earth connection to the tank.
- The magnetic circuit shall be connected to the clamping structure at one point only and this shall be brought out of the top cover of the transformer tank through a suitably rated insulator. A disconnecting link shall be provided on transformer tank to facilitate disconnections from ground for IR measurement purpose.
- Coil clamping rings of metal at earth potential shall be connected to the adjacent core clamping structure on the same side as the main earth connections.

Windings

- Winding shall be subjected to a shrinking and seasoning process, so that no further shrinkage occurs during service. Adjustable devices shall be provided for taking up possible shrinkage in service.
- All low voltage windings for use in the circular coil concentric winding shall be wound on a performed insulating cylinder for mechanical protection of the winding in handling and placing around the core.
- Winding shall not contain sharp bends which might damage the insulation or produce high dielectric stresses. No strip conductor wound on edge shall have width exceeding six times the thickness.
- The winding insulation shall be free from insulating compounds which are liable to soften, ooze out, shrink or collapse. It shall be non catalytic and chemically inert in hot transformer oil during normal service.
- The stacks of windings are to receive adequate shrinkage treatment.
- The windings and connections are to be braced to withstand shocks during transport, switching, short circuit or other transient conditions.
- Permanent current carrying joints in the windings and leads shall be welded or brazed. Clamping bolts for current carrying parts inside oil shall be made of oil resistant material which shall not be affected by acidity in the oil steel bolts, if used, shall be suitably treated.
- Terminals of all windings shall be brought out of the tank through bushings for external connections.
- The windings shall be uniformly insulated and the L.V neutral points shall be insulated for full voltage.
- The completed core and coil assemble shall be dried in vacuum at not more than 0.5mm of mercury absolute pressure and shall be immediately impregnated with oil after the drying process to ensure the elimination of air and moisture within the insulation. Vacuum may be applied in either vacuum over or in the transformer tank.
- The winding shall be so designed that all coil assemblies of identical voltage ratings shall be interchangeable and field repairs to the winding can be made readily without special equipment. The coils shall have high dielectric strength.
- Coils shall be made of continuous smooth high grade electrolytic copper or aluminium conductor shaped and braced to provide for expansion and contraction due to temperature changes.
- Adequate barriers shall be provided between coils and core and between high and low voltage coil. End turn shall have additional protection against abnormal line disturbances
- The insulation of winding shall be designed to withstand voltage stress arising from surge in transmission lines due to atmospheric or transient conditions caused by switching etc
- Tapping shall not be brought out from inside the coil or from intermediate turns and shall be so arranged as to preserve as far as possible magnetic balance of transformer at all voltage ratios.

- Magnitude of impulse surges transferred from HV to LV windings by electromagnetic induction and capacitance coupling shall be limited to BIL of LV winding.
- The winding conductor shall be of Al. up to 250 KVA transformers and copper for 500 KVA Transformers. The current density shall not exceed 1.4 Amp/ mm² for aluminium and 2.4 Amp/ mm² for copper at normal full load current.

17.0 BUSHINGS AND TERMINATIONS

Bushings

- Bushings shall be of the outdoor type and easily replaceable. Cemented in types will not be accepted. They shall be sufficiently robust to withstand normal transport and erection hazards and shall conform to IEC 137 /IS 3347 and 2099.
- All bushings shall have a minimum creepage distance of 25 mm /KV and shall have a continuous rating of 200% of the transformer rating. The protected creepage distance shall not be less than 50% of the total.

The following minimum 11 KV clearance shall be provided:

	External (Air) for 11 KV
Phase to phase	280 mm
Phase to earth	140 mm

- The 11 KV bushings of transformers shall be provided with a bi-metallic terminal connector or suitable device to receive 55 –100 mm² AAAC or ACSR conductor directly without any bimetallic action.
- The secondary bushings of transformers shall be fitted with non ferrous threaded terminals. With the exception of brass the terminals shall be protected from atmospheric deterioration by suitable tinning or by some other approved coating.
- The terminals are to be supplied with one 16mm bolt, one conic spring washer, one matching flat washer, one nut and one lock nut for each hole in the terminal plate.
- HV Bushing stud shall be not less than 12 mm dia for 250KVA & 500KVA with HV side terminal connectors & LV Bushing stud shall be not less than 32 mm dia for 500KVA & 20 mm dia for 250KVA with Palm terminal connectors (For LV studs)

Bushing Labels

- The HV bushings shall be labeled U, V and W and the LV bushing u, v, w and n. Marking letters shall be at least 12 mm high. The means of marking shall be either,
 - ❖ engraved metal plate; or

- ❖ etched anodized aluminum.

Phase identification by adhesive stickers shall not be acceptable.

- If labeling is to be carried out on the tank, it is preferred that one plate be used rather than individual markings for each phase, in order to prevent incorrect phase markings. Labels shall conform to the requirements of the section on labels in this specification.

Earthing Terminals

All transformers shall be provided with two earthing terminals conforming to relevant Standards and M12 ISO metric bolt and nut which shall be non ferrous. It shall include a spring washer and lock washer.

18.0 LIGHTNING ARRESTORS

9 KV, 5KA metal oxide lightning arresters of reputed make conforming to IS-3070 Part- III, one number per phase shall be provided.(Under the HV bushing with GI earth strip 25x4 mm connected to the body of the transformer with robust clamping arrangement). Lightening arrestors with polymer insulators in conformance with relevant IEC can also be used.

19.0 TANK FABRICATION

All transformer sizes, the tank shall be of bolted type construction in accordance with IS 1180 (Part 2).

- The tank shall be at atmospheric pressure at an internal temperature of 100 C;
- The tank shall be designed for an internal pressure of 100 Kg/ m² at 50⁰ C ambient conditions. It shall be capable of withstanding an unlimited number of 24 hours cyclic variations of internal pressure from atmospheric to this value.
- The tenderer shall state the top oil temperature at which the tank internal pressure shall reach the value of 100 kN/ m² and the value of steady load which will result in this top oil temperature with an ambient temperature of 45⁰ C.
- Adequate space shall be provided at the bottom of the tank for collection of sediments.

Transformer tanks of all types shall be designed so that the completed transformer can be lifted and transported without permanent deformation or oil leakage. Stiffeners provided on all the four side walls for rigidity should be so designed that there is no accumulation of water.

The Tank shall be of rectangular shape with round edges fabricated from tested quality mild steel plates with minimum thickness of 3.15 mm. for the side walls while top cover and the bottom plate of the tank shall have a minimum thickness of 5 mm. The transformer tank and the top cover shall be designed in such a manner as to leave no external pockets in which water can log, or any internal pocket where air/ gas can accumulate.

All sealing washers / gaskets shall be made of oil and heat resistant neoprene rubber or neoprene bonded cork seals suitable for temperature as stipulated in this specification. Surfaces at gasketed joints shall be such that an even face is presented to gasket, thereby eliminating the necessity for the gasket to take up surface irregularities.

All pipes, radiators, stiffeners or corrugations which are welded to the tank wall shall be welded externally and shall be double welded wherever possible. All welds shall be stress relieved.

The transformer tank shall be complete with all accessories, lifting lugs etc. and shall be designed to allow the complete transformer filled with oil to be lifted by crane or jacks without risk of any damage and can be transported by Rail/ Road without straining any joints and without causing any leakage of oil.

20.0 PRESSURE RELIEF DEVICE

Transformers shall be fitted with a pressure relief device in the form of explosion vent. The tenderer shall state the pressure at which it is designed to operate.

21.0 OIL LEVEL GAUGE

A suitable oil level gauge (Magnetic type) shall be fitted on the transformers and so located that it can be easily read from ground level. The gauge fitted with the conservator shall be graduated for temperatures of 5⁰ C, 30⁰ C and +98⁰ C.

22.0 CONSERVATORS AND BREATHERS

All the transformers shall be provided with a conservator tank.

The conservator tank shall be so designed and located as to eliminate any trapping of air in the transformer or pipe work. It shall be inclined at an angle of about 5 degrees to the horizontal towards the drain plug and the pipe connecting the main tank to the conservator should project about 20 mm above the bottom of the conservator so as to create a sump for the collection of impurities. Minimum oil level corresponding to 50 C shall be well above the sump level.

All transformers shall be fitted with a silica gel breather of weatherproof design at a convenient height with oil seal at the bottom, draw in plug and filling holes with covers to isolate the silica gel from the atmosphere. The breather pipe should be connected at top of the conservator tank with two bends at right angles. The cover of the main tank and bushings turrets shall be provided with air release plug to enable the trapped air to be released.

23.0 FITTINGS AND ACCESSORIES

The following standard fittings and accessories shall be provided:

- rating, diagram and terminal marking plate.
- two earthing terminals .
- lifting lugs/ platform lugs.
- pressure relief device in form of explosion vent.
- silica gel breather. (1 Kg for 500KVA)
- filling and drain / sampling plugs (A single drain / filling plug shall consist of a 20 mm pipe inside the transformer tank, starting from the bottom and projecting to the top cover with a hermetically sealed / welded plug).
- a magnetic or prismatic oil level gauge for all transformers indicating three position of oil i.e. minimum. 5 °C, 30 °C and 98 °C.
- A thermometer pocket with thermometer with screwed top to prevent ingress of water or leakage oil.
- Inlet valve having p-30 mm thread (with cover) on the transformers body/ conservator.
- Drain valve 12 mm size for draining the conservator oil with locking arrangement.
- Top filter valve (25 mm with adopter for 16 mm hole) with plug.
- Bottom filter valve with drain Plug.
- Air release plugs at transformer top cover, bushing turrets etc.
- Lightning Arresters (LA) for HT bushing.
- Set of Radiators.
- Conservator Tank.

Bi-metallic terminals on the bushings for connection with over head ACSR/ AAAC conductor (For HV & LV).

The Specification and brief details of the salient features of these terminals should be stated.

The fittings, tap-changer for 250 KVA and 500 KVA Transformers, accessories and sizes listed are indicative only and any other fittings and accessories which are generally required for satisfactory operation of the transformer are to be provided without any extra cost.

24.0 TAP CHANGING ARRANGEMENTS

Off - load tap changing mechanism for 250 KVA & 500 KVA, 11/0.433 KV Transformers shall have the following characteristics:-

- Tap changing shall be carried out with the transformers in off circuit.
- Tap positions shall be numbered as follows:

Tap No. - 1	Tap No. - 2	Tap No. - 3	Tap No. - 4	Tap No. - 5
+ 2.5 %	Principal/ Normal tap	- 2.5 %	- 5 %	- 7.5 %

- Provision shall be made for locking of the tap switch handled by using a pad-lock with 6 mm diameter hasp.
- Tap-changing handles shall be fitted with gasketed covers, so that sealing of the transformers under normal condition is independent of the switch shaft gland.

25.0 TRANSFORMER OIL

The transformers shall be supplied complete with first filling of transformer oil and 10% extra. The quantity of oil required for the first filling of the transformer and its full specification shall be stated in the bid. The complete first filling shall be of new oil free from inhibitors and additives. The bidder shall quote the price of transformer complete with first filling of oil plus 10% extra. However, the rate of transformer oil in Rupees per litre shall be quoted separately also. The transformer oil shall be supplied in non-returnable drums.

The insulating oil for the transformer shall be of EHV grade, generally conforming to IEC: 296/ BS: 148/ REC: 39/ 1993 or latest version of IS: 335/ 1983 whichever is more stringent. No inhibitors shall be used in the oil. The dielectric strength of the oil shall not be less than 60 KV at 2.5 mm. gap when tested in accordance with IS: 6792/ 1972. If an anti-oxidant inhibitor is recommended, its use shall be subject to the purchaser's approval.

The design and materials used in the construction of the transformer shall be such as to reduce the risk of the development of acidity in the oil.

The Contractor shall warrant that oil furnished is in accordance with the following specifications.

S. No	Characteristic	Requirement	Method of Test
1	Appearance	The oil shall be clear & transparent & free from suspended matter or sediment	A representative sample of oil shall be examined in a 100 mm thick layer at ambient temp.
2	Density at 200C	0.89 g/cm ³ Max.	IS:1448
3	Kinematic Viscosity at 27 deg. C Max	27 CST	IS:1448
4	Interfacial tension at 27deg.C Min.	0.03 N/m	IS:6104
5	Flash Point	136 0C	IS:1448
6	Pour Point Max.	-6 0C	IS:1448
7	Neutralisation Value (Total Acidity) Max.	0.03 mg KOH/gm	IS:335
8	Electric strength Breakdown (voltage) Min.	72.5 KV	IS:6792

9	Dielectric dissipation factor tan delta at 900 C	0.03 Max	IS:6262
10	Min specific resistance(resistivity) at 90 deg.C	35X10 ¹² ohm cm (min.)	IS:6103
11	Oxidation stability		
12	Neutralization value after oxidation	0.40mg KOH/g	
13	Total sludge after oxidation	0.10% by weight max.	
14	Presence of oxidation Inhibitor	The oil shall not contain anti-oxidant Additives.	IS:335
15	Water content Max:	Less than 25ppm	IS:2362

26.0 RATING AND CONNECTION PLATE

Each transformer shall be provided with a rating plate of weatherproof material showing the following items indelibly marked:

- type of transformer
- standard to which it is manufactured (preferably IEC 76)
- manufacturer's name
- transformer serial number
- year of manufacture
- rated frequency in Hz (50)
- rated voltages in KV (11/0.433)
- number of phases (3)
- rated power in KVA
- type of cooling (ONAN)
- rated currents in A
- vector group symbol (Dyn11)
- 1.2/50 μ s wave impulse voltage withstand level in KVp
- power frequency withstand voltage in KV
- impedance voltage at rated current and frequency in percentage at 75°C at normal tap
- Measured load loss in KW at rated current and at 75°C at normal tap
- Measured no-load loss in KW at rated voltage and rated frequency
- continuous ambient temperature at which ratings apply in 0C
- top oil and winding temperature rise at rated load in 0C
- winding connection diagram
- total weight in kg with complete oil filled.

- total weight of the transformer without oil
- volume of oil in litres.
- weight of core and windings in kg; and
- name of the purchaser (<EMPLOYER>)

The rating plate shall conform to the requirements of the section of Labels in this specification.

27.0 BASE MOUNTING ARRANGEMENT

The under base of all transformers of 460 mm long with holes of 14 mm dia at a centre to centre distance of 415 mm to make them suitable for fixing on a platform or plinth. 500 KVA transformers shall be provided with bi-directional flat rollers, suitable for use on a 1000 mm gauge track.

28.0 PAINTING

All paints shall be applied in accordance with the paint manufacturer's recommendations.

Particular attention shall be paid to the following:

- a) Proper storage to avoid exposure as well as extremes of temperature.
- b) Surface preparation prior to painting.
- c) Mixing and thinning
- d) Application of paints and the recommended limit on time intervals between coats.
- e) Shelf life for storage.

All paints, when applied in normal full coat, shall be free from runs, sags, wrinkles, patchiness, brush marks or other defects.

All primers shall be well marked into the surface, particularly in areas where painting is evident, and the first priming coat shall be applied as soon as possible after cleaning. The paint shall be applied by airless spray according to the manufacturer's recommendations. However, wherever airless spray is not possible, conventional spray be used with prior approval of purchaser.

The supplier shall, prior to painting protect nameplates, lettering gauges, sight glasses, light fittings and similar such items.

Cleaning and Surface Preparation

- After all machining, forming and welding has been completed, all steel work surfaces shall be thoroughly cleaned of rust, scale, welding slag or spatter and other contamination prior to any painting.
- Steel surfaces shall be prepared by Sand/Shot blast cleaning or chemical cleaning by seven tank process including Phosphating to the appropriate quality.
- The pressure and Volume of the compressed air supply for the blast cleaning shall meet the work requirements and shall be sufficiently free from all water contamination prior to any painting.

- Chipping, scraping and steel wire brushing using manual or power driven tools cannot remove firmly adherent mill-scale and shall only be used where blast cleaning is impractical

Protective Coating

- As soon as all items have been cleaned and within four hours of the subsequent drying, they shall be given suitable anticorrosion protection.

Paint Material

Followings are the type of paints that may be suitably used for the items to be painted at shop and supply of matching paint to site:

- i) Heat resistant paint (Hot oil proof) for inside surface.
- ii) For external surfaces one coat of Thermo Setting Paint or 2 coats of Zinc chromate followed by 2 coats of Synthetic Enamel paint. The color of the finishing coats shall be dark admiral grey conforming to No.632 or IS 5:1961.

Painting Procedure

- All painting shall be carried out in conformity with both specifications and with the paint manufacture's recommendations. All paints in any one particular system. Whether shop or site applied, shall originate from one paint manufacturer.
- Particular attention shall be paid to the manufacturer's instructions on storage, mixing, thinning and pot life. The paint shall only be applied in the manner detailed by the manufacturer e.g. brush, roller, conventional or airless spray and shall be applied under the manufacturer's recommended conditions. Minimum and maximum time intervals between coats shall be closely followed.
- All prepared steel surfaces should be primed before visible re-rusting occurs or within 4 hours whichever is sooner. Chemical treated steel surfaces shall be primed as soon as the surface is dry and while the surface is warm.
- Where the quality of film is impaired by excess film thickness,(wrinkling, mud cracking or general softness) the supplier shall remove the unsatisfactory paint coatings and apply another. As a general rule, dry film thickness should not exceed the specified minimum dry film thickness by more than 25%. In all instances, where two or more coats of the same paints are specified, such coatings may or may not be of contrasting colors.
- Paint applied to items that are not be painted, shall be removed at supplier's expense, leaving the surface clean, un-stained and undamaged.

Damages to Paints Work

Any damage occurring to any part of the painting scheme shall be made good to the same standard of corrosion protection and appearance as that originally employed. Any damaged paint work shall be made as follows:

a) The damaged area, together with an area extending 25mm around its boundary, shall be cleaned down to bare metal.

b) A priming coat shall immediately applied, followed by a full paint finish equal to that originally applied and extending 50mm around the perimeter of the originally damaged.

The repainted surface shall present a smooth surface. This shall be obtained by carefully chamfering the paint edges before & after priming.

Dry Film Thickness

To the maximum extent practicable, the coats shall be applied as a continuous film of uniform thickness and free of pores. Over-spray, skips, runs, sags and drips should be avoided. The different coats may or may not be same color.

Each coat of paint shall be allowed to harden before the next is applied as per manufacture's recommendations. Particular attention must be paid to full film thickness at edges.

The requirement for the dry film thickness (DFT) of paint and the material to be used shall be as given below:

Sl. No	Paint Type	Area to be painted	No of Coats	Total Dry film thickness(Min)
1	Powder Paint (2) Thermo setting powder	Inside outside	01 01	20 Micron 60 Micron
2	Liquid paint a) Zinc Chromate(Primer) b) Syenthetic Enamel(Finish Coat) c) Hot Oil paint	Outside Outside inside	02 02 01	45 micron 35 micron 35 micron

29.0 SEALING GASKETS

All sealing washers / gaskets shall be made of oil and heat-resistant Nitrile/ Neoprene rubber/ synthetic rubber bonded cork type RC-70C gaskets. Gaskets made of natural rubber or cork sheet are not permissible.

30.0 SUPPRESSION OF HARMONICS

The transformer shall be designed with attention to the suppression of harmonic voltage, especially the third and fifth.

31.0 GUARANTEE:

The manufacturers of the transformer shall provide a guarantee of 60 months from the date of date of commissioning. In case the Distribution transformer fails within the guarantee period the purchaser will immediately inform the supplier who shall take back the failed DT within 15 days from the date of the intimation at his own cost and replace/repair the transformer within forty five days of date of intimation with a roll over guarantee.

The outage period i.e. period from the date of failure till unit is repaired/ replaced shall not be counted for arriving at the guarantee period.

In the event of the supplier's inability to adhere to the aforesaid provisions, suitable penal action will be taken against the supplier which may inter alia include blacklisting of the firm for future business with the purchaser for a certain period.

32.0 TESTS

Routine Tests

Routine tests shall be carried out on all transformers and the tests shall be conducted in accordance with relevant National/ International Standards. No sampling is allowed. In addition, tank tests in accordance with IS:1180 shall be carried out.

The following routine measurements and tests shall be carried out in presence of Purchaser's authorized representative(s):

- a) Measurement of winding resistance. (For 500 KVA at all tap positions)
- b) Voltage ratio measurement and check of polarity and vector group. Bushing positions shall have permanent markings at this stage of production;
- c) Measurement of impedance voltages/ short circuit impedance at rated current and frequency (for 500 KVA transformers at normal, highest and lowest tap positions)
- d) Measurement of load loss at half load & full load at 75°C; (for 500 KVA transformers at normal, highest and lowest tap positions)
- e) Measurement of neutral unbalance current;
- f) Temperature rise test on one transformer of each rating and measurement of hot resistance.
- g) Measurement of no-load loss and no-load currents at 50%, 75%, 90%, 100%, 110%, 115%, and 120% of rated voltages on one transformer of each rating; (For unit transformer of each Lot)
- h) Induced over voltage withstand test at 22KV for 60 sec on the HV windings;
- i) Power frequency voltage withstand tests on HV and LV windings;
- j) Magnetic balance test
- k) Polarization Index test P.I. value shall be not less than 1.5. $P.I. = IR \text{ at } 600 \text{ sec} / IR \text{ at } 60 \text{ sec}.$
- l) Oil leakage test : The criterion of leakage shall be discoloration by oil of whitewash applied externally to suspected parts at an oil temperature of 90°C or other method, as approved by the Purchaser;
- m) Pressure test on transformer tank on one unit for each rating. Bushings and oil shall be subject to the following routine tests.
- n) Bushing routine test: in accordance with IEC 137/IS 3347;

o) Oil dielectric and moisture content test: conforming to IEC 156 or IS 335. Routine test certificates shall include in addition to the test results, the purchaser's order number, the transformer serial number, outline drawing number and transformer KVA rating.

Any other applicable tests shall be conducted at the discretion of the Purchaser without any extra cost to purchaser.

Type Tests

- The measurements and tests should be carried out in accordance with the standard specified in each case as indicated in the following table if the same tests were not conducted earlier at CPRI or any Govt. approved Laboratory on the transformers of the offered design.

Type Test	Standard
Temperature Rise Test	IEC 76/IS 2026
Impulse Voltage Withstand Test, including Full Waves and Chopped Waves as listed below	IEC 76/IS 2026
Noise Level Measurement	IEC 551
Short Circuit Test	IEC 76 / IS 2026

In accordance with IEC 76-3 the following sequence of impulses should have been/ should be applied;

- one full wave at 50% BIL;
- one full wave at 100% BIL;
- one chopped wave at 50% BIL;
- two chopped waves at 100% BIL and
- two full waves at 100% BIL.
- If the type test report(s) submitted by the bidder do not fulfil the criteria, as stipulated in this technical specification/ Bidder's offer, the relevant type test(s) has/ have to be conducted by the Bidder at his own cost in CPRI/ National Govt. approved laboratory in the presence of EMPLOYER's representative(s) without any financial liability to EMPLOYER, in the event of order placed on him.
- Even if the Type test report(s) confirm(s) the Purchaser's specification, the Purchaser at his discretion may ask the Supplier to repeat any or all specified type tests at CPRI/ National Govt. approved laboratory on sample(s), selected at random by the purchaser's representative(s) out of the offered quantity (first lot i.e. minimum one third of the total ordered quantity). The type test(s) are to be test-witnessed by the Purchaser's representative(s). For such type of repetition of type tests, the Bidder may quote Type Test Charges in the enclosed Price Schedule or conduct the tests free of cost.
- The supplier shall furnish calculations in accordance with IS: 2026 to demonstrate the Thermal ability of the transformers to withstand Short Circuit forces.

TEST VOLTAGE

Transformers shall be capable of withstanding the Power frequency and Impulse test voltage as described below:

Nominal system voltage	Highest System voltage	Impulse Test voltage	Power frequency test voltage
433 V (rms)			3 KV (rms)
11 KV (rms)	12 KV (rms)	75 KV (Peak)	29 V (rms)

13.15. — Installation, Testing & Commissioning of 3-phase outdoor Switched Capacitor Bank

—Scope:

1.1 This specification covers design & supply of ~~1.98 & 3.96 MVAR (Employer may include the requirements as per its need)~~ capacitor bank along with all required equipments to be installed in 33kV sub stations. The capacitor bank shall consist of capacitor bank, circuit breaker, Series Reactor, control & relay panel, isolators, LAs, CTs and NCT, conductor, all type of necessary connectors along with suitable mounting structure. All these equipment shall have suitable terminal/equipment connectors as detailed in Technical specification.

1.2 The equipments to be supplied against this specification are required for vital installations where continuity of service is very important. The design, materials and manufacture of the equipment shall, therefore, be of the highest order to ensure continuous and trouble-free service over the years

1.3 The equipment offered shall be complete with all parts necessary for their effective and trouble-free operation. Such parts will be deemed to be within the scope of the supply irrespective of whether they are specifically indicated in the commercial order or not.

1.4 Configuration: The major equipments involved for each mechanically switched shunt capacitor bank are as follows:

1. 12.65 kV, 1980 kVAr(or any other rating as defined by Employer), 3-Phase, 50 C/s housed in Outdoor Type CRCA Panel, Capacitor bank having two variable step of 792 Kvar& one Variable steps of 396 kVAr. Bank shall be complete with Capacitor units of 264/132 kVAr, Aluminium busbars, Pin & Post insulators, HRC fuses, Surge arrester etc. with details as follows (1) 11 kV, Aluminium Wound, Dry type Series reactors a) 0.52 kVAr for 792 kVAr step—6 Nos., b) 0.25 kVAr for 396 kVAr step—3 Nos. (2) 11 kV, 3-Phase Dry Type RVT—1 No. (3) 12 kV 3 Phase Indoor type metal enclosed Vacuum Capacitor switches. — 3 Nos. (4) Indoor Type Automatic Control Unit—1 No.(5) IP 55 , Outdoor CRCA cubicle Panel for accommodating capacitors, Series Reactor, Vacuum contactor, Surge arrester & Fuses

2. 12.65 kV, 3960 kVAr, 3-Phase, 50 C/s housed in Outdoor Type CRCA Panel, Capacitor bank having two variable step of 792 Kvar& two Variable steps of 1188 kVAr. Bank shall be complete with Capacitor units of 396/264 kVAr, Aluminium busbars, Pin & Post insulators, HRC fuses, Surge arrester etc.with details as follows-

(1) 11 kV, Aluminium Wound, Dry type Series reactors

a) 0.52 kVAr for 792 kVAr step—6 Nos.,

b) 0.8 kVAr for 1188 kVAr step—6 Nos.

- ~~(2) 11 kV, 3-Phase Dry Type RVT – 1 No.~~
- ~~(3) 12 kV 3 Phase Indoor type metal enclosed Vacuum Capacitor switches. – 4 Nos.~~
- ~~(4) Indoor Type Automatic Control Unit – 1 No.(5) IP 55 , Outdoor CRCA cubicle Panel for accommodating capacitors, Series Reactor, Vacuum contactor, Surge arrester & Fuses etc~~

~~3. 11 kV Circuit Breaker-~~

~~4. 11 kV Isolator with earth blade-~~

~~5 11 kV lightning Arrestors-~~

~~6. 11 kV Current Transformer~~

~~7. 11 kV Neutral current transformer-~~

~~8. 11 kV Single phase Current Limiting Reactors-~~

~~9. Control & Protection Equipment-~~

~~1.5. It is not the intent to specify herein complete details of design and construction. The equipment offered shall conform to the relevant standards and be of high quality, sturdy, robust and of good design and workmanship complete in all respects and capable to perform continuous and satisfactory operations in the actual service conditions at site and shall have sufficiently long life in service as per statutory requirements. The dimensional drawings attached with this specification and the notes thereto are generally of illustrative nature. In actual practice, notwithstanding any anomalies, discrepancies, omissions, in completeness, etc. in these specifications and attached drawings, the design and constructional aspects, including materials and dimensions, will be subject to good engineering practice in conformity with the required quality of the product, and to such tolerances, allowances and requirements for clearances etc. as are necessary by virtue of various stipulations in that respect in the relevant Indian Standards, IEC standards, I.E. Rules, I.E. Act and other statutory provisions.~~

~~1.6 The Tenderer/supplier shall bind himself to abide by these considerations to the entire satisfaction of the purchaser and will be required to adjust such details at no extra cost to the purchaser over and above the tendered rates and prices.~~

~~1.7 The tenderer shall furnish in his offer a list of recommended spares with unit rates for each set of equipment that may be necessary for satisfactory operation and maintenance of circuit breaker and Isolators for a period of 10 years. The purchaser reserves right of selection of items and quantities of these spares to be ordered. The cost of such spares shall not be considered for tender evaluation.~~

~~1.8 The tenderer shall submit a list and unit rates of all the special tools, equipment and instruments required for erection, testing, commissioning and maintenance of the equipment. The purchaser shall decide the quantity of tools to be ordered. Prices of these tools shall not be considered for tender evaluation. However, the list of necessary tools/equipment which will be supplied free of cost with each CB may be furnished separately.~~

1.9 11 KV Multiple switched Automatic Capacitor bank(CRCA Cubicle panel) shall be manufactured by principle manufacturer of capacitor banks.

2.0 STANDARDS

The equipment shall conform (for performance and testing thereof) in all respects to the relevant Indian/International Standards specifications with latest amendments thereto.

2.1 INDIAN STANDARDS

IS NO.	Title
13925:1998	Specification for H.T. shunt Capacitor
IS 9920-2002	Vacuum Contactors/ Capacitor Switch
IS 9921 -1985	Isolator
IS 2705	Current Transformer
IS 3070	Lighting Arrestor
IS 3156	Residual Voltage Transformer.
IS 5553	Series Reactor
IEC 61000	Automatic Power Factor Controller

The other components such as VCB panel & other auxiliary equipments shall comply with the latest version of latest Indian/International standards.

2.3 Equipment conforming to other internationally accepted standards which ensure equal or higher quality than the above mentioned standards would also be acceptable. In such

case bidders, who wish to offer material conforming to standards other than listed above, shall clearly bring the salient points of difference between the standards forward/adopted and specified hereinabove. Four copies of such standards with authentic English Translation shall be furnished along with the offer. In case of conflict order of preference shall be (1) ISS (2) IEC (3) other standards. In case of any difference between provisions of these standards and provision of this specification the provision contained in this specification shall prevail.

3.0 SERVICE CONDITIONS

The capacitor Bank to be supplied against this specification shall be required to operate satisfactorily and continually under the following moderately hot and humid tropical climate conducive to rust and fungus growth

- Location: - To be defined by the Employer
- Maximum ambient air temperature (deg. C) To be defined by the Employer
- Minimum ambient temperature (deg. C) To be defined by the Employer
- Average daily ambient air temperature (deg/C) To be defined by the Employer
- Maximum relative Humidity (%) To be defined by the Employer
- Maximum altitude above sea level (M) To be defined by the Employer
- Average annual rainfall (MM) To be defined by the Employer
- Isocearaunic level (days per year) To be defined by the Employer
- Seismic level (Horigentalacen.) To be defined by the Employer
- Maximum wind pressure 0kg/sqm) To be defined by the Employer

4.0 PRINCIPAL PARAMETER

The equipment covered under this specification shall conform to specific parameters given below:

4.1 CAPCITOR BANKS

Sl. No.	Item	Specification
1.	Nominal system voltage	11 KV
2.	Rated voltage of capacitor bank	12.65 KV
	Output of capacitor bank at 12.65 KV	1980 & 3960 KVAR (To be given by
4.	Rated line current	To be filled by Employer
5.	Connection of capacitor bank	Single star
6.	No. of phases	3
7.	Rated voltage of individual capacitor unit	To be filled by Employer
8.	Capacity of individual capacitor unit	To be filled by Employer
9.	Insulation level	RMS-28 KV
		Peak-75 KV
10.	Maximum temp. rise over ambient	10 C
	measured on container	
11.	Type of discharge	Internally though resistor provided
		within the Unit
12.	Type of fuse	External fuse
13.	Type of installation	Outdoors
14.	Power loss (Tan delta)	Not to exceed 0.2 watt/KVAR
		-subject to tolerance as per standard.

Capacitor Bank Rating:

Sl. No.	Transformer Capacity (MVA)	Rating of Capacitor Bank (MVar)	Steps configuration kVar X No. of Steps (Switched)
1	5	1.98	396+792+792
2	8 & 10	3.96	792+792+1188+1188
3	Any other capacity as defined by Employer	Any other rating as defined by Employer	To be specified by the Employer

Note: The stages may be changed during detailed engineering Residual Voltage Transformer

5.0 TECHNICAL REQUIREMENT

5.1 CAPACITOR UNIT

The capacitor shall be of unit type construction suitable for indoor installation having high dielectric strength. No sun protection will be provided. The capacitor bank shall be complete with mounting frames, insulators and all other components for formation of capacitor bank. The bank shall be open type complete with inter connecting aluminum bus bars and adequate clearance shall be provided between phases and phase to earth..

The capacitor should be able to withstand 10% overvoltage and 30% over current (r.m.s. value) arising due to over voltage and harmonics

5.2 ASSEMBLY

—Capacitor units of 132, 264 & 396 KVAR, 7.3 single phase shall be connected in parallel in each phase to form a three phase star connected capacitor bank. The bank shall be mounted on a steel frame work in suitable one/two tier formation and shall be so arranged that an individual unit of 132, 264 & 396 KVAR can be removed easily without disturbing the complete assembly/ other units.

5.3 CONSTRUCTION OF CAPACITOR UNIT

A. CONTAINER

The container shall be built from CRCA of sufficient thickness (not less than 1.6 mm) to avoid damages to the tank in case of internal fault. It shall be of fabricated construction with all joints properly welded and designed to withstand rough handling and should be hydraulically tested before assembling the internal elements. It shall be adequately epoxy pointed. The lid of container shall be properly welded to the container.

The capacitor unit shall be hermetically sealed after the entire assembly has been dried and impregnated with suitable liquid (Dielectric.) The capacitor elements shall be thoroughly dried and impregnated with an **impregnate** which has been completely refined and degasified so as not to have any impurities or gas which may cause deterioration of the dielectric. The **impregnate** used shall have low viscosity and high chemical stability and should be non-PCB. The container shall be adequately insulated from capacitor elements. Sufficient 'Wall' insulation shall be provided so that the capacitor units meant for use of 11 KV nominal system can be place directly on grounded steel structures. The metallic surface of capacitor units shall be epoxy painted making capacitor units suitable for installing outdoor under moist tropical climatic conditions. **Capacitor panel shall be bolted type design. Capacitor Panel shall have IP-55 Degree of protection. Capacitor Panel shall be Powder coated**

B. CAPACITOR UNIT

The capacitor unit shall have **aluminium** foil as conducting layer. The dielectric used shall be polypropylene film by using layers of polypropylene film shall have the following compatibility criterion:—

- (i) Polypropylene film shall conform to standard specification with latest amendments, for plastic film for new generation.
- (ii) Compatibility between oil film (after thermal aging at 115 C for 96 Hrs.)

The ~~impregnate~~ used shall be non PCB liquid with ~~low be accumulating~~, rapid bio-degradation and low toxicity. Adequate number of such elements shall be assembled and enclosed in the enclosure to form a single phase unit with terminal bushings. The air in the enclosure and moisture absorbed by the paper shall be removed under high vacuum at elevated temperature and replaced by suitable impregnating medium having high permeability, high dielectric strength and non-inflammable properties.

C. ~~DISCHARGE DEVICE:~~

Suitable discharge device shall be connected across the capacitor unit in accordance with IS: 13925. The discharge device shall reduce the residual voltage from the crest value of the rated voltage to 50 V or less within 10 Minutes after the capacitor is disconnected from the source supply.

D. ~~EARTHING CONNECTIONS:~~

The container of each capacitor unit shall be provided with suitable earthing terminal clearly marked with Earth symbol.

E. ~~MARKING:~~

The capacitor unit shall be provided with a rating plate and terminal markings as stipulated in IS: 13925. The bidder shall submit the type test report along with the bid.

F. ~~FUSES~~

Each capacitor element shall be protected by External HRC fuse of suitable rating and interruption capacity so that a faulty capacitor element shall be disconnected by fuse. The fuse shall satisfactorily operate under ambient conditions. The following requirements shall be considered while selecting the right size of fuse.

- a. ~~Ability to withstand the maximum discharge current from healthy capacitor element.~~
- b. ~~Capability of handling fault current so as to Blow off before the in case rupture takes place thereby avoiding damage to adjoining capacitor elements/capacitor units.~~

G. ~~BUSHINGS~~

Bushing shall be of porcelain or polycrystalline and shall be jointed to the case by welding method (Weldable type bushing) to ensure adequate and permanent seal. Leads shall be brought out through one piece bushing and welded to the terminal stud to make a strong and positive electrical contact. Bushing terminal shall be of stainless steel.

Capacitors to be tested for cyclic Over voltage and 3 G test for mechanical shock & vibration, bidder has to clarify / confirm these points in GTP

5.4 ~~PHYSICAL ARRANGEMENT OF BANK~~

Star point of the capacitor bank shall be ungrounded. The mounting rack arrangement shall be such that one no. additional unit in each phase can be installed in future for increasing capacity.

5.5 ~~AUTOMATIC CONTROL UNIT~~

(a) Switching Arrangement:

The Automatic control unit shall be provided inside the control; room to continuously monitor total load KVAR on secondary side of the transformer and shall automatically switch ON or switch OFF the capacitor banks through the operation of 12 KV Capacitor Switch in accordance with the parameter given in table no. 4.2 Overriding provision shall also be made for electrical switching ON or OFF of the capacitor switch by the operator from the ACU control box.

(b) Time Delay:

The switching ON operation will take place after period of 10 minutes. The switching OFF operation of relevant steps will be instantaneous.

(c) Controls:

The Automatic control unit shall instantly switch OFF the capacitor bank in the following contingencies occurring in any of the phases:

- i) Voltage increased by 10% above the rated voltage of 11 KV.
- ii) Power transformer current impedance (due to single phasing and for any other reasons) between any of the two phases exceeding 20% of the lowest, iii) Current increases in any capacitor unit by 30% above the rated current (only the relevant capacitor switch will open). Current between any of the two phases of the capacitor bank differs more than 15% of the lowest current of the 3 phases (only the relevant capacitor switch will open).

(d) Monitoring Facility:

A suitable display should be provided to indicate the capacitor current in each phases of the complete capacitor bank on the ACU panel inside the control room. Indications shall also be provided to indicate ON & OFF status of each capacitor bank. Along with audio alarm indicating tripping of capacitor bank and ON /OFF, visual display window be provided on control panel. Automatic Control unit shall have GSM(4G/3G/2G/GPRS)/CDMA connectivity; suitable modem shall be connected along with control unit to transfer the data to remote locations. Provision of SIM will be under the scope of bidder. Bidder has to provide online Dashboard to the Employer users as per their requirements, Capable to show real time data and capable to generate MIS as per requirement. Bidder has to establish secure head end system on cloud which will be under the scope of bidder. Data transferred from Modem to Head end system through secure APN SIM, for the entire agreed period.

GSM / GPRS MODEM Specifications:

- Quad-band 850/900/1800/1900MHz
- GPRS multi-slot class 12/10
- GPRS mobile station class B
- Compliant to GSM phase 2/2+
- Class 4 (2 W @ 850/900MHz)
- Class 1 (1 W @ 1800/1900MHz)

•Control via AT Commands (3GPP TS 27.007, 27.005 and enhanced AT Commands)

- (e) **Control Power:**
The AC control voltage for operation of the ACU shall be taken from substation battery. The required control voltage shall be 230 VAC supply.
- (f) **Temperature Variation:**
The control equipment and associate circuitry shall be suitable for operation at an ambient temperature in the range of + 5 deg C to (+) 50 deg C.
- (g) **Protection of ACU:**
Besides in-built protection against lines surges and transient over voltages, suitable fuses/MCB shall be provided for protection against over current. The ACU shall remain fully functional during and after line surges and transient over voltages.
- (h) **Control Unit Casing:**
Except for the terminals, the ACU shall be enclosed in a suitable casing so as to avoid ingress of dust.
ACU should be installed at inside of substation on Floor mounting arrangement.

5.6 VACUUM CONTACTOR SWITCHES

This specification covers 11 KV, 50 Hz, Indoor type automatic Vacuum Contactor Switch suitable for switching capacitor in steps.

- (a) **Applicable Standards:**
Unless otherwise stipulated in this specification the Vacuum Contactor Switch shall comply with the latest version of IS:9920 (AC Switches for voltages above 1000 V). Capacitor should be tested by International Labs as per IEC 60265-1 (1998)
- (b) **Rated Voltage:**
The rated voltage for the Vacuum Contactor Switch shall be 12 KV. This represents the highest system voltage corresponding to the nominal system voltage of 11 KV 12.65 KV.
- (c) **Rated Current:**
The standard rated normal current shall be 200A
- (d) **Rated Capacitive Switching Current:**
The rated capacitive switching current shall not be less than 100 A Note: The capability of the Vacuum Contactor Switch shall also take into account the parallel switching of capacitor bank steps.
- (e) **Rated Short Time Current:**
The rated short time symmetrical current for 1 second shall be 10KA (rms AC component).

- (f) ~~Rated Short Circuit Making Current:~~ The rated making current shall be 25 KA Peak.
- (g) ~~Basic Impulse Level (BIL):~~
The rated basic impulse level of Vacuum Contactor Switch to earth as also across the open terminals shall be 75 KV.
- (h) ~~Control Supply:~~
The control power for closing the Vacuum Contactor Switch shall be 230 V single phase AC supply. The closing mechanism shall be suitable for a voltage variation of (+) 10% to (-) 20%.
- (i) ~~Design & Construction Requirement:~~
Type:
a. ~~The Capacitor Switch shall be of vacuum type.~~
b. ~~The Vacuum Contactor Switch shall be of three phase construction and shall be suitable for remote operation.~~
c. ~~The Vacuum Contactor Switch shall be suitable for indoor installation and shall have sealed weather proof type construction.~~
d. ~~The enclosure of the Vacuum Contactor Switch shall be provided with two earthing terminals marked with the earth symbol.~~
e. ~~The bushings provided on the switch shall have clamp type of terminals to directly receive aluminium conductors up to 10mm dia in both horizontal and vertical directions. The terminal arrangement shall be such as to avoid bimetallic corrosion.~~
- (j) ~~Operating Mechanism:~~
The operating mechanism shall be either solenoid or motor charged spring for which the control supply shall be as per clause 31.
- (k) ~~Mechanical and Electrical Endurance:~~
The Vacuum Contactor Switch shall be capable of performing not less than 10,000 mechanical operations and 10,000 electrical operations at 100A capacitive current without getting damaged.
- (l) ~~Marking:~~
The Vacuum Contactor Switch shall be provided with a legible and indelibly marked name plate with the following:
a) ~~Name of the manufacturer.~~
b) ~~Type, designation and serial number.~~
c) ~~Rated voltage and current.~~
d) ~~Rated frequency.~~
e) ~~Number of poles.~~
f) ~~Rated short time current (symmetrical).~~
g) ~~Rated making current.~~
h) ~~Rated capacitive switching current.~~
i) ~~Date of manufacturing.~~

j) ~~Property of respective Employer~~

(m) ~~Testes: The Vacuum Contactor Switch shall be subjected to the following tests in accordance with the IS:9920 (Part IV), & Should also be tested by international labs as per IEC 60265-1(1998)~~

(i) ~~Type Tests~~

- a) ~~Tests to verify the insulation level, including withstand tests at power frequency voltages on auxiliary equipment.~~
- b) ~~Tests to prove that the temperature rise of any part does not exceed the specified values.~~
- c) ~~Making and breaking tests including tests for the rated capacitive current.~~
- d) ~~Tests to prove the capability of the switch to carry the rated short time current.~~
- e) ~~Tests to prove satisfactory operation and mechanical/electrical endurance.~~

(ii) ~~Routine Tests~~

- a) ~~Power frequency voltage dry tests.~~
- b) ~~Voltage tests for auxiliary circuits.~~
- c) ~~Measurement of the resistance of the main circuits.~~
- d) ~~Tests to prove satisfactory operation.~~

5.7 AUXILIARY EQUIPMENTS

Isolator:

- (i) ~~The Isolator shall be Outdoor type, 11 KV, 400Amp, Single throw, Double break, off load type, triple pole, Horizontal gang operated with earth switch.~~
- (ii) ~~Tests: The Isolator shall be type tested and shall be subjected to routine and acceptance test in accordance with IS: 1818-1972.~~
- (iii) ~~The bidder shall submit guaranteed technical particulars along with their bid.~~

5.8 LIGHTNING ARRESTOR

- (i) ~~The specification covers the supply, delivery, erection, testing & commissioning of 9KV, 10 KA, Station class heavy duty, gapless, metal (zinc) oxide surge arrestor complete along with clamps, complete fitting and accessories for installation on outdoor type 11 KV switchgear, transmission lines, transformers etc.~~
- (ii) ~~Tests: The Lightning Arrestors shall be type tested and shall be subjected to routine and acceptance test in accordance with IS: 3070.~~
- (iii) ~~The bidder shall submit guaranteed technical particulars along with their bid.~~

5.8 B) Suitable one number RC surge suppressor shall be provide per bank inside of cubicle panel. LA and Isolator shall be mounted on same structure and outgoing of Isolator shall be connected with CRCA capacitor panel through suitable power cable.

5.9 RESIDUAL VOLTAGE TRANSFORMERS

~~The residual voltage transformers shall be in door type, dry with primary in star and secondary in star & tertiary in open delta formation. The neutral of the primary winding shall kept fully insulated and would be isolated from ground. The tertiary winding in open~~

delta shall be used to energise the neutral unbalanced voltage withstand relay. The RVT should be suitable to discharge the capacitor bank to voltage not exceeding as per standards with latest amendments thereof. The RVT should be designed to withstand the temperature rise due to energy discharge in to it capacitors in case of tripping. All the type test as per IS including temperature rise test should be furnished. RVT shall be mounted inside a cubicle.

5.10 — **HRC FUSES**

Suitable indoor type 11 KV HRC fuses along with the mounting insulators etc. to provide proper protection for the capacitor unit shall form part of the equipment to be supplied.

5.11 — **SERIES REACTORS**

0.2 % Series reactor per phase per step of capacitor rating for inrush current restriction to be connected on neutral end as per IS: 5553. The rated voltage shall be 12 KV. The reactor shall be dry type single phase reactors mounted on post insulators and designed to carry 130 % of rated current continuously without exceeding the temperature rise & shall be applicable for thermal class of insulation used. The reactor shall be mounted on structure.

- i. Tests: The series reactor shall be type tested and shall be subjected to routine and acceptance test in accordance with IS: 5553.
- ii. The bidder shall submit guaranteed technical particulars along with their bid.

5.12 — **CAPACITOR CUBICLE:**

It shall be free standing outdoor type sheet steel enclosure fabricated from 2 mm. thick CRCA sheets. Capacitor cubical shall be mounted on mild steel channel frame and base frame shall be provided with mounting holes for fixing on concrete foundation. All doors and covers shall be designed to avoid ingress of water, moisture, dust etc. and shall be provided with suitable gaskets to achieve IP-55 degree of protection. Covers and doors shall be provided with electrical interlocks to avoid access to live parts. Viewing glasses shall be provided to view inside parts like fuses, contactors. CFL type internal panel lighting shall also be provided to have proper view in the night. Capacitor enclosure shall be duly powder coated. FRP canopy shall be provided at the top and which projects about 200 mm beyond cubicle on all sides. All LT internal wiring shall be fire retardant cable of 2.5sq.mm. All cable entries shall be from bottom through cable glands of suitable size. HT XLPE cable entry shall be through a cable entry box mounted on cubicle or fixed separately on foundation and coupled to the cubicle. Necessary Danger plate & Name plate etc shall be provided at prominent places. All other necessary fittings and accessories should be provided by manufacturer to ensure safe and smooth operation of the equipment.

Cubicle panel shall have provision of Internal Arc prevention as per IEC 62271-200

Cubicle panel shall be bolted type design.

Cubicle panel shall be IP 55 degree of protection.

Cubicle panel shall be powder coated.

5.13 — **BUS BARS AND INTERCONNECTION MATERIALS**

Suitable bus bar arrangement shall be provided by the supplier and requisite quantity of bus bar material shall be provided for the Bank. All bus bars shall be aluminum flats with suitable cross section. Bus bar connections between Bank and RVT. Shall also be provided.

5.14 ACCESSORIES

Each capacitor bank cubicle panel shall be provided with the following accessories:-

1. 2 Nos. earthing terminals
2. Clamps and connectors
3. Aluminum bus bar
4. RC Surge Suppressor one no per bank
5. RVT
6. Capacitors
7. Series reactor
8. Vacuum Contactor
9. Rating plate

All other accessories required for erection, assembly and commissioning of the capacitor bank

ACU shall be floor mounted and kept inside of substation building near to VCB panel. LA and Isolator shall be mounted on external structure and to be kept outside.

5.15 RATING PLATE

Each unit shall be fitted with a rating plate giving clearly the particulars specified of marking as per standards:

5.16 CLEARNCES INSTALLATION AND MAINTENANCE INSTRUCTIONS:

The supplier shall provide 3 sets of detailed instruction manuals and drawings covering all aspects of installation and maintenance of the capacitor bank and the associated equipments.

5.17 OPERATION OF CAPACITOR BANK

- a. The capacitors are proposed to be connected in 3 phase, 11 KV, 50 Hz system. The maximum symmetrical short circuit level on 11 KV systems is 26.2 kA for 1seconds.
- b. It is to be specifically noted that 1.5 & 3 MVAR capacitors banks are intended for use at our 33/11 KV receiving substations within our distribution network.
- c. Maximum permissible over voltage shall be as per standards and latest amendments thereof.
- d. Permissible increase in current loading due to any or all of the following shall not exceed 30% of the rated current.
 1. Increased voltage
 2. Increased frequency

3. ~~Non sinusoidal voltage~~
- e. ~~The capacitors shall be suitable for operating in temperature category 50° C as per standards.~~

Note: ~~All the parameters which are not covered under the above mentioned specification will be considered according to IS.~~

~~6.0 TESTS~~

~~6.1 TYPES TESTS~~

~~All the offered equipment shall be fully type tested by the bidder as per relevant standards including the type tests mentioned below. Type test should have been conducted on the similar or higher capacity of equipments for 11 KV or 33 KV class of capacitor bank from recognized test laboratory preferably CPRI or other Govt. test labs within 5 years prior to date of opening of bid. The bidder shall furnish four sets of test reports as per relevant standards for each type of equipment offered, along with the bid. The offers received without type tests shall be tested as non responsive and rejected.~~

- a. ~~Thermal stability~~
- b. ~~Capacitor loss tangent measurement at elevated temperature.~~
- c. ~~A.C. voltage test between terminal & container.~~
- d. ~~Lightening impulse voltage test between terminal and container.~~
- e. ~~Short circuit discharge test.~~

~~6.2 ACCEPTING TEST~~

~~All acceptance tests stipulated in relevant standards and including those as mentioned below shall be carried out by the Supplier in presence of Purchaser's representative.~~

- a. ~~Capacitance measurement test~~
- b. ~~Capacitor loss tangent measurement test.~~
- c. ~~Voltage test between terminals.~~
- d. ~~A.C. voltage test between terminal and container.~~
- e. ~~Tests of internal discharges device.~~
- f. ~~Sealing test~~

~~The method shall be subject to agreement between the Supplier and Purchaser where it is not specified in the relevant standards. The Purchaser reserves the right to carry out any other test (s) of reasonable nature, in addition to above mentioned tests, at works/test house of the Supplier or any other recognized laboratory/Research Institute to satisfy that the material compiles with the intent of this specification~~

~~7.0 INSPECTION~~

~~The inspection shall be carried out by the Purchaser at two stages of manufacture i.e. inspection during manufacturing and final inspection and testing. The Supplier shall keep the Purchaser informed in advance of the manufacturing programmer so that the arrangement can be made for inspection. The Manufacturer shall grant free access to works, for Purchaser's representative at a reasonable time. Inspection and acceptance of any equipment under this specification by the Purchaser shall not relieve the Supplier of his obligation of~~

~~furnishing the equipment in accordance with this specification and shall not prevent subsequent rejection if the equipment is found to be defeat/not as per this specification. All acceptance tests and inspection shall be carried out at the place of manufacture unless otherwise specifically agreed upon by the contractor and Purchase. The contractor shall offer to the inspecting official (s) representing the Purchase, all reasonable facilities without charge, to satisfy that the material is being furnished in accordance with this specification. The Purchase has the rights to have the tests carried out at his own cost by an independent agency wherever there is a dispute regarding the quality of the supply. The contractor shall give not less than 15 days advance intimation to enable the purchase to depute his representative for witnessing the state/acceptance tests.~~

~~8.0 ——— QUALITY ASSURANCE PLAN~~

~~8.1 ——— The bidder shall have ISO 9001/9002 or any latest, certification'. The bidder shall invariably furnish the following information along with his bid part-I falling which his bid shall be liable for rejection. Separate information should be given be individual type of material offered.~~

~~(I) — Statement giving list of important raw materials, name of Suppliers for raw material, list of standards according to which the raw materials are tested and list of tests normally carried out on raw materials in presence of bidder's representative, copies of tests certificates~~

~~(II) — Information and copies of test certificates as in (1) above in respect of bought out items,~~

~~(III) — List of manufacturing facilities available~~

~~(IV) — Level of automation and list of areas where manual processing — exists.~~

~~(V) — List of areas in manufacturing process where stage inspections are normally carried out for quality control and details of such test.~~

~~(VI) — List of testing equipment available with the bidder for stage and final testing of equipment offered and test plant limitations if ay, vis-a vis the type test, special acceptance and routine test specified in the relevant standards. These limitations shall be very clearly brought out in the relevant schedule of deviations as deviations from specified tests requirements.~~

~~8.2 ——— The successful bidder(s) shall within 30 days of placement of order submit the ——— following Information:—~~

- ~~i. — List of raw material and bought out items and names of the Suppliers selected from those furnished along with the bid.~~
- ~~ii. — Type test certificates or the raw material and bought out items.~~
- ~~iii. — Quality assurance plan (QAP) with hold points for purchase's inspection (to be finalized after mutual discussions between the bidder and the purchaser, at latter's office.)~~

HOLD POINT

A stage in the material procurement of manufacturing process beyond which work shall not proceed without the documental approval of the purchase.

NOTIFICATION POINT:

A stage in the material procurements, or manufacturing process for which advance notice of the activity is required to facilitate witness by the purchasersrepresentatives.

8.3 The QAP of the contractor shall consist of the following details.

- ◆ An outline of the proposed work and program sequence.
- ◆ The structure of contractor organisation for the contract.
- ◆ The duties and responsibilities assigned to the staff ensuring quality of work
- ◆ Hold and Notifications points.
- ◆ Submission of engineering documents required by this specification.
- ◆ The inspection of material and components on receipt
- ◆ Stage Inspection.
- ◆ Final Inspection.

9.0 DOCUMENTATION

All drawing shall conform to International standards organisation (ISO), 'A' series of drawing sheets/Indian standards specification IS: 656. All dimensions shall be in SI units.

9.1 LIST OF DRAWINGS

The bidder shall furnish the following alongwith the bid:—

- i. Two sets of drawing showing clearly the general arrangement, fitting details, electrical connections etc. required for erection & commissioning
- ii. Technical leaflets (users manual) giving operating instructions.
- iii. Three copies of dimensional drawings.

9.2 The manufacturing of the equipment shall be strictly in accordance with drawings approved by purchaser and no deviation shall be permitted without the written approval of the purchase. Any manufacturing and fabrication prior to approval of the purchaser shall be at supplier risks.

9.3 Approval of drawing/work by the purchase shall not relieve at supplier of his responsibility and liability for ensuring the correctness and correct

9.4 Interpretation of the drawing for meeting the requirements of latest revisions of applicable standards, rules and code 6f practices. The purchase shall have power to reject any work or material which in his judgment is no in all accordance therewith.

9.5 Three sets of drawings for purchaser's approval shall be furnished within two weeks of placement of order. The purchaser shall communicate his comments/ approval within reasonable. The supplier, shall, if necessary modify the drawings and resubmit three

copies of modified drawings for a approval.

9.6 — ~~Three sets of separating manual, drawing, technical leaflets, inspection manual etc shall be supplied to each consignee in the first instance.~~

9.7 — ~~One set of routine test certificate shall accompany such dispatch consignment.~~

10.0 — **PACKING & FORWARDING**

~~The equipment shall be packed in crates suitable for vertical, horizontal transport as the case may be and suitable to withstand handling during transport and outdoor storage during transit. The supplier shall be responsible for any damage to the equipment during transit, due to improper and to the equipment during transit, due to improper and inadequate packing. The easily damageable material shall be carefully packed and marked with the appropriate caution symbol. Wherever necessary proper arrangement for lifting such as fitting hooks shall be provided. Any material found short within the packing case(s) shall be supplied immediately by the supplier without any extra cost to purchaser.~~

~~Each consignment shall be accompanied with a detailed packing list containing the following information and shall be marked "PROPERTY OF respective <DISCOM>".~~

- ~~a) Name of the consignee~~
- ~~b) Details of consignment~~
- ~~c) Destination~~
- ~~d) Total weight~~
- ~~e) Handling and packing instructions~~
- ~~f) Bill of material indicating contents of each package.~~

~~In addition to the above the marking on each package shall per relevant standards.~~

10.1 — ~~The packing shall be done as per manufacture's standards practice ensuring that no material is damaged during transit by Rail/Road.~~

11.0 — **SUPERVISION SERVICES:**

~~The bidders shall provide free of services of their engineers, If required during erection & commissioning of capacitor bank at various places.~~

~~Advance notice of 15 days shall be given to the contractor to depute his engineer to various substation in state of Uttar Pradesh.~~

12. — **MANDATORY SPARES AND TOOLS**

~~The bidder shall have suitable stock to carry out O&M as and when required.~~

13. TRAINING:-

~~13.1. Bidder has to organise at least two training sessions every Division for substation operator and field staff at substation only after commissioning.~~

~~13.2. Bidder shall provide posters in Hindi regarding DOs and DON'Ts regarding operation of Capacitor Banks properly displayed in Control room at minimum two locations along with contact details of person to approach in case of problem/ fault.~~

14. FACILITY MANAGEMENT SERVICES

Annexure-B

General Technical Instructions

(This document is meant for the exclusive purpose of bidding against this Package and shall not be transferred, reproduced or otherwise used for purposes other than that for which it is specifically issued.)

Technical Instructions of RDSS

1.1.	33 V Line support.....	236
1.2.	11 KV line Support and DTR Substation support.....	237
1.3.	Route And Terrain.....	237
1.4.	Detailed GPS Survey.....	237
1.5.	Profile Plotting.....	238
1.6.	Road Crossing.....	238
1.7.	Railways Crossings.....	238
1.8.	Telecommunication, LT or HT Line Crossing.....	239
1.9.	Details En-route.....	239
1.10.	Clearances - General.....	239
1.11.	Electrical System Data.....	241
1.12.	Pole Location.....	241
1.13.	Construction.....	242
1.14.	Erection of DP Structure for Angle Locations.....	242
1.15.	Concreting.....	242
1.16.	Providing Of Guys To Supports.....	242
1.17.	Guy Strain Insulators.....	243
1.18.	Fixing Of Cross-Arms.....	244
1.19.	Insulators And Bindings.....	244
1.20.	Conductor Erection.....	245
1.21.	Tensioning and Sagging Operations.....	246
1.22.	Clipping In.....	246
1.23.	Fixing of Conductors and Earthwire Accessories.....	247
1.24.	Replacement.....	247
1.25.	Tying Of Conductor On Pin Insulators.....	247
1.26.	Kind And Size Of Tie Wire To Be Used.....	248
1.27.	Rules Of Good Tying Practice.....	248
1.28.	Conductors At Different Voltages On Same Supports.....	248
1.29.	Earthing.....	249
1.30.	Anti-Climbing Devices.....	250
1.31.	Testing And Commissioning.....	250
1.32.	River Crossing.....	251
1.33.	Guarding.....	251
1.34.	Repair to conductors.....	252
1.35.	LT Lines and Service connection.....	252

General Technical Instructions

Following CEA regulations shall be applicable during execution of work:

- a. Construction Regulation – Central Electricity Authority (Technical Standards for construction of electrical plants and electric lines) Regulation, 2010 (as amended time to time)
- b. Safety Regulation for construction and O&M - Central Electricity Authority (Safety requirements for construction, Operation and Maintenance of electrical plants and electric lines) Regulation, 2011 (as amended time to time)
- c. Connectivity Regulation – Technical Standard for connectivity to the grid (Amendment) Regulation 2013; Technical Standards for connectivity of the Distributed Generation resources, 2013; Central Electricity Authority (Grid Standard) Regulation, 2010 (as amended time to time)
- d. Metering Regulations – Central Electricity Authority (Installation and Operation of meters) Regulations, 2006; Central Electricity Authority (Installation and Operation of meters) (Amendment) Regulations, 2010 and 2015 (as amended time to time)
- e. Central Electricity Authority (Measures relating to safety and Electric supply regulations), 2010 and amendment regulation 2015 (as amended time to time)

~~1.1. 33 KV Line support~~

~~9.1m meter long PCC Pole (or PCC Pole as per state practice shall be used for 33 KV line support). 152x152mm H-Beam (37.1kg/m) / Wide parallel Beams 160x30.44 kg/m can also be used as support in urban/forest area and or Steel Tubular Poles/Wide parallel Beams 160x30.44 kg/m(Expandable through jointing plates) may be used in hilly area where head load shifting is the only option. Cement concreting shall be used for 33 KV support foundations in mixture 1:3:6 (1: cement, 3: coarse sand and 6 Stone ballast 40mm sizes). Each support shall be concrete (0.5mx0.5mx2m) = 0.5 cmt. 0.014 cmt shall also be used in muffing of the support. PCC pole shall not be provided with muffing.~~

~~1.1.1. Pole base plates as per specifications shall be used.~~

~~1.1.2. Pole earthing shall be performed through earthing coil duly connected with 6 SWG wire. The GI wires between pole structure and the earthing coil should not be used in cut length. Wherever, cut is evitable, proper nut bolt, washer and binding should be made as per REC specifications. The GI wire between support and earth coil should be placed 1 meter below the ground level.~~

~~1.1.3. Earth coil should be inserted 1200 mm away from pole.~~

1.2. 11 KV line Support and DTR Substation support

- 1.2.1. 9.0 meters or equivalent PCC Poles as per prevailing practices of the state shall be used for 11 KV line and substation support. Wide Parallel Beam 160x30.44 kg/m can also be used as support in urban/forest area and or Steel Tubular Poles/Wide parallel Beam (with expandable lengths through jointing plates) may be used in hilly area where head load shifting is the only option.

The single PCC pole supports shall be erected with Stone bolder/stone ballast mixed with excavated earth in normal soil. PCC poles in Double Pole structures, turning point structure, Distribution Transformer Substation structure shall be grouted in cement concrete mixture of 1:3:6 (1: cement, 3: coarse sand and 6 Stone ballast 40mm sizes). Single pole supports in water logging area shall also be grouted in cement concrete mixture of 1:3:6 (1: cement, 3: coarse sand and 6 Stone ballast 40mm sizes). PCC pole shall be grouted with concrete (0.6mx0.6mx1.35m) = 0.486 cmt.. In special location, wherever, Project Manager specifically decides, to enhance additional strength, concreting may be used as support foundation.

In forest, wherever special care is to be made for elephant corridors, Wide Parallel Beams 160x 30.44 kg/m may be used for 11 KV line support.

Steel Tubular Poles/ Wide Parallel Beams 160 x 30.44 kg/m shall be grouted in cement concrete mixture of 1:3:6 (1: cement, 3: coarse sand and 6 Stone ballast 40mm sizes) in all the formation.

- 1.2.2. Pole base plates as per specifications shall be used.
- 1.2.3. Pole earthing shall be performed through earthing coil duly connected with 6 SWG wire. The GI wires between pole structure and the earthing coil should not be used in cut length. Wherever, cut is evitable, proper nut bolt, washer and binding should be made as per REC specifications. The GI wire between support and earth coil should be placed 1 meter below the ground level.
- 1.2.4. Earth coil should be inserted 1200 mm away from pole.

1.3. Route And Terrain

- 1.3.1. The scope of HT/LT length of feeder are enclosed with the tender documents. On award of the contract, Contractor shall perform foot GPS Survey to access the route, pole location and thus Single Line Diagram of the line works. The GPS Survey shall be approved by Project Manager. Accordingly requirements of materials shall be finalized by the turnkey contractor in association with Project Manager.

1.4. Detailed GPS Survey

- 1.4.1. The detailed GPS Survey shall be carried out for the approved feeders/spur lines by the Contractor and submitted for Employer approval.

1.5. Profile Plotting

- 1.5.1. Span: The number of consecutive spans between the section points shall not exceed design length considering wind pressure, type of poles and size of conductor.
- 1.5.2. Extension: An individual span shall be as near to the normal design span as possible. In case an individual span becomes too short with normal supports on account of undulation in ground profile, one or both the supports of the span may be extended by inserting standard body extension designed for the purpose according to technical specification.
- 1.5.3. Loading: There shall not be any upward force on poles under normal working conditions and the suspension poles shall support at least the minimum weight span as provided in the design. In case uplift is unavoidable, it shall be examined if the same can be overcome by adding standard body extensions to the poles failing which tension poles designed for the purpose shall be employed at such positions.
- 1.5.4. Horizontal Tensions on pin insulators are to be avoided by proper alignment of the line. In case where installation of DP structure is not possible to erect for turning the line, "two pins" arrangement with suitable jumpering shall be provided at all those locations where pins are subjected to horizontal tension. Bridling type V Cross arms for such installations shall be used by the agency accordingly.

1.6. Road Crossing

At all road crossings, the poles shall be fitted with horizontally aligned disc type tension insulator string(s) or bridling V-cross arm supports using double pin insulator per phase depending on the type of poles and line but the ground clearance at the roads under maximum temperature and in still air shall be such that it should not fall below 6.1m in case of 33 KV and 11 KV lines. Also, cradle guarding is to be used at all the road crossing locations as per drawings / specifications enclosed.

1.7. Railways Crossings

Railway Crossings at pre-planned locality shall be selected in such a way that minimum feeder length shall be re-routed. The line crossing should be executed as per prevailing practices and

approved drawings of railways. Railways crossing shall preferably be executed through underground cabling. Horizontal drill machine shall be used for this purpose. Required permission to block the Railways traffic and approval for railway crossing shall be arranged by the Employer at his own cost. All liaison works shall be performed by turnkey Contractor.

1.8. Telecommunication, LT or HT Line Crossing

The angle of crossing shall be as near 90 degrees as possible. However, deviation to the extent of 30 degree may be permitted under exceptionally difficult situations. Cradle guarding is to be used at all such crossing locations as per drawings / specifications enclosed.

1.9. Details En-route

All topographical details, permanent features, such as well, trees, building etc. 75 m on either side of the alignment shall be detailed on the profile plan.

1.10. Clearances - General

For the purpose of computing the vertical clearance of an over-head line, the maximum sag of any conductor shall be calculated on the basis of the maximum sag in still air and the maximum design temperature. Similarly, for the purpose of computing any horizontal clearance of an over-head line, the maximum deflection of any conductor shall be calculated on the basis of the wind pressure specified by the State Government under rule 76 (2) (a) [or may be taken as 35°, whichever is greater]. Following clearances shall be maintained by the Contractor while executing the work:

1.6.1. CLEARANCE ABOVE GROUND OF THE LOWEST CONDUCTOR: No conductor of an over-head line, including service lines, erected across a street shall at any part thereof be at a height less than

- | | |
|--------------------------------------|------------|
| (a) For low and medium voltage lines | 5.8 metres |
| (b) For high voltage lines | 6.1 metres |

1.6.2. No conductor of an over-head line, including service, lines, erected along any street shall at any part thereof be at a height less than

- | | |
|--|------------|
| a. For low, medium and high voltage lines upto and including 11,000 volts, if bare - | 4.6 metres |
|--|------------|

b. For low, medium and high voltage lines Upto and including 11,000 volts, if insulated - 4.0 metres
c. For high voltage lines above 11,000 volts - 5.2 metres

For extra-high voltage lines the clearance above ground shall not be less than 5.2 meters plus 0.3 meter for every 33,000 volts or part thereof by which the voltage of the line exceeds 33,000 volts:

Provided that the minimum clearance along or across any street shall not be less than 6.1 meters.

1.6.3. CLEARANCE FROM BUILDINGS OF LOW AND MEDIUM VOLTAGE LINES AND SERVICE LINES:

Where line is to cross over another line of the same voltage or lower voltage, pole with suitable extensions shall be used. Provisions to prevent the possibility of its coming into contact with other overhead lines shall be made in accordance with the latest CEA regulations (as amended from time to time). The Contractor will be required to under cross higher voltage lines by erecting gantries/suitable Rail Pole structures.

Where a low or medium voltage over-head line passes above or adjacent to or terminates on any building, the following minimum clearances from any accessible point, on the basis of maximum sag, shall be observed:-

- a) For any flat roof, open balcony, verandah roof and lean-to-roof
 - i. When the line passes above the building a vertical clearance of 2.5 meters from the highest point; and
 - ii. When the line passes adjacent to the building a horizontal clearance of 1.2 meters from the nearest point, and
- b) For pitched roof
 - i. When the line passes above the building a vertical clearance of 2.5 meters immediately under the lines, and
 - ii. When the line passes adjacent to the building a horizontal clearance of 1.2 meters.

The horizontal clearance shall be measured when the line is at a maximum deflection from the vertical due to wind pressure.

1.6.4. CLEARANCE FROM BUILDINGS OF HIGH AND EXTRA-HIGH VOLTAGE LINES:

Where a high or extra-high voltage over-head line passes above or adjacent to any building or part of building it shall have on the basis of maximum sag a vertical clearance above the highest part of a building immediately under such line, of not less than

(a)	For High Voltage Lines up to and including 33,000 volts	3.7 m
(b)	For Extra High Voltage Lines	3.7 m plus 0.3 m for every additional 33 KV or part thereof.

1.11. Electrical System Data

	<u>33 KV</u>	<u>11KV</u>
Nominal voltage	33 kV	11KV
Maximum system voltage	36 kV	12KV
BIL (Impulse)	170 kVp	75KV
Power frequency withstand voltage (wet)	75 kV (rms)	28KV
Minimum corona extinction voltage for phase to earth	Not less than 27 kV, 50 Hz ac system under Dry condition(rms)	
Radio interference voltage at one MHz for 27 kV (dry condition)	Not exceeding 1000 micro-volts	

1.12. Pole Location

In locating poles on lines, the following general principles should be kept in mind:-

1. Keep spans uniform in length as far as possible.
2. Locate to give horizontal grade.
3. By locating the poles on high places short poles can be used and will maintain proper ground clearance at the middle of the span. In extremely hilly or mountainous country, poles are located on ridges there by greatly increasing the spans without greatly increasing the pull on the conductor. This is possible because the sag can be made very large and will maintain the required ground clearance. Special attention should be given to the locations of poles, where the ground washes badly. Poles should not be placed along the edges of cuts at or embankment or along the banks of creeks or streams.

1.13. Construction

The construction of overhead-lines may be divided into the following parts:-

- (1) Pit marking, pit digging.
- (2) Erection of supports and concreting.
- (3) Providing of guys to supports.
- (4) Mounting cross-arms, pin and insulators, and pin binding.
- (5) Paying and stringing of the conductor.
- (6) Sagging and Tensioning of Conductors.
- (7) Crossings.
- (8) Guarding.
- (9) Earthing.
- (10) Testing and Commissioning.

1.14. Erection of DP Structure for Angle Locations

For angles of deviations more than 10 degree, DP structure may be erected. The pit digging should be done along the bisection of angle of deviation.

After the poles are erected, the horizontal/cross bracings should be fitted and the supports held in a vertical position with the help of temporary guys of Manila rope 20/25 mm dia.

Wherever space is not found sufficient to install double Pole structure, single pole cut point may be installed. The support so erected must be grouted.

1.15. Concreting

The concreting mixture of one cum 1:3:6 ratios would mean 1 part cement, 3 parts coarse sand and 6 part 40 mm aggregate size stones. It may be noted that while preparing the concrete mixture, large quantities of water should not be used as this would wash away cement and sand.

1.16. Providing Of Guys To Supports

Guys are installed at locations where terminal poles are erected at sectional cut points. These cut points may be in same alignment or at turn points. Guys are installed to nullify tension on supports resulted due to conductors tension. In spite of careful planning and alignment of line route, certain situations arise where the conductor tries to tilt the pole from its normal position

due to abnormal wind pressure and deviation of alignment, etc. When these cases of strain arise, the pole is strengthened and kept in position by guys. One or more guys will have to be provided for all supports where there is unbalanced strain acting on the support, which may result in tilting/uprooting or breaking of the support.

Guys are braces fastened to the pole. In this work anchor type guy sets are to be used. These guys are provided at (i) angle locations (ii) dead end locations (iii) T - off points (iv) Steep gradient locations and (v) where the wind pressure is more than 50 kg / Sq.m.

The fixing of guys stays will involve (i) pit digging and fixing stay rod (ii) fastening guy wire to the support (iii) Tightening guy wire and fastening to the anchor. The marking of guy pit, digging and setting of anchor rod must be carefully carried out. The stay rod should be placed in a position so that the angle of rod with the vertical face of the pit is 30°/45° as the case may be.

Before start of erection of Stay sets, required concreting materials like Cement, Sand, Stone Chips and Construction water need to be made available near the pit.

Galvanized Stay Set with stay clamp, guy insulator (1 No.), anchor plate (230x230x6mm) , nut-bolts, 1 Nos turn-buckles, 1830 mm long, 20 mm diameter solid GS stay rod & 7/3.15 mm dia GI stranded wire complete. For double pole structure (DP), four stays along the line, two in each direction and two stays along the bisection of the angle of deviation (or more) as required depending on the angle of deviation are to be provided. Hot dip galvanized stay sets are to be used. One stay to counter the angular deformation force shall be used.

After concreting, back filling and ramming must be done well and allowed 7 days to set. The free end of the guy wire/stay wire is passed through the eye of the anchor rod, bent back parallel to the main portion of the stay/guy and bound after inserting the G.I. thimble, where it bears on the anchor rod. If the guy wire proves to be hazardous, it should be protected with suitable asbestos pipe filled with concrete of about 2 m length above the ground level, painted with white and black strips so that, it may be visible at night. The turn buckle shall be mounted at the pole end of the stay and guy wire so fixed that the turn buckle is half way in the working position, thus giving the maximum movement for tightening or loosening.

1.17. Guy Strain Insulators

Guy insulators are placed to prevent the lower part of the Guy from becoming electrically energized by a contact of the upper part of the guy when the conductor snaps and falls on them or due to leakage. No guy insulator shall be located less than 2.6 m from the ground. Guy insulators are to be used in stay wires only. All stay conductors are to be provided with guy insulators as per following specifications.

11 KV line stay	Type C guy insulator (1 No)
33 KV line stay	Type C guy insulators (2Nos)

1.18. Fixing Of Cross-Arms

After the erection of supports and providing guys, the cross-arms are to be mounted on the support with necessary clamps, bolts and nuts. The practice of fixing the cross arms before the pole erection is also there. In case, the cross-arm is to be mounted after the pole is erected, the lineman should climb the pole with necessary tools. The cross-arm is then tied to a hand line and pulled up by the ground man through a pulley, till the cross-arm reaches the line man. The ground man should station himself on one side, so that if any material drops from the top of the pole, it may not strike him. All the materials should be lifted or lowered through the hand line, and should not be dropped.

1.19. Insulators And Bindings

Line conductors are electrically insulated from each other as well as from the pole by 'Insulators'. Following two type of insulators shall be used for the line insulation:

- (1) Pin type
- (2) Strain type

The pin type insulators will be used for straight stretch of line. The insulator and its pin should be mechanically strong enough to withstand the resultant force due to combined effect of wind pressure and weight of the conductor in the span.

The strain insulators are intended for use at terminal locations or dead end locations and where the angle of deviation of line is more than 10°. Strain insulators are also intending to use at major road crossing locations.

The pins for insulators are fixed in the holes provided in the cross-arms and the pole top brackets. The insulators are mounted in their places over the pins and tightened. In the case of strain or angle supports, where strain fittings are provided for this purpose, one strap of the strain fittings is placed over the cross-arm before placing the bolt in the hole of cross-arms. The nut of the straps is so tightened that the strap can move freely in horizontal direction.

All HT/LT insulators shall be tested for insulation tests before installation on line. They shall be dipped into water for 24 hrs and then tested for insulation resistance tests at the stores. The insulators found fit in IR testing shall be sent to site for erection. 11KV na d33 KV insulators

shall be tested by at-least 1 KV megger whereas LT insulators shall be tested by 500 Volts megger.

1.20. Conductor Erection

The main operations are:-

- (a) Transportation of Conductor to works site.
- (b) Paying and Stringing of Conductor
- (c) Jointing of Conductor
- (d) Tensioning and Sagging of Conductor

While transporting conductors drums to site, precautions are to be taken so that the conductor does not get damaged/injured. The drum could be mounted on cable drum support, which generally is made from crow-bar and wooden slippers for small size conductor drums. The direction of rotation of the drum has to be according to the mark in the drum so that the conductor could be drawn. While drawing the conductor, it should not rub causing damage. The conductor could be passed over poles on wooden or aluminum snatch block (pulley) mounted on the poles for this purpose.

When approaching the end of a drum length at least three coils shall be left in place when the stringing operations are stopped. These coils are to be removed carefully and if another length is required to be run out a joint shall be made as per the recommendations of the accessories manufacturer.

The mid span jointing is done through compressions or if helical fittings are used the jointing could be done manually. After completing the jointing, tensioning operation could be commenced. The conductor is pulled through come-along clamps to stringing the conductor between the tension locations.

Conductor splices shall not crack or otherwise be susceptible to damage in the stringing operation. The Contractor shall use only such equipment / methods during conductor stringing which ensures complete compliance in this regard.

All the joints on the conductor and earth-wire shall be of the compression type, in accordance with the recommendations of the manufacturer, for which all necessary tools and equipment like compressors, dies, etc., shall be obtained by the Contractor. Each part of the joint shall be cleaned by wire brush till it is free of rust or dirt, etc., and be properly greased with anti-corrosive compound. If required and as recommended by the manufacturer, before the final compression is carried out with the compressors.

All the joints or splices shall be made at least 15 meters away from the pole. No joints or splices shall be made in spans crossing over main roads, railways and small river spans. Not more than one joint per sub-conductor per span shall be allowed. The compression type fittings shall be of the self-centering type or care shall be taken to mark the conductors to indicate when the fitting is centered properly. During compression or splicing operation, the conductor shall be handled in such a manner as to prevent lateral or vertical bearing against the dies. After compressing the joint, the aluminum sleeve shall have all corners rounded; burrs and sharp edges removed and smoothened.

During stringing of conductor to avoid any damage to the joint, the Contractor shall use a suitable protector for mid span compression joints in case they are to be passed over pulley blocks / aerail rollers. The pulley groove size shall be such that the joint along with protection can be passed over it smoothly.

1.21. Tensioning and Sagging Operations

The tensioning and sagging shall be done in accordance with the approved stringing charts or sag tables. The “initial” stringing chart shall be used for the conductor and “final” stringing chart for the earth-wire. The conductors shall be pulled up to the desired sag and left in running blocks for at least one hour after which the sag shall be rechecked and adjusted, if necessary, before transferring the conductors from the running blocks to the suspension clamps. The conductor shall be clamped within 36 hours of sagging in.

The sag will be checked in the first and the last section span for sections up to eight spans and in one additional intermediate span for sections with more than eight spans. The sag shall also be checked when the conductors have been drawn up and transferred from running blocks to the insulator clamps.

At sharp vertical angles, conductor and earth-wire sags and tensions shall be checked for equality on both sides of the angle and running block. The suspension insulator assemblies will normally assume verticality when the conductor is clamped.

Tensioning and sagging operations shall be carried out in calm weather when rapid changes in temperature are not likely to occur.

1.22. Clipping In

Clipping of the conductors into position shall be done in accordance with the manufacturer's recommendations. Jumpers at section and angle towers shall be formed to parabolic shape to ensure maximum clearance requirements. Fasteners in all fittings and accessories shall be secured in position. The security clip shall be properly opened and sprung into position.

1.23. Fixing of Conductors and Earthwire Accessories

Conductor and earth-wire accessories supplied by the Contractor shall be installed by the Contractor as per the design requirements and manufacturer's instruction within 24 hours of the conductor / earth-wire clamping. While installing the conductor and earth-wire accessories, proper care shall be taken to ensure that the surfaces are clean and smooth and that no damage occurs to any part of the accessories or of the conductors.

1.24. Replacement

If any replacements are to be effected after stringing and tensioning or during maintenance e.g. replacement of cross arms, the conductor shall be suitably tied to the pole at tension points or transferred to suitable roller pulleys at suspension points.

Sagging of conductor has to be in accordance to the Sag Tension chart. In order to achieve it, it is preferred to pull the conductor to a tension a little above the theoretical value so that while transferring it from the snatch blocks to the pin insulators and to take care of temperature variation. Proper sag could be achieved. Sagging for 33/11 KV line is mostly done by "Sighting". A horizontal strip of wood is fixed below the cross-arm on the pole at the required sag. The lineman sees from other end and the sag is adjusted by increasing or decreasing the tension. The tension clamps could then be finally fixed and conductor be fixed on pin-insulators. All fittings, accessories like guys, cross-arms, etc., could be checked as they should not have deformalities.

The maximum permissible spans for all the lines of 33/11/0.4 KV are prescribed according to the design of the supports. Sag-tension charts for these conductors are to be followed.

1.25. Tying Of Conductor On Pin Insulators

Conductors should occupy such a position on the insulator as will produce minimum strain on the tie wire. The function of the wire is only to hold the conductor, in place on the insulator, leaving the insulator and pin to take the strain of the conductor.

In straight line, the best practice is to use a top groove insulator. These insulators will carry grooves on the side as well. When the conductor is placed on the top groove, the tie wire serves only to keep the conductor from slipping out.

On corners and angles (below 5 degree deviations) the conductors should be placed on the outside of the insulators. On the far side of the pole, this pulls the conductor against the insulator instead of away from the insulator.

1.26. Kind And Size Of Tie Wire To Be Used

Helically formed fittings are to be used for tying the insulators, end terminal connectors etc.. The tie should always be made of soft annealed wire so that it may not be brittle and injure the line conductor. A tie wire should never be used for second time. Specifications of helically formed fittings are given in this section.

1.27. Rules Of Good Tying Practice

- a. Use only helically formed fittings.
- b. Use of size of tie wire which can be readily handled yet one which will provide adequate strength.
- c. Use length of tie wire sufficient for making the complete tie, including an allowance for gripping with the hands. The extra length should be cut from each end if the tie is completed.
- d. A good tie should
 - (a) Provide a secure binding between line wire insulator and tie wire.
 - (b) Have positive contacts between the line wire and the tie wire so as to avoid any chattering of the contacts.
 - (c) Re-enforce line wire in the vicinity of insulator.
- e. Apply without use of pliers.
- f. Do not use the wire which has been previously used.
- g. Do not use hard drawn wires for tying.

1.28. Conductors At Different Voltages On Same Supports

In urban area, lines are to be erected with provision for forming lines of two different gradients as under

- a) 11 KV Line and LT Lines
- b) 33 KV Line and LT Lines

Where conductors forming parts of systems at different voltages are erected on the same supports, the Contractor shall make adequate provision to guard against danger to linesmen and others from the lower voltage system being charged above its normal working voltage by leakage from or contact with the higher voltage system; and the methods of construction and the clearances between the conductors of the two systems shall be as described in the specifications.

The agency shall be intimated by the Project Manager in writing about the locations where such provisions is intended by him. At all such locations, the Contractor shall make adequate provision to guard against danger to linesmen and others from the lower voltage system being charged above its normal working voltage by leakage from or contact with the higher voltage system.

1.29. Earthing

Earthing shall generally be carried out in accordance with the requirements of latest CEA regulations (as amended from time to time) and the relevant regulations of the Electricity Supply Authority concerned and as indicated below:

- a) All metallic supports shall be earthed.
- b) For PCC poles the metal cross-arms and insulator pins shall be bonded and earthed at every pole for HT lines.
- c) All special structures on which switches, transformers, fuses, etc., are mounted / likely to mount should be earthed.
- d) The supports on either side of the road, railway or river crossing should be earthed.
- e) All supports (Steel & PCC) HT lines passing through inhabited areas, road crossings and along such other places, where Earthing of all poles is considered desirable from safety considerations should be earthed.
- f) In special locations and special structures, road crossings etc., pipe/rod Earthing should be done on either side of the construction.
- g) At other locations the coil Earthing may be adopted. The coil Earthing consists of 10 m length of 6 SWG. G.I. wire compressed into a coil 450 mm length and 50 mm dia and buried 1500 mm deep as per REC standard J-1.

Following shall be the earthing requirements:

No	Description	Type of Earthing
----	-------------	------------------

1	Single Pole - PCC/RS Joist/steel tubular	1 No. Coil/Spike Earthing at each SP
2	Double pole - PCC/RS Joist/steel tubular	2 Nos. Coil/Spike Earthing at each DP
3	Substation Poles structure - PCC/RS Joist/steel tubular	GI Pipe/ Chemical Earthing 3 Nos
4	Road crossing	GI Pipe / Chemical earthing on either side one each
5	Telephone line crossing	GI Pipe / Chemical earthing on either side one each
6	DP with Isolating switch	Coil/Spike earthing 2 Nos and GI Pipe / Chemical earthing 1 No

1.30. Anti-Climbing Devices

In order to prevent unauthorized persons from climbing any of the supports of HT lines without the aid of a ladder or special appliance, certain anti-climbing devices are provided to the supports. Barbed wire binding is to be adopted for this purpose at a distance of 30 to 40 cm at a height of 3.5 to 4 m from ground level. The barbed wire shall conform to IS – 278 (Grade A1). The barbed wire shall be given chromatin dip as per procedure laid down in IS: 1340. At-least 3.5 kgs barbed wire is to be used per pole for the purpose.

1.31. Testing And Commissioning

When the line is ready for energisation, it should be thoroughly inspected in respect of the following:-

- a) Poles-Proper alignment, concerting and muffing.
- b) Cross-arms – Proper alignment.
- c) Finishing of fabricated steel items used.
- d) Insulators – Proper finish, cleanliness, insulation resistance.
- e) Binding, clamps and jumpers – To check whether these are in reach.
- f) Conductor and earth wire – Proper sag to check whether there are any cuts, etc.
- g) Guys: To check whether the Guy wire is tight and whether the Guy insulators are in tact.
- h) Earthing System: To check whether the earthing connections of supports and fittings are intact. Measure earth resistance with earth tester.

After the visual inspection is over and satisfied, the conductor is tested for continuity/ground, by means of megger. At the time of testing through megger person should not climb on the pole or touch the guarding, conductor, guy wire etc.

- a. Before charging any new line, it should be ensured that the required inspection fee for the new line is paid to the Electrical Inspector and approval obtained from him for charging the line.
- b. The line should be energized before the officer who has been authorized by the Project Manager in this regard.
- c. Before energizing any new line, the Contractor of the line shall notify to the workmen that the line is being energized and that it will no longer be safe to work on line. Acknowledgement of all the workmen in writing should be taken in token of having intimated them.
- d. Wide publicity by Tom-toming should be arranged in all the localities through which the line, that is to be energized passes, intimating the time and date of energizing and warning public against the risk in meddling with the line.
- e. The Officer-in-charge of the line shall personally satisfy himself that the same is in a fit state to be energized.

1.32. River Crossing

No special structures are to be erected for this work. River crossing more than normal span of poles are not considered under the package. For small rivers etc., data for the highest flood-level should be obtained for previous years. The structures should be located at such places that they should be approached under flood condition. Normal DP structures are to be used for such crossings on approval of Project Manager.

In case of river crossing with longer span, special designed structures are to be used for the purpose.

1.33. Guarding

Guarding is to be provided for the lines, so that a live conductor, when accidentally broken, is prevented to come in contact with other electric lines, telephone or telegraph lines, roads, and persons or animals and carriages moving along the road, by providing a sort of cradle below the main electric line.

Guarding is not required for crossings of 66 KV and higher voltage lines where the transmission line is protected by fast acting relay operated circuit breaker of modern design with a tripping time of the order of 0.25 sec. from occurrence of fault to its clearance. For all other crossings, guarding is essential for all telecommunication lines and major road crossing.

The guarding shall consist of GI guard cross arm of length 2.5 mtrs made out of 65x65x6 mm angle & shall be hot dipped galvanized generally conforming to IS : 2633/72. The clamps shall also be hot dipped galvanized generally conforming to IS: 2633/72 & suitable for 13 m 52 kgs/m rail pole & for 8.0 meters long RCC poles. Guarding shall be erected with ground & line clearances as per the I.E. rules. Cradle guard wire should be of ACSR 20sqmm. Wire provided with lashing of 8 SWG GI wire at a distance of 2 m along the length of the guarding. Tension clamps, threaded eye bolts, turn buckles, thimble, tying wires and hardware are as per specified in the specifications. A sketch showing arrangement of guarding at road crossing is enclosed with tender drawing.

The minimum height between any guard wires and live crossing conductor shall not be less than 1.5 m in case of a railway crossing.

1.34. Repair to conductors

The conductor shall be continuously observed for loose or broken strands or any other damage during the running out operations. Repair to conductors, if necessary, shall be carried out with repair sleeves. Repairing of the conductor surface shall be carried out only in case of minor damage, scuff marks, etc. The final conductor surface shall be clean, smooth and free from projections, sharp points, cuts, abrasions, etc. The Contractor shall be entirely responsible for any damage to the poles during stringing.

1.35. LT Lines and Service connection

- 1.7.1. The LT line shall be erected of single phase or three phase arrangements through AB Cable depending on site requirements. Every 6th pole of LT line shall be earthed with GI spike/GI Coil as per specifications.
- 1.7.2. In all those locations where LT AB cable is to be erected on the same support in which 11KV or 33KV line is also erected, proper isolation is to be maintained.
- 1.7.3. All single phase service connections released under the RDSS schemes shall be provided with one earth point near the energy meter. This point is connected with the proper earthing system through GI wires. 10mm diameter earth knob in form of bolt and nut is to be installed on energy meter

board. This earth point is to be maintained by service providing Distribution Company after installation and energisation. In up-stream network, this earth point is to be connected with earth point.

- 1.7.4. Service connection is to be issued on proper GPS Surveying of the location so that excessive erection of LT line or 11 KV line may be avoided. The service wire is to be hanged on supportive GI wire between pole support and the house. Before installing service wires and GI wire, GI pipe on the consumer premises is to be erected using clamps/ nails/proper binding etc. In case of hut or poor structure at consumer premises, GI pipe is to clamp on wooden planks/wooden structure existing in the house. The GI pipe should be supported for neutralizing tension by means of GI tie wire support. In pukka/brickwork/cement concrete foundations, house, GI support pipe is to be clamped by means of MS clips.

PART 3

CONDITIONS OF CONTRACT AND CONTRACT FORMS

Section - 7 :Conditions of Contract

Table ofContents

PART 3.....	1
Section - 7 : Conditions of Contract.....	2
General Conditions of Contract.....	7
A. Contract and Interpretation.....	7
1. Definitions.....	7
2. Contract Documents.....	10
3. Interpretation.....	11
4. Communications.....	13
5. Law and Language.....	13
6. Fraud and Corruption.....	14
B. Subject Matter of Contract.....	14
7. Scope of Facilities.....	14
8. Time for Commencement and Completion.....	15
9. Contractor's Responsibilities.....	15
10. Employer's Responsibilities.....	17
C. Payment.....	18
11. Contract Price.....	18
12. Terms of Payment.....	19
13. Securities.....	20
14. Taxes and Duties.....	21
D. Intellectual Property.....	21
15. License/Use of Technical Information.....	21
16. Confidential Information.....	22

E. Execution of the Facilities.....	23
17. Representatives.....	23
18. Work Program.....	26
19. Subcontracting.....	27
20. Design and Engineering.....	28
21. Procurement.....	31
22. Installation.....	33
23. Test and Inspection.....	42
24. Precommissioning, Commissioning, Guarantee Tests and Completion of the Facilities 45	
25. Operational Acceptance.....	51
F. Guarantees and Liabilities.....	52
26. Completion Time Guarantee.....	52
27. Defect Liability.....	53
28. Functional Guarantees.....	56
29. Patent Indemnity.....	57
30. Limitation of Liability.....	59
G. Risk Distribution.....	59
31. Transfer of Ownership.....	59
32. Care of Facilities.....	61
33. Loss of or Damage to Property; Accident or Injury to Workers; Indemnification..	62
34. Insurance.....	63
35. Unforeseen Conditions.....	69
36. Change in Laws and Regulations.....	71
37. Force Majeure.....	71
38. War Risks.....	73

H. Change in Contract Elements.....	75
39. Change in the Facilities.....	75
40. Extension of Time for Completion.....	76
41. Suspension.....	77
42. Termination.....	79
43. Assignment.....	87
I. Claims, Disputes and Arbitration.....	87
44. Contractor’s Claims.....	87
45. Disputes and Arbitration.....	89
J. Additional.....	90
46. Up-front intimation of approved manufacturers and criterion for Fresh Vendor approval.....	91
47. Up-front intimation of Guaranteed Technical Particulars.....	91
48. Turnkey Contractor’s Store at Project site.....	91
49. Handing over of assets.....	92
50. Supply of Materials in lots.....	93
51. 93	
Contract Closing.....	93
52. Suspension of business dealings.....	94
Special Conditions of Contract.....	100
Section - 8 : Contract Forms.....	107
2. BID SECURITY FORM.....	108
3a. FORM OF NOTIFICATION BY THE EMPLOYER TO THE BANK.....	112
3b. FORM OF NOTIFICATION BY THE EMPLOYER TO THE BANK.....	113
4. FORM OF ‘NOTIFICATION OF AWARD OF CONTRACT’.....	115
5. FORM OF CONTRACT AGREEMENT.....	126
[Alternative – a].....	126
[Alternative – b].....	132
Appendix-1: TERMS AND PROCEDURES OF PAYMENT.....	139
Appendix-2 : PRICE ADJUSTMENT.....	148
Appendix-3 : INSURANCE REQUIREMENTS.....	165

Appendix-4 : TIME SCHEDULE.....	171
Appendix-5 : LIST OF APPROVED SUBCONTRACTORS.....	173
Appendix-6 : SCOPE OF WORKS AND SUPPLY BY THE EMPLOYER.....	174
Appendix-7 : LIST OF DOCUMENTS FOR APPROVAL OR REVIEW.....	176
Appendix-8 : GUARANTEES, LIQUIDATED DAMAGES FOR NON – PERFORMANCE.....	177
6. PERFORMANCE SECURITY FORM.....	178
7. BANK GUARANTEE FORM FOR ADVANCE PAYMENT.....	182
8. FORM OF COMPLETION CERTIFICATE.....	185
9. FORM OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR THE EQUIPMENT HANDED OVER IN ONE LOT BY WBSEDCL FOR PERFORMANCE OF ITS CONTRACT.....	186
10. FORM OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR THE EQUIPMENT HANDED OVER IN INSTALLMENTS BY WBSEDCL FOR PERFORMANCE OF ITS CONTRACT.....	190
11. FORM OF AUTHORISATION LETTER.....	194
12. FORM OF TRUST RECEIPT FOR PLANT, EQUIPMENT AND MATERIALS RECEIVED.....	196
13. FORM OF EXTENSION OF BANK GUARANTEE.....	197
14. FORM OF POWER OF ATTORNEY FOR JOINT VENTURE.....	199
15. FORM OF UNDERTAKING BY THE JOINT VENTURE PARTNERS.....	202
16. FORMAT FOR EVIDENCE OF ACCESS TO OR AVAILABILITY OF CREDIT/FACILITIES.....	207
17. FORM OF OPERATIONAL ACCEPTANCE.....	209
18. FORM OF SAFETY PLAN TO BE SUBMITTED BY THE CONTRACTOR WITHIN SIXTY DAYS OF AWARD OF CONTRACT.....	210
19. FORM OF JOINT DEED OF UNDERTAKING BY THE SUB-CONTRACTOR ALONGWITH THE CONTRACTOR.....	227
20.FORM OF CERTIFICATE OF FINANCIAL PARAMETERS FOR QR	230

General Conditions of Contract

A. Contract and Interpretation

1. Definitions

1.1 The following words and expressions shall have the meanings hereby assigned to them:

“Contract” means the Contract Agreement entered into between the Employer and the Contractor in accordance with the mode of contracting as per SCC, together with the Contract Documents referred to therein; they shall constitute the Contract, and the term “the Contract” shall in all such documents be construed accordingly.

“Contract Documents” means the documents listed in Article 1.1 (Contract Documents) of the Contract Agreement (including any amendments thereto).

“GCC” means the General Conditions of Contract hereof.

“SCC” means the Special Conditions of Contract.

“day” means calendar day.

“year” means 365 days.

“month” means calendar month.

“Party” means the Employer or the Contractor, as the context requires, and “Parties” means both of them.

“Employer” means the person named as such in the SCC and includes the legal successors or permitted assigns of the Employer.

“Project Manager” means the person appointed by the Employer in the manner provided in GCC Sub-Clause 17.1 (Project Manager) hereof and named as such in the SCC to perform the duties delegated by the Employer.

“Contractor” means the person(s) whose Bid to perform the Contract has been accepted by the

Employer and is named as Contractor in the Contract Agreement, and includes the legal successors or permitted assigns of the Contractor.

“Contractor’s Representative” means any person nominated by the Contractor and approved by the Employer in the manner provided in GCC Sub-Clause 17.2 (Contractor’s Representative and Construction Manager) hereof to perform the duties delegated by the Contractor.

“Construction Manager” means the person appointed by the Contractor’s Representative in the manner provided in GCC Sub-Clause 17.2.4.

“SubContractor,” including manufacturers, means any person to whom execution of any part of the Facilities, including preparation of any design or supply of any Plant, is sub-contracted directly or indirectly by the Contractor, and includes its legal successors or permitted assigns.

“Contract Price” means the sum specified in Article 2.1 (Contract Price) of the Contract Agreement, subject to such additions and adjustments thereto or deductions therefrom, as may be made pursuant to the Contract.

“Facilities” (alternatively referred to as the “Works”) means the Plant to be supplied and installed, as well as all the Installation Services to be carried out by the Contractor under the Contract.

“Plant” means permanent plant, equipment, machinery, apparatus, goods, materials, articles and things of all kinds to be provided and incorporated in the Facilities by the Contractor under the Contract (including the spare parts to be supplied by the Contractor under GCC Sub-Clause 7.3 hereof), but does not include Contractor’s Equipment.

“Installation Services” means all those services ancillary to the supply of the Plant for the Facilities, to be provided by the Contractor under the Contract, such as transportation and provision of marine or other similar insurance, inspection, expediting, site preparation works (including the provision and use of

Contractor's Equipment and the supply of all construction materials required), installation, testing, precommissioning, commissioning, operations, maintenance, the provision of operations and maintenance manuals, training, etc. as the case may require.

“Contractor's Equipment” means all facilities, equipment, machinery, tools, apparatus, appliances or things of every kind required in or for installation, completion and maintenance of Facilities that are to be provided by the Contractor, but does not include Plant, or other things intended to form or forming part of the Facilities.

“Site” (alternatively referred to as the “ Project Site”) means the land and other places upon which the Facilities are to be installed, and such other land or places as may be specified in the Contract as forming part of the Site.

“Effective Date” means the date of fulfillment of all conditions stated in Article 3 (Effective Date) of the Contract Agreement, from which the Time for Completion shall be counted.

“Time for Completion” means the time within which Completion of the Facilities as a whole (or of a part of the Facilities where a separate Time for Completion of such part has been prescribed) is to be attained, as referred to in GCC Clause 8 and in accordance with the relevant provisions of the Contract.

“Completion” means that the Facilities (or a specific part thereof where specific parts are specified in the Contract) have been completed operationally and structurally and put in a tight and clean condition, that all work in respect of Precommissioning, Guarantee Test, Commissioning and Asset Tagging on the GIS Portal of the Facilities or such specific part thereof has been completed as provided in GCC Clause 24 (Precommissioning, Commissioning, Guarantee Tests and Completion of Facilities) hereof.

“Precommissioning” means the testing, checking and other requirements specified in the Employer's Requirements that are to be carried out by the

Contractor in preparation for Commissioning as provided in GCC Clause 24 (Precommissioning, Commissioning, Guarantee Tests and Completion of Facilities) hereof.

“Commissioning” means operation of the Facilities or any part thereof by the Contractor following Precommissioning, which operation is to be carried out by the Contractor as provided in GCC Clause 24 (Precommissioning, Commissioning, Guarantee Tests and Completion of Facilities) hereof, for the purpose of carrying out Guarantee Test(s).

“Guarantee Test(s)” means the test(s) specified in the Employer’s Requirements to be carried out to ascertain whether the Facilities or a specified part thereof is able to attain the Functional Guarantees specified in the Appendix to the Contract Agreement titled Functional Guarantees, in accordance with the provisions of GCC Clause 24 (Precommissioning, Commissioning, Guarantee Tests and Completion of Facilities) hereof.

“Operational Acceptance” means the acceptance by the Employer of the Facilities (or any part of the Facilities where the Contract provides for acceptance of the Facilities in parts), which certifies the Contractor’s fulfillment of the Contract in respect of Functional Guarantees of the Facilities (or the relevant part thereof) in accordance with the provisions of GCC Clause 28 (Functional Guarantees) hereof and shall include deemed acceptance in accordance with GCC Clause 25 (Operational Acceptance) hereof.

“Defect Liability Period” means the period of validity of the warranties given by the Contractor commencing at Completion of the Facilities or a part thereof, during which the Contractor is responsible for defects with respect to the Facilities (or the relevant part thereof) as provided in GCC Clause 27 (Defect Liability) hereof.

2. Contract Documents

- 2.1 Subject to Article 1.2 (Order of Precedence) of the Contract Agreement, all documents forming part of the Contract (and all parts thereof) are intended to be correlative, complementary and mutually explanatory.

The Contract shall be read as a whole.

3. Interpretation

3.1 In the Contract, except where the context requires otherwise:

- (a) words indicating one gender include all genders;
- (b) words indicating the singular also include the plural and words indicating the plural also include the singular;
- (c) provisions including the word “agree,” “agreed,” or “agreement” require the agreement to be recorded in writing;
- (d) the word “tender” is synonymous with “Bid,” “tenderer,” with “Bidder,” and “tender documents” with “Bidding Document,” and
- (e) “written” or “in writing” means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions.

3.2 Incoterms

Unless inconsistent with any provision of the Contract, the meaning of any trade term and the rights and obligations of Parties thereunder shall be as prescribed by *Incoterms*.

Incoterms means international rules for interpreting trade terms published by the International Chamber of Commerce (latest edition), 38 Cours Albert 1^{er}, 75008 Paris, France.

3.3 Entire Agreement

Subject to GCC Sub-Clause 16.4 hereof, the Contract constitutes the entire agreement between the Employer and Contractor with respect to the subject matter of Contract and supersedes all communications, negotiations and agreements (whether written or oral) of Parties with respect thereto made prior to the date of

Contract.

3.4 Amendment

No amendment or other variation of the Contract shall be effective unless it is in writing, is dated, expressly refers to the Contract, and is signed.

3.5 Independent Contractor

The Contractor shall be an independent Contractor performing the Contract. The Contract does not create any agency, partnership, joint venture or other joint relationship between the Parties hereto. Subject to the provisions of the Contract, the Contractor shall be solely responsible for the manner in which the Contract is performed. All employees, representatives or SubContractors engaged by the Contractor in connection with the performance of the Contract shall be under the complete control of the Contractor and shall not be deemed to be employees of the Employer, and nothing contained in the Contract or in any subcontract awarded by the Contractor shall be construed to create any contractual relationship between any such employees, representatives or SubContractors and the Employer.

3.6 Non-Waiver

3.6.1 Subject to GCC Sub-Clause 3.6.2 below, no relaxation, forbearance, delay or indulgence by either Party in enforcing any of the terms and conditions of the Contract or the granting of time by either Party to the other shall prejudice, affect or restrict the rights of that Party under the Contract, nor shall any waiver by either Party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.

3.6.2 Any waiver of a Party's rights, powers or remedies under the Contract must be in writing, must be dated and signed by an authorized representative of the Party granting such waiver, and must specify the right and the extent to which it is being waived.

3.7 Severability

If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.

3.8 Country of Origin

“Origin” means the place where the plant and component parts thereof are mined, grown, produced or manufactured, and from which the services are provided. Plant components are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that is substantially in its basic characteristics or in purpose or utility from its components.

4. Communications

4.1 Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices, requests and discharges, these communications shall be:

- (a) in writing and delivered against receipt; and
- (b) delivered, sent or transmitted to the address for the recipient’s communications as stated in the Contract Agreement.

1.1 When a certificate is issued to a Party, the certifier shall send a copy to the other Party. When a notice is issued to a Party, by the other Party or the Project Manager, a copy shall be sent to the Project Manager or the other Party, as the case may be.

5. Law and Language

5.1 The Contract shall be governed by and interpreted in accordance with laws of India including any other instruments having the force of law in India, as they may be issued and in force from time to time.

5.2 The ruling language of the Contract shall be English.

5.3 The language for communications shall be the ruling language unless otherwise stated in the SCC.

6. Fraud and Corruption

6.1 The Employer requires compliance with the stipulations on Fraud and Corruption, as set forth in the Attachment 1 to the GCC and the Integrity Pact if applicable as per SCC.

B. Subject Matter of Contract**7. Scope of Facilities**

7.1 Unless otherwise expressly limited in the Employer's Requirements, the Contractor's obligations cover the provision of all Plant and the performance of all Installation Services required for the design, and the manufacture (including procurement, quality assurance, construction, installation, associated civil works, Precommissioning and delivery) of the Plant, and the installation, completion and Commissioning of the Facilities in accordance with the plans, procedures, specifications, drawings, codes and any other documents as specified in the Section, Employer's Requirements. Such specifications include, but are not limited to, the provision of supervision and engineering services; the supply of labor, materials, equipment, spare parts (as specified in GCC Sub-Clause 7.3 below) and accessories; Contractor's Equipment; construction utilities and supplies; temporary materials, structures and facilities; transportation (including, without limitation, unloading and hauling to, from and at the Site); and storage, except for those supplies, works and services that will be provided or performed by the Employer, as set forth in the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer.

7.2 The Contractor shall, unless specifically excluded in the Contract, perform all such work and/or supply all such items and materials not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for attaining Completion of the Facilities as if such work and/or items and materials were expressly mentioned in the Contract. No extra payment shall be made for these additional accessories or materials required.

7.3 In addition to the supply of Mandatory Spare Parts

included in the Contract, the Contractor agrees to supply spare parts required for the operation and maintenance of the Facilities for the period specified in the SCC and the provisions, if any, specified in the SCC. However, the identity, specifications and quantities of such spare parts and the terms and conditions relating to the supply thereof are to be agreed between the Employer and the Contractor, and the price of such spare parts shall be that given in Price Schedule No. 4, which shall be added to the Contract Price. The price of such spare parts shall include the purchase price therefor and other costs and expenses (including the Contractor's fees) relating to the supply of spare parts.

**8. Time for
Commencement and
Completion**

- 8.1 The Contractor shall commence work on the Facilities within the period specified in the SCC and without prejudice to GCC Sub-Clause 26.2 hereof, the Contractor shall thereafter proceed with the Facilities in accordance with the time schedule specified in the Appendix to the Contract Agreement titled Time Schedule.
- 8.2 The Contractor shall attain Completion of the Facilities or of a part where a separate time for Completion of such part is specified in the Contract, within the time stated in the SCC or within such extended time to which the Contractor shall be entitled under GCC Clause 40 hereof.

**9. Contractor's
Responsibilities**

- 9.1 The Contractor shall design, manufacture including associated purchases and/or subcontracting, install and complete the Facilities in accordance with the Contract. When completed, the Facilities should be fit for the purposes for which they are intended as defined in the Contract.
- 9.2 The Contractor confirms that it has entered into this Contract on the basis of a proper examination of the data relating to the Facilities including any data as to boring tests provided by the Employer, and on the basis of information that the Contractor could have obtained from a visual inspection of the Site if access thereto was available and of other data readily available to it relating to the Facilities as of the date

twenty-eight (28) days prior to Bid submission. The Contractor acknowledges that any failure to acquaint itself with all such data and information shall not relieve its responsibility for properly estimating the difficulty or cost of successfully performing the Facilities.

- 9.3 The Contractor shall acquire and pay for all permits, approvals and/or licenses which are not covered under GCC Clause 10.3 Employer's Responsibility from all local, state or national government authorities or public service undertakings in relevant to where the Site is located, which such authorities or undertakings require the Contractor to obtain in its name and which are necessary for the performance of the Contract, including, without limitation, permits/ certificates if needed for the Contractor's and SubContractor's personnel and entry permits for all Contractor's Equipment.
- 9.4 The Contractor shall comply with all laws in force in India including any instruments having the force of law. The laws will include all local, state, national or other laws that affect the performance of the Contract and bind upon the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, damages, claims, fines, penalties and expenses of whatever nature arising or resulting from the violation of such laws by the Contractor or its personnel, including the SubContractors and their personnel, but without prejudice to GCC Sub-Clause 10.1 hereof.
- 9.5 Any Plant and Installation Services that will be incorporated in or be required for the Facilities and other supplies shall have their origin which do not violate the provisions of any Orders/ Circulars or other instruments issued by the Government that are in force. Any subContractors retained/ engaged by the Contractor in accordance with the provisions of the Contract, shall not violate the provisions of any Orders/ Circulars or other instruments issued by the Government that are in force.
- 9.6 If the Contractor is a joint venture, or association (JV) of two or more persons, all such persons shall be jointly and severally bound to the Employer for the

fulfillment of the provisions of the Contract, and shall designate one of such persons to act as a leader with authority to bind the JV. The composition or the constitution of the joint venture shall not be altered without the prior written consent of the Employer.

10. Employer's Responsibilities

- 10.1 All information and/or data to be supplied by the Employer as described in the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer, shall be deemed to be accurate, except when the Employer expressly states otherwise.
- 10.2 The Employer shall be responsible for acquiring and providing legal and physical possession of the Site and access thereto, and for providing possession of and access to all other areas reasonably required for the proper execution of the Contract, including all requisite rights of way, as specified in the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer. The Employer shall give full possession of and accord all rights of access thereto on or before the date(s) specified in that Appendix.
- 10.3 The Employer shall acquire and pay for all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the country where the Site is located which (a) such authorities or undertakings require the Employer to obtain in the Employer's name, (b) are necessary for the execution of the Contract, including those required for the performance by both the Contractor and the Employer of their respective obligations under the Contract, and (c) are specified in the Appendix (Scope of Works and Supply by the Employer). Such expenditure incurred by the Employer shall be booked as a part of the project cost, within the overall sanctioned costs under the scheme.
- 10.4 If requested by the Contractor, the Employer shall use its best endeavors to assist the Contractor in obtaining in a timely and expeditious manner all permits, approvals and/or licenses necessary for the execution of the Contract from all local, state or national government authorities or public service undertakings that such authorities or undertakings require the Contractor or SubContractors or the personnel of the

Contractor or SubContractors, as the case may be, to obtain.

- 10.5 Unless otherwise specified in the Contract or agreed upon by the Employer and the Contractor, the Employer shall provide sufficient, properly qualified operating and maintenance personnel; shall supply and make available all utilities and facilities; and shall perform all work and services of whatsoever nature, including those required by the Contractor to properly carry out Precommissioning, Commissioning and Guarantee Tests, all in accordance with the provisions of the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer, at or before the time specified in the program furnished by the Contractor under GCC Sub-Clause 18.2 hereof and in the manner thereupon specified or as otherwise agreed upon by the Employer and the Contractor.
- 10.6 The Employer shall be responsible for the continued operation of the Facilities after issuance of Completion certificate, in accordance with GCC Sub-Clause 24.
- 10.7 All costs and expenses involved in the performance of the obligations under this GCC Clause 10 shall be the responsibility of the Employer, save those to be incurred by the Contractor with respect to the performance of Guarantee Tests and Commissioning, in accordance with GCC Clause 24.
- 10.8 In the event that the Employer shall be in breach of any of his obligations under this Clause, the additional cost/ compensation, if any, payable to the Contractor in consequence be determined by the Engineer-in-charge.

C. Payment

11. Contract Price

- 11.1 The Contract Price shall be as specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement.
- 11.2 Unless an adjustment clause is provided for in the SCC, the Contract Price shall be a firm not subject to any alteration, except in the event of a Change in

the Facilities or as otherwise provided in the Contract.

- 11.3 Subject to GCC Sub-Clauses 9.2, 10.1 and 35 hereof, the Contractor shall be deemed to have satisfied itself as to the correctness and sufficiency of the Contract Price, which shall, except as otherwise provided for in the Contract, cover all its obligations under the Contract.

12. Terms of Payment

- 12.1 The Contract Price shall be paid as specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement and in the Appendix to the Contract Agreement titled Terms and Procedures of Payment, which also outlines the procedures to be followed in making application for and processing payments.
- 12.2 No payment made by the Employer herein shall be deemed to constitute acceptance by the Employer of the Facilities or any part(s) thereof.
- 12.3 In the event that the Employer fails to make any payment by its respective due date or within the period set forth in the Contract, the Employer shall pay to the Contractor interest on the amount of such delayed payment at the rate(s) shown in the Appendix to the Contract Agreement titled Terms and Procedures of Payment, for the period of delay until payment has been made in full, whether before or after judgment or arbitration award.
- 12.4 The currency or currencies in which payments are made to the Contractor under this Contract shall be specified in the Appendix to the Contract Agreement titled Terms and Procedures of Payment, subject to the general principle that payments will be made in the currency or currencies in which the Contract Price has been stated.
- 12.5 <The Employer shall be eligible for 1.50% of rebate of invoice value (excluding GST) in the event it makes payment to the Contractor within 10 days of receipt of invoices complete in all respect.>

13. Securities

13.1 Issuance of Securities

The Contractor/Bidder shall provide the securities specified below in favor of the Employer at the times, and in the amount, manner and form specified below.

13.2 Advance Payment Security

13.2.1 The Contractor/Bidder shall, within twenty-eight (28) days of the notification of contract award, provide a security in an amount equal to 110% of the advance payment calculated in accordance with the Appendix to the Contract Agreement titled Terms and Procedures of Payment, and in the same currency or currencies.

13.2.2 The security shall be in the form provided in the Bidding documents or in another form acceptable to the Employer. The amount of the security shall be reduced in proportion to the value of the Facilities executed by and paid to the Contractor/Bidder from time to time, and shall automatically become null and void when the full amount of the advance payment has been recovered by the Employer. The security shall be returned to the Contractor/Bidder immediately after its expiration.

13.3 Performance Security

13.3.1 The Contractor/Bidder shall, within twenty-eight (28) days of the notification of contract award, provide a security for the due performance of the Contract in the amount specified in the SCC.

13.3.2 The Performance Security shall be denominated in the currency or currencies of the Contract, and shall be in the form provided in Section 8, Contract Forms, corresponding to the type of bank guarantee stipulated by the Employer in the SCC, or in another form acceptable to the Employer.

13.3.3 The Security shall be valid till 180 days beyond the Defect Liability Period specified in GCC 27 and shall be reduced pro rata to the Contract

Price of a part of the Facilities for which a separate Time for Completion is provided, after successful completion of the Defect Liability Period of that part of the Facilities; provided, however, that if the Defects Liability Period has been extended on any part of the Facilities pursuant to GCC Clause 27 hereof, the Contractor/Bidder shall issue an additional security in an amount proportionate to the Contract Price of that part. The security shall be returned to the Contractor/Bidder immediately after successful completion of the Defect Liability Period, provided, however, that if the Contractor/Bidder, pursuant to GCC Sub-Clause 27.10, is liable for an extended defect liability obligation, the Performance Security shall be extended for the period specified in the SCC pursuant to GCC Sub-Clause 27.10 and up to the amount specified in the SCC.

14. Taxes and Duties

14.1 Except as otherwise specifically provided in the Contract, the Contractor shall bear and pay all taxes, duties, levies and charges assessed on the Contractor, its SubContractors or their employees by all municipal, state or national government authorities in connection with the Facilities in and outside of the country where the Site is located.

14.2 Notwithstanding GCC Sub-Clause 14.1 above, the Employer shall pay/ reimburse to the Contractor, the taxes and duties, if any, specified in SCC.

D. Intellectual Property

15. License/Use of Technical Information

15.1 For the operation and maintenance of the Plant, including procurement of future spares, the Contractor hereby grants a non-exclusive and non-transferable license (without the right to sub-license) to the Employer under the patents, utility models or other industrial property rights owned by the Contractor or by a third Party from whom the Contractor has received the right to grant licenses thereunder, and shall also grant to the Employer a non-exclusive and non-transferable right (without the right to sub-license) to use the know-how and other technical information disclosed to the Employer

under the Contract. Nothing contained herein shall be construed as transferring ownership of any patent, utility model, trademark, design, copyright, know-how or other intellectual property right from the Contractor or any third Party to the Employer.

- 15.2 The copyright in all drawings, documents and other materials containing data and information furnished to the Employer by the Contractor herein shall remain vested in the Contractor or, if they are furnished to the Employer directly or through the Contractor by any third Party, including suppliers of materials, the copyright in such materials shall remain vested in such third Party. However, this shall not prejudice the right of the Employer to use these drawings, documents and other materials containing data and information for Employer's own use whatsoever including future procurements basis the same.

16. Confidential Information

- 16.1 The Employer and the Contractor shall keep confidential and shall not, without the written consent of the other Party hereto, divulge to any third Party any documents, data, drawings or other information furnished directly or indirectly by the other Party hereto in connection with the Contract, whether such information has been furnished prior to, during or following termination of the Contract. Notwithstanding the above, the Contractor may furnish to its SubContractor(s) such documents, data and other information it receives from the Employer to the extent required for the SubContractor(s) to perform its work under the Contract, in which event the Contractor shall obtain from such SubContractor(s) an undertaking of confidentiality similar to that imposed on the Contractor under this GCC Clause 16.

- 16.2 The Employer shall not use such documents, data and other information received from the Contractor for any purpose other than the operation and maintenance of the Facilities, including procurement of future spares. Similarly, the Contractor shall not use such documents, data and other information received from the Employer for any purpose other than the design, procurement of Plant, construction or such other work and services as are required for the performance of the

Contract.

- 16.3 The obligation of a Party under GCC Sub-Clauses 16.1 and 16.2 above, however, shall not apply to that information which
- (a) now or hereafter enters the public domain through no fault of that Party
 - (b) can be proven to have been possessed by that Party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other Party hereto
 - (c) otherwise lawfully becomes available to that Party from a third Party that has no obligation of confidentiality.
- 16.4 The above provisions of this GCC Clause 16 shall not in any way modify any undertaking of confidentiality given by either of the Parties hereto prior to the date of the Contract in respect of the Facilities or any part thereof.
- 16.5 The provisions of this GCC Clause 16 shall survive termination, for whatever reason, of the Contract.

E. Execution of the Facilities

17. Representatives

17.1 Project Manager

If the Project Manager is not named in the Contract, then within fourteen (14) days of the Effective Date, the Employer shall appoint and notify the Contractor in writing of the name of the Project Manager. The Employer may from time to time appoint some other person as the Project Manager in place of the person previously so appointed, and shall give a notice of the name of such other person to the Contractor without delay. No such appointment shall be made at such a time or in such a manner as to impede the progress of work on the Facilities. Such appointment shall only take effect upon receipt of such notice by the Contractor. The Project Manager shall represent and act for the Employer at all times during the performance of the Contract. All notices,

instructions, orders, certificates, approvals and all other communications under the Contract shall be given by the Project Manager, except as herein otherwise provided.

17.2 Contractor's Representative & Construction Manager

17.2.1 If the Contractor's Representative is not named in the Contract, then within fourteen (14) days of the Effective Date, the Contractor shall appoint the Contractor's Representative and shall request the Employer in writing to approve the person so appointed. If the Employer makes no objection to the appointment within fourteen (14) days, the Contractor's Representative shall be deemed to have been approved. If the Employer objects to the appointment within fourteen (14) days giving the reason therefor, then the Contractor shall appoint a replacement within fourteen (14) days of such objection, and the foregoing provisions of this GCC Sub-Clause 17.2.1 shall apply thereto.

17.2.2 The Contractor's Representative shall represent and act for the Contractor at all times during the performance of the Contract and shall give to the Project Manager all the Contractor's notices, instructions, information and all other communications under the Contract.

All notices, instructions, information and all other communications given by the Employer or the Project Manager to the Contractor under the Contract shall be given to the Contractor's Representative or, in its absence, its deputy, except as herein otherwise provided.

The Contractor shall not revoke the appointment of the Contractor's Representative without the Employer's prior written consent, which shall not be unreasonably withheld. If the Employer consents thereto, the Contractor shall appoint some other person as the Contractor's Representative, pursuant to

the procedure set out in GCC Sub-Clause 17.2.1.

17.2.3 The Contractor's Representative may, subject to the approval of the Employer which shall not be unreasonably withheld, at any time delegate to any person any of the powers, functions and authorities vested in him or her. Any such delegation may be revoked at any time. Any such delegation or revocation shall be subject to a prior notice signed by the Contractor's Representative, and shall specify the powers, functions and authorities thereby delegated or revoked. No such delegation or revocation shall take effect unless and until a copy thereof has been delivered to the Employer and the Project Manager.

Any act or exercise by any person of powers, functions and authorities so delegated to him or her in accordance with this GCC Sub-Clause 17.2.3 shall be deemed to be an act or exercise by the Contractor's Representative.

17.2.4 From the commencement of installation of the Facilities at the Site until Completion, the Contractor's Representative shall appoint a suitable person as the Construction Manager. The Construction Manager shall supervise all work done at the Site by the Contractor and shall be present at the Site throughout normal working hours except when on leave, sick or absent for reasons connected with the proper performance of the Contract. Whenever the Construction Manager is absent from the Site, a suitable person shall be appointed to act as the Construction Manager's deputy.

17.2.5 The Employer may by notice to the Contractor object to any representative or person employed by the Contractor in the execution of the Contract who, in the reasonable opinion of the Employer, may behave inappropriately, may be incompetent or negligent, or may commit a serious breach of the Site regulations provided under GCC Sub-Clause 22.4. The Employer shall provide evidence of the same, whereupon the Contractor shall remove such person from the Facilities.

17.2.6 If any representative or person employed by the Contractor is removed in accordance with GCC

Sub-Clause 17.2.5, the Contractor shall, where required, promptly appoint a replacement at his own cost.

18. Work Program

18.1 Contractor's Organization

The Contractor shall supply to the Employer and the Project Manager a chart showing the proposed organization to be established by the Contractor for carrying out work on the Facilities within twenty-one (21) days of the Effective Date. The chart shall include the identities of the key personnel and the curricula vitae of such key personnel to be employed shall be supplied together with the chart. The Contractor shall promptly inform the Employer and the Project Manager in writing of any revision or alteration of such an organization chart.

18.2 Program of Performance

Within twenty-eight (28) days after the Effective Date, the Contractor shall submit to the Project Manager a detailed program of performance of the Contract, made in a form acceptable to the Project Manager and showing the sequence in which it proposes to design, manufacture, transport, assemble, install and precommission the Facilities, as well as the date by which the Contractor reasonably requires that the Employer shall have fulfilled its obligations under the Contract so as to enable the Contractor to execute the Contract in accordance with the program and to achieve Completion including Commissioning and Acceptance of the Facilities in accordance with the Contract. The program so submitted by the Contractor shall accord with the Time Schedule included in the Appendix to the Contract Agreement titled Time Schedule, and any other dates and periods specified in the Contract. The Contractor shall update and revise the program as and when appropriate or when required by the Project Manager, but without modification in the Times for Completion specified in the SCC pursuant to Sub-Clause 8.2 and any extension granted in accordance with GCC Clause 40, and shall submit all such revisions to the Project Manager.

18.3 Progress Report

The Contractor shall monitor progress of all the activities specified in the program referred to in GCC Sub-Clause 18.2 above, and supply a progress report to the Project Manager every month.

The progress report shall be in a form acceptable to the Project Manager and shall indicate: (a) percentage completion achieved compared with the planned percentage completion for each activity; and (b) where any activity is behind the program, giving comments and likely consequences and stating the corrective action being taken.

18.4 Progress of Performance

If at any time the Contractor's actual progress falls behind the program referred to in GCC Sub-Clause 18.2, or it becomes apparent that it will so fall behind, the Contractor shall, at the request of the Employer or the Project Manager, prepare and submit to the Project Manager a revised program, taking into account the prevailing circumstances, and shall notify the Project Manager of the steps being taken to expedite progress so as to attain Completion of the Facilities within the Time for Completion under GCC Sub-Clause 8.2, any extension thereof entitled under GCC Sub-Clause 40.1, or any extended period as may otherwise be agreed upon between the Employer and the Contractor.

18.5 Procedures

The Contract shall be executed in accordance with the Contract Documents including the procedures given in the Forms and Procedures of the Employer's Requirements.

The Contractor may execute the Contract in accordance with its own standard project execution plans and procedures to the extent that they do not conflict with the provisions contained in the Contract.

19. Subcontracting

19.1 The Appendix to the Contract Agreement titled List of Major Items of Plant and Installation Services and

List of Approved SubContractors, specifies major items of supply or services and a list of approved SubContractors against each item, including manufacturers. Insofar as no SubContractors are listed against any such item, the Contractor shall prepare a list of SubContractors for such item for inclusion in such list. The Contractor may from time to time propose any addition to or deletion from any such list. The Contractor shall submit any such list or any modification thereto to the Employer for its approval in sufficient time so as not to impede the progress of work on the Facilities. Such approval by the Employer for any of the SubContractors shall not relieve the Contractor from any of its obligations, duties or responsibilities under the Contract.

19.2 The Contractor shall select and employ its SubContractors for such major items from those listed in the lists referred to in GCC Sub-Clause 19.1.

19.3 For items or parts of the Facilities not specified in the Appendix to the Contract Agreement titled List of Major Items of Plant and Installation Services and List of Approved SubContractors, except when otherwise required as per the provisions of the Contract or instructions in writing by the Project Manager including the provisions if any specified in SCC, the Contractor may employ such SubContractors as it may select, at its discretion.

19.4 Each sub-contract shall include provisions which would entitle the Employer to require the sub-contract to be assigned to the Employer under GCC 19.5 (if and when applicable), or in event of termination by the Employer under GCC 42.2.

19.5 If a subContractor's obligations extend beyond the expiry date of the relevant Defects Liability Period and the Project Manager, prior to that date, instructs the Contractor to assign the benefits of such obligations to the Employer, then the Contractor shall do so.

20. Design and Engineering

13.1 Specifications and Drawings

13.1.1 The Contractor shall execute the basic and detailed design and the engineering work in compliance with the provisions of the Contract, or where not so

specified, in accordance with good engineering practice.

The Contractor shall be responsible for any discrepancies, errors or omissions in the specifications, drawings and other technical documents that it has prepared, whether such specifications, drawings and other documents have been approved by the Project Manager or not, provided that such discrepancies, errors or omissions are not because of inaccurate information furnished in writing to the Contractor by or on behalf of the Employer.

- 13.1.2 The Contractor shall be entitled to disclaim responsibility for any design, data, drawing, specification or other document, or any modification thereof provided or designated by or on behalf of the Employer, by giving a notice of such disclaimer to the Project Manager.

13.2 Codes and Standards

Wherever references are made in the Contract to codes and standards in accordance with which the Contract shall be executed, the edition or the revised version of such codes and standards current at the date twenty-eight (28) days prior to date of Bid submission shall apply unless otherwise specified. During Contract execution, any changes in such codes and standards shall be applied subject to approval by the Employer and shall be treated in accordance with GCC Clause 39.

13.3 Approval/Review of Technical Documents by Project Manager

- 20.3.1 The Contractor shall prepare or cause its SubContractors to prepare, and furnish to the Project Manager the documents listed in the Appendix to the Contract Agreement titled List of Documents for Approval or Review, or elsewhere in the Contract, for its approval or review as specified and in accordance with the requirements of GCC Sub-Clause 18.2 (Program of Performance).

Any part of the Facilities covered by or related

to the documents to be approved by the Project Manager shall be executed only after the Project Manager's approval thereof.

GCC Sub-Clauses 20.3.2 through 20.3.7 shall apply to those documents requiring the Project Manager's approval, but not to those furnished to the Project Manager for its review only.

20.3.2 Within fourteen (14) days after receipt by the Project Manager of any document requiring the Project Manager's approval in accordance with GCC Sub-Clause 20.3.1, the Project Manager shall either return one copy thereof to the Contractor with its approval endorsed thereon or shall notify the Contractor in writing of its disapproval thereof and the reasons therefor and the modifications that the Project Manager proposes.

20.3.3 The Project Manager shall not disapprove any document, except on the grounds that the document does not comply with the Contract or that it is contrary to good engineering practice.

20.3.4 If the Project Manager disapproves the document, the Contractor shall modify the document and resubmit it for the Project Manager's approval in accordance with GCC Sub-Clause 20.3.2. If the Project Manager approves the document subject to modification(s), the Contractor shall make the required modification(s), whereupon the document shall be deemed to have been approved.

20.3.5 If any dispute or difference occurs between the Employer and the Contractor in connection with or arising out of the disapproval by the Project Manager of any document and/or any modification(s) thereto that cannot be settled between the Parties within a reasonable period, then such dispute or difference may be referred for dispute resolution in accordance with GCC 46 hereof. If such dispute or difference is referred for dispute resolution in accordance

with GCC 46, the Project Manager shall give instructions as to whether and if so, how, performance of the Contract is to proceed. The Contractor shall proceed with the Contract in accordance with the Project Manager's instructions, provided that if the Contractor's view on the dispute has been upheld, then the Contractor shall be reimbursed by the Employer for any additional costs incurred by reason of such instructions and shall be relieved of such responsibility or liability in connection with the dispute and the execution of the instructions as may be decided under the applicable dispute resolution forum, and the Time for Completion shall be extended accordingly.

20.3.6 The Project Manager's approval, with or without modification of the document furnished by the Contractor, shall not relieve the Contractor of any responsibility or liability imposed upon it by any provisions of the Contract except to the extent that any subsequent failure results from modifications required by the Project Manager.

20.3.7 The Contractor shall not depart from any approved document unless the Contractor has first submitted to the Project Manager an amended document and obtained the Project Manager's approval thereof, pursuant to the provisions of this GCC Sub-Clause 20.3.

21. Procurement

14.1 Plant

The Contractor shall procure and transport all Plant in an expeditious and orderly manner to the Site.

14.2 Employer-Supplied Plant

If the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer, provides that the Employer shall furnish any specific items to the Contractor, the following provisions shall apply:

- 14.2.1 The Employer shall, at its own risk and expense, transport each item to the place on or near the Site as agreed upon by the Parties and make such item available to the Contractor at the time specified in the program furnished by the Contractor, pursuant to GCC Sub-Clause 18.2, unless otherwise mutually agreed.
- 14.2.2 Upon receipt of such item, the Contractor shall inspect the same visually and notify the Project Manager of any detected shortage, defect or default. The Employer shall immediately remedy any shortage, defect or default, or the Contractor shall, if practicable and possible, at the request of the Employer, remedy such shortage, defect or default at the Employer's cost and expense. After inspection, such item shall fall under the care, custody and control of the Contractor. The provision of this GCC Sub-Clause 21.2.2 shall apply to any item supplied to remedy any such shortage or default or to substitute for any defective item, or shall apply to defective items that have been repaired.
- 21.2.3 The foregoing responsibilities of the Contractor and its obligations of care, custody and control shall not relieve the Employer of liability for any undetected shortage, defect or default, nor place the Contractor under any liability for any such shortage, defect or default whether under GCC Clause 27 or under any other provision of Contract.

21.3 Transportation

- 21.3.1 The Contractor shall at its own risk and expense transport all the materials and the Contractor's Equipment to the Site by the mode of transport that the Contractor judges most suitable under all the circumstances.
- 21.3.2 Unless otherwise provided in the Contract, the Contractor shall be entitled to select any safe mode of transport operated by any person to carry the materials and the Contractor's Equipment.

21.3.3 Upon dispatch of each shipment of materials and the Contractor's Equipment, the Contractor shall notify the Employer by telex, cable, facsimile or electronic means, of the description of the materials and of the Contractor's Equipment, the point and means of dispatch, and the estimated time and point of arrival at the Site. The Contractor shall furnish the Employer with relevant documents to be agreed upon between the Parties.

21.3.4 The Contractor shall be responsible for obtaining, if necessary, approvals from the authorities for transportation of the materials and the Contractor's Equipment to the Site. The Employer shall use its best endeavors in a timely and expeditious manner to assist the Contractor in obtaining such approvals, if requested by the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any claim for damage to roads, bridges or any other traffic facilities that may be caused by the transport of the materials and the Contractor's Equipment to the Site.

21.4 Customs Clearance

The Contractor shall, at its own expense, handle and be responsible and liable for all imported materials and Contractor's Equipment including Customs clearance and shall handle any formalities for the same, provided that if applicable laws or regulations require any application or act to be made by or in the name of the Employer, the Employer if considered fit and appropriate, may take such steps to comply with such requirement as the Employer may consider necessary, without bearing any responsibility or liability for the same.

22. Installation

22.1 Setting Out/Supervision

22.1.1 Bench Mark: The Contractor shall be responsible for the true and proper setting-out of the Facilities in relation to bench marks, reference marks and lines provided to it in

writing by or on behalf of the Employer.

If, at any time during the progress of installation of the Facilities, any error shall appear in the position, level or alignment of the Facilities, the Contractor shall forthwith notify the Project Manager of such error and, at its own expense, immediately rectify such error to the reasonable satisfaction of the Project Manager. If such error is based on incorrect data provided in writing by or on behalf of the Employer, the expense of rectifying the same shall be borne by the Employer.

22.1.2 Contractor's Supervision: The Contractor shall give or provide all necessary superintendence during the installation of the Facilities, and the Construction Manager or its deputy shall be constantly on the Site to provide full-time superintendence of the installation. The Contractor shall provide and employ only technical personnel who are skilled and experienced in their respective callings and supervisory staff who are competent to adequately supervise the work at hand.

22.2 Labor:

22.2.1 Engagement of Staff and Labor

Except as otherwise stated in the Specification, the Contractor shall make arrangements for the engagement of all staff and labor, local or otherwise, and for their payment, housing, feeding and transport.

The Contractor shall provide and employ on the Site in the installation of the Facilities such skilled, semi-skilled and unskilled labor as is necessary for the proper and timely execution of the Contract. The Contractor is encouraged to use local labor that has the necessary skills.

The Contractor shall be responsible for obtaining all necessary permit(s) and/or

permissions(s) from the appropriate authorities for the entry of all labor and personnel to be employed on the Site. The Employer will, if requested by the Contractor, use his best endeavors in a timely and expeditious manner to assist the Contractor in obtaining any local, state, national or government permission required for bringing in the Contractor's personnel.

The Contractor shall at its own expense provide the means of repatriation to all of its and its SubContractor's personnel employed on the Contract at the Site to the place where they were recruited or to their domicile. It shall also provide suitable temporary maintenance of all such persons from the cessation of their employment on the Contract to the date programmed for their departure. In the event that the Contractor defaults in providing such means of transportation and temporary maintenance, the Employer may provide the same to such personnel and recover the cost of doing so from the Contractor.

22.2.2 Persons in the Service of Employer

The Contractor shall not recruit, or attempt to recruit, staff and labor from amongst the Employer's Personnel.

22.2.3 Labor Laws

The Contractor shall comply with all the relevant labor Laws applicable to the Contractor's Personnel, including Laws relating to their employment, health, safety, welfare, immigration and emigration, and shall allow them all their legal rights.

The Contractor shall at all times during the progress of the Contract use its best endeavors to prevent any unlawful, riotous or disorderly conduct or behavior by or amongst its employees and the labor of its Subcontractors

The Contractor shall, in all dealings with its labor and the labor of its SubContractors currently employed on or connected with the Contract, pay due regard to all recognized festivals, official holidays, religious or other customs and all local laws and regulations pertaining to the employment of labor.

22.2.4 Rates of Wages and Conditions of Labor

The Contractor shall pay rates of wages, and observe conditions of labor, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose trade or industry is similar to that of the Contractor.

The Contractor shall inform the Contractor's Personnel about their liability to pay personal income taxes in the Country in respect of such of their salaries, wages and allowances as are chargeable under the Laws for the time being in force, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such Laws.

22.2.5 Working Hours

Normally, work may not be carried out on the Site on locally recognized days of rest, or outside the normal working hours, unless:

- (a) otherwise stated in the Contract,
- (b) the Project Manager gives consent, or
- (c) the work is unavoidable, or necessary for the protection of life or property or for the safety of the Works, in which case the Contractor shall immediately advise the Project Manager.

If and when the Contractor considers it necessary to carry out work at night or on public

holidays so as to meet the Time for Completion and requests the Project Manager's consent thereto, the Project Manager shall not unreasonably withhold such consent.

This Sub-Clause shall not apply to any work which is customarily carried out by rotary or double-shifts.

22.2.6 Facilities for Staff and Labor

Except as otherwise stated in the Specification, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel. The Contractor shall also provide facilities for the Employer's Personnel if and as stated in the Specification.

The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.

22.2.7 Health and Safety

The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel. In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay and other services are available at all times at the Site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.

The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the performance of the Contract, the Contractor

shall provide whatever is required by this person to exercise this responsibility and authority.

The Contractor shall send to the Project Manager, details of any accident as soon as practicable after its occurrence. The Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Project Manager may reasonably require.

The Contractor shall throughout the contract (including the Defects Notification Period): (i) conduct Information, Education and Consultation Communication (IEC) campaigns, as per guidelines of concerned local, state or government authorities, addressed to all the Site staff and labor (including all the Contractor's employees, all SubContractors, and all truck drivers and crew making deliveries to Site for construction activities) and to the immediate local communities, concerning the risks, dangers and impact, and appropriate avoidance behavior with respect to of risks of various transmittable diseases, epidemic etc.

22.2.8 Funeral Arrangements

In the event of the death of any of the Contractor's personnel or accompanying members of their families, the Contractor shall be responsible for making the appropriate arrangements for their return or burial, unless otherwise specified in the SCC.

22.2.9 Records of Contractor's Personnel

The Contractor shall keep accurate records of the Contractor's personnel, including the number of each class of Contractor's Personnel on the Site and the names, ages, genders, hours worked and wages paid to all workers. These records shall be available for inspection by the Project Manager until the Contractor has completed all work.

22.2.10 Supply of Water

The Contractor shall, having regard to local conditions, provide on the Site an adequate supply of drinking and

22.2.11 Prohibition of All Forms of Forced or Compulsory Labor

The Contractor shall not employ “forced or compulsory labor” in any form. “Forced or compulsory labor” consists of all work or service, not voluntarily performed, that is extracted from an individual under threat of force or penalty.

22.2.12 Prohibition of Harmful Child Labor

The Contractor shall not employ any child to perform any work that is economically exploitative, or is likely to be hazardous to, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development, as may be required as per the applicable laws.

22.3 Contractor's Equipment

22.3.1 All Contractor's Equipment brought by the Contractor onto the Site shall be deemed to be intended to be used exclusively for the execution of the Contract. The Contractor shall not remove the same from the Site without the Project Manager's consent that such Contractor's Equipment is no longer required for the execution of the Contract.

22.3.2 Unless otherwise specified in the Contract, upon completion of the Facilities, the Contractor shall remove from the Site all Equipment brought by the Contractor onto the Site and any surplus materials remaining thereon.

22.3.3 The Employer will, if requested, use its best endeavors to assist the Contractor in obtaining any local, state or national government permission required by the Contractor for

removal of the equipment from Site, which was brought to Site by the Contractor for use in the execution of the Contract that is no longer required for the execution of the Contract.

22.4 Site Regulations and Safety

The Employer and the Contractor shall establish Site regulations setting out the rules to be observed in the execution of the Contract at the Site and shall comply therewith. The Contractor shall prepare and submit to the Employer, with a copy to the Project Manager, proposed Site regulations for the Employer's approval, which approval shall not be unreasonably withheld.

Such Site regulations shall include, but shall not be limited to, rules in respect of security, safety of the Facilities, gate control, sanitation, medical care, and fire prevention.

22.5 Opportunities for Other Contractors

22.5.1 The Contractor shall, upon written request from the Employer or the Project Manager, give all reasonable opportunities for carrying out the work to any other Contractors employed by the Employer on or near the Site.

22.5.2 If the Contractor, upon written request from the Employer or the Project Manager, makes available to other Contractors any roads or ways the maintenance for which the Contractor is responsible, permits the use by such other Contractors of the Contractor's Equipment, or provides any other service of whatsoever nature for such other Contractors, the Employer shall fully compensate the Contractor for any loss or damage caused or occasioned by such other Contractors in respect of any such use or service, and shall pay to the Contractor reasonable remuneration for the use of such equipment or the provision of such services.

22.5.3 The Contractor shall also so arrange to

perform its work as to minimize, to the extent possible, interference with the work of other Contractors. The Project Manager shall determine the resolution of any difference or conflict that may arise between the Contractor and other Contractors and the workers of the Employer in regard to their work.

22.5.4 The Contractor shall notify the Project Manager promptly of any defects in the other Contractors' work that come to its notice, and that could affect the Contractor's work. The Project Manager shall determine the corrective measures, if any, required to rectify the situation after inspection of the Facilities. Decisions made by the Project Manager shall be binding on the Contractor.

22.6 Emergency Work

If, by reason of an emergency arising in connection with and during the execution of the Contract, any protective or remedial work is necessary as a matter of urgency to prevent damage to the Facilities, the Contractor shall immediately carry out such work.

If the Contractor is unable or unwilling to do such work immediately, the Employer may do or cause such work to be done as the Employer may determine is necessary in order to prevent damage to the Facilities. In such event the Employer shall, as soon as practicable after the occurrence of any such emergency, notify the Contractor in writing of such emergency, the work done and the reasons therefor. If the work done or caused to be done by the Employer is work that the Contractor was liable to do at its own expense under the Contract, the reasonable costs incurred by the Employer in connection therewith shall be paid by the Contractor to the Employer. Otherwise, the cost of such remedial work shall be borne by the Employer.

22.7 Site Clearance

22.7.1 Site Clearance in Course of Performance: In the course of carrying out the Contract, the Contractor shall keep the Site reasonably free

from all unnecessary obstruction, store or remove any surplus materials, clear away any wreckage, rubbish or temporary works from the Site, and remove any Contractor's Equipment no longer required for execution of the Contract.

22.7.2 Clearance of Site after Completion: After Completion of all parts of the Facilities, the Contractor shall clear away and remove all wreckage, rubbish and debris of any kind from the Site, and shall leave the Site and Facilities in a clean and safe condition.

22.8 Watching and Lighting

The Contractor shall provide and maintain at its own expense all lighting, fencing, and watching when and where necessary for the proper execution and the protection of the Facilities, or for the safety of the owners and occupiers of adjacent property and for the safety of the public.

23. Test and Inspection

23.1 The Contractor shall at its own expense carry out at the place of manufacture and/or on the Site all such tests and/or inspections of the Plant and any part of the Facilities as are specified in the Contract.

23.2 The Employer and the Project Manager or their designated representatives shall be entitled to attend the aforesaid test and/or inspection, provided that the Employer shall bear all costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses.

23.3 Whenever the Contractor is ready to carry out any such test and/or inspection, the Contractor shall give a reasonable advance notice of such test and/or inspection and of the place and time thereof to the Project Manager. The Contractor shall obtain from any relevant third Party or manufacturer any necessary permission or consent to enable the Employer and the Project Manager or their designated representatives to attend the test and/or inspection.

23.4 The Contractor shall provide the Project Manager

with a certified report of the results of any such test and/or inspection.

If the Employer or Project Manager or their designated representatives fails to attend the test and/or inspection, or if it is agreed between the Parties that such persons shall not do so, then the Contractor may proceed with the test and/or inspection in the absence of such persons, and may provide the Project Manager with a certified report of the results thereof.

- 23.5 The Project Manager may require the Contractor to carry out any test and/or inspection not required by the Contract, provided that the Contractor's reasonable costs and expenses incurred in the carrying out of such test and/or inspection shall be added to the Contract Price. Further, if such test and/or inspection impede the progress of work on the Facilities and/or the Contractor's performance of its other obligations under the Contract, due allowance will be made in respect of the Time for Completion and the other obligations so affected.
- 23.6 If any Plant or any part of the Facilities fails to pass any test and/or inspection, the Contractor shall either rectify or replace such Plant or part of the Facilities and shall repeat the test and/or inspection upon giving a notice under GCC Sub-Clause 23.3.
- 23.7 If any dispute or difference of opinion shall arise between the Parties in connection with or arising out of the test and/or inspection of the Plant or part of the Facilities that cannot be settled between the Parties within a reasonable period of time, it may be referred for settlement of dispute in accordance with GCC Clause 46.
- 23.8 The Contractor shall afford the Employer and the Project Manager, at the Employer's expense, access at any reasonable time to any place where the Plant are being manufactured or the Facilities are being installed, in order to inspect the progress and the manner of manufacture or installation, provided that the Project Manager shall give the Contractor a reasonable prior notice.
- 23.9 The Contractor agrees that neither the execution of a

test and/or inspection of Plant or any part of the Facilities, nor the attendance by the Employer or the Project Manager, nor the issue of any test certificate pursuant to GCC Sub-Clause 23.4, shall release the Contractor from any other responsibilities under the Contract.

23.10 No part of the Facilities or foundations shall be covered up on the Site without the Contractor carrying out any test and/or inspection required under the Contract. The Contractor shall give a reasonable notice to the Project Manager whenever any such parts of the Facilities or foundations are ready or about to be ready for test and/or inspection; such test and/or inspection and notice thereof shall be subject to the requirements of the Contract.

23.11 The Contractor shall uncover any part of the Facilities or foundations, or shall make openings in or through the same as the Project Manager may from time to time require at the Site, and shall reinstate and make good such part or parts.

If any parts of the Facilities or foundations have been covered up at the Site after compliance with the requirement of GCC Sub-Clause 23.10 and are found to be executed in accordance with the Contract, the expenses of uncovering, making openings in or through, reinstating, and making good the same shall be borne by the Employer, and the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been delayed or impeded in the performance of any of its obligations under the Contract.

The Employer/Nodal agency/ Third part inspecting agency may also deploy mobile vans with Testing facility to test the plants and facilities by selecting random samples from store or from site. In such a case if the material/ facility fails, the same shall be replaced with new material, and one more random sample would be selected from the same batch for testing. If the material fails the test again, then the whole lot shall be replaced by the Contractor at its own risk and cost.

**24. Precommissioning,
Commissioning,
Guarantee Tests and
Completion of the
Facilities****24.1 Pre- Commissioning**

24.1.1 As soon as the Facilities or any part thereof have, in the opinion of the Contractor/Bidder, been completed operationally and structurally and put in a tight and clean condition as specified in the Employer's Requirements, excluding minor items not materially affecting the operation or safety of the Facilities, the Contractor/Bidder shall so notify the Employer in writing.

24.1.2 Within seven (7) days after receipt of the notice from the Contractor/Bidder under GCC Sub-Clause 24.1.1, the Employer shall supply the operating and maintenance personnel specified in the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer for Precommissioning of the Facilities or any part thereof.

Pursuant to the Appendix to the Contract Agreement titled Scope of Works and Supply by the Employer, the Employer shall also provide, within the said seven (7) day period, the utilities, facilities, services and other matters required for Precommissioning of the Facilities or any part thereof.

24.1.3 As soon as reasonably practicable after the operating and maintenance personnel have been supplied by the Employer and the utilities, facilities, services and other matters have been provided by the Employer in accordance with GCC Sub-Clause 24.1.2, the Contractor shall commence Precommissioning of the Facilities or the relevant part thereof in preparation for Commissioning, subject to GCC Sub-Clause 24.8.

24.1.4 As soon as all works in respect of Precommissioning are completed and, in the opinion of the Contractor, the Facilities or any part thereof are ready for Commissioning, the Contractor/Bidder shall so notify the Project Manager in writing.

24.1.5 The Project Manager, within fourteen (14) days after receipt of the Contractor's notice under GCC Sub-

Clause 24.1.4, either intimate in writing to commence Commissioning, or notify the defects and/or deficiencies to be rectified/ corrected by the Contractor pending which Commissioning cannot be commenced.

24.1.6 If the Project Manager notifies the Contractor of any defects and/or deficiencies, the Contractor shall then correct/ rectify such defects and/or deficiencies, and shall repeat the procedure described in GCC Sub-Clause 24.1.4.

24.1.7 If the Project Manager is satisfied that the Facilities or that part thereof are ready for Commissioning, the Project Manager shall, within seven (7) days after receipt of the Contractor's repeated notice, issue a communication in writing to the Contractor to commence Commissioning.

If the Project Manager is not so satisfied, then it shall notify the Contractor in writing of any defects and/or deficiencies within seven (7) days after receipt of the Contractor's repeated notice, and the above procedure shall be repeated.

24.1.8 If the Project Manager fails to issue any written communication/ intimation to the Contractor, and fails to inform the Contractor of any defects and/or deficiencies within fourteen (14) days after receipt of the Contractor's notice under GCC Sub-Clause 24.4.1 or within seven (7) days after receipt of the Contractor's repeated notice, then the Facilities or that part thereof shall be deemed to be ready for Commissioning as on expiry of the 14 days/ 7 days period as aforesaid, as the case may be.

24.2 Commissioning

24.2.1 Commissioning of the Facilities or any part thereof shall be commenced by the Contractor immediately after issue of the written intimation for the same by the Project Manager.

24.2.2 The Employer shall supply the operating and maintenance personnel and all utilities, facilities, services and other matters required for Commissioning.

24.2.3 In accordance with the requirements of the Contract, the Contractor's and Project Manager's advisory personnel shall attend the Commissioning, including the Guarantee Test, and shall advise and assist the Employer.

24.3 Guarantee Test

24.3.1 Subject to GCC Sub-Clause 24.8, the Guarantee Test and repeats thereof shall be conducted by the Contractor during Commissioning of the Facilities or the relevant part thereof to ascertain whether the Facilities or the relevant part can attain the Functional Guarantees specified in the Appendix to the Contract Agreement titled Functional Guarantees. The Employer shall promptly provide the Contractor with such information as the Contractor may reasonably require in relation to the conduct and results of the Guarantee Test and any repeats thereof.

24.4 Completion

24.4.1 As soon as all works in respect of Precommissioning, Commissioning, Guarantee Tests and geo-tagging of the assets on GIS portal, are completed in the opinion of the Contractor, the Facilities or any part thereof have achieved Completion, the Contractor shall so notify the Project Manager in writing.

24.4.2 The Project Manager shall, within fourteen (14) days after receipt of the Contractor's notice under GCC Sub-Clause 24.4.1, either issue a Completion Certificate in the form specified in the Section 8, stating that the Facilities or that part thereof have reached Completion as of the date of the Contractor's notice under GCC Sub-Clause 24.4.1, or notify the Contractor in writing of any defects and/or deficiencies.

24.4.3 If the Project Manager notifies the Contractor of any defects and/or deficiencies, the Contractor shall then correct such defects and/or deficiencies, and shall repeat the procedure described in GCC Sub-Clause 24.4.1.

- 24.4.4 If the Project Manager is satisfied that the Facilities or that part thereof have reached Completion, the Project Manager shall, within seven (7) days after receipt of the Contractor's repeated notice, issue a Completion Certificate stating that the Facilities or that part thereof have reached Completion as of the date of the Contractor's repeated notice.

If the Project Manager is not so satisfied, then it shall notify the Contractor in writing of any defects and/or deficiencies within seven (7) days after receipt of the Contractor's repeated notice, and the above procedure shall be repeated.

- 24.4.5 If the Project Manager fails to issue the Completion Certificate and fails to inform the Contractor of any defects and/or deficiencies within fourteen (14) days after receipt of the Contractor's notice under GCC Sub-Clause 24.4.1 or within seven (7) days after receipt of the Contractor's repeated notice under GCC Sub-Clause 24.4.4, or if the Employer makes use of the Facilities or part thereof, then the Facilities or that part thereof shall be deemed to have reached Completion as of the date of the Contractor's notice or repeated notice, or as of the Employer's use of the Facilities, as the case may be. The Contractor shall accordingly issue written communication/ intimation on the same to the Project Manager.

- 24.5 As soon as possible after Completion, the Contractor shall complete all outstanding minor items so that the Facilities are fully in accordance with the requirements of the Contract, failing which the Employer will undertake such completion and deduct the costs thereof from any monies owing to the Contractor.

- 24.6 Upon Completion, the Employer shall be responsible for the care and custody of the Facilities or the relevant part thereof, together with the risk of loss or damage thereto, and shall thereafter take over the Facilities or the relevant part thereof.

24.7 Partial Acceptance

- 24.7.1 If the Contract specifies that Commissioning

and Completion shall be carried out in respect of parts of the Facilities, the provisions relating to Commissioning and Completion including the Guarantee Test shall apply to each such part of the Facilities individually, and the Completion Certificate shall be issued accordingly for each such part of the Facilities.

24.8 Delayed Precommissioning, Commissioning and/or Guarantee Test

24.8.1 In the event that the Contractor is unable to proceed with the Precommissioning of the Facilities pursuant to GCC Sub-Clause 24.1, or with the Commissioning/Guarantee Test pursuant to GCC Sub-Clause 24.2/ 24.3, for reasons attributable to the Employer either on account of non availability of other facilities under the responsibilities of other Contractor(s), or for reasons beyond the Contractor's control, the provisions leading to "deemed" completion of activities such as Completion, pursuant to GCC Sub-Clause 24.4, and Operational Acceptance, pursuant to GCC Sub-Clause 25, and Contractor's obligations regarding Defect Liability Period, pursuant to GCC Sub-Clause 27.2, Functional Guarantee, pursuant to GCC Clause 28, and Care of Facilities, pursuant to GCC Clause 32, and GCC Clause 41.1, Suspension, shall not apply. In this case, the following provisions shall apply.

24.8.2 When the Contractor is notified by the Project Manager that he will be unable to proceed with the activities and obligations pursuant to above Sub-Clause 24.8.1, the Contractor shall be entitled to the following:

- (a) the Time of Completion shall be extended for the period of suspension without imposition of liquidated damages pursuant to GCC Sub-Clause 26.2;

- (b) payments due to the Contractor in accordance with the provision specified in the Appendix to the Contract Agreement titled Terms and Procedures of Payment, which would not have been payable in normal circumstances due to non-completion of the subject activities, shall be released to the Contractor against submission of a security in the form of a bank guarantee of equivalent amount acceptable to the Employer, and which shall become null and void when the Contractor will have complied with its obligations regarding those payments, subject to the provision of Sub-Clause 24.8.3 below;
- (c) the expenses towards the above security and extension of other securities under the contract, of which validity needs to be extended, shall be reimbursed to the Contractor by the Employer;
- (d) the additional charges towards the care of the Facilities pursuant to GCC Sub-Clause 32.1 shall be reimbursed to the Contractor by the Employer for the period between the notification mentioned above and the notification mentioned in Sub-Clause 24.8.4 below. The provision of GCC Sub-Clause 33.2 shall apply to the Facilities during the same period.

24.8.3 In the event that the period of suspension under above Sub-Clause 24.8.1 actually exceeds one hundred eighty (180) days, the Employer and Contractor shall mutually agree to any additional compensation payable to the Contractor.

24.8.4 When the Contractor is notified by the Project Manager that the plant is ready for Precommissioning/ Commissioning/ Guarantee Tests, the Contractor shall proceed without delay in performing Precommissioning, Commissioning, Guarantee Tests and achieving Completion in

accordance with GCC Clause 24.

25. Operational Acceptance

25.1 Operational Acceptance

25.1.1 Subject to GCC Sub-Clause 24.7, Operational Acceptance shall occur in respect of the Facilities or any part thereof when

- (a) the Guarantee Test has been successfully completed and the Functional Guarantees are met; or
- (b) the Contractor has paid the liquidated damages specified in GCC Sub-Clause 28.3 hereof; and
- (c) any minor items mentioned in GCC Sub-Clause 24.5 hereof relevant to the Facilities or that part thereof have been completed.

25.1.2 In case if the requirements of GCC 25.1.1 have been complied upon or before achieving the Completion, Operational Acceptance shall be deemed to have occurred upon Completion. In case if the requirements of GCC 25.1.1 have been not been complied upon on or before achieving the Completion, at any time after the same are complied, the Contractor may give a notice to the Project Manager requesting the issue of an Operational Acceptance Certificate in respect of the Facilities or the part thereof specified in such notice as of the date of such notice.

25.3.3 The Project Manager shall, after consultation with the Employer, and within seven (7) days after receipt of the Contractor's notice, issue an Operational Acceptance Certificate.

25.3.4 If within seven (7) days after receipt of the Contractor's notice, the Project Manager fails to issue the Operational Acceptance Certificate or fails to inform the Contractor in writing of the justifiable reasons why the Project Manager has not issued the Operational Acceptance Certificate, the Facilities or the relevant part thereof shall be deemed to have

been accepted as of the date of the Contractor's said notice. The Contract shall intimate the same to the Project Manager through awritten communication/intimation.

F. Guarantees and Liabilities

26. Completion Time Guarantee

26.1 The Contractor guarantees that it shall attain Completion of the Facilities (or a part for which a separate time for completion is specified) within the Time for Completion specified in the SCC pursuant to GCC Sub-Clause 8.2, or within such extended time to which the Contractor shall be entitled under GCC Clause 40 hereof.

26.2 If the Contractor fails to attain Completion of the Facilities or any part thereof within the Time for Completion or any extension thereof under GCC Clause 40, the Contractor shall pay to the Employer liquidated damages in the amount specified in the SCC as a percentage rate of the Contract Price or the relevant part thereof. The aggregate amount of such liquidated damages shall in no event exceed the amount specified as "Maximum" in the SCC as a percentage rate of the Contract Price. Once the "Maximum" is reached, the Employer may consider termination of the Contract, pursuant to GCC Sub-Clause 42.2.2.

Such payment shall completely satisfy the Contractor's obligation to attain Completion of the Facilities or the relevant part thereof within the Time for Completion or any extension thereof under GCC Clause 40. The Contractor shall have no further liability whatsoever to the Employer in respect thereof.

However, the payment of liquidated damages shall not in any way relieve the Contractor from any of its obligations to complete the Facilities or from any other obligations and liabilities of the Contractor under the Contract.

Save for liquidated damages payable under this GCC Sub-Clause 26.2, the failure by the Contractor to attain any milestone or other act, matter or thing by any date

specified in the Appendix to the Contract Agreement titled Time Schedule, and/or other program of work prepared pursuant to GCC Sub-Clause 18.2 shall not render the Contractor liable for any loss or damage thereby suffered by the Employer.

27. Defect Liability

25.2 The Contractor warrants that the Facilities or any part thereof shall be free from defects in the design, engineering, materials and workmanship of the Plant supplied and of the work executed. Further, in addition to the provisions contained herein, the provisions, if any, specified in SCC shall also apply.

27.2 The Defect Liability Period shall be Twelve (12) month from the date of Completion of the Facilities (or any part thereof) unless specified otherwise in the SCC pursuant to GCC Sub-Clause 27.10, and the duration of every extension applicable (as per GCC 27.8) should be same as the duration of the defect liability period above. The aggregate value of all extensions will be subject to the maximum extension permissible (as per GCC 27.8).

If during the Defect Liability Period any defect should be found in the design, engineering, materials and workmanship of the Plant supplied or of the Installation Services/ work executed by the Contractor, the Contractor shall promptly, in consultation and agreement with the Employer regarding appropriate remedying of the defects, and at its own cost, repair, replace or otherwise make good such defect as well as any damage to the Facilities caused by such defect, to the satisfaction of the Employer. The Contractor shall not be responsible for the repair, replacement or making good of any defect or of any damage to the Facilities arising out of or resulting from any of the following causes:

- (a) improper operation or maintenance of the Facilities by the Employer;
- (b) operation of the Facilities outside specifications

provided in the Contract; or

- (c) normal wear and tear.

27.3 The Contractor's obligations under this GCC Clause 27 shall not apply to:

- (a) any materials that are supplied by the Employer under GCC Sub-Clause 21.2, are normally consumed in operation, or have a normal life shorter than the Defect Liability Period stated herein;
- (b) any designs, specifications or other data designed, supplied or specified by or on behalf of the Employer or any matters for which the Contractor has disclaimed responsibility herein; or
- (c) any other materials supplied or any other work executed by or on behalf of the Employer, except for the work executed by the Employer under GCC Sub-Clause 27.7.

27.4 The Employer shall give the Contractor a notice stating the nature of any such defect together with all available evidence thereof, promptly following the discovery thereof. The Employer shall afford all reasonable opportunity for the Contractor to inspect any such defect.

27.5 The Employer shall afford the Contractor all necessary access to the Facilities and the Site to enable the Contractor to perform its obligations under this GCC Clause 27.

The Contractor may, with the consent of the Employer, remove from the Site any Plant or any part of the Facilities that are defective if the nature of the defect, and/or any damage to the Facilities caused by the defect, is such that repairs cannot be expeditiously carried out at the Site.

27.6 If the repair, replacement or making good is of such a character that it may affect the efficiency of the Facilities or any part thereof, the Employer may give to the Contractor a notice requiring that tests of the defective part of the Facilities shall be made by the

Contractor immediately upon completion of such remedial work, whereupon the Contractor shall carry out such tests.

If such part fails the tests, the Contractor shall carry out further repair, replacement or making good, as the case may be, until that part of the Facilities passes such tests. The tests shall be agreed upon by the Employer and the Contractor.

27.7 If the Contractor fails to commence the work necessary to remedy such defect or any damage to the Facilities caused by such defect within a reasonable time (which shall in no event be considered to be less than fifteen (15) days), the Employer may, following notice to the Contractor, proceed to do such work, and the reasonable costs incurred by the Employer in connection therewith shall be paid to the Employer by the Contractor or may be deducted by the Employer from any monies due the Contractor or claimed under the Performance Security.

27.8 If the Facilities or any part thereof cannot be used by reason of such defect and/or making good of such defect, the Defect Liability Period of the Facilities or such part, as the case may be, shall be extended by a period equal to the period during which the Facilities or such part cannot be used by the Employer because of any of the aforesaid reasons.

Upon correction of the defects in the Facilities or any part thereof by repair/replacement, the repaired/ replaced item(s) shall have the Defect Liability Period extended by a period mentioned in GCC Sub-Clause 27.2 from the time of such replacement/repair of the facilities or any part thereof. However, such extension of Defect Liability Period, in aggregate, shall, not exceed the period specified in SCC.

27.8.1 At the end of the Defect Liability Period, the Contractor's Liability ceases except for latent defects. The Contractor's liability for latent defects warranty shall be limited to period specified in SCC, reckoned from the end of Defect Liability Period including extension thereof. For the purpose of this clause, the latent defects shall be the defects inherently lying within the material or arising out of design deficiency, which do not manifest themselves during the Defect Liability Period

defined in this GCC Clause 27, but later. The bidder should submit an undertaking in non-judicial stamp paper (Rs.100/-) for providing Latent Defect Coverage support warranty against each equipments and it shall be limited to period specified in SCC/Technical Specifications, reckoned from the end of defect liability period including extension thereof and the related format is enclosed herewith.

27.9 Except as provided in GCC Clauses 27 and 33, the Contractor shall be under no liability whatsoever and howsoever arising, and whether under the Contract or at law, in respect of defects in the Facilities or any part thereof, the Plant, design or engineering or work executed that appear after Completion of the Facilities or any part thereof, except where such defects are the result of the gross negligence, fraud, or criminal or willful action of the Contractor.

27.10 In addition, any such component of the Facilities, and during the period of time as may be specified in the SCC, shall be subject to an extended defect liability period. Such obligation of the Contractor shall be in addition to the defect liability period specified under GCC Sub-Clause 27.2.

28. Functional Guarantees

28.1 The Contractor guarantees that during the Guarantee Test, the Facilities and all parts thereof shall attain the Functional Guarantees specified in the Appendix to the Contract Agreement titled Functional Guarantees, subject to and upon the conditions therein specified.

28.2 If, for reasons attributable to the Contractor, the minimum level of the Functional Guarantees specified in the Appendix to the Contract Agreement titled Functional Guarantees, are not met either in whole or in part, the Contractor shall at its cost and expense make such changes, modifications and/or additions to the Plant or any part thereof as may be necessary to meet at least the minimum level of such Guarantees. The Contractor shall notify the Employer upon completion of the necessary changes, modifications and/or additions, and shall request the Employer to repeat the Guarantee Test until the minimum level of the Guarantees has been met. If the

Contractor eventually fails to meet the minimum level of Functional Guarantees, the Employer may consider termination of the Contract, pursuant to GCC Sub-Clause 42.2.2 subject to all other actions as deemed fit by the Employer including but not limited to legal recourse

28.3 If, for reasons attributable to the Contractor, the Functional Guarantees specified in the Appendix to the Contract Agreement titled Functional Guarantees, are not attained either in whole or in part, but the minimum level of the Functional Guarantees specified in the said Appendix to the Contract Agreement is met, the Contractor shall, at the Contractor's option, either

- (a) make such changes, modifications and/or additions to the Facilities or any part thereof that are necessary to attain the Functional Guarantees at its cost and expense, and shall request the Employer to repeat the Guarantee Test or
- (b) pay liquidated damages to the Employer in respect of the failure to meet the Functional Guarantees in accordance with the provisions in the Appendix to the Contract Agreement titled Functional Guarantees.

28.4 The payment of liquidated damages under GCC Sub-Clause 28.3, up to the limitation of liability specified in the Appendix to the Contract Agreement titled Functional Guarantees, shall completely satisfy the Contractor's guarantees under GCC Sub-Clause 28.3, and the Contractor shall have no further liability whatsoever to the Employer in respect thereof. Upon the payment of such liquidated damages by the Contractor, the Project Manager shall issue the Operational Acceptance Certificate for the Facilities or any part thereof in respect of which the liquidated damages have been so paid.

29. Patent Indemnity

29.1 The Contractor shall, subject to the Employer's compliance with GCC Sub-Clause 29.2, indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, which the

Employer may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Contract by reason of: (a) the installation of the Facilities by the Contractor or the use of the Facilities in the country where the Site is located; and (b) the sale of the products produced by the Facilities in any country.

Such indemnity shall not cover any use of the Facilities or any part thereof other than for the purpose indicated by or to be reasonably inferred from the Contract, any infringement resulting from the use of the Facilities or any part thereof, or any products produced thereby in association or combination with any other equipment, plant or materials not supplied by the Contractor, pursuant to the Contract Agreement.

- 29.2 If any proceedings are brought or any claim is made against the Employer arising out of the matters referred to in GCC Sub-Clause 29.1, the Employer shall promptly give the Contractor a notice thereof, and the Contractor may at its own expense and in the Employer's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

If the Contractor fails to notify the Employer within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Employer shall be free to conduct the same on its own behalf. Unless the Contractor has so failed to notify the Employer within the twenty-eight (28) day period, the Employer shall make no admission that may be prejudicial to the defense of any such proceedings or claim.

The Employer shall, at the Contractor's request, afford all available assistance to the Contractor in conducting such proceedings or claim, and shall be reimbursed by the Contractor for all reasonable expenses incurred in so doing.

- 29.3 The Employer shall indemnify and hold harmless the Contractor and its employees, officers and SubContractors from and against any and all suits,

actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, which the Contractor may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Contract arising out of or in connection with any design, data, drawing, specification, or other documents or materials provided or designed by or on behalf of the Employer.

30. Limitation of Liability

30.1 Except in cases of criminal negligence or willful misconduct,

- (a) neither Party shall be liable to the other Party, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, which may be suffered by the other Party in connection with the Contract, other than specifically provided as any obligation of the Party in the Contract, and
- (b) the aggregate liability of the Contractor to the Employer, whether under the Contract, in tort or otherwise, shall not exceed the amount resulting from the application of the multiplier specified in the SCC, to the Contract Price or, if a multiplier is not so specified, the total Contract Price including any price adjustment pursuant to the Contract, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the Contractor to indemnify the Employer with respect to patent infringement.

G. Risk Distribution

31. Transfer of Ownership

31.1 Ownership of the Plant (including spare parts) shall be transferred to the Employer when the Plant are brought on to the Site.

31.2 Ownership of the Contractor's Equipment used by the

Contractor and its SubContractors in connection with the Contract shall remain with the Contractor or its SubContractors.

- 31.3 Ownership of any Plant in excess of the requirements for the Facilities shall revert to the Contractor upon Completion of the Facilities or at such earlier time when the Employer and the Contractor agree that the Plant in question are no longer required for the Facilities.
- 31.5 Notwithstanding the transfer of ownership of the Plant, the responsibility for care and custody thereof together with the risk of loss or damage thereto shall remain with the Contractor pursuant to GCC Clause 32 (Care of Facilities) hereof until Completion of the Facilities or the part thereof in which such Plant are incorporated.
- 31.6 For the Plant/ goods/ equipment/material to be supplied by the Contractor under the Contract, it will be the responsibility of the Contractor to take delivery, unload and store the materials at Site and execute an Indemnity Bond and obtain authorisation letter from Employer as per specified proforma, in favour of the Employer against loss, damage and any risks involved for the full value of the Plant/ goods/ equipment/material. This Indemnity Bond shall be furnished by the Contractor before commencement of the supplies and shall be valid till the Completion of the Facilities.
- 31.7 Under the Contract, where the Employer hands over Employer supplied plant/ goods/ equipment/material to the Contractor for executing the Contract, then the Contractor shall, at the time of taking delivery of the equipment through Bill of Lading or other despatch documents, furnish trust Receipt for such plant/ goods/ equipment/material and also execute an Indemnity Bond in favour of the Employer in the form acceptable to the Employer for keeping the plant/ goods/ equipment/material in safe custody and to utilize the same exclusively for the purpose of the Contract as per the specified proforma for the Trust receipt and Indemnity Bond.. The Employer shall also issue a separate Authorization Letter to the Contractor to enable him to take physical delivery of plant/ goods/ equipment/material from the Employer as per specified proforma.

32. Care of Facilities

32.1 The Contractor shall be responsible for the care and custody of the Facilities or any part thereof until the date of Completion of the Facilities pursuant to GCC Clause 24 or, where the Contract provides for Completion of the Facilities in parts, until the date of Completion of the relevant part, and shall make good at its own cost any loss or damage that may occur to the Facilities or the relevant part thereof from any cause whatsoever during such period. The Contractor shall also be responsible for any loss or damage to the Facilities caused by the Contractor or its SubContractors in the course of any work carried out, pursuant to GCC Clause 27. Notwithstanding the foregoing, the Contractor shall not be liable for any loss or damage to the Facilities or that part thereof caused by reason of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GCC Sub-Clauses 32.2 and 38.1.

32.2 If any loss or damage occurs to the Facilities or any part thereof by reason of

- (a) insofar as they, in relation to Site, relate to nuclear reaction, nuclear radiation, radioactive contamination, pressure wave caused by aircraft or other aerial objects, or any other occurrences that an experienced Contractor could not reasonably foresee, or if reasonably foreseeable could not reasonably make provision for or insure against, insofar as such risks are not normally insurable on the insurance market and are in the general excluded of the policy of insurance, including War Risks and Political Risks, taken out under GCC Clause 34 hereof; or
- (b) any use or occupation by the Employer or any third Party other than a SubContractor, authorized by the Employer of any part of the Facilities; or
- (c) any use of or reliance upon any design, data or specification provided or designated by or on behalf of the Employer, or any such matter for which the Contractor has disclaimed responsibility herein,

the Employer shall pay to the Contractor all sums

payable in respect of the Facilities executed, notwithstanding that the same be lost, destroyed or damaged. If the Employer requests the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Contractor shall make good the same at the cost of the Employer in accordance with GCC Clause 39. If the Employer does not request the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Employer shall either request a change in accordance with GCC Clause 39, excluding the performance of that part of the Facilities thereby lost, destroyed or damaged, or, where the loss or damage affects a substantial part of the Facilities, the Employer shall terminate the Contract pursuant to GCC Sub-Clause 42.1 hereof.

32.3 The Contractor shall be liable for any loss of or damage to any Contractor's Equipment, or any other property of the Contractor used or intended to be used for purposes of the Facilities.

32.4 With respect to any loss or damage caused to the Facilities or any part thereof by reason of any of the matters specified in GCC Sub-Clause 38.1, the provisions of GCC Sub-Clause 38.3 shall apply.

33. Loss of or Damage to Property; Accident or Injury to Workers; Indemnification

33.1 Subject to GCC Sub-Clause 33.3, the Contractor shall indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, in respect of the death or injury of any person or loss of or damage to any property other than the Facilities whether accepted or not, arising in connection with the supply and installation of the Facilities and by reason of the negligence of the Contractor or its SubContractors, or their employees, officers or agents, except any injury, death or property damage caused by the negligence of the Employer, its Contractors, employees, officers or agents.

33.2 If any proceedings are brought or any claim is made against the Employer that might subject the Contractor to liability under GCC Sub-Clause 33.1, the Employer shall promptly give the Contractor a notice thereof and

the Contractor may at its own expense and in the Employer's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

If the Contractor fails to notify the Employer within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Employer shall be free to conduct the same on its own behalf. Unless the Contractor has so failed to notify the Employer within the twenty-eight (28) day period, the Employer shall make no admission that may be prejudicial to the defense of any such proceedings or claim.

33.3 The Employer shall indemnify and hold harmless the Contractor and its employees, officers and SubContractors from any liability for loss of or damage to property of the Employer, other than the Facilities not yet taken over, that is caused by fire, explosion or any other perils, in excess of the amount recoverable from insurances procured under GCC Clause 34, provided that such fire, explosion or other perils were not caused by any act or failure of the Contractor.

33.4 The Party entitled to the benefit of an indemnity under this GCC Clause 33 shall take all reasonable measures to mitigate any loss or damage which has occurred. If the Party fails to take such measures, the other Party's liabilities shall be correspondingly reduced.

34. Insurance

34.1 To the extent specified in the Appendix to the Contract Agreement titled Insurance Requirements, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified in the said Appendix. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, who should not unreasonably withhold such approval.

a) Marine Cargo Policy/Transit Insurance Policy:

- I. (i) Marine Cargo policy for imported equipment
Since imported finished materials are not permitted

under the contract, this policy shall not be applicable,
(ii) Transit Insurance Policy for indigenous equipment

Transit Insurance Policy shall be taken wherein only inland transit is involved for the movement of Plant and Equipment supplied from within India. The policy shall cover movement of Plant and Equipment from the manufacturer's works to the project's warehouse at final destination site. Inland Transit Clause (ITC) 'A' along with war & Strike Riots & Civil Commotion (SRCC) extension cover shall be taken. The policy shall cover movement of Plant and Equipment from the manufacturer's works to the project's warehouse at final destination site. The policy shall cover all risk for loss or damage that may occur during transit of Plant and Equipment from the Contractor/sub-Contractor's works or stores until arrival at project's warehouse/ store at final destination. Institute Cargo Clause (ICC) 'A' along with war & Strike Riots & Civil Commotion (SRCC) cover shall be taken.

- II. If during the execution of Contract, the Employer requests the Contractor to take any other add-on cover(s)/ supplementary cover(s) in aforesaid insurance, in such a case, the Contractor shall promptly take such add-on cover(s)/ supplementary cover(s) and the charges towards such premium for such add-on cover(s)/ supplementary cover(s) shall be reimbursed to the Contractor on submission documentary evidence of payment to the Insurance company. Therefore, charges towards premium for such add-on cover(s)/ supplementary cover(s) are not included in the Contract Price.
 - III. The Contractor shall take the policy in the joint names of Employer and the Contractor. The policy shall indicate the Employer as the beneficiary. However, if the Contractor is having an open policy for its line of business, it should obtain an endorsement of the open cover policy from the insurance company indicating that the dispatches against this Contract are duly covered under its open policy and include the name of the Employer as jointly Insured in the endorsements to the open policy.
- b) Erection All Risk Policy/Contractor All Risk Policy:

- I. The policy should cover all physical loss or damage to the facility at site during storage, erection and commissioning covering all the perils as provided in the policy as a basic cover and the add on covers as mentioned at Sl. No. (III) below.
- II. The Contractor shall take the policy in the joint name of Employer and the Contractor. All these policies shall indicate Employer as the beneficiary. The policy shall be kept valid till the date of the Operational Acceptance of the project and the period of the coverage shall be determined with the approval of the Employer.

If the work is completed earlier than the period of policy considered, the Contractor shall obtain the refund as per provisions of the policy and pass on the benefit to Employer. In case no refund is payable by the insurance company then the certificate to that effect shall be submitted to Employer at the completion of the project.

- III. The following add-on covers shall also be taken by the Contractor:
 - i. Earthquake
 - ii. Terrorism
 - iii. Escalation cost (approximately @10% of sum insured on annual basis)
 - iv. Extended Maintenance cover for Defect Liability Period
 - v. Design Defect
 - vi. Other add-on covers viz., 50-50 clause, 72 hours clause, loss minimization clause, waiver of subrogation clause (for projects of more than Rs. 100 crores, cover for offsite storage/fabrication (over Rs. 100 crores).
- IV. Third Party Liability cover with cross Liability within Geographical limits of India as on ADD-on cover to the basic EAR cover:

The third party liability add-on cover shall cover bodily injury or death suffered by third parties (including the Employer's personnel) and loss of or damage to property (including the Employer's property and any

parts of the Facilities which have been accepted by the Employer) occurring in connection with supply and installation of the Facilities.

- V. The cost of insurance premium is to be reimbursed to the Contractor for Employer Supplied Materials (OSM) for which the insurer is to be finalized by the Contractor as detailed therein. Alternatively, the Contractor may take a single policy covering the entire cost of the project including the cost of OSM. For this purpose, the Contractor shall submit documentary evidence for the premium paid for the entire project to the Employer and Employer shall reimburse to the Contractor the proportion of premium equal to value of OSM to total sum insured.
- VI. If during the execution of Contract, the Employer requests the Contractor to take any other add-on cover(s)/ supplementary cover(s) in aforesaid insurance, in such a case, the Contractor shall promptly take such add-on cover(s)/ supplementary cover(s) and the charges towards such premium for such add-on cover(s)/ supplementary cover(s) shall be reimbursed to the Contractor on submission documentary evidence of payment to the Insurance company. Therefore, charges towards premium for such add-on cover(s)/ supplementary cover(s) are not included in the Contract Price.

c) Automobile Liability Insurance

The Contractor shall ensure that all the vehicles deployed by the Contractor or its SubContractors (whether or not owned by them) in connection with the supply and installation of the Facilities in the project are duly insured as per RTA act. Further the Contractor or its SubContractors may also take comprehensive policy (own damage plus third party liability) of each individual vehicles deployed in the project on their own discretion in their own name to protect their own

interest.

d) Workmen Compensation Policy:

- I. Workmen Compensation Policy shall be taken by the Contractor in accordance with the statutory requirement applicable in India. The Contractor shall ensure that all the workmen employed by the Contractor or its SubContractors for the project are adequately covered under the policy.
- II. The policy may either be project specific covering all men of the Contractor and its SubContractors. The policy shall be kept valid till the date of Operational Acceptance of the project.

Alternatively, if the Contractor has an existing 'Workmen Compensation Policy' for all its employees including that of the SubContractor(s), the Contractor must include the interest of the Employer for this specific Project in its existing 'Workmen Compensation Policy'.

- III. Without relieving the Contractor of its obligations and responsibilities under this Contract, before commencing work the Contractor shall insure against liability for death of or injury to persons employed by the Contractor including liability by statute and at common law. The insurance cover shall be maintained until all work including remedial work is completed including the Defect Liability Period. The insurance shall be extended to indemnify the Principal for the Principal's statutory liability to persons employed by the Contractor.

The Contractor shall also ensure that each of its

SubContractors shall effect and maintain insurance on the same basis as the 'Workmen Compensation Policy' effected by the Contractor.

e) Contractor's Plant and Machinery (CPM) Insurance

The Employer (including without limitation any consultant, servant, agent or employee of the Employer) shall not in any circumstances be liable to the Contractor for any loss of or damage to any of the Contractor's Equipment or for any losses, liabilities, costs, claims, actions or demands which the Contractor may incur or which may be made against it as a result of or in connection with any such loss or damage.

f) Other Insurances

Such other insurances as may be specifically agreed upon by the Parties hereto as listed in the Appendix to the Contract Agreement titled Insurance Requirements.

34.2 The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 34.1, except for the Third Party Liability, Workers' Compensation and Employer's Liability Insurances, and the Contractor's SubContractors shall be named as co-insureds under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 34.1 except for the Cargo Insurance During Transport, Workers' Compensation and Employer's Liability Insurances. All insurer's rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.

34.3 The Contractor shall, in accordance with the provisions of the Appendix to the Contract Agreement titled Insurance Requirements, deliver to the Employer certificates of insurance or copies of the insurance policies as evidence that the required policies are in full force and effect. The certificates shall provide that no less than twenty-one (21) days' notice shall be given to the Employer by insurers prior to cancellation

or material modification of a policy.

- 34.4 The Contractor shall ensure that, where applicable, its SubContractor(s) shall take out and maintain in effect adequate insurance policies for their personnel and vehicles and for work executed by them under the Contract, unless such SubContractors are covered by the policies taken out by the Contractor.
- 34.5 If the Contractor fails to take out and/or maintain in effect the insurances referred to in GCC Sub-Clause 34.1, the Employer may take out and maintain in effect any such insurances and may from time to time deduct from any amount due the Contractor under the Contract any premium that the Employer shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Contractor
- 34.6 Unless otherwise provided in the Contract, the Contractor shall prepare and conduct all and any claims made under the policies effected by it pursuant to this GCC Clause 34, and all monies payable by any insurers shall be paid to the Contractor. The Employer shall give to the Contractor all such reasonable assistance as may be required by the Contractor. With respect to insurance claims in which the Employer's interest is involved, the Contractor shall not give any release or make any compromise with the insurer without the prior written consent of the Employer. With respect to insurance claims in which the Contractor's interest is involved, the Employer shall not give any release or make any compromise with the insurer without the prior written consent of the Contractor.

35. Unforeseen Conditions

- 35.1 If, during the execution of the Contract, the Contractor shall encounter on the Site any physical conditions other than climatic conditions, or artificial obstructions that could not have been reasonably foreseen prior to the date of the Contract Agreement by an experienced Contractor on the basis of reasonable examination of the data relating to the Facilities including any data as to boring tests, provided by the Employer, and on the basis of information that it could have obtained from a visual inspection of the Site if access thereto was available, or other data readily available to it relating to the Facilities, and if the Contractor determines that

it will in consequence of such conditions or obstructions incur additional cost and expense or require additional time to perform its obligations under the Contract that would not have been required if such physical conditions or artificial obstructions had not been encountered, the Contractor shall promptly, and before performing additional work or using additional Plant or Contractor's Equipment, notify the Project Manager in writing of

- (a) the physical conditions or artificial obstructions on the Site that could not have been reasonably foreseen;
- (b) the additional work and/or Plant and/or Contractor's Equipment required, including the steps which the Contractor will or proposes to take to overcome such conditions or obstructions;
- (c) the extent of the anticipated delay; and
- (d) the additional cost and expense that the Contractor is likely to incur.

On receiving any notice from the Contractor under this GCC Sub-Clause 35.1, the Project Manager shall promptly consult with the Employer and Contractor and decide upon the actions to be taken to overcome the physical conditions or artificial obstructions encountered. Following such consultations, the Project Manager shall instruct the Contractor, with a copy to the Employer, of the actions to be taken.

- 35.2 Any reasonable additional cost and expense incurred by the Contractor in following the instructions from the Project Manager to overcome such physical conditions or artificial obstructions referred to in GCC Sub-Clause 35.1 shall be paid by the Employer to the Contractor as an addition to the Contract Price. However the Employer's decision in this regard shall be final and binding.

If the Contractor is delayed or impeded in the performance of the Contract because of any such physical conditions or artificial obstructions referred to in GCC Sub-Clause 35.1, the Time for Completion

shall be extended in accordance with GCC Clause 40.

36. Change in Laws and Regulations

36.1 If, after the date twenty-eight (28) days prior to the date of Bid submission, in India, any law, regulation, ordinance, order or by-law having the force of law is enacted, promulgated, abrogated or changed which shall be deemed to include any change in interpretation or application by the competent authorities, that subsequently affects the costs and expenses of the Contractor and/or the Time for Completion, the Contract Price shall be correspondingly increased or decreased, and/or the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been affected in the performance of any of its obligations under the Contract. Notwithstanding the foregoing, such additional or reduced costs shall not be separately paid or credited if the same has already been accounted for in the price adjustment provisions where applicable, in accordance with the SCC pursuant to GCC Sub-Clause 11.2 or under other provisions of the Contract.

37. Force Majeure

37.1 “Force Majeure” shall mean any event beyond the reasonable control of the Employer or of the Contractor, as the case may be, and which is unavoidable notwithstanding the reasonable care of the Party affected, and shall include, without limitation, the following:

- (a) war, hostilities or warlike operations whether a state of war be declared or not, invasion, act of foreign enemy and civil war
- (b) rebellion, revolution, insurrection, mutiny, usurpation of civil or military government, conspiracy, riot, civil commotion and terrorist acts
- (c) confiscation, nationalization, mobilization, commandeering or requisition by or under the order of any government or de jure or de facto authority or ruler or any other act or failure to act of any local state or national government authority
- (d) strike, sabotage, lockout, embargo, import restriction, port congestion, lack of usual means of public transportation and communication,

industrial dispute, shipwreck, shortage or restriction of power supply, epidemics, quarantine and plague

- (e) earthquake, landslide, volcanic activity, fire, flood or inundation, tidal wave, typhoon or cyclone, hurricane, storm, lightning, or other inclement weather condition, nuclear and pressure waves or other natural or physical disaster
- (f) shortage of labor, materials or utilities where caused by circumstances that are themselves Force Majeure.

37.2 If either Party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within fourteen (14) days after the occurrence of such event.

37.3 The Party who has given such notice, unless disputed by the other Party, shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such Party's performance is prevented, hindered or delayed. The Time for Completion shall be extended in accordance with GCC Clause 40.

37.4 The Party or Parties affected by the event of Force Majeure shall use reasonable efforts to mitigate the effect thereof upon its or their performance of the Contract and to fulfill its or their obligations under the Contract, but without prejudice to either Party's right to terminate the Contract under GCC Sub-Clauses 37.6 and 38.5.

37.5 No delay or nonperformance by either Party hereto caused by the occurrence of any event of Force Majeure shall

- (a) constitute a default or breach of the Contract, or
- (b) give rise to any claim for damages or additional cost or expense occasioned thereby, subject to

GCC Sub-Clauses 32.2, 38.3 and 38.4

if and to the extent that such delay or nonperformance is caused by the occurrence of an event of Force Majeure.

37.6 If the performance of the Contract is substantially prevented, hindered or delayed for a single period of more than ninety (90) days or an aggregate period of more than one hundred and eighty (180) days on account of one or more events of Force Majeure during the currency of the Contract, the Parties will attempt to develop a mutually satisfactory solution, failing which either Party may terminate the Contract by giving a notice to the other, but without prejudice to either Party's right to terminate the Contract under GCC Sub-Clause 38.5.

37.7 In the event of termination pursuant to GCC Sub-Clause 37.6, the rights and obligations of the Employer and the Contractor shall be as specified in GCC Sub-Clauses 42.1.2 and 42.1.3.

37.8 Notwithstanding GCC Sub-Clause 37.5, Force Majeure shall not apply to any obligation of the Employer to make payments to the Contractor herein.

38. War Risks

38.1 "War Risks" shall mean any event specified in paragraphs (a) and (b) of GCC Sub-Clause 37.1 and any explosion or impact of any mine, bomb, shell, grenade or other projectile, missile, munitions or explosive of war, occurring or existing in the India impacting the Site.

38.2 Notwithstanding anything contained in the Contract, the Contractor shall have no liability whatsoever for or with respect to

- (a) destruction of or damage to Facilities, Plant, or any part thereof;
- (b) destruction of or damage to property of the Employer or any third Party; or
- (c) injury or loss of life

if such destruction, damage, injury or loss of life is

caused by any War Risks, and the Employer shall indemnify and hold the Contractor harmless from and against any and all claims, liabilities, actions, lawsuits, damages, costs, charges or expenses arising in consequence of or in connection with the same.

38.3 If the Facilities or any Plant shall sustain destruction or damage by reason of any War Risks, the Employer shall pay the Contractor for

- (a) any part of the Facilities or the Plant so destroyed or damaged to the extent not already paid for by the Employer

and so far as may be required by the Employer, and as may be necessary for completion of the Facilities; and

- (b) replacing or making good any such destruction or damage to the Facilities or the Plant or any part thereof .

If the Employer does not require the Contractor to replace or make good any such destruction or damage to the Facilities, the Employer shall either request a change in accordance with GCC Clause 39, excluding the performance of that part of the Facilities thereby destroyed or damaged or, where the loss, destruction or damage affects a substantial part of the Facilities, shall terminate the Contract, pursuant to GCC Sub-Clause 42.1.

If the Employer requires the Contractor to replace or make good on any such destruction or damage to the Facilities, the Time for Completion shall be extended in accordance with GCC 40.

38.4 Notwithstanding anything contained in the Contract, the Employer shall pay the Contractor for any increased costs or incidentals to the execution of the Contract, to the extent reasonable, that are in any way attributable to, consequent on, resulting from, or in any way connected with any War Risks, provided that the Contractor shall as soon as practicable notify the Employer in writing of any such increased cost.

38.5 If during the performance of the Contract any War Risks shall occur that financially or otherwise

materially affect the execution of the Contract by the Contractor, the Contractor shall use its reasonable efforts to execute the Contract with due and proper consideration given to the safety of its and its SubContractors' personnel engaged in the work on the Facilities, provided, however, that if the execution of the work on the Facilities becomes impossible or is substantially prevented for a single period of more than ninety (90) days or an aggregate period of more than one hundred and eighty (180) days on account of any War Risks, the Parties will attempt to develop a mutually satisfactory solution, failing which either Party may terminate the Contract by giving a notice to the other.

38.6 In the event of termination pursuant to GCC Sub-Clauses 38.3 or 38.5, the rights and obligations of the Employer and the Contractor shall be specified in GCC Sub-Clauses 42.1.2 and 42.1.3.

H. Change in Contract Elements

- 39. Change in the Facilities**
- 39.1 The Employer shall have the right to propose, and subsequently require, that the Project Manager order the Contractor from time to time during the performance of the Contract to make any change, modification, addition or deletion to, in or from the Facilities hereinafter called "Change", provided that such Change falls within the general scope of the Facilities and does not constitute unrelated work and that it is technically practicable, taking into account both the state of advancement of the Facilities and the technical compatibility of the Change envisaged with the nature of the Facilities as specified in the Contract.
- 39.2 Notwithstanding GCC Sub-Clauses 39.1, no change made necessary because of any default of the Contractor in the performance of its obligations under the Contract shall be deemed to be a Change, and such change shall not result in any adjustment of the Contract Price or the Time for Completion.
- 39.3 The pricing of any Change shall, as far as practicable, be calculated in accordance with the rates and prices

included in the Contract.

39.4 Employer has the right to introduce a Change by issuing an amendment to the Contract and amending the Contract Price, by varying the quantities of items originally included in the priced Schedule of Items and Bill of Quantities forming part of the Contract, within the limit as specified in SCC at the unit rates of the items specified in the Contract.

40. Extension of Time for Completion

40.1 The Time(s) for Completion specified in the SCC pursuant to GCC Sub-Clause 8.2 shall be extended if the Contractor is delayed or impeded in the performance of any of its obligations under the Contract by reason of any of the following:

- (a) any Change in the Facilities as provided in GCC Clause 39 except if otherwise stated therein.
- (b) any occurrence of Force Majeure as provided in GCC Clause 37, unforeseen conditions as provided in GCC Clause 35, or other occurrence of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GCC Sub-Clause 32.2
- (c) any suspension order given by the Employer under GCC Clause 41 hereof or reduction in the rate of progress pursuant to GCC Sub-Clause 41.2 or
- (d) any changes in laws and regulations as provided in GCC Clause 36 or
- (e) any default or breach of the Contract by the Employer, or any activity, act or omission of the Employer, or the Project Manager, or any other Contractors employed by the Employer, or
- (f) any delay on the part of a SubContractor, provided such delay is due to a cause for which the Contractor himself would have been entitled to an extension of time under this sub-clause, or
- (g) delays attributable to the Employer or caused by customs, or

- (h) any other matter specifically mentioned in the Contract

by such period as shall be fair and reasonable in all the circumstances and as shall fairly reflect the delay or impediment sustained by the Contractor.

40.2 Except where otherwise specifically provided in the Contract, the Contractor shall submit to the Project Manager a notice of a claim for an extension of the Time for Completion, together with particulars of the event or circumstance justifying such extension as soon as reasonably practicable after the commencement of such event or circumstance. As soon as reasonably practicable after receipt of such notice and supporting particulars of the claim, the Employer and the Contractor shall agree upon the period of such extension. In the event that the Contractor does not accept the Employer's estimate of a fair and reasonable time extension, the Contractor shall be entitled to refer the matter for settlement of dispute in accordance with GCC Sub-Clause 46.

40.3 The Contractor shall at all times use its reasonable efforts to minimize any delay in the performance of its obligations under the Contract.

40.4 In all cases where the Contractor has given a notice of a claim for an extension of time under GCC 40.2, the Contractor shall consult with the Project Manager in order to determine the steps (if any) which can be taken to overcome or minimize the actual or anticipated delay. The Contractor shall there after comply with all reasonable instructions which the Project Manager shall give in order to minimize such delay. If compliance with such instructions shall cause the Contractor to incur extra costs and the Contractor is entitled to an extension of time under GCC 40.1, the amount of such extra costs shall be added to the Contract Price.

41. Suspension

41.1 The Employer may request the Project Manager, by notice to the Contractor, to order the Contractor to suspend performance of any or all of its obligations under the Contract. Such notice shall specify the obligation of which performance is to be suspended, the effective date of the suspension and the

reasons therefor. The Contractor shall thereupon suspend performance of such obligation, except those obligations necessary for the care or preservation of the Facilities, until ordered in writing to resume such performance by the Project Manager.

If, by virtue of a suspension order given by the Project Manager, other than by reason of the Contractor's default or breach of the Contract, the Contractor's performance of any of its obligations is suspended for an aggregate period of more than ninety (90) days, then at any time thereafter and provided that at that time such performance is still suspended, the Contractor may give a notice to the Project Manager requiring that the Employer shall, within twenty-eight (28) days of receipt of the notice, order the resumption of such performance or request and subsequently order a change in accordance with GCC Clause 39, excluding the performance of the suspended obligations from the Contract.

If the Employer fails to do so within such period, the Contractor may, by a further notice to the Project Manager, elect to treat the suspension, where it affects a part only of the Facilities, as a deletion of such part in accordance with GCC Clause 39 or, where it affects the whole of the Facilities, as termination of the Contract under GCC Sub-Clause 42.1.

41.2 If

- (a) the Employer has failed to pay the Contractor any sum due under the Contract for considerable period beyond the specified period, has failed to approve any invoice or supporting documents without just cause pursuant to the Appendix to the Contract Agreement titled Terms and Procedures of Payment, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, with interest thereon as stipulated in GCC Sub-Clause 12.3, requires approval of such invoice or supporting documents, or specifies the breach and requires the Employer to remedy the same, as the case may be. If the Employer fails to pay such sum together with such interest, fails to approve such invoice or

supporting documents or give its reasons for withholding such approval, or fails to remedy the breach or take steps to remedy the breach within fourteen (14) days after receipt of the Contractor's notice or

- (b) the Contractor is unable to carry out any of its obligations under the Contract for any reason attributable to the Employer, including but not limited to the Employer's failure to provide possession of or access to the Site or other areas in accordance with GCC Sub-Clause 10.2, or failure to obtain any governmental permit necessary for the execution and/or completion of the Facilities,

then the Contractor may by fourteen (14) days' notice to the Employer suspend performance of all or any of its obligations under the Contract, or reduce the rate of progress.

41.3 If the Contractor's performance of its obligations is suspended or the rate of progress is reduced pursuant to this GCC Clause 41, then the Time for Completion shall be extended in accordance with GCC Sub-Clause 40.1, and any and all additional costs or expenses incurred by the Contractor as a result of such suspension or reduction, provided that the Contractor's performance of any of its obligations is suspended for an aggregate period of more than ninety (90) days, then for the time of suspension thereafter and provided that at that time such performance is still suspended, shall be paid by the Employer to the Contractor in addition to the Contract Price, except in the case of suspension order or reduction in the rate of progress by reason of the Contractor's default or breach of the Contract.

41.4 During the period of suspension, the Contractor shall not remove from the Site any Plant, any part of the Facilities or any Contractor's Equipment, without the prior written consent of the Employer.

42. Termination

42.1 Termination for Employer's Convenience

42.1.1 The Employer may at any time terminate the Contract for any reason by giving the

Contractor a notice of termination that refers to this GCC Sub-Clause 42.1.

42.1.2 Upon receipt of the notice of termination under GCC Sub-Clause 42.1.1, the Contractor shall either immediately or upon the date specified in the notice of termination

- (a) cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition
- (b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) (ii) below
- (c) remove all Contractor's Equipment from the Site, repatriate the Contractor's and its SubContractors' personnel from the Site, remove from the Site any wreckage, rubbish and debris of any kind, and leave the whole of the Site in a clean and safe condition, and
- (d) subject to the payment specified in GCC Sub-Clause 42.1.3,
 - (i) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination
 - (ii) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its SubContractors; and
 - (iii) deliver to the Employer all non-proprietary drawings, specifications and other documents prepared by the

Contractor or its SubContractors as
at the date of termination in
connection with the Facilities.

42.1.3 In the event of termination of the Contract under GCC Sub-Clause 42.1.1, the Employer shall pay to the Contractor the following amounts:

- (a) the Contract Price, properly attributable to the parts of the Facilities executed by the Contractor as of the date of termination
- (b) the costs reasonably incurred by the Contractor in the removal of the Contractor's Equipment from the Site and in the repatriation of the Contractor's and its SubContractors' personnel
- (c) any amounts to be paid by the Contractor to its SubContractors in connection with the termination of any subcontracts, including any cancellation charges
- (d) costs incurred by the Contractor in protecting the Facilities and leaving the Site in a clean and safe condition pursuant to paragraph (a) of GCC Sub-Clause 42.1.2
- (e) the cost of satisfying all other obligations, commitments and claims that the Contractor may in good faith have undertaken with third Parties in connection with the Contract and that are not covered by paragraphs (a) through (d) above.

42.2 Termination for Contractor's Default

42.2.1 The Employer, without prejudice to any other rights or remedies it may possess, may terminate the Contract forthwith in the following circumstances by giving a notice of termination and its reasons therefor to the Contractor, referring to this GCC Sub-Clause 42.2:

- (a) if the Contractor becomes bankrupt or insolvent, has a receiving order issued

against it, compounds with its creditors, or, if the Contractor is a corporation, a resolution is passed or order is made for its winding up, other than a voluntary liquidation for the purposes of amalgamation or reconstruction, a receiver is appointed over any part of its undertaking or assets, or if the Contractor takes or suffers any other analogous action in consequence of debt

- (b) if the Contractor assigns or transfers the Contract or any right or interest therein in violation of the provision of GCC Clause 43.
- (c) if the Contractor, in the judgment of the Employer has engaged in Fraud and Corruption, as defined in Attachment 1 to the GCC, in competing for or in executing the Contract.

42.2.2 If the Contractor

- (a) has abandoned or repudiated the Contract
- (b) has without valid reason failed to commence work on the Facilities promptly or has suspended, other than pursuant to GCC Sub-Clause 41.2, the progress of Contract performance for more than twenty-eight (28) days after receiving a written instruction from the Employer to proceed
- (c) persistently fails to execute the Contract in accordance with the Contract or persistently neglects to carry out its obligations under the Contract without just cause
- (d) refuses or is unable to provide plant, equipment, goods, materials, services or labor sufficient to execute and complete the Facilities in the manner specified in the program furnished under GCC Sub-Clause 18.2 at rates of progress that give

reasonable assurance to the Employer that the Contractor can attain Completion of the Facilities by the Time for Completion as extended,

then the Employer may, without prejudice to any other rights it may possess under the Contract including encashment of Performance and other securities, give a notice to the Contractor stating the nature of the default and requiring the Contractor to remedy the same. If the Contractor fails to remedy or to take steps to remedy the same within fourteen (14) days of its receipt of such notice, then the Employer may terminate the Contract forthwith by giving a notice of termination to the Contractor that refers to this GCC Sub-Clause 42.2.

42.2.3 Upon receipt of the notice of termination under GCC Sub-Clauses 42.2.1 or 42.2.2, the Contractor shall, either immediately or upon such date as is specified in the notice of termination,

- (a) cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition
- (b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) below
- (c) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination
- (d) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its SubContractors

- (e) deliver to the Employer all drawings, specifications and other documents prepared by the Contractor or its SubContractors as of the date of termination in connection with the Facilities.

42.2.4 The Employer may enter upon the Site, expel the Contractor, and complete the Facilities itself or by employing any third Party. The Employer may, to the exclusion of any right of the Contractor over the same, take over and use with the payment of a fair rental rate to the Contractor, with all the maintenance costs to the account of the Employer and with an indemnification by the Employer for all liability including damage or injury to persons arising out of the Employer's use of such equipment, any Contractor's Equipment owned by the Contractor and on the Site in connection with the Facilities for such reasonable period as the Employer considers expedient for the supply and installation of the Facilities.

Upon completion of the Facilities or at such earlier date as the Employer thinks appropriate, the Employer shall give notice to the Contractor that such Contractor's Equipment will be returned to the Contractor at or near the Site and shall return such Contractor's Equipment to the Contractor in accordance with such notice. The Contractor shall thereafter without delay and at its cost remove or arrange removal of the same from the Site.

42.2.5 Subject to GCC Sub-Clause 42.2.6, the Contractor shall be entitled to be paid the Contract Price attributable to the Facilities executed as of the date of termination, the value of any unused or partially used Plant on the Site, and the costs, if any, incurred in protecting the Facilities and in leaving the Site in a clean and safe condition pursuant to paragraph (a) of GCC Sub-Clause 42.2.3. Any sums due the Employer from the Contractor accruing prior to the date of termination shall be deducted from the amount

to be paid to the Contractor under this Contract.

- 42.2.6 If the Employer completes the Facilities, the cost of completing the Facilities by the Employer shall be determined.

If the sum that the Contractor is entitled to be paid, pursuant to GCC Sub-Clause 42.2.5, plus the reasonable costs incurred by the Employer in completing the Facilities, exceeds the Contract Price, the Contractor shall be liable for such excess.

If such excess is greater than the sums due the Contractor under GCC Sub-Clause 42.2.5 and any other monies otherwise due to the Contractor under the Contract, and including remittances, if any, received by the Employer through securities furnished by the Contractor, the Contractor shall pay the balance to the Employer, and if such excess is less than the sums as aforesaid, the Employer shall pay the balance to the Contractor.

The Employer and the Contractor shall agree, in writing, on the computation described above and the manner in which any sums shall be paid.

42.3 Termination by the Contractor

- 42.3.1 The Contractor may terminate the Contract forthwith by giving a notice to the Employer to that effect, referring to this GCC Sub-Clause 42.3.1, if the Employer becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, being a corporation, if a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any part of its undertaking or assets, or if the Employer takes or suffers any other analogous action in consequence of debt.

- 42.3.2 If the Contract is terminated under GCC Sub-Clauses 42.3.1, then the Contractor shall immediately

- (a) cease all further work, except for such work as may be necessary for the purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition
- (b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) (ii)
- (c) remove all Contractor's Equipment from the Site and repatriate the Contractor's and its SubContractors' personnel from the Site, and
- (d) subject to the payment specified in GCC Sub-Clause 42.3.3,
 - (i) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination
 - (ii) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Plant as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its SubContractors, and
 - (iii) deliver to the Employer all drawings, specifications and other documents prepared by the Contractor or its SubContractors as of the date of termination in connection with the Facilities.

42.3.3 If the Contract is terminated under GCC Sub-Clauses 42.3.1 , the Employer shall pay to the Contractor all payments specified in GCC Sub-Clause 42.1.3, and reasonable compensation for all loss, except for loss of profit, or damage sustained by the Contractor arising out of, in

connection with or in consequence of such termination.

42.3.4 Termination by the Contractor pursuant to this GCC Sub-Clause 42.3 is without prejudice to any other rights or remedies of the Contractor that may be exercised in lieu of or in addition to rights conferred by GCC Sub-Clause 42.3.

42.4 In this GCC Clause 42, the expression “Facilities executed” shall include all work executed, Installation Services provided, and all Plant acquired, or subject to a legally binding obligation to purchase, by the Contractor and used or intended to be used for the purpose of the Facilities, up to and including the date of termination.

42.5 In this GCC Clause 42, in calculating any monies due from the Employer to the Contractor, account shall be taken of any sum previously paid by the Employer to the Contractor under the Contract, including any advance payment paid pursuant to the Appendix to the Contract Agreement titled Terms and Procedures of Payment.

43. Assignment

43.1 Neither the Employer nor the Contractor shall, without the express prior written consent of the other Party, which consent shall not be unreasonably withheld, assign to any third Party the Contract or any part thereof, or any right, benefit, obligation or interest therein or thereunder.

I. Claims, Disputes and Arbitration

44. Contractor’s Claims

44.1 If the Contractor considers himself to be entitled to any extension of the Time for Completion and/or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall submit a notice to the Project Manager, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than 28 days after the Contractor became aware, or should have become aware, of the event or circumstance.

If the Contractor fails to give notice of a claim within

such period of 28 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this Sub-Clause shall apply.

The Contractor shall also submit any other notices which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.

The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at another location acceptable to the Project Manager. Without admitting the Employer's liability, the Project Manager may, after receiving any notice under this Sub-Clause, monitor the record-keeping and/or instruct the Contractor to keep further contemporary records. The Contractor shall permit the Project Manager to inspect all these records, and shall (if instructed) submit copies to the Project Manager.

Within 42 days after the Contractor became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Project Manager, the Contractor shall send to the Project Manager a fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect:

- (a) this fully detailed claim shall be considered as interim;
- (b) the Contractor shall send further interim claims at monthly intervals, giving the accumulated delay and/or amount claimed, and such further particulars as the Project Manager may reasonably require; and
- (c) the Contractor shall send a final claim within 28 days after the end of the effects resulting from the event or circumstance, or within such other

period as may be proposed by the Contractor and approved by the Project Manager.

Within 42 days after receiving a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the Project Manager and approved by the Contractor, the Project Manager shall respond with approval, or with disapproval and detailed comments. He may also request any necessary further particulars, but shall nevertheless give his response on the principles of the claim within such time.

The requirements of this Sub-Clause are in addition to those of any other Sub-Clause which may apply to a claim. If the Contractor fails to comply with this or another Sub-Clause in relation to any claim, any extension of time and/or additional payment shall take account of the extent (if any) to which the failure has prevented or prejudiced proper investigation of the claim, unless the claim is excluded under the second paragraph of this Sub-Clause.

In the event that the Contractor and the Employer cannot agree on any matter relating to a claim, either Party may refer the matter for settlement of dispute pursuant to GCC 46 hereof.

45. Disputes and Arbitration

- 45.1 The Parties shall seek to resolve any dispute amicably by mutual consultation. If either Party objects to any action or inaction of the other Party, the objecting Party may file a written Notice of Dispute to the other Party providing in detail the basis of the dispute. The Party receiving the Notice of Dispute will consider it and respond in writing within fourteen (14) days after receipt. If that Party fails to respond within fourteen (14) days, or the dispute cannot be amicably settled within fourteen (14) days following the response of that Party, Clause **GCC 45.2** shall apply. The Parties shall use their best efforts to settle amicably all disputes arising out of or in connection with this Contract or its interpretation.
- 45.2 If, the parties have failed to resolve their dispute or difference by such mutual consultation as per Clause **GCC 45.1**, then either the Employer or the Contractor may give notice to the other party of its intention to commence conciliation/ arbitration, as

hereinafter provided, as to the matter in dispute, and no conciliation/ arbitration in respect of this matter may be commenced unless such notice is given. Any dispute or difference in respect of which a notice of intention to commence conciliation/ arbitration has been given in accordance with this Clause shall be finally settled in accordance with the following provisions:

(i) Disputes shall be settled through conciliation or arbitration in accordance with Arbitration and Conciliation Act, 1996 including amendments thereto, as applicable from time to time, in accordance with the rules thereto and the Applicable Law.

In any arbitration proceeding hereunder:

- (a) proceedings shall be held in the place mentioned in SCC which shall be the seat as well as the venue of arbitration except otherwise agreed by the Parties.
- (b) English language shall be the official language for all purposes; and
- (c) the decision of the sole arbitrator or of a majority of the arbitrators (or of the third arbitrator if there is no such majority) shall be final and binding and shall be enforceable in the court of competent jurisdiction in India, as per the Applicable Law

45.3 Notwithstanding any dispute and/or reference to conciliation/ arbitration herein,

- (a) the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree; and

the Purchaser shall pay the Supplier any monies due to the Supplier.

J. Additional

46. Up-front intimation of approved manufacturers and criterion for Fresh Vendor approval

46.1 Employer shall up-front intimate list containing name of already approved vendors/manufacturers of various sub-transmission and distribution materials. Employer shall up-load the list on their web portal. The turnkey Contractor shall choose one or more than one vendors from the pre-approved lists depending upon capacity and capability of vendors to supply the materials for RDSS works. No separate approval for vendor shall be required from Employer.

Also, normal procedure being followed for empanelment of new vendors shall be uploaded and up-front intimated to all turnkey Contractors. In case turnkey Contractor desires to add new vendor, up-front intimation shall be available on criterion and procedure for selection of vendors.

47. Up-front intimation of Guaranteed Technical Particulars

47.1 Technical Specifications are enclosed with the bid documents. Employer shall up-front intimate acceptable Guaranteed Technical Particulars of various materials through their web portal.

47.2 The turnkey Contractor will examine these documents and supply only those materials which meets the above acceptable criterion. In case there are Employer's approved vendor(s) (one or more) through which turnkey Contractor wish to procure the materials and are complying with the acceptable GTP parameters of Employer as available on their web portal, there would not be any formality needed like approval of sub-vendor or approval of GTP again.

47.3 In event of change in name of vendor or change in GTP parameter, separate approval of Employer shall be sought by successful turnkey Contractor.

48. Turnkey Contractor's Store at Project site

48.1 "Project wise separate Site Stores shall be maintained and manned by turnkey Contractor. Same store shall not be used for more than one projects even if neighboring districts' projects are awarded to the same agency. The turnkey Contractor shall deploy his own manpower in stores for round the clock security and for its day to day operation through trained Store-keeper.

Since materials received in this stores are owned by Employer (including owner's free issued material) and are pre-dispatch inspected by Employer's representative/ or NABL lab inspected, materials in a lot shall not be issued to the sub-Contractor for physical execution by turnkey Contractor. Instead, day to day requirements shall be issued to the working teams of sub-vendors by authorized store-keeper. In exceptional cases, on prior written permission of Employer, materials for a week time may be issued to working team of sub-vendor. Daily accounting of materials receipt, materials issues, materials in custody of sub-vendors are to be maintained by turnkey Contractor. Handing of Stores shall, in no circumstances, be off loaded.

In no case, inter-project transfer of materials shall be permitted.

49. Handing over of assets

49.1 On completion of erection and testing of a section of line, DTR substation, power substation, contracting agency shall submit digital photographs in soft copies of each and every support structures along-with submission of completion report in support of their claim for energisation and handing over of assets. In addition, Contractor shall also ensure 100% tagging of assets on GIS portal provided by Employer. The Mobile App for GIS asset tagging shall be provided by the Employer. Project Manager within a week time, shall review the photographs for acceptance of quality of works and shall immediately deploy officials for joint measurement and inspection of executed works for energisation. In parallel, a requisition to State Electrical Inspectorate shall also be submitted by Project Manager. Fee/Charges for inspection by electrical inspector shall be paid by Project Manager (Employer).

While offering section of work / substation for commissioning and handing over, turnkey Contractor shall provide pre-commissioning test reports and detailed checklist (format provided along with quality guidelines at Part 2: Section 6).

50. Supply of Materials in lots

50.1 Item wise mobilization of materials shall be planned in [6 lots or as decided by the Employer]. Employer shall arrange pre-dispatch inspections for at least [6 lots or as decided by the Employer] at his own expenditure. However, in case of approved quantity variation, employer may consider to increase the number of Lots. In addition, Employer shall also ensure that samples (as per IS Sampling standard) from 01st lot and one other lot randomly selected by the Employer will be sent to nearest NABL accredited lab approved by the employer for testing directly from the manufacturing unit. TkC shall incur the expenses of testing. During the Pre-Dispatch inspection of materials, Contractor shall also mandatorily send its authorized person in the manufacturing facility. The authorized person of Contractor shall also sign the joint inspection report along with the Employer. All such cost shall be borne by the Contractor.

51.

Contract Closing

51.1 On completion of handing over formality and successfully completion of defect liability / guarantee period, the contract shall be closed on completion of following formality:

- I. Material reconciliation of owner free issued materials as well as material supplied by turnkey Contractor,
- II. Payment reconciliations, submission and verifications that reconciliation of payment toward statutory provisions like GST, any other dues etc. Reconciliation statement shall be verified and vetted by chartered accountant.
- III. Approval for extension of Completion period, with or without compensation, as required.
- IV. Certification from agency regarding payment of dues to its
 - i. Sub-vendors
 - ii. Workers/ contract laborers,
 - iii. Payment of statutory dues toward Provident Funds, wages etc. as required.
- V. Certification of Project Manager & agency to the effect that erection, testing and commissioning of the equipment have been completed as per specifications laid down in the contract and defects noted at the time of commissioning and notified to

- the agency have been liquidated to the satisfaction of Employer.
- VI. Removal of construction meant for site stores, hutment, labour colony etc. in the premises of EMPLOYER.
 - VII. Certificate from Project Manager in charge regarding final amendment of drawings and detailed of such amendments,
 - VIII. Drawing receipt certificate by the Project Manager,
 - IX. Receipt of compliance report on Quality Assurance Mechanism along with photograph, Assurance documents by Project Manager
 - X. Shortfall in equipment / Line performance Certificate issued by Project Manager,
 - XI. No demand certificate issued by Contractor,
 - XII. Certificate about completion of Defect Liability Period of the package by Project Manager,
 - XIII. Certificate regarding return of Performance Security / Indemnity Bond by Project Manager/Employer.

52. Suspension of business dealings

52.1 Employer shall suspend business dealings with Contractor on following grounds for the period as decided by Project Manager:-

- a. If the Contractor fails to submit Performance Security after issuance of Letter of Intent (LoI) within 28 days.
- b. If the Contractor fails to accept the award of contract or has abandoned or repudiated the Contract.
- c. If the Contractor is found to be non-performing in execution of contract by the Employer.
- d. If a disaster / major failure / accident / collapse of a structure / system is caused during erection or during defect liability period due to negligence of Contractor or design deficiency or poor quality of execution.
- e. Misbehavior or physical manhandling by the

Contractor or his representative or any person acting on his behalf with any official of the Company dealing with the concerned contract is established.

- f. If the Director / Owner of the Contractor, proprietor or partner of the Contractor, is convicted by a court of law for offences involving corrupt and fraudulent practices including moral turpitude in relation to its business dealings with the government or State Public Sector Undertakings or Central Public Sector Undertakings or Employer or Employer's group companies, during the last five years.
- g. If the proprietors of the Contractor have been guilty of malpractices such as bribery, corruption, fraud, substitution of the tenders, interpolations, etc.
- h. If the Contractor continuously refuses to return / refund the dues of Employer or Employer's group companies, without showing adequate reason and this is not due to any reasonable dispute which would attract proceedings in arbitration or court of Law;
- i. If the Contractor employs a public servant dismissed / removed or employs a person convicted for an offence involving corruption or abetment of such offences;
- j. If business dealings with the Contractor have been banned by the Ministry of Power or Government of India and the ban is still in force,
- k. If it is established that Contractor has resorted to corrupt, fraudulent practices including misrepresentation of facts;

- l. If the Contractor uses intimidation/threatening or brings undue outside pressure on the Project Manager or his authorised representatives or its officials in acceptance / performance of the job under the contract.
- m. If the Contractor indulges in repeated and / or deliberate use of delay tactics in complying with contractual stipulations;
- n. If the Contractor is found to be involved in cartel formation during bidding.
- o. On willful indulgence by the Contractor in supplying sub-standard material with respect to Technical Specifications under the Contract irrespective of whether pre-dispatch inspection was carried out by Employer or not;
- p. If the Contractor is declared bankrupt or insolvent or its financial position has become unsound, and in the case of a limited company, it is wound up or liquidated.
- q. Established litigant nature of the Contractor to derive undue benefit;
- r. Continued poor performance of the Contractor;
- s. If the Contractor violates the provisions of the Integrity Pact provided in the Contract.
- t. If the Contractor commits fraud as defined under the Fraud Prevention Policy of Employer.
- u. If the Contractor has assigned or transferred the contract or engaged subcontractor(s) without the prior approval of the Competent Authority in violation of the provisions of the

contract.

- v. If the Contractor misuses the premises or facilities of the Employer, forcefully occupies, tampers or damages the Employer's properties including land, water resources, forests / trees, etc.
- w. If the security consideration, including questions of loyalty of the Contractor to the state, so warrants;

ATTACHMENT 1 to GCC

Fraud and Corruption

1. Purpose

1.1 Government's/ **WBSEDCL's** Anti-Corruption Laws/ Guidelines apply with respect to procurement.

2. Requirements

2.1 **WBSEDCL** requires that bidders (applicants/proposers), consultants, Contractors and suppliers; any sub-Contractors, sub-consultants, service providers or suppliers; any agents (whether declared or not); and any of their personnel, observe the highest standard of ethics during the procurement process, selection and contract execution, and refrain from Fraud and Corruption.

2.2 To this end, **WBSEDCL**:

I. Defines, for the purposes of this provision, the terms set forth below as follows:

- i. “corrupt practice” is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;
- ii. “fraudulent practice” is any act or omission, including misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain financial or other benefit or to avoid an obligation;
- iii. “collusive practice” is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;
- iv. “coercive practice” is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
- v. “obstructive practice” is:
 - (a) deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede investigation into allegations of a corrupt, fraudulent, coercive, or collusive practice; and/or threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or

II. Rejects a proposal (also referred to as the bid) for award if the WBSEDCL determines that the firm or individual recommended for award, any of its personnel, or its agents, or its sub-consultants, sub-Contractors, service providers, suppliers and/ or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question.

- III. In addition to the legal remedies set out in the relevant Legal Agreement, may take other appropriate actions,;
- IV. Pursuant to the Anti- Corruption Laws/ Guidelines and in accordance with due process, WBSEDCL, may sanction a firm or individual, either indefinitely or for a stated period of time, including by publicly declaring such firm or individual ineligible (i) to be awarded or otherwise benefit from contract awarded by WBSEDCL or its subsidiaries/ affiliates, financially or in any other manner; (ii) to be a nominated sub-Contractor, consultant, manufacturer or supplier, or service provider of an otherwise eligible firm being awarded a contract WBSEDCL or its subsidiaries/ affiliates; and (iii) to receive the proceeds of any loan made by the WBSEDCL or otherwise to participate further in the preparation or implementation of any WBSEDCL project.
- V. And the bidders (applicants/proposers), Consultants, Contractors, service providers and suppliers have entered into **Integrity Pact** which shall also apply in addition to the aforesaid.

Special Conditions of Contract

Number of GCC Clause	Amendments of, and Supplements to, Clauses in the General Conditions of Contract (GCC)
GCC 1.1	<p>Mode of contracting is as under:</p> <p>1. The Contract is entered into between the Employer and the Contractor as under:</p> <p>(i) Contract Part I (<i>Supply of Plant Contract</i>): for Supply of Plant on FOB (final place of destination Site/ Project Site) basis including design, engineering, manufacture, testing, transportation, insurance etc. and other services, incidental thereto, as applicable,</p> <p>(ii) Contract Part II (<i>Supply of Services Contract</i>): For providing all services including unloading and handling of Plant, all labor, Contractor's equipment, temporary works, materials, consumables, design and preparation of layout, engineering drawings, and all matters and things of whatsoever nature, including testing, pre-commissioning and commissioning, operations and maintenance services, the provision of as-built drawings, operations and maintenance manuals, training, etc., as specified in Contract and applicable and necessary for the proper execution of the Installation Services (but excluding the incidental to supply under Contract Part I) and other services, related to and incidental to successful installation of the Plant supplied under the "Contract Part I", at final destination (Site/ Project Site).</p> <p>2. The award of two separate Contract parts shall not in any way dilute the responsibility of the Contractor for the successful completion of the Facilities as per Contract and Specification and a breach in one part of the Contract shall automatically be construed as a breach of the other part of the Contract which will confer a right on the Employer to terminate the Contract at the risk and the cost of the Contractor.</p> <p>3. The Contract will be signed in two originals and the Contractor shall be provided with one signed original and the other will be retained by the Employer.</p> <p>4. If required by the Employer, the Contractor shall provide free of cost to the Employer all the engineering data, drawing and descriptive materials etc. submitted with its Bid, in at least two (2) copies to form a part of the Contract.</p>
GCC 1.1	The Employer is: <i>WEST BENGAL STATE ELECTRICITY DISTRIBUTION COMPANY LTD. (WBSEDCL)</i> .
GCC 1.1	The Project Manager is: <i>The Region Manager Of Respective District.</i>

GCC 6.1	Integrity Pact is applicable as indicated in Attachment 1 to the GCC.
GCC 7.3	Supply spare parts required for operations and maintenance, and the provision thereof required by the DISCOM / Utility
GCC 8.1	From the date of issuance of Notification of Award
GCC 8.2	06 Months
GCC 11.2	<p>The Contract Price is subject to adjustment during performance of the contract to reflect changes in the cost elements such as labor, material, transport and Contractor's equipment in accordance with the procedures specified in the corresponding Appendix to the Contract Agreement as per which the contract price for specified goods/ equipment/ material shall be adjustable as per the method and procedures for the price adjustment specified therein. <i>{Appendix 2 of Form 5 in Section – 8 of the RFB/ bidding documents}</i>.</p> <p>The Contract Price is subject to alteration in the event of a Change in the Facilities as per GCC 39, through an amendment to the Contract.</p>
GCC 13.3.1	<ol style="list-style-type: none"> 1. The Performance Security amount is 10% of Contract Price, and the Standard Form of Performance Security acceptable to the Employer shall be as specified in Section 8. Contract Forms. 2. The Additional Performance Security amount is 10% pursuant to ITB clause 37.1 ...e.g., the percentage of the bid price more than the percentage specified in the said clause limited to ...3 % percent of the Contract Price, and the Standard Form of Performance Security acceptable to the Employer shall be as specified in Section 8. Contract Forms. 3. The Contractor/Bidder shall, within twenty-eight (28) days of the notification of contract award, provide a security in an amount equal to 110% of the advance payment calculated in accordance with the Appendix to the Contract Agreement titled Terms and Procedures of Payment, and in the same currency or currencies.
GCC 13.3.2	<p>The Bank Guarantee towards Performance Security shall be issued by a Bank mentioned below:</p> <p>Any Scheduled Bank in India</p>
GCC 14.2	Only GST applicable in India, on the Plant and Installation Services provided/ supplied by the Contractor to the Employer under the Contract shall be paid/ reimbursed by Employer against requisite documents, at actuals.
GCC 19.3	Any subcontract of value equal to more than 5% shall necessarily require prior approval of the Employer. However, sub-contract for engagement of labour shall not require prior approval of the Employer.
GCC 23	1) Category – A (Pre-Dispatch Inspection & Testing at NABL accredited Labs):

	<p>a) This category shall include high ticket materials (Power Transformers, Distribution Transformers, Circuit Breakers, AB/XLPE Cables, Overhead Conductor (AAAC/ACSR), Insulator which involves more and important testing procedures and hence the inspection of these materials will be carried out in the factory before the dispatch of the material.</p> <p>b) In addition, Employer shall also ensure that for major materials as discussed above, samples from 1st lot and one other lot randomly selected by the Employer shall be directly sent to NABL accredited test labs for third party testing. It is also to be noted that material clearance of the lots under testing shall only be given post receipt of successful test results. Contractor shall also mandatorily depute its authorized official for pre – dispatch inspection at manufacturing facility along with the Employer officials. The inspection and testing report would be jointly signed by the Employer and the Contractor. All the expenses related to testing would be borne by the Contractor.</p> <p>c) Apart from the above-mentioned protocol any one power transformer shall be selected by Employer from the supply schedule from the vendor, which shall be jointly sealed and tested for short circuit testing on turnkey- Contractor's expenses.</p> <p>2) Category – B (On-site inspection): This category includes the materials for which a factory inspection is not warranted and the material can be inspected upon arrival at the site before the installation. In case the Employer is apprehensive about the quality of the material supplied it reserves the right to send the selected lot to the NABL accredited testing lab for third party testing.</p> <p>3) Employer also reserves the right to send any installed equipment / materials to the NABL accredited testing lab for testing. The Employer would have to reimburse the expenses related to transportation of material from site to testing lab and all testing expenses in this regard.</p> <p>4) The material which has to be tested at laboratory shall be sealed in the presence of authorized official of Employer and Contractor.</p> <p>5) If the materials tested at Laboratory fails then the entire lot would be rejected. Contractor shall bear the responsibility of sending back such failed materials from site. Any subsequent delay in contract performance due to failure of materials in the test laboratory would be on account of Contractor and no time extension would be provided by the Employer in this regard. Any LD levies in this regard would be borne by the Contractor.</p> <p>Pre-dispatch Inspection:</p> <p>Pre-dispatch inspection shall be performed on various materials at manufacturer's</p>
--	--

	<p>work place for which Contractor shall be required to raise requisition giving at least 10-day time to employer for allocating inspection team. Depending on requirement, inspection shall be witnessed by representatives of Employer, TPIA and Contractor/Bidder.</p> <p>The Contractor shall ensure receipt of material at site within 21 days from date of receipt of dispatch instructions. In case materials are not received within 21 days from date of issue of dispatch instruction, the dispatch instruction shall stand cancelled and a fresh pre -dispatch would be required to issue dispatch instruction. All expenditure incurred by Employer in performance of dispatch instruction shall be recovered from turnkey Contractor.</p> <p>The turnkey Contractor shall ensure that pre-dispatch inspection for materials is intimated only when the material is completely ready for inspection. On due date of inspection, if it is found that materials are not ready in required quantities or the inspection could not be carried out due to non-availability of requisite calibrated certificate of instruments with manufacturer, closing of works on scheduled date of inspection, non-availability of sufficient testing/material handling staff at manufacturer works etc., all expenditures incurred on deployment of various inspecting officials along with a fine of Rs 50,000/- inclusive of GST shall be recovered from the bills of the agency and re-inspection shall be carried out on expense of Contractor.</p> <p>2nd such situation at same manufacturer/supplier shall result in rejection of name of manufacturer from list of approved vendors/sub-vendors. In case sub-standard materials (old component, re-cycled materials, re-used core material, re-used transformer coil material etc.) offered for inspection and are noticed during the inspection, materials shall be rejected, and approval of sub-vendor shall also be cancelled for all RDSS projects.</p> <p>In case, a material fails the pre-dispatch inspection as per GCC Clause 23, and also fails the subsequent repeat inspection of the rectified/replaced material, the complete lot of material under inspection will be required to be replaced by the manufacturer/supplier. If in subsequent inspection of the new lot, the material again fails the inspection, then materials shall be rejected and approval of vendor/sub-vendor shall also be cancelled for all RDSS projects.</p> <p>Third Party Inspection at NABL accredited lab: Employer shall also ensure that for major materials as discussed above samples from 1st lot and one other lot randomly selected by the Employer shall be directly sent to nearest NABL accredited lab for third party testing. In case a material fails in the test, the whole offered lot would be rejected and complete lot of material under inspection will be required to be replaced by the manufacturer/supplier. If in subsequent inspection of the new lot, the material again fails the inspection, then materials shall be rejected and the vendor/sub-vendor shall also be debarred for all RDSS projects. In case of default by vendors/manufacturers, Contractor/ Bidder shall also be penalized as per below table:</p>
--	--

	<table><tr><th>Sr. No.</th><th>No. of Material/lot rejected in a project/district</th><th>% Penalty imposed on contract price</th></tr><tr><td>1</td><td>>5</td><td>5%</td></tr><tr><td>2</td><td>>3</td><td>2.5%</td></tr><tr><td>3</td><td>>1</td><td>1%</td></tr></table>	Sr. No.	No. of Material/lot rejected in a project/district	% Penalty imposed on contract price	1	>5	5%	2	>3	2.5%	3	>1	1%
	Sr. No.	No. of Material/lot rejected in a project/district	% Penalty imposed on contract price										
	1	>5	5%										
	2	>3	2.5%										
	3	>1	1%										
	<p>Penalty provision for defects found in Field inspection: There are three categories of defects found in field inspection they are critical, major and minor defects. There should be a provision to impose penalty on Contractor based on the percentage of major/critical defects observed by TPQMA.</p>												
	<table><tr><th>Sr. No.</th><th>Defect criteria</th><th>% Penalty imposed on sanctioned cost</th></tr><tr><td>1</td><td>Critical Defects</td><td>1%</td></tr><tr><td>2</td><td>Major Defects</td><td>0.5%</td></tr><tr><td>3</td><td>Minor Defects</td><td>0% if rectified within 30 days</td></tr></table>	Sr. No.	Defect criteria	% Penalty imposed on sanctioned cost	1	Critical Defects	1%	2	Major Defects	0.5%	3	Minor Defects	0% if rectified within 30 days
	Sr. No.	Defect criteria	% Penalty imposed on sanctioned cost										
	1	Critical Defects	1%										
	2	Major Defects	0.5%										
3	Minor Defects	0% if rectified within 30 days											
<p>Electrical Inspector inspection: After successful completion of the work permission from State Electrical Inspectorate is required. Necessary fee etc. shall be paid by the Employer. However if Contractor pays such fee it shall be reimbursed on actual basis on documentary evidence. Defects / in-complete works notified by Electrical Inspectorate shall be completed by the agency at no extra cost implication to Employer.</p>													
<p>GCC 26.2 If the Contractor fails to attain Completion of the Facilities or any part thereof within the Time for Completion or any extension thereof under GCC Clause 40, the Contractor shall pay to the Employer liquidated damages at 0.15% for each week or part thereof, of the value of unexecuted works. The value of unexecuted works shall be equal to the difference of 1. The approved value of the surveyed & approved BOQ (inclusive of GST) and 2. The value of executed works (total billed amount only, inclusive of GST).till the time for completion or any extension thereof under GCC clause 40. The aggregate amount of such liquidated damages shall in no event exceed 5% of the value of unexecuted works (inclusive of GST). Once the “Maximum” is reached, the Employer may consider termination of the Contract, pursuant to GCC Sub-Clause 42.2.2.</p>													

GCC 27.1	<p>(a) Volume of concreting: If it was observed by employer, quality monitoring agencies and/or REC/MoP that volume and quality of concreting used in foundation of support, equipment foundation, gantry structure foundation, stay set etc. are not as per requirement specified in the scope of work/technical specifications, the Contractor has to dismantle the supports, foundation and redo the concreting of all the supports in that particular section of line/redo all the foundations in that particular substation at his own cost. To ensure this, the employer reserves the right to withhold the payment of Contractor for such defective works till such time the Contractor conforms to scope of works, technical specification and tender drawings.</p> <p>(b) Galvanization of metallic structure: All Metallic structures & fabricated items excluding metallic supports (Steel tubular poles/H-Beam) must be galvanized. In case any metallic item found rusted during execution of works, the Contractor has to replace the item used at all places. To ensure this, the employer reserves the right to withhold the payment of Contractor for such works till such time the Contractor conforms to scope of works, technical specification and tender drawings.</p> <p>(c) Painting of metallic supports (Steel tubular poles/H-Beam): Painting of metallic supports in overhead lines, distribution transformer substation and Power substation shall be ensured as per specifications. In case metallic supports found rusted during execution of works, the Contractor has to remove inferior painting, clean the surface and re-paint it as per given specifications. To ensure this, the employer reserves the right to withhold the payment of Contractor for such works till such time the Contractor conforms to scope of works, technical specification and tender drawings.</p>
GCC 27.8	The extension of Defect Liability Period, in aggregate, shall, not exceed 36 months .
GCC 27.8.1	The Contractor's liability for latent defects warranty shall be limited to 5 years reckoned from the end of Defect Liability Period including extension thereof.
GCC 39.4	<p>The quantity of items given in the Price Schedules forming part of the Contract are provisional. The variation in quantity of the items shall be within the limit of plus/minus (+/-) fifty percent (50%) for individual items. In case the quantity variation of the individual items is beyond the limit specified above, the unit rates for the quantity beyond the said limit, shall be mutually agreed based on prevailing market rates as may be fair and reasonable.</p> <p>It is to be noted that Employer may choose to approve a variation of upto 20% of contract value (calculated using the rates quoted at the time of bidding) which has been caused due to quantity variation. For variation of greater than 20% but less than 50% of contract value(calculated using the rates quoted at the time of bidding), Employer will need to take DRC approval for approving the said quantity variation.</p>
GCC 45.2 (a)	Hon'ble Calcutta High Court.
Additional Clause	Nil

Section - 8 : Contract Forms

2. BID SECURITY FORM

(To be stamped in accordance with Stamp Act, the Non-Judicial Stamp Paper should be in the name of the issuing Bank)

Bank Guarantee No.:

Date:

To: *(insert Name and Address of Employer)*

WHEREAS M/s. (insert name of Bidder)..... having its Registered/Head Office at (insert address of the Bidder) (hereinafter called "the Bidder") has submitted its Bid for the performance of the Contract for.....*(insert name of the Package)*.....under.....*(insert Specification No)*..... (hereinafter called "the Bid")

KNOW ALL PERSONS by these present that WE*(insert name & address of the issuing bank)* having its Registered/Head Office at*(insert address of registered office of the bank)*..... (hereinafter called "the Bank"), are bound unto*(insert name of Employer)*..... (hereinafter called "the Employer") in the sum of*(insert amount of Bid Security in figures & words)*..... for which payment well and truly to be made to the said Employer, the Bank binds itself, its successors and assigns by these presents.

Sealed with the Common Seal of the said Bank this day of 20....

THE CONDITIONS of this obligation are:

- (1) If the Bidder withdraws its bid during the period of bid validity specified by the Bidder in the Bid Form; or
- (2) In case the Bidder does not withdraw the deviations proposed by him, if any, at the cost of withdrawal stated by him in the bid and/or accept the withdrawals/rectifications pursuant to the declaration/confirmation made by him in Attachment – Declaration of the Bid; or

- (3) If the Bidder does not accept the corrections to arithmetical errors identified during preliminary evaluation of his bid pursuant to ITB Clause 33.1; or
- (4) If, as per the requirement of Qualification Requirements the Bidder is required to submit a Deed of Joint Undertaking and he fails to submit the same, duly attested by Notary Public of the place(s) of the respective executant(s) or registered with the Indian Embassy/High Commission in that Country, within ten days from the date of intimation of post – bid discussion; or
- (5) in the case of a successful Bidder, if the Bidder fails within the specified time limit
- (i) to sign the Contract Agreement, in accordance with ITB Clause 43, or
- (ii) to furnish the required performance security, in accordance with ITB Clause 44.
- or
- (6) In any other case specifically provided for in ITB.

WE undertake to pay to the Employer up to the above amount upon receipt of its first written demand, without the Employer having to substantiate its demand, provided that in its demand the Employer will note that the amount claimed by it is due to it, owing to the occurrence of any of the above-named CONDITIONS or their combination, and specifying the occurred condition or conditions.

This guarantee will remain in full force up to and including(*insert date, which shall be the date 30 days after the period of bid validity*)....., and any demand in respect thereof must reach the Bank not later than the above date.

For and on behalf of the Bank

[*Signature of the authorised signatory(ies)*]

Signature_____

Name_____

Designation_____

POA Number_____

Contact Number(s): Tel._____ Mobile_____

Fax Number _____

email _____

Common Seal of the Bank _____

Witness:

Signature _____

Name _____

Address _____

Contact Number(s): Tel. _____ Mobile _____

email _____

Note:

1. In case the bid is submitted by a Joint Venture, the bid security shall be in the name of the Joint Venture and not in the name of the Lead Partner or any other Partner(s) of the Joint Venture.
2. The Bank Guarantee should be in accordance with the proforma as provided. However, in case the issuing bank insists for additional paragraph for limitation of liability, the following may be added at the end of the proforma of the Bank Guarantee [*i.e., end paragraph of the Bank Guarantee preceding the signature(s) of the issuing authority(ies) of the Bank Guarantee*]:

Quote*“Notwithstanding anything contained herein:*

1. *Our liability under this Bank Guarantee shall not exceed _____ (value in figures) _____ [_____ (value in words) _____].*
2. *This Bank Guarantee shall be valid upto _____ (validity date) _____.*

3. *We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only & only if we receive a written claim or demand on or before _____ (validity date) _____.*”

Unquote

3a. FORM OF NOTIFICATION BY THE EMPLOYER TO THE BANK*(Applicable for Forfeiture of Bank Guarantee)*To: *(insert Name and Address of the issuing Bank)*

Ref.: Forfeiture of Bid Security Amount against Bank Guarantee No.
 dated for, issued by you on behalf of M/s.*(insert name of the Bidder)*

Dear Sirs,

Please refer to the subject Bank Guarantee executed by you in our favour for as Bid Security for the bid submitted by M/s.*(insert name of the Bidder)* against *(insert name of the Package)* ; Specification No.

As per the terms of the said guarantee, the bank has guaranteed and undertaken to pay immediately on demand by the Employer the amount of without any reservation, protest, demur and recourse. Further, any demand made by the Employer shall be conclusive and binding on the Bank irrespective of any dispute or difference raised by the Bidder.

In terms of the said guarantee, we hereby submit our claim/demand through this letter for remittance of Bid Security amount to *(insert name of the Employer)* owing to the occurrence of the condition referred to at Sl. No. The Bank is requested to remit the full guaranteed sum towards proceeds of the bid security in the form of Demand Draft in favour of ‘.... *(insert name of the Employer)*’, payable at*(insert place of the Employer)*....’.

Thanking you,

For.....*(Name of the Employer)***(AUTHORISED SIGNATORY)**

Copy to:

.....*(Registered Office of the Bank)*....

3b. FORM OF NOTIFICATION BY THE EMPLOYER TO THE BANK***(Applicable for conditional claim pending extension of Bank Guarantee by the Bidder)***To: *(insert Name and Address of the issuing Bank)*

Ref.: Conditional Claim against Bank Guarantee No. dated
 for valid up to issued by you on behalf of
 M/s. *(insert name of the Bidder)*

Dear Sirs,

Please refer to the subject Bank Guarantee executed by you in our favour on behalf of
 M/s. *(insert name of the Bidder)*, who have submitted this Bank Guarantee
 to us towards Bid Security against *(insert name of the Package)* ; Specification
 No.

We, *(insert name of the Employer)* do hereby request you to lodge our
 claim/demand against the subject Bank Guarantee for full guaranteed sum. Kindly note that
 this claim/demand against the subject Bank Guarantee is without any further notice in case
 the amendment to Bank Guarantee No. dated extending its validity
 upto is not got arranged by *(insert name of the Bidder)* in
 our favour and are not received by us upto In such an event you are requested to
 remit the full guaranteed amount in terms of the subject guarantee in its letter and spirit and
 proceeds of this Bank Guarantee shall be forwarded to us in form of demand draft in favour
 of ‘... *(insert name of the Employer)* payable at ... *(insert place of the Employer)* ...’.

This is without prejudice to our right under this guarantee and under the law.

Thanking you,

For.....(Name of the Employer)

(AUTHORISED SIGNATORY)

Copy to:

(insert Name and Address of the Bidder)

- You are requested to do the needful so that the amendment to the subject Bank Guarantee extending the validity up to is received by us by

4. FORM OF 'NOTIFICATION OF AWARD OF CONTRACT'

4a. FORM OF 'NOTIFICATION OF AWARD OF CONTRACT FOR SUPPLY OF PLANT

Ref. No. :

Date :

.....(*insert Contractor's Name &Address*).....

.....

.....

.....

[in case of Joint Venture, the aforesaid details shall be of the Lead Partner and the following shall also be included:

(Lead Partner of the Joint Venture of M/s. and M/s.)]

Attn : Mr.....

Sub. : Notification of Award for Supply of Plant Contract (Contract Part I) for
(insert name of the Package) Specification No. National
 Competitive Bidding. (Project Funding:)

(Contract Part I)

Dear Sir,

1.0 REFERENCE

This has reference to the following:

1.1 Our Request for Bids (RFB) dated

1.2 RFB/bidding documents for the subject package issued vide our letter Ref. No. dated and downloaded by you from e-tender portal, comprising the following:

- a) Part 1 : Bidding Procedures and Requirements
 (Document Code No.)
- b) Part 2 : Employer's Requirements
 (Document Code No.)

c) Part 3 : Conditions of Contract and Contract Forms

(Document Code No.)

- 1.2.1 Amendment/Errata No. to Bidding Documents issued to you vide our letter no. dated

(Applicable only if any Errata/Amendment to the Bidding Documents has been issued subsequently)

- 1.2.2 Clarifications to the Bidding Documents, pursuant to pre-bid conference held on, issued to you vide our letters no. dated *(Use as applicable)*

(Applicable only if any clarification to the Bidding Documents has been issued subsequently)

(INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO THE BIDDER AFTER ISSUANCE OF BIDDING DOCUMENTS UP TO BID OPENING)

- 1.3 Technical Part (First envelope) of your Bid submitted/the Bid submitted by the Joint Venture (JV) of M/s.(Lead Partner) and M/s. (Other Partner) for the subject package under Letter of Bid/Proposal reference no. dated, which was opened on *(Use as applicable)*

- 1.4 Intimation for Opening of Financial Part (Second Envelope) of Bid issued to you vide our letter no. dated

- 1.5 Price Part (Second Envelope) of your Bid/the Bid by the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) under Letter of Bid/ Proposal reference no. dated which was opened on.....*(Use as applicable)*

- 1.6 Post bid discussions we had with you on various dates from to resulting into the Minutes of Meeting/ Record Notes of Post Bid Discussions enclosed as APPENDIX (NOA)-1 with this Notification of Award.

2.0 AWARD OF CONTRACT AND ITS SCOPE

- 2.1 We confirm having accepted your Bid/Bid of the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) *(Use as applicable)* (referred to at para 1.3 & 1.5 above) read in conjunction with all the

specifications, terms & conditions of the Bidding Documents (referred to at para 1.2, 1.2.1 & 1.2.2 *[modify as applicable]* above) and specific confirmations recorded in the Record Notes of Post Bid Discussions (referred to at para 1.6 above), and award on you/the JV (*use as applicable*) the ‘Supply of Plant Contract’ (also referred to as the ‘Contract Part I’) covering inter-alia supply of Plant on FOR {final place of destination (Site/ Project Site)} basis inter-alia including design, engineering, manufacture, testing, transportation, insurance etc. and other services, incidental thereto, , required for the complete execution of the (*insert name of Package along with name of the Project*), as detailed in the documents referred hereinabove. The scope of work inter-alia includes the following:

..... (*Indicate brief Scope of Work*)

The scope of work under this Notification of Award (NOA) shall also include all such items which are not specifically mentioned in the bidding documents and/or your bid but are necessary for the successful completion of your scope under the Contract for the construction of (*insert name of Package along with name of the Project*), unless otherwise specifically excluded in the Bidding Documents or in this NOA.

2.1.1 You, the Lead Partner of the JV, along with M/s., the Other Partner of JV, shall be liable jointly and severally for the execution of the Contract in accordance with terms and conditions of the Contract. As per the Power of Attorney furnished in your favour by the Joint Venture, as enclosed with Bid Proposal of the JV, you shall act as the Partner In-charge (Lead Partner) of the above Joint Venture for execution of the Contract. (*This provision shall be included only in case the Bidder is a Joint Venture*)

2.2 The notification for award of Contract for performance of all other Installation Services/ activities, as set forth in the bidding documents, viz.

..... (*Indicate brief scope of work of the Contract Part II*)

has been issued on you vide our NOA no. dated (hereinafter called the “Contract Part II” or “Supply of Installation Services Contract”).

Notwithstanding the award of work for Completion of the Facilities under the Contract in two separate parts in the aforesaid manner, you/the JV (*use as applicable*) shall be overall responsible to ensure the execution of both the parts of the Contract to achieve successful completion and taking over of the Facilities/Works under the package by the Employer as per the requirements stipulated in the Bidding Documents. It is expressly understood and agreed by you/the JV (*use as applicable*)

that any default or breach under the ‘Contract Part II’ shall automatically be deemed as a default or breach of this ‘Contract Part I’ also and vice-versa, and any such default or breach or occurrence giving us a right to terminate the ‘Contract Part II’, either in full or in part, and/or recover damages there under, shall give us an absolute right to terminate this Contract Part I, at your/JV’s *(use as applicable)* risk, cost and responsibility, either in full or in part and/or recover damages under this ‘Contract Part I’ as well. However, such default or breach or occurrence in the ‘Contract Part II’, shall not automatically relieve you/the JV *(use as applicable)* of any of your/JV’s *(use as applicable)* obligations under this ‘Contract Part I’. It is also expressly understood and agreed by you/the JV *(use as applicable)* that the Plant/equipment/goods/ materials supplied by you/the JV *(use as applicable)* under this ‘Contract Part I’, when erected, installed & commissioned by you under the ‘Contract Part II’ shall give satisfactory performance in accordance with the provisions of the Contract.

3.0 CONTRACT PRICE FOR CONTRACT PART I

- 3.1 The total Contract Price for Contract Part I for the entire scope of work under this Contract Part I shall be*(Specify the currency and the amount in figures & words)* as per the following break-up:

Sl. No.	Price Component	Amount
1.	FOR Price component	_____
Total for Supply of Plant Contract		_____

- 3.2 Notwithstanding the break-up of the Contract Price, the Contract shall, at all times, be construed as a single source responsibility Contract and any breach in any part of the Contract shall be treated as a breach of the entire Contract.
- 4.0 You/The JV *(use as applicable)*are/is required to furnish at the earliest a Performance Security(ies), as per the Bidding Documents, for an amount of *(Specify the value)* i.e. equal to [3% (Three percent)] of the Contract Price, and valid upto and including and any other securities as per the Bidding Documents.
(In case any other performance security is required to be furnished, the same is to be mentioned here)
- 5.0 For release of advance payment (admissible as per the Bidding Documents) equal to% of the FOR Price component of the Contract Price for Contract part I, you

- are, inter-alia, required to furnish a Bank Guarantee for the 110% of the advance amount. The validity of the Advance Bank Guarantee shall be up to and including Further, please note that furnishing of all the Contract Performance Securities under the 'Contract Part I' and 'Contract Part II' shall be one of the conditions precedent to release of advance under this Contract Part I.
- 6.0 All the bank guarantees shall be furnished from an eligible bank as described in the Bidding Documents.
- 7.0 The schedule for Taking Over/Completion of Facilities by the Employer upon successful Completion of the *(insert name of Package along with name of the Project)*.... shall be ... *(indicate the completion schedule)* months from the date of issue of this Notification of Award for all contractual purposes.
- 8.0 This Notification of Award constitutes formation of the Contract and comes into force with effect from the date of issuance of this Notification of Award.
- 9.0 You shall enter into a Contract Agreement with us within twenty-eight (28) days from the date of this Notification of Award.
- 10.0 This Notification of Award is being issued to you in duplicate. We request you to return its duplicate copy duly signed and stamped on each page including the enclosed Appendix as a token of your acknowledgement.

Please take the necessary action to commence the work and confirm action.

Yours faithfully,

For and on behalf of

.....*(Name of the Employer)*.....
(Authorised Signatory)

Enclosures:

APPENDIX (NOA) – 1 - Record Notes of Post - Bid Discussions held on various dates from to

4b. FORM OF 'NOTIFICATION OF AWARD OF CONTRACT' FOR INSTALLATION OF PLANT AND EQUIPMENT

Ref. No. :

Date :

.....(*insert Contractor's Name &Address*).....

.....

.....

.....

[in case of Joint Venture, the aforesaid details shall be of the Lead Partner and the following shall also be included:

(Lead Partner of the Joint Venture of M/s. and M/s.)/

Attn : Mr.....

Sub. : Notification of Award for Supply of Installation Services Contract (Contract Part II) for (*insert name of the Package*) Specification No.: Domestic Competitive Bidding. (Project Funding: Domestic).

(Contract Part II)

Dear Sir,

1.0 REFERENCE

This has reference to the following:

1.1 Our Request for Bids (RFB) dated

1.2 RFB/ bidding documents for the subject package issued vide our letter Ref. No. dated, and downloaded by you from e-tender portal, comprising the following:

- a) Part 1 : Bidding Procedures and Requirements
(Document Code No.)
- b) Part 2 : Employer's Requirements
(Document Code No.)

c) Part 3 : Conditions of Contract and Contract Forms
 (Document Code No.)

1.2.1 Amendment/Errata No. to Bidding Documents issued to you vide our letter no. dated

(Applicable only if any Errata/Amendment to the Bidding Documents has been issued subsequently)

1.2.2 Clarifications to the Bidding Documents, pursuant to pre-bid conference held on, issued to you vide our letters no. dated *(Use as applicable)*

(Applicable only if any clarification to the Bidding Documents has been issued subsequently)

(INCLUDE AS FURTHER SUB-PARAGRAPHS ANY OTHER CORRESPONDENCE MADE TO THE BIDDER AFTER ISSUANCE OF BIDDING DOCUMENTS UP TO BID OPENING)

1.3 Technical Part (First envelope) of your Bid submitted/the Bid submitted by the Joint Venture (JV) of M/s.(Lead Partner) and M/s. (Other Partner) for the subject package under Letter of Bid/ Proposal reference no. dated, which was opened on *(Use as applicable)*

1.4 Intimation for Opening of Financial Part (Second Envelope) of Bid issued to you vide our letter no. dated

1.5 Price Part (Second Envelope) of your our Bid/the Bid by the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) under proposal reference no. dated, which was opened on.....*(Use as applicable)*

1.6 Post bid discussions we had with you on various dates from to resulting into the Minutes of Meeting/ Record Notes of Post Bid Discussions enclosed as APPENDIX (NOA)-1 with this Notification of Award.

2.0 AWARD OF CONTRACT AND ITS SCOPE

2.1 We confirm having accepted your Bid/Bid of the Joint Venture (JV) of M/s. (Lead Partner) and M/s. (Other Partner) *(Use*

as applicable) (referred to at para 1.3 & 1.5 above) read in conjunction with all the specifications, terms & conditions of the Bidding Documents (referred to at para 1.2, 1.2.1 & 1.2.2 [*modify as applicable*] above) and specific confirmations recorded in the Record Notes of Post Bid Discussions (referred to at para 1.6 above), and award on you/the JV(*use as applicable*) the ‘Supply of Installation Services Contract’ (also referred to as the ‘Contract Part II’) for providing/ supplying all Installation Services (excluding the incidental services included in Contract Part I), interalia, unloading and handling of Plant, all labor, Contractor’s equipment, temporary works, materials, consumables, design and preparation of layout, engineering drawings, and all matters and things of whatsoever nature, including testing, pre-commissioning, guarantee tests and commissioning, the provision of as-built drawings, operations and maintenance manuals, training, etc., applicable and necessary for the proper execution of the installation and other services, at final destination (Site/ Project Site), related to and incidental to successful installation of the Plant supplied under the Contract Part I. as set forth in the bidding documents, viz. (*Indicate brief scope of work*) for the (*insert name of Package along with name of the Project*)....

The scope of work under this Notification of Award (NOA) shall also include all such items which are not specifically mentioned in the bidding documents and/or your bid but are necessary for the successful completion of your scope under the Contract for the construction of (*insert name of Package along with name of the Project*), unless otherwise specifically excluded in the bidding documents or in this NOA.

2.1.1 You, the Lead Partner of the JV, along with M/s., the Other Partner of JV, shall be liable jointly and severally for the execution of the Contract in accordance with terms and conditions of the Contract. As per the Power of Attorney furnished in your favour by the Joint Venture, as enclosed with Bid Proposal of the JV, you shall act as the Partner In-charge (Lead Partner) of the above Joint Venture for execution of the Contract. (*This provision shall be included only in case the Bidder is a Joint Venture*)

2.2 The notification for award of Contract for Supply of Plant including Type Testing to be conducted, as set forth in the bidding documents, viz.

..... (*Indicate brief scope of work of the Contract Part I*)

has been issued on you vide our NOA no. dated (hereinafter called the “Supply of Plant Contract” or “Contract Part I”).

Notwithstanding the award of work for Completion of the Facilities under the Contract in two separate parts in the aforesaid manner, you/the JV (*use as applicable*) shall be overall responsible to ensure the execution of both the parts of the Contract to achieve successful completion and taking over of the Facilities/ works under the package by the Employer as per the requirements stipulated in the Bidding Documents. It is expressly understood and agreed by you/the JV (*use as applicable*) that any default or breach under the ‘Contract Part I’ shall automatically be deemed as a default or breach of this ‘Contract Part II’ also and vice-versa, and any such default or breach or occurrence giving us a right to terminate the ‘Contract Part I’, either in full or in part, and/or recover damages there under, shall give us an absolute right to terminate this Contract Part II, at your/JV’s (*use as applicable*) risk, cost and responsibility, either in full or in part and/or recover damages under this ‘Contract Part II’ as well. However, such default or breach or occurrence in the ‘Contract Part I’, shall not automatically relieve you/the JV (*use as applicable*) of any of your obligations under this ‘Contract Part II’. It is also expressly understood and agreed by you/the JV (*use as applicable*) that the Plant/equipment/goods/ materials supplied by you/the JV (*use as applicable*) under the ‘Contract Part I’, when erected, installed & commissioned by you/the JV (*use as applicable*) under this ‘Contract Part II’ shall give satisfactory performance in accordance with the provisions of the Contract.

3.0 CONTRACT PRICE FOR CONTRACT PART II

- 3.1 The total Contract Price Contract Part II for the entire scope of work under this Contract Part II shall be (*Specify the currency and the amount in figures & words*) as per the following break-up:

Sl. No.	Price Component	Amount
1.	Installation Services	
2.	Training Charges	Not Applicable
Total for Supply of Installation Services Contract		

- 3.2 Notwithstanding the break-up of the Contract Price, the Contract shall, at all times, be construed as a single source responsibility Contract and any breach in any part of the Contract shall be treated as a breach of the entire Contract.

- 4.0 You/the JV(*use as applicable*)are/is required to furnish at the earliest a Performance Security(ies), as per the Bidding Documents, for an amount of (*Specify the value*) i.e. equal to [3% (Three percent)] of the Contract Price, and valid upto and including and any other securities as per the Bidding Documents.

(In case any other performance security is required to be furnished, the same is to be mentioned here)

- 5.0 All the bank guarantees shall be furnished from an eligible bank as described in the Bidding Documents.
- 6.0 The schedule for Taking Over/Completion of Facilities by the Employer upon successful Completion of the (*insert name of Package along with name of the Project*) ... shall be ... (*indicate the completion schedule*) ... months from the date of issue of this Notification of Award for all contractual purposes.
- 7.0 This Notification of Award constitutes formation of the Contract and comes into force with effect from the date of issuance of this Notification of Award.
- 8.0 You shall enter into a Contract Agreement with us within twenty-eight (28) days from the date of this Notification of Award.
- 9.0 This Notification of Award is being issued to you in duplicate. We request you to return its duplicate copy duly signed and stamped on each page including the enclosed Appendix as a token of your acknowledgement.

Please take the necessary action to commence the work and confirm action.

Yours faithfully,

For and on behalf of

.....(*Name of the Employer*).....

(*Authorised Signatory*)

Enclosures:

APPENDIX (NOA) – 1 - Record Notes of Post - Bid Discussions held on various dates
from to

Note:

- (1) Instructions indicated in italics in this notification of award are to be taken care of by the issuing authority. The Forms may be modified appropriately to suit the specific requirement of the Contract.

5. FORM OF CONTRACT AGREEMENT

[Alternative – a]

CONTRACT AGREEMENT PART I FOR SUPPLY OF PLANT BETWEEN.....
 (Name of Employer) AND M/s. (Name of Contractor)/JOINT VENTURE (JV) OF M/s.(Name of Lead Partner)....
 (THE LEAD PARTNER OF THE JV) AND M/s.(Name of Other Partner)..... (THE PARTNER OF THE JV) [Use as applicable]

THIS CONTRACT AGREEMENT PART I No. (also referred to as 'Supply of Plant Contract/the Contract Part I ') is made on the day of 20....

BETWEEN

(1) (Name of Employer)..... a company incorporated under the laws of Companies Act 1956/2013 (with amendment from time to time) and having its Registered Office at(registered address of the Employer) and its Corporate Office at(address of the Employer)..... (hereinafter called "the Employer" and also referred to as “.....(insert abbreviated name of the Employer)”)

and

(2) M/s (Name of Contractor), a company incorporated under the laws of Companies Act 1956/2013 (with amendment from time to time) and having its Principal place of business at(Address of Contractor) and Registered Office at(Registered address of Contractor) (hereinafter called "the Contractor" and also referred to as “.....(insert abbreviated name of the Contractor)”)

or

Joint Venture (JV) of M/s (Name of Lead Partner) (the Lead Partner of JV), a company incorporated under the laws of Companies Act 1956 and having its Principal place of business at(Address of Lead Partner) and Registered Office at(Registered address of Lead Partner) and M/s (Name of Other Partner) (the Partner of JV), a company incorporated under the laws of Companies Act 1956/2013 (with amendment from time to time) and having its Principal place of business at(Address of Other Partner) and Registered Office at(Registered address of Other Partner) (hereinafter called "the Contractor" and also referred to as “Joint Venture”/the ‘JV’”)

(Applicable only in case of Joint Venture)

WHEREAS the Employer desires to engage the Contractor to design, manufacture, test, deliver, install, commission and complete certain Facilities, viz. [insert the name of the Package along with] (“the Facilities”) as detailed in the Contract Document, and the Contractor, in accordance with the mode of contracting specified therein, has agreed to such engagement upon and subject to the terms and conditions appearing in this Contract Agreement Part I for Supply of Plant and in Contract Agreement Part II for Supply of Installation Services for the Facilities, the two parts read together, jointly and in conjunction, constituting the Contract. and the aggregate of the Contract Price for Contract Part I and the Contract Price for Contract Part II constituting the Contract Price for the Contract.

WHERE, the Employer, under this Contract Agreement Part I, desires to engage the Contractor for the supply of Plant on FOR {final place of destination (Site/ Project Site)} basis inter alia including design, engineering, manufacture, testing, transportation, insurance etc. and other services, incidental thereto, required for the complete execution of the (insert name of Package along with name of the Project), and the scope of work is briefly described below:

[.....insert brief scope of work]

NOW IT IS HEREBY AGREED as follows:

Article 1. Contract Documents

1.1 Contract Documents (Reference GCC Clause 2)

The following documents shall constitute the Contract between the Employer and the Contractor, and each shall be read and construed as an integral part of the Contract:

VOLUME – A

1. This Contract Agreement and the Appendices thereto.
2. Notification of Award Ref. No. /NOA-I/01 dated DD/MM/YYYY.

VOLUME – B

3. Documents comprising of the following:

- Conditions of Contract and Contract Forms (Part 3 of Bidding Documents)
 - Conditions of Contract including Special Conditions of Contract (SCC) and General Conditions of Contract (GCC); (Section 7 of Bidding Documents)
 - Contract Forms (Section 8 of Bidding Documents)
- Employers' Requirements (Part 2 of Bidding Documents)
 - Employer's Requirements (Section 6 of Bidding Document)
- Bidding Procedures and Requirements (Part 1 of Bidding Documents)
 - Request for Bids Notice (Section 1 of Bidding Documents)
 - Eligibility and Qualification Requirements (Section 2 of Bidding Documents)
 - Instruction to Bidders and Bid Data Sheets (Section 3 of Bidding Documents)

VOLUME – C

4. Bid Submitted by the Contractor.

(Only relevant extracts are attached herewith for easy reference. Should the circumstances warrant, the original Bid along with the enclosures thereof, shall be referred to.).

1.2 Order of Precedence (Reference GCC Clause 2)

In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above.

1.3 Definitions (Reference GCC Clause 1)

Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions of Contract/Special Conditions of Contract.

Article 2. Contract Price and Terms of Payment

2.1 Contract Price (Reference GCC Clause 11) for Contract Part I

The Employer hereby agrees to pay to the Contractor the Contract Price for Contract Part I in consideration of the performance by the Contractor of its obligations hereunder. The Contract Price for Contract Part I shall be the aggregate of (*amount in words*) (*.....(amount in figures).....*), or such other sums as may be determined in accordance with the terms and conditions of the Contract. The break-up of the Contract Price for Contract Part I is as under:

Sl. No.	Price Component	Amount
1.	FOR Price Component	
Total for Supply of Plant Contract		

The detailed break-up of Contract Price for Contract Part I is given in the relevant Appendices hereto.

2.2 Terms of Payment (Reference GCC Clause 12)

The terms and procedures of payment according to which the Employer will reimburse the Contractor are given in Appendix 1 (Terms and Procedures of Payment) hereto.

Article 3. Effective Date for Determining Time for Completion

3.1 Effective Date (Reference GCC Clause 1)

The Effective Date from which the Time for Completion of the Facilities shall be counted and determined is the date of the Notification of Award i.e.,

Article 4. Appendices

The Appendices listed in the List of Appendices, as mentioned below, shall be deemed to form an integral part of this Contract Agreement Part I and the Contract.

Reference in this Contract Agreement Part I and the Contract, to any Appendix shall mean and include the Appendices attached hereto, and the this Contract Agreement Part I and the Contract shall be read and construed accordingly.

List of Appendices

Appendix 1	Terms and Procedures of Payment
Appendix 2	Price Adjustment
Appendix 3	Insurance Requirements
Appendix 4	Time Schedule
Appendix 5	List of Approved Subcontractors
Appendix 6	Scope of Works and Supply by the Employer
Appendix 7	List of Document for Approval or Review
Appendix 8	Guarantees, Liquidated Damages for Non-Performance
Appendix 9	Price Schedules indicating Price Breakdown of Contract Price for Contract Part I for Supply of Plant
Appendix 11	Integrity Pact

Article 5.

The Contract Agreement Part II No. has also been made on the day of 20...., between the Employer and the Contractor for the Supply of Installation Services (hereinafter referred to as the “Contract Part II”) for providing/ supplying all Installation Services (excluding the incidental services included in Contract Part I), interalia, unloading and handling of Plant, all labor, Contractor’s equipment, temporary works, materials, consumables, design and preparation of layout, engineering drawings, and all matters and things of whatsoever nature, including testing, pre-commissioning, guarantee tests and commissioning, the provision of as-built drawings, operations and maintenance manuals, training, etc., applicable and necessary for the proper execution of the installation and other services, at final destination (Site/ Project Site), related to and incidental to successful installation of the Plant supplied under the Contract Part I, required for the complete execution of the *(insert name of Package along with name of the Project)*, and the scope of work is briefly described below:

[.....insert brief scope of work.....]

Notwithstanding the award of work for Completion of the Facilities under the Contract in two separate parts in the aforesaid manner, the Contractor shall be overall responsible to ensure the execution of both the parts of the Contract to achieve successful completion and taking over of the Facilities by the Employer as per the requirements stipulated in the Contract. It is expressly understood and agreed by the Contractor that any default or breach under the ‘Contract Part II’ shall automatically be deemed as a default or breach of this ‘Contract Part I’ also and vice-versa and any such breach or occurrence or default giving the Employer a right to terminate the

‘Contract Part II’ either in full or in part, and/or recover damages there under the Contract Part II, shall give the Employer an absolute right to terminate this Contract Part I at the Contractor’s risk, cost and responsibility, either in full or in part and /or recover damages under this ‘Contract Part I’ as well. However, such breach or default or occurrence in the ‘Contract Part II’ shall not automatically relieve the Contractor of any of its responsibility/ obligations under this ‘Contract Part I’. It is also expressly understood and agreed by the Contractor that the Plant/equipment/ goods /materials supplied by the Contractor under this ‘Contract Part I’ when erected, installed and commissioned by the Contractor under the ‘Contract Part II’ shall give satisfactory performance in accordance with the provisions of the Contract.

IN WITNESS WHEREOF the Employer and the Contractor have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

Signed by for and
on behalf of the Employer

.....

Signature

.....

Title

in the presence of

Signed by for and
on behalf of the Contractor

.....

Signature

.....

Title

in the presence of

5. FORM OF CONTRACT AGREEMENT

[Alternative – b]

CONTRACT AGREEMENT PART II FOR SUPPLY OF INSTALLATION SERVICES BETWEEN *(Name of Employer)* AND M/s. *(Name of Contractor)*/JOINT VENTURE (JV) OF M/s.*(Name of Lead Partner)*.... (THE LEAD PARTNER OF THE JV) AND M/s.*(Name of Other Partner)*..... (THE PARTNER OF THE JV) [Use as applicable]

THIS CONTRACT AGREEMENT PART I No. (also referred to as 'Supply of Installation Services Contract/the Contract Part II') is made on the day of 20.....

BETWEEN

(1) *(Name of Employer)*..... a company incorporated under the laws of Companies Act 1956/2013 (with amendment from time to time) and having its Registered Office at*(registered address of the Employer)* and its Corporate Office at*(address of the Employer)*..... (hereinafter called "the Employer" and also referred to as “.....*(insert abbreviated name of the Employer)*”)

and

(2) M/s *(Name of Contractor)*, a company incorporated under the laws of Companies Act 1956/2013 (with amendment from time to time) and having its Principal place of business at*(Address of Contractor)* and Registered Office at*(Registered address of Contractor)* (hereinafter called "the Contractor" and also referred to as “.....*(insert abbreviated name of the Contractor)*”)

or

Joint Venture (JV) of M/s *(Name of Lead Partner)* (the Lead Partner of JV), a company incorporated under the laws of Companies Act 1956 and having its Principal place of business at*(Address of Lead Partner)* and Registered Office at*(Registered address of Lead Partner)* and M/s *(Name of Other Partner)* (the Partner of JV), a company incorporated under the laws of Companies Act 1956/2013 (with amendment from time to time) and having its Principal place of business at*(Address of Other Partner)* and Registered Office at*(Registered address of Other Partner)*

Partner) (hereinafter called "the Contractor" and also referred to as "Joint Venture"/the 'JV'")

(Applicable only in case of Joint Venture)

WHEREAS the Employer desires to engage the Contractor to design, manufacture, test, deliver, install, commission and complete certain Facilities, viz. [insert the name of the Package along with] ("the Facilities") as detailed in the Contract Document, and the Contractor, in accordance with the mode of contracting specified therein, has agreed to such engagement upon and subject to the terms and conditions appearing in this Contract Agreement Part II for Supply of Installation Services and in Contract Agreement Part I for Supply of Plant for the Facilities, the two parts read together, jointly and in conjunction, constituting the Contract. and the aggregate of the Contract Price for Contract Part I and the Contract Price for Contract Part II constituting the Contract Price for the Contract.

WHERE, the Employer, under this Contract Agreement Part II, desires to engage the Contractor for the supply of Installation Services for providing/ supplying all Installation Services (excluding the incidental services included in Contract Part I), interalia, unloading and handling of Plant, all labor, Contractor's equipment, temporary works, materials, consumables, design and preparation of layout, engineering drawings, and all matters and things of whatsoever nature, including testing, pre-commissioning, guarantee tests and commissioning, the provision of as-built drawings, operations and maintenance manuals, training, etc., applicable and necessary for the proper execution of the installation and other services, at final destination (Site/ Project Site), related to and incidental to successful installation of the Plant supplied under the Contract Part I, for the complete execution of the (insert name of Package along with name of the Project) and the scope of work is briefly described below:

[.....insert brief scope of work.....]

NOW IT IS HEREBY AGREED as follows:

Article 1. Contract Documents

1.1 Contract Documents (Reference GCC Clause 2)

The following documents shall constitute the Contract between the Employer and the Contractor, and each shall be read and construed as an integral part of the Contract:

VOLUME – A

1. This Contract Agreement and the Appendices thereto.
2. Notification of Award Ref. No./NOA-II/02 dated DD/MM/YYYY.

VOLUME – B

3. Documents comprising of the following:
 - Conditions of Contract and Contract Forms (Part 3 of Bidding Documents)
 - Conditions of Contract including Special Conditions of Contract (SCC) and General Conditions of Contract (GCC); (Section 7 of Bidding Documents)
 - Contract Forms (Section 8 of Bidding Documents)
 - Employers' Requirements (Part 2 of Bidding Documents)
 - Employer's Requirements (Section 6 of Bidding Document)
 - Bidding Procedures and Requirements (Part 1 of Bidding Documents)
 - Request for Bids Notice (Section 1 of Bidding Documents)
 - Eligibility and Qualification Requirements (Section 2 of Bidding Documents)
 - Instruction to Bidders and Bid Data Sheets (Section 3 of Bidding Documents)

VOLUME – C

4. Bid Submitted by the Contractor.

(Only relevant extracts are attached herewith for easy reference. Should the circumstances warrant, the original Bid along with the enclosures thereof, shall be referred to.).

1.2 Order of Precedence (Reference GCC Clause 3)

In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above.

1.3 Definitions (Reference GCC Clause 1)

Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions of Contract/Special Conditions of Contract.

Article 2. Contract Price and Terms of Payment

2.1 Contract Price (Reference GCC Clause 11) for Contract Part II

The Employer hereby agrees to pay to the Contractor the Contract Price for Contract Part II in consideration of the performance by the Contractor of its obligations hereunder. The Contract Price for Contract Part II shall be the aggregate of (*amount in words*) (*.....(amount in figures).....*), or such other sums as may be determined in accordance with the terms and conditions of the Contract. The break-up of the Contract Price for Contract Part II is as under:

Sl. No.	Price Component	Amount
1.	Installation Services	
2.	Training Charges (if required)	Not Applicable
Total for Supply of Installation Services Contract		

The detailed break-up of Contract Price for Contract Part I is given in the relevant Appendices hereto.

2.2 Terms of Payment (Reference GCC Clause 12)

The terms and procedures of payment according to which the Employer will reimburse the Contractor are given in Appendix 1 (Terms and Procedures of Payment) hereto.

Article 3. Effective Date for Determining Time for Completion

3.1 Effective Date (Reference GCC Clause 1)

The Effective Date from which the Time for Completion of the Facilities shall be counted and determined is the date of the Notification of Award i.e.,

Article 4. Appendices

The Appendices listed in the List of Appendices, as mentioned below, shall be deemed to form an integral part of this Contract Agreement Part II and the Contract.

Reference in this Contract Agreement Part II and the Contract to any Appendix shall mean and include the Appendices attached hereto, and this Contract Agreement Part II and the Contract shall be read and construed accordingly.

List of Appendices

Appendix 1	Terms and Procedures of Payment
Appendix 2	Price Adjustment
Appendix 3	Insurance Requirements
Appendix 4	Time Schedule
Appendix 5	List of Approved Subcontractors
Appendix 6	Scope of Works and Supply by the Employer
Appendix 7	List of Document for Approval or Review
Appendix 8	Guarantees, Liquidated Damages for Non-Performance
Appendix 9	Price Schedules indicating Price Breakdown of Contract Price for Contract Part II for Supply of Installation Services
Appendix 11	Integrity Pact

Article 5.

The Contract Agreement Part I No. has also been made on the day of 20...., between the Employer and the Contractor for the Supply of Plant (hereinafter referred to as the “Contract Part I”) for the supply of Plant on FOR {final place of destination (Site/ Project Site)} basis interalia including design, engineering, manufacture, testing, transportation, insurance etc. and other services, incidental thereto, required for the complete execution of the
(insert name of Package along with name of the Project), and the scope of work is briefly described below:

[.....insert brief scope of work]

Notwithstanding the award of work for Completion of the Facilities under the Contract in two separate parts in the aforesaid manner, the Contractor shall be overall

responsible to ensure the execution of both the parts of the Contract to achieve successful completion and taking over of the Facilities by the Employer as per the requirements stipulated in the Contract. It is expressly understood and agreed by the Contractor that any default or breach under the 'Contract Part I' shall automatically be deemed as a default or breach of this 'Contract Part II' also and vice-versa and any such breach or occurrence or default giving the Employer a right to terminate the 'Contract Part I' either in full or in part, and/or recover damages there under the Contract Part I, shall give the Employer an absolute right to terminate this Contract Part I at the Contractor's risk, cost and responsibility, either in full or in part and /or recover damages under this 'Contract Part II' as well. However, such breach or default or occurrence in the 'Contract Part I' shall not automatically relieve the Contractor of any of its responsibility/ obligations under this 'Contract Part I'. It is also expressly understood and agreed by the Contractor that the Plant/equipment /goods/ materials supplied by the Contractor under the 'Contract Part I' when erected, installed and commissioned by the Contractor under this 'Contract part II' shall give satisfactory performance in accordance with the provisions of the Contract.

IN WITNESS WHEREOF the Employer and the Contractor have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

Signed by for and
on behalf of the Employer

Signed by for and
on behalf of the Contractor

.....
Signature

.....
Signature

.....
Title

.....
Title

in the presence of

in the presence of

(Separate Contract Agreements shall be executed by the Employer and the Contractor in accordance with the mode of contracting stipulated at ITB, Section 3 of bidding documents. The forms of Contract under both Alternative i.e., a & b shall be used).

Appendix-1: TERMS AND PROCEDURES OF PAYMENT

In accordance with the provisions of GCC Clause 12 (Terms of Payment), the Employer shall pay the Contractor in the following manner and at the following times, on the basis of the Price Breakdown given in the Appendix regarding Price Schedules. Payments will be made in Indian Rupees.

- I. “Billable Items” are worked out and attached to Price Schedule. Items otherwise required for completion of work but not listed in the Price Schedule shall also be in the scope of the Contractor. The costs of such “Non- billable Items” is deemed to be included in the quoted price of “Billable Items” by the bidder in the Price Schedule. The payment shall be made on billable item wise basis only as indicated in Price Schedule.
- II. Valid Contract Performance Security to be furnished by the Contractor as per the Contract and accepted by the Employer, shall be a condition precedent for release of the advance and progressive payment. Further, for release of any advance payment, requisite securities including Advance Payment Guarantee, as the case may be, to be furnished by the Contractor as specified in the Contract and accepted by the Employer, shall also be a condition precedent. In case, the duration of contract gets extended then the Contractor shall furnish the revised Performance Bank Guarantee equal to 3% of the contract value and valid till 30 days beyond the warranty period as per the new contract timelines. The revised Bank Guarantee shall be submitted by the Contractor within 28 days from the date of approval of time extension by the Employer.
- III. The interest rate on advance payment shall be Marginal Cost of Funds Based Lending Rate (MCLR) for one year of the State Bank of India, prevailing on the date of advance payment to the Contractor. The interest accrued on interest bearing advance shall be adjusted first before releasing any payment. The interest rate shall be calculated on the daily progressive balances outstanding as on the date of recovery/adjustment i.e. on daily rest basis.
- IV. Deleted
- V. Unmeasured ad-hoc payment: The employer, at his discretion in exigencies, to ensure liquidity of funds with the Contractor may accept un-measured ad-hoc bill of the Contractor. In this method, following methodology shall be adopted:

- a. Submission of certificate on measurement book by Project Manager that materials under consideration have been erected, tested and commissioned as per technical specification, scope of work & approved drawings.
- b. Quantum and completion of works is certified by Project Manager jointly with Contractor and eligible amount of such works are computed as per approved payment terms.
- c. 50% of such eligible amount shall be released to the Contractor immediately within a week. The amount of un-measured bill should not be more than average of previous two measured bill.
- d. Next bill of the work shall invariably be a measured bill in which, various quantities of unmeasured bill shall be verified and measured jointly by Project Manager and Contractor.

A. Supply, Erection, Testing and Commissioning of works under RDSS:

1. Advance payment (Optional):

- i. Under the Supply of Plant Contract (Contract Part I), initial interest bearing adjustable Advance of 15% of Contract Price for Contract Part I shall be released in 2 (two) installments each of 7.5% of the Contract Price for Contract Part I.

First installment of 7.5% of the Contract Price for Contract Part I shall be released on presentation of the following:

- a. Signing of Contract Agreement Part I and Contract Agreement Part II by the Employer and the Contractor.
- b. Contractor's detailed invoice.
- c. Submission and acceptance of unconditional & irrevocable part Bank Guarantees (in two (02) equal installments) in favor of employer with total amounting to 110% of total advance amount as per proforma attached with Form:7, Section – 8 of Part -3 (Contract Forms). For release of the Ist Installment of advance the Bank Guarantee equal to 110% of Ist Installment amount shall be taken . Once it gets adjusted and the 2nd installment is due for release, the Bank Guarantee for the 2nd instalment equal to 110% of

2nd Installment amount shall be taken. The said Bank Guarantees shall be initially valid upto end of thirty (30) days after the scheduled month of supply of materials and shall be extended from time to time till thirty (30) days beyond revised scheduled month of supply of materials, as may be required under the Contract.

- d. An unconditional & irrevocable Bank Guarantee for ten percent (10%) of the total Contract price towards Contract Performance Guarantee (CPG) in accordance with the provisions of Clause 44.1, Section 3 and as per proforma attached with Section-8 of Part 3 (Contract forms). The said bank guarantee shall be initially valid up to thirty (30) days after expiry of the Warranty Period and shall be extended from time to time till thirty (30) days beyond successful completion of warranty period, as may be required under the Contract.
- e. Detailed PERT Network/Bar chart and its approval by the Employer.

The bidder must utilize first advance installment of 7.5% of ex-works supply component before requesting for second advance installment. Second installment of 7.5% shall be released on submission of Contractor's invoice, bank guarantee equal to 110% of the advance installment and satisfactory utilization certificate supported with documentary evidences of first advance installment.

- ii. Under the Supply of Installation Services Contract (Contract part II), initial interest-bearing adjustable Mobilization Advance of 10% of Contract Price for Contract Part II shall be released in 2 (two) installments each of 5% of the Contract Price for Contract Part II:

First installment of 5% of the Contract Price for Contract Part I shall be released on presentation of the following:

- a. Submission of detailed invoice for advance payment.
- b. Establishment of Contractor's site offices and certification by Engineer that satisfactory mobilization for erection exists
- c. Submission and acceptance of unconditional & irrevocable part Bank Guarantees (in two (02) equal installments) in favor of employer with total amounting to 110% of total advance amount as per proforma attached with

Form:7, Section – 8 of Part -3 (Contract Forms). For release of the Ist Installment of advance the Bank Guarantee equal to 110% of Ist Installment amount shall be taken . Once it gets adjusted and the 2nd installment is due for release, the Bank Guarantee for the 2nd instalment equal to 110% of 2nd Installment amount shall be taken. The said Bank Guarantees shall be initially valid upto end of thirty (30) days after the scheduled month of erection of materials and shall be extended from time to time till thirty (30) days beyond revised scheduled month of erection of materials, as may be required under the Contract.

- d. Submission of an unconditional & irrevocable Bank Guarantee in favor of Employer for three percent (3%) of the total Contract price towards Contract Performance Guarantee (CPG) in accordance with Clause 44.1 of Section-3, Part 1 and as per proforma attached with Section 8 of Part 3 (Contract Forms). The said Bank Guarantee shall be initially valid up to 30 (thirty) days after the expiry of warranty period and shall be extended from time to time till thirty (30) days beyond successful completion of warranty period, as may be required under the Contract.

The bidder must utilize first advance installment of 5% of Contract Price for Contract Part II before requesting for second advance installment. Second installment of 5% shall be released on submission of Contractor's invoice, bank guarantee equal to 110% of the advance installment and satisfactory utilization certificate supported with documentary evidences of first advance installment.

2. Progressive payments (Supply of Plant):

2.1. First Installment (60%): Sixty percent (60%) payments for the supply of Plant under the Contract Part I, against various items in the attached Price Schedule, including 100% GST thereon reimbursable/ payable by Employer as per Contract, shall be paid on receipt and acceptance of Plant/ equipment/ goods/ materialson submission of documents indicated herein:

- a. Signing of Contract Agreement Part I and ContractAgreement Part II by the Employer and the Contractor.
- b. Detailed Project Execution Plan/PERT chart and its approval by the Employer.
- c. Evidence of dispatch (R/R or receipted L/R)

- d. Contractor's detailed invoice & packing list identifying contents of each shipment.
- e. Invoice certifying payments of GST
- f. Copy of Certificate to the effect of payments of State/ Central taxes, duties, levies etc. have been made against supply of materials through sub-vendors under the contract.
- g. Certified copy of Insurance policy/Insurance Certificate.
- h. Manufacturer's/Contractor's guarantee certificate of Quality.
- i. Material Dispatch Clearance Certificate (MDCC) / Dispatch Instructions (DI) for dispatch of materials from the manufacturer's works. MDCC/DI shall be issued by authorized officer of Employer
- j. Manufacturer's copy of challan
- k. submission of the certificate by the Employer's representative that the item(s) have been received,
- l. Submission of certificate by Project Manager that materials have been supplied as per technical specification, scope of work & approved drawings enclosing certified copy of inspection reports and dispatch clearances.
 - a. 60% of proportionate Mobilization Advance against Supply shall be adjusted while making payments of this installment. In case of delay of project, the entire mobilization advance shall get recovered from the Contractor as per supply and erection contracts' works completion schedule respectively.

2.2. Second Installment (30%): Thirty percent (30%) payments against various items of price schedule 1 shall be paid on following conditions:

- a. Unconditional acceptance of the Letter of Award and signing of contract agreement by the Contractor.
- b. Detailed Project Execution Plan/PERT chart and its approval by the Employer.

- c. Evidence of dispatch (R/R or receipted L/R)
- d. Contractor's detailed invoice & packing list identifying contents of each shipment.
- e. Invoice certifying payments of ED, Taxes for the direct transaction between Employer and Contractor,
- f. Copy of Certificate to the effect of payments of State/ Central taxes, duties, levies etc. have been made against supply of materials through sub-vendors under the contract.
- g. Certified copy of Insurance policy/Insurance Certificate.
- h. Manufacturer's/Contractor's guarantee certificate of Quality.
- i. Material Dispatch Clearance Certificate (MDCC) / Dispatch Instructions (DI) for dispatch of materials from the manufacturer's works. MDCC/DI shall be issued by authorized officer of Employer
- j. Manufacturer's copy of challan
- k. Submission of the certificate on measurement book by the Project Manager that the item(s) have been received,
- l. Submission of certificate on measurement book by Project Manager that materials under consideration have been erected, tested and commissioned as per technical specification, scope of work & approved drawings.
- m. Test check certification on Measurement Book be recorded by officers in hierarchy with the claim as per policy.
While releasing 2nd installment of 30% supply payment following adjustment shall be made:
 - a. Balance initial mobilization advance shall be adjusted. Also, up-to-date accrued interest shall also be recovered.
 - b. In case of delay of project, the entire mobilization advance shall get recovered at this stage.

2.3. Third & Final Installment (10%):

- a. The balance ten percent (10%) of payment against Supply contracts excluding Excise Duty, Taxes etc. shall be reimbursable on successful supply, erection, testing and commissioning of the works in the project and issuance of Completion Certificate by the Employer.
- b. 'Commissioning' for the purpose of payments shall mean satisfactory completion of all supplies, erection, commissioning checks and successful completion of all site tests and continuous energisation of the equipment/materials at rated voltage as per the Contract and to the satisfaction/approval of the Employer.
- c. On submission of the certificate by the Project Manager that the item(s) have been received, erected, tested and commissioned.
- d. In case, for any reason not attributable to the Contractor, the commissioning and charging of equipment/materials is delayed beyond 120 days of successful completion of final checking and testing of works, the balance 10% payment shall be released against an unconditional & irrevocable bank guarantee of equivalent amount initially valid till 6 months from the readiness of works for commissioning and charging at rated voltage, to be extended till 30 days beyond actual commissioning & taking over.

3. Progressive payments (Erection):

3.1. First Installment (90%) :Ninety percent (90%) payments against Erection contracts shall be paid on erection, testing and commissioning of works and on submission of relevant documents indicated herein under:

- a. Unconditional acceptance of the Letter of Award and signing of contract agreement by the Contractor.
- b. Detailed Project Execution Plan/PERT chart and its approval by the Employer.
- c. Certified copy of Insurance policy/Insurance Certificate.
- d. Material reconciliation statement consisting of the materials utilized for erection, testing & commissioning vis-à-vis erection activity of the lot of villages.

- e. Submission of certificate on measurement book by Project Manager that materials under consideration have been erected, tested and commissioned as per technical specification, scope of work & approved drawings.
- f. Test check certification on Measurement Book be recorded by officers in hierarchy with the claim as per policy.

While releasing 1st installment of 90% erection payment following adjustment shall be made:

- b. 100% Mobilization Advance against Erection shall be fully adjusted while making payments of first installment. Also, up-to-date accrued interest shall also be recovered.
- c. In case of delay of project, the entire mobilization advance shall get recovered from the Contractor as per supply and erection contracts' works completion schedule respectively.

3.2. Second and Final Installment (10%):

- a. The balance ten percent (10%) of payment against Erection contracts shall be released on successful commissioning of the works in the project, issuance of Completion Certificate of the project and asset tagging of the created asset in GIS portal provided by the Nodal agency.
- b. 'Commissioning' for the purpose of payments shall mean satisfactory completion of all supplies, erection, commissioning checks and successful completion of all site tests and continuous energisation of the equipment/materials at rated voltage as per the Contract and to the satisfaction/approval of the Employer.
- c. On submission of the certificate by the Project Manager that the equipment/materials have been erected, tested and commissioned.
- d. On certification of Project Manager for reconciliation of materials and payments.
- e. On certification of Project Manager of updating the asset information in the GIS platform and providing requisite information as per Employer's GIS data model. The mobile application for GIS mapping has to be provided by the Employer.

- f. On certification of Project Manager that assets under the project are created and are taken over by Employer.
 - g. However, in case, for any reason solely attributable to the Owner/Employer, the commissioning of equipment/materials is delayed beyond 120 days of successful completion of final checking and testing of line for the purpose of commissioning as defined in bid documents, the balance 10% payment shall be released against an unconditional & irrevocable bank guarantee of equivalent amount initially valid till 6 months from the readiness of transmission lines/ distribution transformer/ service connections for commissioning and charging at rated voltage, to be extended till 30 days beyond actual commissioning & taking over.
 - h. <For development of new lines/ poles, the Contractor should also submit an automated measurement report based on the GPS coordinates captured through the mobile application.>
4. The Project Manager shall within sixty (60) days after receipt of invoices enclosing requisite documents as per payment terms release the payment through electronic mode in designated bank account of the Contractor. In the event that the Contractor has duly followed the procedure enumerated above and the Employer fails to make any payment on its respective due date, the Employer shall pay to the Contractor interest on the amount of such delayed payment as from the end of the 60days period on certified amount due but not paid at the end of such period. The applicable interest rate on the delayed amount willbe equal tothe marginal cost of funds based lending rate (MCLR) for one year of the State Bank of India, as applicable on the 1stApril of the financial year in which the date of disbursement of the payment lies. In case the period of default lies in two or more financial years the interest amount shall be calculated separately for the periods falling in different years.

Appendix-2 :PRICE ADJUSTMENT

The prices for execution of the entire works covered under the scope of this work shall be quoted by the Bidder in the manner specified, in the BPS. The Ex-works price component, less advance will be subject to price adjustment, only for equipment/materials/items of work specifically stated under clause 1.0 below, (for which the bidder shall quote a base price), based on separate formulae as per price adjustment provisions given herein. However, it shall be noted that the Price Adjustment clause will be effective from the contract signing date. The Employer shall ensure that all the Price Adjustment would be governed as per the approved L-2 schedule signed by Employer and Contractor, which would be included in the contract.

Prices for Ex-works price component for all other equipment/items except specified at Clause 1.0 below, Charges for Erection, Inland Freight & Insurance etc. shall be FIRM and no price adjustment shall be applicable for these components for the entire duration of the Contract.

No price adjustment shall be applicable on the portion of the Contract Price payable to the Contractor as advance payment. However, if a Contractor opts for no advance then Price Adjustment would be applicable on 100% contract value.

1.0 Materials and Labour portion:

1.0.1 For ACSR Conductor

The price quoted/confirmed for Aluminum Conductor is based on the input cost of raw materials as on the date of quotation. It is deemed to be related to the prices of the raw materials, as specified in the price variation clauses mentioned below. In case of any variation in these prices, the prices payable shall be subject to adjustment up or down in accordance with the following formula:

For Excise duty units:

$$P = P_o + WA (AL - AL_o) + WF (FE - FE_o)$$

For Excise duty exempted units:

$$P = P_o + WA (AL_e - AL_{o_e}) + WF (FE_e - FE_{o_e})$$

Wherein,

P = Ex-works price payable in Rs. Per km as adjusted in accordance with the price variation clause

P_o = Ex-works price quoted/confirmed in Rs. Per km.

WA = Weight of Aluminium in ACSR conductor in MT per km. (As per IS: 398)

WF = Weight of Steel content in the ACSR conductor in MT per km. (As per IS: 398)

AL = Price of EC Grade Aluminium Ingot/Rod (as per contract) exclusive of excise duty in Rs./MT for the conductor. This price is applicable prevailing as on 30 days prior to the date of delivery.

AL_e = Price of EC Grade Aluminium Ingot/Rod (as per contract) inclusive of excise duty in Rs./MT for the conductor. This price is applicable prevailing as on 30 days prior to the date of tender delivery.

AL_o = Price of EC Grade Aluminium Ingot/Rod (as per contract) exclusive of excise duty in Rs./MT for the conductor. This price is applicable prevailing as on 30 days prior to the date of tender opening.

AL_{o_e} = Price of EC Grade Aluminium Ingot/Rod (as per contract) inclusive of excise duty in Rs./MT for the conductor. This price is applicable prevailing as on 30 days prior to the date of tender opening.

FE = Price (exclusive of excise duty) of high tensile galvanized steel wire in Rs./MT of appropriate size. This price is applicable prevailing as on 30 days prior to the date of delivery.

FE_e = Price (exclusive of excise duty) of high tensile galvanized steel wire in Rs./MT of appropriate size. This price is applicable prevailing as on 30 days prior to the date of delivery.

FE_o = Price (exclusive of excise duty) of high tensile galvanized steel wire in Rs./MT of appropriate size. This price is applicable prevailing as on 30 days prior to the date of tender opening.

FE_{o_e} = Price (exclusive of excise duty) of high tensile galvanized steel wire in Rs./MT of appropriate size. This price is applicable prevailing as on 30 days prior to the date of tender opening.

Note : In case of any clarifications in the above formula kindly refer the IEEMA price variation formula for ACSR conductors given in circular IEEMA/PVC/CONDUCTOR/2012 effective from 1st April 2012, In case of any discrepancies the IEEMA circular mentioned shall prevail.

1.0.2 **For Station/ Power Transformer**

The price adjustment on the Ex-works price component, less advance, of Transformers shall be as follows:

1.0.2.1 The price variation clause for 'Power Transformers'

The price payable shall be subject to adjustment, up or down in accordance with the following formula:

$$P = 0.01 \times P_o (6 + 32X (C / C_o) + 27 X(ES / ESo) + 12X (IS / ISo) + 4X(IM / IMo) + 9X(TO/TOo) + 10X(W/W_o))$$

Wherein,

P = Price payable as adjusted in accordance with the above formula.

P_o = Price quoted / confirmed.

C_o = Price of CC copper rods (as published by IEEMA) This price is applicable for the month, one month prior to the date of tendering.

E_{So} = Price of CRGO Electrical steel lamination (as published by IEEMA) This price is applicable for the month, one month prior to the date of tendering.

I_{So} = Average price of steel Plates 10 mm thick(as published by IEEMA) This price is applicable for the month, one month prior to the date of tendering.

I_{Mo} = Price of Insulating Material (as published by IEEMA) This price is applicable for the month, one month prior to the date of tendering.

T_{Oo} = Price of Transformer oil (as published by IEEMA) This price is applicable for the month, one month prior to the date of tendering.

W_o = All India average consumer price index number for industrial workers, as published by the labour bureau, Ministry of Labour, Govt. of India (Base: 2001 = 100) This index number is applicable for the month, three months prior to the date of tendering.

C = Price of CC copper rods (as published by IEEMA) This price is applicable for the month, two months prior to the date of delivery.

ES = Price of CRGO Electrical steel lamination (as published by IEEMA) This price is applicable for the month, two months prior to the date of delivery.

IS = Average price of Steel Plates 10 mm thick(as published by IEEMA) This price is applicable for the month, one month prior to the date of delivery.

IM = Price of Insulating Material (as published by IEEMA) This price is applicable for the month, two months prior to the date of delivery.

TO = Price of Transformer oil (as published by IEEMA) This price is applicable for the month, one month prior to the date of delivery.

W = All India average consumer price index number for industrial workers, as published by the labour bureau, Ministry of Labour, Govt. of India (Base: 2001 = 100) This index number is applicable for the month, three months prior to the date of delivery.

Note :In case of any clarifications in the above formula kindly refer the IEEMA price variation formula given in circular IEEMA/PVC/PWR TRF_upto 400 KV/2021 effective from 1st September 2021, In case of any discrepancies the IEEMA circular mentioned shall prevail.

1.0.3 **Station / Distribution Transformer (Aluminum/Copper wound)**

The price adjustment on the Ex-works price component, less advance, of Transformers shall be as follows:

1.0.3.1 The price variation clause for Aluminium wound distribution transformers (Single & Three phase of ratings upto and including 2,500kVA and voltage upto 33kV) complete with all accessories and components.

The price payable shall be subject to adjustment, up or down in accordance with the following formula:

$$P = 0.01 \times P_o (8 + 22X (AL / ALo) + 36X(ES / ESo) + 12X(IS / ISo) + 5X(IM / IMo) + 10 X(TO/TOo) + 7X(W/Wo))$$

Wherein,

P = Price payable as adjusted in accordance with the above formula.

Po = Price quoted / confirmed.

ALo = LME CSP Average of Aluminium (as published by IEEMA) This price as applicable for the month, one month prior to the date of tendering.

ESo = Price of CRGO Electrical steel lamination (as published by IEEMA) This price as applicable for the month, one month prior to the date of tendering.

ISo = Price of the HR coil of 3.15 mm thickness (as published by IEEMA) This price is as applicable for the month, one month prior to the date of tendering.

IMo = Price of Insulating Material (as published by IEEMA) This price is as applicable for the month, one month prior to the date of tendering.

TOo = Price of Transformer oil (as published by IEEMA) This price is as applicable for the month, one month prior to the date of tendering.

Wo = All India average consumer price index number for industrial workers, as published by the labour bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100) This index number is as applicable for the month, three months prior to the date of tendering.

AL = LME CSP Average of Aluminium (as published by IEEMA) This price as applicable for the month, one month prior to the date of delivery.

ES = Price of CRGO Electrical steel lamination (as published by IEEMA) This price as applicable for the month, one month prior to the date of delivery.

IS = Price of the HR coil of 3.15 mm thickness (as published by IEEMA) This price is as applicable for the month, one month prior to the date of delivery.

IM = Price of Insulating Material (as published by IEEMA) This price is as applicable for the month, one month prior to the date of delivery.

TO = Price of Transformer oil (as published by IEEMA) This price is as applicable for the month, one month prior to the date of delivery.

W = All India average consumer price index number for industrial workers, as published by the labour bureau, Ministry of Labour, Govt. of India (Base: 2001 = 100) This index number is as applicable for the month, three months prior to the date of delivery.

Note : In case of any clarifications in the above formula kindly refer the IEEMA price variation formula given in circular IEEMA/PVC/DIST_AL_upto 2.5 MVA/2021 effective from 1st September 2021, In case of any discrepancies the IEEMA circular mentioned shall prevail.

1.0.3.2 The price variation clause for Copper wound distribution transformers (Single & Three phase of ratings upto and including 2,500kVA and voltage upto 33kV) complete with all accessories and components.

The price payable shall be subject to adjustment, up or down in accordance with the following formula:

$$P = 0.01 \times P_o (7 + 41 \times (C / C_o) + 23 \times (ES / ESo) + 10 \times (IS / ISo) + 5 \times (IM / IMo) + 8 \times (TO/TOo) + 6 \times (W/W_o))$$

Wherein,

P = Price payable as adjusted in accordance with the above formula.

P_o = Price quoted / confirmed.

C_o = Price of CC copper rods (as published by IEEMA) This price as applicable for the month, one month prior to the date of tendering.

E_{So} = Price of CRGO Electrical steel lamination (as published by IEEMA) This price as applicable for the month, one month prior to the date of tendering.

I_{So} = Price of the HR coil of 3.15 mm thickness (as published by IEEMA) This price is as applicable for the month, one month prior to the date of tendering.

I_{Mo} = Price of Insulating Material (as published by IEEMA) This price is as applicable for the month, one month prior to the date of tendering.

TOo = Price of Transformer oil (as published by IEEMA) This price is as applicable for the month, one month prior to the date of tendering.

Wo = All India average consumer price index number for industrial workers, as published by the labour bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100) This index number is as applicable for the month, three months prior to the date of tendering.

C = Price of CC copper rods (as published by IEEMA) This price is as applicable for the month, one month prior to the date of delivery.

ES = Price of CRGO Electrical steel lamination (as published by IEEMA) This price is as applicable for the month, one month prior to the date of delivery.

IS = Price of the HR coil of 3.15 mm thickness (as published by IEEMA) This price is as applicable for the month, one month prior to the date of delivery.

IM = Price of Insulating Material (as published by IEEMA) This price is as applicable for the month, one month prior to the date of delivery.

TO = Price of Transformer oil (as published by IEEMA) This price is as applicable for the month, one month prior to the date of delivery.

W = All India average consumer price index number for industrial workers, as published by the labour bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100) This index number is as applicable for the month, three months prior to the date of delivery.

Note : In case of any clarifications in the above formula kindly refer the IEEMA price variation formula given in circular IEEMA/PVC/DIST_CU_upto 2.5 MVA/2021 effective from 1st September 2021, In case of any discrepancies the IEEMA circular mentioned shall prevail.

1.0.4 **Cables**

The price adjustment on the Ex-works price component, less advance, of Cables shall be as follows:

Terms used in price variation formula :

P = Price payable as adjusted in accordance with the appropriate formula (in Rs/km)

Po = Price quoted/confirmed (in Rs/km)

Aluminium

AIF = Variation factor in Aluminium (as published by IEEMA)

Al = Price of EC grade aluminum rods (Properzi rods) (as published by IEEMA). This price is as applicable on the first working day of the month, one month prior to the date of delivery.

Alo = Price of EC grade aluminum rods (Properzi rods) (as published by IEEMA). This price is as applicable on the first working day of the month, one month prior to the date of tendering.

Copper

CuF = Variation factor for copper

Cu = Price of CC copper rods (as published by IEEMA). This price is as applicable on the first working day of the month, one month prior to the date of delivery.

Cuo = Price of CC copper rods (as published by IEEMA). This price is as applicable on the first working day of the month, one month prior to the date of tendering.

PVC Compound Polymer

PVCc = Price of PVC compound (as published by IEEMA). This price is as applicable on the first working day of the month, one month prior to the date of delivery.

PVCco = Price of PVC compound (as published by IEEMA). This price is as applicable on the first working day of the month, one month prior to the date of tendering.

CCFAl = Variation factor for PVC Compound/ Polymer for aluminum conductor cable (as published by IEEMA)

CCFCu = Variation factor for PVC Compound/ Polymer for copper conductor cable (as published by IEEMA)

XLPE COMPOUND

Cc = Price of XLPE compound. This price is as applicable on first working day of the month, one month prior to the date of delivery.

Cco = Price of XLPE compound. This price is as applicable on first working day of the month, one month prior to the date of tendering.

XLFAL = Variation factor for XLPE compound for aluminum conductor cable.

XLFCU = Variation factor for XLPE compound for Copper Conductor cable.

Steel

FeF = Variation factor for steel (as published by IEEMA)

FeW = Variation factor for round wire steel armouring (as published by IEEMA)

Fe = Price of steel strips / steel wire (as published by IEEMA). This price is as applicable on the first working day of the month, one month prior to the date of delivery.

Feo = Price of steel strips / steel wire (as published by IEEMA). This price is as applicable on the first working day of the month, one month prior to the date of tendering.

The prices and indices mentioned above are published by IEEMA vide circular reference IEEMA(PVC)/Cable/--/-- prevailing as on 1st working day of the month i.e., one month prior to the date of tendering.

Price variation formulae for Power Cables

A. Aluminium conductor PVC insulated 1.1kV power cables

$$P = P_o + AIF (AL - ALo) + CCFAI (PVCC - PVCco) + FeF (Fe - Feo)$$

For unarmoured multicore cables (without steel armour); $FeF = 0$

B. Copper conductor PVC insulated 1.1kV power cables

$$P = P_o + CuF (Cu - Cuo) + CCFCu (PVCC - PVCco) + Fef (Fe - Feo) + AIF (Al - Alo)$$

For steel armoured cables; $AIF = 0$

For aluminium armoured cables ; $FeF = 0$

For unarmoured cables ; $FeF, AIF = 0$

C. Copper conductor PVC insulated 1.1kV control cables

$$P = P_o + CuF (Cu - Cuo) + CCFCu (CC - Cco) + FeF (Fe - Feo)$$

For unarmoured cables; $FeF = 0$

D. Aluminium conductor XLPE insulated 1.1kV power cables

$$P = P_o + AIF (AL - ALo) + XLFAL (CC - Cco) + CCFAI (PVCC - PVCco) + FeF (Fe - Feo)$$

For unarmoured cables; $FeF = 0$

E. Copper conductor XLPE insulated 1.1kV power cables

$$P = P_o + CuF (Cu - Cuo) + XLFCU (CC - Cco) + CCFCu (PVCC - PVCco) + FeF (Fe - Feo) + AIF (AL - Alo)$$

For steel armoured cables; $AIF = 0$

For aluminium armoured cables ; $FeF = 0$

For unarmoured cables ; $FeF, AIF = 0$

F. Copper conductor XLPE insulated 1.1kV control cables

$$P = P_o + CuF (Cu - Cuo) + XLFCU (CC - Cco) + CCFCu (PVCC - PVCco) + FeF (Fe - Feo)$$

For unarmoured cables; $FeF = 0$

G. For Aluminium conductor XLPE insulated 3.3 to 33kV power cables

$$P = P_o + AIF (AL - ALo) + XLFAL (CC - Cco) + CCFAI (PVCC - PVCco) + FeF (Fe - Feo)$$

For unarmoured multicore cables (without steel armour); $FeF = 0$

H. Copper conductor XLPE insulated 3.3 to 33kV power cables

$$P = P_o + CuF (Cu - Cuo) + XLFCU (CC - Cco) + CCFCu (PVCC - PVCco) + FeF (Fe - Feo) + AIF (AL - Alo)$$

For steel armoured cables; $AIF = 0$

For aluminium armoured cables; $FeF = 0$

For unarmoured cables; $FeF, AIF = 0$

Note :In case of any clarifications in the above formula kindly refer the IEEMA price variation formula given in circular IEEMA/DIV/CAB/05dated 24.04.2018 effective

from 1st November 2017, In case of any discrepancies the IEEMA circular mentioned shall prevail.

1.0.5 A. Steel Structure

Steel structure (excluding nuts, bolts) used in fabrication work at various places in Sub-Transmission and Distribution network (such as lattice structure used in ST&D network/line, switchyard etc.), which are billable items in the Bill of quantity (BOQ) shall be covered under this head. The price adjustment formula for such structural steel items shall be as mentioned hereinafter.

The price component of the structural steel for any shipment/ dispatch comprises of a fixed portion (designated as 'F' and the value of which is specified hereunder) and a variable portion linked with the indices for respective materials and labour (description and co-efficient as enumerated below).

The amount of price adjustment towards variable portion payable/recoverable on each shipment/dispatch shall be computed as under:

$$EC = EC1 - EC0$$

EC1 will be computed as follows in any of appropriate manner as applicable (a or b or c):

- a) For structure using both heavy and lighter angles:

$$EC1 = EC0 * [F + 0.18 * (HA1/HA0) + 0.40 * (LA1/LA0) + 0.16 * (Zn1/Zn0) + 0.11 * (L1/L0)]$$
- b) For structure using only heavy angles:

$$EC1 = EC0 * [F + 0.58 * (HA1/HA0) + 0.16 * (Zn1/Zn0) + 0.11 * (L1/L0)]$$
- c) For structure using only lighter angles:

$$EC1 = EC0 * [F + 0.58 * (LA1/LA0) + 0.16 * (Zn1/Zn0) + 0.11 * (L1/L0)]$$
- d) Steel Pole Tower (including Bolts, Nuts & structural component etc.)

$$EC1 = EC0 [0.15 + 0.58 * (HA1/HA0) + 0.16 * (Zn1/Zn0) + 0.11 * (L1/L0)] - EC0$$

Where

EC = Adjustment to Ex-Works price component payable to Contractor for each shipment/dispatch

EC1 = Adjusted amount of Ex-works price component of Contract payable to Contractor for each shipment / dispatch.

EC0 = Ex-works price for the respective item of the Contract, Shipment/dispatch wise (quoted price).

F = Fixed portion of the ex-works/FOB component of the Contract Price (F) shall be 0.15.

HA = Price of Heavy angle steel, as published by IEEMA

LA = Price of Lighter angle steel, as published by IEEMA

Zn = Price of electrolytic high grade zinc, as published by IEEMA

L = All India average Consumer Price Index Number for Industrial Workers (base 2001=100) as published/declared by Labour Bureau, Shimla, Government of India and circulated by IEEMA.

For the indices, subscript 'o' refers to indices as on 30 days prior to date set for opening of bids. Subscript 'l' refers to indices as of

(a) two months/sixty (60) days prior to the date of shipment/dispatch for labour, and

(b) at the expiry of two third (2/3) period from the date of Notification of Award to the date of shipment/dispatch, for material.

For the purpose of this clause the date of shipment/ dispatch shall mean the Schedule date of shipment/dispatch or actual date of shipment/dispatch, whichever is earlier. The schedule date of shipment/dispatch shall be as identified in line with provisions of Time Schedule in the Contract Agreement.

In case of shipments/ dispatches which are delayed beyond the schedule date of shipment/dispatch for reasons attributable to the Contractor, the price adjustment provision shall not be applicable for the period of time between the schedule date of shipment/dispatch and the actual date of shipment/dispatch.

Note: As per IEEMA Circular No. IEEMA(PVC)/TLT/(R)/02/2007-

- 1) Heavy Steel Angles of size 150mm*150mm*12mm as per IS-2062 has been categorized as Heavy Angles (HA).
- 2) Re-rolled steel angles of size 50mm*50mm*4 mm Lighter has been categorized as Lighter Angles (LA).
- 3) Input costs for all heavy angles of size above 110m*110mm are deemed to be related to the price under Sr No.1.
- 4) Input costs for all lighter angles of size below & including 110m*110mm are deemed to be related to the price under Sr No.2.

Steel Tubular Poles: PRICE VARIATION CLAUSE FOR POLES: The price quoted/confirmed is based on the input cost of raw materials/components and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials and all India average consumer price index number for industrial workers as specified in the price variation clause given below. In case of any variation in these prices and index numbers, the price payable shall be subject to adjustment, up or down in accordance with the following formula:

(A) Steel Tubular Poles

$$P = P_0 \cdot 100 (7 + 70 \frac{IS}{IS_0} + 13 \frac{Zn}{Zn_0} + 10 \frac{W}{W_0})$$

(B) Polygonal Poles

$$P = P_0 \cdot 100 (9 + 64 \frac{IS}{IS_0} + 13 \frac{Zn}{Zn_0} + 14 \frac{W}{W_0})$$

Wherein,

P = Price payable as adjusted in accordance with the above formula.

P₀ = Price quoted/confirmed.

IS₀ = Price of HR Coil of 3.15 mm thickness (refer notes) This price is as applicable for the month, ONE month prior to the date of tendering.

Zn₀ = Price of Electrolytic high grade zinc (refer notes) This price is as applicable on the 1st working day of the month, ONE month prior to the date of tendering.

W₀ = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100) (Refer notes)

This index number is as applicable for the month, THREE months prior to the date of tendering.

For example, if date of tendering falls in May 2022, the applicable prices of HR Coil (IS₀) should be for the month March 2022, Zinc (Zn₀) should be for the month April 2022 and all India average consumer price index number (W₀) should be for the month of February 2022.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA (PVC)/TLT-2014 (R-1)/__ ONE month prior to the date of tendering.

IS = Price of HR Coil of 3.15 mm thickness (refer notes) This price is as applicable for the month, FOUR month prior to the date of delivery.

Zn = Price of Electrolytic high grade zinc (refer notes) This price is as applicable on the 1st working day of the month, ONE month prior to the date of delivery.

W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100) (Refer notes) This index number is as applicable on the first working day of the month, THREE months prior to the date of delivery.

For example, if date of delivery falls in December 2022, the applicable prices of HR Coil (IS) should be for August 2022 and Zinc (Zn) should be for the month November 2022 and all India average consumer price index number (W) should be for the month of September 2022.

The date of delivery is the date on which Poles are notified as being ready for inspection/dispatch (in the absence of such notification, the date of manufacturer's dispatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

Notes:

(a) All prices of raw materials are exclusive of GST and any other central, state or local taxes etc.

(b) The details of prices are as under:

1. Price of steel is the average retail price of HR Coil 3.15 mm thickness as published by Joint Plant Committee (JPC) in Rs./MT.

2. The price of Electrolytic high grade zinc (in Rs/MT) is ex-works price as quoted by a primary producer.

(C) Note : In case of any clarifications in the above formula kindly refer the IEEMA price variation formula given in circular 10/PVC/T & D Project/05 effective from 1st April 2022, In case of any discrepancies the IEEMA circular mentioned shall prevail.

1.0.6 ~~66/11 KV & 33/11 KV Switchgear (indoor/outdoor) including 66/33/11 KV Circuit Breakers and Isolators:~~

~~The Contract Price shall be subject to price adjustment during performance of the Contract to reflect changes in the cost of labour and material components in accordance with the provisions described below.~~

~~The Ex-Works price of 66/11 KV & 33/11 KV Switchgear (Indoor/Outdoor), Circuit Breakers, and Isolators excluding Mandatory Spares and Type Tests Charges (if any) will be subject to Price adjustment. The price adjustment formula for the components of the Contract Price, as mentioned above shall be as stipulated hereinafter.~~

~~The price component of the equipment for any shipment/ dispatch comprises of a fixed portion (designated as 'F' and the value of which is specified hereunder) and a variable portion linked with the indices for various materials and labour (description and co-efficient as enumerated below).~~

~~The amount of price adjustment towards variable portion payable/recoverable on each shipment/dispatch shall be computed as under:~~

$$P = 0.01 \times P_o \left(20 + 28 \left(\frac{IS}{IS_o} \right) + 26 \left(\frac{C}{C_o} \right) + 4 \left(\frac{AL}{AL_o} \right) + 9 \left(\frac{Ln}{Ln_o} \right) + 13 \left(\frac{W}{W_o} \right) \right)$$

~~Wherein,~~

~~P = Price payable as adjusted in accordance with the above formula~~

~~Po = Price quoted/confirmed~~

~~ISo = Wholesale price index number for 'Manufacture of Basic Metals' (Base: 2011-12 = 100) (as published by IEEMA). This price index number for the month, Three month prior to the date of tendering~~

~~Co = Average LME settlement price of copper wire bars (as published by IEEMA). This price is applicable for the month, One month prior to the date of tendering~~

~~Alo = Price of busbar grade aluminum (as published by IEEMA). This price is applicable on the 1st working day of the month, One month prior to the date of tendering~~

~~Ino = Price of epoxy resin for indoor circuit breakers and switch gear (as published by IEEMA). This price is applicable on the 1st working day of the month, One month prior to the date of tendering~~

~~Or wholesale price index of insulator for outdoor circuit breakers (VBF and SDB) (as published by IEEMA). This index number is as applicable for the month, Three month prior to the date of tendering~~

~~Wo = All India average consumer price index number for industrial workers, as published by the Labour bureau, Ministry of Labour, Government of India (Base : 2001 = 100)~~

~~This index number is as applicable for the month, Four month prior to the date of tendering. (as published by IEEMA)~~

~~ISo = Wholesale price index number for 'Manufacture of Basic Metals' (Base: 2011-12 = 100) (as published by IEEMA). This price index number for the month, Three month prior to the date of tendering~~

~~Co = Average LME settlement price of copper wire bars (as published by IEEMA). This price is applicable for the month, One month prior to the date of tendering~~

~~Alo = Price of busbar grade aluminum (as published by IEEMA). This price is applicable on the 1st working day of the month, One month prior to the date of tendering~~

~~lno = Price of epoxy resin for indoor circuit breakers and switch gear (as published by IEEMA). This price is applicable on the 1st working day of the month, One month prior to the date of tendering~~

~~Or wholesale price index of insulator for outdoor circuit breakers (VBF and SDB) (as published by IEEMA). This index number is as applicable for the month, Three month prior to the date of tendering~~

~~Wo = All India average consumer price index number for industrial workers, as published by the Labour bureau, Ministry of Labour, Government of India (Base : 2001 = 100) (as published by IEEMA). This index number is as applicable for the month, Four month prior to the date of tendering~~

Note : In case of any clarifications in the above formula kindly refer the IEEMA price variation formula given in circular IEEMA/PVC/MVSWGR/2019 (R-2) effective from 1st January 2019, In case of any discrepancies the IEEMA circular mentioned shall prevail.

1.0.7 ~~Aerial Bunched Cables~~

~~The price payable shall be subject to adjustment up or down in accordance with the formulae provided in this document.~~

~~Terms used in price variation formulae:~~

~~P = Price payable as adjusted in accordance with above appropriate formula (in Rs/Km)~~

~~Po = Price quoted/confirmed (in Rs/Km)~~

~~n = No. of phase conductor~~

~~ALUMINIUM~~

~~Alph = Aluminium factor for phase conductor (as published by IEEMA)~~

~~Alm = Aluminium factor for messenger conductor (as published by IEEMA)~~

~~Alsl = Aluminium factor for street light conductor (as published by IEEMA)~~

~~Aln = Aluminium factor for neutral conductor (as published by IEEMA)~~

~~AI = Price of LME average Cash SELLER Settlement price of Primary Aluminium in US\$ per MT as published by London Metal Bulletin (LME) including Premium for Aluminium Ingot in US\$ per MT converted in Rs./MT~~

~~This price is as applicable of first working day of the month, one month prior to the date of delivery.~~

~~Alo = Price of LME average Cash SELLER Settlement price of Primary Aluminium in US\$ per MT as published by London Metal Bulletin (LME) including Premium for Aluminium Ingot in US\$ per MT converted in Rs./MT~~

~~This price is as applicable on first working day of the month, one month prior to the date of tendering.~~

XLPE COMPOUND

CCFAlph = XLPE factor for phase conductor (For LV AB Cables) (as published by IEEMA)

CCF1Alph= XLPE factor for phase conductor (For MV_HV AB Cables) (as published by IEEMA)

CCFAIm= XLPE factor for messenger conductor (as published by IEEMA)

CCFAIsl= XLPE factor for street light conductor (as published by IEEMA)

CCFAIn= XLPE factor for neutral conductor (as published by IEEMA)

Cc = Price of LV/HV XLPE Compound in Rs/MT of a representative grade applicable for LV /HV Aerial

Bunch Cables respectively; as quoted by supplier/s. (as published by IEEMA)

This price is as applicable of first working day of the month, one month prior to the date of delivery

Cco = Price of LV/HV XLPE Compound in Rs/MT of a representative grade applicable for LV /HV Aerial

Bunch Cables respectively; as quoted by supplier/s.

This price is as applicable of first working day of the month, one month prior to the date of tendering

PVC/PE Compound

CCF2Alph= PVC/ PE factor for phase conductor (For MV_HV AB Cables)

PVCc price of PVC compound (equivalent to CW-22 grade) in Rs/MT; as quoted by supplier/s.

This price is as applicable on first working day of the month, one month prior to the date of delivery

PVCco Price of PVC compound (Equivalent to CW-22 Grade) in Rs/MT; as quoted by supplier/s.

This price is as applicable on first working day of the month, one month prior to the date of tendering Copper

CuFtph= Cu tape factor for phase conductor

CU = The LME price of Copper Wire Bars (in Rs./MT) is the LME average settlement price of Copper

Wire Bars converted into Indian Rupees with average exchange rate of the month.

This price is the

landed cost, inclusive of applicable customs duty only.

This price is as applicable of first working day of the month, one month prior to the date of delivery.

CU0 = The LME price of Copper Wire Bars (in Rs./MT) is the LME average settlement price of Copper

Wire Bars converted into Indian Rupees with average exchange rate of the month.

This price is the landed cost, inclusive of applicable customs duty only.

This price is as applicable of first working day of the month, one month prior to the date of tendering.

The above prices and indices are as published by IEEMA vide Circular reference IEEMA(PVC)/CABLE(R-1)/--/-- prevailing as on 1st working day of the month i.e. one month prior to the date of tendering.

Price variation formulae for 'LV & HV Aerial Bunch Cables'

1. LV Aerial Bunched Cables with Aluminium Conductor, XLPE Insulated and Aluminium Magnesium-Silicon Alloy Messenger Conductor

$$P = P_0 + \text{Alph} * n * (A_1 - A_{10}) + \text{Alm}(A_1 - A_{10}) + \text{Alsl}(A_1 - A_{10}) + \text{Aln}(A_1 - A_{10}) + \text{CCFAlph} * n * (CC - CC_0) + \text{CFAlm}(CC - CC_0) + \text{CCFAlsl}(CC - CC_0) + \text{CCFAln}(CC - CC_0)$$

In case messenger is bare; XLPE factor CCFAlm = 0

2. HV Aerial Bunched Cables with Aluminium Conductor, Conductor screened, XLPE Insulated, insulation screened followed by copper tape and over all PVC/PE sheathe cores twisted around Bare Aluminium Magnesium-Silicon Alloy Messenger Conductor

$$P = P_0 + \text{Alph} * n * (A_1 - A_{10}) + \text{Alm}(A_1 - A_{10}) + \text{CUFtph} * n * (Cu - Cu_0) + \text{CCF1Alph} * n * (CC - CC_0) + \text{CCF2Alph} * n * (PVCe - PVCe_0) + \text{CCFAlm}(CC - CC_0)$$

Note In case of any clarifications in the above formula kindly refer the IEEMA price variation formula given in circular IEEMA(PVC)/AB CABLE/2017 effective from 1st November 2017, In case of any discrepancies the IEEMA circular mentioned shall prevail.

1.0.8 The Employer shall use the recent formula/ revisions published by IEEMA to calculate the Price adjustment on supply of plants and facilities.

1.0.9 The price adjustment amount towards the price components of materials shall be as per the price variation formulas mentioned in para 1.0.1 to 1.0.8 without any ceiling.

- ~~1.0.10 For the purpose of price adjustment for Ex-works price component, the date of shipment for goods shall mean the scheduled date of shipment or actual date of shipment, whichever is earlier. Scheduled date of shipment will be ex-works date of dispatch, governed by the approved PERT Chart as per Appendix-4 Time Schedule.~~
- ~~1.0.11 No price increase shall be allowed beyond the original delivery dates unless specifically stated in the Time Extension letter, if any, issued by the Employer. The Employer will, however, be entitled to any decrease in the Contract price which may be caused due to lower price adjustment amount in case of delivery beyond the original delivery dates. In such event where the time extension is agreed by the Employer, a revised L2 schedule is to be released by the Employer for the extended period in which price variation would also be allowed.~~
- ~~1.0.12 In case of non-publication of applicable indices on a particular date, which happens to be the applicable date for price adjustment purposes, the published indices prevailing immediately prior to the particular date shall be applicable.~~
- ~~1.0.13 If the price adjustment amount works out to be positive, the same is payable to the Contractor by the Employer and if it works out to be negative, the same is to be recovered by the Employer from the Contractor without any ceiling.~~
- ~~1.0.14 The Contractor shall promptly submit the price adjustment invoices for the supplies made and works executed at site, positively within three (3) months from the date of shipment/work done whether it is positive or negative.~~
- ~~1.0.15 Bids shall conform to the price adjustment provisions detailed above. Bids specifying prices for items on variable basis run the risk of rejection. A bid submitted on a fixed price basis will not be rejected but the price adjustment will be treated as zero.~~
- ~~1.0.16 In case of extension of the project beyond the scheduled date of completion, the price adjustment shall remain in effect till the time of scheduled completion, however for the period beyond the scheduled date of completion for which the Contractor is liable to pay liquidated damages to the employer, the price adjustment shall not be applicable.~~

Appendix-3: INSURANCE REQUIREMENTS**A) Insurances to be taken out by the Contractor**

In accordance with the provisions of GCC Clause 34, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, such approval not to be unreasonably withheld. The inability of the insurers to provide insurance cover in the sums and with the deductibles and other conditions as set forth below, shall not absolve the Contractor of his risks and liabilities under the provisions of GCC Clause 34. However, in such a case the Contractor shall be required to furnish to the Employer documentary evidence from the insurer in support of the insurer's inability as aforesaid.

(a) Marine Cargo Policy/Transit Insurance Policy:**(I) Transit Insurance Policy for indigenous equipment**

Similarly, Transit Insurance Policy shall be taken wherein only inland transit is involved for the movement of Plant and Equipment supplied from within India. The policy shall cover movement of Plant and Equipment from the manufacturer's works to the project's warehouse at final destination site. Inland Transit Clause(ITC) 'A' along with war & Strike Riots & Civil Commotion (SRCC) extension cover shall be taken.

Amount	Deductible Limits	Parties insured	From	To
120% of Ex-work Price of all the Plant and Equipment to be supplied from within India plus Excise Duty and Sales Tax/ GST etc., if additionally payable.	Nil	Contractor & Employer	Mfrs warehouse	Project's warehouse store at final destination

- (II)** If during the execution of Contract, the Employer requests the Contractor to take any other add-on cover(s)/ supplementary cover(s) in aforesaid insurance, in such a case, the Contractor shall promptly take such add-on cover(s)/ supplementary cover(s) and the charges towards such premium for such add-on cover(s)/ supplementary cover(s) shall be reimbursed to the Contractor on submission documentary evidence of payment to the Insurance

company. Therefore, charges towards premium for such add-on cover(s)/ supplementary cover(s) are not included in the Contract Price.

- (III) The Contractor shall take the policy in the joint names of Employer and the Contractor. The policy shall indicate the Employer as the beneficiary. However, if the Contractor is having an open policy for its line of business, it should obtain an endorsement of the open cover policy from the insurance company indicating that the dispatches against this Contract are duly covered under its open policy and include the name of the Employer as jointly Insured in the endorsements to the open policy.

(b) Erection All Risk Policy/Contractor All Risk Policy:

- (I) The policy should cover all physical loss or damage to the facility at site during storage, erection and commissioning covering all the perils as provided in the policy as a basic cover and the add on covers as mentioned at Sl. No. (III) below.

Amount	Deductible limits	Parties insured	From	To
105% of Ex-work Price of all the Plant and Equipment to be supplied from within India plus Excise Duty and Sales Tax/ GST etc., if additionally payable. and 100% of erection price component	Nil	Contractor & Employer	Receipt at site of first lot of the Plant and Equipment	Up to Operational Acceptance

- (II) The Contractor shall take the policy in the joint name of Employer and the Contractor. All these policies shall indicate Employer as the beneficiary. The policy shall be kept valid till the date of the Operational Acceptance of the project and the period of the coverage shall be determined with the approval of the Employer.

If the work is completed earlier than the period of policy considered, the Contractor shall obtain the refund as per provisions of the policy and pass on the benefit to Employer. In case no refund is payable by the insurance company then the certificate to that effect shall be submitted to Employer at the completion of the project.

(III) The following add-on covers shall also be taken by the Contractor:

- i) Earthquake
- ii) Terrorism
- iii) Escalation cost (approximately @10% of sum insured on annual basis)
- iv) Extended Maintenance cover for Defect Liability Period
- v) Design Defect
- vi) Other add-on covers viz., 50-50 clause, 72 hours clause, loss minimization clause, waiver of subrogation clause (for projects of more than Rs.100 crores, cover for offsite storage/fabrication (over Rs.100 crores).

(IV) ***Third Party Liability cover with cross Liability within Geographical limits of India as on ADD-on cover to the basic EAR cover:***

The third party liability add-on cover shall cover bodily injury or death suffered by third parties (including the Employer's personnel) and loss of or damage to property (including the Employer's property and any parts of the Facilities which have been accepted by the Employer) occurring in connection with supply and installation of the Facilities.

Amount	Deductible limits	Parties insured	From	To
<ul style="list-style-type: none"> For projects upto Rs. 100 crores, the third party liability limit shall be 10% of the project value for single occurrence/ multiple occurrences in aggregate during the entire policy period. 	Nil	Contractor/ Sub-Contractor	Receipt at site	Upto Defect Liability Period.
<ul style="list-style-type: none"> For projects from Rs. 100 crores to Rs. 500 crores, the third party liability limit 				

shall be Rs. 10 crores for single occurrence/multiple occurrences in aggregate during entire policy period. For projects of more than Rs.500 crores, the third party liability limit shall be Rs. 25 crores for single occurrence/multiple occurrences in aggregate during entire policy period.				
--	--	--	--	--

Clause 30.8, the cost of insurance premium is to be reimbursed to the Contractor for Owner Supplied Materials (OSM) for which the insurer is to be finalized by the Contractor as detailed therein. Alternatively, the Contractor may take a single policy covering the entire cost of the project including the cost of OSM. For this purpose, the Contractor shall submit documentary evidence for the premium paid for the entire project to the Employer and Employer shall reimburse to the Contractor the proportion of premium equal to value of OSM to total sum insured.

If during the execution of Contract, the Employer requests the Contractor to take any other add-on cover(s)/ supplementary cover(s) in aforesaid insurance, in such a case, the Contractor shall promptly take such add-on cover(s)/ supplementary cover(s) and the charges towards such premium for such add-on cover(s)/ supplementary cover(s) shall be reimbursed to the Contractor on submission documentary evidence of payment to the Insurance company. Therefore, charges towards premium for such add-on cover(s)/ supplementary cover(s) are not included in the Contract Price.

(c) Automobile Liability Insurance

The Contractor shall ensure that all the vehicles deployed by the Contractor or its Subcontractor (whether owned by them) in connection with the supply and installation of the Facilities in the project are duly insured as per RTA act. Further the Contractor or its Subcontractors may also take comprehensive policy (own damage plus third-party liability) of each individual vehicle deployed in the project on their own discretion in their own name to protect their own interest.

(d) Workmen Compensation Policy:

- (I) Workmen Compensation Policy shall be taken by the Contractor in accordance with the statutory requirement applicable in India. The Contractor shall ensure that all the workmen employed by the Contractor or its Subcontractors for the project are adequately covered under the policy.
- (II) The policy may either be project specific covering all men of the Contractor and its Subcontractors. The policy shall be kept valid till the date of Operational Acceptance of the project.

Alternatively, if the Contractor has an existing ‘Workmen Compensation Policy’ for all its employees including that of the Subcontractor(s), the Contractor must include the interest of the Employer for this specific Project in its existing ‘Workmen Compensation Policy’.

- (III) Without relieving the Contractor of its obligations and responsibilities under this Contract, before commencing work the Contractor shall insure against liability for death of or injury to persons employed by the Contractor including liability by statute and at common law. The insurance cover shall be maintained until all work including remedial work is completed including the Defect Liability Period. The insurance shall be extended to indemnify the Principal for the Principal’s statutory liability to persons employed by the Contractor.

The Contractor shall also ensure that each of its Subcontractors shall affect and maintain insurance on the same basis as the ‘Workmen Compensation Policy’ effected by the Contractor.

(e) **Contractor’s Plant and Machinery (CPM) Insurance**

The Employer (including without limitation any consultant, servant, agent or employee of the Employer) shall not in any circumstances be liable to the Contractor for any loss of or damage to any of the Contractor’s Equipment or for any losses, liabilities, costs, claims, actions or demands which the Contractor may incur or which may be made against it as a result of or in connection with any such loss or damage.

The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 34.2, except for the Third-Party Liability, Workmen Compensation Policy Insurances, and the Contractor’s Subcontractors shall be named as co-

insureds under all insurance policies taken out by the Contractor pursuant to GCC Sub-Clause 34.2 except for the Cargo Insurance During Transport and Workmen Compensation Policy Insurances. All insurer's rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.

B) Insurances to be taken out by the Employer

The Employer shall at its expense take out and maintain in effect during the performance of the Contract the following insurances.

Amount	Deductible limits	Parties Insured	From	To
_____ NIL _____				

-- End --

Appendix-4 : TIME SCHEDULE

1. The Project Completion Schedule shall be as follows:

Sl. No.	Activities	Duration in Months from the effective date of Contract
	Handing Over and Taking Over by the Employer upon successful Completion of:	
1.	Development of Distribution Infrastructure at XXXXX District of XXXXX (State name) under the Revamped Reforms-based and Results-linked, Distribution Sector Scheme [Specification No.: XXXXXXXXX].	XX Months

- 1.1 The activity(ies) under the Contractor's programme for Project Completion shall be in the form a PERT chart and shall identify the various activities like engineering, vendor finalization, placement of orders to sub-vendors, survey, Resource mobilization, erection, testing & commissioning including submission of closure proposals. Format of PERT chart is enclosed at Annexure-A. The PERT Chart shall conform to the above Project Completion Schedule.

This PERT Chart shall be discussed and agreed before Award in line with above, engineering drawing and data submission schedule shall also be discussed and finalised before Award. Liquidated damages for delay in successful Completion of the Facilities or specific part thereof (where specific parts are specified in SCC) and Operational Acceptance at rates specified in Clause 26 of GCC shall be applicable beyond the date specified above.

- 1.2 The Employer reserves the right to request minor changes in the work schedule at the time of Award of Contract to the successful Bidder.
- 1.3 The successful Bidder shall be required to prepare detailed PERT Chart and finalise the same with the Employer as per the requirement, which shall form a part of the Contract.

- 1.4 In case of new substations the date of start of the works shall be counted from the date of land made available to the Contractor by the employer.
- 1.5 The start date of the contract will be the date of contract signing between the Contractor and employer. In the L1 and L2 schedule all the milestone timelines should be from the date of start of contract.

Appendix-5 : LIST OF APPROVED SUBCONTRACTORS

Prior to award of Contract, the following details shall be completed indicating those sub-Contractors proposed by the Bidder by Attachment to its bid that are approved by the Employer for engagement by the Contractor during the performance of the contract.

The following Subcontractors are approved for carrying out the item of the facilities indicated. Where more than one Subcontractor is listed, the Contractor is free to choose between them, but it must notify the Employer of its choice in good time prior to appointing any selected Subcontractor. In accordance with GCC Sub-Clause 19.1, the Contractor is free to submit proposals for Subcontractors for additional items from time to time. No Subcontracts shall be placed with any such Subcontractors for additional items until the Subcontractors have been approved in writing by the Employer and their names have been added to this list of Approved Subcontractors.

Item of Facilities	Approved Subcontractors	Nationality

Further, erection portion of the contract shall not be subcontracted without the prior approval of the Employer. However, such approval shall not be necessary for engaging labour.

Appendix-6 : SCOPE OF WORKS AND SUPPLY BY THE EMPLOYER

The following personnel, facilities, works and supplies will be provided/supplied by the Employer, and the provisions of GCC 10, 20, 21 and 24 as well as Employer responsibilities stated in technical specifications shall apply as appropriate.

All personnel, facilities, works and supplies will be provided by the Employer in good time so as not to delay the performance of the Contractor in accordance with the approved Time Schedule and Program of Performance pursuant to GCC Sub-Clause 18.2.

Unless otherwise indicated, all personnel, facilities, works and supplies will be provided free of charge to the Contractor.

Personnel Charge to Contractor – None

-----NIL-----

Facilities Charge to Contractor - None except as noted

Electricity and Water Charge to Contractor - as noted

The Contractor shall be entitled to use for the purposes of the facilities such supplies of electricity and water as may be available on the Site and shall provide any apparatus necessary for such use. The Contractor shall pay the Employer at the applicable tariff plus Employer's overheads, if any, for such use. Where such supplies are not available, the Contractor shall make his own arrangement for provision of any supplies he may require.

Works Charge to Contractor - None

-----NIL-----

Supplies Charge to Contractor – None

-----NIL-----

Appendix-7 :LIST OF DOCUMENTS FOR APPROVAL OR REVIEW

Pursuant to GCC Sub-Clause 20.3.1, the Contractor shall prepare, or cause its Subcontractor to prepare, and present to the Project Manager in accordance with the requirements of GCC Sub-Clause 18.2 (Program of Performance), the following documents for:

A. Approval

- 1.
- 2.
- 3.

B. Review

- 1.
- 2.
- 3.

Note:

Bidder shall furnish the exhaustive list, which shall be discussed and finalised for incorporation into the Contract Agreement.

Appendix-8 :GUARANTEES, LIQUIDATED DAMAGES FOR NON – PERFORMANCE

1. The equipment offered shall meet the rating and performance requirements stipulated in Technical Specification for various equipment or indicated in Data requirement.
2. The ratings and performance figures of the below mentioned equipment are guaranteed as per losses given in respective Indian Standard (up to date) by bidder.

Sl. No.	Description
A.	12/10/8/6.3/5/3.15/1.6 MVA 33/11kV, 3 ph. Power Transformer
B.	1000/630/500/315/200/160/100/63/25/16 KVA, 11/0.433kV, 3 phase Station & Distribution Transformer
C.	16/10KVA, 11/0.250kV, 1 phase Distribution Transformer

3. If the aforementioned guarantees are not established at factory tests, then the Employer shall reject the equipment.

6. PERFORMANCE SECURITY FORM

Bank Guarantee No.

Date.....

Contract No.....

.....[Name of Contract].....

To:[Name and address of Employer]

Dear Ladies and/or Gentlemen,

We refer to the Contract ("the Contract") signed on(insert date of the Contract)..... between M/s. **XWBSEDCL**, having its Registered Office at **XXXXX** (Registered Address of employer) ("the Employer"/" **XWBSEDCL**") on behalf of **XXXX** (Name of owner) (hereinafter referred to as '**XXXX (Short Name of Owner)**' / 'Owner'), and M/s (Name of Contractor), having its Principal place of business at(Address of Contractor) and Registered Office at(Registered address of Contractor) ("the Contractor") concerning(Indicate brief scope of work) for the complete execution of the (insert name of Package along with name of the Project)..... [Applicable for Bank Guarantees issued by Contractor/Associate for those Contracts awarded to them]

Or

We refer to the Contract signed on(insert date of the Contract)..... between M/s. **XWBSEDCL**, having its Registered Office at **XXXXX** (Registered Address of employer) ("the Employer"/" **XWBSEDCL**") on behalf of **XXXX** (Name of owner) (hereinafter referred to as '**XXXX (Short Name of Owner)**' / 'Owner'), and M/s (Name of Contractor), having its Principal place of business at(Address of Contractor) and Registered Office at(Registered address of Contractor) ("the Contractor") and the Contract ("the Contract") signed on(insert date of the Contract)..... between **XWBSEDCL** on behalf of Owner and M/s (Name of Associate), having its Principal place of business at(Address of Associate) and Registered Office at(Registered address of Associate), the Associate of the

Contractor for executing the Facilities concerning *(Indicate brief scope of work)* for the complete execution of the *(insert name of Package along with name of the Project)*..... *[Applicable for Bank Guarantees to be issued by Contractor against those Contracts awarded to their Associate]*

By this letter we, the undersigned,*(insert name & address of the issuing bank)*, a Bank (which expression shall include its successors, administrators, executors and assigns) organized under the laws of and having its Registered/Head Office at*(insert address of registered office of the bank)*..... do hereby irrevocably guarantee payment to the Employer up to i.e., Threepercent (3%) of the Contract Price until thirty (30) days beyond the Defect Liability Period i.e., upto and inclusive of *(dd/mm/yy)*.

We undertake to make payment under this Letter of Guarantee upon receipt by us of your first written demand signed by the Employer duly authorized officer or the authorized officer of **Owner** declaring the Contractor to be in default under the Contract and without cavil or argument any sum or sums within the above named limits, without your need to prove or show grounds or reasons for your demand and without the right of the Contractor to dispute or question such demand.

Our liability under this Letter of Guarantee shall be to pay to the Employer whichever is the lesser of the sum so requested or the amount then guaranteed hereunder in respect of any demand duly made hereunder prior to expiry of the Letter of Guarantee, without being entitled to inquire whether or not this payment is lawfully demanded.

This letter of Guarantee shall remain in full force and shall be valid from the date of issue until thirty (30) days beyond the Defect Liability Period of the Facilities i.e. upto and inclusive of *(dd/mm/yy)* and shall be extended from time to time for such period (not exceeding one year), as may be desired by M/s. on whose behalf this Letter of Guarantee has been given.

Except for the documents herein specified, no other documents or other action shall be required, notwithstanding any applicable law or regulation.

Our liability under this Letter of Guarantee shall become null and void immediately upon its expiry, whether it is returned or not, and no claim may be made hereunder after such expiry or after the aggregate of the sums paid by us to the Employer shall equal the sums guaranteed hereunder, whichever is the earlier.

All notices to be given under shall be given by registered (airmail) posts to the addressee at the address herein set out or as otherwise advised by and between the parties hereto.

We hereby agree that any part of the Contract may be amended, renewed, extended, modified, compromised, released or discharged by mutual agreement between you and the Contractor, and this security may be exchanged or surrendered without in any way impairing or affecting our liabilities hereunder without notices to us and without the necessity for any additional endorsement, consent or guarantee by us, provided, however, that the sum guaranteed shall not be increased or decreased.

No action, event or condition which by any applicable law should operate to discharge us from liability hereunder shall have any effect and we hereby waive any right we may have to apply such law so that in all respects our liability hereunder shall be irrevocable and, except as stated herein, unconditional in all respects.

For and on behalf of the Bank

[Signature of the authorised signatory(ies)]

Signature_____

Name_____

Designation_____

POA Number_____

Contact Number(s): Tel._____ Mobile_____

Fax Number_____

email_____

Common Seal of the Bank_____

Witness:

Signature_____

Name_____

Address_____

Contact Number(s): Tel. _____ Mobile _____

email _____

Note :

1. For the purpose of executing the Bank Guarantee, the non-judicial stamp papers of appropriate value shall be purchased in the name of Bank who issues the 'Bank Guarantee'.
2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.
3. The Bank Guarantee should be in accordance with the proforma as provided. However, in case the issuing bank insists for additional paragraph for limitation of liability, the following may be added at the end of the proforma of the Bank Guarantee [*i.e., end paragraph of the Bank Guarantee preceding the signature(s) of the issuing authority(ies) of the Bank Guarantee*]:

Quote

“Notwithstanding anything contained herein:

1. Our liability under this Bank Guarantee shall not exceed _____ (*value in figures*) _____ [*(value in words)* _____].
2. This Bank Guarantee shall be valid upto _____ (*validity date*) _____.
3. We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only & only if we receive a written claim or demand on or before _____ (*validity date*) _____.”

Unquote

7. BANK GUARANTEE FORM FOR ADVANCE PAYMENT

Bank Guarantee No.

Date.....

Contract No.....

.....[Name of Contract]

To:[Name and address of the Employer]

Dear Ladies and/or Gentlemen,

We refer to the Contract ("the Contract") signed on(insert date of the Contract) between you and M/s (Name of Contractor), having its Principal place of business at(Address of Contractor) and Registered Office at(Registered address of Contractor) ("the Contractor") concerning(Indicate brief scope of work) for the complete execution of the (insert name of Package along with name of the Project)

Whereas, in accordance with the terms of the said Contract, the Employer has agreed to pay or cause to be paid to the Contractor an Advance Payment in the amount of(Amount in figures and words).....

By this letter we, the undersigned,(insert name & address of the issuing bank), a Bank (which expression shall include its successors, administrators, executors and assigns) organized under the laws of and having its Registered/Head Office at(insert address of registered office of the bank)..... do hereby irrevocably guarantee repayment of the said amounts upon the first demand of the Employer without cavil or argument in the event that the Contractor fails to commence or fulfill its obligations under the terms of the said Contract, and in the event of such failure, refuses to repay all or part (as the case may be) of the said advance payment to the Employer.

Provided always that the Bank's obligation shall be limited to an amount equal to the outstanding balance of the advance payment, taking into account such amounts, which have been repaid by the Contractor from time to time in accordance with the terms of payment of the said Contract as evidenced by appropriate payment certificates.

This Guarantee shall remain in full force from the date upon which the said advance payment is received by the Contractor upto thirty (30) days beyond the date on which the entire advance so advanced along with the interest if any due thereon has been fully adjusted in terms of the Contract i.e., upto of thirty (30) days beyond the date of Completion of the Facilities under the Contract. This Guarantee may be extended from time to time, as may be desired by M/s. on whose behalf this Guarantee has been issued.

Any claims to be made under this Guarantee must be received by the Bank during its period of validity, i.e. upto thirty (30) days beyond the date of Completion of the Facilities by the Employer i.e. upto and inclusive of (dd/mm/yy).

For and on behalf of the Bank

[Signature of the authorised signatory(ies)]

Signature _____

Name _____

Designation _____

POA Number _____

Contact Number(s): Tel. _____ Mobile _____

Fax Number _____

email _____

Common Seal of the Bank _____

Witness:

Signature _____

Name _____

Address _____

Contact Number(s): Tel. _____ Mobile _____

email _____

Note:

1. For the purpose of executing the Bank Guarantee, the non-judicial stamp papers of appropriate value shall be purchased in the name of Bank who issues the 'Bank Guarantee'.
2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.
3. The Bank Guarantee should be in accordance with the proforma as provided. However, in case the issuing bank insists for additional paragraph for limitation of liability, the following may be added at the end of the proforma of the Bank Guarantee [*i.e., end paragraph of the Bank Guarantee preceding the signature(s) of the issuing authority(ies) of the Bank Guarantee*]:

Quote

“Notwithstanding anything contained herein:

1. Our liability under this Bank Guarantee shall not exceed _____ (*value in figures*) _____ [*value in words*] _____].
2. This Bank Guarantee shall be valid upto _____ (*validity date*) _____.
3. We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only & only if we receive a written claim or demand on or before _____ (*validity date*) _____.”

Unquote

8. FORM OF COMPLETION CERTIFICATE

Date.....

Name of Contract.....

Contract No.....

To :

(Name and address of the Contractor)

Dear Ladies and/or Gentlemen,

Pursuant to GCC 24.4 (Completion) of the General Conditions of the Contract entered into between yourselves and the Employer dated relating to the *(insert brief description of the Facilities)*..... we hereby notify you that the following part(s) of the Facilities was (were) complete on the date specified below, and that, in accordance with the terms of the Contract, the Employer hereby takes over the said part(s) of the Facilities, together with the responsibility for care and custody and the risk of loss thereof on the date mentioned below :

1. Description of the Facilities or part thereof
2. Date of Completion :.....

However, you are required to complete the outstanding items listed in the attachment hereto as soon as practicable.

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defects Liability Period.

Very truly yours,

Title

(Project Manager)

9. FORM OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR FOR THE EQUIPMENT HANDED OVER IN ONE LOT BY(abbreviated name of the Employer)..... FOR PERFORMANCE OF ITS CONTRACT

INDEMNITY BOND

THIS INDEMNITY BOND is made this..... day of 20.... by a Company registered under the Companies Act, 1956/2013 (with amendment from time to time)/Partnership firm/ proprietary concern having its Registered Office at.....(hereinafter called as 'Contractor' or "Obligor" which expression shall include its successors and permitted assigns) in favour of (insert name of the Employer)....., a Company incorporated under the Companies Act, 1956/2013 (with amendment from time to time) having its Registered Office at(insert registered address of the Employer)and its project at (hereinafter called ".....(abbreviated name of the Employer)....." which expression shall include its successors and assigns):

WHEREAS(abbreviated name of the Employer)..... has awarded to the Contractor a Contract for..... vide its Notification of Award/Contract No..... dated..... and its Amendment No. (applicable when amendments have been issued) (hereinafter called the "Contract") in terms of which(abbreviated name of the Employer)..... is required to hand over various Equipment to the Contractor for execution of the Contract.

And WHEREAS by virtue of Clause No.....of the said Contract, the Contractor is required to execute an Indemnity Bond in favour of(abbreviated name of the Employer)..... for the Equipment handed over to it by(abbreviated name of the Employer)..... for the purpose of performance of the Contract/Erection portion of the contract (hereinafter called the "Equipment").

AND THEREFORE, This Indemnity Bond witnesseth as follows:

1. That in consideration of various Equipment as mentioned in the Contract, valued at (amount in words.....) handed over to the Contractor for the purpose of performance of the Contract, the Contractor hereby undertakes to indemnify and shall keep(abbreviated name of the Employer)..... indemnified, for the full value of the Equipment. The Contractor hereby acknowledges receipt of the Equipment as per dispatch title documents handed over to the Contractor duly endorsed in their favour and detailed in the Schedule appended hereto. It is expressly understood by the Contractor that handing over of the dispatch title

- documents in respect of the said Equipments duly endorsed by(abbreviated name of the Employer)..... in favour of the Contractor shall be construed as handing over of the Equipment purported to be covered by such title documents and the Contractor shall hold such Equipment in trust as a Trustee for and on behalf of(abbreviated name of the Employer).....
2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Equipment at(abbreviated name of the Employer)..... project Site against all risks whatsoever till the Equipment are duly used/erected in accordance with the terms of the Contract and the Plant/Package duly erected and commissioned in accordance with the terms of the Contract, is taken over by(abbreviated name of the Employer)..... The Contractor undertakes to keep(abbreviated name of the Employer)..... harmless against any loss or damage that may be caused to the Equipment.
 3. The Contractor undertakes that the Equipment shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilised for any other work of purpose whatsoever. it is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal/penal consequences.
 4. That(abbreviated name of the Employer)..... is and shall remain the exclusive Employer of the Equipment free from all encumbrances, charges or liens of any kind, whatsoever. The equipment shall at all times be open to inspection and checking by the Employee or Employer's Representative in this regard. Further,(abbreviated name of the Employer)..... shall always be free at all times to take possession of the Equipment in whatever form the equipment may be, if in its opinion, the Equipment are likely to be endangered, misutilised or converted to uses other than those specified in the Contract, by any acts of omission or commission on the part of the Contractor or any other person or on account of any reason whatsoever and the Contractor binds himself and undertakes to comply with the directions of demand of(abbreviated name of the Employer)..... to return the equipment without any demur or reservation.
 5. That this indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is misutilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Employer's Representative as to assessment of loss or damage to the Equipment shall be final

and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipment at his own cost and/or shall pay the amount of loss to(abbreviated name of the Employer).....without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to(abbreviated name of the Employer).....against the Contractor under the Contract and under this Indemnity Bond.

6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with the terms and conditions of this Bond to the satisfaction of(abbreviated name of the Employer)....., THEN, the above Bond shall be void, but otherwise, it shall remain in full force and virtue.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorized representative under the common seal of the Company, the day, month and year first above mentioned.

SCHEDULE

Particulars of the Equipment handed over	Quantity	Particulars of Dispatch title Documents		Value of the Equipment	Signature of the Attorney in token of receipt
		RR/GR No. date of lading	Carrier		

For and on behalf of
M/s.....

WITNESS

1. Signature.....

Signature.....

Name.....

Name.....

Address.....

Address.....

2. Signature.....

Authorised representative

Name.....

(Common Seal)

Address.....

(In case of Company)

Indemnity Bonds are to be executed by the authorised person and (i) in case of contracting Company under common seal of the Company or (ii) having the power of attorney issued under common seal of the company with authority to execute Indemnity Bonds, (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a Photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond.

**10. FORM OF INDEMNITY BOND TO BE EXECUTED BY THE CONTRACTOR
FOR THE EQUIPMENT HANDED OVER IN INSTALLMENTS
BY(abbreviated name of the Employer)..... FOR PERFORMANCE OF
ITS CONTRACT**

INDEMNITY BOND

THIS INDEMNITY BOND is made this day of 20..... by a Company registered under the Companies Act, 1956/2013 (with amendment from time to time)/Partnership firm/proprietary concern having its Registered Office at(hereinafter called as 'Contractor' or 'Obligor' which expression shall include its successors and permitted assigns) in favour of(insert name of the Employer)....., a company incorporated under the Companies Act, 1956/2013 (with amendment from time to time) having its Registered Office at(insert registered address of the Employer)..... and its project at (hereinafter called ".....(abbreviated name of the Employer)....." which expression shall include its successors and assigns):

WHEREAS(abbreviated name of the Employer)..... has awarded to the Contractor a Contract forvide its Notification of Award/Contract No. datedand Amendment No. (applicable when amendments have been issued) (hereinafter called the "Contract") in terms of which(abbreviated name of the Employer)..... is required to handover various Equipment to the Contractor for execution of the Contract.

AND WHEREAS by virtue of Clause No.....of the said Contract, the Contractor is required to execute an Indemnity Bond in favour of(abbreviated name of the Employer)..... for the Equipment handed over to it by(abbreviated name of the Employer)..... for the purpose of performance of the contract/Erection portion of the Contract (hereinafter called the "Equipment".)

NOW THEREFORE, This Indemnity Bond witnesseth as follows:

1. That in consideration of various Equipments as mentioned in the Contract, valued at (amount in words _____) to be handed over to the Contractor in installments from time to time for the purpose of performance of the contract, the Contractor hereby undertakes to indemnify and shall keep(abbreviated name of the Employer).....indemnified, for the full value of Equipment. The Contractor hereby acknowledges receipt of the initial installment of the equipment per details in the schedule appended hereto. Further, the Contractor agrees to acknowledge receipt

- of the subsequent installments of the Equipment as required by(abbreviated name of the Employer)..... in the form of Schedules consecutively numbered which shall be attached to this Indemnity bond so as to form integral parts of this Bond. It is expressly understood by the Contractor that handing over the dispatch title documents in respect of the said Equipments duly endorsed by(abbreviated name of the Employer)..... in favour of the Contractor shall be construed as handing over the Equipment purported to be covered by such title documents and the Contractor shall hold such Equipments in trust as a Trustee for and on behalf of(abbreviated name of the Employer).....
2. That the Contractor is obliged and shall remain absolutely responsible for the safe transit/protection and custody of the Equipment at(abbreviated name of the Employer)..... project Site against all risks whatsoever till the Equipment are duly used/erected in accordance with the terms of the Contract and the Plant/Package duly erected and commissioned in accordance with the terms of the Contract, is taken over by(abbreviated name of the Employer)..... The Contractor undertakes to keep(abbreviated name of the Employer)..... harmless against any loss or damage that may be caused to the Equipment.
 3. The Contractor undertakes that the Equipment shall be used exclusively for the performance/execution of the Contract strictly in accordance with its terms and conditions and no part of the equipment shall be utilised for any other work or purpose whatsoever. It is clearly understood by the Contractor that non-observance of the obligations under this Indemnity Bond by the Contractor shall inter-alia constitute a criminal breach of trust on the part of the Contractor for all intents and purpose including legal/penal consequences.
 4. That(abbreviated name of the Employer)..... is and shall remain the exclusive Employer of the Equipment free from all encumbrances, charges or liens of any kind, whatsoever. The equipment shall at all times be open to inspection and checking by the Employer or Employer's Representative in this regard. Further,(abbreviated name of the Employer)..... shall always be free at all times to take possession of the Equipment in whatever form the Equipment may be, if in its opinion, the Equipment are likely to be endangered, misutilised or converted to uses other than those specified in the Contract, by any acts of omission or commission on the part of the Contractor or any other person or on account of any reason whatsoever and the Contractor binds himself and undertakes to comply with the directions of demand of(abbreviated name of the Employer)..... to return the equipment without any demur or reservation.

5. That this indemnity Bond is irrevocable. If at any time any loss or damage occurs to the Equipment or the same or any part thereof is misutilised in any manner whatsoever, then the Contractor hereby agrees that the decision of the Employer's Representative as to assessment of loss or damage to the Equipment shall be final and binding on the Contractor. The Contractor binds itself and undertakes to replace the lost and/or damaged Equipment at its own cost and/or shall pay the amount of loss to(*abbreviated name of the Employer*)..... without any demur, reservation or protest. This is without prejudice to any other right or remedy that may be available to(*abbreviated name of the Employer*)..... against the Contractor under the Contract and under this Indemnity Bond.
6. NOW THE CONDITION of this Bond is that if the Contractor shall duly and punctually comply with the terms and conditions of this Bond to the satisfaction of(*abbreviated name of the Employer*)....., THEN, the above Bond shall be void, but otherwise, it shall remain in full force and virtue.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorised representative under the common seal of the Company, the day, month and year first above mentioned.

SCHEDULE No. 1

Particulars of the Equipment handed over	Quantity	Particulars of Dispatch title Documents		Value of the Equipment	Signature of the Attorney in token of receipt
		RR/GR No. date of lading	Carrier		

For and on behalf of
M/s.....

WITNESS

1. Signature.....

Signature.....

Name.....

Name.....

Address.....

Address.....

2. Signature..... Authorised representative
- Name..... (Common Seal)
- Address..... (In case of Company)

Indemnity Bonds are to be executed by the authorised person and (i) in case of contracting Company under common seal of the Company or (ii) having the power of attorney issued under common seal of the company with authority to execute Indemnity Bonds, (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to Indemnity Bond.

11. FORM OF AUTHORISATION LETTER

Ref. No:

Date :

To

M/s.....

.....

.....

REF.: Contract No. dated for
awarded by(insert name of the Employer).....

Dear Sir,

Kindly refer to Contract No. dated
for You are hereby authorised on behalf of (Name of
Employer)..... a company incorporated under the laws of Companies Act 1956/2013
(with amendment from time to time) and having its Registered Office at(registered
address of the Employer)and its Project at to take physical
delivery of materials/equipments covered under Dispatch Document/Consignment Note
No.* datedand as detailed in the enclosed schedule for the sole
purpose of successful performance of the aforesaid contract and for no other purpose,
whatsoever.

(Signature of Project Authority)**

Designation.....

Date.....

Encl: As Above.

** To be signed not below the rank of Manager.

* Mention LR/RR No.

Schedule of Material/Equipment covered under Dispatch Title Document (RR No./LR No.)

Sl. No.	Contract Name	NOA No./ CA No.	Description of Materials/ Equipments	Spec. No.	Qty.	Value	Remarks

(Signature of the Project Authority)

(Designation)

(Date)

12. FORM OF TRUST RECEIPT FOR PLANT, EQUIPMENT AND MATERIALS RECEIVED

We M/s.(*insert name of the Contractor*) having our Principal place of business at having been awarded a Contract No. dated for (*insert Package name along with name of the Project*)..... by(*insert name of the Employer*)

We do hereby acknowledge the receipt of the Plant, Equipment and Materials as are fully described and mentioned under Documents of Title/RR/LR etc. and in the schedule annexed hereto, which shall form an integral part of this receipt as "Trustee" of (*insert name of the Employer*)..... The aforesaid materials etc. so received by us shall be exclusively used in the successful performance of the aforesaid Contract and for no other purpose whatsoever. We undertake not to create any charge, lien, or encumbrance over the aforesaid materials etc., in favour of any other person/institution(s)/Banks.

For M/s
(*Contractor's Name*)

Dated :

(AUTHORISED SIGNATORY)

Place :

SEAL OF COMPANY

13. FORM OF EXTENSION OF BANK GUARANTEE

Ref. No.....

Dated:.....

To: *[Name and address of the Employer]*

Dear Sirs,

Sub.: Extension of Bank Guarantee No. dated for, issued to you on behalf of M/s.(*insert name of the Contractor*) in respect of Contract No. dated for(*insert name of the Package along with the Project name*)(hereinafter called original Bank Guarantee).

At the request of M/s..... (*insert name of the Contractor*), We(*insert name & address of the issuing bank*), a Bank organized under the laws of and having its Registered/Head Office at(*insert address of registered office of the bank*)..... do hereby extend our liability under the above-mentioned Guarantee No. Dated for a further period of Years/Months from to expire on Except as provided above, all other terms and conditions of the original Bank Guarantee No. dated shall remain unaltered and binding.

Please treat this as an integral part of the original Guarantee to which it would be attached.

For and on behalf of the Bank

[Signature of the authorised signatory(ies)]

Signature_____

Name_____

Designation_____

POA Number_____

Contact Number(s): Tel._____ Mobile_____

Fax Number _____

email _____

Common Seal of the Bank _____

Witness:

Signature _____

Name _____

Address _____

Contact Number(s): Tel. _____ Mobile _____

email _____

Note:

1. For the purpose of executing the Bank Guarantee, the non-judicial stamp papers of appropriate value shall be purchased in the name of Bank who issues the 'Bank Guarantee'.
2. The Bank Guarantee shall be signed on all the pages by the Bank Authorities indicating their POA nos. and should invariably be witnessed.

14. FORM OF POWER OF ATTORNEY FOR JOINT VENTURE

KNOW ALL MEN BY THESE PRESENTS THAT WE , the Partners whose details are given hereunder have formed a Joint Venture under the laws of and having our Registered Office(s)/Head Office(s) at (hereinafter called the 'Joint Venture' which expression shall unless repugnant to the context or meaning thereof, include its successors, administrators and assigns) acting through M/s being the Partner in-charge do hereby constitute, nominate and appoint M/s..... a Company incorporated under the laws of and having its Registered/Head Office at as our duly constituted lawful Attorney (hereinafter called "Attorney" or "Authorised Representative" or "Partner In-charge") to exercise all or any of the powers for and on behalf of the Joint Venture in regard to Specification No. Package the bids for which have been invited by (insert name of the Employer along with address) (hereinafter called the 'Employer') to undertake the following acts :

- i) To submit proposal and participate in the aforesaid Bid Specification of the Employer on behalf of the "Joint Venture".
- ii) To negotiate with the Employer the terms and conditions for award of the Contract pursuant to the aforesaid Bid and to sign the Contract with the Employer for and on behalf of the "Joint Venture".
- iii) To do any other act or submit any document related to the above.
- iv) To receive, accept and execute the Contract for and on behalf of the "Joint Venture".

It is clearly understood that the Partner In-charge (Lead Partner) shall ensure performance of the Contract(s) and if one or more Partner fail to perform their respective portions of the Contract(s), the same shall be deemed to be a default by all the Partners.

It is expressly understood that this Power of Attorney shall remain valid binding and irrevocable till completion of the Defect Liability Period in terms of the Contract.

The Joint Venture hereby agrees and undertakes to ratify and confirm all the whatsoever the said Attorney/Authorised Representatives/Partner in-charge quotes in the bid, negotiates and signs the Contract with the Employer and/or proposes to act on

behalf of the Joint Venture by virtue of this Power of Attorney and the same shall bind the Joint Venture as if done by itself.

IN WITNESS THEREOF the Partners Constituting the Joint Venture as aforesaid have executed these presents on this day of under the Common Seal(s) of their Companies.

for and on behalf of the
Partners of Joint Venture

.....

.....

.....

The Common Seal of the above Partners of the Joint Venture:

The Common Seal has been affixed there unto in the presence of:

WITNESS

1. Signature.....

Name

Designation

Occupation

2. Signature.....

Name

Designation

Occupation

Note:

1. For the purpose of executing the Agreement, the non-judicial stamp papers of appropriate value shall be purchased in the name of Joint Venture.
2. The Agreement shall be signed on all the pages by the authorised representatives of each of the partners and should invariably be witnessed.

15. FORM OF UNDERTAKING BY THE JOINT VENTURE PARTNERS

THIS JOINT DEED OF UNDERTAKING executed on this..... day of..... Two Thousand and..... bya company incorporated under the laws of and having its Registered Office at(hereinafter called the "Party No.1" which expression shall include its successors, executors and permitted assigns) and M/s.....a company incorporated under the laws of and having its Registered Office at (hereinafter called the "Party No.2" which expression shall include its successors, executors and permitted assigns) and M/s. a Company incorporated under the laws of and having its Registered Office at (hereinafter called the "Party No.3" which expression shall include its successors, executors and permitted assigns) for the purpose of making a bid and entering into a contract [hereinafter called the "Contract" {in case of award}] against the Specification No..... for (insert name of the package along with project name) of(insert names of the Employer), a Company incorporated under the Companies Act of 1956/2013 (with amendment from time to time) having its registered office at(insert registered address of the Employer)..... (hereinafter called the "Employer").

WHEREAS the Party No.1, Party No.2 and Party No.3 have entered into an Agreement dated.....

AND WHEREAS the Employer invited bids as per the above-mentioned Specification for the design, manufacture, supply, erection, testing and commissioning of Equipment/Materials stipulated in the Bidding Documents under (insert name of the package along with project name)

AND WHEREAS Clause 10.2, Section 3 of Part 1 and Section 2 (Eligibility and qualification requirements) of Part-1 forming part of the Bidding Documents, inter-alia stipulates that an Undertaking of two or more qualified manufacturers as partners, meeting the requirements of Section 2, as applicable may bid, provided, the Joint Venture fulfills all other requirements under Section 2 and in such a case, the Bid Forms shall be signed by all the partners so as to legally bind all the Partners of the Joint Venture, who will be jointly and severally liable to perform the Contract and all obligations hereunder.

The above clause further states that this Undertaking shall be attached to the bid and the Contract performance guarantee will be as per the format enclosed with the Bidding Documents without any restrictions or liability for either party.

AND WHEREAS the bid is being submitted to the Employer vide proposal No.....dated by Party No.1 based on this Undertaking between all the parties; under these presents and the bid in accordance with the requirements of Clause 10.2, Section 3 of Part 1 and Section 2 (Eligibility and qualification requirements) of Part-1, has been signed by all the parties.

NOW THIS UNDERTAKING WITNESSETH AS UNDER:

In consideration of the above premises and agreements all the parties of this Deed of Undertaking do hereby declare and undertake:

1. In requirement of the award of the Contract by the Employer to the Joint Venture Partners, we, the Parties do hereby undertake that M/s..... the Party No.1, shall act as Lead Partner and further declare and confirm that we the parties to the Joint Venture shall jointly and severally be bound unto the Employer for the successful performance of the Contract and shall be fully responsible for the design, manufacture, supply and successful performance of the equipment in accordance with the Contract:
2. In case of any breach or default of the said Contract by any of the parties to the Joint Venture, the party(s) do hereby undertake to be fully responsible for the successful performance of the Contract and to carry out all the obligations and responsibilities under the Contract in accordance with the requirements of the Contract.
3. Further, if the Employer suffers any loss or damage on account of any breach in the Contract or any shortfall in the performance of the equipment in meeting the performances guaranteed as per the specification in terms of the Contract, the Party(s) of these presents undertake to promptly make good such loss or damages caused to the Employer, on its demand without any demur. It shall not be necessary or obligatory for the Employer to proceed against Lead Partner to these presents before proceeding against or dealing with the other Party(s), the Employer can proceed against any of the parties who shall be jointly and severally liable for the performance and all other liabilities/obligations under the Contract to the Employer.
4. The financial liability of the Parties of this Deed of Undertaking to the Employer, with respect to any of the claims arising out of the performance or non-performance of the obligations set forth in this Deed of Undertaking, read in conjunction with the relevant conditions of the Contract shall, however, not be limited in any way to restrict or limit the liabilities or obligations of any of the Parties of this Deed of Undertaking.

5. It is expressly understood and agreed between the Parties to this Undertaking that the responsibilities and obligations of each of the Parties shall be as delineated in Appendix – I (*to be suitably appended by the Parties along with this Undertaking in its bid*) to this Deed of Undertaking. It is further undertaken by the parties that the above sharing of responsibilities and obligations shall not in any way be a limitation of joint and several responsibilities of the Parties under the Contract.
6. It is also understood that this Undertaking is provided for the purposes of undertaking joint and several liabilities of the partners to the Joint Venture for submission of the bid and performance of the Contract and that this Undertaking shall not be deemed to give rise to any additional liabilities or obligations, in any manner or any law, on any of the Parties to this Undertaking or on the Joint Venture, other than the express provisions of the Contract.
7. This Undertaking shall be construed and interpreted in accordance with the provisions of the Contract.
8. In case of an award of a Contract, we the parties to this Deed of Undertaking do hereby agree that we shall be jointly and severally responsible for furnishing a Contract performance security from a bank in favour of the Employer in the currency/currencies of the Contract.
9. It is further agreed that this Deed of Undertaking shall be irrevocable and shall form an integral part of the bid and shall continue to be enforceable till the Employer discharges the same or upon the completion of the Contract in accordance with its provisions, whichever is earlier. It shall be effective from the date first mentioned above for all purposes and intents.

IN WITNESS WHEREOF, the Parties to this Deed of Undertaking have through their authorised representatives executed these presents and affixed Common Seals of their companies, on the day, month and year first mentioned above.

Common Seal of
has been affixed in my/ our
presence pursuant to Board of
Director's Resolution dated

For Lead Partner (Party No.-1)
For and on behalf of M/s
.....

Name

Designation

Signature

(Signature of the authorized
representative)

WITNESS :

I.

II.

Common Seal of
has been affixed in my/ our
presence pursuant to Board of
Director's Resolution dated

For Party No.-2
For and on behalf of
M/s.....

Name

Designation

Signature

(Signature of the authorized
representative)

WITNESS :

I.

II.

Common Seal of
has been affixed in my/ our
presence pursuant to Board of
Director's Resolution dated

For Party No.-3
For and on behalf of M/s.
.....

Name

Designation

(Signature of the authorized

Signature representative)

WITNESS :

I.

II.

Note:

1. For the purpose of executing the Joint Deed of Undertaking, the non-judicial stamp papers of appropriate value shall be purchased in the name of Joint Venture.
2. The Undertaking shall be signed on all the pages by the authorised representatives of each of the partners and should invariably be witnessed.

16. FORMAT FOR EVIDENCE OF ACCESS TO OR AVAILABILITY OF CREDIT/FACILITIES

BANK CERTIFICATE

This is to certify that M/s. _____ (*insert Name & Address of the Contractor*)
 _____ who have submitted their bid to(*insert name of the Employer*)..... against their tender specification Vide ref. No. for (*insert name of the package along with the project name*) is our customer for the past years.

Their financial transaction with our Bank have been satisfactory. They enjoy the following fund based and non-fund-based limits including for guarantees, L/C, and other credit facilities with us against which the extent of utilization as on date is also indicated below:

Sl. No.	Type of Facility	Sanctioned Limit as on Date	Utilisation as on Date

This letter is issued at the request of M/s. _____.

Signature _____

Name of Bank _____

Name of Authorised Signatory _____

Designation _____

Phone No. _____

Address _____

SEAL OF THE BANK

17. FORM OF OPERATIONAL ACCEPTANCE

Date.....

Name of Contract.....

Contract No.....

To :

(Name and address of the Contractor)

Dear Ladies and/or Gentlemen,

Pursuant to GCC 24.4 (Completion) of the General Conditions of the Contract entered into between yourselves and the Employer dated relating to the *(insert brief description of the Facilities)*..... we hereby notify you that the we System tests and Acceptance tests of the following part(s) of the Facilities were satisfactorily completed on the date specified below :

1. Description of the Facilities or part

thereof
.....

2. Date of Operational Acceptance:.....

This letter does not relieve you of your obligation during the Defects Liability Period and Latent Defect warranty.

Very truly yours,

Title

(Project Manager)

18. FORM OF SAFETY PLAN TO BE SUBMITTED BY THE CONTRACTOR WITHIN SIXTY DAYS OF AWARD OF CONTRACT

[TO BE EXECUTED ON A NON JUDICIAL STAMP PAPER WORTH RS. TWENTY ONLY]

SAFETY PLAN

THIS SAFETY PLAN is made this day of 20..... by a Company registered under the Companies Act, 1956/2013 (with amendment from time to time)/Partnership firm/proprietary concern having its Registered Office at[*to be modified suitably for JV Contractor*] (hereinafter called as 'Contractor' which expression shall include its successors and permitted assigns) for approval of(*insert name of the Employer*)....., a company incorporated under the Companies Act, 1956/2013 (with amendment from time to time) having its Registered Office at(*insert registered address of the Employer*)..... for its Contract for(*insert package name, project name along with Specification number of the Contract*).....

WHEREAS(*abbreviated name of the Employer*)..... has awarded to the Contractor the aforesaid Contract vide its Notification of Award/Contract No. datedand Amendment No. (applicable when amendments have been issued) (hereinafter called the "Contract") in terms of which the Contractor is required to submit 'Safety Plan' along with certain documents to the Engineer In-Charge/Project Manager of the Employer within Sixty (60) days of Notification of Award for its approval.

NOW THEREFORE, the Contractor undertakes to execute the Contract as per the safety plan as follows:

1. THAT the Contractor shall execute the works as per provisions of Bidding Documents including those in regard to Safety Precautions / provisions as per statutory requirements.
2. THAT the Contractor shall execute the works in a well-planned manner from the commencement of Contract as per agreed mile stones of work completion schedule so that planning and execution of construction works goes smoothly and consistently throughout the contract duration without handling pressure in last quarter of the financial year/last months of the Contract and the shall be finalized in association with **WBSEDCL** Engineer In-charge/Project Manager from time to time as required.

3. THAT the Contractor has prepared the safe work procedure for each activity i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. to be executed at site, which is enclosed at **Annexure – 1A (SP)** for acceptance and approval of Engineer In-charge/Project Manager. The Contractor shall ensure that on approval of the same from Engineer In-charge/Project Manager, the approved copies will be circulated to Employer's personnel at site [Supervisor(s)/Executive(s)] and Contractor's personnel at site [Gang leader, supervisor(s) etc.] in their local language / language understood by gang.

THAT the Contractor has prepared minimum manpower deployment plan, activity wise as stated above, which is enclosed at **Annexure – 1B (SP)** for approval of Engineer In-charge/Project Manager.

4. THAT the Contractor shall ensure while executing works that they will deploy minimum 25% of their own experienced work force who are on the permanent roll of the company and balance 75% can be a suitable mix with the hired gangs / local workers / casual workers if required. The above balance 75% work force should be provided with at least 10 days training by the construction agencies at sites and shall be issued with a certificate. No worker shall be engaged without a valid certificate. Hired gang workers shall also follow safe working procedures and safety norms as is being followed by company's workmen. It should also be ensured by the Contractor that certified **workers** fitters who are climbing towers / doing stringing operations can be easily identifiable with a system like issue of Badge / Identification cards (ID cards) etc. Colour identification batches should be worn by the workers. Contractor has to ensure that inexperienced workers / unskilled workers should not be deployed for skilled job.
5. THAT the Contractor's Gang leader / Supervisor / Senior most member available at every construction site shall brief to each worker daily before start of work about safety requirement and warn about imminent dangers and precautions to be taken against the imminent dangers (Daily Safety Drill). This is to be ensured without fail by Contractor and maintain record of each gang about daily safety instructions issued to workers and put up to **WBSEDCL** site In-charge for his review and record.
6. THAT the Contractor shall ensure that working Gangs at site should not be left at the discretion of their Gang Leaders who are generally hired and having little knowledge about safety. Gang leader should be experienced and well versed with the safe working procedures applicable for transmission line/ Sub Station works. In case gang is having Gang leader not on permanent roll of the company then additional Supervisor from company's own roll having thorough knowledge about the works would be deployed so

as to percolate safety instructions upto the grass root level in healthy spirits. Contractor has to ensure close supervision while executing critical locations of transmission lines / sub stations and ensures that all safety instructions are in place and are being followed.

7. THAT the Contractor shall maintain in healthy and working condition all kind of Equipments / Machineries / Lifting tools / Lifting tackles / Lifting gears / All kind of Ropes including wire ropes / Polypropylene ropes etc. used for Lifting purpose during execution of the project and get them periodically examined and load tested for safe working load in accordance with relevant provisions and requirement of Building & other construction workers Regulation of Employment and Conditions of Services Act and Central Rule 1998 or latest, Factories Act 1948 or latest, Indian Electricity Act 2003 before start of the project. A register of such examinations and tests shall be properly maintained by the Contractor and will be promptly produced as and when desired by the Engineer In-charge/Project Manager or by the person authorised by him. The Contractor has to ensure to give special attention on the formation / condition of eye splices of wire rope slings as per requirement of IS 2762 Specification for wire rope slings and sling legs.

THAT the Contractor has prepared a list of all Lifting machines, lifting Tools / Lifting Tackles / Lifting Gears etc. / All types of ropes and Slings which are subject to safe working load is enclosed at **Annexure – 2 (SP)** for review and approval of Engineer In-charge/Project Manager.

8. THAT the Contractor has to procure sufficient quantity of Personal Protective Equipment (PPE) conforming to Indian / International standards and provide these equipment to every workman at site as per need and to the satisfaction of Engineer-in-charge/Project Manager of **WBSEDCL**. The Contractor's Site Supervisor/ Project Manager has to ensure that all workmen must use Personal Protective Equipment at site. The Contractor shall also ensure that Industrial Safety helmets are being used by all workmen at site irrespective of their working (at height or on ground). The Contractor shall further ensure use of safety shoes by all ground level workers and canvas shoes for all workers working at height, Rubber Gum Boots for workers working in rainy season and concreting job, Use of Twin Lanyard Full body Safety Harness with attachment of light weight such as aluminum alloy etc. and having features of automatic locking arrangement of snap hook, by all workers working at height for more than three meters and also for horizontal movement on tower shall be ensured by Contractor. The Contractor shall not use ordinary half body safety harness at site. The Contractor has to ensure use of Retractable type fall arrestors by workers for ascending / descending on suspension insulator string and other similar works etc., Use of Mobile

fall arrestor for ascending / descending from tower by all workers. The Contractor has to provide cotton / leather hand gloves as per requirement, Electrical Resistance Hand gloves for operating electrical installations / switches, Face shield for protecting eyes while doing welding works and Dust masks to workers as per requirement. The Contractor will have to take action against the workers not using Personal Protective Equipment at site and those workers shall be asked to rest for that day and also their Salary be deducted for that day. **WBSEDCL** may issue warning letter to Project Manager of Contractor in violation of above norms.

THAT the Contractor shall prepare a detailed list of PPEs, activity wise, to commensurate with manpower deployed, which is enclosed at **Annexure – 3 (SP)** for review and approval of Engineer In-charge/Project Manager. It shall also be ensured that the sample of these equipment shall be got approved from **WBSEDCL** supervisory staff before being distributed to workers. The Contractor shall submit relevant test certificates as per IS / International Standard as applicable to PPEs used during execution of work. All the PPE's to be distributed to the workers shall be checked by **WBSEDCL** supervisory staff before its usage.

The Contractor also agrees for addition / modification to the list of PPE, if any, as advised by Engineer In-Charge/Project Manager.

9. THAT the Contractor shall procure, if required sufficient quantity of Earthing Equipment / Earthing Devices complying with requirements of relevant IEC standards (Generally IECs standards for Earthing Equipments / Earthing Devices are – 855, 1230, 1235 etc.) and to the satisfaction of Engineer In-Charge/ Project Manager and Contractor to ensures to maintained them in healthy condition.

THAT the Contractor has prepared / worked out minimum number of healthy Earthing Equipments with Earthing lead confirming to relevant IS / European standards per gang wise during stringing activity/as per requirement, which is enclosed herewith at **Annexure – 4 (SP)** for review and acceptance of Engineer In-Charge/ Project Manager prior to execution of work.

10. THAT the Contractor shall provide communication facilities i.e., Walkie – Talkie / Mobile Phone, Display of Flags / whistles for easy communication among workers during Tower erection / stringing activity, as per requirement.
11. THAT the Contractor undertakes to deploy qualified safety personnel responsible for safety as per requirements of Employer/Statutory Authorities.

THAT the Contractor employing more than 250 workmen whether temporary, casual, probationer, regular or permanent or on contract, shall employ at least one full time officer exclusively as qualified safety officer having diploma in safety to supervise safety aspects of the equipment and workmen who will coordinate with Engineer In-charge /Project Manager/Safety Coordinator of the Employer. In case of work being carried out through sub-Contractors the sub – Contractor's workmen / employees will also be considered as the Contractor's employees / workmen for the above purpose. If the number of workers are less than 250 then one qualified safety officer is to be deployed for each contract. He will report directly to his head of organization and not the Project Manager of Contractor He shall also not be assigned any other work except assigning the work of safety. The curriculum vitae of such person shall be got cleared from **WBSEDCL** Project Manager / Construction staff.

The name and address of such safety officers of Contractor will be promptly informed in writing to Engineer In-charge with a copy to safety officer - In-charge before start of work or immediately after any change of the incumbent is made during the currency of the contract. The list is enclosed at **Annexure – 5A (SP)**.

THAT the Contractor has also prepared a list including details of Explosive Operator (if required), Safety officer / Safety supervisor / nominated person for safety for each erection / stringing gang, list of personnel trained in First Aid Techniques as well as copy of organisation structure of the Contractor in regard to safety. The list is enclosed at **Annexure – 5B (SP)**.

12. The Project Manager shall have the right at his sole discretion to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and/or property, and/or equipment. In such cases, the Contractor shall be informed in writing about the nature of hazards and possible injury/accident and he shall comply to remove shortcomings promptly. The Contractor after stopping the specific work can, if felt necessary, appeal against the order of stoppage of work to the Project Manager within 3 days of such stoppage of work and decision of the Project Manager in this respect shall be conclusive and binding on the Contractor.
13. THAT, if, any Employer's Engineer/ supervisor at site observes that the Contractor is failing to provide safe working environment at site as per agreed Safety Plan / **WBSEDCL** Safety Rule/ Safety Instructions / Statutory safety requirement and creates hazardous conditions at site and there is possibility of an accident to workmen or workmen of the other Contractor or public or the work is being carried out in an un safe manner or he continues to work even after being instructed to stop the work by

Engineer / Supervisor at site / RHQ / Corp. Centre, the Contractor shall be bound to pay a penalty of Rs. 10,000/- per incident per day till the instructions are complied with, and as certified by Engineer / Supervisor of Employer at site. The work will remain suspended and no activity will take place without compliance and obtaining clearance / certification of the Site Engineer / Supervisor of the Employer to start the work.

14. THAT, if the investigation committee of Employer observes any accident or the Engineer In-charge/Project Manager of the Employer based on the report of the Engineer/Supervisor of the Employer at site observes any failure on the Contractor's part to comply with safety requirement / safety rules/ safety standards/ safety instruction as prescribed by the Employer or as prescribed under the applicable law for the safety of the equipment, plant and personnel and the Contractor does not take adequate steps to prevent hazardous conditions which may cause injury to its own Contractor's employees or employee of any other Contractors or Employer or any other person at site or adjacent thereto, or public involvement because of the Contractor's negligence of safety norms, the Contractor shall be liable to pay a compensation of Rs. 10,00,000/- (Rupees Ten Lakh only) per person affected causing death and Rs. 1,00,000/- (Rupees One Lakh only) per person for serious injuries / 25% or more permanent disability to the Employer for further disbursement to the deceased family/ Injured persons. The permanent disability has the same meaning as indicated in Workmen's Compensation Act 1923 or latest. The above stipulations is in addition to all other compensation payable to sufferer as per workmen compensation Act / Rules

THAT as per the Employer's instructions, the Contractor agrees that this amount shall be deducted from their running bill(s) immediately after the accident, That the Contractor understands that this amount shall be over and above the compensation amount liable to be paid as per the Workmen's Compensation Act /other statutory requirement/ provisions of the Bidding Documents.

15. THAT the Contractor shall submit Near-Miss-Accident report along with action plan for avoidance such incidence /accidents to Engineer – In-charge/ Project Manager. Contractor shall also submit Monthly Safety Activities report to Engineer – In-charge/ Project Manager and copy of the Monthly Safety Activities report also to be sent to Safety In-charge at RHQ of the Employer for his review record and instructions.
16. THAT the Contractor is submitting a copy of Safety Policy/ Safety Documents of its Company which is enclosed at **Annexure – 6 (SP)** and ensure that the safety Policy and safety documents are implemented in healthy spirit.

17. THAT the Contractor shall make available of First Aid Box [Contents of which shall be as per Building & other construction workers (Regulation of Employment and Conditions of Services Act and Central Rule 1998 or latest / **WBSEDCL** Guidelines)] to the satisfaction of Engineer In-Charge/ Project Manager with each gang at site and not at camp and ensures that trained persons in First Aid Techniques with each gang before execution of work.
18. THAT the Contractor shall submit an 'Emergency Preparedness Plan' for different incidences i.e. Fall from height, Electrocution, Sun Stroke, Collapse of pit, Collapse of Tower, Snake bite, Fire in camp / Store, Flood, Storm, Earthquake, Militancy etc. while carrying out different activities under execution i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. which is enclosed at **Annexure – 7 (SP)** for approval of the Engineer In-Charge/ Project Manager before start of work.
19. THAT the Contractor shall organise Safety Training Programs on Safety, Health and Environment and for safe execution of different activities of works i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. for their own employees including sub-Contractor workers on regular basis.

The Contractor, therefore, submits copy of the module of training program, enclosed at **Annexure – 9 (SP)**, to Engineer In-charge/Project Manager for its acceptance and approval and records maintained.

20. THAT the Contractor shall conduct safety audit, as per Safety Audit Check Lists enclosed at **Annexure – 8 (SP)**, by his Safety Officer(s) every month during construction of Transmission Lines / Sub Stations / any other work and copy of the safety audit report will be forwarded to the Employer's Engineer In-charge / Site In-charge/Project Manager for his comments and feedback. During safety audit, healthiness of all Personal Protective Equipment (PPEs) shall be checked individually by safety officer of Contractor and issue a certificate of its healthiness or rejection of faulty PPEs and Contractor has to ensure that all faulty PPEs and all faulty lifting tools and tackles should be destroyed in the presence of **WBSEDCL** construction staff. Contractor has to ensure that each gang be safety audited at least once in two months. During safety audit by the Contractor, Safety officer's feedback from **WBSEDCL** concerned shall be taken and recorded. The Employer's site officials shall also conduct safety audit at their own from time to time when construction activities are under progress. Apart from above, the Employer may also conduct surveillance safety audits. The Employer may take action against the person / persons as deemed fit under various

statutory acts/provisions under the Contract for any violation of safety norms / safety standards.

21. THAT the Contractor shall develop and display Safety Posters of construction activity at site and also at camp where workers are generally residing.
22. THAT the Contractor shall ensure to provide potable and safe drinking water for workers at site / at camp.
23. THAT the Contractor shall do health checkup of all workers from competent agencies and reports will be submitted to Engineer In-Charge within fifteen (15) days of health checkup of workers as per statutory requirement.
24. THAT the Contractor shall submit information along with documentary evidences regarding compliance to various statutory requirements as applicable which are enclosed at **Annexure – 10A (SP)**.

The Contractor shall also submit details of Insurance Policies taken by the Contractor for insurance coverage against accident for all employees are enclosed at **Annexure – 10B (SP)**.

25. THAT a checklist in respect of aforesaid enclosures along with the Contractor's remarks, wherever required, is attached as **Annexure – Check List** herewith.

THE CONTRACTOR shall incorporate modifications/changes in this 'Safety Plan' necessitated on the basis of review/comments of the Engineer In-Charge/Project Manager within fourteen (14) days of receipt of review/comments and on final approval of the Engineer In-Charge/Project Manager of this 'Safety Plan', the Contractor shall execute the works under the Contract as per approved 'Safety Plan'. Further, the Contractor has also noted that the first progressive payment towards Services Contract shall be made on submission of 'Safety Plan' along with all requisite documents and approval of the same by the Engineer In-Charge/Project Manager.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand through its authorised representative under the common seal of the Company, the day, month and year first above mentioned.

For and on behalf of

M/s.....

WITNESS

1. Signature..... Signature.....

Name..... Name.....

Address..... Address.....

2. Signature..... Authorised representative

Name..... (Common Seal)

Address..... (In case of Company)

Note:

All the annexure referred to in this “Safety Plan“ are required to be enclosed by the Contractor as per the attached “Check List “

1. Safety Plan is to be executed by the authorised person and (i) in case of contracting Company under common seal of the Company or (ii) having the power of attorney issued under common seal of the company with authority to execute such contract documents etc., (iii) In case of (ii), the original Power of Attorney if it is specifically for this Contract or a Photostat copy of the Power of Attorney if it is General Power of Attorney and such documents should be attached to this Safety Plan.
2. For all safety monitoring/ documentation, Engineer In-charge / Regional In-charge of safety at RHQ will be the nodal Officers for communication.

CHECK LIST FOR SEFETY PLAN

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
1.	Annexure – 1A (SP) Safe work procedure for each activity i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc. to be executed at site.	Yes/No	
2.	Annexure – 1B (SP) Manpower deployment plan, activity wise foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc.	Yes/No	
3.	Annexure – 2 (SP) List of Lifting Machines i.e. Crane, Hoist, Triffor, Chain Pulley Blocks etc. and Lifting Tools and Tackles i.e. D shackle, Pulleys, come along clamps, wire rope slings etc. and all types of ropes i.e. Wire ropes, Poly propylene Rope etc. used for lifting purposes along with test certificates.	Yes/No	
4.	Annexure – 3 (SP) List of Personal Protective Equipment (PPE), activity wise including the following along with test certificate of each as applicable: A. Industrial Safety Helmet to all workmen at site. (EN 397 / IS 2925) with chin strap and back stay arrangement. B. Safety shoes without steel toe to all ground level workers and canvas shoes for	Yes/No	

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
	<p>workers working on tower.</p> <hr/> <p>C. Rubber Gum Boot to workers working in rainy season / concreting job.</p> <p>D. Twin lanyard Full Body Safety harness with shock absorber and leg strap arrangement for all workers working at height for more than three meters. Safety Harness should be with attachments of light weight such as of aluminum alloy etc. and having a feature of automatic locking arrangement of snap hook and comply with EN 361 / IS 3521 standards.</p> <p>E. Mobile fall arrestors for safety of workers during their ascending / descending from tower / on tower. EN 353 -2 (Guided type fall arresters on a flexible anchorage line.)</p> <p>F. Retractable type fall arrestor (EN360: 2002) for ascending / descending on suspension insulator string etc.</p> <p>G. Providing of good quality cotton hand gloves / leather hand gloves for workers engaged in handling of tower parts or as per requirement at site.</p> <p>H. Electrical Resistance hand gloves to workers for handling electrical equipment / Electrical connections. IS : 4770</p> <p>I. Dust masks to workers handling cement as per requirement.</p> <p>J. Face shield for welder and Grinders. IS : 1179 / IS : 2553</p> <p>K. Other PPEs, if any, as per requirement etc.</p>		
5.	<p>Annexure – 4 (SP)</p> <p>List of Earthing Equipment / Earthing devices with Earthing lead conforming to IECs for</p>	<p>Yes/No</p> <hr/>	<hr/>

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
	earthing equipment are – (855, 1230, 1235 etc.) gang wise for stringing activity/as per requirement		
6.	Annexure – 5A (SP) List of Qualified Safety Officer(s) along with their contact details	Yes/No	
7.	Annexure – 5B (SP) Details of Explosive Operator (if required), Safety officer / Safety supervisor for every erection / stringing gang, any other person nominated for safety, list of personnel trained in First Aid as well as brief information about safety set up by the Contractor along with copy of organisation of the Contractor in regard to safety	Yes/No	
8.	Annexure – 6 (SP) Copy of Safety Policy/ Safety Document of the Contractor's company	Yes/No	
9.	Annexure – 7 (SP) 'Emergency Preparedness Plan' for different incidences i.e. Fall from height, Electrocution, Sun Stroke, Collapse of pit, Collapse of Tower, Snake bite, Fire in camp / Store, Flood, Storm, Earthquake, Militancy etc. while carrying out different activities under execution i.e. foundation works including civil works, erection, stringing (as applicable), testing & commissioning, disposal of materials at site / store etc.	Yes/No	

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
10.	Annexure – 8 (SP) Safety Audit Check Lists (Formats to be enclosed)	Yes/No	
11.	Annexure – 9 (SP) Copy of the module of Safety Training Programs on Safety, Health and Environment, safe execution of different activities of works for Contractor's own employees on regular basis and sub-Contractor employees.	Yes/No	
12.	Annexure – 10A (SP) Information along with documentary evidences in regard to the Contractor's compliance to various statutory requirements including the following:		
(i)	Electricity Act 2003 _____ [Name of Documentary evidence in support of compliance]	Yes/No	
(ii)	Factories Act 1948 or latest _____ [Name of Documentary evidence in support of compliance]	Yes/No	
(iii)	Building & other construction workers (Regulation of Employment and Conditions of	Yes/No	

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
	Services Act and Central Act 1996 or latest) and Welfare Cess Act 1996 or latest with Rules. — <i>[Name of Documentary evidence in support of compliance]</i>		
(iv)	Workmen Compensation Act 1923 or latest and Rules. — <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(v)	Public Insurance Liabilities Act 1991 or latest and Rules. — <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(vi)	Indian Explosive Act 1948 or latest and Rules. — <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(vii)	Indian Petroleum Act 1934 or latest and Rules. — <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
	<p>— [Name of Documentary evidence in support of compliance]</p>		
(viii)	<p>License under the contract Labour (Regulation & Abolition) Act 1970 or latest and Rules.</p> <p>— [Name of Documentary evidence in support of compliance]</p>	Yes/No	
(ix)	<p>Indian Electricity Rule 2003 and amendments if any, from time to time.</p> <p>— [Name of Documentary evidence in support of compliance]</p>	Yes/No	
(x)	<p>The Environment (Protection) Act 1986 or latest and Rules.</p> <p>— [Name of Documentary evidence in support of compliance]</p>	Yes/No	
(xi)	<p>Child Labour (Prohibition & Regulation) Act 1986 or latest.</p> <p>—</p>	Yes/No	

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
	<i>[Name of Documentary evidence in support of compliance]</i>		
(xii)	National Building Code of India 2005 or latest (NBC 2005). <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(xiii)	Indian standards for construction of Low/ Medium/ High/ Extra <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
(iv)	Any other statutory requirement(s) <i>[please specify]</i> <i>[Name of Documentary evidence in support of compliance]</i>	Yes/No	
13.	Annexure – 10B (SP) Details of Insurance Policies along with documentary evidences taken by the Contractor for the insurance coverage against accident for all employees as below:		

S. N.	Details of Enclosure	Status of Submission of information/ documents	Remarks
(i)	Under Workmen Compensation Act 1923 or latest and Rules. _____ – <i>[Name of Documentary evidence in support of insurance taken]</i>	Yes/No	_____
(ii)	Public Insurance Liabilities Act 1991 or latest _____ – <i>[Name of Documentary evidence in support of insurance taken]</i>	Yes/No	_____
(iii)	Any Other Insurance Policies _____ – <i>[Name of Documentary evidence in support of insurance taken]</i>	Yes/No	_____

19. FORM OF JOINT DEED OF UNDERTAKING BY THE SUB-CONTRACTOR ALONGWITH THE CONTRACTOR

THIS DEED OF UNDERTAKING executed this day of
Two Thousand and by M/s., a Company incorporated under
the laws of and having its Registered Office
at (hereinafter called the “**Sub-Contractor**” which
expression shall include its successors, executors and permitted assigns), and
M/s., a Company incorporated under the laws of
having its Registered Office at (hereinafter called the
“**Bidder**”/”**Contractor**” which expression shall include its successors, executors and permitted
assigns) in favour of **WBSEDCL** a Company incorporated under the Companies Act
of 1956/2013 (with amendment from time to time) having its registered office at **Vidyut
Bhawan, 2nd Floor, Block-DJ, Sector-II, Bidhannagar, Kolkata-700091** (hereinafter called
the “**Employer**” which expression shall include its successors, executors and permitted
assigns)

WHEREAS the “**Employer**” invited Bid as per its Specification No.....for **RDSS
works of including installation of Sub-stations, lines, bays, DTs and
providing service connections etc.**

AND WHEREAS Clause No., Section, of, Part...
forming part of the Bid Documents inter-alia stipulates that the Bidder and/or Sub-Contractor
must fulfill the Qualifying Requirements and be jointly and severally bound and responsible
for the quality and timely execution of **RDSS works** in the event the Bid submitted by the
Bidder is accepted by the Employer resulting in a Contract.

AND WHEREAS the Bidder has submitted its Bid to the Employer vide Proposal
No. dated based on tie-up with the **Sub-Contractor** for execution
of aforesaid **RDSS works**.

NOW THEREFORE THIS UNDERTAKING WITNESSETH as under:

- 1.0 In consideration of the award of Contract by the Employer to the Bidder (hereinafter
referred to as the “**Contract**”) we, the **Sub-Contractor** and the Contractor do hereby
declare that we shall be jointly and severally bound unto the **WBSEDCL**, for
execution of RDSS works in accordance with the Contract Specifications.
- 2.0 Without in any way affecting the generality and total responsibility in terms of this
Deed of Undertaking, the **Sub-Contractor** hereby agrees to depute their
representatives from time to time to the Employer’s Project site as mutually
considered necessary by the Employer, Contractor and the **Sub-Contractor** to ensure

proper quality, manufacture, testing and supply on FOR destination delivery at site basis and successful performance of **RDSS works** in accordance with Contract Specifications. Further, if the Employer suffers any loss or damage on account of non-performance of the material fully meeting the performance guaranteed as per Bid Specification in terms of the contract. We the **Sub-Contractor** and the Contractor jointly and severally undertake to pay such loss or damages to the Employer on its demand without any demur.

- 3.0 This Deed of Undertaking shall be construed and interpreted in accordance with the laws of India and the Courts in **Kolkata** (Headquarter of Employer) shall have exclusive jurisdiction in all matters arising under the Undertaking.
- 4.0 We, the Bidder/Contractor and **Sub-Contractor** agree that this Undertaking shall be irrevocable and shall form an integral part of the Contract and further agree that this Undertaking shall continue to be enforceable till the Employer discharges it. It shall become operative from the effective date of Contract.

IN WITNESS WHEREOF the **Sub-Contractor** and/or the Contractor have through their Authorised Representatives executed these presents and affixed Common seals of their respective Companies, on the day, month and year first above mentioned.

WITNESS

(For **Sub-Contractor**)

Signature

(Signature of the authorized representative)

Name

Office Address

Name

Common Seal of
Company

WITNESS

(For Bidder)

Signature

(Signature of the authorized representative)

Name

Office Address

Name

Common Seal of
Company

Note:

1. For the purpose of executing the Deed of Joint Undertaking, the non-judicial stamp papers of appropriate value shall be purchased in the name of executant(s).
2. The Undertaking shall be signed on all the pages by the authorised representatives of each of the partners and should invariably be witnessed.
3. This Deed of Joint Undertaking duly attested by Notary Public of the place(s) of the respective executant(s), shall be submitted along with the bid.
4. In case the bid is submitted by a Joint Venture (JV) of two or more firms as partners, then the Joint deed of undertaking shall be modified accordingly.

20. FORM OF CERTIFICATE OF FINANCIAL PARAMETERS FOR QR**(as per clause ref. no. 2 of Section 2 of Part 1))****(Rupees in Lakhs)**

S. No.	Financial parameters	2020-21	2019-20	2018-19	2017-18	2016-17
1.	Net Worth					
a)	Paid up Capital					
b)	Free Reserves and Surplus*					
c)	Misc. expenses to the extent not written off					
	Net Worth (a+b-c)					
2.	Annual Turnover **					
3.	Liquid Asset (Total Current Asset – Inventories)					

* Free Reserve and Surplus should be Exclusive of Revaluation Reserve, written back of Depreciation Provision and Amalgamation.

** Annual total Income/ turnover as incorporated in the Profit and Loss Account excluding non-recurring income, i.e., sale of fixed asset etc.

It is certified that all the figures are based on audited accounts read with auditors report and Notes to Accounts etc.

Date

Certified By

Place

(Chartered Accountants)

Membership No.

Seal