



Tamil Nadu Energy Development Agency Chennai, Tamil Nadu

Bidding Document for Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, State-run industrial units and educational institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW.

*Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road, Chennai – 600 006,
Phone: 044-28242800,
e-mail: dgm2@teda.in, tender@teda.in
website: www.teda.in*

This page intentionally left blank

Table of Contents

Disclaimer	1
A. Disclaimer Notice.....	3
1. Disclaimer.....	3
Invitation for Bids (IFB)	5
A. Invitation for Bids.....	7
1. Overview and Context.....	7
B. Notice Inviting Tender.....	8
2. Project Details.....	8
3. Name of the work.....	8
4. Sale of Bid Documents.....	8
5. Checklist of Annexures/Documents to be furnished.....	9
C. Bid Information Sheet.....	10
6. Bid Particulars.....	10
Section I Instruction to Bidders (ITB)	13
A. Glossary, Abbreviations and Interpretations.....	15
1. Glossary/Definitions.....	15
2. Abbreviations and Acronyms.....	21
3. Interpretations.....	24
B. General.....	25
4. Scope of Bid.....	25
5. Source of Funds.....	25
6. Corrupt and Fraudulent Practices.....	25
7. Eligible Bidders.....	26
C. Contents of Bidding Document.....	27
8. Sections of Bidding Document.....	27
9. Clarification of Bidding Document, Pre-bid Meeting.....	28
10. Amendment of Bidding Document.....	29
D. Preparation of Bids.....	30
11. Cost of Bidding.....	30
12. Language.....	30
13. Documents Comprising the Bid.....	30
14. Letters of Bid and Schedules.....	33
15. Alternatives to the Bid Requirement and Alternative Bids.....	33
16. Bid Prices and Discounts.....	33
17. Currencies of Bid and Payment.....	35
18. Technical Proposal and Subcontractors.....	35
19. Documents Establishing Eligibility and Qualifications of the Bidder.....	36
20. Period of Validity of Bids.....	36
21. Bid Security.....	36

22. Format and Signing of Bid.....	38
E. Submission and Opening of Bids.....	38
23. Sealing and Marking of Bid.....	38
24. Deadline for Submission of Bids.....	40
25. Late Bids.....	40
26. Withdrawal, Substitution, and Modification of Bids.....	40
27. Bid Opening.....	41
F. Evaluation and Comparison of Bids.....	42
28. Confidentiality.....	42
29. Clarification of Bids.....	42
30. Deviations, Reservations and Omissions.....	43
31. Preliminary Examination of Technical Bids.....	43
32. Qualification of Bidders.....	44
33. Determination of Responsiveness of Technical Bids.....	44
34. Non-material Non-conformities in Bids.....	46
35. Correction of Arithmetic Errors.....	46
36. Conversion to Single Currency.....	47
37. Evaluation of Price Bids.....	47
38. Comparison of Bids.....	48
39. Employer's Right to Accept Any Bid, and to Reject Any or All Bids.....	48
G. Award of Contract.....	49
40. Award Criteria/Process of Empanelment.....	49
41. Right to Vary Capacities at the Time of Award or within the Validity of Tender.....	49
42. Notification of Award.....	50
43. Signing of Contract.....	50
44. Performance Security.....	50
45. Notification to Unsuccessful Bidders and Debriefing.....	51
H. Special Instructions To Bidders For E-Tendering.....	51
46. General.....	51
47. About e-Tender Portal.....	51
48. Pre-requisite for participation in bidding process.....	52
49. Bidding Related Information for this Tender.....	52
50. Procedure for Electronic Submission of Bids.....	54
51. Critical Do's and Don'ts for Bidders.....	55
52. Content of Bid.....	56
Section II Evaluation and Qualification Criteria (EQC).....	59
A. Evaluation and Qualification Criteria.....	61
1. Evaluation.....	61
2. Qualification.....	65
3. Key Information regarding Documentary proofs.....	69
Section III Bidding Forms.....	71
A. Bidding Forms.....	73

Letter of Bid.....	73
Letter of Price Bid.....	77
Form ELI - 1: Bidder Information Form.....	79
Form CON-1: Historical Contract Non-Performance.....	80
Form CON-2: Undertaking for No Blacklisting & No Banning.....	81
Form FIN - 1: Historical Financial Performance.....	82
Form FIN - 2: Average Annual Turnover.....	84
Form FIN - 3: Financial Resources.....	85
Form FIN - 4: Certificate from Banker.....	86
Form EXP - 1: General Experience.....	88
Form EXP - 2: Specific Experience.....	89
Form SBG: Bid Security (Bank Guarantee).....	91
Form BSD: Bid Security Declaration.....	93
Form BGV: Checklist for Bank Guarantee Verification.....	94
Form PBQ: Pre-bid Queries to be raised by Bidder.....	96
Form POA: Power of Attorney.....	97
Form DTR: Schedule of Deviations from Technical Requirements.....	99
Form DCR: Schedule of Deviations from Commercial Requirements.....	100
Form OIR: Declaration Regarding No Omissions or Inconsistencies or Reservations.....	101
Form MAS: Details of Materials and Services to be Offered.....	103
Form MOE: Declaration for using same Make of Equipments as per the Type Test Certificate....	105
Form DAC – Disclosure for ALMM Compliance.....	107
B. Price Schedule.....	109
Price Schedule - Abstract.....	109
Price Schedule - Engineering, Procurement and Commissioning.....	112
Form SPS: Schedule of Provisional Sums.....	120
C. Technical Proposal.....	121
1. Technical Proposal.....	121
2. Design Methodology.....	121
3. System Design.....	123
4. Method Statement.....	124
5. Mobilization and Installation Schedule.....	124
Section IV Employer’s Requirements.....	126
A. Scope of Work.....	128
1. Disclaimer.....	128
2. Definition.....	128
3. Detailed Scope of Work.....	128
4. Site Details.....	134
5. Requirement of approvals on makes of the Components.....	134
6. Tender Sample Requirement.....	135
7. Technology Risk.....	136
B. Technical Specifications.....	136

8. Design Philosophy.....	136
9. Quality and Workmanship.....	139
10. PV System Capacity.....	139
11. Planning and Designing.....	139
12. Safety Measures.....	139
13. Civil Work.....	140
14. PV Modules.....	141
15. Inverter/Power Conditioning Unit (PCU).....	152
16. Battery Bank.....	159
17. Module Mounting Structures.....	160
18. Junction Box.....	182
19. AC Distribution Board (ACDB).....	184
20. Low voltage switchgears.....	185
21. Cables.....	186
22. Quality Certification, Standards and Testing.....	188
23. Protection System.....	195
24. Integration of PV power with grid/power evacuation.....	197
25. Danger Boards.....	198
26. Drawings & Manuals.....	198
27. Project Management.....	199
28. Other Key Responsibilities.....	200

Section V General Conditions of Contract (GC).....202

A. Definitions and Interpretation.....	204
1. Definitions.....	204
2. Contract Documents.....	209
3. Interpretation.....	209
4. Communications.....	211
5. Law and Language.....	211
6. Corrupt or Fraudulent Practices.....	211
B. Subject Matter of Contract.....	212
7. Scope of Facilities.....	212
8. Commencement and Time for Completion.....	213
9. Contractor's Responsibilities.....	214
10. Employer's Responsibilities.....	215
C. Payment.....	216
11. Contract Price.....	216
12. Terms of Payment.....	216
13. Securities.....	217
14. Taxes and Duties.....	218
D. Intellectual Property.....	220
15. License/Use of Technical Information.....	220
16. Confidential Information.....	221

E. Execution of the Facilities.....	222
17. Representatives.....	222
18. Work Programme.....	224
19. Subcontracting.....	225
20. Design and Engineering.....	225
21. Procurement.....	228
22. Installation.....	230
23. Test and Inspection.....	233
24. Completion of Facilities.....	235
25. Commissioning and Operational Acceptance.....	236
F. Guarantees and Liabilities.....	238
26. Completion Time Guarantee.....	238
27. Defects Liability and Comprehensive Maintenance.....	239
28. Functional Guarantees.....	243
29. Patent Indemnity.....	245
30. Limitation of Liability.....	246
G. Risk Distribution.....	246
31. Transfer of Ownership.....	246
32. Care of Facilities.....	247
33. Loss of or Damage to Property; Accident or Injury to Workers; Indemnification.....	247
34. Insurance.....	248
35. Unforeseen Conditions.....	251
36. Change in Laws and Regulations.....	251
37. Force Majeure.....	252
38. War Risks.....	254
H. Change in Contract Elements.....	256
39. Change in the Facilities.....	256
40. Extension of Time for Completion.....	259
41. Suspension.....	261
42. Termination.....	262
43. Assignment.....	268
I. Claims, Disputes and Arbitration.....	268
44. Contractor's Claims.....	268
45. Disputes and Arbitration.....	270
Section VI Particular Conditions (PC).....	274
A. Contract Data.....	276
Section VII Contract Forms (CF).....	286
Form LOA – Letter of Acceptance.....	288
Form PBG – Performance Bank Guarantee.....	289
Form COA – Contract Agreement.....	291
I. Definitions.....	291

II. Interpretations.....	299
Article 1. Contract Documents and General particulars of the Contract.....	299
Article 2. Contract Price and Terms of Payment.....	301
Article 3. Appendices.....	301
Appendix 1: Time Schedule.....	304
Appendix 2: Metering and Remote Monitoring.....	305
Appendix 3: List of Subcontractors.....	308
Appendix 4: List of Documents for Approval and Review.....	309
Appendix 5: Responsibilities of the Employer and the Contractor.....	310
Appendix 6: Liquidated Damages and Penalties.....	318
Appendix 7: Performance Evaluation.....	319
Appendix 8: Functional Guarantees.....	320
Appendix 9: Contractor's Obligations and Defect Liability.....	324
Appendix 10: Payment Terms and Procedures.....	327
Appendix 11: Insurance Requirements.....	330
Appendix 12: Force Majeure.....	332
Appendix 13: Change in Laws and Regulations.....	334
Appendix 14: Suspension and Termination.....	335
Appendix 15: Indemnification.....	342
Appendix 16: General Covenants.....	343
Appendix 17: Claims, Disputes and Arbitration.....	346
Appendix 18: Representations & Warranties.....	349
Appendix 19: Corrupt or Fraudulent Practices and Prevention Policy.....	351
Appendix 20: Miscellaneous Provisions.....	355
Form FSR – Feasibility Survey Report.....	359
Form NPD – Name Plate Details.....	360
Form INC-1 – Installation Certificate from TEDA.....	361
Form FUG – Functional Guarantee.....	363
Form OPA – Operational Acceptance.....	364
Form GUC – Guarantee Card.....	365
Form TOC – Taking over Certificate.....	366
Form CCC – Contract Complete Certificate.....	367
Form PCN – Payment Claim Note.....	368
Form INR – Insurance Requirement.....	370
Form DLF – Documents List for Approval.....	371
Form MSR – Maintenance and Service Report.....	372
Form QMR – Quarterly Maintenance Report.....	373
Section VIII Annexures.....	374
Annexure A – Pre-dispatch Inspection Protocol for Crystalline PV Modules.....	376

Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection.....	376
A. Pre-dispatch inspection procedure.....	376
1. Objective.....	376
2. Standard.....	376
3. Definitions.....	376
4. Inspection Schedule.....	376
5. Scope of Inspection.....	376
6. Sampling Process.....	377
7. Decision Rules for Acceptance/Rejection.....	377
8. Inspection Process.....	378
9. Re-inspection and review.....	379
10. Inspection Summary.....	379
11. Disclaimer.....	379
B. Sampling Plan.....	380
12. Sampling Plan as Per ISO 2859 - 1.....	380
13. Sampling Plan as Per ISO 2859 – 2 (Normal, Tightened and Reduced).....	381
C. Inspection Report.....	384
Customer inspection Report.....	384



This page intentionally left blank



**Tamil Nadu Energy Development Agency
Chennai, Tamil Nadu**

Disclaimer

*Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road, Chennai – 600 006,
Phone: 044-28242800,
e-mail: dgm2@teda.in, tender@teda.in
website: www.teda.in*

This page intentionally left blank

A. Disclaimer Notice

1. Disclaimer

- 1.1.** The information contained in this tender document or subsequently provided to Bidder(s), whether verbally or in documentary or any other form by or on behalf of Tamil Nadu Energy Development Agency (TEDA) or any of their authorized employees or advisors, is provided to Bidder(s) on the terms and conditions set out in this tender and such other terms and conditions subject to which such information is provided.
- 1.2.** This tender (the "Bid") is not an agreement and is neither an offer nor invitation by TEDA to the prospective Bidders or any other person. The purpose of this tender is to provide interested parties with information that may be useful to them in preparing their proposal pursuant to this tender. This tender includes statements, which reflect various assumptions and assessments arrived at by TEDA in relation to the Project. Such assumptions, assessments and statements do not purport to contain all the information that each Bidder may require. The assumptions, assessments, statements and information contained in this tender may not be complete, accurate or adequate. Each Bidder should, therefore, conduct its own investigations and analysis and should check the accuracy, adequacy, correctness, reliability and completeness of the assumptions, assessments, statements and information contained in this tender.
- 1.3.** Information provided in this tender to the Bidder(s) is on a wide range of matters, some of which depends upon interpretation of law. The information given is not an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. TEDA accepts no responsibility for the accuracy or otherwise for any interpretation or opinion on law expressed herein.
- 1.4.** TEDA, and its authorized employees or advisors make no representation or warranty and shall have no liability to any person, including any Bidder under any law, statute, rules or regulations or tort, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything contained in this tender or otherwise, including the accuracy, adequacy, correctness, completeness or reliability of the tender and any assessment, assumption, statement or information contained therein or deemed to form part of this tender or arising in any way in the Bidding process.
- 1.5.** TEDA also accepts no liability of any nature whether resulting from negligence or otherwise howsoever caused arising from reliance of any Bidder upon the statements contained in this tender.
- 1.6.** TEDA may in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information, assessment or assumptions contained in this Tender.
- 1.7.** The issue of this tender does not imply that TEDA is bound to select a Bidder and TEDA reserves the right to reject all or any of the Bidders or Bids without assigning any reason whatsoever.

- 1.8.** The Bidder shall bear all its costs associated with or relating to the preparation and submission of its Bid including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by TEDA or any other costs incurred in connection with or relating to its Bid, regardless of the conduct or outcome of the Bidding Process. All such costs and expenses will remain with the Bidder.
- 1.9.** TEDA shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by a Bidder in preparation or submission of the Bid, regardless of the conduct or outcome of the Bidding Process.
- 1.10.** The prospective Bidders are requested to remain updated for any or all notices, amendments, corrigendum, clarifications etc. to this tender published through the websites www.teda.in and www.tntenders.gov.in. No separate notifications will be issued for such notices, amendments, corrigendum, clarifications etc. in the print media or individually to the prospective Bidders and in no case shall TEDA be held responsible for any loss of information to the Bidders. Intimation regarding notification on the above will be updated and available on www.teda.in and www.tntenders.gov.in.





Tamil Nadu Energy Development Agency Chennai, Tamil Nadu

Invitation for Bids (IFB)

This section provides specific details, such as the name of the Employer, the address for Bid submission, important dates, bid security and tender processing fees. The Invitation for Bids is not part of the Bidding Document.

*Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road, Chennai – 600 006,
Phone: 044-28242800,
e-mail: dgm2@teda.in, tender@teda.in
website: www.teda.in*

This page intentionally left blank

A. Invitation for Bids

1. Overview and Context

- 1.1.** The Government of Tamil Nadu is committed to mitigate the climate change effects on the one hand and to tap and judiciously use the abundant source of Renewable Energy on the other hand. To promote the use of New and Renewable Energy Sources and promote energy conservation activities, the Government of Tamil Nadu set up the Tamil Nadu Energy Development Agency (TEDA) in 1985.
- 1.2.** It is with these twin laudable policy objectives of protecting and improving the environment on the one hand, and welfare of the poor and farmers, on the other hand, that the Government of Tamil Nadu has introduced and successfully implemented several 'pro-poor, pro-farmer' environmental friendly welfare schemes in the power sector. Notable schemes among these include: Hon'ble Chief Minister's solar powered greenhouse scheme; Hon'ble Chief Minister's solar rooftop capital incentive scheme; and solar water pump programme. Tamil Nadu is having an installed capacity of 17,688.73 MW of renewable energy, which constitutes around 50% of the State's total installed capacity.
- 1.3.** Being the State Nodal Agency for the Ministry of New and Renewable Energy (MNRE), TEDA has facilitated implementation of RE projects with a cumulative capacity of 74.28 MW of medium and small level projects which include 57.28 MW in domestic rooftop solar PV systems and 17 MW of wind projects.
- 1.4.** The Tamil Nadu has set a target of 9,000 MW cumulative installed solar energy capacity to be achieved by the year 2023. The overall solar energy target is divided into targets for the utility category solar (5,400MW) and the consumer category solar (3,600 MW).
- 1.5.** Government of Tamil Nadu designated TEDA to act as RESCO for providing solar rooftops in Government/Local Body/Public sector undertaking buildings under section (3) of Tamil Nadu Transparency in Tenders Act 1998 vide G.O. (Ms) No.9 dated 29.01.2019.
- 1.6.** TEDA invites bids from eligible bidders to participate in Request for Selection (RFS) for empanelment of vendors for Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity as specified in the Bid Information Sheet.

B. Notice Inviting Tender

2. Project Details

Date	: 12.01.2024
Project Name	: Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.

3. Name of the work

- 3.1.** Tamil Nadu Energy Development Agency invites sealed Bids from eligible and qualified Bidders for the following:

Table 01 - Name of the work			
Bid Identification No.	Particulars	Bid Security INR (₹)	Bid Submission / Opening date
REF: 00007/TEDA/ CAPEX/ 2024, Dated 12.01.2024	Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of twenty (20) MW.	Refer Bid Information Sheet	Refer Bid Information Sheet


4. Sale of Bid Documents

- 4.1.** Bid documents can be obtained by remitting the cost either by cash or crossed Demand Draft in favour of Tamil Nadu Energy Development Agency payable at Chennai noting the Bid Identification number and furnishing the receipt to the General Manager, Tamil Nadu Energy Development Agency, 5th Floor, E.V.K. Sampath Maaligai, No.68, College Road, Chennai – 600 006, Tamil Nadu, with a requisition furnishing the complete postal address, on all working days from 10.30 a.m to 5.00 p.m. during the period of sale mentioned above.

Cost of tender document	
In person	₹ 5,000/- + 18% GST


- 4.2.** The bid documents are also available in Tamil Nadu Energy Development Agency's website www.teda.in Government of Tamil Nadu's website www.tntenders.gov.in at free of cost.

- 4.3. Telex/Fax/Telegraphic bid will not be accepted and TEDA is not responsible for any delay in submission of bids.
- 4.4. TEDA will not be responsible for any costs or expenses incurred by bidders in connection with the preparation or delivery of bids including the costs and expenses incurred towards site visits.
- 4.5. Bids must be submitted online on or before 15.00 hrs on the specified Bid submission date indicated in the table here under. All Bids must be accompanied by a **Bid Security** for appropriate amount in Indian Rupees, indicated in the Bid Information Sheet.
- 4.6. Bids will be opened online at 15.15 hrs on the specified date in the presence of the Bidders' representatives who choose to attend at the above address on the specified bid submission date indicated as under. Late Bids will be rejected.

Table 02 - Schedule for Receipt and Opening of Bid	
Date of commencement of sale	: 31.01.2024
Date and time of closing of sale	: 17.00 hrs on 11.03.2024
Date and time of pre bid meeting	: 15.00 hrs on 21.02.2024
Due date and time of receipt of bids	: Up to 15.00 hrs on 11.03.2024
Date & Time of Opening of bids	: 15.15 hrs on 12.03.2024
 Note <u>If any of the above happen to be a holiday, the next working day will be due date.</u>	

5. Checklist of Annexures/Documents to be furnished

Table 03 – Checklist of Documents to be submitted		
Sl.No.	Documents	Yes/No
5.1.	A blank copy of the tender document with each page signed and stamped	
5.2.	Documents in support of General Eligibility as per EQC §-2.2 - Eligibility	
5.3.	Documents to support Non-performance of a contract did not occur as a result of contractor's fault as per EQC §-2.3 – Historical Contract Non-performance.	
5.4.	Documents in support of Financial Eligibility as per EQC §-2.4 - Financial Eligibility.	
5.5.	Documents in support of Technical Eligibility as per EQC §-2.5 - Technical Experience.	

5.6.	Bid Security/Bid Security declaration as per ITB §-21 – Bid Security.	
5.7.	Type Test Certificates as per ER §-21 – Quality Certification, Standards and Testing.	
5.8.	Power of Attorney for the person representing bidder for this tender as per ITB §-22 – Format and Signing of Bid.	
5.9.	Affidavit to confirm that bidder has not been Debarred or Blacklisted by any Government Department or Undertaking as per Section III, Bidding Forms, Form CON-2: Undertaking for No Blacklisting & No Banning	
5.10.	Letter of Bid as per Section III - Bidding Forms, Letter of Bid.	
5.11.	Checklist of Documents to be submitted	
5.12.	Any other document, as per this tender document	
<p> Note</p> <ul style="list-style-type: none"> ■ The bidder would ensure that all the required documents, as mentioned in this bidding document, are submitted along with the bid and in the prescribed format only. Non-submission of the required documents or submission of the documents in a different format/contents may lead to the rejections of the bid. 		

C. Bid Information Sheet

6. Bid Particulars

Table 04 – Bid Information Sheet	
Particulars	Description
6.1. Name of the work	Tender for the selection of developer(s) to Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of twenty (20) MW.
6.2. Bid reference No. & Date	REF: 00007 / TEDA / CAPEX /2024, Dated 12.01.2024
6.3. Scope of work	The scope of work shall be as specified in “Section IV, Employer’s Requirements”
6.4. Work Area/“Site”	The Project Sites shall be the buildings of various Government buildings, State-run Industrial Units and Educational Institutions spread across in the state of Tamil Nadu.

6.5.	Estimated capacity	Twenty (20) MW
6.6.	Total Estimated Project cost	₹ 120.00 crore (approx) (Indian Rupees one hundred and twenty crore only)
6.7.	Bid Security	<p>₹ 1.00 crore (Indian Rupees one crore only) is to be submitted in the form of Indian Rupees by way of demand draft or banker's cheque/irrevocable bank guarantee {in the format provided under Form SBG: Bid Security (Bank Guarantee) in Section III – Bidding Forms) only, from any of the nationalized/scheduled banks operating in India, drawn in favour of "Tamil Nadu Energy Development Agency" and payable at Chennai only.</p> <p>In case of Government undertakings, PSUs and SSI units who are exempted from submission of Bid Security please refer ITB §-21.7 and ITB §-21.8. An undertaking to this effect shall be furnished in the format provided under Form BSD: Bid Security Declaration, in Section III – Bidding Forms.</p>
6.8.	Downloading of tender document	The tender document can be downloaded online through websites www.teda.in and www.tntenders.gov.in .
6.9.	Date of commencement of sale	31.01.2024
6.10.	Pre-Bid meeting date, time and place	21.02.2024 @ 15:00 hrs at TEDA office.
6.11.	Last date and time of receipt of pre-Bid queries from the Bidders	28.02.2024 @ 15:00 hrs
6.12.	Bid Due Date and Time and place for submission of the Bid	11.03.2024 @ 15:00 hrs at TEDA office (Online).
6.13.	Technical Bid Opening	12.03.2024 @ 15:15 hrs at TEDA office (Online).
6.14.	Price Bid opening	The date of Price Bid opening will be intimated only to the Bidders who are qualified in the Eligibility Bid on the basis of "Section II, Evaluation and Qualification Criteria".
6.15.	Cost of tender document	₹ 5,000/- plus 18% GST for direct purchase from TEDA. The document fee is waived for the downloaded tender document.
6.16.	Address for submission of Bids	The General Manager, Tamil Nadu Energy Development Agency, V Floor, E.V.K. Sampath Maaligai, 68, College Road, Chennai-600006.

i Important

1. The prospective Bidders are requested to remain updated for any or all notices, amendments, corrigendum, clarifications etc. to this tender published through the websites www.teda.in and www.tntenders.gov.in. No separate notifications will be issued for such notices, amendments, corrigendum, clarifications etc. in the print media or individually to the prospective Bidders and in no case shall TEDA be held responsible for any loss of information to the Bidders. Intimation regarding notification on the above will be updated and available on www.teda.in and www.tntenders.gov.in.
2. If any one of the above mentioned dates in the Bid information sheet happens to be a holiday, the next working day will be the due date.
3. Bidder shall ensure compliance of all provisions of this tender and submit their Bid accordingly. Tender with any deviation to the Bid conditions shall be liable for rejection.
4. Bid documents shall be page numbered and bounded.





Tamil Nadu Energy Development Agency Chennai, Tamil Nadu

Section I Instruction to Bidders (ITB)

This Section specifies the procedures to be followed by the Bidders when preparing and submitting their technical and price Bids. It also provides information on the opening and evaluation of Bids and on the award of the Contract.

*Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road, Chennai – 600 006,
Phone: 044-28242800,
e-mail: dgm2@teda.in, tender@teda.in
website: www.teda.in*

This page intentionally left blank

A. Glossary, Abbreviations and Interpretations

1. Glossary/Definitions

Following terms used in the document will carry the meaning and interpretations as described below:

- 1.1. **"Act" or "Electricity Act, 2003"** shall mean the Electricity Act, 2003 and include any modifications, amendments and substitutions issued from time to time;
- 1.2. **"Affiliate"** shall mean a company that either directly or indirectly, controls or is controlled by or is under common control with a Bidding Company where "control" means ownership by one company of at least twenty-six percent (26%) of the voting rights of the other company;
- 1.3. **"Allocated capacity"** shall mean the capacity allocated to a bidder by TEDA based on the procedure defined in ITB §-40. The allocated capacity will be mentioned in the Letter of Allocation (LoA).
- 1.4. **"Beneficiary" or "Customer"** shall mean the Government offices who are the Consumers of Tamil Nadu Generation and Distribution Corporation Limited having 1-phase/3-phase connection of Supply of Electricity
- 1.5. **"Bid"** shall mean the Technical Bid, Eligibility Bid and Price Bid submitted by the Bidder in response to this tender and in accordance with the terms and conditions hereof;
- 1.6. **"Bidder"** shall mean Bidding Company submitting the Bid. Any reference to the Bidder includes Bidding Company, including its successors, executors and permitted assigns and lead member of the bidding consortium jointly and severally, as the context may require".
- 1.7. **"Bidding consortium or consortium"** shall refer to a group of companies that have collectively submitted the response in accordance with the provisions of this RFS.
- 1.8. **"Bid Bond" or "Bid Security" or "EMD"** shall mean the unconditional and irrevocable bank guarantee or Demand Draft to be submitted along with the Bid by the Bidder as specified in the Bid Information Sheet, IFB §-6.7, in the prescribed Format;
- 1.9. **"Bid Deadline"** shall mean the last date and time for submission of Bid in response to this tender as specified in Bid Information Sheet, IFB §-6.12;
- 1.10. **"Bid Capacity"** shall means capacity offered by the bidder in his Bid under invitation.
- 1.11. **"Bid Price"** shall mean the price offered by the Bidder as provided for in ITB §-16;
- 1.12. **"Bid Due Date and Time"** shall mean last date and time for submission of Bids in response to this tender as specified in the Bid Information Sheet, IFB §-6.12;
- 1.13. **"BIS"** shall mean Bureau of Indian Standards;

- 1.14.** “**Capacity Utilization Factor (CUF)**” shall mean the ratio of actual energy generated by a solar PV system during a year to the product of installed plant capacity (in kW) and the total hours in a year (365 x 24). $CUF = \text{Plant output in kWh} / (\text{installed plant capacity in kW} * 365 * 24)$;
- 1.15.** “**CAPEX**” shall mean the CAPEX Model or the Capital Expenditure model.
- 1.16.** “**CEA**” shall mean the Central Electricity Authority, Government of India;
- 1.17.** “**Chartered Accountant**” shall mean a person practicing in India or a firm whereof all the partners practicing in India as a Chartered Accountant(s) within the meaning of the Chartered Accountants Act,1949;
- 1.18.** “**Competent Authority**” shall mean the Chairman and Managing Director of Tamil Nadu Energy Development Agency or any person authorized by him/her;
- 1.19.** “**Company**” shall mean a body incorporated in India under the Companies Act, 1956 or Companies Act, 2013 including any amendment thereto;
- 1.20.** “**Contract**” shall mean the agreement to be entered into by TEDA with the Empanelled Agency upon receiving the Letter of Empanelment from TEDA for implementation of the Scheme/Project and shall include the General and commercial terms and condition, scope of work, project requirement, technical conditions, schedules, appendixes, drawings and any other conditions specifically agreed between the parties forming a part of the contract.
- 1.21.** “**Contract Agreement**” shall mean an agreement to be entered into between TEDA and the Successful Bidder(s) stipulating the rights and obligations of TEDA and the Successful Bidder(s);
- 1.22.** “**Contractor**” shall mean a Successful Bidder with whom TEDA has entered into a Contract Agreement relating to the Project;
- 1.23.** “**Commercial Operation Date (COD)**” in relation to a solar system means the date declared by the Contractor and approved by TEDA on which the Ground Mounted/Rooftop Solar PV System has become operational after demonstrating that the Ground Mounted Solar PV System/Rooftop Solar PV System has been tested and verified for its design, specifications and performance evaluation requirements and has been successfully connected to the metering point of TANGEDCO;
- 1.24.** “**Controlling Equity**” shall mean holding not less than 51% of the paid up equity share capital;
- 1.25.** “**CRCA**” means cold rolled close annealed;
- 1.26.** “**DNI**” shall means Direct Normal Irradiation.
- 1.27.** “**Date of completion of project**” shall mean that the date of completion of project with project handed over and accepted by the consumer / beneficiary in all respect provided that the assigns, Guarantee and warranty of five (5) years shall be applicable as per this Bid Document’s terms and condition after the date of completion of Project.

- 1.28. “Day” shall mean calendar day;**
- 1.29. “Division” shall mean Operation and Maintenance Division of TANGEDCO.**
- 1.30. “Eligibility Criteria” shall mean the Eligibility Criteria as set forth in EQC §-2 of this tender;**
- 1.31. “Eligibility Bid” shall mean all Bid documents other than the Price Bid;**
- 1.32. “Effective Date” shall mean the date of execution of Projects;**
- 1.33. “Equity” shall mean paid up share capital.**

Add: Free Reserves

Subtract: Revaluation Reserves Subtract: Intangible Assets

Subtract: Miscellaneous Expenditures to the extent not written off and carry forward losses

** Share premium will form an integral part of Equity provided it is realized in cash or cash equivalent. However, this condition will not apply in case of listed Companies.

- 1.34. “Empanelled Vendor(s)/Contractor/Project Developers(s)” shall mean the Bidder(s) selected by TEDA pursuant to this RFS.**
- 1.35. “EPC” Shall mean Engineering, Procurement and commissioning of the complete project as per the terms and condition of the RFS Document.**
- 1.36. “Financial Eligibility Criteria” shall mean the financial eligibility criteria as given in EQC §-2.4 - Financial Eligibility of this tender document;**
- 1.37. “Financial Closure or Project Financing Arrangements” means arrangement of necessary funds by the bidder either by way of commitment of funds by the Company from its internal resources and/or tie up of funds through a bank/financial institution by way of sanction of a loan or letter agreeing to finance;**
- 1.38. “Group Company” of a Company means**
- 1.38.1.** a Company in which the Company, directly or indirectly, holds ten percent (10%) or more of the share capital of such Company or;
- 1.38.2.** a Company in which the Company, directly or indirectly, has the power to direct or cause to be directed the management and policies of such Company whether through the ownership of securities or agreement or any other arrangement or otherwise or;
- Provided that a financial institution, scheduled bank, foreign institutional investor, Non-Banking Financial Company, and any mutual fund shall not be deemed to be Group Company, and its shareholding and the power to direct or cause to be directed the management and policies of a Company shall not be considered for the purposes of this definition unless it is the Project Company or a Member of the Consortium developing the Project.

- 1.39. **“Installed Capacity”** shall mean the capacity of Grid connected Rooftop Solar Photovoltaic Systems installed and commissioned by the bidder during the empanelment period.
- 1.40. **“Inter-connection point/Delivery/Metering Point”** shall mean the point at distribution voltage level where the power from the solar power Project is injected. Metering shall be done at this interconnection point where the power is injected into the Distribution System i.e. the Delivery Point. For interconnection with grid and metering, the EPC shall abide by the relevant TANGEDCO's/TNERC's Regulations and their amendments thereof.
- 1.41. **“IEC”** shall mean International Electro-technical Commission;
- 1.42. **“IS”** shall mean Indian Standard, published by the Bureau of Indian Standards;
- 1.43. **“kW_p”** shall mean kilowatt peak;
- 1.44. **“kWh”** shall mean kilowatt hour;
- 1.45. **“Letter of Acceptance (LoA)/Letter of Allocation (LoA)/“Letter of Intent” (LOI)”** shall mean the letter issued by TEDA to the Selected Bidder to secure their Intent for award of the Project.
- 1.46. **“Limited Liability Partnership (LLP)”** shall mean a Company governed by Limited Liability Partnership Act 2008 or as amended.
- 1.47. **“LLC”** shall mean Limited Liability Company
- 1.48. **“Lead Member”** shall mean the member of a Bidding Consortium who satisfies the Financial Eligibility criteria.
- 1.49. **“Minimum CUF”** shall mean the minimum capacity utilisation factor as specified in GC §-28.5.3 of this tender document;
- 1.50. **“MNRE”** shall mean Ministry of New and Renewable Energy, Government of India;
- 1.51. **“Net Meter”** means an appropriate energy meter (bi-directional) capable of recording both import and export of electricity or a pair of meters one each for recording the net import and net export of electricity as the case may be.
- 1.52. **“Non-Performing System”** shall mean non-performing Projects as defined in GC §-28.5.8 of this tender document.
- 1.53. **“O&M”** shall mean Operation & Maintenance;
- 1.54. **“OBIS”** shall mean Object Identification System, which defines identification codes for all data in DLMS/COSEM compliant metering equipment as per IEC 62056 (parts 21, 42, 46, 47, 53, 61 and 62) and IS 15959:2011;
- 1.55. **“Member in a Bidding Consortium”** or **“Member”** shall mean each Company in a Bidding Consortium. In case of a Technology Partner being a member in the Consortium, it has to be a Company;
- 1.56. **“Month”** shall mean calendar month;

- 1.57. “Paid-up Share Capital”** shall mean such aggregate amount of money credited as paid-up as is equivalent to the amount received as paid up in respect of shares issued and also includes any amount credited as paid up in respect of shares of the company, but does not include any other amount received in respect of such shares, by whatever name called; Paid-up share capital includes:
- Paid-up equity share capital;
 - Fully, compulsorily and mandatorily convertible Preference shares and
 - Fully, compulsorily and mandatorily convertible Debentures.
- 1.58. “Parent Company”** shall mean a company, which holds at least 51% equity either directly or indirectly in the Bidding Company or Project Company or a Member in a Consortium developing the Project;
- 1.59. “Performance Certificate”** shall mean a certificate of performance issued by an Eligible Client by which the performance of Bidder.
- 1.60. “Performance Ratio” (PR)** means the ratio of plant output versus installed plant capacity at any instance with respect to the radiation measured.
- $$PR = \frac{\text{Measured output (kW)}}{\text{Installed plant capacity (kWp)}} \times \frac{1000 \text{ W/m}^2}{\text{Measured radiation intensity (W/m}^2\text{)}}$$
- 1.61. “Performance Security”** shall mean a financial guarantee to be provided by the Successful Bidder as described in ITB §-44 of this tender;
- 1.62. “Price Bid”** shall mean Envelope II: Price Bid of the Bid, containing the Bidder’s quoted Price as per this RFS;
- 1.63. “Project”** Shall mean the project of the Site Survey, Design, Supply, Installation, testing & Commissioning of Grid connected Rooftop Solar Systems including five (5) years comprehensive maintenance
- 1.64. “Project capacity”** means Capacity in kW allocated to the Bidder for various locations within the state of Tamil Nadu.
- 1.65. “Project Commissioning”** the Project will be considered as commissioned if all equipment as per rated project capacity has been installed and energy has flown into grid, in line with the Commissioning procedures defined in the guidelines/tender;
- 1.66. “Project Company”** shall mean a Company incorporated by the Bidder as per the laws of India for the implementation of Project selected based on this tender;
- 1.67. “Project Cost/Project Price”** shall mean the price offered by the Bidder for the Scope of work as per RFS document.
- 1.68. “Provisional Sums for Contingencies”** are budgetary items only, and are not bid competitively. They may be a fixed amount, or a percentage of the bid price as a whole or of the bid price of specific bills of the bill of quantities as specified in the bidding document.

- 1.69.** “**PV System**” or “**SPV** ” or “ **SPV System**” shall for the purpose of this tender mean the Grid-connected Rooftop Solar Photo-Voltaic (PV) system including the PV modules, grid-connected inverter(s), module mounting structure(s), cables and connectors, safety and Earthing equipment, interconnection equipment, and inverter with remote monitoring with other components for Rooftop Solar System that shall be supplied, installed, commissioned and maintained by the Empanelled Agency.
- 1.70.** “**Qualified Bidder**” shall mean the Bidder(s) who, after evaluation of the Eligibility Criteria stand eligible for opening and evaluation of their Price Bid;
- 1.71.** “**RFS**” shall mean Request for Selection/Bid Document/Tender Document.
- 1.72.** “**Renewable Energy Meter (REM)**” shall mean a Solar Energy Generation meter as specified in the CEA (Installation and Operation of meters) Regulation 2006 and as amended from time to time.
- 1.73.** “**Rooftop Owner**” shall means owner of roofs at various buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions within the state of Tamil Nadu consisting of single or multiple rooftops.
- 1.74.** “**Selected Bidder or Successful Bidder**” shall mean the Bidder selected pursuant to this tender to set up the Solar PV systems as per terms and conditions of this tender;
- 1.75.** “**SNA**” shall mean State Nodal Agency.
- 1.76.** “**Solar Energy Generation Meter**” shall mean a renewable energy meter as specified in the CEA (Installation and Operation of meters) Regulation 2006 and as amended from time to time;
- 1.77.** “**Solar Energy Price**” shall mean the solar energy price as stated in the Contract Agreement;
- 1.78.** “**Solar Power Developer (SPD)**” shall mean Empanelled Vendor(s) to whom the project is/are allocated.
- 1.79.** “**Specification**” shall mean the RFS Document forming a part of the contract along with Proforma, schedules, appendixes and Annexures.
- 1.80.** “**State Transmission Utility (STU)**” shall mean the Board or the Government Company notified by the respective State Government under Sub-Section I of Section 39 of the Electricity Act, 2003;
- 1.81.** “**Statutory Auditor**” shall mean the auditor of a Company appointed under the provisions of the Companies Act, 1956 or under the provisions of any other applicable governing law.
- 1.82.** “**Sub-Division**” shall mean Operation and Maintenance Sub-Division of DISCOM.
- 1.83.** “**System**” shall mean the Grid connected Rooftop Solar System as per RFP Document that shall be supplied, installed, commissioned and maintained with all other ancillary required by the vendor for satisfactory operation of the System.

- 1.84.** “**TANGEDCO**” shall mean Tamil Nadu Generation and Distribution Corporation Limited;
- 1.85.** “**Technical Eligibility Criteria**” shall mean the technical eligibility criteria as given in EQC §-2.5 - Technical Eligibility;
- 1.86.** “**TEDA**” shall mean Tamil Nadu Energy Development Agency;
- 1.87.** “**Tender**” in context of this document shall have the same meaning as clause 2 (i) of The Tamil Nadu Transparency in Tender Act 1998 & The Tamil Nadu Transparency in Tender Rules, 2000;
- 1.88.** “**Tendered Capacity**” shall mean the Total aggregate capacity in kW_p/MW_p proposed and allocated by TEDA to the Contractor(s) through this bidding process as per terms and conditions specified therein;
- 1.89.** “**TNERC**” shall mean Tamil Nadu Electricity Regulatory Commission.
- 1.90.** “**Ultimate Parent Company**” shall mean a company which directly or indirectly owns at least twenty-six percent (26%) paid up equity capital in the Bidding Company) and/or in the Financially Evaluated Entity and such Bidding Company and/or the Financially Evaluated Entity shall be under the direct control or indirectly under the common control of such company;
- 1.91.** “**Week**” shall mean calendar week;
- 1.92.** “**Work**” shall mean activities of Supply, Installation, testing and commissioning of the RFS Document item for which the offers are invited.
- 1.93.** “**W_p**” shall mean Watt peak;

2. Abbreviations and Acronyms

Abbreviations	Full Forms
AC	Alternating Current
ACDB	Alternating Current Distribution Board
Ah	Ampere-hour
ALMM	Approved List of Models and Manufacturers
BOQ	Bill of Quantity
BIS	Bureau of Indian Standards
CCA	Controller of Certifying Authorities
CEA	Central Electricity Authority
CFA	Central Financial Assistance
CEI	Chief Electrical Inspector
CMC	Comprehensive Maintenance Contract
CUF	Capacity Utilization Factor
DC	Direct Current
DCDB	DC Distribution Board

DPR	Detailed Project Report
DG	Diesel Generator
DISCOM	Distribution Company
DPB	Distribution Panel Board
DSP	Digital Signal Processor
EMC	Electromagnetic Compatibility
EMD	Earnest Money Deposit
EMI	Electromagnetic Interference
EN	European Norms
EOI	Expression of Interest
EP	Empanelled Partner
EPDM	Ethylene Propylene Diene Monomers
FF	Fill Factor
FOR	Freight on Rail/Road
FRP	Fibre-reinforced plastic
GHI	Global Horizontal Irradiance
GHS	Group Housing Society
GI	Galvanised Iron
GPRS	General Packet Radio Service
GPS	Global Positioning System
GRP	Glass Reinforced Plastic
GST	Goods and Services Tax
HDPE	High Density Polyethylene
Hz	Hertz
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IGBT	Insulated-gate bipolar transistor
I_{mp}	Peak Power Current
INR	Indian Rupees
IP	Ingress Protection
IS	Indian Standard
I_{sc}	Short Circuit Current
ISI	Indian Standards Institute
ISO	International Standards Organization
ITB	Instructions to Bidders
JB	Junction Box
JSON	JavaScript Object Notation

kg	Kilogram
km/hour	kilometres per hour
kVA	kilo-volt-ampere
kW	Kilowatt
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LoA	Letter of Acceptance
LoI	Letter of Intent
LPSC	Lightning Protection System Components
LT	Low Tension
MCB	Miniature Circuit Breaker
MCCB	Moulded Case Circuit Breaker
mm	Millimetre
MNRE	Ministry of New and Renewable Energy
MMS	Module Mounting Structure
MOSFET	Metal-Oxide Semiconductor Field-Effect Transistor
MOV	Metal Oxide Varistor
MPPT	Maximum Power Point Tracker
MSME	Micro, Small and Medium Enterprises
MW	Mega Watt
NIB	Notice Inviting Bid
NIT	Notice Inviting Tender
NOC	No Objection Certificate
O&M	Operations and Maintenance
PAN	Permanent Account Number
PBG	Performance Bank Guarantee
PCU	Power Conditioning Unit
PR	Performance Ratio
PGT	Performance Guarantee Test
PSU	Public Sector Undertaking
PV	Photovoltaic
PVC	Polyvinyl Chloride
PWM	Pulse width modulation
RFID	Radio Frequency Identification
RFP	Request for Proposal
RFS	Request for Selection
RTS	Rooftop Solar

RWA	Residential Welfare Association
SBD	Standard Bid Document
SERC	State Electricity Regulatory Commission
SIM	Subscriber Identification Module
SNA	State Nodal Agency
SPD	Surge Protection Device
SPIN	Solar Photovoltaic Installation
SPV	Solar Photo Voltaic
sq.m	square meter
STC	Standard Testing Condition
TAC	Tariff Advisory Committee
THD	Total Harmonic Distortion
TIN	Taxpayer Identification Number
UV	Ultraviolet
V	Volt
VA	Volt Ampere
V _{mp}	Peak Power Voltage
V _{oc}	Open Circuit Voltage
XLPE	Cross-linked polyethylene
XLPO	Cross-linked Polyolefin
XML	Extensible Mark-up Language
W	Watt

3. Interpretations

- 3.1.** The words and expressions beginning with capital letters and defined in this document shall, unless the context otherwise requires, have the meaning ascribed thereto herein.
- 3.2.** All applicable law herein shall be construed as reference to such applicable law including its amendments or re-enactments from time to time;
- 3.3.** A time of day shall save as otherwise provided in any agreement or document be construed as a reference to Indian Standard Time;
- 3.4.** Different parts of this tender are to be taken as mutually explanatory and supplementary to each other and if there is any differentiation between or among the parts of this tender, they shall be interpreted in a harmonious manner so as to give effect to each part;
- 3.5.** The table of contents and the headings and sub headings in this tender document has been inserted for the sake of convenient reference only and shall not affect the interpretation of this tender document.
- 3.6.** Throughout this Bidding Document:

- i. the terms “Facilities” and “Plant and Installation Services” are synonymous with the term “Plant Design, Supply and Installation”;
- ii. the term “in writing” means communicated in written form and delivered against receipt;
- iii. except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular;
- iv. male also means female or neuter, and the other way around;
- v. “firm” means a private entity, a state-owned enterprise or institution; and
- vi. “Joint Venture” or “JV” means any combination of two or more firms in the form of a joint venture, consortium, association or other unincorporated grouping under an existing agreement or with the intention to enter into such an agreement supported by a formal letter of intent.

B. General

4. Scope of Bid

- 4.1. TEDA on behalf of various Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in Tamil Nadu issue this Bidding Document (hereinafter referred to as “Bidding Document”) for the work of Site Survey, Plant Design, Supply, Installation, Commissioning and Comprehensive maintenance for five (5) years as specified in Section IV, Employer’s Requirements in accordance with the procedures stipulated in the Tamil Nadu Transparency in Tenders Act 1998 and Tender Rules 2000 as amended from time to time.
- 4.2. The name of the Project is Solarization of buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.
- 4.3. The tentative cumulative capacity of the project is as specified in the Bid Information Sheet. The generated energy from the solar PV system will be consumed by the beneficiary and the excess energy if any, can be fed into the grid as per the grid connectivity norms specified TNERC orders and as amended from time to time.
- 4.4. The successful Bidder shall work closely with TEDA and Government offices in Tamil Nadu involved in this programme and ensure the success of the programme by completing the installations from the date of granting permission by the concerned offices for carrying out the works.

5. Source of Funds

- 5.1. The scheme is to be funded by the beneficiary Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions.

6. Corrupt and Fraudulent Practices

- 6.1. It is expected from the Bidders that they will observe the highest standard of ethics during the procurement and execution of the project. In pursuance of this policy:
 - i. for the purposes of this provision, the terms set forth below shall mean as under:

- a. "corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution; and
- b. "fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of TEDA, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive TEDA of the benefits of free and open competition;
- c. "Collusive practice" means a scheme or arrangement between two or more bidders, with or without the knowledge of TEDA, designed to establish bid prices at artificial, noncompetitive levels;
- d. "Coercive practice" means harming or threatening to harm, directly or indirectly, person or their property to influence or affect the execution of a contract;

6.2. In pursuance of the policy stated in ITB §-6.1, TEDA:

- i. will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt / fraudulent / collusive / coercive practice(s) in competing for the contract in question.
- ii. will declare a firm ineligible, either indefinitely or for a stated period of time, if it at any time determines that the firm has engaged in corrupt/fraudulent/collusive/coercive practice(s) in competing for, or in executing, the contract.

6.3. If TEDA determines, based on reasonable evidence, that any Bidder has engaged in any corrupt / fraudulent / collusive / coercive practice(s), TEDA may disqualify such Bidder after notifying the grounds of such disqualification.

6.4. Furthermore, the Bidders shall be aware of the provision stated in GC §-6 of General Conditions of Contract.

7. Eligible Bidders

7.1. The bidder must meet the eligibility criteria independently as a single entity bidding company. No combination of such entities in the form of a joint venture or association (JVA) are not eligible.

7.2. The Bidder and all partners constituting the Bidder shall not have a conflict of interest. The Bidder shall be disqualified under any of the circumstances set forth below, where it is determined to have a conflict of interest throughout the bidding/selection process and/or the execution of the Contract unless the conflict has been resolved in a manner acceptable to TEDA.

- i. a Bidder has been engaged by TEDA to provide consulting services for the preparation related to procurement or implementation of the project;

- ii. a Bidder is any associates/affiliates (inclusive of parent firms) of a firm or an organization mentioned in subparagraph (i) above; or
 - iii. a Bidder lends, or temporarily seconds its personnel to firms or organizations which are engaged in consulting services for the preparation related to procurement for or implementation of the project, if the personnel would be involved in any capacity on the same project.
 - iv. a firm having any other form of conflict of interest other than (i) through (iii) above shall also be disqualified.
- 7.3.** Based on the “One Bid Per Bidder” principle, which is to ensure fair competition, a firm and any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm shall not be allowed to submit more than one Bid, either individually as a single firm or as a member of a JV in the same bidding process. A Bidder who submits or participates in, more than one bid will cause all of the proposals in which the Bidder has participated to be disqualified. No Bidder can be a subcontractor while submitting a bid individually in the same bidding process. A Bidder, if acting in the capacity of subcontractor in any bid, may participate in more than one bid, but only in that capacity.
- 7.4.** The Bidder shall provide such evidence of its continued eligibility satisfactory to TEDA, as TEDA shall reasonably request.

C. Contents of Bidding Document

8. Sections of Bidding Document

- 8.1.** The Bidding Document consists of Parts 1, 2, and 3, which include all the Sections specified below, and which should be read in conjunction with any addenda issued in accordance with ITB §-10.
- 8.1.1. PART 1 - Bidding Procedures**
 - Section I. Instructions to Bidders (ITB)
 - Section II. Evaluation and Qualification Criteria (EQC)
 - Section III. Bidding Forms (BF)
 - 8.1.2. PART 2 – Technical Requirements and Specifications**
 - Section IV. Employer’s Requirements (ER)
 - Section VIII. Annexures
 - 8.1.3. PART 3 – Conditions of Contract and Contract Forms**
 - Section V. General Conditions (GC)
 - Section VI. Particular Condition (PC)
 - Section VII. Contract Forms (CF)
- 8.2.** The Invitation for Bids issued by TEDA is not part of the Bidding Document.

- 8.3.** TEDA is not responsible for the completeness of the Bidding Document and its addenda, if they were not obtained directly from the source stated by the Employer in the “Invitation for Bids (IFB)”.
- 8.4.** The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Document, and to furnish with its Bid all information and documentation as is required by the Bidding Document. The information or documentation shall be complete, accurate, current, and verifiable. Failure to furnish all information or documentation required by the Bidding Document may result in the rejection of the bid.

9. Clarification of Bidding Document, Pre-bid Meeting

- 9.1.** The Bidder requiring any clarification of the Bidding Document shall contact TEDA in writing addressed to the General Manager, Tamil Nadu Energy Development Agency, V Floor, E.V.K. Sampath Maaligai, 68, College Road, Chennai-600006 or raise its enquiries during the pre-bid meeting in accordance with ITB §-9.4. TEDA will respond in writing to any request for clarification, provided that such request is received no later than fourteen (14) days prior to the deadline for submission of Bids. TEDA shall forward copies of its response to all Bidders who have acquired the Bidding Document in accordance with ITB §-8.3, including a description of the inquiry but without identifying its source. TEDA shall also promptly publish its response on www.teda.in and www.tntenders.gov.in. Should the clarification result in changes to the essential elements of the Bidding Document, TEDA shall amend the Bidding Document following the procedure under ITB §-10 and ITB §-24.2.
- 9.2.** The identification of the projects (roof tops) at the time of bidding is not mandatory as the list of identified buildings were already surveyed by TEDA and the proposed capacities have been determined based on the available shadow free area, sanctioned demand etc., The Bidder, however, in its own interest is advised to visit and examine the Site where the Plant is to be installed 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 the execution of Plant and Installation Services. TEDA, as applicable, shall not entertain any request for clarifications from the Bidder, regarding such local conditions, post award of contract. It must be understood and agreed that such factors have properly been investigated and considered while submitting the Bid. No claim for financial adjustment to the contract awarded under this tender document will be entertained by TEDA as applicable. Neither any change in the time schedule of the contract nor any financial adjustments arising thereof shall be permitted by TEDA as applicable, which are based on the lack of such clear information or its effect on the cost of the works to the Contractor. The Contractor can take few visits to locations of different area to get acquainted with local conditions, if required. The costs of visiting the Site shall be at the Bidder’s own expense.
- 9.3.** The Bidder and any of its personnel or agents will be granted permission by TEDA 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 TEDA 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.

- 9.4.** 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.
- 9.5.** A prospective bidder requiring any clarification on the tender documents may notify TEDA in writing as specified in the "Section III Bidding Forms, Form PBQ: Queries to be raised by Bidder" and shall reach TEDA not later than seven (7) days before the specified Date and Time of pre-bid meeting as per the information provided in "Invitation for Bids (IFB)".
- 9.6.** Minutes of the pre-bid meeting, including the text of the questions asked by the Bidders, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Document in accordance with ITB §-8.3. Any modification to the Bidding Document that may become necessary as a result of the pre-bid meeting shall be made by TEDA exclusively through the issue of an addendum pursuant to ITB §-10 and not through the minutes of the pre-bid meeting. Non attendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.
- 9.7.** The Bidders may suggest amendments to the tender in writing, through a letter or by email to reach TEDA at the address, date and time mentioned in Bid information sheet.
- 9.8.** TEDA is not under any obligation to entertain/respond to suggestions made or to incorporate modifications sought for. TEDA would prepare and upload the corrigendum and final tender document based on modifications (if any).
- 9.9.** TEDA will not enter into any correspondence with the Bidders, except to furnish clarifications on tender documents, if necessary.

10. Amendment of Bidding Document

- 10.1.** At any time prior to the Bid Due Date and Time, TEDA may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the tender document by issuing clarification(s) and/or amendment(s)/Corrigendum/Addenda.
- 10.2.** Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document from TEDA in accordance with ITB §-8.3. TEDA shall also promptly publish the addendum on TEDA's web page in accordance with ITB §-9.1.
- 10.3.** TEDA will not bear any responsibility or liability arising out of non-receipt of the information regarding tender amendments in time or otherwise. Bidders must check TEDA website for any such amendment before submitting their Bid.
- 10.4.** To give the Bidders reasonable time in which to take an addendum into account in preparing their Bids, TEDA may extend the deadline for the submission of Bids,

pursuant to ITB §-24.2.

- 10.5.** Any change in date of submission and opening of bids shall be made available in Tamil Nadu Energy Development Agency's website www.teda.in and Government of Tamil Nadu's website www.tntenders.gov.in.
- 10.6.** In case an amendment is notified after submission of the Bid and prior to the opening of the Eligibility Bids, Bids received by TEDA shall be returned to the concerned Bidders on their request through registered post or courier and it will be for the Bidders to submit fresh Bids on or before the date notified by TEDA for the purpose.

D. Preparation of Bids

11. Cost of Bidding

- 11.1.** The Bidder shall bear all costs associated with the preparation and submission of its Bid, and TEDA shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process. The Bidder shall not be entitled to claim any costs, charges and expenses of and incidental to or incurred by him through or in connection with his submission of the Bid even though TEDA may elect to modify/withdraw the invitation of Bid.

12. Language

- 12.1.** All documents, drawings, instructions, design data, calculations, operation, maintenance and safety manuals, reports, labels and any other documents or data shall be in the **English** language. The Contract Agreement and all correspondence between TEDA and the Bidder/Contractor shall also be in the English language.

13. Documents Comprising the Bid

- 13.1.** The identification of this bidding process is: "**Single-Stage: Two-Envelope**". The Bid shall comprise two (2) envelopes submitted simultaneously, one called the **Technical Bid** containing the documents listed in ITB §-13.2 and the other one called the **Price Bid** containing the documents listed in ITB §-13.3 and soft copies of both the envelopes shall be uploaded at the e-Procurement portal at www.tntenders.gov.in as per provisions therein.
- 13.2.** The **first envelope** marked with **Technical Bid** should contain the following
- i. **Letter of Bid** in accordance with ITB §-14.1;
 - ii. **Cost of tender document** as mentioned in "IFB - Bid Information Sheet".
 - iii. **Tender Processing Fee** as mentioned in "IFB - Bid Information Sheet".
 - iv. **Bid security** as mentioned in "IFB - Bid Information Sheet".
 - v. **Power of Attorney**, authorizing the signatory of the Bids to commit the Bidder, in accordance with ITB §-22.2.
 - vi. **Technical Proposal** in accordance with ITB §-18.1;

- vii. **Documentary evidence** in accordance with ITB §-18.2 establishing that the Plant and Installation Services offered by the Bidder conform to the Bidding Document
 - viii. **documentary evidence** in accordance with ITB §-19 establishing the Bidder's eligibility and qualifications to perform the Contract if its Bid is accepted.
 - a. Bidder information Form
 - b. Form CON-1: Historical Contract Non-Performance
 - c. Form CON-2: Undertaking for No Blacklisting & No Banning
 - d. Form FIN -1: Historical Financial Performance
 - e. Form FIN -2: Average Annual Turnover
 - f. Form FIN -3: Financial Resources
 - g. Form FIN - 4: Certificate from Banker
 - h. Form EXP -1: General Experience
 - i. Form EXP -2: Specific Experience
 - j. Type Test Certificates in accordance with EQC §-2.5.2 (2).
 - ix. **Declaration of material offered** as per "Section III, Bidding Forms, Form MAS: Details of Materials and Services to be Offered".
 - x. **Declaration for using same Make of Equipments as per the Type Test Certificate** as per "Section III, Bidding forms, Form MOE: Declaration for using same Make of Equipments as per the Type Test Certificate"
 - xi. **Declaration by the Bidder regarding Omissions/Inconsistencies/Reservations** as per "Section III, Bidding Forms, Form OIR: Declaration Regarding No Omissions or Inconsistencies or Reservations".
 - xii. **Declaration by the Bidder regarding Deviations from Technical Requirements** as per "Section III, Bidding Forms, Form DTR: Schedule of Deviations from Technical Requirements".
 - xiii. **Declaration by the Bidder regarding Deviations from Commercial Requirements** as per "Section III, Bidding Forms, Form DCR: Schedule of Deviations from Commercial Requirements".
 - xiv. **Checklist for Bank Guarantee Verification** as per "Section III, Bidding Forms, Checklist for Bank Guarantee Verification".
- 13.3.** The **Second envelope** marked with **Price Bid** shall comprise the following:
- i. **Letter of Price Bid**, in accordance with ITB §-14.1;
 - ii. **Completed Price Schedules** in accordance with ITB §-16, including

completed Price Schedules but excluding any Schedule required in ITB §-13.2;

13.4. On each envelope the Bid Reference Number, Bid Due Date and Time shall also be mentioned.

13.5. The outer main envelope containing the above two envelopes "Technical Bid" and "Price Bid" shall bear the following identification:

"Bid Identification No. REF: 00007 / TEDA / CAPEX / 2024, Dated 12.01.2024 (Due date of opening:12.03.2024) for Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model"

 **Important**

The words "DO NOT OPEN BEFORE 12.03.2024 (date of Bid opening) should also appear on it."

13.6. If the outer envelope is not sealed, not marked as indicated above and not as per the instructions available at www.tntenders.gov.in, TEDA will assume no responsibility for the Bid's misplacement or premature opening.

13.7. Strict adherence to the formats wherever specified, is required. Wherever, information has been sought in specified formats, the Bidder shall refrain from referring to brochures/pamphlets. Non-adherence to formats and/or submission of incomplete information may be a ground for declaring the Bid as non-responsive. Each format has to be duly signed and stamped by the authorized signatory of the Bidder.

13.8. The **offline** documents of the bid shall comprise of following documents to be submitted in sealed envelope, as part of First Envelope.

"Bid Identification No. REF: 00007 / TEDA / CAPEX / 2024, Dated 12.01.2024 (Due date of opening:12.03.2024) for Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model"

- i. Letter of Bid in accordance with ITB §-14.1;
- ii. Tender Processing Fee as mentioned in "IFB - Bid Information Sheet".
- iii. Cost of tender document as mentioned in "IFB - Bid Information Sheet".
- iv. Original Bid security as mentioned in "IFB - Bid Information Sheet".
- v. Power of Attorney, authorizing the signatory of the Bids to commit the Bidder, in accordance with ITB §-22.2.

- vi. Copy of Board Resolution
- vii. The Pass-Phrase to decrypt the relevant Bid-Parts (for both Techno-Commercial and Financial) in separate sealed envelopes before the start date and time of the Tender Opening Event (TOE)
- viii. Original copy of the Consortium Agreement, If any

The envelope shall bear the following identification.

"Bid Identification No. REF: 00007 / TEDA / CAPEX / 20MW / 2024, Dated 12.01.2024 (Due date of opening:12.03.2024) for Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model"

Important

Bidder shall also upload the scanned copies of all the above-mentioned original documents during online Bid Submission as a part of First envelope.

"Bidder should explicitly note that no offline documents are to be submitted as a part of Second envelope".

14. Letters of Bid and Schedules

- 14.1. The Bidder shall complete the Letter of Bid and Letter of Price Bid and the Schedules, including the Price Schedules, using the relevant forms furnished in Section III, Bidding Forms. The forms must be completed as instructed in each form. The forms must be completed without any alterations to the text, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested

15. Alternatives to the Bid Requirement and Alternative Bids

- 15.1. Alternative bids shall not be considered at all.

16. Bid Prices and Discounts

- 16.1. The prices and discounts (including any price reduction) quoted by the Bidder in the Letter of Price Bid and in the Price Schedule shall conform to the requirements specified below.
- 16.2. Bidders shall quote for the entire Plant and Installation Services on a "**single responsibility**" basis such that the total Bid Price covers all the Contractor's obligations mentioned in or to be reasonably inferred from the Bidding Document in respect of the design, 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; the operation, maintenance and training services and such other items and services as may be specified in the Bidding Document, all in accordance with the requirements of the General Conditions of Contract.

The bidder shall quote for all the capacity ranges as categorized in ER §-3.2 and bidders shall not be permitted to quote categories (capacity ranges) selectively. In the event of price bid furnished with the offer being found to be not quoted for all the capacity ranges as stated above, the bid will be summarily rejected.

Items against which no price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed to be covered by the prices for other items.

For the purpose of evaluation, any item against which no price is entered by the Bidder shall be assumed to be not included in the Bid. However provided that the Bid is determined to be substantially responsive notwithstanding this omission, the average price of the item quoted by the substantially responsive Bidders will be added to the Bid Price and the total cost of the Bid so determined will be used for price

- 16.3.** The Bidder shall give a breakdown of the prices in the manner and detail called for in the Price Schedules included in Section III, Bidding Forms.
- 16.4.** Bidders are required to quote the price for the commercial, contractual and technical obligations outlined in the Bidding Documents.
- 16.5.** Bidder shall quote for all the items of Price Schedule after careful analysis of cost involved for the performance of the completed item considering all parts of the Tender Document. In case any activity though specifically not covered in description of item under Price Schedule but is required to complete the works as per Specifications, Scope of Work/Service, Standards, General Conditions of Contract, or any other part of Bidding Document, the prices quoted shall be deemed to be inclusive of cost incurred for such activity.
- 16.6.** The Bidder shall quote the prices in 'figures' and words. There should not be any discrepancy between the prices indicated in figures and the price indicated in words. In case of any discrepancy, the same shall be dealt as per ITB §-35.
- 16.7.** The price to be quoted in the Letter of Price Bid, in accordance with ITB §-16.1, shall be the total price of the Bid, excluding any discounts offered. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the Bid.
- 16.8.** The Bidder shall quote any discounts and indicate the methodology for their application in the Letter of Bid in accordance with ITB §-16.1.
- 16.9.** Prices quoted by the Bidder shall remain FIRM and 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.
- 16.10.** The quoted prices by Bidders shall be inclusive of packing and forwarding charges. The stores shall be strongly and adequately packed to ensure safe arrival at destination. All packing must be clearly marked with order Number and consignee's name and address.

- 16.11.** Total capacity offered under this tender is as per IFB §-6.5. The Bidders have to submit their proposals for entire capacity accordingly. Bid for partial capacity will not be considered.
- 16.12.** All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the Base Date, shall be included in the rates and prices and the total Bid Price submitted by the Bidder. The prices quoted by the Bidders should indicate clearly the Goods & Service Tax (GST) components as also mentioned under the Price Schedule.
- 16.13.** If any tax exemptions or concessions are available, the successful bidder shall obtain such benefits directly. TEDA in no case will be responsible for providing any tax exemptions to the Bidder.

 **Important Note**

Bidders are directed that price offer shall be furnished only in envelope marked with "Price Bid". If price offer is found submitted in the envelope marked "Technical bid", such bids will be rejected in technical bid evaluation stage and will not be considered for further process to conclude the bid.

17. Currencies of Bid and Payment

- 17.1.** Prices shall be quoted in Indian Rupees (INR ₹) only.

18. Technical Proposal and Subcontractors

- 18.1.** The Bidder shall furnish as part of the Technical Bid, a **Technical Proposal**, including a design methodology, statement of work methods, equipment, personnel, schedule, safety plan, and any other information as stipulated in Section III, Bidding Forms in sufficient detail to demonstrate substantial responsiveness of the Bidder's proposal to meet TEDA's Requirements and the completion time.
- 18.2.** The documentary evidence of the conformity of the Plant and Installation Services with the Bidding Document may be in the form of literature, drawings and data, and shall include:
- i. a detailed description of the essential technical and performance characteristics of the Plant and Installation Services, including the functional guarantees of the proposed Plant and Installation Services, in response to TEDA's Requirements. The functional guarantees of the proposed Plant and Installation Services shall be as stated in the applicable forms in Section III, Bidding Forms;
 - ii. a list giving full particulars, including available sources, of all spare parts (i.e. Mandatory Spare Parts and Recommended Spare Parts (if required)), special tools, etc., necessary for the proper and continuing functioning of the plant for the period specified in the Bid Document, after the Operational Acceptance of the Facilities in accordance with the provisions of the Contract; and
 - iii. adequate evidence demonstrating the substantial responsiveness of the Plant and Installation Services to the Employer's Requirements. The Bidder shall

note that standards for workmanship, materials and equipment designated by the Employer in the Bidding Document are intended to be descriptive (establishing standards of quality and performance) only and not restrictive. The Bidder may substitute alternative standards, brand names and/or catalogue numbers in its Technical Proposal, provided that it demonstrates to TEDA's satisfaction that the substitutions are substantially equivalent or superior to the standards designated in TEDA's Requirements.

19. Documents Establishing Eligibility and Qualifications of the Bidder

- 19.1.** To establish its eligibility and qualifications to perform the Contract in accordance with Section II, Evaluation and Qualification Criteria, the Bidder shall provide the information requested in the corresponding information sheets included in Section III, Bidding Forms.

The aforementioned Evaluation and Qualification Criteria contains, among other things, the requirements as to eligibility specified in ITB §-7.

20. Period of Validity of Bids

- 20.1.** The bid validity period shall be one hundred and eighty (180) days from the date of opening of bid as prescribed by TEDA in accordance with ITB §-24.1 with the Bidder having no right to withdraw, revoke or cancel his Bid or unilaterally vary the Bid submitted or any terms thereof. A Bid valid for a shorter period shall be rejected by the Employer as non-responsive.
- 20.2.** In exceptional circumstances, prior to the expiration of the Bid validity period, TEDA may request the Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. The Bid Security shall also be extended for thirty (30) days beyond the deadline of the extended validity 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.
- 20.3.** In case of the Bidder revoking or canceling his Bid or varying any term and conditions in regard thereof or not accepting to enter into a Contract Agreement, TEDA shall forfeit the EMD furnished by him. Confirmation regarding the Bid validity shall be clearly mentioned in the Letter of the Bid.

21. Bid Security

- 21.1.** The Bidder shall furnish an interest free Bid Security/Earnest Money Deposit (EMD) of amount as specified in the Bid Information Sheet, IFB §-6.7.
- 21.2.** The EMD shall be denominated in Indian Rupees and shall, at the Bidder's option, be in the form of a demand draft or a bank guarantee from any of the nationalized/scheduled banks operating in India In favour of "Tamil Nadu Energy Development Agency", payable at Chennai.

The initial validity of the Bid Security shall be for a period of validity of bids in accordance with ITB §-20.1 with additional claim period of 30 days from the Bid Due Date, which may be extended by the Bidder as provided for in ITB §-20.2.

- 21.3.** Any Bid not accompanied by a substantially responsive Bid Security shall be rejected by TEDA as non-responsive.

- 21.4.** The Bid Security of all Bidders who have been rejected on the grounds of their Technical Bids being substantially non-responsive to the requirements of the Bidding Document, shall be returned as promptly as possible upon TEDA's notification of such rejection pursuant to ITB §-27.10.

The Bid Security of all unsuccessful Bidders (other than those referred in the above paragraph) shall be returned as promptly as possible upon the successful Bidder's signing the Contract and furnishing the Performance Security pursuant to ITB §-43.

- 21.5.** 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.

- 21.6.** The Bank Guarantee (BG) for bid security shall be executed on Non-Judicial Stamp Paper worth 0.25% of BG value or Rs. 25,000/- whichever is lower.

- 21.7.** Government undertakings, Public Sector Undertakings (PSU) are exempted for Bid Security deposition on producing certificate issued by competent authority in Hard Copy in Envelope-1 - Technical Bid.

- 21.8.** In accordance with Rule 14(1) of The Tamil Nadu Transparency in Tenders Rules, 2000, all category of bidders specifically exempted from the payment of EMD will not be required to make such a deposit, instead, bidders shall sign a "Bid Security Declaration" as per Form BSD: Bid Security Declaration, under section III – Bidding Forms, accepting that if they withdraw or modify their Bids during the period of validity, or if they are empanelled and they fail to submit a Performance Bank Guarantee before the deadline defined in the tender document, they will be suspended for a period of five (5) years from being eligible to submit Bids/Proposals for contracts with TEDA.

- 21.9. Forfeiture of Bid Security:** The Bid Security taken from the Bidder shall be forfeited in the following cases:-

- i.** If the Bidder modifies/withdraws its Bid except as per the provisions specified in this tender document;
- ii.** If the Bidder withdraws its Bid before the expiry of the Bid validity period;
- iii.** If the successful Bidder does not accept the Letter of Intent unconditionally within three (3) days of issue of Letter of Intent or the period as extended by TEDA.
- iv.** If the successful bidder fails to provide the Performance Security to TEDA and execute the Contract within the stipulated time or any extension thereof provided by TEDA;
- v.** If any information or document furnished by the Bidder turns out to be misleading or untrue in any material respect.
- vi.** If the Bidder violates any of the provisions of the regulations contained herein.
- vii.** If the Bidder revises any of the terms quoted during the validity period;

- viii. In the event of a bidder not responding to further negotiations as required for selection of Contractor, TEDA reserves the right to forfeit the Bid Security Deposit amount furnished by such Bidders.
 - ix. in the event of documents furnished with the offer being found to be bogus or documents contain false particulars.
- 21.10.** Bid Security of a bidder lying with TEDA in respect of other bids awaiting decision will not be adjusted towards bid security for the fresh bids. The bid security money originally deposited may, however, would be taken into consideration in case bids are re-invited.

22. Format and Signing of Bid

- 22.1.** The Bidder shall prepare one (1) Technical Bid and one (1) Price Bid comprising the documents as described in ITB §-13 and clearly mark them “TECHNICAL BID” and “PRICE BID”, as appropriate.
- 22.2.** The Bid, bidding forms/templates/annexure etc., wherever applicable, shall be typed or written in indelible ink and all the pages shall be signed by a person duly authorized by Bidder to sign, in token of acceptance of all the terms and conditions of the tender document. This authorization shall consist of a written confirmation in the form of **Power of Attorney** as specified in the bidding document and shall be included in Technical Bid.
- 22.3.** Any inter-lineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Bid.
- 22.4.** The Bidder shall clearly mark “**CONFIDENTIAL**” any information which they regard as confidential to their business. Such information may include proprietary information, trade secrets, or commercial or financially sensitive information.
- 22.5.** All pages of the tender document shall be numbered sequentially.

E. Submission and Opening of Bids

23. Sealing and Marking of Bid

- 23.1.** The Bidder shall submit:
- i. the Technical Bid, duly named as Envelope-1 - TECHNICAL BID, all documents comprising the Technical Bid, as described in ITB §-13.2;
 - ii. the Price Bid, duly named as Envelope-2 - PRICE BID, all documents comprising the Price Bid, as described in ITB §-13.3;

These envelopes shall be submitted online at www.tntenders.gov.in in accordance with ITB §-46 through ITB §-51 under Special Instructions To Bidders For E-Tendering. Detailed instructions for online submission of bid documents are available in the User Manual at www.tntenders.gov.in.

- 23.2.** The envelopes shall be

- i. clearly marked with the name and address of the Bidder;
 - ii. submitted online at www.tntenders.gov.in in accordance with ITB §-24.1; and
 - iii. On each envelope the Bid Reference Number, Bid Due Date and Time shall also be mentioned.
- 23.3.** The envelopes containing the Technical Bid shall be clearly marked with a warning "NOT TO BE OPENED BEFORE THE TIME AND DATE FOR THE OPENING OF TECHNICAL BID", in accordance with ITB §-27.1.
- 23.4.** The envelopes containing the Price Bid shall be clearly marked with a warning "NOT TO BE OPENED UNTIL ADVISED BY TEDA".
- 23.5.** If any one or more of the envelopes is/are not prepared/signed/closed/sealed and not super scribed/labelled as per the specified requirements, TEDA will assume no responsibility for the Bid's misplacement or premature opening of the Bid.
- 23.6.** Bids submitted by telegram/fax/e-mail shall not be considered under any circumstances. TEDA shall not be responsible if the bid could not be submitted online on the portal for whatsoever reason. Any Bid or part thereof received after the Bid Due Date and Time shall not be considered under any circumstances.
- 23.7.** It should be noted that except in Envelope-2 ("Price Bid"), no other envelope shall contain any information/document relating to the Price Bid. TEDA shall not be responsible for premature opening of the Price Bids in case of non-compliance of the above.
- 23.8.** All pages of the Bid, except for the EMD, and any other document executed on non-judicial stamp paper, forming part of the Bid and corrections in the Bid, if any, must be signed by the authorized signatory on behalf of the Bidder. It is clarified that the same authorized signatory shall sign all pages of the Bid. However, any published document submitted with the Bid shall be signed by the authorized signatory at least on the first and last page of such document Bidders shall submit the Bid in original, duly signed by their authorized signatory of the Bidder. No change or supplementary information to a Bid will be accepted after the Bid Due Date and Time, unless the same is requested for by TEDA.
- 23.9.** If necessary, additional papers may be attached by the Bidder to furnish/submit the required information.
- 23.10.** Any term/condition proposed by the Bidder in his Bid which is not in accordance with the terms and conditions of the tender document or any financial conditions, payment terms etc. mentioned in the Price Bid shall be considered as a conditional Bid and will make the Bid invalid.
- 23.11.** Offline documents (Specific documents only) as mentioned in ITB §-13.8 of the Tender document shall be submitted in a Sealed Covering Envelope. The Covering Envelope shall have the following Sticker
- "Bid Identification No. REF: 00007 / TEDA / CAPEX / 20MW / 2024, Dated 12.01.2024 (Due date of opening:12.03.2024) for Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance

of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model”

24. Deadline for Submission of Bids

- 24.1.** Bids must be received by TEDA at the address specified in the Bid Information Sheet, IFB §-6.12 and no later than the date and time specified in the Bid Information Sheet.
- 24.2.** TEDA may, at its discretion, extend the deadline for the submission of Bids by amending the Bidding Document in accordance with ITB §-10, in which case all rights and obligations of the Employer and the Bidders subject to the previous deadline shall thereafter be subject to the deadline as extended.
- 24.3.** Normally, the date of submission and opening of bids would not be extended. However, in exceptional circumstances or when the tender document is required to be substantially modified as a result of discussions in pre-bid meeting and the time with the prospective bidders for preparation of bids appears insufficient, the date may be extended by TEDA, which shall be informed on the websites www.teda.in and www.tntenders.gov.in. In such cases, it would be ensured that after issue of corrigendum, reasonable time is available to the Bidders to prepare and submit their bids. Any change in date of submission and opening of bids would also be placed on the websites www.teda.in and www.tntenders.gov.in. However, if the modifications in tender document, specifications of goods and service are substantial, fresh publication of original tender document may also be issued.

25. Late Bids

- 25.1.** TEDA shall not consider any Bid that arrives after the deadline for submission of Bids, in accordance with ITB §-24. Any Bid received online by the Employer after the deadline for submission of Bids shall be declared late, rejected, and returned unopened to the Bidder.

26. Withdrawal, Substitution, and Modification of Bids

- 26.1.** The bidders can resubmit the bid as many times as possible till the closing time of the bid submission.
- 26.2.** In case a bidder intends to modify his bid online before the deadline, the bidder need not make any additional payment towards the cost of bid processing. For bid modification and consequential re-submission, the bidder is not required to withdraw his bid submitted earlier. Modification and consequential re-submission of bids is allowed any number of times. The last modified bid submitted by the bidder within the bid submission time shall be considered as the bid.
- 26.3.** The bidders can also withdraw the bid before the closing time of the bid submission. The bidder may withdraw his bid by uploading his request before the deadline for submission of bids, however, if the bid is withdrawn, the re-submission of the bid is not allowed.
- 26.4.** For this purpose, modification/withdrawal by other means will not be accepted.

- 26.5.** 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 Letters of Technical Bid and Price Bid or any extension thereof

27. Bid Opening

- 27.1.** Except in the cases specified in ITB §-25 and ITB §-26, TEDA shall electronically open the Bids in public and read out in accordance with ITB §-27.2 and ITB §-27.3 all Technical Bids received by the deadline, at the date, time and place specified in IFB - Bid Information Sheet, in the presence of the Bidders' designated representatives and anyone who choose to attend. The Price Bids will remain unopened and will be opened at the time to be specified in accordance with ITB §-27.7.
- 27.2.** First of all Envelope-1 ("Technical Bid") furnished by bidder shall be electronically opened and documents submitted against cost of tender document, tender processing charges Bid Security, Technical Proposals and Techno-commercial Deviations shall be read out as per the requirement of tender conditions.
- 27.3.** Only Technical Bids read out at the opening of Technical Bids shall be considered for evaluation. The Employer shall neither discuss the merits of any Bid nor reject any Bid (except for late Bids, in accordance with ITB §-27.1).
- 27.4.** TEDA shall prepare a record of the opening of Technical Bid and Technical Bids that shall include, as a minimum:
- i.** the name of the Bidder;
 - ii.** the presence or absence of a Bid Security.
 - iii.** schedule of Deviations from Technical Requirements
 - iv.** Schedule of Deviations from Commercial Requirements
 - v.** any other details as TEDA may consider appropriate.
- 27.5.** The Bidders' representatives who are present shall be requested to sign the record evidencing their attendance. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record.
- 27.6.** At the end of the evaluation of the Technical Bids, TEDA will invite the Bidders who have submitted substantially responsive Technical Bids and who have been determined as being qualified for award to attend the opening of the Price Bids. The date, time, and location of the opening of Price Bids will be advised in writing by TEDA. The opening date should allow the Bidders sufficient time to make arrangements for attending the opening of Price Bids.
- 27.7.** All envelopes containing Price Bids shall be opened one at a time, reading out:
- i.** the name of the Bidder;
 - ii.** the total Bid Price including any discount; and

- iii. any other details as TEDA may consider appropriate.

Only Price Bids and Price Bid discounts read out and recorded at the opening of Price Bid shall be considered for evaluation. The Employer shall neither discuss the merit of any Price Bid nor reject any Price Bid at the Price Bid opening.

- 27.8.** TEDA shall prepare a record of the opening of Price Bids that shall include, as a minimum:
- i. the name of the Bidder, and
 - ii. the total Bid Price including any discount;
- 27.9.** The Bidders' representatives who are present shall be requested to sign the record evidencing their attendance. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record.
- 27.10.** The Employer will notify, in writing, the Bidders who have been rejected on the grounds of their Technical Bids being substantially non-responsive to the requirements of the Bidding Document and/or who have been determined as being disqualified for award, and return their Price Bids unopened, together with the Bid Security.

F. Evaluation and Comparison of Bids

28. Confidentiality

- 28.1.** Information relating to the evaluation of Bids and recommendation of Contract award shall not be disclosed to the Bidders or any other persons not officially concerned with the bidding process until information on Contract award is communicated to all Bidders in accordance with ITB §-42.

The use by any Bidder of confidential information related to this bidding process may result in the rejection of its Bid

- 28.2.** Any attempt by a Bidder to influence the Employer in the evaluation of the Bids or Contract award decisions may result in the rejection of its Bid.
- 28.3.** Notwithstanding ITB §-28.2, 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 shall do so in writing.

29. Clarification of Bids

- 29.1.** To assist in the examination, evaluation, and comparison of the Technical and Price Bids, and qualification of the Bidders, the Employer may, at its discretion, ask any Bidder for a clarification of its Bid, giving a reasonable time for a response. Any clarification submitted by a Bidder that is not in response to a request by TEDA shall not be considered. The Employer's request for clarification and the response shall be in writing. No change in the substance of the Technical Bid or prices in the Price Bid, including any voluntary increase or decrease in the prices, shall be sought, offered, or permitted, except to confirm the correction of arithmetical errors

discovered by TEDA in the evaluation of the Price Bids, in accordance with ITB §-35.

- 29.2.** No substantive change to qualification information or to a submission, including changes aimed at making an unqualified bidder, qualified or an unresponsive submission, responsive shall be sought, offered or permitted.
- 29.3.** All communications generated under this rule shall be included in the record of the procurement proceedings.
- 29.4.** If a Bidder does not provide clarifications of its Bid by the date and time set in the Employer's request for clarification, its Bid may be rejected.

30. Deviations, Reservations and Omissions

- 30.1.** During the evaluation of Bids, the following definitions apply:
 - i.** **“Deviation”** is a departure from the requirements specified in the Bidding Document;
 - ii.** **“Reservation”** is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and
 - iii.** **“Omission”** is the failure to submit part or all of the information or documentation required in the Bidding Document.

31. Preliminary Examination of Technical Bids

- 31.1.** The Employer shall examine Technical Bids to confirm that all documents and information requested in ITB §-13.2 and ITB §-13.3 have been provided, and to determine the completeness of each document submitted.
- 31.2.** The Employer shall confirm that the following documents and information have been provided in the Technical Bid. If any of these documents or information is missing, the Bid shall be rejected.
 - i.** Letter of Bid;
 - ii.** Power of Attorney to commit the Bidder;
 - iii.** Bid Security;
 - iv.** Tender Processing Fee; and
 - v.** Technical Proposal in accordance with ITB §-18.1.
 - vi.** Documentary evidence in accordance with ITB §-18.2 establishing that the Plant and Installation Services offered by the Bidder conform to the Bidding Document
 - vii.** documentary evidence in accordance with ITB §-19 establishing the Bidder's eligibility and qualifications to perform the Contract if its Bid is accepted.

32. Qualification of Bidders

- 32.1.** The Bidder shall substantially meet or exceed the specified qualification requirements. The Employer shall determine to its satisfaction whether the Bidders meet the qualification criteria specified in Section II, Evaluation and Qualification Criteria, during the evaluation of Technical Bids.
- 32.2.** The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB §-19. For the purposes of this determination, only the qualification of the legal entity(ies) comprising the Bidder shall be considered. In particular, the qualifications of affiliated entities (such as the parent company(ies), group companies, subsidiaries or other affiliates) shall not be considered.
- 32.3.** The Employer reserves the right to waiver minor (nonmaterial) deviations in the qualification criteria if they do not materially affect the technical capability and financial resources of the Bidder to perform the contract.
- 32.4.** An affirmative determination shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the Bid.

If the assessment of the Bidder's qualification was conducted only for the lowest evaluated Bidder, in accordance with ITB §-32.1, and the result of such assessment is negative, the Employer shall proceed to the next lowest evaluated Bid to make a similar determination.

33. Determination of Responsiveness of Technical Bids

- 33.1.** The Employer's determination of a Technical Bid's responsiveness is to be based on the contents of the Technical Bid itself, as defined in ITB §-13.2.
- 33.2.** For the purposes of this determination, a substantially responsive Technical 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,
- i.** if accepted, would
 - a.** affect in any substantial way the scope, quality, or performance of the Plant and Installation Services specified in the Contract; or
 - b.** limit in any substantial way, inconsistent with the Bidding Document, the Employer's rights or the Bidder's obligations under the proposed Contract; or
 - ii.** if rectified, would unfairly affect the competitive position of the other Bidders presenting substantially responsive Bids
- 33.3.** The Employer shall examine Technical Bid submitted in accordance with ITB §-18 and Section II, Evaluation and Qualification Criteria, in particular, to confirm that all requirements of Section IV, Employer's Requirements have been met without any material deviation, reservation or omission. The Recommended Spare Parts, if any, proposed by the Bidder shall not be subject to evaluation.

- 33.4.** If a Technical Bid is not substantially responsive to the requirements of the Bidding Document, it shall be rejected by the Employer and shall not subsequently be made responsive by correction of the material deviation, reservation, or omission.
- 33.5.** Bids shall be considered non-responsive and are liable for disqualification/rejection for the following indicative list of reasons:
- i.** Bid is not received by the due date & time and Bids is not accompanied with the required documents and schedules.
 - ii.** Bid not submitted in accordance with tender document.
 - iii.** Bid do not meet the minimum eligibility criteria as mentioned in the bidding document.
 - iv.** Bids is not accompanied by Bid Security/Cost of tender document/tender processing fees.
 - v.** Conditional Bid submitted.
 - vi.** Proposal is not valid for at least six (6) months from the date of opening of online Technical Bid.
 - vii.** During validity of the Bid or its extended period, if any, Bidder increases his quoted prices.
 - viii.** Desired certificates in the required in the tender document not attached by the bidder.
 - ix.** Prices not quoted in prescribed Proforma/schedule.
 - x.** Bidder has made misleading or false representations in the forms, statements and attachments submitted in proof of the eligibility requirements.
 - xi.** Bidder is found to have a record of poor performance such as abandoning work, not properly completing the contract, inordinately delaying completion, being involved in major litigation or financial failures, etc.
 - xii.** Bidder failed to provide clarifications related thereto, when sought.
 - xiii.** Bidder has submitted more than one bid. This will cause disqualification of all Bids submitted by such Bidders including forfeiture of the Bid Security.
 - xiv.** Bidder who is found to canvass, influence or attempt to influence in any manner for the qualification or selection process, including without limitation, by offering bribes or other illegal gratification shall be disqualified from the process at any stage.
 - xv.** Bid is not meeting any other pre-requisite as spelt out elsewhere in this document.
 - xvi.** Bidders who stand deregistered/banned/blacklisted by any Government Authorities.

xvii. Bidder has not quoted for the entire tendered quantity and for all the tendered categories.

33.6. The eligible Bidders whose bid is determined to be substantially responsive shall be considered to be qualified in the technical evaluation, unless disqualified pursuant to ITB §-33.5 above in this Section, and shall be informed in writing about the date, time and place of opening of their financial bids.

33.7. The Envelope-2 – Price Bid shall be kept unopened and shall be opened later on the date and time intimated to the bidders who qualify in the evaluation of technical bids.

33.8. The Bidders who could not qualify in technical evaluation will not be informed about this fact. Their financial bid will be remain unopened and Bid Security refunded after completion of the bid process as mentioned in tender document.

34. Non-material Non-conformities in Bids

34.1. Provided that a Technical Bid is substantially responsive, the Employer may waive any non-conformities (deviation, reservation or omission) in the Technical Bid

34.2. Provided that a Technical 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 non-conformities in the Technical Bid related to documentation requirements. Requesting information or documentation on such non-conformities shall not be related to any aspect of the Price Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.

34.3. Provided that a Bid is substantially responsive, the Employer shall rectify quantifiable non-material non-conformities 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. Adjustment to the rates and prices of the Price Schedule shall be made in accordance with ITB §-16.2

35. Correction of Arithmetic Errors

35.1. Provided that the bid is substantially responsive, the Employer shall correct arithmetical errors on the following basis:

- i. if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity (months, number of consultants, etc.), the unit price shall prevail and the total price shall be corrected, unless in the opinion of the tendering authority there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected;
- ii. if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
- iii. where there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetical error, in which case the amount in figures shall prevail subject to

(i), (ii) above.

- iv. where there are errors between the total of the amounts given under the column for the price breakdown and the amount given under the Total Price, the total of the amounts given under the column for the price breakdown shall prevail and the amount given under the Total Price will be corrected;

35.2. The Bidder shall be requested to accept correction of arithmetical errors. Failure to accept the correction, in accordance with ITB §-35.1, shall result in the rejection of the Bid.

36. Conversion to Single Currency

36.1. Prices shall be quoted in Indian Rupees (INR ₹) only. If prices are quoted in other than Indian Rupees (₹), the Bid shall not be converted into Indian Rupees (₹) and the Bid shall be rejected by TEDA.

37. Evaluation of Price Bids

37.1. To evaluate a Price Bid, the TEDA shall consider the following:

- i. the Bid Price, excluding the Specified Provisional Sums and the contingency allowance, if any in the Grand Summary of the Price Schedules;
- ii. price adjustment for correction of arithmetical errors in accordance with ITB §-35.1;
- iii. price adjustment due to discounts offered in accordance with ITB §-16.8;
- iv. all costs and all taxes and duties applicable to the bidder as per law of the Central/State Government/Local Authorities.
- v. the additional evaluation factors specified in Section III, Evaluation and Qualification Criteria;
- vi. price adjustment due to quantifiable non-material non-conformities in accordance with ITB §-34.3; and
- vii. converting the amount resulting from applying (i) to (vi) above, if relevant, to a single currency in accordance with ITB §-36.

The price for the Recommended Spare Parts if any, stated in the Price Schedule shall not be subject to evaluation.

37.2. If it is found that the bidders have quoted various GST rates, TEDA will consider uniform GST as per GST Rules as applicable on basic rates offered by the bidders and L₁ rate will be evaluated.

37.3. The Price Bids having price INCLUSIVE OF GST and Cess is likely to be rejected if the rate of GST and Cess is not mentioned clearly unless the Contractor has opted for Composition Scheme under GST Act, which shall be clearly indicated in the price Bid. TEDA may at its discretion consider such offer with presumption of highest applicable rate of GST/Cess prevailing when the price quoted is inclusive of GST and Cess.

- 37.4.** TEDA will not be responsible for any erroneous calculation of tax rates or any subsequent changes in rates or structure of applicable taxes. All differences arising out as above shall be fully borne by the Successful Bidder(s).
- 37.5.** Under no circumstances shall a Bidder increase his/her quoted price or refuse to accept the allocated capacity during the validity period after Bid are opened. Any Bidder who does so resulting in recalling of Bid by TEDA or additional expenditure to TEDA shall not only lose his Performance Security but also run the risk of being Black listed by TEDA.
- 37.6.** In the event of price bid furnished with the offer being found to be not quoted for all the capacity ranges as stated above, the bid will be summarily rejected.

38. Comparison of Bids

- 38.1.** The Employer shall compare the evaluated prices of all substantially responsive Bids established in accordance with ITB §-37.1 to determine the lowest evaluated Bid.
- 38.2.** If the Bid, which results in the lowest evaluated Bid Price, is seriously unbalanced or front loaded in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analyses for any or all items of the Price Schedules, to demonstrate the internal consistency of those prices with the scope of Plant Design, Supply and Installations, proposed methodology, schedule and any other requirements of the Bidding Document. After evaluation of the price analyses, taking into consideration the terms of payments, the Employer may require that the amount of the Performance Security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract
- 38.3.** In the event of identification of a potentially abnormally low Bid, the Employer shall seek written clarifications from the Bidder, including detailed price analyses of its Bid price in relation to the subject matter of the contract, scope, proposed methodology, schedule, allocation of risks and responsibilities and any other requirements of the Bidding Document.

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.

For the purposes of this ITB §-38.3, 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 as to the capability of the Bidder to perform the Contract for the offered Bid Price.

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 the Bidders. In case of annulment, all Bids submitted and specifically, Bid Securities, shall be promptly returned to the Bidders

- 39.2.** TEDA reserves the right to interpret the Bid submitted by the Bidder in accordance with the provisions of the tender and make its own judgment regarding the interpretation of the same. In this regard TEDA shall have no liability towards any Bidder and no Bidder shall have any recourse to TEDA with respect to the selection process. TEDA shall evaluate the Bids with reference to the terms of this tender at its sole discretion. TEDA's decision in this regard shall be final and binding on the Bidders.
- 39.3.** TEDA reserves the right to vary, modify, revise, amend or change any of the terms and conditions of the tender. The decision regarding acceptance or rejection of Bids by TEDA will be final.

G. Award of Contract

40. Award Criteria/Process of Empanelment

- 40.1.** Subject to ITB §-39.1, TEDA shall form a panel with a size not more than fifteen (15) bidders whose Price Bids have been evaluated as per EQC §-1.7.
- 40.2.** Based on the sum of all inclusive price quoted by the bidders for all the capacity ranges, TEDA shall arrange the bids in the ascending order i.e. $L_1, L_2, L_3, \dots, L_n$ (L_1 being the lowest quote).
- 40.3.** $L_2, L_3, L_4, \dots, L_n$ bidders shall be given the option to match the “**Approved Rates**” for each category of capacity range discovered as per EQC §-1.7.3. In case the L_2 bidder does not agree to match the “**Approved Rate**” for each category of capacity range, within the time-frame prescribed by TEDA, then the opportunity shall be passed on to the next bidder, i.e. L_3 and so on. This process shall be continued till the panel size is complete.
- 40.4.** The bidder who fails to match the “**Approved Rates**” for each category of capacity range shall have the Bid Security/EMD refunded.
- 40.5.** TEDA reserves the right to release the allocated capacity in batches based on the number of roof-tops identified for the agencies empanelled and allotment of successive batches on further identification of roof-tops of buildings of Government offices.
- 40.6.** The lowest quoted bidder (L_1) would get two times the capacity allotted to a non- L_1 bidder in the panel. Further, in case of lesser number of projects (rooftops) is identified at the time of award of contract, the L_1 bidder would get initial work.

41. Right to Vary Capacities at the Time of Award or within the Validity of Tender

- 41.1.** At the time of award of the Contract or within the validity period, the Employer reserves the right to increase or decrease the quantity of originally specified, provided this does not exceed the percentages specified in the Tamil Nadu Transparency in Tender Rules, 2000, and without any change in the unit prices or other terms and conditions of the Bid and the Bidding Document.

42. Notification of Award

- 42.1.** Prior to the expiration of the period of Bid validity, the Employer shall notify the successful Bidders, in writing, that their Bids have been accepted. The notification letter (hereinafter and in the Conditions of Contract and Contract Forms called the "Letter of Acceptance (LOA)") shall specify the sum that the Employer will pay the Contractor in consideration of the execution and completion of the Plant and Installation Services (hereinafter and in the Conditions of Contract and Contract Forms called "the Contract Price").
- 42.2.** Until a formal Contract Agreement is prepared and executed, the Letter of Acceptance shall constitute a binding Contract.
- 42.3.** Each Successful Bidder shall acknowledge the LOA and return duplicate copy with signature of the authorized signatory of the Successful Bidder to TEDA within seven (7) days of issue of LOA.
- 42.4.** If the Successful Bidder, to whom the LOA has been issued does not fulfill any of the conditions specified in Bid document, then TEDA reserves the right to annul/cancel the award of the Letter of Acceptance of such Successful Bidder.

43. Signing of Contract

- 43.1.** Promptly upon notification, the Employer shall send the successful Bidder the Contract Agreement.
- 43.2.** Within fourteen (14) days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer.
- 43.3.** A work contract shall come into force from the date on which the Letter of Acceptance is dispatched to the successful bidder.
- 43.4.** If the bidder, whose bid has been accepted, fails to sign a written Contract or fails to furnish the required Performance Security within specified period, TEDA shall take action against the successful bidder as per the provisions of the Act and these rules. TEDA may, in such case, cancel the tender process or if it deems fit, offer for acceptance the rates of lowest or most advantageous bidder to the next lowest or most advantageous bidder, in accordance with the criteria and procedures set out in the tender documents.

44. Performance Security

- 44.1.** Within twenty-eight (28) days of the receipt of the Letter of Acceptance from the Employer, the successful Bidder shall furnish the Performance Security in accordance with the Conditions of Contract, subject to ITB §-38.2, using for that purpose the Performance Security Form included in Section VII, Contract Forms, or another form acceptable to the Employer. If the Performance Security furnished by the successful Bidder is in the form of a bond, it shall be issued by a bank that has been determined by the successful Bidder to be acceptable to TEDA.
- 44.2.** Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security. In that event TEDA may award the Contract to the next lowest evaluated Bidder whose Bid is substantially responsive and is determined by TEDA to be qualified to perform the Contract satisfactorily.

45. Notification to Unsuccessful Bidders and Debriefing

- 45.1.** As promptly as possible upon the successful Bidder's signing the Contract and furnishing the Performance Security pursuant to ITB §-44, the Employer shall notify all unsuccessful Bidders of the results of the bidding.
- 45.2.** After receipt of the Employer's notification pursuant to ITB §-45.1 above, the unsuccessful Bidders (including those rejected on the grounds of their Technical Bids not being substantially responsive) may request in writing to TEDA a debriefing seeking an explanation on the grounds on which their Bids were not selected. TEDA shall promptly respond in writing to any unsuccessful Bidder who requests a debriefing in accordance with this Clause.

H. Special Instructions To Bidders For E-Tendering**46. General****46.1. Submission of Online Bids is mandatory for this Tender.**

46.2. This section contains detailed instructions regarding bid submission procedure under e-tendering system (e-tender portal). Bidders are required to read the following instructions in addition to various instructions mentioned elsewhere in the bid document for e-tendering. The instructions mentioned herein related to bid submission procedure shall supersede and shall prevail over the conditions enumerated elsewhere in the bid/ tender document.

46.3. E-Tendering is a new methodology for conducting Public Procurement in a transparent and secured manner. Now, the Government of Tamil Nadu has made e-tendering mandatory. A portal built using Electronic Tender's software is also referred to as Electronic Tender System (ETS).

46.4. Bidders who wish to participate in e-tenders must go through the 'instructions in respect of e-Tendering essentially covering security settings required for bidder's Personal Computer (Desktop / Laptop), uploading and checking the status of digital signature in the bidder's Personal Computer (Desktop / Laptop), obtaining unique login ID and password, re-setting the password, downloading of Tender document and uploading of Offer / Bid etc.

47. About e-Tender Portal

47.1. Tamil Nadu Energy Development Agency (TEDA) has adopted a secured and user friendly e-tender system enabling bidders to Search, View, Download tender document(s) directly from the e-Procurement portal of the Government of Tamil Nadu. The Tamil Nadu e-Procurement Portal facilitates creation of Tenders, Publishing of Tenders, Online Bid Submission, Bid Opening of both Technical and Financial bids, Award of Contract details in a secured manner. and also enables the bidders to participate and submit online prices directly in the e-tender portal or uploading of Schedule of Rates / Price Schedule (Price Bid) in note and attachment folder, as applicable, and technical bids in secured and transparent manner maintaining absolute confidentiality and security throughout the tender evaluation process and award.

48. Pre-requisite for participation in bidding process

48.1. The following are the pre-requisite for participation in e-Tendering Process:

- 48.2. Personal Computer (Desktop / Laptop) with Windows OS, Internet Explorer:** Bidder must possess Computer System installed with Windows XP or higher Operating System with suitable antivirus in place. The OS should have the latest Service Pack. Internet Explorer 7.0 or higher / Mozilla Firefox 3.0 or higher for hassle free bidding. Bidder is essentially required to effect the security settings as defined in the portal.
- 48.3. Internet Broadband Connectivity:** The Bidder must have a high-speed internet connectivity (preferably Broadband) with internet explorer to access e-Tender Portal for downloading the Tender document and uploading/ submitting the Bids.
- 48.4. A valid e-mail ID of the Organization/ Firm:** The bidder must possess a valid e-mail ID for the organization / firm.
- 48.5. Digital Certificates:** For integrity of data and authenticity / non-repudiation of electronic records, and to be compliant with IT Act 2000, it is necessary for each user to have a Digital Certificate (DC), also referred to as Digital Signature Certificate (DSC), of Class III, issued by a Certifying Authority (CA) licensed by Controller of Certifying Authorities (CCA) (<https://cca.gov.in>).
- Digital signature certificate is required as part of the two-factor authentication as well as signing of bid documents while working with e-Procurement portal.
- 48.6. Registration:** To use the Electronic Tender portal, Bidders need to register on the portal. Registration of each organization is to be done by one of its senior persons who will be the main person coordinating for the e-tendering activities. The Bidders are advised to visit the website www.tntenders.gov.in and click the option 'Click here to enroll' in the top right corner of the homepage to register. This enrollment process gives the user, a Login ID and password through which he is enrolled. For further details, please visit the website / portal www.tntenders.gov.in.

 **Important Note**

Interested bidders have to download official copy of the RFS/ Tender and other documents after login into the ETS Portal (www.tntenders.gov.in). If the official copy of the documents is not downloaded from ETS Portal within the specified period of downloading of RFS/ Tender and other documents, bidder will not be able to participate in the tender.

To minimize problems during the use of ETS (including the Registration process), it is recommended that the user should peruse the instructions including instructions for timely registration on ETS. The instructions relating to 'Essential Computer Security Settings for Use of ETS' and 'Important Functionality Checks' should be especially taken into cognizance.

49. Bidding Related Information for this Tender

- 49.1.** The bid shall be submitted by the Bidder under "Single Stage - Two Envelope" procedure of bidding. Under this procedure, the bid submitted by the Bidder in two envelopes – First Envelope (also referred to as Techno - Commercial Part) and Second Envelope (also referred to as Price Part) shall comprise of the following documents:

- 49.2. The Offline Documents: The offline documents** containing the documents listed in ITB §-13.8 shall be submitted in a sealed envelope, as part of First Envelope.

**Note**

Bidder shall also upload the scanned copies of all the above-mentioned original documents during online Bid Submission as a part of First envelope.

“Bidder should explicitly note that no offline documents are to be submitted as a part of Second envelope”.

49.3. Online Documents:

Online documents/Soft copy of the bid shall comprise of following documents to be uploaded on the ETS portal [https://https://tntenders.gov.in](https://tntenders.gov.in) as per provisions therein.

- A. As part of the First Envelope: Technical Bid** containing the documents listed in ITB §-13.2
- B. As part of the Second Envelope: Price Bid** containing the documents listed in ITB §-13.3

49.4. Special Note on Security and Transparency of Bids

Security related functionality has been rigorously implemented in ETS in a multidimensional manner. Starting with 'Acceptance of Registration by the Service Provider', provision for security has been made at various stages in Electronic Tender's software. Specifically, for Bid Submission, some security related aspects are outlined below:

As part of the Electronic Encrypted functionality, the contents of both the 'Electronic Forms' and the 'Main-Bid' are securely encrypted using a Pass-Phrase created by the Bidder himself. Unlike a 'password', a Pass-Phrase can be a multi-word sentence with spaces between words (e.g. I love this World). A Pass-Phrase is easier to remember, and more difficult to break. It is mandatory that a separate Pass-Phrase be created for each Bid-Part. This method of bid-encryption does not have the security and data-integrity related vulnerabilities which are inherent in e-tendering systems which use Public-Key of the specified officer of a Buyer organization for bid-encryption. Bid-encryption in ETS is such that the Bids cannot be decrypted before the Public Online Tender Opening Event (TOE), even if there is connivance between the concerned tender-opening officers of the Buyer organization and the personnel of e-tendering service provider.

**Note**

All bidders must fill Electronic Form for each bid-part sincerely and carefully, and avoid any discrepancy between information given in the Electronic Form and the corresponding Main-Bid.

If any variation is noted between the price mentioned in the Electronic Form and the Main Bid (Refer Clause above for the definitions of Electronic Form and Main Bid), the price mentioned in the Main Bid shall prevail.

In case of any discrepancy between the values mentioned in figures and in words, the value mentioned in words will prevail.

The bidder shall make sure that the Pass-Phrase to decrypt the relevant Bid-Part is submitted into the 'Time Locked Electronic Key Box (EKB)' after the deadline of Bid Submission and before the commencement of the Online TOE of Technical Bid. The process of submission of this Pass-Phrase in the 'Time Locked Electronic Key Box' is done in a secure manner by first encrypting this Pass-Phrase with the designated keys provided by the Employer.

Additionally, the bidder shall make sure that the Pass-Phrase to decrypt the relevant Bid-Part is submitted to Employer in a sealed envelope before the start date and time of the Tender Opening Event (TOE).

50. Procedure for Electronic Submission of Bids

- 50.1.** The bidder shall submit online the requirements under qualification criteria and Technical Documents required and Price Schedule/BOQ. All the documents are required to be signed digitally by the bidder. After electronic online bid submission, the system generates a unique bid reference number which is time stamped. This shall be treated as acknowledgement of bid submission.
- 50.2.** The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
- 50.3.** The Bidder shall furnish a bid security in the form of Bank Guarantee. The Bidder has to select the payment option as "offline" and enter details of the instrument. The Bid security should be posted/couriered/given in person so as to reach the General Manager / Transmission-IV, before two (2) hours of the techno commercial bid opening. TEDA shall not be responsible for any delay in submission of EMD by any mode.
- 50.4.** The scanned copy of e-payment receipt of EMD amount/proof for payment of EMD has to be uploaded. The details of the bid security in the form of Bank Guarantee, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise the uploaded bid will be rejected. TEDA shall not be responsible for any delay in submission of EMD by any mode.
- 50.5.** A BOQ format for the price bid has been provided with the tender document to be filled by all the bidders. Bidders are requested to note that they should necessarily submit their financial bids in the BOQ format provided and no other format is acceptable. Bidders are required to download the BOQ file, open it and complete the coloured (Unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the file name. If the BOQ file is found to be modified by the bidder, the bid will be rejected.
- 50.6.** **The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.**

- 50.7.** All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128-bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid openers' public keys. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
- 50.8.** Upon the successful and timely submission of bids, (i.e. after clicking "Freeze Bid submission" in the portal) the portal will give a successful bid submission message and a bid summary will be displayed with the bid no. and the date and time of submission of the bid with all other relevant details. The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.
- 50.9.** Department or Service Provider is not responsible for any failure such as a bad internet connection or power failure outside of their control. The bidder is responsible to ensure they have sufficient time to submit an electronic bid prior to closing date and time including the payment of any fees including the Bid security and getting e-receipt. In case of a failure in the system within the control of the service provider that may affect a bidding process, the contracting authority on his sole discretion will postpone the closing time at least 24 hours from the time of system recovery to allow bidders sufficient time to submit their bids.

51. Critical Do's and Don'ts for Bidders

Specifically, for Supplier organizations, the following 'KEY INSTRUCTIONS for BIDDERS' must be assiduously adhered to:

- 51.1.** Obtain individual Digital Signing Certificate (DSC or DC) of Class III well in advance of your tender submission deadline on ETS.
- 51.2.** Register your organization on ETS well in advance of the important deadlines for your first tender on ETS viz 'Date and Time of Closure of Procurement of Tender Documents' and 'Last Date and Time of Receipt of Bids'. Please note that even after acceptance of your registration by the Service Provider, to respond to a tender you will also require time to complete activities related to your organization, such as creation of -- Marketing Authority (MA) [ie a department within the Supplier/ Bidder Organization responsible for responding to tenders], users for one or more such MAs, assigning roles to them, etc. It is mandatory to create at least one MA. This unique feature of creating an MA enhances security and accountability within the Supplier/ Bidder Organization.
- 51.3.** Get your organization's concerned executives trained on ETS well in advance of your first tender submission deadline on ETS
- 51.4.** For responding to any particular tender, the tender (ie its Tender Search Code or TSC) has to be assigned to an MA. Further, an 'Official Copy of Tender Documents' should be procured/downloaded before the expiry of Date and Time of Closure of

Procurement of Tender Documents. Note: Official copy of Tender Documents is distinct from downloading 'Free Copy of Tender Documents'. Official copy of Tender Documents is the equivalent of procuring physical copy of Tender Documents with official receipt in the paper-based manual tendering system.

- 51.5.** Submit your bids well in advance of tender submission deadline on ETS (There could be last minute problems due to internet timeout, breakdown, etc)
- 51.6.** It is the responsibility of each bidder to remember and securely store the Pass-Phrase for each Bid-Part submitted by that bidder. The bidders are required to submit correct, valid and operative Pass-Phrase to decrypt either Technical Bid Part or Financial Bid Part in a separate sealed envelope before due date and time of submission of bid. In the event, the bids are not opened with the pass-phrase submitted by bidder, Employer may ask for re-submission/clarification for correct pass-phrase. If bidder fails to submit correct pass-phrase immediately as requested by Employer, the Tender Processing Fee and Tender Document Fee, if applicable, shall be forfeited and bid shall not be opened, and EMD, if applicable shall be refunded. No request on this account shall be entertained by Employer/ Owner.
- 51.7.** ETS will make your bid available for opening during the Online Public Tender Opening Event (TOE) 'ONLY IF' the status pertaining Overall Bid-Submission is 'COMPLETE'. For the purpose of record, the bidder can generate and save a copy of 'Final Submission Receipt'. This receipt can be generated from 'Bid-Submission Overview Page' only if the status pertaining overall Bid-Submission' is 'COMPLETE'



Note

While the first three instructions mentioned above are especially relevant to first-time users of ETS, the fourth, fifth, sixth and seventh instructions are relevant at all times.

52. Content of Bid

52.1. Un-Priced Bid

The Un-Priced Bid (i.e., Part I - Technical Bid, refer ITB of tender for details) to be uploaded using Link "TECHNICAL DOCUMENT". Bidders are advised to not upload duly filled Schedule of Rates (SOR)/ Price Schedule (PS) at this link.

Before the bid is uploaded, the bid comprising of all relevant documents mentioned in the tender document should be digitally signed in accordance with the Indian IT Act 2000. If any modifications are required to be made to a document thereafter the modified documents shall be again digitally signed before uploading.

Bidders are required to upload all Tender forms and supporting documents which form part of the bid/ tender in the Collaboration Folder (C-Folder) under tender document of e-tender portal.

Uploading the documents relevant to bid before the bid submission date and time is the sole responsibility of the bidder.

52.2. Price Bid

The Price Bid (i.e. Part II - Price Bid, refer ITB for details) to be uploaded using Link given under ISN portals & and NOT using link "TECHNICAL DOCUMENT". Bidders

are advised not to upload any other documents and same shall be ignored. For detailed instructions, refer tender document and instructions as given above.

Employer/ Owner shall not be responsible for any failure on the part of the bidder in submission of Priced Bid.

Instructions mentioned under "PRICE BID [Online]" shall be applicable in case Bidders have been asked to quote their prices on-line directly in the e-tender portal in addition to uploading of scanned copy of SOR/PS or only the on-line price submission in the portal, as the case may be.



This page intentionally left blank



**Tamil Nadu Energy Development Agency
Chennai, Tamil Nadu**

Section II

**Evaluation and Qualification
Criteria (EQC)**

This Section specifies the criteria to determine the lowest evaluated Bid and the qualifications of the Bidder to perform the Contract.

*Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road, Chennai – 600 006,
Phone: 044-28242800,
e-mail: dgm2@teda.in, tender@teda.in
website: www.teda.in*

This page intentionally left blank

A. Evaluation and Qualification Criteria

1. Evaluation

1.1. Submission of the Bid, its opening, initial examination to determine substantial responsiveness, evaluation including technical evaluation, determination of the lowest evaluated price, acceptance of the Bid and award of the contract shall be as per The Tamil Nadu Transparency in Tenders Act, 1998 & The Tamil Nadu Transparency in Tender Rules 2000 (as amended from time to time).

1.2. The procedure for finalization of Bid would be as follows

- i. Evaluation of Qualification Documents
- ii. Evaluation of Technical Bids
- iii. Opening and evaluation of Price Bids of Techno-commercially qualified Bidders.

1.3. Evaluation of eligibility/qualification Criteria

1.3.1. TEDA will determine, to its satisfaction, whether the Bidders are eligible, qualified and capable in all respects to perform the contract satisfactorily. Tenders that do not meet the required eligibility/qualification criteria prescribed will be treated as unresponsive and not considered further. This determination will, inter-alia, take into account the Bidder's financial, technical and production capabilities for satisfying all of TEDA's requirements as incorporated in the tender document. Such determination will be based upon scrutiny and examination of all relevant data and details submitted by the Bidder in its/his tender as well as such other allied information as deemed appropriate by TEDA.

1.4. Evaluation of Technical Bid

1.4.1. TEDA shall strictly apply only and all of the evaluation and qualification criteria specified in this Bid document.

1.4.2. The determination shall be based upon an examination of the documentary evidence of the bidder's qualifications submitted by the Bidder.

1.4.3. The evaluation of the Technical Bids consists of the following:

- i. assessment of the qualification of the Bidder to perform the Contract satisfactorily in accordance with ITB §-32. The qualification criteria for the purpose of this assessment have been described in detail under ER §-2 Qualification below.
- ii. determination of the substantial responsiveness of the Technical Bid in accordance with ITB §-33. The evaluation

criteria for the purpose of this determination have been described herein under.

Determination of the substantial responsiveness of the Technical Bid includes, among other things, an assessment of the adequacy of the Bidder's Technical Proposal, during which the Bidder's technical capacity to complete the Facilities will be assessed in terms of the following. Based on such assessment, the Employer will determine whether the Technical Proposal is substantially responsive to the requirements stipulated in Section IV Employer's Requirements.

- a.** overall completeness and compliance with the Employer's Requirements.
- b.** 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) acceptable levels corresponding to each functional guarantee, as indicated in the Employer's Requirements and in this Section.
- c.** suitability of the Plant and Installation Services offered in relation to the environmental and climatic conditions prevailing at the site.
- d.** quality, function and operation of any process control concept included in the Bid.
- e.** type, quantity and long-term availability of mandatory and recommended spare parts and maintenance services.
- f.** mobilization of key construction equipment and personnel execution of the Plant and Installation Services.
- g.** adequately supervising and controlling of the execution of the Plant and Installation Services by the appropriate allocation of staff.
- h.** planning and scheduling of all work activities in such a manner that the Facilities will be completed on time and meet with all Contract requirements, mainly the compliance with the time schedule called for in the corresponding Appendix to the Contract Agreement, as evidenced by a milestone schedule provided in the Technical Proposal.

- i. execution of the Plant and Installation Services fully in accordance with all Contract requirements including but not limited to work methods, material sourcing, etc
- j. carrying out all operations for the execution of the Plant and Installation Services safely and in an environmental friendly manner

1.5. 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) acceptable levels for the specified functional guarantees, will be rejected.

1.6. Evaluation of Commercial Conditions

1.6.1. TEDA will also evaluate the commercial conditions quoted by the tenderer to confirm that all terms and conditions specified in the General Conditions of the Contract have been accepted without reservations by the tenderer. Only minor deviations may be accepted/allowed, provided these do not constitute material deviations without financial impact and do not grant the tenderer any undue advantage vis-à-vis other tenders and Procuring Entity.

1.7. Evaluation of Price Bid

1.7.1. Price Bid of the Qualified Bidders shall be opened in the presence of the representatives of such Qualified Bidders, who wish to be present, on the date and time as may be intimated by TEDA to the Bidders who qualify in the evaluation of technical bids. The evaluation of Price Bid shall be carried out based on the information furnished in Financial Bid (Price Bid). The Price Bid submitted by the Bidders shall be scrutinized to ensure conformity with the Bid Document. Any Bid not meeting any of the requirements of this Bid Document may cause the Bid to be considered "Non-responsive" at the sole decision of the TEDA.

1.7.2. The Price Bids are evaluated in accordance with the criteria listed in ITB §-37.

1.7.3. Negotiations

- i. The Competent Committee appointed by TEDA shall have full powers to undertake negotiations. Detailed reasons and results of negotiations shall be recorded in the proceedings.
- ii. The lowest or most advantageous bidder shall be informed in writing either through messenger or by registered letter and email (if available). In case of urgency the Competent Committee, after recording reasons, may reduce the time, provided the lowest or most advantageous bidder has received the intimation and consented to regarding holding

of negotiations.

- iii. Negotiations shall not make the original offer made by the bidder inoperative. The Competent Committee shall have option to consider the original offer in case the bidder decides to increase rates originally quoted or imposes any new terms or conditions.
- iv. In case of non-satisfactory achievement of rates from lowest or most advantageous bidder, the Competent Committee may choose to make a written counter offer to the lowest or most advantageous bidder and if this is not accepted by him, the committee may decide to reject and re-invite bids or to make the same counter-offer first to the second lowest or most advantageous bidder, then to the third lowest or most advantageous bidder and so on in the order of their initial standing and work/supply order be awarded to the bidder who accepts the counter-offer. **This procedure can be used in exceptional cases only.**
- v. In case the rates even after the negotiations are considered very high, fresh bids shall be invited.
- vi. In the event of a bidder not responding to further negotiations as required for selection of Contractor, TEDA reserves the right to forfeit the Bid Security Deposit amount furnished by such bidders.

1.7.4. The lowest evaluated rate (L_1), for each category of capacity range identified after negotiation, shall be considered as “**Approved Rate**” for that specific category for awarding the contract.

1.7.5. An Abnormally Low Bid is one in which the Bid price, in combination with other elements of the Bid, appears so low that it raises material concerns as to the capability of the Bidder to perform the contract at the offered price. TEDA may in such cases seek written clarifications from the Bidder, including detailed price analyses of its Bid price in relation to scope, schedule, resource mobilization, allocation of risks and responsibilities, and any other requirements of the bids document. If, after evaluating the price analyses, TEDA determines that the Bidder has substantially failed to demonstrate its capability to deliver the contract at the offered price, TEDA may reject the Bid/Proposal.



Note

No credit will be given for completion earlier than the Minimum Designated Period. Bids offering a completion date beyond the Maximum Designated Period shall be rejected.

2. Qualification

2.1. Qualification of the Bidder but not of Bidder's Affiliates

It is the legal entity or entities comprising the Bidder (which is/are party to the Bidder under a JV or as specialized subcontractors to be employed for the key activities listed in this Section), and not the Bidder's parent company(ies), group companies, subsidiaries or other affiliates, that must satisfy the qualification criteria.

2.2. General Eligibility

Eligibility and Qualification Criteria		Compliance Requirements	Documentation
No.	Factor	Requirement	Submission Requirements
2.2.1.	Legal Entity	The Bidder should have any of the following legal status: a. Body incorporated in India under the Companies Act, 2013 including any amendment thereto; OR b. Body incorporated in India under the Limited Liability Partnership (LLP) Act, 2008 including any amendment thereto; OR c. Firm registered under Partnership Act, 1932 in India; OR d. Sole Proprietor	Forms ELI – 1 and ELI – 2 with attachments
2.2.2.	Bidder Category	Bidder must meet the Eligibility Criteria independently as a Single Firm	Forms ELI – 1.
2.2.3.	Tax Registration	The Bidder must have the required GST Registration	Copy of GST registration certificate with legible GSTIN.

2.2.4.	Income Tax Identification	The Bidder must have valid PAN Number.	Copy of PAN Card.
2.2.5.	Conflict of Interest	No conflicts of interest in accordance with ITB §7.2	Letter of Bid

2.3. Historical Contract Non-Performance

Eligibility and Qualification Criteria		Compliance Requirements	Documentation
No.	Factor	Requirement	Submission Requirements
2.3.1.	History of Non-Performing Contracts ⁽ⁱⁱⁱ⁾	Non-performance of a contract ⁽ⁱⁱ⁾ did not occur as a result of contractor's default since 1 st January 2015	Form CON-1: Historical Contract Non-Performance



Notes for the Bidders

i. *Non-performance, as decided by the Employer, shall include all contracts:*

- a. *where non-performance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and*
- b. *that were so challenged but fully settled against the contractor.*
- c. *Non-performance shall not include contracts where Employer's decision was overruled by the dispute resolution mechanism. Moreover, non-performance must be based on all information on fully settled disputes or litigation, i.e. dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract and where all appeal instances available to the Bidder have been exhausted.*

- ii. The Bidder shall provide accurate information on the related Bidding Form about any litigation resulting from contracts completed or ongoing under its execution over the last five (5) years. A consistent history of court orders against the Bidder may result in failure of the Bid.

2.4. Financial Eligibility

Eligibility and Qualification Criteria		Compliance Requirements	Documentation
No.	Factor	Requirement	Submission Requirements
2.4.1.	Financial Performance	The financial statements for the last three (3) years shall be submitted and must demonstrate the current soundness of the Bidder's financial position and indicate its prospective long-term profitability. As a minimum requirement, a Bidder's net worth calculated as the difference between total assets and total liabilities should be positive for each of the last three (3) Financial years (FY19-20, FY 20-21 and FY21-22).	Form FIN – 1 with attachments
2.4.2.	Average Annual Turnover	The Minimum average Annual Turn Over (MAAT) in the immediate preceding three (3) completed financial years should not be less than ₹ 2.00 crore.	Form FIN – 2
2.4.3.	Financial Capabilities	The Bidder shall demonstrate, to the satisfaction of the Employer that it currently (as of the Bid submission deadline), has access to, or has available, liquid assets, unencumbered real assets, lines of credit, and other financial means (independent of any contractual advance payment) sufficient to meet the construction cash flow requirements estimated as ₹ 1.00 crore for the subject contract(s) net of the Bidder's all other commitments, both current and future.	Form FIN – 3 and FIN – 4 FIN-4 – Certificate from Banker shall be indicating various fund based/non fund based limits sanctioned to the bidder and the extent of utilization as on date. Such certificate shall have been issued not earlier than three (3) months prior to the date of bid opening. Wherever necessary, TEDA may make queries with the Bidders' bankers.

2.5. Technical Experience

Eligibility and Qualification Criteria		Compliance Requirements	Documentation
No.	Factor	Requirement	Submission Requirements
2.5.1.	General Experience	The Bidder should be either of the following: Manufacturer of Solar PV Module / Inverter (or) System integrator/Solar Power Developer from 1 st January 2015	Form EXP –1
2.5.2.	1. Specific Experience	Bidder shall have experience of execution of design, supply, installation and maintenance of Grid-connected (10 kW and above) SPV systems, Solar Pumps and/or off-grid and/or Grid-connected and/or Hybrid SPV Power Projects and having a cumulative capacity of 1 MW spread across India during the last three (3) years (i.e., 2019-20 to 2021-22).	Form EXP –2
	2. Type Test Reports	Original/attested photocopies of the latest Type test certificate(s) not older than five (5) years obtained from MNRE approved/any recognized Government Laboratory, for all type tests wherever prescribed in the relevant latest edition of MNRE/BIS/IEC (as applicable) as per ER §-21 – Quality Certification, Standards and Testing for solar PV modules, Inverters(Grid-tie and Hybrid), Junction/Distribution Boxes (AC and DC) and Cables shall be furnished.	Copies of Type Test Reports

3. Key Information regarding Documentary proofs

- 3.1.** The bidder must fill up above information clearly in enclosed sheet and attach all required documents in support as at a glance in Technical bid. If supporting documents are not attached for each eligible criterion above, the bid may be rejected without further reference.
- 3.2.** It will be mandatory to use indigenously manufactured solar panels with indigenous solar cells and modules. Further, inverters/controllers and the balance of system should also be manufactured indigenously. The contractor has to declare the list of imported components used in the solarisation system.
- 3.3.** Summation of number of small value contracts (less than the value specified under requirement) to meet the overall requirement will not be accepted.
- 3.4.** Completion shall be evidenced by submission of copy of end-user certificates such as Taking-over Certificates and Completion Certificates as required to be submitted as attachment to Form EXP-2 of Section III, Bidding Forms.



This page intentionally left blank



**Tamil Nadu Energy Development Agency
Chennai, Tamil Nadu**

Section III

Bidding Forms

This Section includes the forms which are to be completed by the Bidders and submitted as part of their Bids.

*Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road, Chennai – 600 006,
Phone: 044-28242800,
e-mail: dgm2@teda.in, tender@teda.in
website: www.teda.in*

This page intentionally left blank

A. Bidding Forms

Letter of Bid

[Prepare this Letter of Bid on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

Date: *[Insert date of Bid submission]*

Bid reference No.: *[Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]*

Project: *Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.*

To

The General Manager,
Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road, Chennai - 600 006

Sir/Madam,

Sub: Tender for the selection of developer(s) for Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW - Regarding.



We, the undersigned, declare that:

We, the undersigned [insert name of the 'Bidder'] having read, examined and understood in detail the tender document for the selection of Vendor to for Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW. We confirm that neither we nor any of our Parent Company/Affiliate/Ultimate Parent Company has submitted Bid other than this Bid directly or indirectly in response to the aforesaid tender. We give our unconditional acceptance to the tender *[Insert Invitation for Bid number]* dated *[Insert date of Bid submission]* and tender documents attached thereto, issued by TEDA as amended. This shall also be construed as a token of our acceptance to the tender documents including all its amendments and clarifications given by TEDA. We shall ensure that we have furnished documents as per the provisions of the tender and all provisions of such tender documents shall be binding on us.

a. Cost of Bid Document

We have furnished an amount of ₹ *[Insert the amount in figures and words]* towards the cost of Bid document, in the form of Demand Draft vide *[Insert DD No.]* dated *[Insert date of issuance of DD]* issued by *[Insert the DD issuing Bank]*.

b. Bid Security/EMD

We have furnished an EMD of ₹ *[Insert the amount in figures and words]*, in the form of irrevocable bank guarantee no. *[Insert Bank Guarantee No.]* dated *[Insert date of issuance of Bank Guarantee]* as per Form SBG: Bid Security (Bank Guarantee) from *[Insert name of bank providing Bank Guarantee]* and valid up to *[Insert the validity date]* as per Instruction to Bidders ITB §-21.1.

We hereby accept that the earnest money be absolutely forfeited by TEDA as per the terms & conditions laid down as per ITB §-21.9.

c. Processing Fee

We have furnished an amount of *[Insert the amount in figures and words]* towards the cost of Bid Processing Fee, in the form of Demand Draft vide *[Insert DD No.]* dated *[Insert date of issuance of DD]* issued by *[Insert the DD issuing Bank]*.

d. Submission of Technical Bid and Price Bid

Further, we have submitted our Technical Bid and Price Bid strictly as per the terms of this tender.

e. Acceptance

We hereby unconditionally and irrevocably agree and accept that the decision made by TEDA in respect of any matter regarding or arising out of the tender shall be binding on us. We hereby expressly waive any and all claims in respect of Bid process.

f. Historical Contract Non-Performance and Litigation

We hereby confirm that there are no litigations or disputes pending against us, which materially affect our ability to fulfill our obligations with regard to execution of projects of capacity offered by us.

g. Fraud and Corruption

We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in any type of fraud and corruption.

h. Familiarity with Relevant Indian Laws & Regulations

We hereby confirm that we have studied the provisions of the relevant Indian laws and regulations as required to enable us to submit this Bid and execute the tender documents, in the event of our selection as Successful Bidder. We further undertake and agree that all such factors as mentioned in tender have been fully examined and considered while submitting the Bid.

We have furnished the Envelope-I and Envelope-II (Price Bid) containing duly signed formats, each one duly sealed separately in accordance with ITB §-23.

We hereby confirm that our Bid is consistent with all the requirements of submission as stated in the tender and subsequent communications from TEDA. The information submitted in our Bid is complete, strictly as per the requirements stipulated in the tender and is correct to the best of our knowledge and understanding. We would be solely responsible for any errors or omissions in our Bid.

DO HEREBY DECLARE THAT-

1. We have examined and have no reservations to the Bidding Document, including addenda issued in accordance with Instruction to Bidders (ITB) §-9 [insert the number and issuing date of each addendum];
2. We meet the eligibility requirements in accordance with ITB §-7;
3. We are capable of executing and completing the work as required in the tender.
4. We accept all risks and responsibilities directly or indirectly connected with the performance of the tender.
5. We have no collusion with other contractor, any employee of TEDA/Department of Energy, Govt. of Tamil Nadu or its autonomous bodies or with any other person or firm in the preparation of the bid.
6. We have not been influenced by any statement or promises of TEDA/Department of Energy, Govt. of Tamil Nadu or its autonomous bodies or any of its employees but only by the tender document.
7. We are financially solvent and sound to execute the work.
8. We are sufficiently experienced and competent to perform the contract to the satisfaction of TEDA.
9. The information and the statements submitted with the tender are true.
10. We are familiar with all general and special laws, acts, ordinances, rules and regulations of the Municipal, District, State and Central Government that may affect the work, its performance or personnel employed therein.
11. We have not been debarred or Black Listed from similar type of work by TEDA and or Central/State Government Departments/Undertaking during last three (3) years.
12. We, including any subcontractors or manufacturers for any part of the contract, do not have any conflict of interest in accordance ITB §-7.2
13. We offer to design, supply and install, in conformity with the Bidding Document, the following Facilities:

Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW.
14. Our Bid shall be valid for a period of one hundred and eighty (180) days from the date fixed for the Bid submission deadline in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

15. If our Bid is accepted, we commit to obtain and submit a Performance Security in accordance with the Bidding Document;
16. In view of the above, we hereby undertake to you and confirm that in the event of failure of [Insert name of the Bidding Company] to submit the Performance Guarantee in full or in part at any stage, as specified in the tender and/or fail to execute the Contract Agreement within the stipulated time or extension thereof provided by TEDA, TEDA may forfeit the Bid Security submitted by [Insert name of the Bidding Company].
17. We hereby by assure to execute the work as per technical specifications, terms and conditions of this tender document.
18. We hereby by assure to execute the work in accordance to the time schedule as per duly approved by TEDA.
19. The terms and conditions of this tender document will be binding upon us in the event of acceptance of their tender.
20. We hereby accept that the earnest money be partially/absolutely forfeited by TEDA as per the terms & conditions laid down in this tender document.

Name of the Bidder: *[insert complete name of the Bidder]*

Name of the person duly authorized to sign the Bid on behalf of the Bidder : *[insert complete name of person duly authorized to sign the Bid]*

Title of the person signing the Bid : *[insert complete title of the person signing the Bid]*

Signature of the person named above: *[insert signature of person whose name and capacity are shown above]*

Date signed: *[insert date of signing] day of [insert month], [insert year]*

**Note**

Person signing the Bid shall have the Power of Attorney given by the Bidder to be included in the Technical Bid.



Letter of Price Bid

[Prepare this Letter of Technical Bid on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

Date: *[Insert date of Bid submission]*

Bid reference No.: *[Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]*

Project: *Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.*

To

The General Manager,
Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road, Chennai - 600 006

Sir/Madam,

Sub: Tender for the selection of developer(s) for Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW - Regarding.

■■■

We, the undersigned, declare that:

- a. We have examined and have no reservations to the Bidding Document, including addenda issued in accordance with Instruction to Bidders (ITB) §-10 [insert the number and issuing date of each addendum];
- b. We offer to design, supply and install, in conformity with the Bidding Document, the following Facilities:

Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW.

- c. The total price of our Bid, excluding any discounts offered in item (d) below is:

[Insert the total Bid Price in words and figures, indicating the amounts in ₹]

- d. The discounts offered and the methodology for their application are:

The discounts offered are: *[specify in detail each discount offered]*

The exact method of calculations to determine the net price after application of discounts is shown below: *[specify in detail the method that shall be used to apply the discounts];*

- e. Our Bid shall be valid for a period of *one hundred and eighty (180)* days from the date fixed for the Bid submission deadline in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- f. If our Bid is accepted, we commit to obtain and submit a Performance Security in accordance with the Bidding Document;
- g. We understand that this Bid, together with your written acceptance thereof included in your Letter of Acceptance, shall constitute a binding Contract between us, unless and until a formal Contract is prepared and executed; and
- h. We understand that you are not bound to accept the lowest evaluated Bid or any other Bid that you may receive
- i. In view of the above, we hereby undertake to you and confirm that in the event of failure of *[Insert name of the Bidding Company]* to submit the Performance Guarantee in full or in part at any stage, as specified in the tender and/or fail to execute the Contract Agreement within the stipulated time or extension thereof provided by TEDA, TEDA may forfeit the Bid Security submitted by *[Insert name of the Bidding Company]*.

Name of the Bidder: *[insert complete name of the Bidder]*

Name of the person duly authorized to sign the Bid *[insert complete name of person duly authorized to sign the Bid]*
on behalf of the Bidder :

Title of the person signing the Bid : *[insert complete title of the person signing the Bid]*

Signature of the person named above: *[insert signature of person whose name and capacity are shown above]*

Date signed: *[insert date of signing] day of [insert month], [insert year]*



Note

Person signing the Bid shall have the Power of Attorney given by the Bidder to be included in the Technical Bid.



Form ELI - 1: Bidder Information Form

[Prepare this Letter of Technical Bid on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

Date: *[Insert date of Bid submission]*

Bid reference No.: *[Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]*

Project: *Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.*

Page: *[insert page number] of [insert total number] pages*

[Bidders shall provide the following information. The documents listed/stated as required shall be submitted as attachments hereto.]

1.	Bidder's Legal Name	<i>[insert full name]</i>
2.	Bidder's Year of Registration	<i>[insert year of incorporation]</i>
3.	Bidder's Legal Address in Country of Registration	<i>[insert mailing address]</i>
4.	Bidder's Authorized Representative Information	
	a. Name	<i>insert full name]</i>
	b. Address	<i>[insert mailing address]</i>
	c. Telephone/Fax numbers	<i>[insert telephone/fax numbers, including country and city codes]</i>
	d. Email Address	<i>[insert E-mail address]</i>
5.	Bidding company PAN Number	<i>[insert PAN Number]</i>
6.	Bidding Company GST Number	<i>[insert GST Number]</i>
7.	Has the bidder/Company ever been debarred/blacklisted by any Govt. Dept./Undertaking for undertaking any work.	<i>[insert full name]</i>
8.	EMD/Bank Guarantee No	
9.	Validity of EMD	
10.	Banker E-mail ID/FAX No of the banker/Correspondence address & Pin Code	
11.	Attached are copies of original documents of	
	● Articles of Incorporation or Registration of the legal entity named above, in accordance with ITB §-7.1".	
	● Authorization to represent the firm, in accordance with ITB §-22.2.	
	● Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.	



Form CON-1: Historical Contract Non-Performance

[Prepare this Letter of Technical Bid on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

[The following table shall be filled in for the Bidder]

Date: *[Insert date of Bid submission]*

Bid reference No.: *[Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]*

Project: *Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.*

Bidder's Legal Name: *[insert full name]*

Page: *[insert page number] of [insert total number] pages*

◆ **History of Non-Performing Contracts**

In accordance with EQC §-2.3.1, as appropriate, since 1st January 2015:

[The Bidder shall indicate the applicable wording below by checking the appropriate box]

- contract non-performance did not occur.
 contract non-performance occurred as indicated below.

Non-Performing Contracts			
Year	Non- performed portion of contract	Contract Identification	Total Contract Amount
<i>[insert year]</i>	<i>[insert amount and percentage]</i>	Contract Identification: <i>[insert complete contract name, number, and any other identification]</i>	<i>[insert value of the contract]</i>
		Name of Employer: <i>[insert full name]</i>	
		Address of Employer: <i>[insert mailing address]</i>	
		Matter in Dispute: <i>[Insert the details about the nature of non-performance]</i>	
		Reason(s) for non-performance <i>[indicate main reason(s)]</i>	



Form CON-2: Undertaking for No Blacklisting & No Banning

(On Letterhead of Bidder giving said declaration, signed by authorized signatory)

(SHOULD BE ATTESTED BY NOTARY PUBLIC)

Date: [Insert date of Bid submission]

Bid reference No.: [Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]

Project: Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.

Bidder's Legal Name: [insert full name]

Page: [insert page number] of [insert total number] pages

I/We hereby declare that presently our Company/Limited Liability Partnership/Partnership Firm/Sole Proprietorship is having unblemished record and is not declared ineligible for corrupt/fraudulent practices by any State/Central Government/PSU on the date of Bid Submission.

I/We further declare that presently our Company/Limited Liability Partnership/Partnership Firm/Sole Proprietorship is not blacklisted and not declared ineligible for reasons other than corrupt/fraudulent practices by any State/Central Government/PSU on the date of Bid Submission.

If this declaration is found to be incorrect then without prejudice to any other action that may be taken, our security may be forfeited in full and the tender if any to the extent accepted may be cancelled.

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



Form FIN - 1: Historical Financial Performance

[Prepare this Letter of Technical Bid on stationery with its letterhead clearly showing the name address of the Chartered Accountant/Statutory Auditors of the Bidder]

[The following table shall be filled in for the Bidder. The documents listed/stated as required shall be submitted as attachments hereto.]

Date: *[Insert date of Bid submission]*

Bid reference No.: *[Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]*

Project: *Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.*

Bidder's Legal Name: *[insert full name]*

Page: *[insert page number] of [insert total number] pages*

1. Financial data

In accordance with EQC §-2.4.1, as appropriate, since 1st January 2019:

Financial Data			
Financial information in (₹)	Historic information for previous 3 years in (₹)		
	2019-20	2020-21	2021-22
Information from Balance Sheet			
Total Assets (TA)			
Total Liabilities (TL)			
Net Worth (NW)			
Current Assets (CA)			
Current Liabilities (CL)			
Working Capital (WC)			
Information from Income Statement			
Total Revenue (TR)			

Profits Before Taxes (PBT)			
Profits After Taxes (PAT)			
Information from Cash Flow Statement			
Cash Flow from Operating Activities			

2. Financial documents

The Bidder shall provide copies of the financial statements for the number of years indicated in EQC §-2.4.1, as appropriate. The financial statements shall:

- a. reflect the financial situation of the legal entity(ies) comprising the Bidder, and not of the affiliated entities (such as parent company(ies), group companies or subsidiaries) of the Bidder.
- b. be independently audited or certified in accordance with local legislation.
- c. be complete, including all notes to the financial statements.
- d. correspond to accounting periods already completed and audited.
- e. Attached herewith are copies of financial statements for the number of years required above, and complying with the requirements.

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



Notes for the Bidders

If the most recent set of financial statements is for a period earlier than 12 months from the date of bid, the reason for this should be justified.



Form FIN - 2: Average Annual Turnover

[Prepare this Letter of Technical Bid on stationery with its letterhead clearly showing the name address of the Chartered Accountant/Statutory Auditors of the Bidder]

[The following table shall be filled in for the Bidder. The documents listed/stated as required shall be submitted as attachments hereto.]

Date: *[Insert date of Bid submission]*

Bid reference No.: *[Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]*

Project: *Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.*

Bidder's Legal Name: *[insert full name]*

Page: *[insert page number] of [insert total number] pages*

Annual Turnover Data	
Year	Amount in ₹ lac

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



Form FIN - 3: Financial Resources

[Prepare this Letter of Technical Bid on stationery with its letterhead clearly showing the name address of the Chartered Accountant/Statutory Auditors of the Bidder]

[The following table shall be filled in for the Bidder. The documents listed/stated as required shall be submitted as attachments hereto.]

Date: [Insert date of Bid submission]

Bid reference No.: [Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]

Project: Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.

Bidder's Legal Name: [insert full name]

Page: [insert page number] of [insert total number] pages

Financial Resources	
Sl.No	Amount in ₹ lac ¹

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:

**Notes for the Bidders**

1. Sources of financing may include working capital (to be taken from FIN-1), Credit Line (to be substantiated by a letter from the bank issuing the line of credit), etc



Form FIN - 4: Certificate from Banker**Evidence of Access to or Availability of Credit/Facilities**

[Prepare this Letter of Technical Bid on stationery with its letterhead clearly showing the name address of the Banker of the Bidder/Member of JV.]

[The following table shall be filled in for the Bidder. The documents listed/stated as required shall be submitted as attachments hereto.]

Date: *[Insert date of Bid submission]*

Bid reference No.: *[Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]*

Project: *Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.*

Bidder's Legal Name: *[insert full name]*

Page: *[insert page number] of [insert total number] pages*

To

The General Manager,
Tamil Nadu Energy Development Agency,
5th Floor, EVK Sampath Maaligai,
No.68, College Road, Chennai - 600 006

BANKER's CERTIFICATE

This is to certify that M/s. _____ *[insert Name & Address of the Contractor]* _____ who have submitted their bid to Tamil Nadu Energy Development Agency (TEDA) for "the work of Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW, under *[insert tender reference No.]*", is our customer for the past years.

Their financial transactions 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:

Credit Limits Data			
Sl.No	Type of facility	Sanctioned limit as on date	Utilization 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



Form EXP - 1: General Experience

[Prepare this Letter of Technical Bid on stationery with its letterhead clearly showing the Bidder’s complete name and business address.]

[The following table shall be filled in for the Bidder. The documents listed/stated as required shall be submitted as attachments hereto.]

Date: [Insert date of Bid submission]

Bid reference No.: [Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]

Project: Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.

Bidder’s Legal Name: [insert full name]

Page: [insert page number] of [insert total number] pages

[The Bidder shall identify contracts that demonstrate continuous experience pursuant to EQC §-2.5.1 and list contracts chronologically, according to their commencement (starting) dates.]

General Experience			
Starting Year	Ending Year	Contract Identification	Role of Bidder
[indicate year]	[indicate year]	<ul style="list-style-type: none"> • Contract name: [insert full name] • Brief description of the works performed by the Bidder: [describe works performed briefly] • Amount of Contract: [insert amount in INR] • Name of Employer: [indicate full name] • Address: [indicate street/number/town or city/country] 	[insert "Prime Contractor"(Single entity or JV member)]

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



Form EXP - 2: Specific Experience

[Prepare this Letter of Technical Bid on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

[The following table shall be filled in for the Bidder. The documents listed/stated as required shall be submitted as attachments hereto.]

Date: [Insert date of Bid submission]

Bid reference No.: [Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]

Project: Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.

Bidder's Legal Name: [insert full name]

Page: [insert page number] of [insert total number] pages

[The Bidder shall fill out one (1) form per contract, in accordance with EQC §-2.5.2]

Contract of Similar Size and Nature	
Similar Contract No. [insert number] of [insert number of similar contracts required]	Information
Contract Identification	[insert contract name and reference identification number, if applicable]
Award Date	[insert day, month, year, e.g., 15 June 2018]
Completion Date	[insert day, month, year, e.g., 03 October 2010]
Role in Contract	Prime Contractor
Total Contract Amount	[insert total contract amount in ₹]
Name of Employer	[insert full name]
Address	[insert mailing address]
Telephone/fax number	[insert telephone/fax numbers, including country and city area codes]

E-mail	<i>[insert E-mail address, if available]</i>
Description of the similarity in accordance with EQC §-2.5.2	<i>[Insert a brief description about the nature of the project]</i>
<p>Attached herewith are the copies of originals of:</p> <ul style="list-style-type: none"> a. abstracts of contract documents, JV Agreements, Work Orders or Performance Certificate with corresponding Work Completion Certificate indicating (a) Name of Work, (b) Name of Client, (c) Actual value of work on completion, (d) Actual date of completion, (e) Capacity of the solar power plant installed etc. evidencing that the size and nature of the above-mentioned contract meets the requirements specified in EQC §-2.5.2. b. the end-user certificate(s) (Taking-over Certificate(s)/Completion Certificate(s)), evidencing that the contract above-mentioned contract has been successfully completed. 	

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



Form SBG: Bid Security (Bank Guarantee)*NON-Judicial – Rs.80/- Stamp Paper**Bank Guarantee No.**Date:*

THIS DEED OF GUARANTEE made on this.....day oftwo thousand and twenty-three by(Bank Name and Address) (Hereinafter called "Bank") to and in favour of Tamil Nadu Energy Development Agency, a registered society having its Registered office at E.V.K. Sampath Maaligai, College Road, Chennai-6 (hereinafter called "TEDA").

WHETHER AS TEDA has invited proposals for the selection of developers for Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW vide tender No. TEDA/EPS/dt....

In accordance with the terms and conditions of tender document, M/s.----- (hereinafter called the BIDDER) has proposed to submit a proposal to TEDA.

WHEREAS in accordance with the terms and conditions of tender document the bidder has to pay a sum of Rs...../(Rupees..... Only) towards EMD in the form of Bank Guarantee from a Nationalized Bank/Scheduled Bank.

AND WHEREAS the Bank has, at the request of the bidder agreed to guarantee the payment of the said sum in case the bidder violates any of the conditions of specifications indicated in the tender document.

NOW THIS DEED WITNESSES AS FOLLOWS:

In consideration of TEDA having agreed to accept the Bank Guarantee from a Nationalized Bank/Scheduled Bank/foreign banks operating in India towards EMD for a sum equivalent to Rs... (Rupees.....only), the Bank hereby guarantee in accordance with the specification and conditions of the tender document, shall pay forthwith merely on demand without any demur to TEDA such amount or amounts, as the Bank may be called upon to pay by TEDA.

PROVIDED that the liability of the Bank under this deed shall not at any time exceed the said guaranteed amount of Rs...../(Rupees... only).

PROVIDED further that the guarantee hereunder furnished shall be released as soon as the bid is finalised in accordance with the terms of the tender document by TEDA. The Bank further undertakes to indemnify TEDA against any loss or damage that may be caused or suffered by TEDA by reason of any breach of the terms and conditions in the said tender document.

The guarantee herein contained shall remain in force till the terms and conditions of the tender

document have been fully and properly carried out and in any case, the guarantee shall not hold good after

The Bank further agrees with TEDA shall have the fullest liberty(without the consent of the Bank and without affecting in any manner the obligations of the Bank hereunder) to vary any of the terms and conditions stipulated in the tender document and to forbear to enforce any of the terms and conditions relating the said tender document and the Bank shall not be relieved of its liability by the reason of any such variations or by reasons of any forbearance, act or omission on the part of TEDA.

Any account settled between TEDA and Successful Bidder shall be the conclusive evidence against the Bank for the amount due and shall not be questioned by the Bank. The expression 'Bank', TEDA and Successful Bidder herein before used shall include their respective successors and assigns.

NOTWITHSTANDING anything contained herein above our liability under this Bank Guarantee shall not exceed Rs...../- (Rupees.....Only).

This Bank Guarantee shall be valid upto (Date of Expiry), and We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only if you serve upon us a written claim or demand on or before..... (Date of Expiry), the expiry of this Guarantee.

IN WITNESS WHERE OF THIRU acting for and behalf of the Bank has signed this Deed on the day, month and year first above written.

Signature

With the seal of the Bank (Name in Block letters)

In the presence of witnesses

1.

(Name in Capital with address)

2.

Name in capitals to be subscribed with designation, Office address or Residential address).



Form BSD: Bid Security Declaration

(To be submitted in the official letter head of the company)

In response to the tender No. _____, dated xx/xx/xxx for Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW, as an owner/partner/Director of _____, I/We hereby declare that if I/we withdraw or modify my/our Proposals during the period of validity, or if me/we are awarded the contract and me/we fail to sign the Contract, or to submit the Performance Security before deadline defined in the tender document, I/we will be suspended for the period of time specified in the Bid document from being eligible to submit Bids/proposals for contracts with TEDA.

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



Form BGV: Checklist for Bank Guarantee Verification

[Prepare this Letter of Technical Bid on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

Date: *[Insert date of Bid submission]*

Bid reference No.: *[Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]*

Project: *Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.*

Bidder's Legal Name: *[insert full name]*

Page: *[insert page number] of [insert total number] pages*

To

The General Manager,
Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road, Chennai - 600 006

Dear Sir,

Sub: Tender for the selection of developer(s) to Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions and educational institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW – Regarding.

Checklist for Bank Guarantee Verification		
Sl.No.	Details of checks	Yes/No
1.	Is the BG on non-judicial Stamp paper of appropriate value, as per applicable Stamp Act of the place of execution	
2.	Whether date, purpose of purchase of stamp paper and name of the purchaser are indicated on the back of Stamp paper under the Signature of Stamp vendor?	
3.	Is the date of purchase of stamp paper should be not later than the date of execution of BG and the stamp paper should be purchased either in the name of the executing Bank or the party on whose behalf the BG has been issued. Also the Stamp Paper should not be older than six (6) months from the date of execution of BG.	
4.	Has the executing Officer of BG indicated his name, designation and Power of Attorney No./Signing Power no. on the BG?	
5.	Is each page of BG duly signed/initialed by executants and whether stamp of Bank is affixed thereon?	

6.	Whether the last page is signed with full particulars including two witnesses under seal of Bank as required in the prescribed Performa?	
7.	Does the Bank Guarantees compare verbatim with the Performa prescribed in the Bid Documents?	
8.	Are the factual details such as Bid Document No./Specification No./LOA No. (if applicable)/Amount of BG and Validity of BG correctly mentioned in the BG?	
9.	Whether overwriting/cutting if any on the BG have been properly authenticated under signature & seal of executant?	
10.	Is the amount and validity of BG is in line with contract provisions?	
11.	Whether the BG has been issued by a reputed (i) Public Sector Bank located in India; or (ii) Scheduled Commercial Indian Private Bank as per the attached list only [List is placed at BDS] (the applicability of the bank shall be in line with the provisions of bidding documents)?	

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



Form PBQ: Pre-bid Queries to be raised by Bidder

[Prepare this Queries to be raised by Bidder on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

Date: *[Insert date of Bid submission]*

Bid reference No.: *[Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]*

Project: *Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.*

Bidder's Legal Name: *[insert full name]*

Page: *[insert page number] of [insert total number] pages*

To

The General Manager,
Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road, Chennai - 600 006

Dear Sir,

Sub: Tender for the selection of developer(s) to Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW – Regarding.

Please find below our queries for the said tender:

List of Pre-Bid Queries			
Sl.No.	Clause No.	Clarification sought/ Change suggested	Rationale behind the suggested change

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



Form POA: Power of Attorney

(To be on non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution.)

Power of Attorney to be provided by the Bidding Company in favour of its representative as evidence of authorized signatory's authority.

Know all men by these presents, we..... (Name and address of the registered office of the Bidding Company as applicable) do hereby constitute, appoint and authorize Mr./Ms. (name & 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 the tender. No..... dated issued by TEDA, Chennai 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 TEDA may require us to submit. The aforesaid Attorney is further authorized for making representations to TEDA and providing information/responses to TEDA representing us in all matters before TEDA and generally dealing with TEDA in all matters in connection with this Bid till the completion of the bidding process as per the terms of the above mentioned tender.

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 tender.

Signed by..... (Insert the name of the executant company) through the hand of Mrduly authorized by the Board (vide Board resolution No) to issue such Power of Attorney

Dated this day of

Accepted.....

Signature of Attorney

(Name, designation and address of the Attorney)

Attested.....

(Signature of the executant)

(Name, designation and address of the executants)

.....

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
(Board of Director's Resolution is also enclosed)

WITNESS**1. Signature**

Name

Designation

2. Signature

Name

Designation

**Note**

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) and the same should be under common seal of the executant affixed in accordance with the applicable procedure. Further, the person whose signatures are to be provided on the power of attorney shall be duly authorized by the executant(s) in this regard.

The person authorized under this Power of Attorney, in the case of the Bidding Company/Lead Member being a public company, or a private company which is a subsidiary of a public company, in terms of the Companies Act, 1956, with a paid-up share capital of more than ₹5.00 crores (Rupees five crores), should be the Managing Director/whole time director/manager appointed under section 269 of the Companies Act, 1956. In all other cases the person authorized should be a director duly authorized by a board resolution duly passed by the Company.

Also, wherever required, the executant(s) should submit for verification the extract of the chartered documents and documents such as a Board resolution/power of attorney, in favour of the person executing this power of attorney for delegation of power hereunder on behalf of the executant(s).



Form DTR: Schedule of Deviations from Technical Requirements

[Prepare this Schedule of Deviations from Technical Requirements on stationery with its letterhead clearly showing the Bidder’s complete name and business address.]

Date: *[Insert date of Bid submission]*

Bid reference No.: *[Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]*

Project: *Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.*

Bidder’s Legal Name: *[insert full name]*

Page: *[insert page number] of [insert total number] pages*

Schedule of Deviations from Technical Requirements		
Section	Clause No.	Deviation

 **Note**

Deviation if not listed in this will not be considered and it will be assumed that there are no deviations.

The bidder hereby certifies that the above mentioned are the only deviations from the Commercial Requirements and the tender confirms to the specification in all other respects without any reservations.

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



Form DCR: Schedule of Deviations from Commercial Requirements

[Prepare this Schedule of Deviations from Commercial Requirements on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

Date: *[Insert date of Bid submission]*

Bid reference No.: *[Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]*

Project: *Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.*

Bidder's Legal Name: *[insert full name]*

Page: *[insert page number] of [insert total number] pages*

Schedule of Deviations from Commercial Requirements		
Section	Clause No.	Deviation



Note

Deviation if not listed in this will not be considered and it will be assumed that there are no deviations.

The bidder hereby certifies that the above mentioned are the only deviations from the Commercial Requirements and the tender confirms to the specification in all other respects without any reservations.

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



Form OIR: Declaration Regarding No Omissions or Inconsistencies or Reservations

[Prepare this Schedule of Declaration Regarding No Omissions or Inconsistencies or Reservations on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

Date: *[Insert date of Bid submission]*

Bid reference No.: *[Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]*

Project: *Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.*

Bidder's Legal Name: *[insert full name]*

Page: *[insert page number] of [insert total number] pages*

To

The General Manager,
Tamil Nadu Energy Development Agency,
5th Floor, EVK Sampath Maaligai,
No.68, College Road, Chennai - 600 006

Dear Sir,

Sub: Tender for the selection of developer(s) to Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW – Regarding.

Dear Sir,

We confirm that Bid submitted by us and have been filled up by us as per the provisions of the Tender Document issued vide above-referenced NIT. Further, we have noted that the same shall be evaluated as per the provisions of the Tender Document.

Further, we hereby confirm that except as mentioned in the Declaration Regarding Technical Deviations and Commercial Deviations to the Provisions hereof and/or the Covering Letter, forming part of our Bid Envelope:

- i. There are no discrepancies/inconsistencies and deviations/omissions/reservations to the Tender Document, in the price bid;
- ii. The description of items and the unit thereof in the price schedules are in conformity with those indicated in the price schedule of the Tender Document without any deviation to the specified scope of work.

We also confirm that in case any discrepancies/inconsistencies and deviations/omissions/reservations, as referred to in para (i) and (ii) above, is observed in the price bid, the same shall be deemed as

withdrawn/rectified without any financial implication, whatsoever to TEDA. However, in case of any arithmetical errors, the same shall be governed as per ITB §-35”.

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



Form MAS: Details of Materials and Services to be Offered

[Prepare this Schedule of Details of Materials and Services to be Offered on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

Date: *[Insert date of Bid submission]*

Bid reference No.: *[Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]*

Project: *Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.*

Bidder's Legal Name: *[insert full name]*

Page: *[insert page number] of [insert total number] pages*

To

The General Manager,
Tamil Nadu Energy Development Agency,
5th Floor, EVK Sampath Maaligai,
No.68, College Road, Chennai - 600 006

Dear Sir,

Sub: Tender for the selection of developer(s) to Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW – Regarding.

Dear Sir,

We confirm that Bid submitted by us and have been filled up by us as per the provisions of the Tender Document issued vide Bid Reference No. cited. Further, we have noted that the same shall be evaluated as per the provisions of the Tender Document.

Further, we hereby confirm that we will procure the materials required for the successful completion of the project from the manufacturer/Distributor as per the Table A – Details of Materials.

Table A – Details of Materials		
Sl.No	Detail of material proposed for supply	Name of the Manufacturer/Distributor with whom the Bidder has made MOU for supply of material under this project
1.	SPV Modules	
2.	Grid-tie/Hybrid Inverters	
3.	Module Mounting Structures	
4.	AC Distribution Box	
5.	DC Distribution Box	
6.	AC Cables	

7.	DC Cables	
----	-----------	--

 **Note**

1. Also provide power performance test data sheets of all modules. The exact power of the module shall be indicated if the data sheet consists of a range of modules with varying output power.
2. Also provide complete technical data sheets for each equipment giving details of the specifications along with make/makes along with basic design of the PV Installation setup and power evacuation, synchronization along with protection equipment.

Table B – Details of Service Centres (Existing)		
Sl.No	Address of the Service Center	Name of contact Person and Phone No.
1.		
2.		
3.		
4.		
5.		

Table C – Details of Service Centres (Proposed)		
Sl.No	Address of the Service Center	Name of contact Person and Phone No.
1.		
2.		
3.		
4.		
5.		

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



Form MOE: Declaration for using same Make of Equipments as per the Type Test Certificate

[Prepare this Schedule of Declaration for using same Make of Equipments as per the Type Test Certificate on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

Date: *[Insert date of Bid submission]*

Bid reference No.: *[Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]*

Project: *Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.*

Bidder's Legal Name: *[insert full name]*

Page: *[insert page number] of [insert total number] pages*

To

The General Manager,
Tamil Nadu Energy Development Agency,
5th Floor, EVK Sampath Maaligai,
No.68, College Road, Chennai - 600 006

Dear Sir,

Sub: Tender for the selection of developer(s) to Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW – Regarding.

Dear Sir,

We are agreeing to accept that the same make of all materials for which the Type Test Reports are to be furnished. In case, if some different make of materials will be supplied during the implementation or Comprehensive Maintenance period, we will submit the test report for that particular make component(s). We also agree that such Test Reports shall be issued by National Institute of Solar Energy or any other lab accredited by NABL.

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:

■■■■■■■■

Form DAC – Disclosure for ALMM Compliance

[Prepare this Schedule of Disclosure for ALMM Compliance on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

Date: *[Insert date of Bid submission]*

Bid reference No.: *[Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]*

Project: *Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.*

Bidder's Legal Name: *[insert full name]*

Page: *[insert page number] of [insert total number] pages*

To

The General Manager,
Tamil Nadu Energy Development Agency,
5th Floor, EVK Sampath Maaligai,
No.68, College Road, Chennai - 600 006

Dear Sir,

Sub: Tender for the selection of developer(s) to Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW – Regarding.

Dear Sir/ Madam,

We declare that we are fully aware of the binding provisions of the ALMM Order and the Lists(s) thereunder, while quoting the rate for the subject tender of "The Manufacturing, Testing, Packing and Forwarding, Supply and Transportation of 20 MW_p domestically manufactured Solar PV Modules".

We further understand that the List-I (Solar PV Modules) of ALMM Order, Annexure-I of the OM, issued by MNRE on 10th March, 2021 will be updated by MNRE from time to time. We also understand that the Modules to be procured for this project, shall be from the List-I of the ALMM Order applicable on the date of invoicing of such modules

We also further understand and accept that we shall be liable for penal action, including but not limited to blacklisting and invocation of Performance Bank Guarantee, if we are found not complying with the provisions of ALMM Order, including those mentioned above.

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:

■■■■■■■■

B. Price Schedule

Price Schedule - Abstract

[Prepare this Price Schedule on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

Date: [Insert date of Bid submission]

Bid reference No.: [Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]

Project: Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.

Bidder's Legal Name: [insert full name]

JV Member's legal name: [insert full name of Bidder's party]

Page: [insert page number] of [insert total number] pages

Price Schedule – Abstract									
Sl.No.	Description of work	Capacity (kW _p)	Quantity	UOM	Basic Price per kW _p (₹)	GST (%)	GST (₹)	Amount per kW _p (₹)	Amount per kW _p (in words)
(1)	(2)	(3)	(4)	(5)	(4)	(5)	(6) = (4) x (5)	(7) = (4) + (6)	(7)
1.	Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV	Upto 3 kW _p	1	kW _p					

2.	<i>Systems of various capacities for buildings of Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model. in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW.</i>	> 3 kW_p and ≤ 10 kW_p	1	kW _p					
3.		> 10 kW_p and ≤ 100 kW_p	1	kW _p					
4.		> 100 kW_p	1	kW _p					
5.		<i>Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Hybrid Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model with 3 kW Hybrid inverter and 5 kWh Battery Bank.</i>	3 kW_p	1	kW _p				
Total									
Amount in words									

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



Price Schedule - Engineering, Procurement and Commissioning

[Prepare this Price Schedule on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

Date: [Insert date of Bid submission]

Bid reference No.: [Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]

Project: Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.

Bidder's Legal Name: [insert full name]

JV Member's legal name: [insert full name of Bidder's party]

Page: [insert page number] of [insert total number] pages

Price Schedule – Grid Connected Rooftop Solar PV System - EPC (For project capacity upto to 3 kW_p)

Sl.No.	Description of Item	Quantity	UOM	Basic Price per kW _p (₹)	Basic Price per kW _p (in words)
(1)	(2)	(3)	(4)	(5)	(6)
1.	Supply of PV modules as specified in the bid document	1	kW		
2.	Supply of Grid-tie PCU/Inverters as specified in the bid document	1	kW		
3.	Supply of Module Mounting Structures as specified in the bid document	1	Set		
4.	Cables (DC, AC)	1	Set		

5.	Supply of Balance of System including all equipments, materials, earthing kits, accessories, etc., and any other supplies specified in the bid document excluding the above items,	1	Set		
6.	Design, Engineering, Installation, Erection, Testing and Commissioning including Performance Testing in respect of all the Equipments Supplied and any other Services Specified in the Tender Documents	1	Lumpsum		
Grand Total (For project capacity upto to 3 kW _p - Grid Connected Rooftop Solar PV System)					
Amount in words					

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:

Price Schedule – Grid Connected Rooftop Solar PV System - EPC (For project capacity from 3 kW_p to 10 kW_p)

Sl.No.	Description of Item	Quantity	UOM	Basic Price per kW _p (₹)	Basic Price per kW _p (in words)
(1)	(2)	(3)	(4)	(5)	(6)
1.	Supply of PV modules as specified in the bid document	1	kW		

2.	Supply of Grid-tie PCU/Inverters as specified in the bid document	1	kW		
3.	Supply of Module Mounting Structures as specified in the bid document	1	Set		
4.	Cables (DC, AC)	1	Set		
5.	Supply of Balance of System including all equipments, materials, earthing kits, accessories, etc., and any other supplies specified in the bid document excluding the above items,	1	Set		
6.	Design, Engineering, Installation, Erection, Testing and Commissioning including Performance Testing in respect of all the Equipments Supplied and any other Services Specified in the Tender Documents	1	Lumpsum		
Grand Total (For project capacity from 3 kW _p to 10 kW _p - Grid Connected Rooftop Solar PV System)					
Amount in words					

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:

Price Schedule – Grid Connected Rooftop Solar PV System - EPC (For project capacity from 10 kW_p to 100 kW_p)					
Sl.No.	Description of Item	Quantity	UOM	Basic Price per kW_p (₹)	Basic Price per kW_p (in words)
(1)	(2)	(3)	(4)	(5)	(6)
1.	Supply of PV modules as specified in the bid document	1	kW		
2.	Supply of Grid-tie PCU/Inverters as specified in the bid document	1	kW		
3.	Supply of Module Mounting Structures as specified in the bid document	1	Set		
4.	Cables (DC, AC)	1	Set		
5.	Supply of Balance of System including all equipments, materials, earthing kits, accessories, etc., and any other supplies specified in the bid document excluding the above items,	1	Set		
6.	Design, Engineering, Installation, Erection, Testing and Commissioning including Performance Testing in respect of all the Equipments Supplied and any other Services Specified in the Tender Documents	1	Lumpsum		
Grand Total (For project capacity from 10 kW _p to 100 kW _p - Grid Connected Rooftop Solar PV System)					
Amount in words					

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:

Price Schedule – Grid Connected Rooftop Solar PV System - EPC (For project capacity above 100 kW_p)					
<i>Sl.No.</i>	<i>Description of Item</i>	<i>Quantity</i>	<i>UOM</i>	<i>Basic Price per kW_p (₹)</i>	<i>Basic Price per kW_p (in words)</i>
(1)	(2)	(3)	(4)	(5)	(6)
1.	<i>Supply of PV modules as specified in the bid document</i>	<i>1</i>	<i>kW</i>		
2.	<i>Supply of Grid-tie PCU/Inverters as specified in the bid document</i>	<i>1</i>	<i>kW</i>		
3.	<i>Supply of Module Mounting Structures as specified in the bid document</i>	<i>1</i>	<i>Set</i>		
4.	<i>Cables (DC, AC)</i>	<i>1</i>	<i>Set</i>		
5.	<i>Supply of Balance of System including all equipments, materials, earthing kits, accessories, etc., and any other supplies specified in the bid document excluding the above items,</i>	<i>1</i>	<i>Set</i>		

6.	<i>Design, Engineering, Installation, Erection, Testing and Commissioning including Performance Testing in respect of all the Equipments Supplied and any other Services Specified in the Tender Documents</i>	<i>1</i>	<i>Lumpsum</i>		
Grand Total (For project capacity above 100 kW _p - Grid Connected Rooftop Solar PV System)					
Amount in words					

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:

Price Schedule – Grid Connected Hybrid Rooftop Solar PV System - EPC (For project capacity 3 kW_p)

<i>Sl.No.</i>	<i>Description of Item</i>	<i>Quantity</i>	<i>UOM</i>	<i>Basic Price per kW_p (₹)</i>	<i>Basic Price per kW_p (in words)</i>
(1)	(2)	(3)	(4)	(5)	(6)
1.	<i>Supply of PV modules as specified in the bid document</i>	<i>1</i>	<i>kW</i>		
2.	<i>Supply of Grid-tie Hybrid PCU/Inverters, 3 kW as specified in the bid document</i>	<i>1</i>	<i>kW</i>		

3.	Supply of Module Mounting Structures as specified in the bid document	1	Set		
4.	Cables (DC, AC)	1	Set		
5.	Supply of 5 kWh Lithium Ferro Phosphate Battery Bank	1	Set		
6.	Supply of Balance of System including all equipments, materials, earthing kits, accessories, etc., and any other supplies specified in the bid document excluding the above items,	1	Set		
7.	Design, Engineering, Installation, Erection, Testing and Commissioning including Performance Testing in respect of all the Equipments Supplied and any other Services Specified in the Tender Documents	1	Lumpsum		
Grand Total (For project capacity upto 3 kW _p - Grid Connected Hybrid Rooftop Solar PV System)					
Amount in words					

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



Form SPS: Schedule of Provisional Sums

[Prepare this Schedule of Provisions on stationery with its letterhead clearly showing the Bidder's complete name and business address.]

Date: *[Insert date of Bid submission]*

Bid reference No.: *[Insert Bid reference No. and Date as specified in the Bid Information Sheet, IFB §-6.2]*

Project: *Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model.*

Bidder's Legal Name: *[insert full name]*

Page: *[insert page number] of [insert total number] pages*

Schedule of Provisional Sums		
Item No.	Description	Amount
1.		
2.		
3.		
4.		
5.		



Note to the Bidders

Provisional Sums included and designated above shall be expended in whole or in part at the direction of the Project Manager and in accordance with GC §-39.4.

For evaluation purposes, Provisional Sum will be excluded

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



C. Technical Proposal

1. Technical Proposal

- 1.1. To establish the conformity of the Goods and Related Services to the Bidding Document, the Bidder shall furnish as part of its Bid a complete list of goods as given in the Price Bid without prices, the documentary evidence wherever applicable that the Goods and Related Services conform to the requirements specified.
- 1.2. Apart from the technical requirements as stipulated in the bid documents, data sheets etc. the documentary evidence may be in the form of literature, drawings or data, and shall consist of a detailed item-by-item description of the essential technical and performance characteristics of the Goods and Related Services, demonstrating substantial responsiveness of the Goods and Related Services to those requirements. If applicable, a statement of deviations and exceptions to the provisions of Technical specifications will be submitted by the bidder separately.
- 1.3. The Bidder can submit a maximum of three (3) PVSyst Simulation Reports using SRRA station data (SRRA stations in Tamil Nadu) for each of the project capacity along with Technical Offer. The bidder can submit more than one (up to a maximum three (3)) PVSyst report based on different combination of PV modules and inverters to obtain a minimum Performance Ratio (PR) of 75% or above etc.) and maintain minimum of 19% Capacity Utilization Factor (CUF) and submit all the details. The bidder should also submit a soft copy of PV Syst simulation file. The successful bidder will be bound to use the combination of PV panels and Inverter used in the PVSyst Simulation Report. The latest one year SRRA station data required for generation of PVSyst report will be provided by NIWE free of cost on official request of potential bidders.
- 1.4. The PV Plant installation & commissioning and O& M for the required period shall be with the same combination of components as per the successful bid offer.

2. Design Methodology

2.1. Grid-connected/Hybrid Solar Photo-Voltaic System

[The Bidder shall briefly but as clearly as possible describe the Solar PV System and describe the major system components and their sizing.]

2.2. Solar PV Module

[The Bidder shall briefly but as clearly as possible describe the Solar PV module to be used and describe the make/model with relevant technical details and submit suitable data-sheets obtained from the manufacturer.]

2.3. Solar PV Grid-tie/Hybrid Inverters

[The Bidder shall briefly but as clearly as possible describe the Solar PV Grid-tie/Hybrid Inverters to be used and describe the make/model with relevant technical details and submit suitable data-sheets obtained from the manufacturer.]

2.4. Module Mounting Structures

[The Bidder shall briefly but as clearly as possible describe the Module Mounting Structure to be used and describe the make/model with relevant technical details and submit suitable data-sheets obtained from the manufacturer.]

2.5. Junction Box

[The Bidder shall briefly but as clearly as possible describe the Junction Box/String Combiner Box to be used and describe the make/model with relevant technical details and submit suitable data-sheets obtained from the manufacturer.]

2.6. AC Distribution Box

[The Bidder shall briefly but as clearly as possible describe the AC Distribution Box to be used and describe the make/model with relevant technical details and submit suitable data-sheets obtained from the manufacturer.]

2.7. Cables

[The Bidder shall briefly but as clearly as possible describe the Cables, both AC and DC to be used and describe the make/model with relevant technical details and submit suitable data-sheets obtained from the manufacturer.]

2.8. Earthing and Lightning Protection

[The Bidder shall briefly but as clearly as possible describe the Earthing and Lightning Protection to be used and describe the make/model with relevant technical details

and submit suitable data-sheets obtained from the manufacturer.]

3. System Design

3.1. Single Line Diagram

3.1.1. *[The Bidder shall insert the Single Line Diagram for Plants upto 10 kW]*

3.1.2. *[The Bidder shall insert the Single Line Diagram for Plants above 10 kW and upto 100 kW]*

3.1.3. *[The Bidder shall insert the Single Line Diagram for Plants above 100 kW]*

3.2. Bill of Quantities

Sl.No.	Description	Unit	Quantity	Make
1.	Solar PV Modules	Nos.		
2.	XXXX kW String/Hybrid Inverter	Nos.		
3.	Module mounting structure(MS Hot Dip Galvanized with appropriate analysis for Load/Wind speed)	Set		MNRE/Indian Standards complied
4.	Electrical Accessories including cables & conduit	Set		MNRE/Indian Standards complied
5.	Mounting structure earthing points	Points		As per CEIG Rules and Recommendations
6.	Lightning Arrestor and earthing kits (If Required)	Points		As per CEIG Rules and Recommendations
7.	Junction Box	Nos.		
8.	AC Distribution Box			

4. Method Statement

[The Bidder shall briefly but as clearly as possible describe including but not limited to the following:

- *the site establishment (start of works),*
- *scaffolding and installation of module mounting structures and solar PV modules,*
- *General site health and safety, PV specific health and safety,*
- *Personal Protective Equipment,*
- *Testing and commissioning,*
- *Handing over,*
- *etc.,]*

5. Mobilization and Installation Schedule**5.1. Mobilization Schedule**

[The Bidder shall insert the Mobilization Schedule.]

5.2. Design, Supply and Installation Schedule

[The Bidder shall insert the Design and Construction Schedule.]



This page intentionally left blank



**Tamil Nadu Energy Development Agency
Chennai, Tamil Nadu**

Section IV

Employer's Requirements

This Section contains a descriptions of the functional and/or performance specification of the Solar Power Plant to be supplied and commissioned.

*Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road, Chennai – 600 006,
Phone: 044-28242800,
e-mail: dgm2@teda.in, tender@teda.in
website: www.teda.in*

This page intentionally left blank

A. Scope of Work

1. Disclaimer

1.1. The specifications mentioned for all the equipments which include Solar PV modules, PCU, Combiner Boxes, DC cables, Module Mounting Structures, Transformer, CT, PT, LT/HT cables, interfacing panels, Switchgears and other associated equipment etc., to complete the power generation and establishing grid connectivity, in the present bidding documents are for the reference only. Any revision/alteration as per the design/planning/good engineering practices etc., shall be carried out by the selected bidder, to the satisfaction of the Employer or its authorized representatives. It is advised that the bidders must satisfy himself with the prevailing site conditions before starting the designing/planning. The design must be optimized as per the site conditions and directed to achieve the maximum output from the installed capacity at all times. Moreover, the components not separately mentioned, but are required to complete the plant for operation is also included in the scope of bidder and shall be vetted by the Employer or its authorized representatives.

2. Definition

2.1. A Grid Tied Solar Rooftop Photo Voltaic (SPV) power plant consists of SPV array, Module Mounting Structure, Power Conditioning Unit (PCU) consisting of Maximum Power Point Tracker (MPPT), Inverter, and Controls & Protections, interconnect cables, Junction boxes, Distribution boxes and switches. PV Array is mounted on a suitable structure. Grid tied SPV system is without battery and should be designed with necessary features to supplement the grid power during day time. Components and parts used in the SPV power plants including the PV modules, metallic structures, cables, Junction Box, switches, PCUs etc., should conform to the BIS or IEC or international specifications, wherever such specifications are available and applicable.

2.2. The system should be capable for exporting the generated AC power to the Grid, whenever the Grid is available with all System Protection facilities.

3. Detailed Scope of Work

3.1. Overall Scope

3.1.1. Scope of work under this tender covers Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu under CAPEX model for a cumulative capacity of 20 MW. Survey shall include assessing the works/approvals, sizing of the PV system required on the Sites/ location of the list of consumers which will be provided by TEDA.

3.1.2. The solar PV plants shall consist of complete system including PV modules, grid-tie/hybrid inverters, module mounting structures (MMS), AC and DC junction boxes, solar meter, net-meter, cables, earthing,

lightning protection, associated civil works, and accessories as described in this section.

- 3.1.3.** The capacities of the Grid Connected solar PV plants shall have SPV system unit sets $\leq 3 \text{ kW}_p$, $> 3 \text{ kW}_p$ & $\leq 10 \text{ kW}_p$, $> 10 \text{ kW}_p$ & $\leq 100 \text{ kW}_p$, and $> 100 \text{ kW}_p$. The capacity of the PV plant shall be based on the existing sanctioned demand of the office building where the system will be installed.
- 3.1.4.** The capacity of the Grid Connected Hybrid solar PV plants shall be with 3 kWp Hybrid inverter and 5 kWh Battery Bank.
- 3.1.5.** All components and works shall adhere to relevant Indian Standards, State and Central policies and regulations, and all statutory provisions under the Indian law.
- 3.1.6.** The Contractor shall be entirely responsible for the execution of the Scope of Work in accordance to this tender document including but not limited to its specification, schedules, and annexure. The Contractor shall further provide guarantee and be responsible for the quality and workmanship of all materials and completed works, survey, correct designs and drawings, correct delivery of material, erection, testing, commissioning and comprehensive maintenance. The contractor shall furnish the guarantee as per Contract Forms – Form GUC – Guarantee Card.
- 3.1.7.** The Contractor after completion of site survey, have to submit Site Survey Report, as per format given by TEDA, duly signed by Construction Manager of the Contractor and the beneficiary. All final specifications, designs, drawings bill of material, quality assurance plan, etc. shall be inspected, vetted and approved by TEDA. After scrutiny of the Site Survey Reports, TEDA will issue Notice to Proceed (NTP) specifying the quantity. Survey shall include assessing the works/approvals required on the sites/buildings of the list of Government offices which will be provided by TEDA.
- 3.1.8.** The Contractor shall be responsible to obtain necessary approval and clearance from TANGEDCO and Electrical Inspectorate as per TNERC regulations as amended from time to time, if required, in order to successfully complete the Scope of Work.
- 3.1.9.** Metering and grid connectivity of the projects under this scheme would be the responsibility of the Contractor(s) in accordance with the prevailing guidelines of the TNERC, as amended from time to time.
- 3.1.10.** Contractor shall adhere to all Boundary Conditions described in this section including but not limited to outreach and handholding of beneficiary consumer(s); integrating the Contractor's own Scope of Work with the supplier of the metering and communicating equipment; obtaining insurance on the PV system including metering set; and so on.

- 3.1.11.** It is mandatory for the Contractor to provide for Comprehensive Maintenance Contract (CMC) for five (5) years from the accepted Commercial Operation Date. The CMC of Solar Photo voltaic Power Plant would include warranty against wear, tear, overhauling, machine breakdown, insurance, and replacement of defective modules, inverters/Power Conditioning Unit(PCU), spares, consumables & other parts for a period of five (5) years.
- 3.1.12.** The Contractor shall completely adhere to the installation guidelines of Inverter Manufacturer including but not limited to protection from exposure to sun, rain and other weather conditions.
- 3.1.13.** Systems installed under this scheme shall meet technical specification and construction standards as specified by the BIS or IEC or international specifications and MNRE from time to time. Non-compliance will be taken seriously to the extent of blacklisting of the Contractor, in the same manner as specified, apart from taking action under any other law in force. Following parts for each SPV projects are mainly required to be supplied.
- i.** SPV Module of capacity of Minimum 500 W_p.
 - ii.** Inverter equivalent to the plant capacity
 - iii.** PVC insulated copper cables as per BIS Codes for AC & DC inter connections
 - iv.** Junction Boxes with Surge Protection Device (SPD).
 - v.** Structure for solar PV project shall be Aluminum/MS Hot Dipped Galvanized
 - vi.** AC Distribution Box with SPD and MCB/MCCB, Bi-directional solar meter and necessary protection as per CEA rules and safety regulations
 - vii.** Lightning arrester
 - viii.** Earthing as per BIS/IS standards required for the SPV Power Plant
 - ix.** Operation and Maintenance manual and warranty card in English and Tamil Language
 - x.** Any other part as per site requirement
 - xi.** Drawings and Manuals
- 3.1.14.** The Contractor will help the user in all respect such as filing of application online, electrical inspection etc. till installation of Bi-Directional Service Connection Meter.
- 3.1.15.** The Contractor shall provide a generation guarantee and maintain an active local office cum service center in each operation district where

work is carried on under this tender, to rectify faults within the stipulated time frame described in this section. Such office cum service centers shall have spares for the system and repair facilities. The Concerned Nodal officer of TEDA shall verify this fact and only then Contractor shall be allowed to install the systems. A leaflet containing the details of operation and the service centers shall be provided to each beneficiary as well as to TEDA.

- 3.1.16.** The Contractor shall adhere to best practices in terms of safety, quality and performance while undertaking the Scope of Work, and the same shall be included within the Contractor's contract price.
- 3.1.17.** The Contractor shall repair at its own cost any damage caused to TANGEDCO's/beneficiary's premises due to implementation of the Scope of Work.
- 3.1.18.** Submission of brochures, technical specifications, designs, data-sheets, etc. at the time of Bidding do not imply approval of the same. All such approvals shall be taken up separately at the time of project execution by the Contractor from TEDA.
- 3.1.19.** PERT/CPM detailed project monitoring charts and schedules along with critical tasks/activities to be monitored along with dates for easy reviews to be submitted with in 15days from the date of LOI.

3.2. Size of Projects (Rooftops)

It is proposed to install grid connected rooftops of the Government offices for an estimated capacity mentioned in IFB §-6.5. The size of each project shall be as per the following table for identified rooftops of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions, connected to TANGEDCO's distribution network. One project may however comprise of several rooftop units. Each roof top unit can separately connect with the grid and may have separate meters.

Sl.No.	Part	Capacity
1.	Part A	upto 3 kW _p (Grid-connected)
2.	Part B	Above 3 kW _p to 10 kW _p (Grid-connected)
3.	Part C	Above 10 kW _p to 100 kW _p (Grid-connected)
4.	Part D	Above 100 kW _p (Grid-connected)
5.	Part E	upto 3 kW _p (Grid-connected Hybrid)

**Note**

- The allocated capacity may be composed of different parts.

3.3. Obligation towards Consumers

- 3.3.1.** It shall be the prime responsibility of the Contractor to manage all Consumers (buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions) allotted to the Contractor.
- 3.3.2.** The Contractor shall directly deal with the Consumers on a regular basis to:
- i. Obtain all necessary approvals, permissions, etc. towards installation and commissioning of the PV system on behalf of the Consumer,
 - ii. Obtain the necessary insurance on the PV system on behalf of the Consumer, if required,
 - iii. Coordinate successful operation and maintenance of the PV system.
- 3.3.3.** The Contractor shall identify a suitable location for the installation of the PV system within the premises of the Consumer. The cable routing of the PV system shall also be mutually agreed upon by the Contractor and the Consumer. The Scope of Work also includes AC cabling between the inverter and interconnection point.
- 3.3.4.** The Contractor shall provide prompt service to the Consumer in times of fault of breakdown of the PV system. Any complaint received from the Consumer shall be rectified by the Contractor within forty-eight (48) hours of such complaint. The Contractor shall be liable for loss of generation from the PV system arising from persisting fault beyond the 48-hour period and shall compensate the Consumer as specified in the Appendix 8 (Functional Guarantees) to the Contract Agreement.
- 3.3.5.** The contractor will update the status of fault rectification on TEDA's website/call centre, which will be established separately, for online monitoring of the complaints registered and services being provided by the Contractor.
- 3.3.6.** The Contractor will educate the consumers on the process for registering the complaints on Call Center/toll free nos. The details of office-cum-service centers along with telephone numbers & contact persons of firm & details of TEDA offices, address and telephone numbers must be provided to each consumer. Consumers shall also be educated through brochures about do's and don'ts on the system.

3.4. Metering and Grid Connectivity

- 3.4.1.** The Contractor shall work in close coordination with TANGEDCO/TEDA or any other agency assigned by

TANGEDCO/TEDA.

- 3.4.2.** The Contractor shall only utilize grid-tie/hybrid inverters with Modbus communication capability via RS-485 serial port, and share the details of the protocol with TANGEDCO or any other agency assigned by TEDA. Further, the Contractor shall assist TANGEDCO or any other agency assigned by TEDA to ensure successful communication of the inverter data to the designated server provided by TANGEDCO.
- 3.4.3.** The Contractor shall assist TANGEDCO or any other agency assigned by the TEDA in case any hardware adjustments are required by TANGEDCO or any other agency assigned by the TEDA or if any support is required during configuration of the inverter communication or commissioning of the metering and communication hardware.
- 3.4.4.** The Bidder(s) shall be responsible to install the two (2) no's of Single/Three phase bi-directional meters as per TANGEDCO's specification for the purpose of calculating Solar Generation at interconnection point, for the measurement of solar generation, and at service connection point, for the measurement of import/export of energy of solar energy. The Contractor shall integrate meter parameter with the IT Wing of TANGEDCO, if required.

Service Connection Net-Meter: The existing service connection meter needs to be replaced with a bidirectional (import kWh and export kWh) service connection meter with 0.5S class for the purpose of net-metering for eligible categories. Installation of the net meter will be carried out by TANGEDCO. Beneficiary will submit application to TANGEDCO to enable the connectivity of Solar rooftops with Grid and to avail net metering benefits.

Solar Generation Meter: Energy Meters to log the actual value of Energy generated by the PV system be provided. Energy meter if required with CT/PT shall be of 0.5s class accuracy class/as per TANGEDCO guidelines.

- 3.4.5.** All parameters of the meter shall be transferred online to TANGEDCO or any other agency assigned by the TEDA.

3.5. Insurance during Construction of PV system

- 3.5.1.** During the construction period, i.e. before the commissioning of the PV system, all insurance-related expenses shall be borne by the Contractor. The goods supplied by the Contractor shall be fully insured against the loss or damage incidental to manufacture or acquisition, transportation, storage, delivery, theft, natural or other disaster/calamity, etc.
- 3.5.2.** In case of any loss or damage or pilferage or theft or fire accident or natural calamity or combination of the said incidents under the coverage of insurance, the Contractor shall lodge the claim as per

rules of insurance. Any FIR required to be lodged at the local Police Station shall be the responsibility of the Contractor.

- 3.5.3.** The Contractor shall arrange to supply/rectify/recover the materials even if the claim is unsettled for timely completion of the Project. The final financial settlement with the insurance company shall be rested upon the Contractor.

3.6. Insurance during Operation of PV system

- 3.6.1.** Upon commissioning of the PV system, the Contractor shall undertake insurance on the PV system against theft and vandalism and natural calamities for a minimum period of five (5) years and include the same within the quoted cost.
- 3.6.2.** The metering and communication hardware for Solar Generation Meter supplied by Contractor shall also be covered under the insurance by the Contractor at the Contractor's cost.
- 3.6.3.** The Contractor shall assist the Consumer for insurance claims during the five (5) years comprehensive maintenance period.
- 3.6.4.** Not later than 2 months before the end of the term of insurance undertaken by the Contractor, the Contractor shall ensure to provide all the necessary documents and guidance to the satisfaction of the Consumer in order to enable the Consumer, in case he wants to renew or to take up the insurance of the PV system at the end of the term of Insurance.

4. Site Details

- 4.1.** The Project Sites shall be the Government office buildings connected to the TANGEDCO's distribution network. The list of such consumers where grid-connected SPV systems are to be installed & commissioned to solarize such connections shall be provided by TEDA.

5. Requirement of approvals on makes of the Components

- 5.1.** Developers are required to procure modules from MNRE's Approved List of Modules Manufacturers (ALMM) applicable on the bid submission date. The remaining system components may be procured from any source.

The PV Modules should be manufactured in India and should be complied with the prevailing Approved List of Models and Manufacturers of Solar Photovoltaic Modules (Requirement for Compulsory Registration) Order 2019 - Implementation issued vide OM NO. 283/54/2018-GRID SOLAR -Part (I) Dated 10th March 2021 and subsequent amendments Rest of the components can be procured from any source. However, these items should meet the Technical specification and standards mentioned in the bid document. A reference bidders' Declaration format associated with Implementation of ALMM (Form DAC – Disclosure for ALMM Compliance) order will also be required to be signed by the bidder as per the format provided vide MNRE OM No. 283/54/2018-GRID SOLAR -Part (I) Dated 2nd June 2021.

- 5.2. Submission of brochures, technical specifications, designs, data sheets, Type Test Reports etc. at the time of Bidding do not imply approval of the same. All such approvals shall be taken up separately at the time of project execution by the Contractor from TEDA.
- 5.3. All system components must comply with the norms and standards of MNRE and the relevant BIS, IEC, CEA and other standards and codes.
- 5.4. Any other item not specifically mentioned in the specifications but which are required for Supply, Installation, Testing and Commissioning of Distributed Grid-connected SPV Systems for the project are deemed to be included in the scope of the specification as per relevant and latest BIS, IEC, MNRE guidelines, and specified by TEDA unless specifically excluded.

6. Tender Sample Requirement

- 6.1. In case of requirement, the Contractor shall furnish to the Project Manager for approval, when requested or if required by the specifications, adequate samples of all materials and finished to be used in the Work. Such samples shall be submitted before the Work is commenced and in ample time to permit tests and examinations thereof. All materials furnished and finishes applied in actual Work shall be fully equal to the approved samples.
- 6.2. The Contractor(s) shall be required to furnish bid samples along with the Type Test Certificates in accordance with EQC §-2.5.2 (2) for the following items which are proposed to be utilized by the bidder in the project. The following list is only an indicative one and TEDA can ask for any other material sample before use of the material on the Site and the Bidder shall be required to submit the same without fail.
 - 6.2.1. Solar PV Module – 1 No.
 - 6.2.2. Grid-tie/Hybrid inverter – 5 kW (for up to 10 kW range)
 - 6.2.3. Grid-tie/Hybrid inverter – 50 kW (for above 10 kW and up to 100 kW range)
 - 6.2.4. Grid-tie/Hybrid inverter – 100 kW (for above 100 kW)
 - 6.2.5. AC Distribution Box – 1 No.
 - 6.2.6. DC Distribution Box – 1 No.
 - 6.2.7. Earthing Kit – 1 No.
 - 6.2.8. AC Cable – 2 m
 - 6.2.9. DC Cable – 2 m
- 6.3. The Samples should be from the same lot, test certificate of which is submitted along with the tender.
- 6.4. Bidders should ensure that the sample submitted by them fully confirms to all the parameters of the Technical Specification spelt out elsewhere in this document.

- 6.5.** Tender sample should have a card affixed to it duly signed and stamped by the firm indicating the following :-
- 6.5.1.** Name and address of the Bidder.
- 6.5.2.** Bid reference No. and Date
- 6.6.** Bid samples may be examined for any required characteristic, whether or not such characteristic is adequately described in the specification.
- 6.7.** The right of passing or rejecting material, components or makes shall remain with TEDA.
- 6.8.** Samples shall be returned to bidders at their request and expense.

7. Technology Risk

- 7.1.** Only commercially established and operational technologies can be used to minimize the technology related risks and to achieve the Scheduled COD of the Projects. All components of the solar PV plant shall be in accordance with technical specifications given in relevant IS/IEC Standards. The design and commissioning also shall be as per latest IS/IEC standards which are provided in "Section IV, Employer's Requirements (ER)" of this bid document.

B. Technical Specifications

8. Design Philosophy

- 8.1.** In grid-tied Solar Photo-Voltaic (SPV) systems, solar energy is fed into the building loads that are connected to the public electricity grid through a service connection with surplus energy being fed into the grid and shortfall being drawn from the grid. Production of surplus energy may happen when solar energy produced exceeds building load energy demand. This surplus is fed into the grid. During the night, or when during the day energy demand in the building exceeds solar energy production, energy is drawn from the grid. Grid-tied solar PV systems have no battery storage and will not work during grid failure. For buildings with grid-tied solar PV systems, the service connection meter needs to be of the bidirectional type, whereby import kWh and export kWh are separately recorded.
- 8.2.** The grid-tied hybrid Solar Photo-Voltaic (SPV) system has to work in conjunction with the grid in either of the following two scenarios:
- 8.2.1.** In the day time the first priority of the inverter shall be to charge the Battery Bank. Whenever battery reaches float charge, inverter shall be supplying the connected load in conjunction with the grid.
- 8.2.2.** It shall function as a stand-alone power plant feeding the connected loads when grid is not available.

In case inverter is not functioning, there shall be provision to bypass the load on to grid. At any point there shall not be any back feeding to the grid. The system shall consider the best operating scenario as per inverter design for stable operation with optimum utilization of solar energy available and using Lithium Ferro Phosphate

(LiFePo4) batteries for energy storage.

Battery based solar inverter cum charge controller shall be a single component. Charge controller will be integral part of inverter. Charge controller of the solar inverter shall have the MPPT charger in order to charge the battery and shall be internally coupled with inverter section of the solar inverter.

The charge controller shall be having the following functionalities:

- (a) Charge controller shall be capable of 3 step (float, boost and trickle) charging, depending on the state of charge of the battery. Inverter/Charge Controller shall utilise solar/grid power to charge the battery bank till battery reaches float with solar as priority for charging the battery.
- (b) Once the battery cells reach float, solar power generated shall be used to meet the connected site load.
- (c) The priority sequence of serving the load shall be Solar, Grid and Battery during sunshine hours and Battery and Grid during no sunshine period as per the following scenarios:
 - i. **Scenario 1: When solar PV main power is available:**

The solar plant will cater building AC load directly in addition to charging battery banks.
 - ii. **Scenario 2: When power from solar array is not available:**

Charged battery banks will cater building AC load till the battery is discharged to a specified voltage level.
 - iii. **Scenario 3: When battery bank voltage falls below the specified voltage level:**

Loads shall be fed through grid supply.
- (d) Once the battery cell drops below the pre-determined voltage, load should be disconnected from battery automatically. Solar/Grid charging shall commence and continue till battery reaches float. After Battery cells reaches float voltage, charging shall be adjusted in such a way to maintain the float voltage.

8.3. The selected bidder will also have to inspect and suitably decide the point of evacuation of energy generated from the Solar PV Plant. The evacuation arrangement should confirm with the norms of the local utility and approval for the same should be taken from electrical inspector.

8.4. All the components shall be in accordance with technical specifications given in relevant BIS/IEC standards.

- 8.5.** The solar modules will be connected in desired series/parallel combination with system voltage of not more than 1500V DC. The DC Power generated by the Solar Modules will be converted to AC Power by Grid Interactive String/Hybrid Inverter(s) that will deliver Single/Three Phase, 240 V/415 V, 50Hz power output duly synchronized with the incoming Utility power.
- 8.6.** The respective Grid Interactive Solar PV Plant will be connected to the local utility under the net metering agreement wherein the excess energy generated and not consumed by the beneficiary will be credited by the utility in the monthly billing. The net metering agreement of beneficiary with TANGEDCO will be facilitated by the selected bidder and all necessary approvals, permissions, compliances required by TANGEDCO, CEIG or any local authority should be taken by selected bidder.
- 8.7.** In case of failure of grid power, the Inverters having anti-islanding feature will disconnect the supply of the Solar Power from the Solar PV System to avoid reverse feeding into the grid. The system must be designed for maximum safety and durability considering the long life of the solar modules.
- 8.8.** Suitable tilt angle of the Solar Module Mounting structure must be provided in order to ensure the best output from the Solar PV Plant. Inter-row spacing between Module mounting structure must be maintained so that shadowing of Modules is completely avoided during the Solar Generation period.
- 8.9.** The Solar PV Power generating system has to operate in parallel with the grid system which is an infinite electrical system. Any faults not taken care of will damage the Solar PV Plant without affecting the infinite system. Thus the Solar Power Plant has to protect its equipment against any of the possible faults or other disturbances from grid. Very fast microprocessor based Directional and Reverse power flow protection should be provided to ensure complete isolation of the Solar PV Plant from the grid in case of any fault.
- 8.10.** The basic and detailed engineering of the Solar PV Plant shall aim at achieving high standards of operational performance especially considering the following:
- a.** Optimum availability of Solar Modules during the day time
 - b.** Proper layout of Solar Modules and structure to prevent shading of Modules.
 - c.** Selecting the best Grid Interactive String/Hybrid Inverter with high track record, having excellent after sales support and ready availability of spare inverters for quick replacement.
 - d.** Careful logging of operation data/historical information from Data monitoring systems and sending alerts/notifications etc on sms and email for quick rectification of faults.
 - e.** SPV Power plants should be designed to operate satisfactorily in parallel with the Grid only (Solar PV Plants will not run in parallel with DG set) within permissible limits of high voltage and frequency fluctuations.
- 8.11.** Based on the Solar Insolation data, the Solar PV Power System should be so designed that it shall take into the peak and lowest temperatures and suitably select the cable so that all AC side line losses are below 2%.

- 8.12.** If any enclosure or room is needed to house the inverters and other electrical/electronic equipment's, the same must be communicated in writing to TEDA. The required drawing should be submitted and only after the permission is granted by TEDA the bidder would be permitted to construct the same. All costs pertaining to the enclosure/room will have to be borne by the bidder and the same needs to be included in the offer.
- 8.13.** The installation practices should be as per industry standards maintaining all safety standards. Excellent workmanship is expected and aesthetic look and qualitative performance should be as per international/national standards only.
- 8.14.** In locations where there is an existing Solar PV Plant installed within the building, the selected bidder must ensure that the application for enhancement of the Solar PV Plant under net metering is made to the DISCOM and permissions with all regulatory authorities should be availed with the total plant capacity. In location where net metering scheme is not implemented the selected bidder must make a common application with total capacity to the DISCOM and other regulatory authorities.

9. Quality and Workmanship

- 9.1.** Solar PV modules are designed to last twenty-five (25) years or more. It is therefore essential that all system components and parts, including the mounting structures, cables, junction boxes, distribution boxes and other parts also have a life cycle of at least twenty-five (25) years. Therefore all works shall be undertaken with the highest levels of quality and workmanship. During inspection, TEDA and its representatives will pay special attention to neatness of work execution and conformity with quality and safety norms. Non compliant works will have to be redone at the cost of the Installer.

10. PV System Capacity

- 10.1.** The AC and DC Capacity of the grid-connected PV system shall be based on the sanctioned load of the Consumer's service connection. In case the Consumer is applying addition/alteration in sanctioned load, prior to installation of the PV system, then the Contractor shall size the PV system based on the revised capacity of the connection as confirmed by TEDA.

11. Planning and Designing

- 11.1.** The Contractor should carry out Shadow Analysis at the site and accordingly design strings and arrays layout considering optimal usage of space, material and labour. The Contractor should submit the array layout drawings along with Shadow Analysis Report to TEDA for approval
- 11.2.** TEDA reserves the right to modify the layout and specification of sub-systems and components at any stage as per local site conditions/requirements.
- 11.3.** The Contractor shall submit preliminary drawing for approval and based on any modification or recommendation, if any. The Contractor shall submit three (3) sets and soft copy in Pen Drive of final drawing for formal approval to proceed with

construction work.

12. Safety Measures

- 12.1.** The Contractor shall take entire responsibility for electrical safety of the installation(s) including connectivity with the grid and follow all the safety rules & regulations applicable as per Electricity Act, 2003 and CEA guidelines etc.,

13. Civil Work

- 13.1.** The scope works shall cover for all services required for completion of civil works in all respect for PV plant. All machineries, tools and designs to be arranged by Contractor.
- 13.2.** Existing shade-free roof-top space shall be used to install Solar PV array. While installing solar power plants on rooftops, the physical condition of the rooftop, chances of shading, chances water level rise in the rooftop during raining due improper drainage in the roof-top should be taken in to consideration.
- 13.3.** Regarding civil structures the Contractor need to take care of the load bearing capacity of the roof and need arrange suitable structures based on the quality of roof.
- 13.4.** The total load of the structure (when installed with PV modules) on the terrace should be less than 60 kg/m².
- 13.5.** The minimum clearance of the structure from the roof level should be 300 mm.
- 13.6.** The work shall be executed according to the specifications and good standard practice necessary to fulfill the objective of the survey work, strictly in accordance with the instructions and satisfaction of TEDA.
- 13.7.** The roof top should look clean and tidy after installation of the array. Neatness, tidiness and aesthetics must be observed while installing the systems.
- 13.8.** PV array shall be installed in the terrace space free from any obstruction and/or shadow and to minimize effects of shadows due to adjacent PV panel rows.
- 13.9.** PV array shall be oriented in the south direction in order to maximize annual energy yield of the plant.
- 13.10.** The solar PV array must be installed on the rooftop in such a way that there is sufficient space on the rooftop for carrying out maintenance activities.
- 13.11.** There should not be any damage what so ever to the rooftop due to setting up of the solar power plant so that on a later day there is leakage of rainwater, etc. from the rooftop.
- 13.12.** Some civil works are inevitable for erecting the footings for the module mounting structure as discussed in Module Mounting Structure section. The roof top may be given a suitable grading plaster with suitable leak proof compound so as to render the roof entirely leak proof.
- 13.13.** Ample clearance shall be provided in the layout of the inverter and DC/AC distribution boxes for adequate cooling and ease of maintenance.
- 13.14.** While cabling the array, care must be taken such that no loose cables lie on the rooftops.

- 13.15. RCC Works:** All RCC works shall be as per IS 456 and the materials used viz. Cement reinforcement, steel etc. shall be as per relevant IS standards. Reinforcement shall be high strength TMT Fe 415 or Fe 500 conforming to IS: 1786-1985.
- 13.16. Brick Works (If any):** All brick works shall be using 1st class bricks of approved quality as per IS 3102.
- 13.17. Plastering:** Plastering in cement mortar 1:3 shall be applied to all.
- 13.18.** Display of mandatory items- Single Line Diagram and layout diagram of modules and interconnection at installation site shall be provided near the inverter for greater than 10 kW_p systems.
- 13.19.** For painting on concrete, masonry and plastered surface IS:2395 shall be followed. For distemping IS 427 shall be followed referred. For synthetic enamel painting IS 428 shall be followed. For cement painting IS 5410 shall be followed.
- 13.20.** All Civil works required for the installation of the PV Plant and other civil and electrical work in evacuation infrastructure, wherever necessary, shall be within the scope of the bidder
- 13.21.** The layout of Inverter accommodation shall be designed to enable adequate heat dissipation and availability. Mount within the existing infrastructure available in consultation with the Site in charge. String/Hybrid Inverters may be installed with Canopy type structure over it to protect it from frequent monsoon and weather changes.
- 14. PV Modules**
- 14.1. General Requirements**
- 14.1.1.** All PV modules shall carry a performance warranty of > 90% during the first ten (10) years, and > 80% during the next fifteen (15) years. Further, module shall have performance warranty of > 97% during the first year of installation. Degradation of module shall not be more than 0.7% per annum.
- 14.1.2.** The PV modules must be PID compliant, salt mist & ammonia resistant and should withstand weather conditions for the project life cycle
- 14.1.3.** PV module shall have module safety class-II and shall be highly reliable, light weight and must have a service life of more than twenty-five (25) years.
- 14.1.4.** Protective devices against surges at the PV module shall be provided.
- 14.1.5.** All materials used for manufacturing solar PV module shall have a proven history of reliability and stable operation in external applications. It shall perform satisfactorily in temperature between -10 °C to +85°C and shall withstand adverse climatic conditions, such as high speed wind, blow with dust, sand particles, saline climatic/soil conditions.

- 14.1.6.** Modules only with the same rating and manufacturer shall be connected to any single inverter.
- 14.1.7.** The Bidder shall provide in the Bid, Power Performance Test Data sheets of all modules. The exact power of the module shall be indicated if the data sheet consists of a range of modules with varying output power.
- 14.1.8.** TEDA or the TPIA reserves the right to inspect the PV modules at the manufacturer's site prior to dispatch.
- 14.1.9.** RF Identification tag for each solar module shall be provided inside the module and must be able to withstand environmental conditions and last the lifetime of the solar module.
- 14.1.10.** Each PV module used in any solar power Project must use a RF identification tag. The following information must be mentioned in the RFID used on each module (This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions):
- Unique Serial No and Model No of the module
 - Name of the manufacturer of PV Module
 - Name of the Manufacturer of Solar cells
 - Type of cell : Mono
 - Month and year of the manufacture (separately for solar cells and module)
 - Country of origin (separately for solar cells and module)
 - I-V curve for the module at Standard Test Condition (1000 W/m², AM 1.5, 25°C)
 - Wattage, I_m , V_m and FF for the module
 - Unique Serial No. and Model No. of the module
 - Date and year of obtaining IEC PV module qualification certificate
 - Name of the test lab issuing IEC certificate
 - Other relevant information on traceability of solar cells and module as per ISO 9000 series
- 14.1.11.** The Contractor shall arrange an RFID reader to show the RFID details of the modules transported to sites, to the site Engineer in charge up to their satisfaction, which is mandatory for the site acceptance test.
- 14.1.12.** The following details should be provided on the module

- Name of the manufacture
- Month and year of manufacture
- Rated Power at STC
- V_{MP} , I_{MP} , V_{OC} , I_{sc}

14.2. Technical Requirements

The PV modules, wherever applicable, shall meet the following technical requirements.

Parameter	Specification
Cell/Module Technology	Mono-crystalline
Power Rating	The nominal power of a single PV module shall be minimum 500 W _p
Power tolerance	+3%
Temperature co-efficient of power	Not more than -0.4 %/°C
Module Efficiency	≥ 20 %
Fill Factor	Minimum 78 %
Temperature co-efficient of power	Not less than -0.40 %/°C
Application Class as per IEC 61730	Class II
Termination box	IP68, 3 bypass diodes

- 14.2.1.** The Contractor shall employ solar PV module of mono-crystalline silicon solar technology only. The Contractor shall provide detail Technical Data Sheets, Certifications of Standard Testing Conditions (STC: defined as Standard Testing Condition with air mass AM1.5, irradiance 1000W/m², and cell temperature 25°C) as per the latest edition of IEC 61215 and IEC 61730 and as tested by MNRE/IEC recognized test laboratory.
- 14.2.2.** The solar photovoltaic modules shall be with efficiency more than 20% for mono-crystalline silicon based modules and Fill factor of the module shall not be less than 78%.
- 14.2.3.** All modules shall be with positive power tolerance only; i.e. all PV modules shall have 'higher than rated' power output report of flash test at the manufacturing factory, including all measuring and machine tolerance. Negative power tolerance shall not be accepted. The rated power of solar PV module shall have maximum tolerance upto +3%.
- 14.2.4.** The Solar Modules should be rated at 500 W_p and above at STC. Module capacity less than minimum 500 W_p shall not be accepted.
- 14.2.5.** Module rating is considered under standard test conditions, however Solar Modules shall be designed to operate and perform as per installation site condition.

- 14.2.6.** The temperature co-efficient power of the PV module shall not be less than - 0.40%/°C.
- 14.2.7.** Modules shall perform satisfactorily in relative humidity up to 85% and temperature between -10 °C and 85 °C (module temperature).
- 14.2.8.** The I-V characteristics of all modules as per specifications to be used in the systems are required to be submitted at the time of supply.
- 14.2.9.** The mismatch losses for PV modules connected to an inverter shall be less than 1%.
- 14.2.10.** The peak-power point voltage and the peak-power point current of any supplied module and/or any module string (series connected modules) shall not vary by more than one percent (1 %) from the respective arithmetic means for all modules and/or for all module strings, as the case may be.

14.3. Component Requirements

- 14.3.1.** The PV Modules glass panel shall be:
- i. For PV Modules with back sheet, toughened low iron glass with minimum thickness of 3.2 mm for mono-crystalline modules
 - ii. The glass used shall have transmittance of above 90% with anti-reflection Coating.
- 14.3.2.** The back sheet used in the crystalline silicon based modules shall be of 3 layered structure. Outer layer of fluoropolymer, middle layer of Polyester (PET) based and Inner layer of fluoropolymer or UV resistant/PID resistant polymer. Back sheet with additional layer of Aluminium also will be considered. The thickness of back sheet should be of minimum 300 microns with water vapour transmission rate less than 2g/m²/day. The Back sheet shall have voltage tolerance of more than 1000 V. The EVA used for the modules should be of UV resistant in nature. The back sheet shall have the following properties.

Parameters	Description
Material thickness	≥ 300 micron
Water vapour transmission rate	< 2 g/m ² /day
Partial discharge test voltage	≥ 1500 V
Elongation at break	> 100 %
Adhesion strength with encapsulant	> 40 N/cm
Interlayer adhesion strength	> 4 N/cm



Note

The Employer reserves the right to conduct Pressure Cooker (PC) test/Highly Accelerated

Stress Test (HAST) to confirm the durability of the back sheet in accelerated conditions.

- 14.3.3.** No different quality/makes of back sheets shall be used in the single lot of supply of modules.
- 14.3.4.** The PV modules shall have suitable encapsulation and sealing arrangements to protect the silicon cells from environment. The encapsulation arrangement shall ensure complete moisture proofing for the entire life of PV modules.
- 14.3.5.** The encapsulant used for the PV modules should be polyolefin based, UV resistant and PID resistant in nature. No yellowing of the encapsulant with prolonged exposure shall occur. The encapsulant shall have the following properties.

Parameters	Description
Gel content	> 75%
Volume resistivity	> $1 \times 10^{14} \Omega \cdot \text{cm}$
Peeling strength with glass	> 40 N/cm

- 14.3.6.** The sealant used for edge sealing of PV modules shall have excellent moisture ingress protection with good electrical insulation (Break down voltage >15 kV/mm) and with good adhesion strength.
- 14.3.7.** The module frame shall be made of corrosion resistant anodized aluminium, which shall be electrically and chemically compatible with the structural material used for mounting the modules. It is required to have provision for earthing to connect it to the earthing grid. It is required to have provision for earthing to connect it to the earthing grid. Module frame thickness/Height should be minimum 40 mm and the anodization thickness shall not be less than 15 micron.
- 14.3.8.** The Solar PV module shall be free of potential induced degradation (PID). The PID test of module, the system voltage will be subject to a conditioning of three (3) cycles at 85 °C and 85% RH for a period of 96 hours and a cell temperature of 85 °C at 1000 V DC. Test reports for the same shall be submitted. In case of expiration of standards or inapplicability, local standards and regulations may apply.
- 14.3.9.** The PV modules shall be equipped with IP68 or higher protection level Junction Box with a minimum of three (3) numbers of bypass diodes of appropriate rating and with two (2) number of appropriately sized output power cable of symmetric length of IEC 62852/EN 50521 certified MC4 or equivalent solar connectors with 1 meter of TUV 2pfg 1169/09.07 certified Cu cable of 4 mm². The terminal box on the module should have a provision for "Opening" for replacing the cable, if required. The cable length shall be in accordance with the PV Module wiring strategy and adequate to ensure that the cable bending radius standard is not exceeded.

- 14.3.10.** All PV modules shall be certified as per the following Standards:
- IEC 61215 2nd Ed. (Design qualification and type approval for Crystalline Si modules)
 - IEC 61730 (PV module safety qualification testing @ 1000 V DC or higher)
 - IEC 61701: Salt Spray test for highly corrosive environment – Severity Level 6
 - IEC 62716: Ammonia Resistant certified
 - Test certificate from NABL approved or ILAC member body approved labs shall be provided.

14.4. Supplier's Requirements

- 14.4.1.** The PV Module Supplier should have supplied minimum 5 GW capacity globally or 500 MW in India in the past five (5) years as on the last date of the bid submission. A certificate from the Solar PV Module manufacturer shall provided to this effect.
- 14.4.2.** Solar PV modules must have proven history of reliability and stable operation. Contractor/Supplier shall provide the performance certificate from the owner or developer of any grid connected single solar power project of minimum capacity of 2 MW AC, where these modules are working satisfactorily since last one (1) year and where only the proposed manufacturer's modules are used.
- 14.4.3.** The Contractor would be required to maintain accessibility to the list of module IDs/serial numbers along with the parametric data for each module.
- 14.4.4.** The Contractor shall provide sufficient information for the satisfaction of TEDA prior placing the order for the PV modules. The Contractor shall provide the copy of publicly available/published data sheet of technical specifications for modules for each of the vendors in addition to the applicable Test Reports.
- 14.4.5.** The Contractor shall provide Guaranteed Technical Particular (GTP) data-sheet and Bill of Materials (BOM) of the module that is submitted for approval along with the data-sheets of each component. The component data sheet shall contain all the information to substantiate the compliance for component specifications mentioned above.
- 14.4.6.** The Contractor shall also provide test certificates corresponding to the standards mentioned above along with complete test reports for the proposed module. The tests should have been conducted at a test laboratory compliant with ISO 17025 for testing and calibration and accredited by an ILAC/IECEE member signatory. Laboratory accreditation certificate or weblink along with scope of accreditation shall also be submitted.

- 14.4.7.** The BOM proposed shall be the subset of Constructional Data Form (CDF)'s of all the test reports.
- 14.4.8.** The Contractor shall submit a detailed Manufacturing Quality Plan (MQP) for the PV Module with list of checks/tests performed during incoming material inspection, production, pre-dispatch and package.
- 14.4.9.** Prior to the delivery of the product, the contractor shall submit including but not limited to the following documents:
- Guarantees
 - Instructions for installation and operation, manual
 - Test reports for routine tests and acceptance tests etc.
- 14.4.10.** The contractor shall deliver the product to the site only after receiving such approval against their request in writing from TEDA.

14.5. Manufacturing and Inspection

- 14.5.1.** Manufacturing date of all modules used in the project shall not be more than twelve (12) months prior to the date of transfer of ownership to TEDA. The representative of the Contractor must be present at the time of module manufacturing of entire capacity and/or flash testing of modules supplied for the Project. TEDA may also depute its Authorized Representative to be present at the time. In such cases, all the expenses of the Authorized Representative of TEDA towards this visit shall be borne by the Contractor.
- 14.5.2.** The Contractor shall inform the module manufacturing schedule to the Employer at least seven (7) working days before the start of proposed schedule.
- 14.5.3.** Proof of procurement of components like cell, back sheet, lamination material, frames, Glass, sealant etc), mentioning manufacturer name, manufacturing date and relevant test certificate shall be submitted at the time of pre-dispatch inspection and acceptance. The Bill of materials (BOM) used for modules shall not differ in any case from the ones submitted for certification of modules.
- 14.5.4.** The Employer shall perform material inspection at the Manufacturer's factory before the start of proposed manufacturing schedule. Proof of procurement of components as per the approved BOM mentioning manufacturer name, manufacturing date and relevant test certificate shall be submitted during material inspection for verification.
- 14.5.5.** The cells used for module making shall be free from all defects like edge chipping, breakages, printing defects, discoloration of top surface etc. Only Class A solar cell shall be used.
- 14.5.6.** The modules shall be uniformly laminated without any lamination defects.

14.5.7. Current binning of modules shall be employed to limit current mismatch of modules. Different colour codes shall be provided on the modules as well as pallet for identification of different bins. Maximum three (3) nos. of bins will be allowed for each module rating.

14.5.8. Pre-dispatch inspection of modules shall be performed as per the inspection protocol attached in Annexure A - Pre-dispatch Inspection Protocol for Crystalline PV Modules by Employer.

14.6. Module Testing and Approval

14.6.1. PV modules must be tested and approved by one of the IEC authorized test centers. Factory test of the random sample by TEDA is also mandatory. The cost of these testing shall be borne by Contractor. The acceptance criteria for all these tests shall be as per the applicable IEC/IS. Standard Industry practice will be adopted with mutual understanding in case if no such guidelines are available in IEC for any of the test.

14.6.2. Factory Acceptance Tests and Inspections

14.6.2.1. TEDA reserves the right to test the Solar PV Modules before the dispatch to confirm their standards to the contract specifications at no extra cost to TEDA. If required, the pre-dispatch testing of the Solar PV Modules shall be done at the manufacture's place. The parameters should match the IEC/ISI/MNRE/BEE standards specified in tender. If components of the system are not as per the standards, entire lot has to be replaced with new components at Bidder's cost which shall conform to the standards mentioned in the tender. TEDA, reserves the right to verify flash test reports of Solar PV modules/inverters.

14.6.2.2. The test program for the Factory Acceptance Tests (FAT) shall be submitted to TEDA for approval at least four (4) weeks prior to commencing of tests. The test report shall be submitted prior to shipment of material.

14.6.2.3. Contractor shall depute its representatives in the module manufacturer's factory for witnessing of QAP (Quality Assurance Plan) and flash tests of complete production of the modules. TEDA may also depute its Authorized Representative to be present at the time. In such cases, all the expenses of the Authorized Representative of TEDA towards this visit shall be borne by the Contractor.

14.6.2.4. Acceptance Tests as per relevant Indian Standard shall be carried out at the module manufacturer's workshop. Following tests as per relevant Indian/International Standards shall be carried out on certain number of

modules from a lot (decided by TEDA) as acceptance tests of Solar PV Modules:

- Visual Inspection
- Performance Test of the modules at STC and NOCT with Sun Simulator of Class B or better as per Indian Standard
- Performance Test of the modules at low irradiance (200 W/m²) with Sun Simulator of Class B or better as per Indian Standard
- Dielectric withstand test
- Continuity and leakage current test
- Insulation Resistant test
- Wet leakage current test
- Mechanical load test
- Dynamic load test
- Tear off test
- PID Test report will be verified before approval of module make, also one (1) sample randomly selected during inspection by TEDA for entire project will be tested at third party laboratory.
- Any other test as desired by TEDA

14.6.2.5. Arrangements for the aforesaid testing and inspection at manufacturer's site are to be provided by the contractor.

14.6.3. On-Site Tests

14.6.3.1. TEDA may select certain number of modules delivered at site by the contractor on random basis for conducting performance test of those modules from any accredited test laboratory of MNRE/NABL. If there are any discrepancy found in the test results and the values specified by the contractor, the contractor will be bound to accept the decision made by TEDA in respect of taking further course of action.

14.6.3.2. These tests shall be carried out as per the applicable IEC/IS standards before Final Acceptance Test at site shall be arranged to be conducted by the third-party testing agency like TUV, UL, SEC etc.,

- Establishment of module capacity (shall be carried out in TUV/UL/SEC Lab) randomly selected one (1) module for project capacity for 1 MW shall be sent to test lab.
- A sample of 1/1000 modules shall be tested. The results of the measurements shall be compared to flasher protocols.
- Establishment of string capacity.
- A sample of five (5) strings/MW shall be tested.
- Measurement temperature of the PV modules with thermal image camera with respect to the neighboring cells shall be carried out at site by third party. A sample of 1/500 shall be tested. In case of failure rate > 10%, the sample shall be increased to 1/100.

14.6.3.3. Cost towards the on-site testing shall be borne by the Contractor.

14.6.3.4. The PV modules shall be subject to witness testing onsite to ensure their performance. The testing should be performed during the following phases of the project:

- i. Pre-commissioning
- ii. Commissioning and test on completion
- iii. Performance tests

14.6.3.5. The site tests shall be witnessed by TEDA. The commissioning test program shall be submitted at least two (2) weeks in advance of any testing.

14.6.4. Neither the waiving of inspection nor acceptance after inspection by TEDA shall, in any way, absolve the Contractor of the responsibility of supplying the plant and equipment strictly in accordance with specification and drawings etc.

14.7. Transportation, Handling, Storage and Installation

14.7.1. Transportation, handling, storage and installation of modules shall be in accordance with the manufacturer manual so as not to breach warranty conditions. The Standard Operating Procedure (SOP) for the same shall be shared by the Contractor prior to dispatch.

14.7.2. It is required to construct a temporary platform (graded) while keeping the modules at least above the highest flood level. If the contractor scheduled/planned to mount the modules immediately after the receipt at site, then the module shall be kept in common storage area with

proper arrangement.

- 14.7.3.** Modules shall be dispatched in line with the Construction schedule. If Modules are dispatched ahead of schedule, following measures shall be undertaken: Modules shall be covered with tarpaulin sheet. Alternatively, the Modules, properly stacked as per OEM recommendations, shall be stored under a temporary shed. Further, the temporary platform for keeping the modules shall be treated with anti-termite treatment.

14.8. Safe Disposal of Solar PV Modules

- 14.8.1.** The bidder will ensure that all Solar PV modules from their plant after their end of life (when they become defective/non-operational/non-repairable) are disposed in accordance with the "e-waste (Management and Handling) Rules, 2011" notified by the Government and as revised and amended from time to time.

14.9. Warranties

14.9.1. Material Warranty

- i. Material Warranty is defined as: The manufacturer shall warrant the Solar Module(s) to be free from the defects and/or failures specified below for a period not less than fifteen (15) years from the declared Commercial Operation Date.
- ii. Defects and/or failures due to manufacturing defects and/or failures due to materials, including PID defect.
- iii. Non-conformity to specifications due to faulty manufacturing and/or inspection processes.

If the solar Module(s) fails to conform to this warranty, the Contractor will repair or replace the solar module(s), at TEDA's sole option.

14.9.2. Performance Warranty

- i. The manufacturer shall warrant the output of Solar Module(s) for at least 90 % of its rated power at the end of ten (10) years and 80 % of its rated power at the end of twenty-five (25) years from the date of receipt of modules on Site. The manufacturer shall warrant for the linear output of Solar Module(s) and degradation of the PV modules will be linear over twenty-five (25) years from the date of receipt of modules at site.
- ii. If, Module(s) fail(s) to exhibit such power output in prescribed time span, the Contractor will either deliver additional PV Module(s) to replace the missing power output with no change in area of land used or repair or replace the PV Module(s) with no change in area of land used at TEDA's sole option. Total land available from TEDA is fixed and the Contractor shall design the plant so that in this case he has enough space within this land to accommodate additional capacity.

14.9.3. The above warranties shall be backed by third party insurance.

15. Inverter/Power Conditioning Unit (PCU)

15.1. General Requirements

- 15.1.1.** As SPV array produce direct current electricity, it is necessary to convert this direct current into alternating current and adjust the voltage levels to match the grid voltage. Conversion shall be achieved using an electronic Inverter and the associated control and protection devices. All these components of the system are termed the "Power Conditioning Unit (PCU)". In addition, the PCU shall also house MPPT (Maximum Power Point Tracker), an interface between Solar PV array and the Inverter, to the power conditioning unit/inverter should also be DG set interactive.
- 15.1.2.** Three phase inverter shall be used with each power plant system for 4 kW and/or above but in case of less than 4 kW single phase inverter can be used as per site requirement. The inverter of single phase shall be installed if grid supply is of single phase and that of three phase shall be installed if grid supply is of three phase.
- 15.1.3.** Inverters/PCUs shall comply with IEEE standard 929-2000 or equivalent.
- 15.1.4.** The inverter/PCU shall be non-transformer String/Hybrid inverters, grid tied in nature, shall consist of MPPT controller. Inverters shall be decided based on array design/suitable rating in case of string design. It shall provide necessary protections for Grid Synchronization. The Inverters should convert DC power produced by SPV modules into AC power and must synchronize automatically its AC output to the exact AC Voltage and frequency of Grid.
- 15.1.5.** All inverters/PCUs shall consists of associated control, protection and data logging devices and Remote Monitoring Hardware and software for string level monitoring.
- 15.1.6.** The inverters/PCUs shall be capable of complete automatic operation, including wake-up, synchronization and shut down independently and automatically.
- 15.1.7.** The inverters/PCUs shall operate in sleeping mode when there will no power connected.
- 15.1.8.** The Inverters/PCUs shall be capable of operating in parallel with the grid utility service and shall be capable of interrupting line fault currents and line to ground fault currents. The output of power factor of inverter/PCU is suitable for all voltage ranges or sink of reactive power; inverter should have internal protection arrangement against any sustainable fault in feeder line and against the lightning on feeder.
- 15.1.9.** The inverters/PCUs shall include appropriate self-protective and self-diagnostic features to protect itself and the PV array from damage in

the event of inverter's/PCU's component failure or from parameters – beyond the inverter's/PCU's safe operating range due to internal or external causes. The self-protective features shall not allow signals from the inverter's/PCU's front panel to cause the inverter/PCU to be operated in a manner which may be unsafe or damaging. Faults due to malfunctioning within the inverter/PCU, including commutation feature, shall be cleared by the inverter/PCU protective devices and not by the existing site utility grid service circuit breaker.

- 15.1.10.** The inverters/PCUs should be tested from the MNRE approved test centers/NABL/BIS/IEC accredited testing- calibration laboratories. In case of imported inverter/PCU, these should be approved by international test houses. The inverters/PCUs shall be in compliance with the IS/BIS/IEC standards specified under ER - §-23. Quality Certification, Standards and Testing in Technical Specification.
- 15.1.11.** The Inverter shall be tropicalized and design shall be compatible with conditions prevailing at site. Provision of exhaust fan with proper ducting for cooling of Inverter's/PCU's internal circuit shall be incorporated in the Inverter.
- 15.1.12.** Built-in meter and data logger to monitor plant performance through external computer shall be provided.
- 15.1.13.** The rated/name plate AC capacity of the inverter/PCU shall be AC power output of the inverter/PCU at 50°C.
- 15.1.14.** The Inverter, if installed in open, shall be placed inside a canopy shed with at least 60 cm in all directions. Alternatively, the Contractor may install the inverter on the column post of the Module Mounting Structure, below the modules. In such case, the canopy is not required, and the column and foundation shall be designed accordingly.
- 15.1.15.** The following information must be mentioned on each String/Hybrid inverter (This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions)
- i.** Name of the manufacturer of String/Hybrid inverter
 - ii.** Month and year of the manufacture
 - iii.** Country of origin
 - iv.** Unique Serial No. and Model No. of the String/Hybrid inverter
 - v.** Name of the test lab issuing IEC certificate
 - vi.** A disclaimer note of not for sale in retail market/Anti-theft mechanism etc.

15.2. Supplier's Requirements

- 15.2.1.** The Grid-tie Inverter Supplier should have supplied minimum 5 GW capacity globally or 500 MW in India in the past five (5) years as on last date of the bid submission. A certificate from the Inverter manufacturer shall provided to this effect.
- 15.2.2.** The Grid-tie Hybrid Inverter Supplier should have supplied minimum 2 GW capacity globally or 5 MW in India in the past five (5) years as on last date of the bid submission. A certificate from the Inverter manufacturer shall provided to this effect.
- 15.2.3.** The complete Power Conditioning Unit shall be warranted against all material/manufacturing defects and workmanship for minimum of seven (7) years from the declaration of Commercial Operation Date.
- 15.2.4.** The Contractor shall provide sufficient information for the satisfaction of TEDA prior placing the order for the inverters.
- 15.2.5.** Dimension and weight of the PCU shall be indicated by the Bidder in the Bid.
- 15.2.6.** The Bidder shall guarantee average annual power loss due to non-threshold condition to be less than 0.1% and shall support the claim with necessary document/data/graphs in the Bid.
- 15.2.7.** There must be a good maintenance setup of the proposed inverter manufacturer with having sufficient numbers of qualified service engineers (Degree/Diploma engineers) and well equipped set up with instruments, tools and tackles at anywhere in Tamil Nadu. The maintenance setup of the proposed inverter manufacturer may be inspected by TEDA, if required. Necessary test certificates and approvals of the inverters and documents pertaining to license of the manufacturing firm have to be submitted by the contractor to TEDA with their Detailed Design Report.

15.3. Technical Requirements of Inverters

- 15.3.1.** Typical technical features of the inverter/PCU shall be as follows:

Technical Specifications		
S. No	Parameters	Description
1.	Parameters Display	The inverter shall have local LCD (Liquid crystal display) and keypad for monitoring instantaneous parameters, event logs and data logs. Display should be simple and self-explanatory, and should indicate: DC Voltage (V) DC current (A) DC power (W)

		AC voltage (V) AC current (A) Apparent AC power (W) Power Factor (Cosφ) Active AC power (W) Reactive AC power (W) Daily energy generation (kWh) Cumulative generation (kWh) Cumulative run time (hours) Note: In case of outdoor PCU, PCU without LCD display with provision for Data access over Bluetooth/Wi-Fi shall be acceptable.
2.	Nominal AC Output Voltage	415 VAC +15%, 3 phase, 50 Hz
3.	Type of solar charge controller	MPPT-based Solar Charge Controller
4.	Switching Devices	IGBT based
5.	Control	Microprocessor based
6.	Maximum Input Voltage	Not more than 1000 VDC
7.	Output Waveform	Pure Sine wave
8.	DC voltage range, MPPT	As per design
9.	Peak efficiency	At least 97% measured as per IEC 61683
10.	Euro efficiency	At least 98% measured as per IEC 61683
11.	Output frequency	50 Hz + 3% to – 5% Hz
12.	Power Factor	0.95 lag – 0.95 lead
13.	Max. THD at rated power	≤ 3% at 0-50 °C
14.	No load loss	< 1% of rated power and maximum loss in sleep mode shall be less than 0.50%
15.	Humidity	15% to 95% non-condensing
16.	Ingress Protection	IP-54 (Minimum) for indoor installation and IP-65(Minimum) for outdoor installation as per IEC 60068-2 (Environmental)
17.	Protection ratings as per IEC 60721-3-3	Classification of chemically active substances: 3C2 Classification of mechanically active substances: 3S2
18.	Harmonics	Harmonic current injections should not exceed the limits specified in IEEE 519 (recommendation by CEA)
19.	Flicker	Flicker should not go beyond the limits specified in IEC

		61000 (recommendation by CEA)
20.	DC Injection	DC injection into the grid should not be greater than 0.5% of the full rated output at the interconnection point. CEA Technical Standards for connectivity of the Distributed Generation Resources) Regulations, 2013
21.	Grid Connection Standard	As per IEC 61727, VDE 0126-1-1/IEC 60255.5/IEC 60255.27/IEC 62116.
22.	Grid voltage tolerance	+15% to -10%
23.	Communication Interfaces	RS 485 interface/RF/PLC/others as per site requirement
24.	Automatic mode of protection	a. The Inverter shall automatically "WAKE UP" in the morning and began to export power provided there is sufficient solar energy and the grid voltage and frequency is in range.
25.	Remote Monitoring Mechanism (GSM/GPRS)	a. Remote monitoring features shall be integrated with GSM/GPRS gateway with Geo tagging and should comply with the MNRE Specifications. b. GSM/GPRS Charges to be included in the costing till the end of five (5) years AMC Period. c. Controller should have support of sufficient internal memory/SD card/memory card to support remote monitoring in case of network failure.
26.	Embossing/Lamination/Stick	"TEDA" at the front side.

Safety Compliances

S. No	Parameters	Description
27.	Protective systems	Over and under voltage trip functions if voltage reaches above 110% or below 80% respectively with a clearing time up to 2 seconds Over and under frequency trip functions, if frequency reaches 50.5 Hz and below 47.5 Hz with a clearing time up to 0.2 seconds Inverter should cease to energize the circuit to which it is connected in case of any fault in the circuits A voltage and frequency sensing and time-delay function to prevent inverter from energizing a de-energized circuit, and preventing inverter to reconnect to the electricity system unless voltage and frequency reached prescribed limit and are stable for 60 seconds A function to prevent the inverter from contributing to the formation of an unintended island, and cease to energize the electricity system within two seconds of the formation of an unintended island leakage current

		monitoring unit. Every time the inverter is synchronized to the electricity system, it shall not cause voltage fluctuation greater than $\pm 5\%$ at the point of connection. CEA (Technical Standards for connectivity of the Distributed Generation Resources) Regulations, 2013
28.	Main Surge protection	Should be provided
29.	Lightning protection	Should be provided
30.	Electronics degree of protection	Protection of electronics against dust, accidental contact, and water by mechanical casings and electrical enclosures - IEC 60529 (IP 20, 54, 65)
31.	Degree of protection	Degree of protection for stationary use at non-weather protected locations - IEC 60721-3-4

- 15.3.2.** Every DC input terminal of PCU shall be provided with Fuse/MCB/MCCB of appropriate rating with lockout feature for isolation of DC input. The combined DC feeder shall have suitably rated isolators for safe start up and shut down of the system. One spare DC input terminal shall be provided for each PCU. String/Hybrid inverters without DC fuse may be acceptable in case not more than two strings are connected to the same MPPT.
- 15.3.3.** DC input terminals must be in enough numbers so as each terminal is connected to dedicated single input from the PV string. Two DC inputs cannot be connected to a single input DC terminal of the inverter. If adequate number of inputs are not available in the selected inverter by the Contractor then a DC Junction Box shall be incorporated into the design.
- 15.3.4.** All the phases shall be supervised with respect to rise/fall in programmable threshold values of frequency.
- 15.3.5.** The Inverter output shall always follow the grid in terms of voltage and frequency. This shall be achieved by sensing the grid voltage and frequency and feeding this information to the feedback loop of the Inverter. Thus, control variable then shall control the output voltage and frequency of the Inverter, so that Inverter is always synchronized with the grid.
- 15.3.6.** The Inverter shall be capable of synchronizing with grid in less than one (1) minute.
- 15.3.7.** The inverter shall automatically "wake up" in the morning and begin to export power provided there is sufficient solar energy and the grid voltage and frequency is in range.
- 15.3.8. Operating Modes:** Operating modes of PCU shall include, but not

limited to, the following modes. These operating modes and conditions for transition are indicative only. The Contractor shall provide the detailed flow chart indicating the various operating modes and conditions for transition during detailed engineering.

- i. **Sleep Mode:** Automatic sleep mode shall be provided so that unnecessary losses are minimized at night. The power conditioner must also automatically re-enter standby mode when threshold of standby mode reached.
- ii. **Stand-by Mode:** The control system shall continuously monitor the output of the solar power plant until pre-set value is exceeded and that value to be indicated.
- iii. **Basic System Operation (Full Auto Mode):** The control system shall continuously monitor the output of the solar power plant until pre-set value is exceeded and that value to be indicated.
- iv. **MPPT Mode:** When the input DC voltage is above the pre-set value and AC grid connection conditions are fulfilled, the PCU shall enter into MPPT mode.

15.3.9. Protection Features

The inverter shall include appropriate self-protective and self-diagnostic features to protect itself and the PV array from damage in the event of inverter component failure or from parameters beyond the inverter's safe operating range due to internal or external causes. The self-protective features shall not allow signals from the inverter front panel to cause the inverter to be operated in a manner which may be unsafe or damaging. Faults due to malfunctioning within the inverter, including commutation failure, shall be cleared by the inverter's protective devices. In addition, the inverter shall have following minimum protection against various possible faults:

- i. Ground fault monitoring
- ii. Grid monitoring
- iii. Type-II surge protective device (SPD) conforming to IEC 61643-11/IEC 61643-31/EN 50539-11 shall be connected between positive/negative bus and earth. if the inverter does not have integrated DC surge arrestors, then the surge arrestors shall be separately installed in the DC Junction Box on the positive and negative DC inputs.
- iv. DC reverse polarity
- v. AC short-circuit capability
- vi. DC/AC Over-voltage and over-current
- vii. Anti-islanding (as per IEEE 1547/UL 1741/equivalent BIS standard)

- viii. Balancing of unequal phases
- ix. Negative earthing
- x. Manual DC isolator
- xi. Galvanic Isolation - The PCU inverter shall have provision for galvanic isolation. Each solid state electronic device shall have to be protected to ensure long life of the inverter as well as smooth functioning of the inverter.

15.3.10. Circuit Breaker or Relay of appropriate voltage and current rating shall be provided at the output to isolate the PCU from grid in case of faults.

15.3.11. All the conducting parts of the PCU that are not intended to carry current shall be bonded together and connected to dedicated earth pits through protective conductor of appropriate size. DC negative terminal shall be grounded.

16. Battery Bank

16.1. The battery shall be Lithium Ferro Phosphate (LiFePo4) having capacity as per the table given below.

16.2. The configuration of battery assembly should be for 5 kWh capacity.

16.3. The cell should be prismatic type having capacity not less than 50 Ah.

16.4. The battery shall have an integrated "Battery Management System" (**BMS**) to ensure the proper charging and discharging of each cell of battery with temperature compensation. BMS primary focus is therefore on the safety and the protection of the battery pack, to minimize the risk of sudden failure and to maximize the life cycle of the battery. The secondary function of the BMS is to perform battery diagnosis, such as State of Charge (**SOC**) estimation, State of Health (**SOH**) estimation and State of Power (**SOP**) estimation.

16.5. This battery also needs constant current and constant voltage charging methodology related to upper voltage limit of battery.

16.6. The battery shall be got tested from MNRE/NABAL accredited laboratories as per IEC/BIS standards. The Test Report should be submitted along with tender.

16.7. Manufacturer's Warrantee of Battery shall be submitted.

16.8. Technical Requirements

Technical Specifications		
S. No	Parameters	Description
1.	Battery Chemistry	Lithium Ferro Phosphate (LiFePo4)
2.	Capacity	≥ 100 Ah
3.	Depth of Discharge	90%
4.	Cycle Life @ 25° C, 90% DOD	≥ 6000
5.	Installation	Wall mount / Rack mount

6.	Communication Port	CAN2.0, RS485
7.	Warranty Period	10 years

17. Module Mounting Structures

17.1. General Requirements

- 17.1.1.** Supply, installation, erection and acceptance of module mounting structure (MMS) with all necessary accessories, auxiliaries and spare part shall be in the scope of the Contractor.
- 17.1.2.** Details of Module Mounting Structure for different capacities are furnished under this section, ER §-16, Module Mounting Structure. These are indicative of minimum standards and for reference purpose only. TEDA may specify higher standards based on actual site conditions.
- 17.1.3.** Design of the MMS shall take into consideration site conditions, loading data, wind data and design standards as per latest applicable IS standard.
- 17.1.4.** The metallic structures for mounting the solar PV modules should be of adequate strength and appropriate design and shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels. The Contractor shall carry out necessary studies before designing the MMS.
- 17.1.5.** The MMS shall be designed and constructed such that it complies with the necessary mounting requirements of PV modules in order to maintain the PV module's warranty. MMS shall be designed considering life span of twenty-five (25) years.
- 17.1.6.** The PV modules shall be mounted on fixed metallic structures having adequate strength and appropriate design, which can withstand the load of the modules and high wind velocities as per the wind zone and IS of the location of installation. The PV array structure design shall be appropriate with a factor of safety of minimum 1.5
- 17.1.7.** Suitable fastening arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed. The structure should be capable of withstanding a minimum wind load of 150 km per hour, after grouting and installation. The Contractor shall be fully responsible for any damages to SPV System caused due to high wind velocity within guarantee period as per technical specification.
- 17.1.8.** The structure shall be designed for simple mechanical and electrical installation. It shall support SPV modules at a given orientation and tilt, absorb and transfer the mechanical loads to the ground properly.

- 17.1.9.** The module mounting structures should have angle of inclination as per the site conditions to take maximum insolation and complete shadow-free operation during generation hours. However, to accommodate more capacity the angle of inclination may be reduced until the plant meets the specified performance ratio requirements.
- 17.1.10.** The upper edge of the module must be covered with wind shield so as to avoid build air ingress below the module. Slight clearance must be provided on both edges (upper and lower) to allow air for cooling.
- 17.1.11.** The structures shall be designed to allow easy replacement, repairing and cleaning of any module. The array structure shall be so designed that it will occupy minimum space without sacrificing the output from the SPV panels. Necessary testing provision for MMS to be made available at site.
- 17.1.12.** Cutting, Welding, drilling etc. at site is not allowed for MMS. Contractor shall carry out all correction in structure (if required) at his works. If any cutting, welding, drilling is required to be done after material arrived at site then material shall be again sent for hot dip galvanization. No zinc spray shall be allowed on the MMS.
- 17.1.13.** Adequate spacing shall be provided between two panel frames and rows of panels to facilitate personnel protection, ease of installation, replacement, cleaning of panels and electrical maintenance.
- 17.1.14.** The structure shall be designed to withstand operating environmental conditions for a period of minimum twenty-five (25) years.
- 17.1.15.** Junction boxes shall be mounted on the MMS such that they are easily accessible and are protected from direct sunlight and harsh weather.
- 17.1.16.** Bird spike shall be provided so as to avoid bird sitting on the Solar PV modules at the highest point of the array/module structure.
- 17.1.17.** All the cables shall be aesthetically tied to module mounting structure.
- 17.1.18.** MMS should have theft proof arrangements with the use of Stainless Steel C channel along with the array support structure for locking arrangement of solar PV modules for protecting them from theft. Its size should be with reference to the specifications of the solar PV modules such that modules can comfortably slide in the channel while installation. It should not hide any portion of the photovoltaic circuit encapsulated in the lamination of the solar PV module, there by not affecting the efficiency & rating of the solar PV modules. Anti-Theft Nut Bolts of SS (with washers) should also be used for better theft proofing along with "C" Channel MMS.

17.2. Technical Requirements

- 17.2.1.** Module mounting structures can be made from three (3) types of materials. They are Hot Dip Galvanized Iron, Aluminium and Hot Dip

Galvanized Mild Steel (MS). However, MS will be preferred for raised structure.

- 17.2.2.** The minimum thickness of galvanization shall be 85 micron. No averaging is allowed in the measurement of coating thickness. Necessary testing provision for MMS to be made available by Contractor at site.
- 17.2.3.** MMS Steel shall be as per latest IS 2062:2011 and galvanization of the mounting structure shall be in compliance of latest IS 4759. MMS Aluminium shall be as per AA6063 T6. For Aluminium structures, necessary protection towards rusting need to be provided either by coating or anodization.
- 17.2.4.** All bolts, nuts, fasteners shall be of stainless steel of grade SS 304 or hot dip galvanized, panel mounting clamps shall be of aluminium and must sustain the adverse climatic conditions. Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts.

17.3. Contractor's Requirements

- 17.3.1.** The Contractor to prepare the design for MMS, frames, foundation etc. and submit to TEDA for approval. The Contractor also needs to furnish validation certificates from certified labs for key and integral part of MMS such as structure, foundation etc. Bidder to follow the latest IS 2629 including subsequent amendments, if any.
- 17.3.2.** The Contractor shall be fully responsible for any damages caused by high wind velocity within guarantee period. The parameters of prevailing wind speed, soil conditions, load, and upward lift shall be taken care of while preparing the design and the same is required to be mentioned on design.
- 17.3.3.** Contractor shall submit the all the quality test documents and test certificates complying with the requirement of the structure.

17.4. Rooftop Structure

- 17.4.1.** The Rooftop Structures maybe classified in three (3) broad categories as follows
- 17.4.2. Ballast structure**
- i. The mounting structure must be Non-invasive ballast type and any sort of penetration of roof to be avoided.
 - ii. The minimum clearance of the structure from the roof level should be in between 150-300 mm to allow ventilation for cooling, also ease of cleaning and maintenance of panels as well as cleaning of terrace.
 - iii. The structures should be suitably loaded with reinforced concrete

blocks of appropriate weight made out of M25 concrete mixture.

17.4.3. Tin shed

- i. The structure design should be as per the slope of the tin shed.
- ii. The inclination angle of structure can be done in two ways-
 - a. Parallel to the tin shed (flat keeping zero-degree tiling angle), if the slope of shed in Proper south direction
 - b. With same tilt angle based on the slope of tin shed to get the maximum output.
- iii. The minimum clearance of the lowest point from the tin shade should be more than 100 mm.
- iv. The base of structure should be connected on the Purlin of tin shed with the proper riveting.
- v. All structure member should be of minimum 2 mm thickness.

17.4.4. RCC Elevated structure

17.4.4.1. It can be divided into further three (3) categories:

17.4.4.2. Minimum Ground clearance (300 mm – 1000 mm)

- a. The structure shall be designed to allow easy replacement of any module and shall be in line with site requirement. The gap between module should be minimum 30 mm.
- b. **Base Plate** – Base plate thickness of the Structure should be 5 mm for this segment.
- c. **Column** – Structure Column should be minimum 2 mm in Lip section/3 mm in C-Channel section. The minimum section should be 70 mm in Web side and 40 mm in flange side in Lip section.
- d. **Rafter** - Structure rafter should be minimum 2 mm in Lip section/3 mm in C-Channel section. The minimum section should be 70 mm in Web side (y-axis) and 40 mm in flange side (x-axis).
- e. **Purlin** - Structure purlin should be minimum 2 mm in Lip section. The minimum section should be 60 mm in Web side and 40 mm in flange side in Lip section.
- f. **Front/back bracing** – The section for bracing part should be minimum 2 mm thickness.
- g. **Connection** – The structure connection should be

bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.

- h. For single portrait structure the minimum ground clearance should be 500 mm.

17.4.4.3. Medium Ground clearance (1000 mm – 2000 mm)

- a. **Base Plate** – Base plate thickness of the Structure should be Minimum 6 mm for this segment.
- b. **Column** – Structure Column should be minimum 2 mm in Lip section/3 mm in C-Channel section. The minimum section should be 80 mm in Web side and 50 mm in flange side in Lip section.
- c. **Rafter** - Structure rafter should be minimum 2 mm in Lip section/3 mm in C-Channel section. The minimum section should be 70 mm in Web side and 40 mm in flange side in Lip section.
- d. **Purlin** - Structure purlin should be minimum 2 mm in Lip section. The minimum section should be 70 mm in Web side and 40 mm in flange side in Lip section.
- e. Front/back bracing – The section for bracing part should be minimum 2 mm thickness.
- f. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade

17.4.4.4. Maximum Ground clearance (2000 mm – 3000 mm)

- a. **Base Plate** – Base plate thickness of the Structure should be minimum 8 mm for this segment.
- b. **Column** – Structure Column thickness should be minimum 2.6 mm in square hollow section (minimum 50 X 50) or rectangular hollow section (minimum 60 X 40) or 3 mm in C-Channel section.
- c. **Rafter** - Structure rafter should be minimum 2 mm in Lip section/3 mm in Channel section. The

minimum section should be 80 mm in Web side and 50 mm in flange side in Lip section.

- d. **Purlin** - Structure purlin should be minimum 2 mm in Lip section. The minimum section should be 80 mm in Web side and 50 mm in flange side in Lip section.
- e. **Front/back bracing** – The section for bracing part should be minimum 3 mm thickness.
- f. **Connection** – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade

17.4.4.5. Super elevated structure (More than 3000 mm)

a. Base structure

- i. **Base Plate** – Base plate thickness of the Structure should be 10 mm for this segment.
- ii. **Column** – Structure Column minimum thickness should be minimum 2.9 mm in square hollow section (minimum 60 X 60) or rectangular hollow section (minimum 80 X 40).
- iii. **Rafter** - Structure Rafter minimum thickness should be minimum 2.9 mm in square hollow section (minimum 60 X 60) or rectangular hollow section (minimum 80 X 40).
- iv. **Cross bracing** – Bracing for the connection of rafter and column should be of minimum thickness of 4 mm L-angle with the help of minimum bolt diameter of 10 mm.

b. Upper structure of super elevated structure

- i. **Base Plate** – Base plate thickness of the Structure should be minimum 5 mm for this segment.
- ii. **Column** – Structure Column should be minimum 2 mm in Lip section/3 mm in Channel section. The minimum section should be 70 mm in Web side and 40 mm in flange

side in Lip section.

- iii. **Rafter** - Structure rafter should be minimum 2 mm in Lip section/3 mm in Channel section. The minimum section should be 70 mm in Web side and 40 mm in flange side in Lip section.
 - iv. **Purlin** - Structure purlin should be minimum 2 mm in Lip section. The minimum section should be 60 mm in Web side and 40 mm in flange side in Lip section.
 - v. **Front/back bracing** – The section for bracing part should be minimum 2 mm thickness.
 - vi. **Connection** – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.
- c. If distance between two legs in X-Direction is more than 3 m than sag angle/Bar should be provide for purlin to avoid deflection failure. The sag angle should be minimum 2 mm thick, and bar should be minimum 12 Dia.
 - d. **Degree** - The Module alignment and tilt angle shall be calculated to provide the maximum annual energy output. This shall be decided on the location of array installation.
 - e. **Foundation** – Foundation should be as per the roof condition; two types of the foundation can be done- either penetrating the roof or without penetrating the roof.
 - i. If penetration on the roof is allowed (based on the client requirement) then minimum 12 mm diameter anchor fasteners with minimum length 100 mm can be used with proper chipping. The minimum RCC size should be 400 X 400 X 300 cubic mm. Material grade of foundation should be minimum M20.
 - ii. If penetration on roof is not allowed, then foundation can be done with the help of 'J

Bolt' (refer IS 5624 for foundation hardware). Proper Neto bond solution should be used to adhere the Foundation block with the RCC roof. Foundation J - bolt length should be minimum 12 mm diameter and length should be minimum 300 mm.

17.5. Ground Mounted MMS

17.5.1. Design Loads

17.5.1.1. Unless otherwise specified elsewhere, Dead load, Live load, Wind load and Seismic load for buildings and structures shall be considered as per provisions of relevant BIS standards.

17.5.1.2. The following minimum imposed load as indicated for some of the important areas shall, however be considered for the design. If actual expected load is more than the specified minimum load, then actual load is to be considered.

Sl.No.	Area	Imposed (Live) Load
1.	Roof	1.50 kN/Sq.m
2.	Building floors (GF) & Grade Slab	10.00 kN/Sq.m
3.	RCC Floors (General)	5.00 kN/Sq.m
4.	Outdoor platforms, Stairs, Landing and Balconies, Walkway, Chequered plate and Grating (except cable trench cover)	5.00 kN/Sq.m
5.	Road culverts & allied structures over drain and pipe crossings subjected to vehicular traffic	Design for Class – 'AA' loading (Wheeled and Tracked both) and check for Class – 'A' loading as per IRC Standard
6.	Underground structures such as Sump, Pit, Trench, Drain, UG tank etc.	In addition to Earth pressure and Ground water table at FGL, a surcharge of 20kN/Sqm (10kN/Sqm for drains) shall also be considered. The structure shall be designed for following criteria – (a) Inside empty with outside fill+ surcharge and water table at GL & (b) Inside water with no fill & water table outside
7.	Pre-cast and chequered plate cover over cable	4.00 kN/Sq.m

	trench	
8.	Main access and Internal Roads	As per IRC SP 20 corresponding to vehicular traffic of 150 commercial vehicles per day and critical in-field CBR.

17.5.1.3. Primary Loads

- i. Dead Load (DL)
- ii. Live Load (LL)
- iii. Wind Load (WL) – Both along $\pm X$ & $\pm Z$ horizontal direction
- iv. Seismic Load (EL) – Both along $\pm X$ & $\pm Z$ horizontal direction

17.5.1.4. Basic wind speed (V_b) at project site shall be taken as per IS 875 (part-3) unless otherwise specified elsewhere.

17.5.1.5. To calculate the design wind speed (V_z), the factors k_1 (probability factor or risk coefficient), k_2 (terrain roughness and height factor) and k_3 (topography factor) shall be considered as per IS 875 (Part-3). However, minimum values for k_1 , k_2 and k_3 shall be 0.94, 1.0 and 1.0 respectively.

17.5.1.6. Topography factor ' k_3 ' shall be taken as 1.0 up to upwards slope of 3° . For topography with upward slope greater than 3° , the value of ' k_3 ' shall be calculated as per Annexure-C of IS 875 (Part-3).

17.5.1.7. In case of plant site within 60 km of sea coast, the importance factor for cyclonic region, ' k_4 ' shall be taken as 1.15.

17.5.1.8. To calculate the design wind pressure ' p_d ', factors ' k_a ' (area averaging factor) and ' k_c ' (combination factor) shall be taken as 1.0. (The factor ' k_d ' shall be taken as 1.0 in case of plant site within 60km of sea coast).

17.5.1.9. The Seismic Load shall be considered corresponding to Earth quake zone at site as per IS: 1893 (Part- 4) with Importance factor 1.5. Ductile detailing as per IS 13920 shall be followed in concrete structures except in case of concrete support structure up to plinth level supporting open installations of inverter transformers and control panels at ICR/LCR, wherein the detailing shall conform to IS 456 and SP 34.

17.5.1.10. Notes for MMS Design

- i. WL shall be considered as detailed below for estimation of WL under primary loads:
 - a. WL_x (downward), WL_z (downward): Load due to positive pressure on design tilt angles of MMS members for wind acting in both ($\pm X$, $\pm Z$) directions.
 - b. WL_x (upward), WL_z (upward): Load due to negative pressure on design tilt angles of MMS members for wind acting in both ($\pm X$, $\pm Z$) directions.
 - c. WL_x (member load), WL_z (member load): Load due to wind action on side (exposed) face of respective MMS members (drag force) for wind acting in both ($\pm X$, $\pm Z$) directions.
 - $\pm WL_x$ (member load, transverse to MMS table): Load due to wind action on column, front and back bracing, longitudinal bracing
 - $\pm WL_z$ (member load, along length of MMS table): Load due to wind action on column, rafter front and back bracing, longitudinal bracing
- ii. For estimation of design wind loads on purlins (Table 8 of IS 875- Part 3), WL (downward) and WL (upward) on modules (laid in the profile of mono slope canopy) shall be applied such that the center of pressure should be at ($0.3 \times$ length of canopy) from windward end (for simplicity, the wind load distribution may be taken as triangular with max. value at windward end). Solidity ratio (\emptyset) shall be taken as 0.0.

**Note**

Wind tunnel studies shall be specific to the site topography as well as array layout. The wind tunnel studies shall be conducted with appropriate scale model and boundary line tunnels and must be validated from an IIT.

- iii. In design of MMS (for height of structures less than 10 m from ground), 20% reduction in wind pressure as per Note under Cl. 6.3 of IS 875 – Part 3 is not permitted in case of purlins (members supporting modules), which shall be designed against action of WL corresponding to full wind pressure.

17.5.1.11. Design Load combinations

- i. Appropriate Load factors in Limit State Method (LSM) design for concrete structures and appropriate Factor of safety in Working Stress Method (WSM) design [Allowable Stress Design (ASD)] for all steel structures including MMS shall be considered as per relevant BIS standard. No increase in permissible stress is permitted in design of MMS.
- ii. Following load combinations shall be considered in design:
 1. **For MMS Design:**
 - a. DL+LL
 - b. DL+LL + WLx (upward) \pm WLx (member load)
 - c. DL+LL + WLx (downward) \pm WLx (member load)
 - d. DL+LL + WLz (upward) \pm WLz (member load)
 - e. DL+LL + WLz (downward) \pm WLz (member load)
 - f. DL+LL \pm ELx
 - g. DL+LL \pm ELz
 2. **For RCC and Steel structures except MMS:**
 - a. DL+LL
 - b. DL+LL \pm WLx
 - c. DL+LL \pm WLz
 - d. DL+LL \pm ELx
 - e. DL+LL \pm ELz
- iii. All buildings, structures and foundations shall be designed to withstand loads corresponding to worst design load combination.

17.5.2. Module Mounting Structure (MMS) Foundation

- 17.5.2.1. Module mounting structure (MMS) may be supported on isolated/strip footing or pile foundation.

17.5.2.2. Bored cast-in situ, Driven precast or under reamed Concrete pile

1. In case the contractor proposes to provide bored cast-in-situ concrete pile; the type, dia. and length of pile shall be as per recommendations of Geotechnical investigation report corresponding to prevalent soil characteristics at site. However, the min. dia of the pile shall be 300mm. When very hard strata/rock ($N > 100$) is encountered at a higher level, the pile shall be extended in to the hard strata minimum 1.5 times the diameter of the pile with total depth of the pile not less than 1200mm below cut-off level. A minimum clear cover of 50 mm shall be available to the steel section or reinforcement in the pile.
2. As specified above, the MMS support shall project minimum 200mm above FGL (Finished grade level) to avoid any damage to the MMS column/sub support due to direct contact of rain water/surface run-off. This shall be ensured through either single stage construction of entire pile length including portion above FGL or by providing a collar (to be cast in second stage) which shall project min. 75mm in plan beyond the pile face and shall extend min. 250mm below GL.
3. For proper bonding, the surface of first stage concrete shall be made rough by trowelling and cleaning out laitance and cement slurry by using wire brush on the surface of joint immediately after initial setting of concrete. The prepared surface should be clean watered to get saturated dry condition when fresh concrete is placed against it. The prepared surface shall be applied with a suitable bonding agent before construction of pile cap/collar as required.
4. In case the column post/stub is supported through base plate-anchor bolt assembly, the same shall only be provided through RCC pile cap to be designed as per provisions of relevant BIS standard with min. clear overhang of 75mm. The pile shall embedded min. 50mm in the pile cap and the pile reinforcement shall be extended in to the pile cap for proper anchorage.
5. In case of collapse of foundation strata during drilling of the pile bore, removable steel liner

shall be used to maintain design depth and diameter of the pile for proper concreting.

6. The design & installation of piles shall conform to IS: 2911.
7. The bore shall be free from water before pouring of pile concrete. For under water concreting tremie shall be used.

17.5.2.3. Helical/Screw Pile

1. The design, manufacture, testing and installation of Helical/Screw pile shall conform to ICB-2009 and Practice Note 28- "**Screw Piles: Guidelines for Design, Construction and Installation**, ISSN 1176-0907 October 2015 (IPENZ Engineers New Zealand)"
2. The design of pile shall be undertaken and verified by a suitably qualified geotechnical or structural Chartered Engineer with experience in the design of helical/screw piles.
3. The pile shall be designed and manufactured in accordance with accepted engineering practice to resist all stresses induced by installation into the ground and service loads.
4. The steel grade for pile shaft, helix plates and other accessories shall be with min. F_y 350 MPa. Min. thickness (BMT) of shaft and helix plate shall be 6 mm and 8 mm respectively in case of coastal installations and soils containing aggressive chemicals and at other project sites it shall be respectively 5 mm and 6 mm. Cap plate and col base plate shall be min. 12 mm thick and of min. grade E-250 conforming to IS:2062.
5. All materials shall be hot dip galvanized conforming to relevant BIS standard with min. thickness of galvanization 80 microns.
6. Wherever the pile shaft is required to be infilled with concrete grout, the same shall be of min. grade M30 (anti shrink).
7. The allowable axial design load (Direct compression & Pull out), P_a , of helical piles shall be the least of the following values:

- i. Sum of the areas of the helical bearing plates times the bearing capacity of the soil or rock comprising the bearing stratum.
 - ii. Capacity determined from well-documented correlations with installation torque.
 - iii. Load capacity determined from initial load tests.
 - iv. Axial capacity of pile shaft.
 - v. Axial capacity of pile shaft couplings.
 - vi. Sum of the axial capacity of helical bearing plates affixed to pile.
8. The lateral allowable load capacity of the pile shall be calculated using P-Y analysis and shall be verified with field trials. The allowable design lateral load shall be equal to the min. of (i) the total lateral load producing max. lateral deflection of 5mm and (ii) 50% of the total lateral load at which the lateral displacement increases to 12 mm.
9. Dimensions of the central shaft and the number, size and thickness of helical bearing plates shall be sufficient to support the design loads.
10. The Design Report shall include following details.
 - i. Design loads
 - ii. Geotechnical Strength Reduction Factors and supporting methodology
 - iii. List of design standards
 - iv. Design methodology and how specific loads such as seismic, lateral and settlement are addressed
 - v. Founding stratum
 - vi. Estimated length
 - vii. Connection design and details between pile shaft & pile cap plate and Col base plate
 - viii. Pre-production and production load testing to support design including acceptance criteria.
11. Helical piles shall be installed to specified embedment depth and torsional resistance

criteria as per design. The torque applied during installation shall not exceed the maximum allowable installation torque of the helical pile.

12. Special inspections shall be performed continuously during installation of helical pile foundations. The information recorded shall include installation equipment used, pile dimensions, tip elevations, final depth, final installation torque and other pertinent installation data as required.
13. The installation of piles shall be done by an agency having adequate experience in helical pile construction.
14. The method statement for pre-production load testing (initial test) and construction of Helical Pile shall be submitted for review and approval. The method statement shall comply following requirements:

- i. **Helical pile pre-production load testing**

The Piling Contractor shall provide a method statement for the pre-production load testing. The method statement shall be submitted 2 weeks prior to pile installation for testing and shall contain the following information (as a minimum):

- Programme of the testing, detailing the timing and sequence of each load test including any additional investigations proposed.
- The general arrangement of the equipment
- A method for measuring the displacement at the head and toe of each test pile
- Template for the Pile load test report
- Confirming the criteria for determining the acceptability of the compression, tension and lateral load tests
- A contingency plan in the event that a load test is deemed not acceptable

- A procedure for verifying the capacity for each individual pile, this may include correlating the installation torque for each pre-production pile with the load test results
- All pile load tests shall be supervised by suitably experienced personnel, who are competent to operate, monitor and record each test throughout its duration. Each pile load test shall be continuously monitored throughout its duration

ii. Helical Pile Construction

The contractor shall provide a method statement for each piling operation to be undertaken in executing the Works. The method statement shall describe all proposed equipment and detail the construction sequence. The method statement shall be submitted with the tender and shall contain the following information (as a minimum):

- Programme of the works, detailing the timing and sequence of individual portions of the works
- Full details of the installation plant to be used, including manufacturer's information and proof of servicing/recent upkeep and calibration
- Proposed phasing of excavation/filling operations such that the design stresses in the piles (and any supporting frames) are not exceeded
- The contingency plan to be adopted, to minimize disruption and delay, in the event of encountering obstructions
- Anticipated noise levels (measured in dB) and vibration levels (measured in mm/sec) arising from piling operations (if applicable)

15. The Piling Contractor shall nominate a suitably experienced, professionally qualified engineer, as the "Piling Supervisor".
16. Unless specified else were, the field trials for initial load tests on concrete and helical/screw pile shall conform to IS: 2911 (Part 4) & Practice Note-28 (IPENZ Engineers New Zealand) as applicable.
17. Contractor shall also carry out routine tests on 0.5 % of the total no. of working/job piles as per provisions of IS: 2911 (Part 4). In case of unsatisfactory results, min. no. of routine tests may be increased up to 2% of the total no. of working/job piles as per the directions of the Engineer.

17.5.3. Module Mounting Structure (MMS) – Design Requirements

- 17.5.3.1. The module mounting structure design shall generally follow the existing land profile. The top of the table shall be in one plane.
- 17.5.3.2. In MMS analysis the column support shall be assumed at EGL/NGL.
- 17.5.3.3. The PV modules shall be mounted on fixed metallic structures having adequate strength and appropriate design, which can withstand the load of the modules and high wind velocities as per the wind zone and IS of the location of installation.
- 17.5.3.4. The MMS shall be designed and constructed such that it complies with the necessary mounting requirements of PV modules in order to maintain the PV module's warranty.
- 17.5.3.5. MMS shall be designed considering life span of 25 years.
- 17.5.3.6. In case of topographical variations more than 30, the contractor shall carry out detailed study of its effect on array layout, shadow analysis and structural stability of MMS.
- 17.5.3.7. The lowest point of the Module shall be the higher of (i) Highest Flood Level (HFL) of the location of installation, and (ii) 900 mm from the ground.
- 17.5.3.8. The panel frame structure should be capable of withstanding a minimum wind load of 150 km per hour, after grouting and installation. MMS should be sturdy and

designed to assist solar PV Modules to render maximum discharge. The hardware (fasteners) used for installation of solar PV Modules and MMS should be of suitable Stainless Steel (SS 304). Bird spike shall be provided so as to avoid bird sitting on the Solar PV modules at the highest point of the array/module structure.

- 17.5.3.9.** The Contractor shall be fully responsible for any damages caused by high wind velocity within guarantee period. The parameters of prevailing wind speed, soil conditions, load, and upward lift shall be taken care of while preparing the design and the same is required to be mentioned on design.
- 17.5.3.10.** The MMS stub/column, rafter, purlin, ties and bracing members shall conform to following Indian standards.
- IS: 2062 – Hot rolled Medium and High tensile structural steel
 - IS: 811 – Cold formed light gauge structural steel sections
 - IS: 1161 – Steel tubes for structural purposes
 - IS: 4923 – Hollow steel sections for structural use
 - Minimum grade of steel for sections conforming to IS: 811 & IS: 4923 shall be E350 conforming to IS: 2062 and YSt 310 conforming to IS: 1608 respectively.
- 17.5.3.11.** The contractor can also propose new light gauge structural steel or structural aluminum sections other than specified in IS: 811 subject to approval of the Engineer. In this case the contractor shall submit his proposal stating the technical advantages of the proposed sections for Engineer's review along with supporting literature and sample design calculations conforming to present specifications at the time of bidding.
- 17.5.3.12.** Aluminum-Zinc Alloy metallic coated steel strip or sheet of grade YS350 and minimum coating class AZ200 conforming to IS 15961 : 2012 may also be used for fabrication of purlin sections. In such a case, all the sections of the base metal exposed after cutting of members and punching of holes shall be provided with sprayed aluminium and zinc coating conforming to IS 5905.

- 17.5.3.13.** The minimum thickness excluding anti corrosive treatment (BMT) of various elements of MMS structure shall be as following:
- Stub/column – 3.15mm,
 - Rafter – 2.5mm and
 - Purlin – Minimum thickness of the purlin section excluding anti corrosive treatment (BMT) shall be 1.5 mm. Aluminum-zinc alloy metallic coated steel strip or sheet of grade YS350 and min. coating class AZ150 conforming to IS-15961:2012 may also be used for fabrication of purlin sections. In such a case, all the sections of the base metal exposed after cutting of members and punching of holes shall be provided with sprayed aluminum and zinc coating conforming to IS-5905.
 - Other members – 2.0 mm
- 17.5.3.14.** The primary loads and load combinations for design of MMS structure shall be as specified under ER §-16.5.1. The design shall be done by Working stress method and no increase in allowable stress shall be permitted.
- 17.5.3.15.** The maximum permissible deflection/side sway limits for various elements of MMS under serviceability conditions shall be as following:
- Lateral deflection/side sway for Column – Span/240
 - Vertical deflection for Rafter and Purlin – Span/180
 - Lateral deflection for Purlin – Span/240
- 17.5.3.16.** In case of natural frequency in first mode less than 5 Hz, the design of the MMS structure shall also be checked against dynamic effects of wind as per provisions of IS – 875 (Part-3) using gust factor method.
- 17.5.3.17.** The purlins shall be provided with min. following tie/sag rods or angles or channels:
- 1 no., in the mid of each span and shall connect all the purlin members
 - 1 no., diagonal, at each corner in end spans
- 17.5.3.18.** Lateral restraint to compression flange if any due to PV panels is not permitted in purlin design.
- 17.5.3.19.** The vertical diagonal bracing shall be provided in end spans and every alternate span of each unit (table) of MMS.

- 17.5.3.20.** MMS shall support SPV modules at a given orientation and tilt and shall absorb and transfer the mechanical loads to the ground properly.
- 17.5.3.21.** Cutting, Welding, drilling etc. at site is not allowed for MMS. Contractor shall carry out all correction in structure (if required) at his works. If any cutting, welding, drilling is required to be done after material arrived at site then material shall be again sent for hot dip galvanization. No zinc spray shall be allowed on the MMS.
- 17.5.3.22.** The MMS structure shall be hot dip galvanized with minimum GSM 610 kg/sqm and/or minimum coating thickness of 80 microns for protection against corrosion. Galvanization shall conform to IS-2629, 4759 & 4736 as applicable.
- 17.5.3.23.** It is to ensure that before application of this coating, the steel surface shall be thoroughly cleaned of any paint, grease, rust, scale, acid or alkali or any foreign material likely to interfere with the coating process.
- 17.5.3.24.** The bidder shall ensure that inner side is also provided with galvanization coating.
- 17.5.3.25.** The galvanization shall be done after fabrication of members and cutting of holes to ensure galvanization of all cut/exposed edges.
- 17.5.3.26.** In case the proposed section is made up of Aluminum, anodized coating shall be Gr. AC25 and shall conform to IS: 1868.
- 17.5.3.27.** The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same time.
- 17.5.3.28.** MMS should have theft proof arrangements with the use of Stainless Steel C channel along with the array support structure for locking arrangement of solar PV modules for protecting them from theft. Its size should be with reference to the specifications of the solar PV modules such that modules can comfortably slide in the channel while installation. It should not hide any portion of the photovoltaic circuit encapsulated in the lamination of the solar PV module, there by not affecting the efficiency and rating of the solar PV modules.
- 17.5.3.29.** In case of seasonal tilt, fasteners and washers to be used for erection of mounting structures shall be of stainless steel grade SS 304. In case of fixed tilt, HDG

fasteners with minimum coating thickness of 80 microns IS-2629, 4759 & 4736, as applicable. may be used. Those for fixing module over MMS shall be of SS 316 with property class A2-70 conforming to relevant ISO standard and must sustain the adverse climatic conditions to ensure the life of the structure for 25 years.

- 17.5.3.30.** Min. diameter of bolt for MMS connections shall be 10mm (12 mm in case of single bolt connection for seasonal tilt) except at column-rafter connection, where it shall not be less than 12mm (not less than 16mm in case of single bolt connection for seasonal tilt). In case of fixed tilt, min. two number of bolts shall be provided at each joint.
- 17.5.3.31.** The hardware (fasteners) used for installation of solar PV Modules and MMS should be of suitable Stainless Steel (SS 304). The structure shall be designed to allow easy replacement of any module by authorized personnel and shall be in line with the site requirements. Bird spike shall be provided so as to avoid bird sitting on the Solar PV modules at the highest point of the array/module structure.
- 17.5.3.32.** Modules shall be clamped or bolted with the structure properly. The material of clamps shall be Al/SS having weather resistant properties. Clamp/bolt shall have EPDM rubber washer and shall be designed in such a way so as not to cast any shadow on the active part of a module.
- 17.5.3.33.** The MMS foundation shall be designed as per ER §-16.5.1.
- 17.5.3.34.** MMS column post supported with base plate secured to foundation shall be fixed with galvanized high strength "J" bolts conforming to specifications of IS: 4000/IS: 1367 and relevant IS code Installation of foundation bolts and embedment of column leg in foundation concrete shall be done by using template to ensure proper alignment. The underside of base plate shall be provided with anti-shrink grout.
- 17.5.3.35.** In case the contractor proposes to extend the column leg to embed it in the pile/pedestal as an alternate fixing arrangement, the column member shall be extended for full depth of the pile (100mm cover at tip of the pile) with an end plate of min. 4mm thickness to be welded at the bottom of column leg. (However, for plants in coastal area or in case of marshy soil the column post shall be

supported only with base secured to foundation through base plate and anchor bolt assembly and no embedment of column leg in foundation is permitted)

- 17.5.3.36.** The array structure shall be grounded properly using maintenance free earthing kit.
- 17.5.3.37.** In case the string monitoring unit (SMU) is mounted on the module mounting structure, Contractor to take into consideration of the load thus added on the MMS. Accordingly, suitable supporting members for mounting the SMU must be designed and supplied. Separate structure for mounting of SMU can also be proposed.
- 17.5.3.38.** The Bidder should design the structure height considering highest flood level at the site and the finished grade level. The minimum clearance between the lower edge of the module and the finished grade shall be the higher of (i) Highest flood level + 100mm and (ii) 1000 mm, as applicable
- 17.5.3.39.** The length of one unit (Table) of MMS shall not generally be more than 20m.
- 17.5.3.40.** The MMS shall be designed to optimize tilt angle and elevation to minimize self-shading and maximize the capture of diffuse light by Bifacial Modules. The Bifacial Module frames shall be rail-edge mounted in landscape configuration to minimize losses.
- 17.5.3.41.** The contractor shall submit the detailed design calculations and drawings for MMS structure, bill of materials and their specifications/standards to the Employer for approval before start of fabrication work as per the engineering work program (L2 schedule) as finalized during kick-off meeting.
- 17.5.3.42.** The length of any cold formed section (CFS) shall not be more than 5.5 m.
- 17.5.3.43.** In case of seasonal tilt, the front and back bracing members (subject to seasonal rotation) shall be connected to the column through gusset plate and shall not be connected directly to the column.
- 17.5.3.44.** The purlin splice shall be near the zone of contra-flexure, i.e. within a distance of 0.15L to 0.25L from the support, where L is the respective span within which splicing is located.
- 17.5.3.45.** The purlin splice shall comprise of flange and web splice plates and splice design shall conform to Annexure-F of

BIS:800. For simplicity in fabrication, the splice member may be of CFS channel section without lips (CU).

- 17.5.3.46.** For same member type, same section shall be used.
- 17.5.3.47.** When any sag or tie member to the purlin (rod, angle or channel) is provided, it shall not be considered in modelling the structure for analysis except its effect as lateral support to the purlin members in strength design.
- 17.5.3.48.** Inspection of the MMS corrosion protection as per applicable IS/ASTM (Shall be carried out at site by third party). A sample of 6 stands per 5 MW shall be tested. In case of a failure rate > 10%, the sample shall be increased to 60 stands.
- 17.5.3.49. Approval**
- i. Proposed layout of the Module mounting structure fitted with equipments and other ancillaries as required over the proposed developed land profile shall be submitted with Detailed Design Report, and soft copy of STAAD file for approval.
 - ii. The contractor shall deliver the product to the site only after receipt of such approval of drawing, and inspection of materials, from TEDA, against their prayer in writing.
 - iii. Approval of the Engineer in charge should be taken before execution of the work at site.

18. Junction Box

- 18.1.** Junction boxes including the module Junction Box, string Junction Box, shall be equipped with appropriate functionality, safety (including fuses, grounding, etc.). Type II Surge Arrestor should be incorporated for surge protection.
- 18.2.** The Contractor shall provide sufficient numbers of array junction boxes/PV combiner boxes/DC distribution boxes to comply with design requirements of the PV system.
- 18.3.** The terminals shall be connected to bus bar/terminal block arrangement of proper sizes. The junction boxes shall have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and outgoing cables. Suitable markings shall be provided on the bus bars for easy identification and cable ferrules will be fitted at the cable termination points for identification.
- 18.4.** The rating of the Junction Box shall be suitable with adequate safety factor to interconnect the Solar PV array.
- 18.5.** The bus bars are made of EC grade copper of required size. Suitable capacity MCBs/MCCB shall be provided for controlling the DC power output to the inverter along with necessary surge arrestors. MCB shall be used for currents up to 63 amperes, and MCCB shall be used for currents greater than 63 amperes

- 18.6.** Suitable markings shall be provided on the bus-bars for easy identification and cable ferrules will be fitted at the cable termination points for identification.
- 18.7.** Detailed Junction Box specifications, certifications and data sheet shall be provided by the Contractor for approval during project execution.
- 18.8.** TEDA reserves the right to inspect the Junction Box at the manufacturer's site prior to dispatch.
- 18.9.** Array sub-main and main junction boxes, shall have the following properties:
- i.** All components should ISI marked.
 - ii.** They shall be dust, vermin & waterproof and made of Polycarbonate-Glass Fiber Substance (PC-GFS) thermoplastic. The enclosure should be double insulated with protection class II as per IEC 61439-1. Material and the protection class shall be marked on the enclosure.
 - iii.** The enclosure shall have a transparent front lid for enabling easy visibility.
 - iv.** Enclosure of junction boxes should be dust free and vermin proof and conform to IP65 protection and mechanical impact resistance shall be at least IK08. The enclosures shall have IP65 or above protection in accordance with IEC 60529.
 - v.** Third party conformance certificate is required to be given for Ingress Protection (IP) rating.
 - vi.** Minimum requirements for fire protection in the event of internal faults: Glow wire test in accordance with IEC 60695-2-11 at 960 °C for box and 850 °C for conducting components.
 - vii.** Burning Behavior: Base part of Polycarbonate Enclosure shall be UL94-V-0 compliant and Lid part of PC Enclosure shall be UL94-V-2 compliant.
 - viii.** The enclosures shall have IK 08 degree of protection for mechanical load.
 - ix.** The material used shall be halogen, silicon free conforming to RoHS directive 2002/95/EC.
 - x.** The enclosure shall have a usage temperature rating of -10 °C to 55 °C.
 - xi.** The enclosure should be chemically resistant to acid, dye, petrol, and mineral oil & partially resistant to benzene.
 - xii.** The enclosures shall have a rated insulated voltage of 1000V DC and dielectric strength of 4.65 kV DC.
 - xiii.** The material of the enclosure shall be UV stabilized.
 - xiv.** Manufacturers are encouraged to provide breather glands in the array junction boxes to prevent overheating and explosions.
 - xv.** Surge Protection devices (SPDs) Class II as per IEC 61643-1, shall be used at the terminals of array junction boxes for external surge protection. Internal

Surge protection (SPDs) shall consist of three (3) MOV type arrestors connected from + ve and – ve terminal to earth (Via Y arrangement) for higher withstand of the continuous PV-DC voltage during earth fault condition. SPD shall have safe disconnection & short circuit interruption arrangement through integrated DC in- built bypass fuse (parallel) which should get tripped during failure mode of MOV, extinguishing DC arc safely (created by inbuilt thermal disconnection) in order to protect the installation against fire hazards. Nominal discharge current (In) at 8/20 microseconds shall be minimum 10 kA with maximum discharge current (Imax) of minimum 20 kA at 8/20 microseconds with visual indication (through mechanical flag) in all modules to monitor the life of SPD. The I_{sc} w_{pv} (Short Circuit current withstand capacity of arrester) would be at least 10% more than Nominal output current of the combiner box and AJB. Detailed internal schematic for the above SPDs, compliant to these specifications, shall be submitted by the contractor.

- xvi.** The junction boxes shall have suitable cable entry points with cable glands of appropriate sizes for both incoming and outgoing cables. Manufacturers are encouraged to provide suitable cable entry points fitted with MC-4 Connectors.
- xvii.** Suitable markings should be provided on the bus bar for easy identification, and cable ferrules shall be fitted at the cable termination points for identification.
- xviii.** The Array Junction Box should preferably have maximum eight (8) input with SPD and Terminal block.
- xix.** "TEDA" should be embossed/laminated at the front side of Junction Boxes.

19. AC Distribution Board (ACDB)

- 19.1.** AC Distribution Panel Board (DPB) shall control the AC power from Inverter, and should have necessary surge arrestors. Interconnection from ACDB to mains at LT Bus bar.
- 19.2.** The ACDB shall be used to terminate single or multiple grid tie inverter/PCU/system outputs. The ACDB must have the following features:
 - i.** Cables connecting bus bar should be minimum 3 times capacity of Solar PV modules
 - ii.** The DBs shall comply with the latest MNRE/CEA/TANGEDCO guidelines.
 - iii.** Appropriate IP protection shall be provided.
- 19.3.** Suitable capacity MCBs/MCCBs/RCCBs shall be provided for controlling the AC power output along with necessary surge arrestors.
- 19.4.** All the Panel's shall be metal clad, totally enclosed, rigid, floor/wall mounted, air-insulated, cubical type suitable for operation on single phase/three phase, 240 volts/415 volts, 50 Hz or voltage levels as per CEA/State regulations)..
- 19.5.** All indoor panels will have protection of IP54 or better. All outdoor panels will have protection of IP65 or better.
- 19.6.** Should conform to Indian Electricity Act and CEA safety regulations (till latest amendment).

- 19.7.** All the 415 or 230 volts (or voltage levels as per CEA/State regulations) AC devices/equipment like bus support insulators, circuit breakers, SPDs, Voltage Transformers (Vts) etc., mounted inside the switchgear shall be suitable for continuous operation and satisfactory performance under under $\pm 5\%$ variation in supply voltage and ± 3 Hz variation in supply frequency.
- 19.8.** MCB/MCCB/RCCB shall be used for successful operation of the PV system.
- 19.9.** All components should be of ISI Marked and all switches and the circuit breakers, connectors should conform to IEC 60947, part I, II and III/IS60947 part I, II and III.
- 19.10.** "TEDA" should be embossed/laminated at the front side of ACDB.

20. Low voltage switchgears

- 20.1.** LV switchboards shall be IP21 for Indoor and IP65 for outdoor application made with heavy duty PVC/metal enclosure.
- 20.2.** Switchboard with metal enclosure shall be minimum 2 mm thick and properly coated.
- 20.3.** MCB/MCCB/RCCB and cables shall be rated as per rated current of the circuit, application voltage class, short circuit capacity.
- 20.4.** All switchboards shall be supplied completely wired internally up to the terminals, ready to receive external cables.
- 20.5.** No extra holes shall be allowed in the gland plate. Proper vermin proofing of the panel is required.
- 20.6.** Suitable cable entry shall be provided considering bending radius of the incoming and outgoing cables.
- 20.7.** All cables, MCB, MCCB, RCCB shall be of reputed ISI marked.

21. Cables

- 21.1.** All cables and connectors for use for installation of solar field must be of solar grade which can withstand harsh environment conditions for twenty-five (25) years and voltages as per latest IEC standards. (Note: IEC standards for DC cables for PV systems is under development, the cables of 1500 volts DC for outdoor installations shall comply with the draft EN 50618 for service life expectancy of twenty-five (25) years.
- 21.2.** Wires with sufficient ampacity and parameters shall be designed and used so that average voltage-drop at full power from the PV modules to inverter shall not be more than 2% (including diode voltage drop). PV Modules should be connected with USE-2/RHW-2 cables array to junction box and junction box to photovoltaic disconnecter with the THHN/THWN-2 sunlight resistant with 90°C wet rated insulation cable. Due consideration shall be made for the de-rating of the cables with respect to the laying pattern in buried trenches/on cable trays, while sizing the cables. The Contractor shall provide voltage drop calculations in excel sheet during detailed engineering. Cable used from PV Module to SCB as per EN 50618 and for SCB to Inverter shall be IS 7098 (Part -2). Bidder shall also follow EN 50618, IEC 60228 and IS7098 (Part-2).

- 21.3.** The cables shall be adequately insulated for the voltage required and shall be suitably colour coded for the required service. Bending radius for cables shall be as per manufacturer's recommendations and IS: 1255.
- 21.4.** All cables shall be supplied in the single largest length to restrict the straight-through joints to the minimum number. Only terminal cable joints shall be accepted. No cable joint to join two cable ends shall be accepted. All wires used on the LT side shall conform to IS and shall be of appropriate voltage grade. Only copper conductor wires of reputed make shall be used for DC connections, while copper or aluminium conductor wires may be used for AC connections.
- 21.5.** Cables of appropriate size to be used in the system shall have the following characteristics:
- 21.5.1.** Temp. Range: -100°C to $+800^{\circ}\text{C}$
 - 21.5.2.** For the DC cabling, XLPE or XLPO insulated and sheathed, UV-stabilized single core multi stranded flexible copper cables shall be used. Multi-core cables shall not be used.
 - 21.5.3.** For the AC cabling, PVC or XLPE insulated and PVC sheathed single or multi-core multi stranded flexible copper cables shall be used. Outdoor AC cables shall have a UV-stabilized outer sheath.
 - 21.5.4.** The cables (as per IS) should be insulated with a special grade PVC compound formulated for outdoor use. Outer sheath of cables shall be electron beam cross linked XLPO type and black in colour.
 - 21.5.5.** Cable Jacket should also be electron beam cross – linked XLPO, flame retardant, UV resistant and black in colour.
 - 21.5.6.** All wires used on the LT side shall conform to IS and shall be appropriate voltage grade. Only copper conductor wires of reputed make shall be used for DC connections and copper or aluminium conductor wires may be used for AC connections.
 - 21.5.7.** The cables shall be adequately insulated for the voltage required and shall be suitably colour coded for required service. Bending radius for cables shall be as per manufacturer's recommendation and as per IS:1255.
 - 21.5.8.** All cable should be ISI marked, reputed make and should conform to IEC 60227/IS 694 and IEC 60502/IS 1554 (Part I and II), IS 7098-1, EN 50618.
- 21.6.** Cabling on DC side of the system shall be as short as possible to minimize the voltage drop in the wiring. Components and hardware shall be vandal and theft resistant. All parts shall be corrosion-resistant.
- 21.7.** All the cabling and cable interconnection must be carried out using suitable UV resistant PVC conduit/flexible pipe/cable tray as per requirement. The UV- stabilized PVC conduit pipe of adequate diameter with a minimum wall thickness of 1.5 mm.

Voltage drop on the DC side from array to the inverter should not be more than 3%. Necessary calculations in this regard shall also be submitted during design approval.

- 21.8. Cable routing/marking:** All cable/wires are to be suitably tagged and marked with proper manner by good quality ferule or by other means so that the cable easily identified.
- 21.9. Armour:** All cables laid underground, if required, shall be armoured. And laid in ground at a minimum depth of 1.5 meter. Armour shall be of galvanised steel flat strip/round wires applied helically in single layers complete with covering the assembly of cores.
- i. For cable size up to 25 Sq. mm. Armour of 1.4 mm dia G.I. round wire
 - ii. For cable size above 25 Sq. mm. Armour of 4 mm wide 0.8 mm thick G.I strip.
- 21.10. Sheath:** The cable shall be rated extruded for XLPE 90°C. Inner sheath shall be extruded type and shall be compatible with the insulation provided for the cables. Outer sheath shall be of an extruded type layer of suitable PVC material compatible with the specified ambient temp 50°C and operating temperature of cables. The sheath shall be resistant to water, ultraviolet radiation, fungus, termite and rodent attacks. The colour of outer sheath shall be black. Sequential length marking required at every 1.0 meter interval on outer sheath shall be available. The Contractor shall furnish resistance/reactance/capacitances of the cable in the technical data-sheet. Packing and marking shall be as per Clause No. 18 of IS 7098 (part I)/1988 amended up to date.
- 21.11.** Cable terminations shall be made with suitable cable lugs and sockets, crimped properly and passed through brass compression type cable glands at the entry and exit point of the cubicles.
- 21.12.** All cable/wires shall be provided with Punched Aluminium tags only. The marking on tags shall be done with good quality letter and number ferrules of proper sizes so that the cables can be identified easily.
- 21.13.** The RS-485 cable from inverter to the metering box shall be armoured and may be laid along with the AC power cables only if there is no mutual interference. In case any interference is found between the power cables and the RS-485 cable, the Contractor shall separately lay the RS-485 cable at its own cost.

22. Quality Certification, Standards and Testing

22.1. Solar Photovoltaic (PV) Modules/Panels

Solar Photovoltaic (PV) Modules/Panels		
Sl.No.	Applicable Standards	Description
1.	IEC 61215/IS 14286	Design qualification and type of approval for crystalline

		silicon Terrestrials photovoltaic Modules
	Part-1	Test requirements
	Part-1.1	Special requirements for testing of crystalline silicon photovoltaic (PV) modules
	Part-2	Test procedures
2.	IEC 61853-1/IS 16170-1	Photovoltaic (PV) module performance testing and energy-Irradiance and temperature performance measurements and power rating
3.	IEC 61730	Photovoltaic (PV) module safety qualifications
	Part-1	Requirements for construction
	Part-2	Requirements for Testing
4.	IEC 61701	Salt mist corrosion testing of photovoltaic (PV) modules. Severity Level 6
5.	IEC 62716	Photovoltaic (PV) modules – Ammonia (NH ₃) Corrosion Testing (As per the site condition like diaries, toilets)
6.	IEC TS 62804-1:2015	Photovoltaic (PV) modules - Test methods for the detection of potential-induced degradation - Part 1: Crystalline silicon (under conditions of 85 °C/85 % RH for minimum 192 hours)

 **Note:**

- Equivalent standards may be used with the prior approval of TEDA.
- As per the Solar Photovoltaics, Systems, Devices and Components Goods (Requirements for Compulsory Registration) Order, 2017, PV Modules used in the grid connected solar power projects shall be registered with BIS and bear the Standard Mark as notified by the Bureau of Indian Standards.
- The successful bidders shall be required to use only the models and manufacturers included in ALMM Lists (of solar PV Cells and Modules)

22.2. Solar PV Grid-tie / Hybrid Inverters

Solar PV Grid-tie/Hybrid Inverters		
Sl.No.	Applicable Standards	Description
1.	IEC 62109-1	Safety of power converters for use in photovoltaic power systems - Part 1: General requirements

2.	IEC 62109-2	Safety of power converters for use in photovoltaic power systems - Part 2: Particular requirements for inverters
3.	IEC 61683/IS 61683	Photovoltaic Systems – Power conditioners: Procedure for Measuring Efficiency (10%, 25%, 50%, 75% and 90-100% Loading Conditions)
4.	IEC 60068-2 (1, 2, 14, 27, 30 and 64)/Equivalent BIS Std.	Environmental Testing for PV system – Power Conditioners and Inverters Charge Controller/MPPT Unit
5.	IEC 62116/UL 1741/IEEE 1547	Utility-interconnected PV Inverters – Test procedure of Islanding Prevention Measures.
6.	IEC 61000-6-2	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments
7.	IEC 61000-6-4	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments

**Note:**

- CEA Technical Standards for Connectivity to the Grid Regulations 2007 with 2013 and 2019 Amendment is applicable
- As per the Solar Photovoltaics, Systems, Devices and Components Goods (Requirements for Compulsory Registration) Order, 2017, Inverters used in the grid connected solar power projects shall be registered with BIS and bear the Standard Mark as notified by the Bureau of Indian Standards.

22.3. Battery Bank

Battery Bank		
Sl.No.	Applicable Standards	Description
1.	IEC 61427	General information relating to the requirements for the secondary batteries used in Photovoltaic Energy Systems (PVES) and to the typical methods of test used for the verification of battery performances.
2.	IEC 60896	This part of IEC 60896 applies to all stationary lead-acid cells and Monobloc batteries of the valve regulated type for float charge applications, (i.e. permanently connected to a load and to a DC power supply), in a static location (i.e. not generally intended to be moved from place to place) and incorporated into stationary equipment or installed in battery rooms for use in

		telecom, uninterruptible power supply (UPS), utility switching, emergency power or similar applications.
3.	IS 13369:1992	This standard specifies Ah capacities, voltage, overall dimensions, performance requirements and tests for stationary lead-acid units in Monobloc container.
4.	IS 1651:2013	This standard specifies rated Ah capacities, overall dimensions, performance requirements and tests for Stationary Lead Acid Cells and Batteries using Tubular Positive Plates
5.	IS 15549:2005	This standard specifies capacities and performance requirements and corresponding test methods for all types of high integrity series stationary Valve regulated lead acid batteries.
6.	IS 16046 : 2015 / IEC 62133 : 2012	Defines requirements and tests for the safe operation of portable sealed secondary cells and batteries containing alkaline or other non-acid electrolyte , under intended use and reasonably foreseeable misuse.
7.	IEC 61056	IEC 61056-1:2012 specifies the general requirements, functional characteristics and methods of test for all general-purpose lead-acid cells and batteries of the valve-regulated type.
8.	IS 16220	IS 16220 defines the general requirements, functional characteristics and methods of test for all general-purpose lead- acid cells and batteries of the valve-regulated type.
9.	IEC 62133-2: 2017	IEC 62133 requirements and tests for the safe operation of portable sealed secondary lithium cells and batteries containing non-acid electrolyte, under intended use and reasonably foreseeable misuse.
10.	IEC 62620:2014	IEC 62620 defines marking, tests and requirements for lithium secondary cells and batteries used in industrial applications including stationary applications.

22.4. Fuses/Switches/Circuit Breakers/Connectors

Fuses/Switches/Circuit Breakers/Connectors		
Sl.No.	Applicable Standards	Description
1.	IS/IEC 60947 (Part 1, 2 and 3), EN 50521	General safety requirements for connectors, switches, circuit breakers (AC/DC)
2.	IEC 60269-6	Low voltage fuses – Part 6: Supplementary requirements for fuse-links for the protection of Solar PV Energy Systems

22.5. Surge Arresters

Surge Arresters		
Sl.No.	Applicable Standards	Description
1.	IEC 61643-11/IS 15086-5	Low voltage surge protective devices – Part 11: Surge protective devices connected to low voltage power systems – Requirements and test methods
2.	IEC 60364-5-53/IS 15086-5 (SPD)	Electrical installations of buildings - Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control
3.	BFC 17-102:2011/NFC 102:2011/IEC 62305	Lightning Protection Standard

22.6. Cables

Cables		
Sl.No.	Applicable Standards	Description
1.	IEC 60227/IS 694, IEC 60502/IS1554 (Part 1 and 2)/IEC69947 (as applicable)	General test and measuring method for PVC (Polyvinyl Chloride) insulated cables (for working voltages up to and including 1100 V, and UV resistant for outdoor installation)
2.	IS 7098-II	Cross linked polyethylene insulated PVC sheathed cables upto 1500 V
3.	IEC 62930/BS EN 50618	Electric cables for photovoltaic systems, mainly for DC cables.

22.7. Earthing

Earthing		
Sl.No.	Applicable Standards	Description
1.	IS 3043	Code of Practice for Earthing
2.	IEC 62561-1	Lightning protection system components (LPSC) – Part 1: Requirements for connection components
3.	IEC 62561-2	Lightning protection system components (LPSC) – Part 2: Requirements for conductors and earth electrodes
4.	IEC 62561-7	Lightning protection system components (LPSC) – Part 7: Requirements for earthing enhancing compounds

5.	IEEE 80	IEEE Guide for Safety in AC Substation Grounding
6.	IEEE 142	IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems
7.	Indian Electricity Rules	

22.8. Junction Box

String Combiner Box (SCB)/String Monitoring Unit (SCU)/Array Junction Box (AJB)		
Sl.No.	Applicable Standards	Description
1.	IEC 60529	Degree of protections provided by the enclosure
2.	IEC 62262	Enclosure Impact Protection
3.	IEC 60269	Fuse
4.	IEC 61643-11	Surge Protection Device
5.	IEC 62852 or EN 50521	Solar cable connector
6.	IEC 60695-2-10	Fire hazard testing

22.9. Solar PV Module Mounting Structure

Solar PV Module Mounting Structure		
Sl.No.	Applicable Standards	Description
1.	IS 6403/456/4091/875	Design of foundation for mounting the structure should be as per defined standards which clearly states the Load Bearing Capacity & other relevant parameters for foundation design
2.	IS 875 – III	Grade of raw material to be used for mounting the structures so that it complies the defined wind loading condition
3.	IS 2062/IS4759	Materials for the structure mounting, angles and channels.
4.	IS 1079	For sheet
5.	IS 1161 & 1239	For round pipes
6.	IS 4923	For rectangular and square hollow section
7.	IS 1852/808/2062/1079/811	Test reports for the raw material

8.	IS 7215	In process inspection report as per approved drawing and tolerance
9.	IS 822	D.P. Test (Pin Hole/Crack) - For ascertaining proper welding of structure part
10.	ER 70 S - 6	Weld wire grade - For ascertaining proper welding of structure part
11.	IS 4759 & EN 1461	Minimum coating requirement - For ascertaining hot dip galvanizing of fabricated structure
12.	IS 2633	Pierce Test – Testing of galvanized material
13.	IS 6745	Mass of Zinc – Testing of galvanized material
14.	IS 2629	Adhesion Test – Testing of galvanized material
15.	IS 2633	CuSO4 Test – Testing of galvanized material
16.	IS 209	Superior High-Grade Zinc Ingot should be of 99.999% purity
17.	IS 5624	Foundation Hardware – If using foundation bolt in foundation

22.10. Solar Generation meter and Service Connection meter

Solar Generation meter and Service Connection meter		
Sl.No.	Applicable Standards	Description
		As per relevant specifications by TANGEDCO.

22.11. Constructions and Safety test

Constructions and Safety test		
Sl.No.	Applicable Standards	Description
	IEC 62109-1 Standalone inverter and MPPT/Charge controller	Safety of power converters for use in photovoltaic power systems –Part 1: General requirements

22.12. Anti-Islanding test

Anti-Islanding test		
Sl.No.	Applicable Standards	Description
	IEC 62116 up to 10 kVA IEEE 1547 more than 10 kVA	Test procedure of islanding prevention measures for utility-interconnected photovoltaic inverters

22.13. Test related to utility

Test related to utility		
Sl.No.	Applicable Standards	Description
1.	IEC 61727	Photovoltaic (PV) systems Characteristics of the utility interface

22.14. Paralleling of Inverter

Paralleling of Inverter		
Sl.No.	Applicable Standards	Description
1.	CI 5.4 IEEE 1547.1	Verify that a synchronization control function will cause the paralleling device to close only when key synchronization parameters are within allowable limits.

23. Protection System**23.1. Earthing Protection**

- 23.1.1.** Each array structure of the PV yard, LT power system, all electrical equipment, inverter, all junction boxes, etc., shall be grounded properly as per IS 3043-2018 and IEEE 80-2000, Indian Electricity Rules, Codes of practice and regulations existing in the location where the system is being installed.
- 23.1.2.** All metal casing/ shielding of the plant shall be thoroughly grounded in accordance with CEA Safety Regulation 2021 or amended with time to time. In addition, the lightning arrester/masts should also be earthed inside the array field and the position and height of the lightning arrester/mast should be such that it would cover the entire volume of the SPV Panels to conduct through cable/ GI strip with proper insulation.
- 23.1.3.** Earth resistance should be as low as possible and shall never be higher than 2 ohms.

- 23.1.4.** For all grid connected rooftop solar PV systems, separate three (3) earth pits shall be provided for individual three (3) earthing viz.: DC side earthing, AC side earthing and lightning arrestor earthing with proper insulator.
- 23.1.5.** Each string/array and MMS of the plant shall be grounded properly. The frame of the PV module array should be earthed at multiple points. The array structures are to be connected to earth pits as per IS standards. Necessary provision shall be made for bolted isolating joints of each earthing pit for periodic checking of earth resistance.
- 23.1.6.** The complete earthing system shall be mechanically and electrically connected to provide independent return to earth.
- 23.1.7.** All the bolts of earthing system shall be of Stainless steel (SS) type.
- 23.1.8.** Minimum earthing conductor size shall be 10 mm² for aluminium strips, or 6 mm² for copper conductors or 70 mm² for hot dip galvanized steel.
- 23.1.9.** The earth electrodes shall have a precast concrete enclosure with a removable lid for inspection and maintenance. The entire earthing system shall comprise noncorrosive components.

23.2. Lightning Protection

- 23.2.1.** All PV systems shall have lightning protection.
- 23.2.2.** The source of over voltage can be lightning or other atmospheric disturbance. Main aim of over voltage protection is to reduce the over voltage to a tolerable level before it reaches the PV or other sub-system components as per IS: 2309 – 1989 (Reaffirmed-2005), Edition 3.1 (2006-01).
- 23.2.3.** The contractor will supply and install an adequate number and appropriate size of IS: 3043 – 2018 compliant earthing kits for AC circuit, DC circuit and lightning protection system.
- 23.2.4.** Necessary foundation/anchoring for holding the lightning conductor in position to be made after giving due consideration to shadow on PV array, maximum wind speed and maintenance requirement at site in future.
- 23.2.5.** The lightning conductor shall be earthed through flats and connected to the earth mats as per applicable Indian Standards with earth pits. Two (2) earth pits shall be provided for each lightning arrestor. Each lightning conductor shall be fitted with individual earth pit as per required Standards including accessories, and providing masonry enclosure with cast iron cover plate having locking arrangement, watering pipe using charcoal or coke and salt as required as per provisions of IS & Earth Resistance of Lightning System must be less than one (1) Ohm.
- 23.2.6.** If necessary more numbers of lightning conductors may be provided.

The Contractor is also free to provide franklin rod/early streamer type of lightning arresters on the MMS structure designed in such a way not to cast shadow on the next row of solar PV modules.

- 23.2.7.** The Contractor shall submit the drawings and detailed specifications of the PV array lightning protection equipment to TEDA for approval before installation of system.
- 23.2.8.** Contractor shall provide dedicated earth pits for Lightning Arrestor as per relevant IS standard.
- 23.2.9.** For systems up to 10 kW_p the lightning arrester shall of conventional type and for above 10 kW_p systems it should be of Early Streamer Emission (ESE) type.

23.3. Surge Protection

- 23.3.1.** Internal surge protection, wherever required, shall be provided.
- 23.3.2.** It will consist of three (3) SPD type-II/MOV type surge arrestors connected from +ve and –ve terminals to earth.

23.4. Grid Islanding

- 23.4.1.** In the event of a power failure on the electric grid, it is required that any independent power-producing inverters attached to the grid turn off in a short period of time. This prevents the DC-to-AC inverters from continuing to feed power into small sections of the grid, known as "Islands." Powered Islands present a risk to workers who may expect the area to be unpowered, and they may also damage grid-tied equipment. The Rooftop PV system shall be equipped with islanding protection. In addition to disconnection from the grid (due to islanding protection) disconnection due to under and over voltage conditions shall also be provided.
- 23.4.2.** A manual disconnect 4-pole isolation switch beside automatic disconnection to grid would have to be provided at utility end to isolate the grid connection by the utility personnel to carry out any maintenance. This switch shall be locked by the utility personnel.

24. Integration of PV power with grid/power evacuation

- 24.1.** The Plant shall be connected to grid as per guidelines of CEA, TNERC and Electrical inspectorate, Government of Tamil Nadu.
- 24.2.** Net metering is the concept in which the energy exported is deducted from energy imported in units to arrive at the net imported or exported energy. The net imported or exported energy is billed or credited or carried over on the basis of retail tariff.
- 24.3.** Net billing Feed-in Tariff is the concept in which the monetary value of the imported energy is debited at the retail tariff. The monetary value of exported energy is credited at feed-in tariff. The monetary value of the exported energy is deducted from the monetary value of imported energy to arrive at the net amount to be billed.

- 24.4.** Gross Metering involves selling of entire solar energy generated to TANGEDCO. The exported solar energy is credited at the feed-in tariff.
- 24.5.** Tamil Nadu Electricity Regulatory Commission (TNERC) has issued “Regulation for GISS ” on 22nd October, 2021.
- 24.6.** The output power from PV array would be fed to the inverters which converts DC produced by PV array to AC and feeds it into the main electricity grid after synchronization.
- 24.7.** In case of grid failure or low or high voltage, solar PV system shall be out of synchronization and shall be disconnected from the grid.
- 24.8.** The maximum capacity for interconnection with grid at a specified voltage level shall be as specified in the Distribution Code/Supply Code of the State and amended from time to time. Following criteria have been suggested for selection of voltage level in the distribution system for ready reference of the solar suppliers.

Plant Capacity	Connecting Voltage
Up to 4 kW	240V-single phase or 415V-three phase at the option of the consumer
Above 4 kW and up to 112 kW	415V – three phase
Above 100kW	At HT/EHT level (11kV/33kV/66kV) as per TANGEDCO rules

**Note:**

- The maximum permissible capacity for rooftop shall be 1 MW for a single net metering point.
- Utilities may have voltage levels other than above, DISCOMS may be consulted before finalization of the voltage level and specification be made accordingly.

- 24.9.** Metering and Grid Connectivity of the RTS Project shall be the responsibility of the Contractor in accordance with the applicable TNERC's Regulations, as amended from time to time.
- 24.10.** The Contractor shall be responsible for obtaining required approvals and clearances for connectivity of the RTS Project(s) with TANGEDCO.
- 24.11.** The Rooftop Owner shall apply to TANGEDCO for Inter-connection of the RTS Project with its grid. The Rooftop Owner shall pay Application fee as per TANGEDCO'S Guidelines.
- 24.12.** The Contractor shall bear the entire cost of metering arrangement to be provided including its accessories. Any applicable charges towards installation of RTS Projects shall be paid to the TANGEDCO or any other agency by the Contractor.

24.13. The installation of meters including Current Transformer (CT) and Potential Transformer (PT), wherever applicable, shall be carried out by the Contractor as per the procedures of TANGEDCO with its permission.

25. Danger Boards

25.1. In addition to the standard caution and danger boards or labels as per IE Rules, the AC Distribution Board (next to the solar grid inverter) to which the AC output of Solar PV System is connected shall be provided with a non-corrosive caution label with the text: **WARNING – DUAL POWER SOURCE – TANGEDCO & SOLAR.**

25.2. The size of the caution level shall be 105 mm (W) X 20 mm (H) with white letters on a red background.

25.3. Caution labels as may be prescribed by TANGEDCO shall be fixed as per TANGEDCO specifications.

26. Drawings & Manuals

26.1. Two (2) sets of engineering, electrical drawings and Installation and O&M manuals are to be supplied. Bidder shall provide complete technical data sheets for each equipment giving details of the specifications along with make/makes in their bid along with basic design of the PV Installation setup and power evacuation, synchronization along with protection equipment.

26.2. The Contractor shall furnish the following drawings after Letter of Acceptance/Letter of Intent and obtain approval:

- i.** General arrangement and dimensioned layout.
- ii.** Schematic drawing showing the requirement of PV panel, Power conditioning Unit(s)/inverter, Junction Boxes, AC and DC Distribution Boards, meters etc.
- iii.** Routing diagram of cables and wires.
- iv.** Data sheets and user manuals of the solar PV panels and the solar grid inverter.
- v.** Structural drawing along with foundation details for the structure.
- vi.** Itemized bill of material for complete SV plant covering all the components and associated accessories.
- vii.** Layout of solar Power Array
- viii.** Shadow analysis of the site
- ix.** Maintenance register.

26.3. Approved ISI and reputed makes for equipment be used.

26.4. For complete electromechanical works, Contractor shall supply complete design, details and drawings for approval to TANGEDCO/TEDA and TPIA before progressing with the installation work.

27. Project Management**27.1. Testing and Third-Party Inspection**

- 27.1.1.** The Contractor shall provide all relevant plant and equipment specifications, data sheets, certificates, designs, drawings, etc. to TEDA for approval prior to commencement of installation. Structural designs shall be provided to TEDA in STAAD Pro format for verification and approval.
- 27.1.2.** TEDA shall have, at all times, access to the Contractor's premises and also shall have the power to inspect and examine the materials and workmanship of project work during its manufacturing, shop assembly and testing. If part of the equipment is required to be manufactured in the premises other than the Contractor's, the necessary permission for inspection shall be obtained by the Contractor on behalf of TEDA.
- 27.1.3.** TEDA shall have the right to serve notice in writing to the Contractor on any grounds of objections, which they may have in respect of the work. The Contractor shall have to satisfy the objection, otherwise, TEDA at its liberty may reject any or all components of equipment or workmanship connected with such work.
- 27.1.4.** The Contractor shall issue request letter to TEDA for testing of any component of the plant, which is ready for testing at least fifteen (15) days in advance from the date of actual date of testing at the premises of the Contractor or elsewhere. When the inspection and the tests have been satisfactorily completed at the Contractor's works, TEDA shall issue a certificate to that effect. However, TEDA at its own discretion may waive the inspection and testing in writing. In such case, the Contractor may proceed with the tests which shall be deemed to have been made in the TEDA's presence, and it shall forthwith forward six (6) sets of duly certified copies of test results and certificates to TEDA for approval of TEDA. The Contractor, on receipt of written acceptance from TEDA, may dispatch the equipment for erection and installation.
- 27.1.5.** For all tests to be carried out, whether in the premises of the Contractor or any subcontractor or the supplier, the Contractor shall provide labour, materials, electricity, fuel, water, stores, apparatus and instruments etc. Free of charge as may reasonably be demanded to carry out such tests of the equipment. The Contractor shall provide all facilities to TEDA to accomplish such testing.
- 27.1.6.** TEDA shall have the right to carry out inward inspection of the items on delivery at the Site and if the items have been found to be not in line with the approved specifications, shall have the liberty to reject the same.
- 27.1.7.** Neither the waiving of inspection nor acceptance after inspection by TEDA shall, in anyway, absolve the Contractor of the responsibility of

supplying the equipment strictly in accordance with requisite standards and specifications.

- 27.1.8.** TEDA shall undertake final commissioning test of the PV system including its design, specification, safety and performance.

28. Other Key Responsibilities

28.1. Inspection & Reporting

28.1.1. TEDA may inspect the ongoing installation or installed plants. In case the installed systems are not as per standards, non-functional on account of poor quality of installation, or non-compliance of AMC, the Employer reserves the right to blacklist the Contractor. Blacklisting may inter-alia include the following:

- a.** The Contractor will not be eligible to participate in tenders for Government supported projects.
- b.** In case, the concerned Director(s) of the Contractor joins another existing or starts/joins a new firm/company, the company will automatically be blacklisted.

28.1.2. The Contractor shall be responsible for providing daily/weekly/fortnightly/monthly or customized information regarding progress of projects required by TEDA, online or in hard copy. For which the Contractor is also responsible for maintaining online & off-line records.

28.1.3. Assist TANGEDCO with a real-time monitoring dedicated web-portal.

28.1.4. Providing training to the beneficiary.



This page intentionally left blank



**Tamil Nadu Energy Development Agency
Chennai, Tamil Nadu**

**Section V
General Conditions of
Contract (GC)**

This Section contains the general clauses to be applied in the contract

*Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road, Chennai – 600 006,
Phone: 044-28242800,
e-mail: dgm2@teda.in, tender@teda.in
website: www.teda.in*

This page intentionally left blank

A. Definitions and Interpretation

1. Definitions

- 1.1. The following words and expressions shall have the meanings hereby assigned to them:
- i. **“Adjudicator”** means the person or persons named as **specified in the Contract Data** to make a decision on or to settle any dispute or difference between the Employer and the Contractor.
 - ii. **“Applicable Law”** means any statute, law, regulation, ordinance, notification, rule, regulation, judgment, order, decree, bye-law, approval, directive, guideline, policy, requirement or other Governmental restriction or any similar form of decision of, or determination by, or any interpretation or administration having the force of law in the Republic of India and the State Government, by any Government Authority or instrumentality thereof, whether in effect as of the date of this Contract or thereafter.
 - iii. **“Affected Party”** means Employer or the Contractor whose performance has been affected by an event of Force Majeure.
 - iv. **“Base Date”** means the date 28 days prior to the latest date for submission of the Bid.
 - v. **“Bid”** shall mean the Techno Commercial and the Financial Proposal submitted by the Bidder along with all documents/credentials/attachments annexure etc., in response to this IFB, in accordance with the terms and conditions hereof.
 - vi. **“Bidder”** shall mean Bidding Company submitting the Bid including its successors, executors and permitted assigns.
 - vii. **“Bid Price”** shall mean the price bid submitted by the bidders comprising of (a) EPC Price bid (Firm value of the financial proposal as the sum of individual Bid value of supply, erection and civil works including all Taxes and Duties) and (b) O&M Price bid including all Taxes and Duties.
 - viii. **“CEA”** shall mean Central Electricity Authority.
 - ix. **“Chartered Accountant”** shall mean a person practicing in India or a firm whereof all the partners practicing in India as a Chartered Accountant(s) within the meaning of the Chartered Accountants Act, 1949;
 - x. **“Commissioning”** means operation of the Facilities or any Section thereof by the Contractor following Completion, which

operation is to be carried out by the Contractor as provided in GC §-25.1 (Commissioning) hereof, for the purpose of carrying out Guarantee Test(s).

- xi.** “**Completion**” means that the Facilities or any Section thereof have been completed operationally and structurally and put in a tight and clean condition, that all work in respect of Precommissioning of the Facilities or such Section thereof has been completed, and that the Facilities or such Section thereof are ready for Commissioning as provided in GC §-24 (Completion of the Facilities) hereof.
- xii.** “**Construction Manager**” means the person appointed by the Contractor’s Representative in the manner provided in GC §-17.2.4.
- xiii.** “**Contract**” means the Contract Agreement entered into between the Employer and the Contractor, 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.
- xiv.** “**Contract Data**” means the pages **entitled contract data** which constitute Part A of the Particular Conditions.
- xv.** “**Contract Documents**” means the documents listed in Article 1.1 (Contract Documents) of the Contract Agreement (including any amendments thereto).
- xvi.** “**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.
- xvii.** “**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.
- In case Contractor undergo any merger or amalgamation or a scheme of arrangement or similar re-organization and the Contract Agreement is assigned to any entity or entities partly or wholly, the Contract Agreement shall be binding mutatis mutandis upon the successor entities and shall continue to remain valid with respect to obligation of the successor entities.
- xviii.** “**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.

- xix. **“Contractor’s Personnel”** means all personnel whom the Contractor utilises for the execution of the Contract, who may include the staff, labour and other employees of the Contractor and of each Subcontractor; and any other personnel assisting the Contractor in the execution of the Contract.
- xx. **“Contractor’s Representative”** means any person nominated by the Contractor and approved by the Employer in the manner provided in GC §-17.2 (Contractor’s Representative and Construction Manager) hereof to perform the duties delegated by the Contractor.
- xxi. **“day”** means calendar day.
- xxii. **“Defects Liability Period”** means the period of validity of the warranties given by the Contractor commencing at Operational Acceptance 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 GC §-27 (Defects Liability) hereof.
- xxiii. **“Dispute Board”** (DB) means the person or persons appointed by agreement between the Employer and the Contractor to make a decision with respect to any dispute or difference between the Employer and the Contractor referred to him or her by the Parties pursuant to GC §-45.1 (Appointment of the Dispute Board) hereof.
- xxiv. **“Effective Date”** means the date under GC §-8.1 from which the Time for Completion shall be calculated.
- xxv. **“Employer”** means the person **named as such in the Contract Data** and includes the legal successors or permitted assigns of the Employer.
- xxvi. **“Employer’s Requirements”** means the document entitled employer’s requirements, as included in the Contract, and any additions and modifications to such document in accordance with the Contract. Such document includes drawings, specifications, and any other documents specifying the purpose, scope, and/or design and/or other technical criteria, for the Facilities.
- xxvii. **“Facilities”** 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.
- xxviii. **“GC”** means the **General Conditions** hereof.
- xxix. **“GHI”** means Global Horizontal Irradiance
- xxx. **“Guarantee Test(s)”** means the test(s) specified in the Employer’s Requirements to be carried out to ascertain whether

the Facilities or a part thereof is able to attain the Functional Guarantees specified in Appendix 8 (Functional Guarantees) to the Contract Agreement, in accordance with the provisions of GC §-25.2 (Guarantee Test) hereof.

- xxxi.** “**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.
- xxxii.** “**Letter of Acceptance**” means the letter of formal acceptance, signed by the Employer, of the Letter of Bid, including any annexed memoranda comprising agreements between and signed by both Parties. If there is not such letter of acceptance, the expression “Letter of Acceptance” means the Contract Agreement and the date of issuing or receiving the Letter of Acceptance means the date of signing of the Contract Agreement.
- xxxiii.** “**Letter of Bid**” means the document(s) entitled letters of technical bid and price bid, or letter of second stage bid as appropriate, which was/were completed by the Contractor and include(s) the signed offer to the Employer for the Facilities.
- xxxiv.** “**Mandatory Spare Parts**” means means the spare parts listed in the Schedule entitled “Mandatory Spare Parts” of the Price Schedule included in the Contract, which are required in the Contract and to be supplied by the Contractor, prior to the completion of the Facilities under GC §-7.3 (Spare Parts) (a), for the purpose of the proper and continuing functioning of the Facilities after the Operational Acceptance of the Faciltieis in accordance with GC §-25.3 (Operational Acceptance) hereof.
- If the said Schedule is not included in the Contract, this Sub-Clause shall not apply.”
- xxxv.** “**Operational Acceptance**” means the acceptance by the Employer of the Facilities or any Section thereof, which certifies the Contractor’s fulfilment of the Contract in respect of Functional Guarantees of the Facilities (or the relevant part thereof) in accordance with the provisions of GC §-28 (Functional Guarantees) hereof and shall include deemed acceptance in accordance with GC §-25 (Commissioning and Operational Acceptance).

- xxxvi. **“Operational Acceptance Certificate”** means a certificate issued under GC §-25 (Commissioning and Operational Acceptance) hereof.
- xxxvii. **“Party”** means the Employer or the Contractor, as the context requires, and “Parties” means both of them.
- xxxviii. **“PC”** means the Particular Conditions.
- xxxix. **“Performance Security”** means the security(ies) under GC §-13.3 (Performance Security) hereof.
- xl. **“Plant”** means permanent plant, equipment, machinery, apparatus, 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 GC §-7.3 hereof), but does not include Contractor’s Equipment.
- xli. **“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 GC §-24 (Completion of the Facilities) hereof.
- xlii. **“Project Manager”** means the person appointed by the Employer in the manner provided in GC §-17.1 (Project Manager) hereof and **named as such in the Contract Data** to perform the duties delegated by the Employer.
- xliii. **“Provisional Sum”** means a sum which is specified in the Contract as a provisional sum, for the supply of any Plant and Installations Services or other services under GC §-39.4 (Provisional Sums) hereof.
- xliv. **“Recommended Spare Parts”** means spare parts listed in the Schedule entitled “Recommended Spare Parts” of the Price Schedule included in the Contract, which are to be supplied by the Contractor under an agreement between the Parties in accordance with GC §-7.3(b), prior to the completion of the Facilities, and are necessary for the purpose of the proper and continuing functioning of the Facilities after the Operational Acceptance of the Facilities in accordance with GC §-25.3 (Operational Acceptance) hereof.
- xlvi. **“Section”** means a part of the Facilities **specified in the Contract Data** as a Section (if any).
- xlvi. **“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.

- xlvi.** “**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.
- xlvi.** “**Time for Completion**” means the time within which Completion of the Facilities or any Section thereof is to be attained, as referred to in GC §-8 (Commencement and Time for Completion) and in accordance with the all relevant provisions of the Contract.
- xlix.** “**year**” means 365 days.

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.
- 2.2.** The Contract (s) will be signed in three (3) originals and the Contractor shall be provided with one signed original and the rest will be retained by the Employer.
- 2.3.** The Contractor shall provide/submit, free of cost to the Employer all the engineering data, drawings and descriptive materials with the bid, in at least two (2) copies to form a part of the Contract immediately after LOA.

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 Document” 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 as of the Base Date), 38 Cours Albert 1er, 75008 Paris, France.

3.3. Entire Agreement

Subject to GC §-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 the 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 by a duly authorized representative of each Party hereto.

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 GC §-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.

It is stated that each paragraph, clause, sub-clause, schedule or annexure of this contract shall be deemed severable & in the event of the unenforceability of any paragraph, clause sub-clause, schedule or the remaining part of the paragraph, clause, sub-clause, schedule annexure & rest of the contract shall continue to be in full force & effect.

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 Data**.

4.2. 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.

4.3. Any notice sent shall be confirmed within two (2) days after receipt.

4.4. Any notice sent by facsimile or e-mail shall be deemed to have been delivered on date of its dispatch and personal delivery deemed to have been delivered on date of delivery.

4.5. Notices shall be deemed to include any approvals, consents, instructions, orders and certificates to be given under the Contract.

5. Law and Language

5.1. The Contract shall be governed by and interpreted in accordance with the laws of India. Any legal proceedings in respect of any matters, claims or disputes under this Agreement shall be under the jurisdiction of appropriate Courts in Chennai.

5.2. The ruling language of the Contract shall be English.

5.3. The language for communications shall be Tamil and English.

6. Corrupt or Fraudulent Practices

6.1. If the Employer determines, based on reasonable evidence, that the Contractor has engaged in any corrupt or fraudulent practice, in competing for or in executing the Contract, then the Employer may, after giving fourteen (14) days' notice to the Contractor, terminate the Contract and

expel him from the Site, and the provisions of GC §-42 of the General Conditions of Contract shall apply as if such expulsion had been made under GC §-42.2.1(c) hereof.

- 6.2. Should any employee of the Contractor be determined, based on reasonable evidence, to have engaged in any corrupt or fraudulent practice during the execution of the Contract, then that employee shall be removed in accordance with GC §-17.2.5.

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 Section IV, 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 GC §-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 **Employer's Requirements**, or any other requirements specified in the Contract.

- 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 the Completion of the Facilities as if such work and/or items and materials were expressly mentioned in the Contract.

7.3. Mandatory and Recommended Spare Parts

- a. The Contractor shall supply to the Employer, the Mandatory Spare Parts, prior to the completion of the Facilities or any Section thereof, at such timing as specified in the Contract for the operation and maintenance of the Facilities for the period **specified in the Contract Data** after the Operational Acceptance by the Employer.

The price of the Mandatory Spare Parts shall be included in the Contract Price.

- b. Upon the both Parties agree on the details of the Recommended Spare Parts for the operation and maintenance of the Facilities for

the period **specified in the Contract Data** including the identity, specifications and quantities of such spare parts and the terms and conditions, a Change is issued under GC §-39 (*Change in the Facilities*) and the price of Recommended Spare Parts shall be included in the Contract Price. The Contractor shall supply to the Employer, the Recommended Spare Parts, prior to the completion of the Facilities.

The price of Recommended Spare Parts shall include the purchase price and other costs relating to the supply of spare parts such as transportation, port charge and the Contractor's fees.

Also, at the end of penultimate year of the O&M contract, contractor shall supply a list of all recommended spares as per the operational requirement of the plant and with reference to the mean time between failures (MTBF), along with detailed specifications, supplier details and tentative cost for future purchase. The price of such spare parts shall include the breakup of taxes and duties as applicable towards purchase and supply of spare parts. Employer, at its discretion, will purchase the spare as required for future operation.

8. Commencement and Time for Completion

8.1. The Effective Date is the date at which the following precedent conditions have been fulfilled and the Project Manager's notification recording the agreement of both Parties on such fulfillment, and instructing to commence the work is received by the Contractor:

- a.** this Contract Agreement has been duly executed for and on behalf of both the Employer and the Contractor;
- b.** reasonable evidence of the Employer's financial arrangements has been delivered by the Employer to the Contractor in accordance with GC §-10.5;
- c.** **except if otherwise specified in the Contract Data**, the possession of the Site and access thereto and all other areas reasonably required for the proper execution of the Contract in accordance with GC §-10.2 is given to the Contractor, as required for the commencement of the work; and
- d.** the Contractor has received the Advance Payment as stated in Appendix 10 (*Payment Terms and Procedures*) provided that the corresponding bank guarantee has been delivered by the Contractor.

The Contractor shall commence the work on the Facilities after the Effective Date and, the Contractor shall thereafter proceed in accordance with time schedule specified in the Appendix 1 (*Time Schedule*) to the Contract Agreement.

- 8.2.** The Contractor shall attain Completion of the Facilities or a Section thereof, within the Time for Completion **stated in the Contract Data**, calculated from the Effective Date, or within such extended time to which the Contractor shall be entitled under GC §-40 hereof.

9. Contractor's Responsibilities

- 9.1.** The Contractor shall design, manufacture including associated purchases, 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:

- a.** has entered into this Contract on the basis of a proper examination of the data relating to the Facilities 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 Base Date; and
- b.** is responsible for interpreting all such data referred to in the above sub-paragraph (a).

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 from all local, state or national Government authorities or public service undertakings which such authorities or undertakings require the Contractor to obtain in its name and which are necessary for the performance of the Contract. The Contractor shall acquire all other permits, approvals and/or licenses that are not the responsibility of the Employer under GC §-10.3 hereof and that are necessary for the performance of the Contract.

- 9.4.** The Contractor shall comply with all laws in force. The laws include all local, state, national or other laws that affect the performance of the Contract and are binding 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 GC §-10.1 hereof.

The Contractor agrees to defend, indemnify and hold harmless TEDA, its officers, Directors, consultant, agents, employees and affiliates (and their respective officers, directors, agents and employees) from and against any and all claims, liabilities, actions, demands, judgments, losses, costs, expenses, suits, actions and damages arising by reason of bodily injury,

death or damage to property sustained by third parties that are caused by an act of negligence or the willful misconduct of the Contractor, or by an officer, Director, agent or employee of the Contractor. Indemnity Bond, if applicable & required shall be submitted by Contractor.

- 9.5.** If the Contractor is a joint venture (JV), which means for the purposes of this Contract, joint venture, consortium, association or unincorporated grouping 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 JV shall not be altered without the prior consent of the Employer.
- 9.6.** In the matter of connectivity of plant with the State Grid, Employer shall fill up the application and hand it over to the contractor however all other activities beyond it such as coordination, technical/regulatory compliance for interconnection including payment of Fee or any other charges to the state agencies/STU as the case may be shall be taken care by the Contractor. Bidders are advised to include these cost in their final offer/Price BID.
- 9.7.** The Contractor shall pay for all permits, approvals and/or licenses from all local, state or national Government authorities or public service undertakings 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 Employer's Requirements.

10. Employer's Responsibilities

- 10.1.** All information and/or data to be supplied by the Employer as described in the Employer's Requirements, shall be deemed to be accurate, except when the Employer expressly states otherwise, and the Contractor shall not be liable for the consequences of any discrepancies, errors, omissions or inaccuracies in such information and/or data.
- 10.2.** The Employer shall be responsible for acquiring and providing 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 Employer's Requirements. The Employer shall give to the Contractor such possession and access on or before the date(s) **specified in the Contract Data**.
- 10.3.** The Employer shall apply for all permits, approvals and/or licenses from all local, state or national Government authorities or public service undertakings 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 Employer's Requirements.

- 10.4.** If requested by the Contractor, the Employer shall use its best endeavours 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.** The Employer shall submit, before the Effective Date and thereafter within 28 days after receiving any request from the Contractor, reasonable evidence that financial arrangements have been made and are being maintained which will enable the Employer to pay the Contract Price punctually (as estimated at that time) in accordance with Appendix 10 (*Payment Terms and Procedures*) to the Contract Agreement. Before the Employer makes any material change to his financial arrangements, the Employer shall give notice to the Contractor with detailed particulars.
- 10.6.** 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; 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 Employer's Requirements, at or before the time specified in the programme furnished by the Contractor under GC §-18.2 (*Programme of Performance*) hereof and in the manner thereupon specified or as otherwise agreed upon by the Employer and the Contractor.
- 10.7.** All costs and expenses involved in the performance of the obligations under this GC §-10 shall be the responsibility of the Employer, save those to be incurred by the Contractor with respect to the performance of Guarantee Tests, in accordance with GC §-25.2 (*Guarantee Test*).

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 otherwise stated in the Contract Data**, the Contract Price shall be a firm lump sum 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 GC §-9.2, GC §-10.1 and GC §-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. Contract Price and Payment Procedure

The Contract Price shall be paid as specified in Article 2 (*Contract Price and Terms of Payment*) of the Contract Agreement, this GC §-12 and Appendix 10 (*Payment Terms and Procedures*) to the Contract Agreement, which also outlines the procedures to be followed in making application for and processing payments.

No payment made by the Employer herein shall be deemed to constitute acceptance by the Employer of the Facilities or any part(s) thereof.

However, if any item of plant and installation services is to be paid according to quantity supplied or work done, the provisions for measurement and evaluation shall be as stated in the Appendix 10 (*Payment Terms and Procedures*), and the Contract Price shall be adjusted accordingly. Any quantities which may be set out in a Schedule are estimated quantities and are not to be taken as the actual and correct quantities of the item of Plant and Installation services which the Contractor is required to execute: and any quantities or price data which may be set out in a Schedule shall be used for the purposes stated in the Schedule and may be inapplicable for other purposes.

The Employer shall make payment to the Contractor the Contract Price in consideration of the performance by the Contractor of its obligations in Indian currency (₹).

12.2. Payment

The Employer shall pay to the Contractor:

- a. the amount approved by the Project Manager with respect of each subsequent payment application, within reasonable time after the Project Manager receives invoice and the documents stated in Appendix 10 (*Payment Terms and Procedures*) to the Contract Agreement.

13. Securities

13.1. Issuance of Securities

The Contractor shall provide the securities specified below in favour of the Employer at the times, and in the amount, manner and form specified below

13.2. Performance Security

- 13.2.1. The Contractor shall, within fourteen (14) days of the receipt of the Letter of Acceptance, provide a security for the due performance of the Contract for the amount **specified in the Contract Data**.

In case of delay in demonstration of the Performance Test (PR test) and Operational Acceptance, the validity of all the contract Performance Bank Guarantees shall be extended by the period of such delay plus ninety (90) days.

13.2.2. The Performance Security shall be denominated in Indian currency (₹) of the Contract and shall be in the form provided in the Contract **as stated in the Contract Data**, or in another form acceptable to the Employer.

13.2.3. Promptly after the expiry date of the Defect Liability Period, the Performance Security shall become null and void.

However, if the Defects Liability Period has been extended on any part of the Facilities pursuant to GC §-27.8 hereof, the Contractor shall issue an additional security in an amount proportionate to the Contract Price of that part.

The Performance security shall be returned immediately after its expiration.

13.2.4. The Employer shall not make a claim under the Performance Security, except for amounts to which the Employer is entitled under the Contract. The Employer shall indemnify and hold the Contractor harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from a claim under the Performance Security to the extent to which the Employer was not entitled to make the claim.

14. Taxes and Duties

14.1. 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, unless otherwise **stated in the Contract Data**.

14.2. If any tax exemptions, reductions, allowances or privileges may be available to the Contractor, the Employer shall use its best endeavours to enable the Contractor to benefit from any such tax savings to the maximum allowable extent.

14.3. For the purpose of the Contract, the Contract Price specified in Article 2 (*Contract Price and Terms of Payment*) of the Contract Agreement shall be deemed to be based on the taxes, duties, levies and charges prevailing at the Base Date (hereinafter called "Tax" in this GC §-14.3).

14.4. If any rates of Tax are increased or decreased, a new Tax is introduced, an existing Tax is abolished, or any change in interpretation or application of any Tax occurs in the course of the performance of Contract, which was or will be assessed on the Contractor, Subcontractors or their employees in connection with performance of the Contract, an equitable adjustment of the Contract Price shall be made to fully take into account any such change by

addition to the Contract Price or deduction therefrom, as the case may be, in accordance with GC §-36 hereof.

14.5. Goods and Service Tax (GST)

14.5.1. Contractor shall mandatorily obtain the registration under GST Law at Central level and/or in respective State as may be required. Further, Contractor shall mandatorily file returns under GST before their due date and comply with the requirements of the Law within timelines. Before releasing the payment to the Contractor. Employer shall not be responsible for any delay in payment release to the contractor in case the GST compliance is not fulfilled from the contractor side in any manner.

14.5.2. Contractor shall be responsible to comply with all the requirements of applicable provisions of GST. Contractor has to mandatorily get registered under GST at Central and relevant State(s). Contractor shall file all the returns on timely basis and upload all the Invoices and acceptance thereof as may be required under the provisions of GST. In case, it is found that Employer is not able to take Input Tax Credit (ITC) benefit of the taxes due to any fault of the Contractor, Employer shall be constrained to deduct the amount from the payments to be made to the Contractor or recover the same in any other manner.

14.5.3. Bidders are required to submit a copy of the GST Registration Certificate or GST provisional certificate while submitting the bids wherever GST tax is applicable.

14.5.4. The responsibility of payment of GST lies with the Service Provider only. Contractor providing taxable service shall issue an Invoice, a Bill or as the case may be, a Challan which is signed, serially numbered and in accordance with rule GST Law. The invoice shall also contain the following:

- i. Name, Address & Registration No. of such Person/Contractor
- ii. Name and Address of the Person/Contractor receiving Taxable Service
- iii. Description, Classification and Value of Taxable Service provided
- iv. GST Amount, if any
- v. HSN code of the Goods/Services.

Payments to Service Provider for claiming GST amount will be made provided the above formalities are fulfilled. Further, Employer may seek copies of challan and certificate from Chartered Accountant for deposit of GST collected from

Employer.

- 14.5.5.** In case CBIT (Central Board of Indirect Taxes and Customs) brings to the notice of Employer that the contractor has not remitted the amount towards GST collected from Employer to the Government exchequer, then, that contractor may be debarred from bidding in future tenders of Employer for given period as per the sole discretion of Employer.
- 14.5.6.** In case of statutory variation in GST during currency of the Contract, the Contractor shall submit a copy of the 'Government Notification' to evidence the rate as applicable on the date of submission of Bid and on the date of revision. Claim for payment of GST/Statutory variation in GST, should be raised within two (2) months from the date of issue of 'Government Notification' for payment of differential (in %) GST, otherwise claim in respect of above shall not be entertained for payment of arrears. The following may also be noted: -
- i. Any increase in the rate of Non ITC based GST beyond the contractual completion period shall be to contractor's account whereas any decrease in the rate shall be passed on to the Employer.
 - ii. The base date for the purpose of applying statutory variation shall be the last date of bid submission.
- 14.5.7.** Employer will reimburse the GST to the Contractor at actuals against submission of ITC based invoices issued in accordance with GST rules. In case of any variation in the executed quantities, the amount on which the GST is applicable shall be modified in same proportion.
- 14.5.8.** Employer will reimburse the GST to the Contractor at actuals against documentary evidence subject to the ceiling amount of GST as quoted by the bidder, subject to any statutory variations. In case of any variation in the executed quantities (If directed and/or certified by the Engineer-In-Charge) the ceiling amount on which GST is applicable will be modified on pro-rata basis.
- 14.5.9.** Contractor shall ensure timely submission of correct invoice(s) with all required supporting document(s) so to enable Owner to avail Input Tax Credit (ITC), If applicable.

D. Intellectual Property

15. License/Use of Technical Information

- 15.1.** For the operation and maintenance of the Plant, 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 intellectual property rights owned by the Contractor or by a third Party from whom the Contractor has received the right to grant sub-licenses, 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.

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 or other information marked as confidential 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 GC §-16.
- 16.2.** The Employer shall not use such documents, data and other information, marked as 'confidential' and received from the Contractor for any purpose other than the operation and maintenance of the Facilities or to comply with applicable laws. Similarly, the Contractor shall not use such documents, data and other information marked as 'confidential' and 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 or to comply with the applicable laws.
- 16.3.** The obligation of a Party under GC §-16.1 and GC §-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; and

- 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 GC §-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 GC §-16 shall survive termination, for whatever reason, of the Contract.

E. Execution of the Facilities

17. Representatives

17.1. Project Manager

The Employer shall appoint the Project Manager and that person shall be **named in the Contract Data**. 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.

If any disagreement, claim or dispute may arise, the Project Manager shall consult with each Party in an endeavour to reach agreement.

17.2. Contractor's Representative & Construction Manager

17.2.1. The Contractor shall appoint the Contractor's Representative prior to the Effective Date. 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 GC §-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 GC §-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 GC §-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 GC §-22.5 (*Site Regulations and Safety*). 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 GC §-17.2.5, the Contractor shall, where required, promptly appoint a replacement with equivalent skills and experience.

18. Work Programme

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. 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. Programme of Performance

Within fourteen (14) days after the Effective Date, the Contractor shall submit to the Project Manager a detailed programme 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 programme and to achieve Completion, Commissioning and Acceptance of the Facilities in accordance with the Contract. The programme so submitted by the Contractor shall accord with the Time Schedule included in Appendix 1 (*Time Schedule*) to the Contract Agreement, and any other dates and periods specified in the Contract. The Contractor shall update and revise the programme as and when appropriate or when required by the Project Manager, but without modification in the Times for Completion specified in the PC pursuant to GC §-8.2 and any extension granted in accordance with GC §-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 programme referred to in GC §-18.2 above and supply a progress report to the Project Manager every fortnight.

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 programme, 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 programme

referred to in GC §-18.1, 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 programme, 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 GC §-8.2, any extension thereof entitled under GC §-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.

18.6. Project Inspection

The work progress will be monitored by TEDA and the works will be inspected for quality at any time during installation and commissioning or after the completion of the works either by TEDA, its authorized representatives or third party inspection agencies appointed by TEDA.

The inspections may include verification of implementation as per required standards, visits to the factory/works of equipment manufacturers to check the quality of products and equipment including compliance with specifications.

19. Subcontracting

19.1. The Contractor shall not, without consent in writing of TEDA, transfer, assign or sublet the work under this contract or any substantial part thereof, other than raw materials, or for any part of the work of which makers are named in the Contract, provided that any such consent shall not relieve the Contractor from any obligation, duty or responsibility under the Contract to any other party.

19.2. The Contractor shall notify the Employer in writing of all sub contracts awarded along with contact details of their representative under the Contract if not already specified in the Bid. No sub-contracting shall relieve the Contractor from the full and entire responsibility of the Contract or from the active superintendence of the work during their progress.

20. Design and Engineering

20.1. Technical Documents

20.1.1. 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.

Subject to GC §-10.1, 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.

- 20.1.2.** 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

20.2. 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 Base Date 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 GC §-39 (*Changes in the Facilities*).

The design, engineering, manufacture, supply, installation, testing and performance of the equipment shall be in accordance with the latest applicable BIS and IEC standards and codes and other standards and relevant regulations, codes as approved and amended from time to time by the CEA, TNERC and MNRE. Non-compliance will be taken seriously to the extent of blacklisting of the vendor, in the same manner as specified, apart from taking action under any other law in force. In order to ensure the scheme meets expected outcomes continuous evaluation of scheme would be undertaken and mid-course correction, as required, shall be implemented.

20.3. 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 Appendix 4 (*List of Documents for Approval or Review*) to the Contract Agreement, for its approval or review in accordance with GC §-18.2 (*Programme of Performance*), together with the Contractor's notice stating that the documents furnished therewith:

- a.** are considered ready, both for review (and approval, if so specified) in accordance with this Sub-Clause and for use; and
- b.** comply with the Contract, or the extent to which it does not comply.

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.

GC §-20.3.2 through GC §-20.3.6 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 the period **specified in the Contract Data** after receipt by the Project Manager of any document requiring the Project Manager's approval in accordance with GC §-20.3.1, the Project Manager shall either return one (1) 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.

If the Project Manager fails to take such action within the period specified above, then the said document shall be deemed to have been approved by the Project Manager.

- 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. If the Project Manager disapproves a document, he shall specify the reasons for such disapproval.

- 20.3.4.** If the Project Manger disapproves the document, the Contractor may either modify the document and re-submit it for the Project Manager's approval in accordance with GC §-20.3.2, or may dispute the disapproval in accordance with GC §-45. If the Project Manager approves the document subject to modification(s), the Contractor may either accept the modification(s), whereupon the document shall be deemed to have been approved, further modify the document and re-submit it for the Owner's approval in accordance with GC §-20.3.2 or dispute the modification(s) in accordance with GC §-45.

- 20.3.5.** 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.

- 20.3.6.** 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 GC §-20.3.

If the Project Manager requests any change in any already approved document and/or in any document based thereon, the provisions of GC §-39 (*Change in the Facilities*) shall

apply to such request.

21. Procurement

21.1. Plant

Subject to the Employer's obligation under GC §-14.2, the Contractor shall procure and transport all Plant in an expeditious and orderly manner to the Site.

Any supplies which have not been specifically mentioned in the Contract Agreement but which are necessary for the design, engineering, manufacture, supply and performance or completeness of the Systems shall be provided by the Contractor without any extra cost and within the time schedule for efficient and smooth operation and maintenance of the Systems.

The Bidders shall take utmost care to submit the documents/Test Certificates/Reports which shall meet the technical specifications as per the tender document. TEDA will list out the approved make of the Solar panel and Inverter based on the Test certificates submitted by Bidder(s) as per conditions laid down in this Tender. The supplies will be allowed as per the written approval from TEDA.

If, any additional make of components to be used shall be allowed only with the written permission of TEDA.

21.2. Employer-Supplied Plant

If the Employer's Requirements, provides that the Employer shall furnish any specific items to the Contractor, the following provisions shall apply:

21.2.1. 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 programme furnished by the Contractor, pursuant to GC §-18.2 (*Programme of Performance*), unless otherwise mutually agreed.

21.2.2. 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 GC §-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 GC §-27 (*Defects Liability*) or under any other provision of the 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.

- 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 fax or email, 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 in the country where the Site is located, if applicable, and at the Site. The Contractor shall furnish the Employer with relevant shipping 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 endeavours 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

- 21.4.1.** The Contractor shall, at its own expense, handle all imported materials and Contractor's Equipment at the point(s) of import and shall handle any formalities for customs clearance, subject to the Employer's obligations under GC §-14.2, 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 shall take all necessary steps to comply with such laws or regulations. In the event of delays in customs clearance that are not the fault of the Contractor, the Contractor shall be entitled to an extension in the Time for

Completion, pursuant to GC §-40 (*Extension of Time for Completion*).

22. Installation

22.1. Setting Out

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.

22.2. Contractor's Superintendence

The Contractor shall give or provide all necessary superintendence during the installation of the Facilities, and as long as thereafter as necessary to fulfill the Contractor's obligation. The Construction Manager or its deputy shall be constantly on the Site to provide full-time superintendence of the installation. Superintendence shall be given by a sufficient number of persons having adequate knowledge of the language for communications (specified in GC §-5 (*Law and Language*)) and of the operations to be carried out (including the methods and techniques required, the hazards likely to be encountered and methods of preventing accidents), for the satisfactory and safe execution of the Plant and Installation Services.

22.3. Contractor's Personnel

The Contractor's Personnel shall be appropriately qualified, skilled and experienced in their respective trades or occupations. The Project Manager may require the Contractor to remove (or cause to be removed) any person employed on the Site or Plant and Installation Services, including the Contractor's Representative if applicable, who

- a. persists in any misconduct or lack of care,
- b. carries out duties incompetently or negligently,
- c. fails to conform with any provisions of the Contract, or
- d. persists in any conduct which is prejudicial to safety, health, or the protection of the environment.

If appropriate, the Contractor shall then appoint (or cause to be appointed) a suitable replacement person with equivalent skills and experience

22.4. Contractor's Equipment

- 22.4.1.** 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.

- 22.4.2.** All equipment used in construction and erection by Contractor shall meet Indian/International standards and where such standards do not exist, the Contractor shall ensure these to be absolutely safe. All equipment shall be strictly operated and maintained by the Contractor in accordance with manufacturer's operation manual and safety instructions and as per guidelines/rules of TANGEDCO/TEDA in this regard.
- 22.4.3.** Upon completion of the Facilities, the Contractor shall remove from the Site all Contractor's Equipment brought by the Contractor onto the Site and any surplus materials remaining thereon. However, the Contractor may retain on Site, during the Defect Liability Period, such Contractor's Equipment as are required for the Contractor to fulfill obligations under the Contract.
- 22.4.4.** The Contractor shall keep accurate records showing the number of each type of Contractor's Equipment on the Site. These records shall be summarized on a monthly basis in a form approved by the Project Manager and shall be available for inspection by the Project Manager until the Contractor has completed all work.

22.5. Site Regulations and Safety

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.

Such Site regulations shall include, but shall not be limited to, rules in respect of security, safety of the Facilities, sanitation, medical care, and fire prevention.

The Contractor shall follow and comply with TANGEDCO's safety rules, relevant provisions of applicable laws pertaining to the safety of workmen, employees, plant and equipment as may be applicable from time to time without any demur, protest or contest or reservations. In case of any discrepancy between statutory requirement and TANGEDCO's safety rules referred above, the latter shall be binding on the Contractor unless the statutory provisions are more stringent.

The Contractor shall be solely responsible for any damage resulting from his operations up to commissioning and handing over of the system. He shall also be responsible for protection of all persons including members of public and employees of the TANGEDCO and the employees of other Contractor and sub-Contractor and all public and private property including structures, building, other plants and equipment and utility either above or below the ground up to commissioning and handing over of the system.

The Contractor will ensure provision of necessary safety equipment such as barriers, signboards, warning lights and alarms, etc. to provide adequate protections to persons and property. The Contractor shall be responsible to give reasonable notice to the Engineer and the TANGEDCO/TEDA of public or private property and utilities when such property and utilities are likely to get damaged or injured during the performance of his works and shall make all necessary arrangements with such employers, related to removal and/or replacement or protection of such property and utilities.

The contractor shall adopt and implement all required measures to ensure non tampering with any equipment or theft of electricity. This shall include but not limited to, installation of both the energy meters (solar meter and net meter) at adequate height with the metering console and proper sealing.

The Contractor shall not interfere or disturb electric fuses, wiring and other electrical equipment belonging to TANGEDCO under any circumstances, whatsoever, unless expressly permitted in writing by TANGEDCO to handle such fuses, wiring or electrical equipment.

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

The Contractor shall keep the Site reasonably free from all unnecessary obstruction, store or remove any surplus materials, clear away any rubbish or temporary works from the Site, and remove any Contractor's Equipment no longer required for execution of the Contract.

After Completion of the Facilities or any Section thereof, the Contractor shall clear away and remove all rubbish and debris of any kind from the Site (or the relevant part thereof), and shall leave the Site (or the relevant part thereof) and the Facilities (or the relevant part thereof) in a clean, tidy 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.

The Contractor shall have total responsibility for security of all equipment and materials in his custody/stores, loose, semi-assembled and/or erected by him at site. The Contractor shall make suitable security arrangements including employment of security personnel to ensure the protection of all materials, equipment and works from theft, fire, pilferage and any other damages and loss up to commissioning of the system.

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 specified in the Contract.

Prior to dispatch, the materials may be inspected and tested by TEDA, at the works of Original Equipment Manufacturer (OEM), where SPV (Solar Photovoltaic) panels, Grid tie Inverters, Module mounting structure, Balance of Systems (BOS) and other components of the project are manufactured.

Materials dispatched without TEDA's approval shall not be accepted and TEDA shall have right to reject it and recover the cost so incurred from the contractor.

- 23.2.** The Employer and the Project Manager or their designated representatives shall be entitled to attend the aforesaid test and/or inspection, the Contractor shall bear all costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses.

However, if the material is not kept ready for inspection after intimation of the offered quantity on the scheduled date for inspection then all consequences will be to Contractor account and TEDA will recover the re-inspection charges as **specified in the Contract Data**.

- 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 by the Project Manager on the request of the Contractor, 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 GC §-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 to the Arbitrator for decision in accordance with GC §-45.3 (*Obtaining Dispute Board's Decision*).
- 23.8.** The Contractor shall afford the Employer and the Project Manager, at the Contractor'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 GC §-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 GC §-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.

23.12. Random Checking of Material at Site

From the lots inspected by the TEDA designated Inspector at the place of manufacture, the Inspector of TEDA, if required, may pick up samples from the lots supplied & Installed at beneficiaries' site at random for quality check only. The samples picked up will be tested for acceptance test as decided by TEDA at MNRE/Government approved laboratory in presence of representatives of Contractor and TEDA as per relevant IEC/ISS/BIS/TEDA specifications. The test results will be binding on the Contractor and TEDA, in general will not allow re-sampling. If the material fails in any of the acceptance tests carried out, the full lot of materials will be considered as rejected. The decision in this regard for acceptance as above of TEDA shall be final and this will be binding on the supplier.

On Commissioning, quality monitor as appointed under the Scheme, as applicable shall inspect the SPV system. Contractor shall provide all requisite details 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.

24. Completion of Facilities

- 24.1.** As soon as the Facilities or any Section thereof has, in the opinion of the Contractor, been completed operationally as specified in the Employer's Requirements, excluding minor items not materially affecting the operation or safety of the Facilities, the Contractor shall so notify the Employer in writing.
- 24.2.** Within seven (7) days after receipt of the notice from the Contractor under GC §-24.1, the Employer shall supply the operating and maintenance personnel specified in the Employer's Requirements for Precommissioning of the Facilities or any Section thereof.
- 24.3.** As soon as all work in respect of Precommissioning are completed and, in the opinion of the Contractor, the Facilities or any Section thereof is ready for Commissioning, the Contractor shall so notify the Project Manager in writing.
- 24.4.** The Project Manager shall, within fourteen (14) days after receipt of the Contractor's notice under GC §-24.4, either issue a Completion Certificate in the form specified in the Employer's Requirements, stating that the Facilities or that Section thereof have reached Completion in accordance with the Contract, as of the date of the Contractor's notice under GC §-24.4, or notify the Contractor in writing of any defects and/or deficiencies.

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 GC §-24.4.

If the Project Manager is satisfied that the Facilities or that Section 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 Section 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.

24.5. 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 GC §-24.4 or within seven (7) days after receipt of the Contractor's repeated notice under GC §-24.5, or if the Employer makes use of the Facilities or any 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 or that part thereof, as the case may be.

24.6. As soon as possible after Completion, the Contractor shall complete all outstanding minor items so that the Facilities or the relevant part thereof 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 due to the Contractor.

25. Commissioning and Operational Acceptance

25.1. Commissioning

25.1.1. Commissioning of the Facilities or any Section thereof shall be commenced by the Contractor immediately after issue of the Completion Certificate by the Project Manager, pursuant to GC §-24.5, or immediately after the date of the deemed Completion, under GC §-24.6.

25.1.2. 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.

25.1.3. Commissioning includes all the processes by which each Grid-connected SPV systems that has been installed is tested to verify for its functions according to its design objectives and specifications and put into operation;

25.2. Guarantee Test

25.2.1. 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 8 (*Functional Guarantees*) to the Contract Agreement. 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.

25.3. Operational Acceptance

25.3.1. Subject to GC §-25.4 below, Operational Acceptance shall occur in respect of the Facilities or any Section thereof when the Guarantee Test has been successfully completed and the Functional Guarantees are met.

25.3.2. At any time after the Conditions for Operational Acceptance set out in GC §-25.3.1 have been met, the Contractor may give a notice to the Project Manager requesting the issue of an Operational Acceptance Certificate in the form provided in the Employer's Requirements in respect of the Facilities or the Section 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.

25.4. Partial Acceptance

25.4.1. If the Contract specifies Sections of the Facilities, the provisions relating to Completion and Commissioning including the Guarantee Test shall apply to each such Section of the Facilities individually, and the Operational Acceptance Certificate shall be issued accordingly for each such Section of the Facilities.

25.5. Final Acceptance

25.5.1. Final Acceptance shall occur in respect of the Facilities when:

- The plant have achieved the Operational acceptance and served the Comprehensive Maintenance for the period stipulated under the contract agreement; and
- All the contractors' liabilities under the Comprehensive Maintenance contract have been satisfied; and
- Contractor has provided the list of recommended spares with detailed specification, source and price for further

procurement; and

- The Contractor has paid the liquidated damages, if any, as specified in GC §-26.2 thereto;

- 25.5.2.** At any time after the events set out in GC §-27.5.1 have occurred, the Contractor may give a notice to the Project Manager requesting the issue of Final Acceptance Certificate in the form provided in the Bidding Documents or in another form acceptable to the Employer in respect of the Facilities or the part thereof specified in such notice as at the date of such notice.
- 25.5.3.** The Project Manager shall, after consultation with the Employer, and within thirty (30) days after receipt of the Contractor's notice, issue Final Acceptance Certificate.
- 25.5.4.** If within thirty (30) days after receipt of the Contractor's notice, the Project Manager fails to issue the Final Acceptance Certificate or fails to inform the Contractor in writing of the justifiable reasons why the Project Manager has not issued the Final Acceptance Certificate, the Facilities shall be deemed to have been accepted as at the date of the Contractor's said notice.
- 25.5.5.** The Comprehensive Maintenance contract period may further be extended on mutually agreed terms and conditions. The contractor is allowed to submit his intent at the time of Final acceptance.

F. Guarantees and Liabilities

26. Completion Time Guarantee

- 26.1.** The Contractor guarantees that it shall attain Completion of the Facilities or any Section thereof within the Time for Completion pursuant to GC §-8.2, or within such extended time to which the Contractor shall be entitled under GC §-40 hereof.
- 26.2.** If the Contractor fails to attain Completion of the Facilities or any Section thereof within the Time for Completion or any extension thereof under GC §-40, the Contractor shall pay to the Employer liquidated damages in the amount **specified in the Contract Data** 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 maximum amount **stated in the Contract Data**. Once the maximum amount is reached, the Employer may consider termination of the Contract, pursuant to GC §-42.2.2.

TEDA may, without prejudice to any other method of recovery, deduct the amount of such damages from any amount due or to become due to the

Contractor.

Such payment shall completely satisfy the Contractor's obligation to attain Completion of the Facilities or any Section thereof within the Time for Completion or any extension thereof under GC §-40 (*Extension of Time for Completion*). 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 any part thereof or from any other obligations and liabilities of the Contractor under the Contract.

Save for liquidated damages payable under this GC §-26.2, the failure by the Contractor to attain any milestone or other act, matter or thing by any date specified in Appendix 1 (*Time Schedule*) to the Contract Agreement, and/or other programme of work prepared pursuant to GC §-18.2 shall not render the Contractor liable for any loss or damage thereby suffered by the Employer.

27. Defects Liability and Comprehensive Maintenance

27.1. 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.

27.2. The Defects Liability Period in respect of the Facilities (or, where Operational Acceptance of any Section of the Facilities occurs, of such part) shall commence upon the date of Operational Acceptance and expire after the period **specified in the Contract Data**.

If during the Defects Liability Period any defect should be found in the design, engineering, materials and workmanship of the Plant supplied or of the 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 cost, repair, replace or otherwise make good as the Contractor shall determine at its discretion, such defect as well as any damage to the Facilities caused by such defect.

27.3. The Contractor's obligations under this GC §-27 shall not apply to:

- a.** any materials that are supplied by the Employer under GC §-21.2 (*Employer-Supplied Plant*), are normally consumed in operation, or have a normal life shorter than the Defects 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 GC §-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 GC §-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 fourteen (14) 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 to the Contractor or claimed under the Performance Security.
- 27.8.** If a defect is made good under this GC §-27, the Defects Liability Period for the item which has been made good shall extend for a period of twelve (12) months from such making good. However, in no event shall the Defects Liability Period extend beyond seventy-two (72) months after the date of Operational Acceptance of the Facilities or the relevant part of the Facilities.
- 27.9.** Except as provided in this GC §-27 and GC §-33 (*Loss of or Damage to Property; Accident or Injury to Workers; Indemnification*), the Contractor shall be under no liability whatsoever and howsoever arising, under the Contract, 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 wilful action of the Contractor.
- 27.10.** The Contractor will submit the manufacturer Warranty on Non-Judicial

Stamp Paper of ₹ 500/-.

27.11. The responsibility of exercising the rights arising from warranty and guarantee provisions and claims and settlements relating thereto shall be the responsibility of the Contractor and the Employer will not be responsible in this regard.

27.12. Comprehensive Maintenance (CMC)

27.12.1. The Contractor shall be responsible for Operation and Maintenance of the Projects for a period of five (5) years from the date of commissioning, during which TEDA will monitor the project for effective performance in line with conditions specified.

27.12.2. During the above mentioned five (5) year period, the Contractor shall be responsible for supply of all spare parts as required from time to time for scheduled and preventive maintenance, major overhauling of the plant, replacement of defective modules, inverters and other system components and maintaining operations log sheets and data on deployment of staff for continuous operations, including qualified engineers for supervision, defect and complaint logging.

27.12.3. This shall also include free replacement warranty on spare parts against manufacturing defects for five (5) years from the date installation.

27.12.4. It may be carefully noted that maintenance of SPV Systems includes maintenance of all items including all accessories.

27.12.5. The Contractor shall ensure half yearly routine maintenance of system. Contractor has to undertake to perform regular visit of his technician with necessary spare parts from the office-cum-Service centre established at various headquarters of the division to the beneficiary Sites selected for attending complaints and for doing regular maintenance of the system installed.

27.12.6. The Contractor shall attend to any complaint from the Beneficiary and rectify any faults or breakdown within a time frame of forty-eight (48) hours from such complaint.

27.12.7. CMC will include submission of monthly/quarterly inspection report of the installation as per prescribed format provided by TEDA. As per the Contract Forms - Form MSR – Maintenance and Service Report quarterly report shall be prepared and submitted to TEDA after providing necessary services.

27.12.8. To ensure timely maintenance of the systems the vendor shall

have one (1) Office-cum-service centre in each operational district and a helpline in local language in each operational State. This may consist of office cum service centre at a convenient place to be reached by a beneficiary.

- 27.12.9.** The office cum service centres shall have spares for the system and repair facility. The Concerned Nodal officer of TEDA shall verify this fact and only then Contractor shall be allowed to install the systems. The office-cum-Service Centre shall have adequately trained staff available for repair and maintenance of Solar PV Systems, Inverters supplied and installed.
- 27.12.10.** The office-cum-Service Centre shall have adequately trained staff available for repair and maintenance of Solar PV Systems, Inverters supplied and installed.
- 27.12.11.** The office-cum-service centre shall be open for at least 8 hours per day and 6 days a week excluding declared holidays by TANGEDCO.
- 27.12.12.** The beneficiaries/TEDA shall be well informed about the CMC centre of the Contractor, call centre/toll free numbers.
- 27.12.13.** The Contractor will educate the Beneficiaries on the process for registering the complaints on Call Center/toll free nos. The details of office cum after sales service centers along with telephone numbers & contact persons of firm & details of TEDA offices, address and telephone numbers must be provided to each beneficiary. Beneficiaries shall also be educated through brochures about dos & don'ts on the system. Contractor will update the status of fault rectification on TEDA website/call centre for online monitoring of the complaints registered and services being provided by the Contractor.

27.13. Resolving Complaints related to Comprehensive Maintenance

- 27.13.1.** In any case of breakdown/any problem/defect in SPV system or whenever a complaint is lodged by the beneficiary, the contractor shall have to replace/repair the defect of the SPV system, resolve it and make the SPV system operative at site as per the Technical specifications, within forty-eight (48) hours of the receipt of the complaint.

27.13.2. Complaint Management

The concerned beneficiary/TEDA may lodge their complaint for SPV system. The record of each and every complaint received and resolved, with down time and up time shall have to be maintained by the Contractor in register as well as

computer based software and in mobile application.

These records shall have to be submitted to TEDA Office weekly (for complaints received and resolved during the week) and monthly (comprising of all complaints received and resolved during the month). Such register shall be verified by Concerned Nodal Officers or TEDA.

27.13.3. While doing repairing or rectification work, the Contractor's technician or any person is not authorized to work on TANGEDCO's electric line of 11 kV and LT having potential danger of electricity.

27.13.4. If the down time period for any beneficiary complaint exceeds 48 hours and the contractor fails to make the plant operational, a penalty for the time period exceeding 48 hours, as per the below mentioned schedule shall be deposited by the contractor to TEDA.

Defect Rectification Penalty = System Capacity (kW) × Down Time (Hrs) × EC

Where EC is the Energy Charges as per the tariff fixed by TNERC for the beneficiary's service connection.

The loss in generation shall be decided on hourly basis.

For any system/consumer complaint, the maximum applicable amount as penalty against loss of generation shall not be more than 10% of the respective cost of the SPV system installed at the consumer premises.

The Contractor shall be issued a notice to pay the applicable penalty within seven (7) days to TEDA. If the Contractor fails to pay the penalty within notice period, TEDA shall encash the Performance Security immediately and action against the firm will also be taken for debarring and black listing.

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 Appendix 8 (*Functional Guarantees*) to the Contract Agreement, 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 Appendix 8 (*Functional Guarantees*) to the Contract Agreement 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 GC §-42.2.2.

- 28.3.** If, for reasons attributable to the Contractor, the Functional Guarantees specified in the Appendix 8 (*Functional Guarantees*) to the Contract Agreement, 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 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.
- 28.4.** The payment of liquidated damages/deficiency penalty under GC §-28.3 up to the maximum amount **specified in the Contract Data**, shall completely satisfy the Contractor's guarantees under GC §-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 Section thereof in respect of which the liquidated damages have been so paid.
- 28.5. System Performance Evaluation/Loss in Generation**
- 28.5.1.** The Contractor shall be required to meet a minimum guarantee solar energy generation with a minimum Performance Ratio (PR) of 75% at the time of commissioning.
- 28.5.2.** Systems with a Performance Ratio (PR) of less than 75% shall not be considered for declaration of Commercial Operation Date.
- 28.5.3.** The Contractor shall be required to maintain a minimum Capacity Utilization Factor (CUF) of nineteen percent (19%) during the Comprehensive Maintenance Contract period (the "Minimum CUF") with respect to the AC capacity of the PV system..
- 28.5.4.** For the purpose of system performance evaluation, the grid availability adjusted capacity utilization factor (CUF) of each Project will be arrived at by taking into account average daytime grid availability. For this purpose the system monitoring equipment of the Projects must include measurement of daytime (06:00h – 18:00h) grid availability at the solar grid inverter AC terminals.
- 28.5.5.** If a Project does not include equipment to measure daytime (06:00h – 18:00h) grid availability, the CUF value used for system performance evaluation purposes will be calculated with an assumed grid availability of ninety-five (95) percent .
- 28.5.6.** This Guaranteed CUF shall be calculated on an annual-basis

and shall be verified by TEDA at the end of each year during the five (5) year guarantee period.

- 28.5.7.** There shall be no year-on-year reduction on the Guaranteed CUF during the five (5) year Comprehensive Maintenance period; i.e., module degradation factor will not be considered during the five (5) year Comprehensive Maintenance period.
- 28.5.8.** If during a year the Contractor does not achieve the Minimum CUF for a Projects system, Contractor shall pay to TEDA a CUF deficiency penalty as per GC §-28.3.

29. Patent Indemnity

- 29.1.** The Contractor shall, subject to the Employer's compliance with GC §-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 the installation of the Facilities by the Contractor.

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 GC §-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 Contract Data** to the Contract Price or, the sum **specified in the Contract Data**, if such multiplier or sum is not so stated, the total Contract Price, 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) to be imported into India shall be transferred to the Employer upon loading on to the mode of transport to be used to convey the Plant from the country of origin to India.
- 31.2. Ownership of the Plant (including spare parts) procured in India shall be transferred to the Employer when the Plant is brought on to the Site.
- 31.3. 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.
- 31.4. Ownership of any Plant in excess of the requirements for the Facilities shall revert to the Contractor upon Operational Acceptance 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 GC §-32 (*Care of Facilities*) hereof until Operational Acceptance of the Facilities or any Section thereof in which such Plant are incorporated.

- 31.6.** Upon Operational Acceptance, 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.

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 Operational Acceptance of the Facilities or that part, pursuant to GC §-25 (*Commissioning and Operational Acceptance*) or, 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 GC §-27 (*Defects Liability and Comprehensive Maintenance*).

- 32.2.** 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.

- 32.3.** With respect to any loss or damage caused to the Facilities or any part thereof or to the Contractor's Equipment by reason of any of the matters specified in GC §-38.1, the provisions of GC §-38.3 shall apply.

33. Loss of or Damage to Property; Accident or Injury to Workers; Indemnification

- 33.1.** Subject to GC §-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.** In case any accident occurs during the construction/erection or during Comprehensive Maintenance Period **as specified in the Contract Data** for the activities undertaken by the Contractor thereby causing any minor or major or fatal injury to his employees/labourer due to any reason, whatsoever, it shall be the responsibility of the Contractor to promptly inform the same to the Engineer in charge of concerned section of TEDA in prescribed form and also to all the authorities envisaged under the applicable laws. For any fatal/nonfatal accident to human or animal or any mishap within area of installation due to mishandling or reason whatsoever

attributable to TEDA at the time of commissioning of SPV system, Contractor has to pay compensation as provided under the relevant applicable Act.

- 33.3.** If any proceedings are brought or any claim is made against the Employer that might subject the Contractor to liability under GC §-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 defence 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.

- 33.4.** 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 GC §-34 (*Insurance*), provided that such fire, explosion or other perils were not caused by any act or failure of the Contractor.

- 33.5.** The Party entitled to the benefit of an indemnity under this GC §-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.** 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 following insurances in the sums and with the deductibles and other conditions specified in Appendix 11 (*Insurance Requirements*).

i. Transit-cum-Storage-Erection Insurance

Covering loss or damage occurring while in transit from the Contractor's or Subcontractor's works or stores until arrival at the Site, to the Plant (including spare parts therefor) and to the Contractor's Equipment.

All the stores covered under the contract shall be required to be supplied up to beneficiary's site and shall have transit insurance

against all transit risks, such as damage, loss, theft, fire, etc. The transit insurance period shall cover sixty (60) days after the date of receipt of materials at installation site(s) to enable the Employer to check the stores fully. It will be the responsibility of the Contractor to lodge claim against the insurance on receiving necessary advice from the consignee. Transit Insurance of the material shall remain the responsibility of the Contractor till the time of Commissioning.

ii. Installation and Comprehensive Maintenance All Risks Insurance

The Contractor shall take an insurance policy for the health and safety of its employees, sub-contractors and other human resources involved in the execution of the Project. The insurance shall cover all health and safety liabilities, including accidents of all types.

Covering physical loss or damage to the Facilities at the Site, occurring prior to Completion of the Facilities, with an extended maintenance coverage for the Contractor's liability in respect of any loss or damage occurring during the Defect Liability Period while the Contractor is on the Site for the purpose of performing its obligations during the Defect Liability Period.

The Contractor has to take the insurance for the whole Solar PV systems with inverter supplied and installed by them as per the Solarization part and as well as the metering system supplied by third party for the risk covering, theft, damage, fire and damage or loss due to natural calamities for five (5) years from the date of commissioning of the last system of the project.

- 34.2.** The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GC §-34.1.
- 34.3.** The Contractor shall, within the periods **stated in the Contract Data** (calculated from the Effective Date), 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.** The Employer shall at its expense take out and maintain in effect during the performance of the Contract those insurances specified in the Contract Data and Appendix 11 (*Insurance Requirements*) to the Contract Agreement, if any, in the sums and with the deductibles and other

conditions specified in the said Appendix. The Contractor and the Contractor's Subcontractors shall be named as co-insureds under all such policies. All insurers' 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. The Employer shall, within the period stated in the Contract Data (calculated from the Effective Date) deliver to the Contractor, certificates of insurance or copies of the insurance policies as evidence that the required policies are in full force and effect. The policies shall provide that not less than twenty-one (21) days' notice shall be given to the Contractor by all insurers prior to any cancellation or material modification of the policies. If so requested by the Contractor, the Employer shall provide copies of the policies taken out by the Employer under this GC §-34.5.

34.6. Unless otherwise provided in the Contract, the Contractor shall prepare and conduct any claim made under the policies effected by it pursuant to this GC §-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.

34.7. Application of Insurance Proceeds

i. Save as expressly provided in this Agreement or respective Insurances, the proceeds of any insurance claim made due to Loss or caused to the Facilities or any part thereof shall be first applied to reinstatement, replacement or renewal or making good of such Loss or damage of the GCRTS system.

34.8. Effect on liability of Implementing Agency

i. Notwithstanding any liability or obligation that may arise under this Agreement, any Loss, damage, liability, Payment, obligation or expense which is insured or not or for which the Contractor can claim compensation, under any Insurance shall not be charged to or payable by the Employer.

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 Base Date by an experienced Contractor on the basis of reasonable examination of the data relating to the Facilities including any data, 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 on the Facilities or using additional 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 on the Facilities, 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 GC §-35.1, the Project Manager shall promptly consult with the Employer and the Contractor to 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 GC §-35.1 shall not be paid by the Employer to the Contractor as an addition to the Contract Price.

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 GC §-35.1, the Time for Completion shall be extended in accordance with GC §-40.

36. Change in Laws and Regulations

- 36.1.** If, after the Base Date, 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 not be correspondingly increased or decreased, and/or the Time for Completion shall not be reasonably adjusted to the extent that the Contractor has thereby been affected in the performance of any of its obligations under the Contract.

- 36.2. Notification of Change in Law**

- 36.2.1.** If the Contractor is affected by a Change in Law in accordance with this clause and wishes to invoke a Change in Law provision, it shall give notice to the Implementing Agency of such Change in Law as soon as reasonably practicable after becoming aware of the same or should reasonably have known of the Change in Law.
- 36.2.2.** Notwithstanding GC §-36.2.1, the Contractor shall be obliged to serve a notice to the Employer if it is beneficially affected by a Change in Law. Without prejudice to the factor of materiality or other provisions contained in this Agreement, the obligation to inform the Employer contained herein shall be material. However, in case the Contractor has not provided such notice, the Employer shall have the right to issue such notice to the Contractor.
- 36.2.3.** Any notice served pursuant to Change in Law shall provide, amongst other things, precise details of:
- a.** The Change in Law; and
 - b.** The effects on the Contractor of the matters relevant for Construction Period and the operation period for the Grid-connected SPV system.

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; and

- f. shortage of labour, 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 Party became or should have become aware of the occurrence of such event.
- 37.3.** The Party who has given such notice 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 GC §-40 (*Extension of Time for Completion*), taking into account such prevention, hindrance or delay, as the case may be.
- 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 GC §-37.6 and GC §-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 GC §-32.2, GC §-38.3 and GC §-38.4
- 37.6.** If the performance of the Contract is substantially prevented, hindered or delayed for a single period of more than sixty (60) days or an aggregate period of more than one hundred and twenty (120) 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 GC §-38.5.
- 37.7.** In the event of termination pursuant to GC §-37.6, the rights and obligations of the Employer and the Contractor shall be as specified in GC §-42.1.2 and GC §-42.1.3.
- 37.8.** Notwithstanding GC §-37.5, Force Majeure shall not apply to any obligation of the Employer to make payments to the Contractor herein.
- 37.9. Force Majeure Exclusions**

- 37.9.1.** Force Majeure shall not include any event or circumstance which is within the reasonable control of the Parties and the following conditions, except to the extent that they are consequences of an event of Force Majeure:
- Unavailability, late delivery, or changes in cost of the plant, machinery, equipment, materials, spare parts or consumables for the Power Project;
 - Delay in the performance of any contractor, sub-contractor or their agents;
 - Non-performance resulting from normal wear and tear typically experienced in power generation materials and equipment;
 - Strikes at the facilities of the Contractor/Affected Party;
 - Insufficiency of finances or funds or the agreement becoming onerous to perform; and
 - Non-performance caused by, or connected with, the Affected Party's:
 - Negligent or intentional acts, errors or omissions;
 - Failure to comply with an Indian Law; or
 - Breach of, or default under this Contract Agreement.
 - Normal rainy seasons and monsoon

38. War Risks

38.1. "War Risks" shall mean any event specified in paragraphs (a) and (b) of GC §-37.1.

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 or Contractor's Equipment or any other property of the Contractor used or intended to be used for the purposes of the

Facilities 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;
- b. replacing or making good any Contractor's Equipment or other property of the Contractor so destroyed or damaged; or
- c. replacing or making good any such destruction or damage to the Facilities or the Plant or any part thereof;

and so far as may be required by the Employer, and as may be necessary for completion of the Facilities.

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 GC §-39 (*Change in the Facilities*), 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 GC §-42.1(*Termination by Employer for Employer's Convenience*).

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 GC §-40 (*Extension of Time for Completion*).

- 38.4.** Notwithstanding anything to the contrary contained in the Contract, the Employer shall not pay the Contractor for any increased costs or incidentals to the execution of the Contract 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 sixty (60) days or an aggregate period of more than one hundred and twenty (120) 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 GC §-38.3, the rights and obligations of the Employer and the Contractor shall be specified in GC §-42.1.2 and GC §-42.1.3.

H. Change in Contract Elements

39. Change in the Facilities

39.1. Introducing a Change

39.1.1. Subject to GC §-39.2.5 and GC §-39.2.7, the Employer shall have the right to propose, and subsequently require, that the Project Manager instructs 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.

39.1.2. The Contractor may from time to time during its performance of the Contract propose to the Employer with a copy to the Project Manager, any Change that the Contractor considers necessary or desirable to improve the quality, efficiency or safety of the Facilities or which is necessitated by reason of any act, omission or breach of the Contract by the Employer or its contractors of any tier. The Employer may at its discretion approve or reject any Change proposed by the Contractor, provided that the Employer shall approve any Change necessitated by reason of any act, omission or breach of the Contract by the Employer or its contractors of any tier or proposed by the Contractor to ensure the safety of the Facilities.

39.1.3. Notwithstanding GC §-39.1.1 and GC §-39.1.2, 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.

39.1.4. The procedure on how to proceed with and execute Changes is specified in GC §-39.2 and GC §-39.3, and further details and forms are provided in the Employer's Requirements (Forms and Procedures).

39.2. Changes Originating from the Employer

39.2.1. If the Employer proposes a Change pursuant to GC §-39.1.1, it shall send to the Contractor a "Request for Change Proposal," requiring the Contractor to prepare and furnish to the Project Manager as soon as reasonably practicable a

“Change Proposal,” which shall include the following:

- a. brief description of the Change;
- b. effect on the Time for Completion;
- c. estimated cost of the Change;
- d. effect on Functional Guarantees (if any);
- e. effect on the Facilities; and
- f. effect on any other provisions of the Contract.

39.2.2. Prior to preparing and submitting the “Change Proposal,” the Contractor shall submit to the Project Manager an “Estimate for Change Proposal,” which shall be an estimate of the cost of preparing and submitting the Change Proposal.

Upon receipt of the Contractor’s Estimate for Change Proposal, the Employer shall do one of the following:

- a. accept the Contractor’s estimate with instructions to the Contractor to proceed with the preparation of the Change Proposal;
- b. advise the Contractor of any part of its Estimate for Change Proposal that is unacceptable and request the Contractor to review its estimate; or
- c. advise the Contractor that the Employer does not intend to proceed with the Change.

39.2.3. Upon receipt of the Employer’s instruction to proceed under GC §-39.2.2(a), the Contractor shall, with proper expedition, proceed with the preparation of the Change Proposal, in accordance with GC §-39.2.1.

39.2.4. The pricing of any Change shall, as far as practicable, be calculated in accordance with the rates and prices included in the Contract. If such rates and prices are inapplicable, the Parties thereto shall agree on specific rates for the valuation of the Change.

39.2.5. If before or during the preparation of the Change Proposal it becomes apparent that the aggregate effect of compliance therewith and with all other Change Orders that have already become binding upon the Contractor under this GC §-39 would be to increase or decrease the Contract Price as originally set forth in Article 2 (*Contract Price and Terms of Payment*) of the Contract Agreement by more than fifteen percent (15%), the Contractor may give a written notice of objection thereto prior to furnishing the Change Proposal as

aforesaid. If the Employer accepts the Contractor's objection, the Employer shall withdraw the proposed Change and shall notify the Contractor in writing thereof.

The Contractor's failure to so object shall neither affect its right to object to any subsequent requested Changes or Change Orders herein, nor affect its right to take into account, when making such subsequent objection, the percentage increase or decrease in the Contract Price that any Change not objected to by the Contractor represents.

- 39.2.6.** Upon receipt of the Change Proposal, the Employer and the Contractor shall mutually agree upon all matters therein contained. Within fourteen (14) days after such agreement, the Employer shall, if it intends to proceed with the Change, issue the Contractor with a Change Order.

If the Employer is unable to reach a decision within fourteen (14) days, it shall notify the Contractor with details of when the Contractor can expect a decision.

If the Employer decides not to proceed with the Change for whatever reason, it shall, within the said period of fourteen (14) days, notify the Contractor accordingly. Under such circumstances, the Contractor shall be entitled to reimbursement of all costs reasonably incurred by it in the preparation of the Change Proposal, provided that these do not exceed the amount given by the Contractor in its Estimate for Change Proposal submitted in accordance with GC §-39.2.2.

- 39.2.7.** If the Employer and the Contractor cannot reach agreement on the price for the Change, an appropriate adjustment to the Time for Completion, or any other matters identified in the Change Proposal, the Employer may nevertheless instruct the Contractor to proceed with the Change by issue of a "Pending Agreement Change Order."

Upon receipt of a Pending Agreement Change Order, the Contractor shall immediately proceed with effecting the Changes covered by such Order. The Parties shall thereafter attempt to reach agreement on the outstanding issues under the Change Proposal.

If the Parties cannot reach agreement within sixty (60) days from the date of issue of the Pending Agreement Change Order, then the matter may be referred to the Arbitrator in accordance with the provisions of GC §-45.

39.3. Changes Originating from Contractor

If the Contractor proposes a Change pursuant to GC §-39.1.2, the Contractor shall submit to the Project Manager a written "Application for Change Proposal," giving reasons for the proposed Change and including the information specified in GC §-39.2.1.

Upon receipt of the Application for Change Proposal, the Parties shall follow the procedures outlined in GC §-39.2.6 and GC §-39.2.7. However, should the Employer choose not to proceed, the Contractor shall not be entitled to recover the costs of preparing the Application for Change Proposal.

39.4. Provisional Sums

Each Provisional Sum, if any, shall only be used, in whole or in part, in accordance with the Project Manager's instructions and the Contract Price shall be adjusted accordingly. The total sum paid to the Contractor shall include only such amounts, for the Plant, or the Installation Service(s) to which the Provisional Sum relates, as the Project Manager shall have instructed. For each Provisional Sum, the Project Manager may instruct:

- a.** work to be executed (including Plant, materials or services to be supplied) by the Contractor and valued under GC §-39 (*Change in the Facilities*); and/or
- b.** Plant, Materials or services to be purchased by the Contractor, for which there shall be included in the Contract Price:
 - i.** the actual amounts paid (or due to be paid) by the Contractor, and
 - ii.** a sum for overhead charges and profit, calculated as a percentage of these actual amounts by applying the percentage rate **stated in the Contract Data**.

The Contractor shall, when required by the Project Manager, produce quotations, invoices, vouchers and accounts or receipts in substantiation.

40. Extension of Time for Completion

40.1. The Time(s) for Completion pursuant to GC §-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 GC §-39 (*Change in the Facilities*);
- b.** any occurrence of Force Majeure as provided in GC §-37 (*Force Majeure*) or unforeseen conditions as provided in GC §-35 (*Unforeseen Conditions*);
- c.** any suspension order given by the Project Manager other than by reason of the Contractor's default or breach of the Contract under GC §-41.1(*Suspension by Employer*) hereof or reduction in the rate

of progress pursuant to GC §-41.2 (*Suspension by Contractor*);

- d. any changes in laws and regulations as provided in GC §-36 (*Change in Laws and Regulations*);
- 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;
- 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;
- g. delays attributable to the Employer or caused by customs; or
- h. any other matter specifically stated 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.

The Time for Completion shall be extended in accordance with this GC §-40.1, irrespective of any delaying factors attributable to the Contractor which operate or operated concurrently with any of the factors stated in (a) through (h) thereof.

- 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 practicable, and not later than twenty-eight (28) days after the Contractor became aware, or should have become aware, of the 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 to a Dispute Board, pursuant to GC §-45.3.
- 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 GC §-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 thereafter 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 GC §-40.1, the amount of such extra costs shall be added to the Contract Price.

41. Suspension

41.1. Suspension by the Employer

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, protection 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 GC §-39 (*Change in the Facilities*), 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 GC §-39 or, where it affects the whole of the Facilities, as termination of the Contract under GC §-42.1 (*Termination by Employer for Employer's Convenience*).

41.2. Suspension by Contractor

If:

- a. the Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause pursuant to Appendix 10 (*Payment Terms and Procedures*) to the Contract Agreement, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, 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, 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 GC §-10.2, or

failure to obtain any Governmental permit necessary for the execution and/or completion of the Facilities;

then, the Contractor may by notice to the Employer suspend performance of all or any of its obligations under the Contract, or reduce the rate of progress.

If the Contractor subsequently receives such payment approval, evidence or payment (as described in the relevant provision of the Contract and in the above notice) before giving a notice of termination, the Contractor shall resume normal working as soon as is reasonably practicable.

41.3. If the Contractor's performance of its obligations is suspended or the rate of progress is reduced pursuant to GC §-41.1 and GC §-41.2 above, then the Time for Completion shall be extended in accordance with GC §-40.1.

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 by Employer 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 GC §-42.1 (*Termination by Employer for Employer's Convenience*).

42.1.2. Upon receipt of the notice of termination under GC §-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, tidy 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, tidy and safe condition; and
- d.** subject to the payment specified in GC §-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 GC §-42.1.1, the Employer shall pay to the Contractor the Contract Price, properly attributable to the parts of the Facilities executed by the Contractor as of the date of termination.

42.2. Termination by Employer 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 GC §-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 GC §-43 (*Assignment*); or
- c. if the Contractor, in the judgment of the Employer has engaged in any corrupt or fraudulent practice, as defined in GC §-6 (*Corrupt or Fraudulent Practices*), 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 GC §-41.2 (*Suspension by Contractor*), 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; or
- d. refuses or is unable to provide sufficient materials, services or labor to execute and complete the Facilities in the manner specified in the programme furnished under GC §-18.2 (*Programme of Performance*) 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, 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 GC §-42.2 (*Termination by Employer for Contractor's Default*).

42.2.3. Upon receipt of the notice of termination under GC §-42.2.1 or GC §-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, tidy 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; and

- 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. After termination in accordance with GC §-42.2.3 above wholly or partly, the Employer may 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 completion 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 GC §-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, tidy and safe condition pursuant to paragraph (a) of GC §-42.2.3. Any sums due to 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 undertakes to complete 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 GC §-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 to the Contractor under GC §-42.2.5, the Contractor shall pay the balance to

the Employer, and if such excess is less than the sums due to the Contractor under GC §-42.2.5, 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. If:

- a.** the Contractor has not received the Project Manager's instruction under GC §-8.1 within one hundred and eighty (180) days after receipt of the Letter of Acceptance by the Contractor, 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 or failure to obtain any Governmental permit necessary for the execution and/or completion of the Facilities; or
- c.** the Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause pursuant to Appendix 10 (*Payment Terms and Procedures*) to the Contract Agreement, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, 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, fails to remedy the breach or take steps to remedy the breach within fourteen (14) days after receipt of the Contractor's notice;
- d.** the Contractor does not receive the reasonable evidence within 42 days after giving notice under GC §-41.2 (*Suspension by Contractor*) in respect of a failure to comply with GC §-10.5;

then the Contractor may give a notice to the Employer thereof, and if the Employer has failed to pay the outstanding sum, to approve the invoice or supporting documents, to give its reasons for withholding such

approval, or to remedy the breach within twenty-eight (28) days of such notice, or if the Contractor is still unable to carry out any of its obligations under the Contract for any reason attributable to the Employer within twenty-eight (28) days of the said notice, the Contractor may by a further notice to the Employer referring to this GC §-42.3.1, forthwith terminate the Contract.

42.3.2. If the Contract is terminated under GC §-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, tidy 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 GC §-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 GC §-42.3.1, the Employer shall pay to the Contractor all payments specified in GC §-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 GC §-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 this GC §-42.3.
- 42.4.** In this GC §-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 GC §-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 Appendix 10 (*Payment Terms and Procedures*) to the Contract Agreement.
- 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, except that the Contractor shall be entitled to assign either absolutely or by way of charge any monies due and payable to it or that may become due and payable to it under the Contract.

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 twenty-eight (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 twenty-eight (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. The Contractor shall submit copies to the Project

Manager.

Within forty-two (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 twenty-eight (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 forty-two (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.

In the event that the Contractor and the Employer cannot agree on any matter relating to a claim within the said above defined period of forty-two (42) days, thereafter either Party may refer the matter to the Arbitrator pursuant to GC §-45 (*Disputes and Arbitration*) hereof.

Each payment approval issued by the Project Manager shall include such amounts for any claim as have been reasonably substantiated as due under the relevant provision of the Contract. Unless and until the particulars supplied are sufficient to substantiate the whole of the claim, the Contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate.

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.

45. Disputes and Arbitration

45.1. Disputes

Unless otherwise specified, the matters where decision of the Engineer-in-Charge is deemed to be final and binding as provided in the Agreement.

If any question, dispute or difference what so ever shall arises between TEDA and the Contractor/Bidder, in the connection with the agreement except as to matters, the decisions for which have been specifically provided, either party may forthwith give to the other notice in writing of existence of such question, dispute or difference.

Disputes shall be referred to and settled by an Arbitration for decision in accordance with GC §-45.3 (*Arbitration*) without prejudice to any other rights the Party may have.

In case of any dispute(s)/difference(s)/issue(s), a Party shall notify the other Party (ies) in writing about such a dispute(s)/difference(s)/issue(s) between/amongst the Parties and that such a Party wishes to refer the dispute(s)/difference(s)/issue(s) to arbitration. Such Invitation for arbitration shall contain sufficient information as to the dispute(s)/difference(s)/issue(s) to enable the other Party(ies) to be fully informed as to the nature of the dispute(s)/difference(s)/issue(s), the amount of monetary claim, if any, and apparent cause(s) of action.

Arbitration proceedings commence when the other Party(ies) accept(s) the invitation to conciliate and confirmed in writing. If the other Party(ies) reject(s) the invitation, there will be no arbitration proceedings.

If the Party initiating arbitration does not receive a reply within thirty (30) days from the date on which he/she sends the invitation, or within such other period of time as specified in the invitation, he/she may elect to treat this as a rejection of the invitation to arbitrate. If he/she so elects, he/she shall inform the other Party(ies) accordingly.

45.2. Amicable Settlement

Where notice of dissatisfaction has been given under GC §-45.1 above, both Parties shall attempt to settle the dispute amicably before the commencement of arbitration. However, unless both Parties agree otherwise, arbitration may be commenced on or after the fifty-sixth (56th) day after the day on which notice of dissatisfaction and intention to commence arbitration was given, even if no attempt at amicable settlement has been made.

It would be only after exhausting the option of Arbitration as an Alternate Dispute Resolution Mechanism that the Parties hereto shall go for Arbitration. For the purpose of this clause, the option of 'Arbitration' shall be deemed to have been exhausted, even in case of rejection of 'Conciliation' by any of the Parties.

45.3. Arbitration

Any dispute between the Parties arising out of or in connection with the Contract not settled amicably in accordance with GC §-45.2 above shall be finally settled by arbitration.

The Additional Chief Secretary/Principal Secretary/Secretary, Energy Department, Government of Tamil Nadu shall be the sole arbitrator. This reference shall be governed by the Indian Arbitration and Conciliation Act 1996, and the Rules made there under.

Arbitration with proceedings conducted in accordance with the laws in the jurisdiction of the state of Tamil Nadu.

The place of arbitration shall be Chennai, Tamil Nadu, India; and the arbitration shall be conducted in the language for communications defined in GC §-5.3 (*Law and Language*).

The arbitrator shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Project Manager, relevant to the dispute. Nothing shall disqualify representatives of the Parties and the Project Manager from being called as a witness and giving evidence before the arbitrator on any matter whatsoever relevant to the dispute.

Arbitration may be commenced prior to or after completion of the Facilities. The obligations of the Parties and the Project Manager shall not be altered by reason of any arbitration being conducted during the progress of the work on the Facilities.

The cost of Arbitration proceedings including but not limited to fees for Conciliator(s), Airfare, Local Transport, Accommodation, cost towards conference facility etc. shall be borne by the Parties equally.

The Parties shall freeze claim(s) of interest, if any, and shall not claim the same during the pendency of Arbitration proceedings. The Settlement Agreement, as and when reached/agreed upon, shall be signed between the Parties and Arbitration proceedings shall stand terminated on the date of the Settlement Agreement.

45.4. Notwithstanding any reference to the arbitration, the Parties shall continue to perform their respective obligations under the Contract unless the Parties otherwise agree.





**Tamil Nadu Energy Development Agency
Chennai, Tamil Nadu**

Section VI

Particular Conditions (PC)

The following Particular Conditions shall supplement the GC. Whenever there is a conflict, the provisions herein shall prevail over those in the GC.

*Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road, Chennai – 600 006,
Phone: 044-28242800,
e-mail: dgm2@teda.in, tender@teda.in
website: www.teda.in*

This page intentionally left blank

A. Contract Data

Conditions	Sub-Clause	Data
Contractor's name and address	1.1 & 4.1	
Contractor's representative's name	1.1	
Employer's name and address	1.1 & 4.1	<i>Tamil Nadu Energy Development Agency, 5th Floor, E.V.K. Sampath Maaligai, No.68, College Road, Chennai – 600 006, Phone: 044-28242800, e-mail: dgm2@teda.in, tender@teda.in website: www.teda.in</i>
Project Manager's name and address	1.1, 4.1 & 17.1	<i>The General Manager Tamil Nadu Energy Development Agency, 5th Floor, E.V.K. Sampath Maaligai, No.68, College Road, Chennai – 600 006, Phone: 044-28242800, e-mail: dgm2@teda.in, tender@teda.in website: www.teda.in</i>
Sections of the Facilities	1.1	<i>Facilities in parts is not applicable in this tender</i>
Law governing Contract and used for its interpretation	5.1	<i>Laws of India</i>
Ruling language	5.2	<i>English</i>
Language for communications	5.3	<i>English</i>
Period for supply of Spare Parts (Mandatory Spare Parts and Recommended Spare Parts)	7.3(a) and (b)	<i>No mandatory spare parts and Recommended spare parts are included in the scope of the contract</i>
Commencement	8.1(c)	<i>The Effective Date is the Date of Commencement.</i>
Time for Completion	8.2	<i>The design, survey, supply, installation, testing, commissioning of distributed Grid-connected SPV systems for Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model as per terms & conditions of this tender document is to be completed within six (6) months from effective date as per GC §8.1. The following completion schedule shall be followed:</i>

Table xx – Project Milestones and Timeline		
Sl. No.	Milestone	Timeline (T is date of award of work)
1	Team mobilization, site survey, design & approvals etc.,	T + 1 month
2	Completion of design, supply, installation, commissioning and testing of grid interactive solar PV systems at all identified locations	T + 6 months
3	Completed Comprehensive annual maintenance of all installed systems for five (5) years	T + 66 months

Employer's Responsibilities: Number of Days for Site Access and Possession	10.2	<i>"By the Effective Date"</i>
Contract Price	11.2	<i>The contract price shall be firm and fixed. The contract price shall not be subject to price variation.</i>
Advance payment	13.2.1	<i>No advance payment is applicable</i>
Performance Security	13.3.1 & 13.3.2	<ul style="list-style-type: none"> • <i>The Performance Security shall be in the form of an of an irrevocable bank guarantee from any of the nationalized/scheduled banks operating in India for an amount equivalent to five percent (5%) of the Contract Price.</i> • <i>The Performance Security shall be denominated in Indian Rupees</i> • <i>The amount of Performance Security shall be: five percent (5%) of the Contract Price.</i> • <i>Further, any delay in submission of PBG period beyond 60 days, TEDA at its sole discretion may cancel the allocated capacity and forfeit 100% of EMD. Such Vendors (who have not submitted PBG) shall be debarred from participating in TEDA is future Tenders for a period as decided by Competent Authority. Part PBG</i>

		<p>shall not be accepted.</p> <ul style="list-style-type: none"> • The Performance Security shall be valid for a minimum period of 78 months from the date of issuance of Allocation Letter(s) and shall be renewed/extended till the completion of Comprehensive Maintenance period. • No interest will be paid by TEDA on the amount of Performance Security. • The Performance Security shall be forfeited as follows without prejudice to the Bidder being liable for any further consequential loss or damage incurred to TEDA: <ul style="list-style-type: none"> ◦ Failure in executing the Contract Agreement with the TEDA ◦ In the event of breach/violation or contravention of any terms and conditions contained herein by the agency i.e. if the selected bidder fails to execute the contract including compliance to Warranty/Guarantee and Annual Maintenance Contract for satisfactory performance of the system, the Performance Security, part/whole as per decision of TEDA, will be forfeited from the guarantor. ◦ If the Contractor is not able to commission the entire projects or part thereof to the satisfaction of TEDA, hundred percent (100%) Performance Security amount would be forfeited. • Notice of reasonable time will be given in case of forfeiture of Performance Security deposit. The decision of TEDA, as applicable, in this regard shall be final. • In all the above cases the corresponding unidentified / non-commissioned / non-performing capacity shall stand cancelled and TEDA has the right to reallocate the capacity to other Successful Bidders.
Taxes and Duties	14.1	1. Goods and Service Tax (GST)

		<p>a. <i>The F.O.R. Destination prices are excluding GST and Cess as applicable which will be paid extra on a given taxable goods and/or services. The amount and % of GST and Cess as applicable shall clearly be indicated separately. (GST/Cess means all applicable Tax/Cess under GST Laws. GST Laws means IGST Act, GST (Compensation to the State for Loss of Revenue) Act, CGST Act, UTGST Act and SGST Act, 2017 and all related ancillary legislations).</i></p> <p>b. <i>Contractor shall have to submit a C.A Certificate & duly authorized Signatory of Contractor, certifying that the Contractor have not claimed Refund of any applicable GST and Cess, charged to TEDA or shall not claim any such Refund, on a future date, from the concerned Authorities and if, any Refund, in respect of such GST and Cess, is claimed by the Contractor, it will be immediately passed on to the TEDA, without TEDA making any specific Claim, for the same, either from the GST Department or from the Contractor.</i></p> <p>c. <i>If the Contractor has opted for the Composition scheme of GST, the same must be clearly specified with valid Declaration & Certificate from Department. In the event of withdrawal/cessation of the Contractor from Composition scheme during the tenure of the contract, the rate mentioned in the price bids shall be final and any additional GST will have to be borne by the Contractor. In no case additional amount towards tax or otherwise will be paid/reimbursed to Contractor. Further Statutory Variation clause will not be applicable in case of Contractor has opted for</i></p>
--	--	---

		<p><i>Composition Scheme under GST.</i></p> <p>d. Contractor shall charge GST in Invoice at the rate as agreed to/mentioned in acceptance of tender document only and any deviation in the same shall not be accepted. Further, any additional liability of GST (later on due to wrong mentioning of GST rate, misinterpretation of HSN/SAC Code, etc.) over and above as charged in the invoice shall be borne by the Contractor.</p> <p>e. However, any refund received by the Contractor on account of GST charged from the TEDA; such refund shall have to be passed on to the TEDA, along with interest if any. Such refund along with interest needs to be passed on suo-moto by the Contractor.</p> <p>f. Further, the TEDA has a right to recover the amount of GST along with penal interest at the rate of 15% per annum if GST charged is not paid/short paid to the Government or fail to upload the details or uploads inaccurate particulars on GSTIN portal by the Contractor within the stipulated time limit. In case, Govt. revises the rate of GST rate/Code during the tenure of the contract, the provision of TEDA's statutory variation clause shall apply.</p> <p>2. Input Tax Credit Benefit</p> <p><i>In the event of any statutory increase in the rate of Input Tax Credit and/or due to inclusion of any other additional item of their inputs/input services under the ambit of the Input Tax Credit provisions under the GST Act, subsequent to the date of submission of the Price Bids, the same shall</i></p>
--	--	---

		<p>be passed on to TEDA by Contractor and Contractor shall inform such changes to TEDA from time to time.</p> <p>3. Statutory Deduction</p> <p>Statutory deduction will be made as per applicable rules & rates for TDS, Worker welfare cess, or any other taxes applicable from time to time etc. All other statutory liabilities towards this contract will be on the part of Contractor.</p> <p>4. Statutory Variation</p> <p>Any statutory increase or decrease in the taxes and duties including GST and Cess as applicable or in the event of introduction of new tax/cess or cessation of existing tax/cess subsequent to submission Price Bids by Bidders and if it takes place within the original contractual delivery date will be to TEDA's account subject to the claim being supported by documentary evidence. However, if any decrease takes place after the contractual delivery date, the advantage will have to be passed on to TEDA and if any increase takes place after the contractual delivery date, such increase will be to the Contractor's account. Statutory Variation clause will not be applicable in case of Contractor has opted for Composition Scheme under GST.</p>
Period for Project Manager's approval/review of technical documents.	20.3.2	Not more than fourteen (14) days.
Normal working hours	22.4.5	08:00 hrs to 18:00 hrs
Test and Inspection	23.2	if the material is not kept ready for inspection after intimation of the offered quantity on the scheduled date for inspection then all consequences will be to Contractor account and TEDA will recover the re-inspection charges @ ₹ 50,000/- per day for outside Tamil Nadu State and @ ₹ 25,000/- per day for within Tamil Nadu State.

Period for completion of guarantee test	25.2.2	<i>Fourteen (14) days from the date of Completion.</i>	
Liquidated damages a. For failure to attain completion time guarantee	26.2	<p><i>If the bidder fails to commission the sanctioned project within specified time, Liquidated Damages on per day basis calculated for the Performance Security on a 5 months period, subject to the limit of ten percent (10%) of Contract Price would be levied. After 9 months the project will get cancelled and the total PBG amount would be forfeited.</i></p> <p><i>Ex: If a project is delayed by 36 days and Performance Security amount for the project is ₹ 5,00,000 then the Liquidated Damages will be levied as given below.</i></p> <p><i>Liquidated Damages</i></p> $= ((\text{Performance Security})/150 \text{ days}) * \text{delayed days}$ $= ₹ (5,00,000/150)*36$ $= ₹ 2,00,000$	
Maximum amount of liquidated damages a. For failure to attain completion time guarantee	26.2	<i>Ten percent (10%) of Contract Price for the whole of the facilities.</i>	
Bonus for early Completion a. Amount/rate of bonus b. Maximum amount of bonus	26.3	<i>Bonus for early completion is applicable.</i>	
Defects Liability Period	27.2	Product	Period
		<i>Solar Panel – Product/Equipment warranty</i>	<i>15 years</i>
		<i>Solar Panel – Performance Guarantee (80 % of generation)</i>	<i>25 years</i>
		<i>Inverter</i>	<i>5 years</i>
		<i>Installation warranty</i>	<i>5 years</i>
		<i>Entire System Warranty</i>	<i>5 years</i>

<p>Functional Guarantees</p> <p>For failure to attain functional guarantee</p>	<p>28.3, 28.4 & 28.5.8</p>	<p>If during a year the Contractor does not achieve the Minimum CUF for a Projects system, Contractor shall pay to TEDA a CUF deficiency penalty, which shall be calculated as per the following formula:</p> $P = (E1 - E2) \times SEP \times R$ <p>In this formula the variables shall have the following meaning: P = CUF deficiency penalty; E1 = calculated energy on the basis of the Minimum CUF; E2 = actual energy generated; SEP = the Solar Energy Price; the applicable tariff fixed by TNERC for the service connection; R = the penalty rate, which shall be as follows:</p> <ul style="list-style-type: none"> a. For a CUF below the Minimum CUF and above 15%, the penalty rate (R) in the formula given above shall be 10%; b. For a CUF below 15% and above 12%, the penalty rate (R) in the formula given above shall be 20%; c. For a CUF below 12% the penalty rate (R) in the formula given above shall be 100%. <p>If for any Projects system the annual CUF is lower than 12% for two (2) consecutive years, the Projects will be declared as a non-performing Projects (“Non- Performing System”).</p>
<p>System Performance Evaluation/Loss in Generation</p> <p>a. Performance Ratio (PR)</p>	<p>28.5.2</p>	<p>The Contractor shall be required to meet a minimum guarantee solar energy generation with a minimum Performance Ratio (PR) of 75% at the time of commissioning.</p>
<p>b. Capacity Utilization Factor (CUF)</p>	<p>28.5.3</p>	<p>The Contractor shall be required to maintain a minimum Capacity Utilization Factor (CUF) of nineteen percent (19 %) during the Power Purchase Agreement period (the “Minimum CUF”).</p>
<p>Limitation of liability</p>	<p>30.1(b)</p>	<p>This entire CD 30.1(b) is not applicable.”</p>
<p>Loss of or Damage to Property; Accident or Injury to Workers; Indemnification</p>	<p>33.2</p>	<p>Ten (10) years from the from the Effective Date</p>
<p>Comprehensive Maintenance</p>		

Period		
Periods for submission of evidence of insurance		
a. by Contractor	34.3	30 days
b. by Employer	34.5	Not applicable
Insurances procured and maintained by the Employer	34.5	<i>This entire CD 34.5 is not applicable.”</i>
Provisional Sums	39.4(b)	<i>This entire CD 39.4(b) is not applicable.</i>
Arbitration:	45.3	<i>The Additional Chief Secretary/The Principal Secretary, Energy Department, Government of Tamil Nadu shall be the sole arbitrator.</i>



This page intentionally left blank



**Tamil Nadu Energy Development Agency
Chennai, Tamil Nadu**

Section VII
Contract Forms (CF)

This Section contains forms which, once completed, will form part of the Contract.

*Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road, Chennai – 600 006,
Phone: 044-28242800,
e-mail: dgm2@teda.in, tender@teda.in
website: www.teda.in*

This page intentionally left blank

Form LOA – Letter of Acceptance

(On the Letter Head of the Employer)

[Insert Date]

To

[insert name and address of the Contractor]

Ref. 1. *[Insert Bid Reference No.]*

2. *[Insert Bidder's offer]*

Sub: *Notification of Award Contract No.*_____

This is to notify you that your Bid dated [insert date] for execution of the [insert name of the Contract and the number of the lot as stated in BDS] for the Contract Price in the aggregate of [insert amount in words and figures] [insert name of currency], as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by [Name of the Employer].

You are requested to furnish the Performance Security within twenty-eight (28) days in accordance with the Conditions of Contract, using for that purpose one of the Performance Security Forms included in Section IX, Contract Forms, of the Bidding Document.

Authorized Signature:

Name and Title of Signatory:

Name of Agency: Tamil Nadu Energy Development Agency

Attachment:

Memoranda [Insert the list of memoranda (if any) as referred in GC §-1.1 (definition of the Letter of Acceptance.)]



Form PBG – Performance Bank Guarantee

[On Non judicial Stamp of worth 0.25% of BG Value (maximum stamp duty of Rs. 25000/-)]

[insert Bank's Name, and Address of Issuing Branch or Office]

Beneficiary : Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road, Chennai – 600 006,
Phone: 044-28242800,

Date :

Performance Guarantee No. :

We have been informed that [insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture] (hereinafter called "the Applicant") has entered into Contract No. [insert reference number of the contract] dated [insert date] with the Beneficiary, for the execution of design, survey, supply, installation, testing, commissioning and five (5) years comprehensive maintenance of distributed Grid-connected solar PV systems for Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of [insert amount in figures] ([insert amount in words]),¹ such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for its demand or the sum specified therein.

Our liability under this Letter of Guarantee shall be to pay to the TANGEDCO/TEDA 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 ninety (90) days beyond the sixty (60) months from the date of successful installation of last system i.e. upto and inclusive of (dd/mm/yy).

1 The Guarantor shall insert an amount representing the percentage of the Contract Price specified in the Letter of Acceptance, less provisional sums, if any, and denominated either in the currency(cies) of the Contract or a freely convertible currency acceptable to the Beneficiary.

Except for the documents herein specified, no other documents or other action shall be required, notwithstanding any applicable law or regulation.

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 shall 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 Numbers.

Telephone:

Mobile:

Fax Number

E-mail:

Common Seal of the Bank

Witness:

Signature:

Name:

Address:

Contact Numbers.

Telephone:

Mobile:



Form COA – Contract Agreement

THIS AGREEMENT is made the _____ day of _____, _____, BETWEEN

Tamil Nadu Energy Development Agency(TEDA), a Government of Tamil Nadu Undertaking, registered under the societies registration act, 1860 for the promotion of new and renewable energy sources in the state and having its office at 5thFloor, E.V.K. Sampath Maaligai, No. 68, College Road, Chennai 600 006, through its authorized signatory, Additional Chief Secretary/Chairman and Managing Director (hereinafter referred to as the “Implementing Agency”), which expression shall, unless it be repugnant to the subject or the context thereof, be deemed to mean and include its successors and permitted assigns (Party 1),

and

[insert name of Contractor], a corporation incorporated under the laws of [insert country of Contractor] and having its principal place of business at [insert address of Contractor], represented through its authorized signatory, (hereinafter called “the Contractor”), which expression shall, unless it be repugnant to the subject or the context thereof, be deemed to mean and include its successors and permitted assigns (Party 2);

TEDA and xxxxxxx shall hereinafter be referred to individually as a “Party”, and collectively as the “Parties”.

WHEREAS the Implementing Agency was established by the Government of Tamil Nadu in 1985 in order to diffuse useful knowledge in the various field of energy and thereby to deal with problem caused on account of the rapid depletion of non–renewable resources and the increasing pollution caused by existing energy and actively engaged in promoting the use and propagation of new and renewable non–conventional energy sources in the state and act as the Nodal Agency for the purpose of implementation of related Projects

WHEREAS the Implementing Agency desires to engage the Contractor to design, survey, supply, install, test, commission and five (5) years comprehensive maintenance of distributed Grid-connected solar PV systems for Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model (hereinafter called “the Facilities”).

The Implementing Agency and the Contractor agreed to enter into this Agreement for implementation of the Project, subject to and on the Terms and Conditions set forth hereinafter.

NOW THEREFORE, in consideration of the foregoing and the respective covenants and Agreements set forth in this Agreement, the sufficiency and adequacy of which is hereby acknowledged, and intending to be legally bound.

NOW IT IS HEREBY AGREED as follows:

I. Definitions

1. **"Actual Monthly Production"** shall mean the amount of energy recorded by the Solar Energy Generation Meter during each calendar month, as defined in Article 33;
2. **"Affected Party"** shall have the meaning as defined in Article 43.3;
3. **"Agreement"** shall mean this Agreement between the Implementing Agency and the Contractor;
4. **"Applicable Law"** shall mean, with respect to any person, any constitutional provision, law, statute, rule, regulation, ordinance, treaty, order, decree, judgment, decision, certificate, holding, injunction, registration, license, franchise, permit, authorization, guideline, Governmental approval, consent or requirement or any Governmental authority in India having jurisdiction over such person or its property, enforceable by law or in equity, including the interpretation and administration thereof;
5. **"Base Date"** means the date 28 days prior to the latest date for submission of the Bid, when Single-Stage Two-Envelope Bidding procedure is used.
6. **"Bill Dispute Notice"** shall mean the notice issued by a Party raising a Dispute regarding a Monthly Bill or a Supplementary Bill issued by the other Party;
7. **"BIS"** shall mean Bureau of Indian Standards;
8. **"Business Day"** shall mean with respect to Contractor and Implementing Agency, a Day other than Sunday/public holiday or a statutory holiday, every official work Day of the week on which the banks remain open for business in Chennai;
9. **"Capacity Utilization Factor (CUF)"** shall mean the ratio of actual energy generated by a solar PV system during a year to the product of installed plant capacity (in kW_p) and the total hours in a year (365 x 24);
10. **"CEA"** shall mean the Central Electricity Authority, Government of India;
11. **"Change in Law"** shall have the meaning as defined in Article 49;
12. **"Commercial Operation Date (COD)"** in relation to a Grid-connected SPV system shall mean the date declared by the Contractor and approved by the Implementing Agency on which the Grid-connected SPV system has become operational after demonstrating that the Grid-connected SPV system has been tested and verified for its design, specifications and Performance evaluation requirements and has been successfully connected to the electrical system of the building with the applicable solar energy metering facility activated by TANGEDCO;

13. **“Competent Authority”** shall mean the Chairman and Managing Director of Tamil Nadu Energy Development Agency or any person authorized by the Employer;
14. **“Commissioning”** means operation of the Facilities or any Section thereof by the Contractor following Completion, which operation is to be carried out by the Contractor as provided in GC §-25.1 (Commissioning) hereof, for the purpose of carrying out Guarantee Test(s).
15. **“Completion”** means that the Facilities or any Section thereof have been completed operationally and structurally and put in a tight and clean condition, that all work in respect of Precommissioning of the Facilities or such Section thereof has been completed, and that the Facilities or such Section thereof are ready for Commissioning as provided in GC §-24 (Completion of the Facilities) hereof.
16. **“Consents, Clearances and Permits”** shall mean all authorizations, licenses, approvals, registrations, permits, waivers, privileges, acknowledgements, Agreements or concessions required to be obtained from or provided by any concerned authority for the purpose of setting up of the generation facilities and/or supply of power:
17. **“Consultation Period”** shall mean the period of sixty (60) days or such other longer/shorter period as the Parties may agree, commencing from the date of issuance of a Contractor Preliminary Default Notice or Implementing Agency Preliminary Default Notice as provided in Article 11: of this Agreement, for consultation between the Parties to mitigate the consequence of the relevant event having regard to all the circumstances;
18. **“Construction Manager”** means the person appointed by the Contractor’s Representative in the manner provided in GC §-17.2.4.
19. **“Contract”** means the Contract Agreement entered into between the Employer and the Contractor, 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.
20. **“Contractor Indemnity”** shall have the meaning as defined in the Article 12.1;
21. **“Contract Data”** means the pages completed by the Employer entitled contract data which constitute Part A of the Particular Conditions.
22. **“Contract Documents”** means the documents listed in Article 1.1 (Contract Documents) of the Contract Agreement (including any amendments thereto).
23. **“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.

24. **“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.

In case Contractor undergo any merger or amalgamation or a scheme of arrangement or similar re-organization and the Contract Agreement is assigned to any entity or entities partly or wholly, the Contract Agreement shall be binding mutatis mutandis upon the successor entities and shall continue to remain valid with respect to obligation of the successor entities.

25. **“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.
26. **“Contractor’s Personnel”** means all personnel whom the Contractor utilises for the execution of the Contract, who may include the staff, labour and other employees of the Contractor and of each Subcontractor; and any other personnel assisting the Contractor in the execution of the Contract.
27. **“Contractor’s Representative”** means any person nominated by the Contractor and approved by the Employer in the manner provided in GC §-17.2 (Contractor’s Representative and Construction Manager) hereof to perform the duties delegated by the Contractor.
28. **“day”** means calendar day.
29. **“Deemed Generation”** shall mean energy (in units or kWh) deemed to have been generated per Day average from the Grid-connected SPV System in the same month of previous year or, if the period of consideration is within the first twelve (12) Months of Operation, the average over such period of Operation (Deemed Generation);
30. **“Delivery Point”** shall mean the point where the AC output of the solar grid inverter is connected to the electrical system of the building;
31. **“Defects Liability Period”** means the period of validity of the warranties given by the Contractor commencing at Operational Acceptance 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 GC §-27 (Defects Liability) hereof.

32. **"Dispute Notice"** shall have the meaning as defined in Article 14.2.1;
33. **"Dispute Resolution"** shall have the meaning as defined in the Article 14.3;
34. **"Disruption Period"** shall have the meaning as defined in Article 15.1.;
35. **"Due Date"** shall have the same meaning ascribed there to in Article 36.4;
36. **"Effective Date"** shall have the meaning set forth in Article 1.1 from which the Time for Completion shall be calculated.
37. **"Employer"** means the person named as such in the Contract Data and includes the legal successors or permitted assigns of the Employer.
38. **"Employer's Requirements"** means the document entitled employer's requirements, as included in the Contract, and any additions and modifications to such document in accordance with the Contract. Such document includes drawings, specifications, and any other documents specifying the purpose, scope, and/or design and/or other technical criteria, for the Facilities.
39. **"Event of Default"** shall have the meaning as defined in Article 11.1;
40. **"Expiration Date"** shall mean the date on which the Agreement terminates by reason of expiration of the Term of the Agreement.
41. **"Facilities"** 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.
42. **"Force Majeure Event"** shall have the meaning as defined in Article 9:
43. **"GC"** means the General Conditions hereof.
44. **"Guarantee Test(s)"** means the test(s) specified in the Employer's Requirements to be carried out to ascertain whether the Facilities or a part thereof is able to attain the Functional Guarantees specified in Appendix 8 (Functional Guarantees) to the Contract Agreement, in accordance with the provisions of GC §-25.2 (Guarantee Test) hereof.
45. **"IEC"** shall mean International Electro-technical Commission;
46. **"Indemnified Persons"** shall mean the Implementing Agency Indemnified Parties or the Contractor- Indemnified Parties, as the context requires.
47. **"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.

48. **"Invoice"** shall mean either a monthly bill/supplementary bill or a monthly Invoice/supplementary Invoice raised by any of the Parties;
49. **"IS"** shall mean Indian Standard, published by the Bureau of Indian Standards;
50. **"kWh"** shall mean kilowatt hour;
51. **"kW_p"** shall mean kilowatt peak;
52. **"Letter of Acceptance"** means the letter of formal acceptance, signed by the Employer, of the Letter of Bid, including any annexed memoranda comprising agreements between and signed by both Parties. If there is not such letter of acceptance, the expression "Letter of Acceptance" means the Contract Agreement and the date of issuing or receiving the Letter of Acceptance means the date of signing of the Contract Agreement.
53. **"Letter of Bid"** means the document(s) entitled letters of technical bid and price bid, or letter of second stage bid as appropriate, which was/were completed by the Contractor and include(s) the signed offer to the Employer for the Facilities.
54. **"Liquidated Damages or LD"** shall mean the penalty levied on the Contractor due to delay in commencement of supply of solar power, from the Project Schedule or extended Project Schedule in accordance with Article 5.1.
55. **"Losses"** shall mean all losses, liabilities, claims, demands, suits, causes of action, judgments, awards, damages, cleanup and remedial obligations, interest, fines, fees, penalties, costs and expenses (including all attorney's fees and other costs and expenses incurred in defending any such claims or other matters or in asserting or enforcing and indemnity obligation);
56. **"Mandatory Spare Parts"** means means the spare parts listed in the Schedule entitled "Mandatory Spare Parts" of the Price Schedule included in the Contract, which are required in the Contract and to be supplied by the Contractor, prior to the completion of the Facilities under GC §-7.3 (Spare Parts) (a), for the purpose of the proper and continuing functioning of the Facilities after the Operational Acceptance of the Facilities in accordance with GC §-25.3(Operational Acceptance).

If the said Schedule is not included in the Contract, this Sub-Clause shall not apply."

57. **"Metering Date"** shall mean the first Business Day of each calendar month subsequent to the month in which the solar power is generated by the Contractor;
58. **"Minimum CUF"** shall mean the Minimum Capacity Utilization Factor;
59. **"MNRE"** shall mean Ministry of New and Renewable Energy, Government of India;
60. **"Non-Performing System"** shall have the meaning as defined in Article 3.1.4;
61. **"OBIS"** shall mean Object Identification System, which defines identification codes for all data in DLMS/COSEM compliant metering equipment as per IEC 62056 (parts 21, 42, 46, 47, 53, 61 and 62) and IS 15959:2011;
62. **"O&M"** shall mean Operation & Maintenance;
63. **"Operational Acceptance"** means the acceptance by the Employer of the Facilities or any Section thereof, which certifies the Contractor's fulfilment of the Contract in respect of Functional Guarantees of the Facilities (or the relevant part thereof) in accordance with the provisions of GC §-28 (Functional Guarantees) hereof and shall include deemed acceptance in accordance with GC §-25 (Commissioning and Operational Acceptance) hereof.
64. **"Operational Acceptance Certificate"** means a certificate issued under GC §-25 (Commissioning and Operational Acceptance) hereof.
65. **"Owner"** shall mean a Party that possesses the exclusive right to hold an asset or property.
66. **"Party"** means the Employer or the Contractor, as the context requires, and "Parties" means both of them.
67. **"PC"** means the Particular Conditions.
68. **"Performance Ratio (PR)"** shall mean the ratio of plant output versus installed plant capacity at any instance with respect to the radiation measured. $PR = (\text{measured output in kW} / \text{Installed plant capacity in kW} * 1000 \text{ W/m}^2 / \text{measured radiation intensity in W/m}^2)$ at the time of Commissioning.
69. **"Performance Security"** means the security(ies) under GC §-13.3 (Performance Security).
70. **"Plant"** means permanent plant, equipment, machinery, apparatus, 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 GC §-7.3 hereof), but does not include Contractor's Equipment.
71. **"Preliminary Default Notice"** shall have the meaning as defined in Article 11.1;

72. **“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 GC §-24 (Completion of the Facilities) hereof.
73. **“Project(s)”** shall mean Grid-connected SPV system for which Contractor has been given responsibility to design, supply, testing, commissioning, comprehensive maintenance for a period of five (5) operational years.
74. **“Project Schedule”** shall mean 180 Days from the date of issue of sanction for each Grid-connected SPV system by Implementing Agency.
75. **“Project Manager”** means the person appointed by the Employer in the manner provided in GC §-17.1 (Project Manager) hereof and named as such in the Contract Data to perform the duties delegated by the Employer.
76. **“Provisional Sum”** means a sum which is specified in the Contract as a provisional sum, for the supply of any Plant and Installations Services or other services under GC §-39.4 (Provisional Sums).
77. **“Recommended Spare Parts”** means spare parts listed in the Schedule entitled “Recommended Spare Parts” of the Price Schedule included in the Contract, which are to be supplied by the Contractor under an agreement between the Parties in accordance with GC §-7.3(b), prior to the completion of the Facilities, and are necessary for the purpose of the proper and continuing functioning of the Facilities after the Operational Acceptance of the Facilities in accordance with GC §-25.3 (Operational Acceptance).
78. **“Section”** means a part of the Facilities specified in the Contract Data as a Section (if any).
79. **“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.
80. **“Solar Energy Generation Meter”** shall mean a renewable energy meter as specified in the CEA (Installation and Operation of meters) Regulation 2006 and as amended from time to time;
81. **“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.

82. **“TANGEDCO”** shall mean the Tamil Nadu Generation and Distribution Corporation;
83. **“TEDA”** shall mean Tamil Nadu Energy Development Agency or Tamil Nadu Renewable Energy Park Pvt. Ltd., (subsidiary company of TEDA);
84. **“Term of the Agreement”** shall have the meaning as defined in Article 1.2;
85. **“Time for Completion”** means the time within which Completion of the Facilities or any Section thereof is to be attained, as referred to in GC §-8 (Commencement and Time for Completion) and in accordance with the all relevant provisions of the Contract.
86. **“TNERC”** shall mean the Tamil Nadu Electricity Regulatory Commission.
87. **“year”** means 365 days.

II. Interpretations

88. Unless otherwise stated, all references made, in this Agreement to "Article", "Article" and "Annexure" shall refer respectively to articles, Articles and Annexures of this Agreement. The Annexures to this Agreement form an integral part of this Agreement and shall have effect as though they were expressly set out in the body of this Agreement:
89. An Applicable Law shall be construed as reference to such Applicable Law including its amendments or re-enactments from time to time;
90. A time of Day shall, save as otherwise provided in any Agreement or document, be construed as a reference to Indian Standard Time;
91. Different parts of this Agreement are to be taken as mutually explanatory and supplementary to each other and if there is any differentiation between or among the parts of this Agreement they shall be interpreted in a harmonious manner so as to give effect to each part;
92. In the Agreement, unless the context otherwise requires (i) words imparting singular connotation shall include plural and vice versa: (ii) the words "include", "includes", and "including" mean include, includes and including "without limitation" and (iii) the words "hereof", "hereto", "herein" and "hereunder" and words of similar import refer to the Agreement as a whole and not to any particular provision of the Agreement.
93. In case of any discrepancy in the provision of RFQ including it's corrigendums and this Agreement, the conditions stipulated in this Agreement shall prevail.

Article 1. Contract Documents and General particulars of the

1.1. Contract Documents (Reference General Conditions ("GC") Clause 2)

Contract

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:

- a. This Contract Agreement and the Appendices hereto.
- b. Letter of Acceptance.
- c. Letter of Technical Bid.
- d. Letter of Price Bid.
- e. Addenda, if any.
- f. Particular Conditions
- g. General Conditions.
- h. Employer's Requirements.
- i. Other completed Bidding Forms submitted with the Bid.
- j. The bid document

1.2. Order of Precedence (Reference GC 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 GC Clause 1)

Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions.

1.4. Effective Date

This Agreement shall come into force and will take effect on the date of execution of this Agreement by all Parties and such date shall be referred to as (the "Effective Date"). However, if the Parties do not sign on the same date, then the date on which the last Party signs the Agreement will be the Effective Date of Agreement.

1.5. Term of the Agreement

The Term of this Agreement shall commence on the Effective Date and shall continue for five (5) years from the

Commercial Operation Date of each Grid-connected SPV system, unless and until terminated earlier pursuant to the provisions of this Agreement.

Unless terminated earlier by any of the Parties in accordance with the terms of this Agreement, this Agreement shall continue in full force and effect until all obligations of the Parties in relation to the Grid-connected system have been fulfilled, discharged and/or waived (the "Term of the Agreement"). Any waiver or discharge of any rights or obligations shall be valid only if agreed in writing and signed by the Parties.

**Article 2.
Contract Price and
Terms of Payment**

2.1. Contract Price (Reference GC Clause 11)

The Employer hereby agrees to pay to the Contractor the Contract Price in consideration of the performance by the Contractor of its obligations hereunder. The Contract Price shall be the aggregate of: *[Insert amount(s) in Indian currency in words and figures]* and *[Insert amount in local currency in words and figures]*, as specified in Grand Summary, or such other sums as may be determined in accordance with the terms and conditions of the Contract.

2.2. Terms of Payment (Reference GC Clause 12)

The Contract Price shall be paid by the Employer to the Contractor at the times, in the manner, and in accordance with GC §-12 and the provisions of Appendix 10 (Payment Terms and Procedures) hereto

**Article 3.
Appendices**

3.1. The Appendices listed in the attached List of Appendices shall be deemed to form an integral part of this Contract Agreement.

3.2. Reference in the Contract to any Appendix shall mean the Appendices attached hereto, and the Contract shall be read and construed accordingly.

IN WITNESS whereof the Employer and the Contractor have caused this Agreement to be executed on the day and year first above written.

Signature:

Signature:

Title:

Title:

For and on behalf of the Employer in the
presence of

For and on behalf of the Employer in the
presence of

Witness:

Witness:

Name:

Name:

Signature

Signature

Address

Address

Appendices:

- Appendix 1: Time Schedule
- Appendix 2: Metering and Remote Monitoring
- Appendix 3: List of Approved Subcontractors
- Appendix 4: List of Documents for Approval and Review
- Appendix 5: Responsibilities of the Employer and the Contractor
- Appendix 6: Liquidated Damages and Penalties
- Appendix 7: Performance Evaluation
- Appendix 8: Functional Guarantees
- Appendix 9: Contractor's Obligations and Defect Liability
- Appendix 10: Payment Terms and Procedures
- Appendix 11: Insurance Requirements
- Appendix 12: Force Majeure
- Appendix 13: Change in Laws and Regulations
- Appendix 14: Suspension and Termination
- Appendix 15: Indemnification
- Appendix 16: General Covenants
- Appendix 17: Claims, Disputes and Arbitration
- Appendix 18: Representations and Warranties

Appendix 19: Corrupt or Fraudulent Practices and Prevention Policy

Appendix 20: Miscellaneous Provisions



Appendix 1: Time Schedule

In accordance with the provisions of GC §-12 (Terms of Payment), the Employer shall pay the Contractor in the following manner and within the periods of time specified in GC §-12.2, on the basis of the price breakdown included in the Price Schedule. Payments will be made in the currencies quoted by the Bidder. Applications for payment in respect of part deliveries may be made by the Contractor as work proceeds.

Table 09 – Project Milestones		
Sl. No.	Milestone	Timeline (T is date of award of work)
	Team mobilization, site survey, design & approvals etc.,	T + 1 month
	Completion of design, supply, installation, commissioning and testing of grid interactive solar PV systems at all identified locations	T + 6 months
	Completed Comprehensive annual maintenance of all installed systems for five (5) years	T + 66 months



Appendix 2: Metering and Remote Monitoring

1. Solar Energy Generation and Service Connection Meters

- 1.1. The solar energy produced shall be measured with a Solar Energy Generation Meter, which shall be installed close to the solar grid inverter and shall be connected in the AC output circuit of the inverter. The Solar Energy Generation Meter shall be of the three-phase type for three phase solar grid inverters.
- 1.2. The electrical energy consumed from and the surplus energy exported to the TANGEDCO's grid shall be measured by a bi-directional three phase energy meter.
- 1.3. The Contractor shall install a Service Connection Meter at the TANGEDCO's supply point.
- 1.4. The Contractor shall install a Solar Energy Generation Meter immediately after the AC output of each solar grid inverter to measure the solar energy generation.
- 1.5. If a number of solar grid inverters that are part of a Grid-connected SPV system are connected to a common solar grid inverter AC distribution board, the Solar Energy Generation Meter may be connected immediately after the output of this common solar grid inverter AC distribution board so that the total of energy generation by all solar grid inverters is recorded by a single energy meter.
- 1.6. The Solar Energy Generation Meter shall be of the direct reading type for solar grid inverters with a capacity of not more than 49 kW and of the indirect reading type with external current Transformers for the solar grid inverter capacities in excess of 49 kW.
- 1.7. The Solar Energy Generation Meter and the Service Connection Meter will be sealed by the Implementing Agency or its authorized agent. Any tampering with the Solar Energy Generation Meter and the Service Connection Meter shall result in major penalty to be decided by the Implementing Agency and other punitive actions as per law.
- 1.8. The direct reading Energy Meters shall be of accuracy class 0.5 as per IS13779-1999. The indirect reading Energy Meters shall be of accuracy class 0.5 as per IS14697-1999
- 1.9. The Energy Meters shall be of the bidirectional digital type with a liquid crystal display.
- 1.10. The display parameters of the Energy Meters shall be as given below:

Auto-scroll display mode:	
OBIS Code	Parameter Description
0.9.2	Date [dd-mm-yyyy]
0.9.1	Time [hh:mm:ss]
1.8.0	Active energy import (+A) [kWh]
2.8.0	Active energy export (-A) [kWh]
16.8.0	Active energy net (+A - -A) [kWh]
1.6.0	Maximum demand – active energy import (+A) [kW]
1.6.0	Maximum demand – active energy import, date of occurrence [dd-mm-yyyy]

1.6.0	Maximum demand – active energy import, time of occurrence [hh:mm]
2.6.0	Maximum demand – active energy export (-A) [kW]
2.6.0	Maximum demand – active energy export, date of occurrence [dd-mm-yyyy]
2.6.0	Maximum demand – active energy export, time of occurrence [hh:mm]
13.5.0	Last average power factor import (+A/+S)
84.5.0	Last average power factor export (-A/-S)
1.7.0	Instantaneous active power import (+A) [kW]
2.7.0	Instantaneous active power export (+A) [kW]
Manual Scroll mode	
The above mentioned auto-scroll parameters and any other additional parameters as may be specified by Implementing Agency.	

- 1.11.** The AC output of the solar grid inverter shall be connected to the incoming side (source) of the Solar Energy Generation Meter Terminal block.
- 1.12.** The Solar Energy Generation Meters shall have a remote reading facility enabled by a communication system and protocol that will be specified by Implementing Agency at time of Commissioning. The parameters that shall be remote readable must include the auto-scroll display parameters as given in Article 28
- 1.13.** The Contractor shall be responsible for maintaining the Solar Energy Generation Meters as may be directed by Implementing Agency. Solar Energy Generation Meters shall not be disconnected, removed or replaced without prior approval by Implementing Agency.
- 1.14.** Solar energy generation as may be recorded and displayed by the solar grid inverter shall not be used for the purpose of energy accounting and payments towards solar energy generation.
- 1.15.** The readings of the Solar Energy Generation Meter will be read remotely which will be accessible to the implementing Agency. Contractor shall raise monthly Invoice(s) based on readings of the Solar Energy Generation Meter. However the readings taken remotely will be counter checked on a random basis by the Implementing Agency in the presence of representative of the Contractor and the beneficiary.

In case of any difficulty in the Remote reading facility, then manual reading shall be done, the readings of the Solar Energy Generation Meter will be read by Contractor's personnel along with the representative of the Implementing Agency on the Metering Date at the location of the Grid-connected SPV system. Both the Parties shall sign a joint meter reading report. However, in case the joint meter reading report is not signed in the first five (5) Business Days of any month due to non-availability of the Implementing Agency authorized representative, the report signed by the Contractor shall be considered as joint meter reading report. The Parties agree that such joint meter reading report shall be final and binding on the Parties.

1.16. Each Grid-connected SPV system shall be commissioned by the Contractor only after activation of the Solar Metering facility by TANGEDCO in accordance with the prevailing guidelines of the TANGEDCO and/or TNERC and Tamil Nadu Solar Policy 2019 and subsequent amendments/substitutions if any. Implementing Agency could facilitate in the process; however, the entire responsibility towards such arrangements lies with the Contractor only.

2. Remote Monitoring System

2.1. The Contractor shall ensure that all Grid-connected SPV systems are enabled for remote monitoring. The remote monitoring data formats and communication protocols shall be agreed upon between the Parties.

2.1. The Contractor shall ensure and shall have no objection to provide remote monitoring access to the Implementing Agency or TANGEDCO authorized by the Implementing Agency.

2.2. The Contractor shall provide all Technical Assistance to the Implementing Agency for the successful implementation of the remote monitoring.

2.3. Implementing Agency or its authorized Agency reserves the right to validate the authenticity of such data for which Contractor shall extend full access and its cooperation.

3. Performance of the remote monitoring system:

3.1. The Contractor shall ensure that the connectivity of the Grid-connected SPV system with the monitoring system of the Implementing Agency is functional at all times.

3.2. The system should have an ability to send data such that the data is not lost due to Performance and load issue. The information should be shared with trusted systems only and should not be available to any other unknown system. The Contractor must ensure the availability and connectivity of the remote monitoring system to be at least 98%.



Appendix 3: List of Subcontractors

The List of Subcontractor becomes part of the contract document in accordance with GC Caluse 19.

Table 10 – List of Subcontractors		
Sl. No.	Name	Address
1.		
2.		
3.		
4.		
5.		



Appendix 4: List of Documents for Approval and Review

Pursuant to GC §-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 GC §-18.2 (Programme of Performance), the following documents for:

Sl. No.	Name
1.	
2.	
3.	
4.	
5.	

Sl. No.	Name	Address
1.		
2.		
3.		
4.		
5.		



Appendix 5: Responsibilities of the Employer and the Contractor

1. Contractor's Responsibilities

1.1. 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.

1.2. Feasibility Survey for Grid-connected SPV System

1.2.1. The Contractor shall be responsible to collect the data of shade-free area availability, Grid-connected SPV system capacity potential, Annual Energy Consumption (in kWh), TANGEDCO's service connection details (tariff, sanctioned load, distribution transformer capacity), availability of spare switch board module for connection of the AC output of the solar grid inverter;

1.2.2. The Contractor shall collect the above-mentioned data as per Annexure I;

1.2.3. The Contractor shall submit building wise Grid-connected SPV system proposals along with detailed drawings to Implementing Agency;

1.2.4. The Contractor shall obtain required sanctions and clearances for each Grid-connected SPV system;

1.2.5. The Contractor shall setup an appropriately staffed Project implementation cell in Chennai and nominate a Construction Manager for coordination with the Implementing Agency.

1.3. Design, Supply, Installation and Commissioning of Grid-connected SPV System

1.3.1. The Contractor shall be responsible to design, supply, install, test, commission along with comprehensive Maintenance of Grid-connected SPV systems with desired level of Performance for a period of five (5) years from the date of Commissioning of each Grid-connected SPV system in accordance with this Agreement;

1.3.2. The Contractor shall design, supply, install and commission the Grid-connected SPV systems with a capacity ranging from above 4 kW_p;

1.3.3. The Contractor shall install and commission each Grid-connected SPV system as per Project Schedule.

1.3.4. The Contractor shall have access to site locations, as reasonably permitted by the Implementing Agency, to perform the supply and installation during the Term of Agreement at the sites in a manner that minimizes inconvenience to and interference with the use of the site to the extent commercially practical.

1.3.5. The Contractor shall provide and lay the electrical cable from the AC output of the solar grid inverter to the Delivery Point. The interconnection shall be such that the solar grid inverter is not paralleled to the stand-by diesel generator, if any, or the output of any other backup supply source

for the Beneficiary, if any;

- 1.3.6.** The Contractor shall maintain general cleanliness of area around the Grid-connected SPV system during construction and the comprehensive maintenance period of the Grid-connected SPV system. In case any damage is caused by the Contractor to the equipment/facilities owned by the Implementing Agency or the Owner of the land, the same shall be made good/rectified by the Contractor at their cost.
- 1.3.7.** The Contractor shall submit monthly progress reports to the Implementing Agency as per the format prescribed (shall be provided at the implementation stage), within first seven (7) Days of the subsequent month. It will have the right to depute its representatives to ascertain the progress of work or the Performance of the Grid-connected SPV system at the sites.
- 1.3.8.** Notwithstanding anything to the contrary contained in this Agreement, the Contractor shall ensure that the technical specifications of the each Grid-connected SPV system to be installed and commissioned shall be in accordance with the Annexure II of the Agreement.

1.4. System Acceptance Testing and Commissioning

- 1.4.1.** The Contractor shall have access to sites, as reasonably permitted by the Implementing Agency, to perform the Testing and Commissioning along with during the term of Agreement at the Premises in a manner that minimizes inconvenience and interference with the use of the Premises to the extent commercially practical.
- 1.4.2.** The Contractor shall give 10 Day's advance notice to conduct the testing of the Grid-connected SPV system and shall conduct testing of the Grid-connected SPV system in the presence of the Implementing Agency or its designated representative. Intimation shall be given by both the Parties prior to 2 Days in case of change in schedule. Contractor shall not have the authority to test the Grid-connected SPV system of his own.
- 1.4.3.** If the results of such testing indicate that the system is capable of operating with a Performance Ratio (PR) of 75% or more, when tested for 5 continuous hours; then the Contractor shall send a written notice to the Implementing Agency to that effect. The date of successful conducting of such tests and injection of power at Delivery Point will be termed as the "Commercial Operation Date".
- 1.4.4.** Grid-connected SPV systems with a Performance Ratio (PR) of less than 75% shall not be considered for declaration of Commercial Operation Date.
- 1.4.5.** The Contractor shall be responsible for the submission of Commissioning reports upon the Commissioning of each The Contractor shall install and commission each Grid-connected SPV system as per Project Schedule. system within 3 Days from the declaration of Commercial Operation

Date. Implementing Agency shall provide the prescribed formats for the submission of Commissioning reports at Project implementation stage.

1.5. Comprehensive Maintenance for five (5) years

- 1.5.1.** The Contractor shall be responsible for Comprehensive Maintenance of the Grid-connected SPV systems with agreed level of Performance for a period of five (5) years from the date of Commissioning of each Grid-connected SPV system at its sole cost and expenses.
- 1.5.2.** The Contractor shall have access to the sites, as reasonably permitted by the Implementing Agency, to perform the Comprehensive Maintenance work during the Term of Agreement at the sites in a manner that minimizes inconvenience to and interference with the use of the Premises to the extent commercially practical.
- 1.5.3.** During the above mentioned five (5) years period, the Contractor shall be responsible for supply of all spare parts as required from time to time for scheduled and preventive maintenance, major overhauling of the Grid-connected SPV, replacement of defective modules, inverters and other system components and maintaining operations log sheets and data on deployment of staff for continuous operations, including qualified engineers for supervision, defect and complaint logging.
- 1.5.4.** All repair and maintenance activities have to be carried out with the minimum disruption of solar energy generation.
- 1.5.5.** The Implementing Agency shall not undertake any O&M activity related to the Grid-connected SPV system. The Contractor shall ensure that each Grid-connected SPV system is adequately maintained to serve the purpose envisaged in the Agreement.

1.6. Type and Quality of Materials and Workmanship

- 1.6.1.** The Contractor shall ensure that the Grid-connected SPV system is designed, built and completed in a good workmanship using sound engineering construction practices and using only materials and equipment that are new and of international utility grade quality such that, the useful life of the Grid-connected SPV system shall be more than twenty-five (25) years.
- 1.6.2.** Any supplies which have not been specifically mentioned in the Contract Agreement but which are necessary for the design, supply, installation, Commissioning and Performance or completeness of the Grid-connected SPV systems shall be provided by the Contractor without any extra cost and within the time schedule for efficient and smooth Operation and Maintenance of the Grid-connected SPV systems.
- 1.6.3.** The Contractor shall ensure that design, supply, installation, Commissioning and testing of all equipment, facilities, components and systems of the Grid-connected SPV system is in accordance with the latest applicable BIS and IEC standards and codes and other standards

and relevant regulations, codes as approved and amended from time to time by the CEA, TNERC and MNRE. For the avoidance doubt, Implementing Agency will have no right to demand replacement of equipment, facilities, components and systems, if there is change in the applicable standard post installation of Grid-connected SPV. Provided further, if replacement is requested by the Implementing Agency, the cost of such replacement will be to the account of the Implementing Agency.

1.7. Suspension of Delivery

1.7.1. The Contractor shall be entitled to suspend delivery of electricity from the Grid-connected SPV system to the Delivery Point(s) for the purpose of maintaining and repairing the Grid-connected SPV system upon giving notice of at least 3 Days in advance to the Implementing Agency, except in the case of emergency repairs. Such suspension of service shall not constitute a breach of this Agreement, provided that the Contractor shall use commercially reasonable efforts to minimize any interruption in service to the Implementing Agency. Further, such suspension period shall be considered for the Grid-connected SPV system Performance evaluation as per clause 3.0. Provide further, commencement of suspension period and continuance thereof for the same shall not exceed 7 Days”.

1.8. Title to the Grid-connected SPV system

1.8.1. Throughout the Term of the Agreement, the Beneficiary shall be the legal and beneficial Owner of the Grid-connected SPV system at all times, and the Grid-connected SPV system shall remain a property of the Beneficiary. The title to the Grid-connected SPV system will be transferred to the Implementing Agency on successful completion of commissioning and declaration of COD.

1.9. Performance Security

1.9.1. The Contractor shall, within twenty-eight (28) days of the receipt of the Letter of Acceptance, provide a security for the due performance.

1.9.2. The Performance Security shall be in the form of an of an irrevocable bank guarantee from any of the nationalized/scheduled banks operating in India for an amount equivalent to 10% of the Contract Price.

1.9.3. The Performance Security shall be denominated in Indian Rupees

1.9.4. The Performance Security shall be valid for the duration of this Agreement which shall be for sixty-one (61) months from the date of Commissioning of each Grid-connected SPV system.

1.9.5. In the event that the Contractor is prevented from performing its obligations under Article 17.1 as per the Project Schedule due to:

1.9.6. The Performance Security shall be forfeited as follows without prejudice to the Bidder being liable for any further consequential loss or damage

incurred to TEDA:

- i. In the event of breach/violation or contravention of any terms and conditions contained herein by the Contractor fails to execute the contract including compliance to Warranty/Guarantee and Comprehensive Maintenance Contract for satisfactory performance of the system, the Performance Security, part/whole as per decision of TEDA, will be forfeited from the guarantor.
- ii. If the Contractor is not able to commission the entire projects or part thereof to the satisfaction of TEDA, hundred percent (100%) Performance Security amount would be forfeited.
- iii. Notice of reasonable time will be given in case of forfeiture of Performance Security deposit. The decision of TEDA, as applicable, in this regard shall be final.
- iv. In all the above cases the corresponding unidentified/non-commissioned/non-performing capacity shall stand cancelled and TEDA has the right to reallocate the capacity to other Successful Bidders.

1.10. Extension of Time for Completion

- 1.10.1.** The Time(s) for Completion pursuant to GC §-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 occurrence of Force Majeure as provided in GC §-37 (Force Majeure), unforeseen conditions as provided in GC §-35 (Unforeseen Conditions), or other occurrence of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GC §-32.2;
 - b. Force Majeure Events affecting Implementing Agency;
 - c. Delay in obtaining statutory approvals or clearances, beyond the control of the Contractor;
 - d. any Change in the Facilities as provided in GC §-39 (Change in the Facilities);
 - e. any suspension order given by the Project Manager other than by reason of the Contractor's default or breach of the Contract under GC §-41.1(Suspension by Employer) hereof or reduction in the rate of progress pursuant to GC §-41.2 (Suspension by

Contractor);

- f. any changes in laws and regulations as provided in GC §-36 (Change in Laws and Regulations);
- g. 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;
- h. 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;
- i. delays attributable to the Employer or caused by customs; or
- j. any other matter specifically stated 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.

The Time for Completion shall be extended in accordance with this GC §-40.1, irrespective of any delaying factors attributable to the Contractor which operate or operated concurrently with any of the factors stated in (a) through (j) thereof.

1.10.2. The Project Schedule may be extended, subject to the limit prescribed in Article 6, for a reasonable period but not less than “Day for Day” basis, to permit the Contractor or Implementing Agency, to overcome the effects of the Force Majeure Events affecting the Contractor or Implementing Agency, or till such time such Event of Default is rectified by the Implementing Agency.

1.10.3. 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 practicable, and not later than twenty-eight (28) days after the Contractor became aware, or should have become aware, of the 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 to a Dispute Board, pursuant to GC §-45.3.

1.10.4. The Contractor shall at all times use its reasonable efforts to minimize any delay in the performance of its obligations under the Contract.

- 1.10.5.** In all cases where the Contractor has given a notice of a claim for an extension of time under GC §-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 thereafter 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 GC §-40.1, the amount of such extra costs shall be added to the Contract Price.
- 1.10.6.** Subject to Article 8 and 9, in case of extension occurring due to reasons specified in Article 4.18 a to e, any of the dates specified there in can be extended, subject to the condition that the Project Schedule would not be extended by more than one hundred and twenty (120) Days.
- 1.10.7.** As a result of such extension, the Project Schedule newly determined shall be deemed to be the Project Schedule for the purposes of this Agreement.
- 1.10.8.** Notwithstanding anything to the contrary contained in this Agreement, any extension of the Project Schedule arising due to any reason envisaged in this Agreement shall not be allowed beyond four (4) months or the date determined pursuant to Article 5 or and 6, whichever is later.
- 1.10.9.** For getting extension of time under Article 2.9.1 d & e, the Contractor shall notify the Implementing Agency, at least fifteen (15) days in advance of the Project Schedule, and detailed out the probable reasons for delay.

2. Employer's Responsibilities

- 2.1.** The Employer shall be responsible for acquiring and providing 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 Employer's Requirements. The Employer shall give to the Contractor such possession and access on or before the date(s) specified in the Contract Data.
- 2.2.** 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 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 Employer's Requirements.
- 2.3.** If requested by the Contractor, the Employer shall use its best endeavours 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.

- 2.4.** The Employer shall submit, before the Effective Date and thereafter within 28 days after receiving any request from the Contractor, reasonable evidence that financial arrangements have been made and are being maintained which will enable the Employer to pay the Contract Price punctually (as estimated at that time) in accordance with Appendix 1 [Payment Terms and Procedures] to the Contract Agreement. Before the Employer makes any material change to his financial arrangements, the Employer shall give notice to the Contractor with detailed particulars.
- 2.5.** 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; 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 Employer's Requirements, at or before the time specified in the programme furnished by the Contractor under GC §-18.2 (Programme of Performance) hereof and in the manner thereupon specified or as otherwise agreed upon by the Employer and the Contractor.
- 2.6.** All costs and expenses involved in the performance of the obligations under GC §-10 shall be the responsibility of the Employer, save those to be incurred by the Contractor with respect to the performance of Guarantee Tests, in accordance with GC §-25.2 (Guarantee Test).
- 2.7.** Provide notice to proceed for each Grid-connected SPV system to be installed in the building which is feasible to take up the Project under this Agreement as per Annexure 1.
- 2.8.** Pay the termination payment, if required, as per the terms and conditions of this Agreement.



Appendix 6: Liquidated Damages and Penalties

1. Completion Time Guarantee

- 1.1.** If the bidder fails to commission the sanctioned project within specified time, Liquidated Damages on per day basis calculated for the Performance Security on a 5 months period, subject to the limit of ten percent (10%) of Contract Price would be levied. After 9 months the project will get cancelled and the total PBG amount would be forfeited.

Ex: If a project is delayed by 36 days and Performance Security amount for the project is ₹ 5,00,000 then the Liquidated Damages will be levied as given below.

Liquidated Damages

$$\begin{aligned}
 &= ((\text{Performance Security})/150 \text{ days}) * \text{delayed days} \\
 &= ₹ (5,00,000/50)*36 \\
 &= ₹ 1,20,000
 \end{aligned}$$

Details of works have been listed out in Section-IV, Employer's Requirements.

Bidder not giving clear and specific acceptance to the above clauses will be considered as non-responsive.

- 1.2.** No bonus will be given for earlier Completion of any of the Facilities or part thereof.
- 1.3.** TEDA may, without prejudice to any other method of recovery, deduct the amount of such damages from any amount due or to become due to the Contractor.
- 1.4.** Such payment shall completely satisfy the Contractor's obligation to attain Completion of the Facilities or any Section thereof within the Time for Completion or any extension thereof under GC §-40 (Extension of Time for Completion). The Contractor shall have no further liability whatsoever to the Employer in respect thereof.
- 1.5.** However, the payment of liquidated damages shall not in any way relieve the Contractor from any of its obligations to complete the Facilities or any part thereof or from any other obligations and liabilities of the Contractor under the Contract.
- 1.6.** Save for liquidated damages payable under this GC §-26.2, the failure by the Contractor to attain any milestone or other act, matter or thing by any date specified in Appendix 4 (Time Schedule) to the Contract Agreement, and/or other programme of work prepared pursuant to GC §-18.2 shall not render the Contractor liable for any loss or damage thereby suffered by the Employer.



Appendix 7: Performance Evaluation**1. Performance Evaluation**

- 1.1.** The Contractor shall be required to meet a minimum guarantee solar energy generation with a minimum Performance Ratio (PR) of 75% at the time of Commissioning.
- 1.2.** Grid-connected SPV systems with a Performance Ratio (PR) of less than 75% shall not be considered for declaration of Commercial Operation Date.
- 1.3.** The Contractor shall be required to maintain a Minimum Capacity Utilization Factor (CUF) of nineteen percent (19 %) during the Term of Agreement (the "Minimum CUF").
- 1.4.** If for any Grid-connected SPV system the annual CUF is lower than 12% for two (2) consecutive years, the Grid-connected SPV will be declared as a non-performing Grid-connected SPV system ("Non- Performing system").
- 1.5.** For the purpose of system Performance Evaluation, the grid availability adjusted Capacity Utilization Factor (CUF) of each Grid-connected SPV system will be arrived at by taking into account average daytime grid availability. For this purpose, the system monitoring equipment of the Grid-connected SPV must include measurement of daytime (06:00h – 18:00h) grid availability at the solar grid inverter AC terminals.
- 1.6.** If a Grid-connected SPV system does not include equipment to measure daytime (06:00h –18:00h) grid availability, the CUF value used for system Performance evaluation purposes will be calculated with an assumed grid availability of ninety-seven percent (97%).



Appendix 8: Functional Guarantees

1. General

This Appendix sets out:

- a. the functional guarantees referred to in GC §-28 (Functional Guarantees);
- b. the preconditions to the validity of the functional guarantees, either in production and/or consumption, set forth below;
- c. the minimum level of the functional guarantees; and
- d. the formula for calculation of liquidated damages for failure to attain the functional guarantees.

2. Preconditions

The Contractor gives the functional guarantees (specified herein) for the facilities, subject to the following preconditions being fully satisfied:

a. System Acceptance Test/Performance Ratio Test

- i. The Contractor shall give 10 days' advance notice to conduct the testing of the Project and shall conduct testing of the Project in the presence of Employer's designated representative.
- ii. To establish the system is capable of generating Electrical energy (full rated KW_p) for five (5) continuous hours, corresponding to actual solar irradiation and environmental conditions prevailing at that time, using such instrument and meters as have been installed for such purposes.
- iii. Performance Ratio (PR) of the PV Plant is calculated as follows (according to IEC 61724 Ed.2).
- iv. The following formula shall be used to calculate the Performance Ratio.

$$\text{Instantaneous PR (\%)} = \frac{\text{Measured output (kW)}}{\text{Installed plant capacity (kW)}} \times \frac{1000 \text{ W/m}^2}{\text{Measured radiation intensity W/m}^2}$$
- v. The PR shall be calculated at every half an hour for five (5) continuous hours. The PR will be measured at Inverter Output level during peak radiation conditions.

b. System Performance Evaluation/Loss of Generation

- i. "Capacity Utilization Factor" (CUF) measures the ratio of the annual output of the plant in kWh versus installed plant capacity for number of days.
- ii. The following formula shall be used to calculate the Capacity Utilization Factor.

$$CUF = \frac{\text{Plant output (kWh)}}{(\text{Installed Plant capacity (kW)} \times 365 \times 24)}$$

- iii. For CUF less than 17%, the penalty can be imposed for the loss of energy generation @ maximum tariff paid by the consumer for that year subject to force majeure conditions.

c. Penalty for delayed Defect Rectification

- i. In any case of breakdown/any problem/defect in SPV system or whenever a complaint is lodged by the beneficiary, the contractor shall have to replace/repair the defect of the SPV system, resolve it and make the SPV system operative at site as per the Technical specifications, within forty-eight (48) hours of the receipt of the complaint.

3. Functional Guarantees

Subject to compliance with the foregoing preconditions, the Contractor guarantees as follows:

3.1. Production Capacity:

i. Guarantee Test and Operational Acceptance

The Performance ratio (i.e. PR) of solar power plant at the time of testing should be at least equal to or more than 75%, for initial project acceptance.

ii. Capacity Utilization Factor and Generation Guarantee

Minimum Annual generation guarantee of 1489 units per kW_p per year, a CUF of 19%, should be maintained after considering the degradation of solar PV modules during the Comprehensive Maintenance Period for release of performance related security deposit.

This Guaranteed CUF shall be calculated on an annual-basis and shall be verified by the TEDA at the end of each year during the five (5) year guarantee period.

If during a year the Contractor does not achieve the Minimum CUF for a Projects system, Contractor shall pay to TEDA a CUF deficiency penalty, which shall be calculated in accordance with Sub-clause 4.1 hereof.

iii. Comprehensive Maintenance and Defect Rectification

The Contractor shall be responsible for Operation and Maintenance of the Projects for a period of five (5) years from the date of commissioning, during which TEDA will monitor the project for effective performance in line with conditions specified.

The concerned beneficiary may lodge their complaint for the SPV system. The record of each and every complaint received and resolved, with down time and up time shall have to be maintained by the Contractor in register as well as computer based software.

The Contractor shall be liable for any loss of generation from the PV system arising from persisting fault beyond the 48-hour period and shall compensate the Consumer at the applicable tariff (energy charges) fixed by TNERC for generation loss beyond the 48-hour period.

4. Failure in Guarantees and Liquidated Damages

4.1. Failure to Attain Guaranteed Production Capacity

If the production capacity of the facilities attained in the guarantee test, pursuant to GC §-25.2, is less than the guaranteed figure specified in para. 3.1 above, but the actual

production capacity attained in the guarantee test is not less than the minimum level specified in para. 4.3 below, and the Contractor elects to pay liquidated damages to the Employer, pursuant to GC §-28.3, then the Contractor shall pay liquidated damages/deficiency penalty at the rate stated below.

The deficiency penalty shall be calculated as per the following formula:

$$P = (E_1 - E_2) \times EC \times R$$

In this formula the variables shall have the following meaning: P = CUF deficiency penalty; E_1 = calculated energy on the basis of the Minimum CUF; E_2 = actual energy generated; EC = the maximum tariff (Energy Charges) paid by the consumer during that year fixed by TNERC for the service connection; R = the penalty rate, which shall be as follows:

- a. For a CUF below the Minimum CUF and above 15%, the penalty rate (R) in the formula given above shall be 10%;
- b. For a CUF below 15% and above 12%, the penalty rate (R) in the formula given above shall be 20%;
- c. For a CUF below 12% the penalty rate (R) in the formula given above shall be 100%.

If for any system the annual CUF is lower than 12% for two (2) consecutive years, the Projects will be declared as a non-performing Projects ("Non- Performing System").

4.2. Penalty for delayed Defect Rectification

If the down time period for any beneficiary complaint exceeds forty-eight (48) hours and the contractor fails to make the plant operational, a penalty for the time period exceeding 48 hours, as per the below mentioned schedule shall be deposited by the contractor to TEDA.

$$\text{Defect Rectification Penalty} = \text{System Capacity (kW)} \times \text{Down Time (Hrs)} \times \text{EC}$$

Where,

EC is the Energy Charges as per the tariff fixed by TNERC for the beneficiary's service connection.

The loss in generation shall be decided on hourly basis.

The Contractor shall be issued a notice to pay the applicable penalty within seven (7) days to TEDA. If the Contractor fails to pay the penalty within notice period, TEDA shall encash the Performance Security immediately and action against the firm will also be taken for debarring and black listing.

4.3. Minimum Levels

Notwithstanding the provisions of this paragraph, if as a result of the guarantee test(s), the following minimum levels of performance guarantees are not attained by the Contractor, the Contractor shall at its own cost make good any deficiencies until the

Facilities reach any of such minimum performance levels, pursuant to GC §-28.2:

- i. The Performance ratio (i.e. PR) of solar power plant at the time of testing should be at least equal to or more than 75%, for initial project acceptance.
- ii. Minimum Annual generation guarantee of 1489 units per kW_p per year, a CUF of 17%, should be maintained after considering the degradation of solar PV modules during the Comprehensive Maintenance Period for release of performance related security deposit.



Appendix 9: Contractor's Obligations and Defect Liability**1. Contractor's Obligations**

- 1.1.** 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 and do Comprehensive Maintenance for a period of five (5) operational years from the date of Commissioning of Grid-connected SPV system in accordance with the Terms and conditions of this Agreement.
- 1.2.** The Contractor shall acquire and pay for all permits, approvals and/or licenses from all local, state or national Government authorities or public service undertakings which such authorities or undertakings require the Contractor to obtain in its name and which are necessary for the performance of the Contract. The Contractor shall acquire all other permits, approvals and/or licenses that are not the responsibility of the Employer under GC §-10.3 hereof and that are necessary for the performance of the Contract.
- 1.3.** The Contractor shall comply with all laws in force. The laws include all local, state, national or other laws that affect the performance of the Contract and are binding 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 GC §-10.1 hereof.
- 1.4.** The Contractor agrees to defend, indemnify and hold harmless TANGEDCO, its officers, Directors, consultant, agents, employees and affiliates (and their respective officers, directors, agents and employees) from and against any and all claims, liabilities, actions, demands, judgments, losses, costs, expenses, suits, actions and damages arising by reason of bodily injury, death or damage to property sustained by third parties that are caused by an act of negligence or the willful misconduct of the Contractor, or by an officer, Director, agent or employee of the Contractor. Indemnity Bond, if applicable & required shall be submitted by Contractor.
- 1.5.** If the Contractor is a joint venture (JV), which means for the purposes of this Contract, joint venture, consortium, association or unincorporated grouping 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 JV shall not be altered without the prior consent of the Employer.
- 1.6. Comprehensive Maintenance**
 - a.** The Contractor shall be responsible for Operation and Maintenance of the Projects for a period of five (5) years, during which TEDA will monitor the project for effective performance in line with conditions specified.
 - b.** During the above mentioned five (5) year period, the Contractor shall be responsible for supply of all spare parts as required from time to time for scheduled and preventive maintenance, major overhauling of the plant, replacement of defective modules, inverters and other system components and

maintaining operations log sheets and data on deployment of staff for continuous operations, including qualified engineers for supervision, defect and complaint logging.

1.7. Contractor undertakes to be responsible, at its own cost and risk, for:

- a. All required approvals, sanctions and clearances relating to the installation and Commissioning of each Grid-connected SPV system. In case the Contractor is facing any difficulties in obtaining any approval, Contractor can request the Implementing Agency for timeline extension for the same.
- b. Supply to the Implementing Agency promptly with copies of each application that the Contractor submits to relevant authorities, and copy/ies of each Consent which it obtains. For the avoidance of doubt, it is clarified that the Contractor shall be solely responsible for maintaining/renewing any Consent and for fulfilling all conditions specified therein during the Term of the Agreement.
- c. Fulfilling all obligations undertaken by the Contractor under this Agreement, read in conjunction with Terms and conditions of this Agreement;
- d. Ensure operations of the solar power plant in a prudent utility basis with an objective of regular power supply to the TANGEDCO's grid.
- e. Submission of name and contact details of the Construction Manager and other key persons of the Project monitoring cell to the Implementing Agency, who will act as a single point of contact for future communication.
- f. Submit a monthly progress report during installation of each Grid-connected SPV system, within first seven (7) Days of the subsequent month.
- g. Contractor shall be excused and not be liable or responsible for any delay or failure to perform the Services or failure of the Services or Contractor's deliverable under this Agreement to the extent that such delay or failure is not solely attributable to Contractor or has arisen as a result of any delay or failure by Implementing Agency or its employees or agents or third Party service providers to perform any of its duties and obligations as set out in this Agreement by means of a valid proof is furnished by the Contractor and the same is accepted by the Implementing Agency.

2. Contractor's Defect Liability

- 2.1. If any supplies by the Contractor have been executed with unsound, imperfect or unskilled workmanship, or with materials of any inferior quality, the Contractor shall forthwith rectify or remove and replace that item so specified and provide other proper and suitable materials at its own charge and cost if so desired by Implementing Agency in writing.
- 2.2. The Contractor shall also be undertaking the Comprehensive Maintenance of the Grid-connected SPV system and consequently shall be required to rectify any defects that emerge during the Comprehensive Maintenance Period of the Grid-connected SPV systems for the entire Term of the Agreement from the date of Commissioning of each Grid-connected SPV system.



Appendix 10: Payment Terms and Procedures

In accordance with the provisions of GC §-12 (Terms of Payment), the Employer shall pay the Contractor in the following manner and within the periods of time specified in GC §-12.2, on the basis of the price breakdown included in the Price Schedule. Payments will be made in the currencies quoted by the Bidder. Applications for payment in respect of part deliveries may be made by the Contractor as work proceeds.

TERMS OF PAYMENT**Schedule No. 1: Design, supply, installation and commissioning services**

In respect of plant and equipment supplied from abroad, payments shall be made as follows:

The contractor's request(s) for release of payment shall be addressed to the the Project Manager and submitted to the respective Engineer In-charge of TEDA, upon fulfillment of required obligations stipulated in the contract along with required documents.

The contractor shall submit the invoice in triplicate showing description, quantity, Unit rate and total amount with all supporting documents as per terms of the Contract. After due verification by Engineer-In-Charge, TEDA shall process the verified Bill (s)/Invoice (s) for release of payment. In case the contractor fails to submit the Invoice/Bill with all the required documents, TEDA reserves the right to hold the payment against such Bills/Invoices.

The contractor shall be responsible for submitting all the requisite documents for processing the Bill (s)/Invoice (s). The contractor shall submit the Bills/Invoices for the work executed showing separately, GST and any other statutory levies in the Bill (s)/Invoice (s).

TEDA has the right to seek any additional documents/information/certification it deems fit prior to be release of any installment.

The Final bill must be submitted to Engineer In-charge of TEDA not later than 30 days after expiry of the scheduled time period.

The payment of billed amount (Design, Survey, Supply, Installation, Testing and Commissioning and CMC) of SPV systems shall be released as per following terms:

I. For projects completed within the Completion Period**a. 1st installment – 90% on completion of installation of SPV systems**

After receipt of claim (Supply) from the Contractor with following documents duly verified by TEDA's concerned Nodal Officer/Engineer In-charge, payment will be made by Designated Payment Officer of TEDA within a reasonable period from the date of submission of invoice along with relevant documents.

1. Unconditional acceptance of the Letter of Acceptance and signing of contract agreement by the Contractor.
2. Submission of Contract Performance Security as per relevant Performance Security clause to TEDA
3. Material Dispatch Clearance Certificate (MDCC)/Dispatch Instructions (DI) for dispatch of materials from the manufacturer's works. MDCC/DI shall be issued by TEDA.
4. Invoice issued by the Contractor
5. Duly Signed Installation Certificate with the following data:
 - i. Service Connection Number of beneficiary
 - ii. Date of commissioning
 - iii. Make and model of PV Modules
 - iv. Serial Nos. of PV modules, and Balance of systems

The installation certificate shall be signed by the beneficiary and Engineer-In charge designated by TEDA

b. Balance 10% - During the five (5) years Comprehensive Maintenance Period

Balance 10% of the contract value (inclusive of taxes) for total contract will be released after successful completion, commissioning and charging in all respect and also subject to clearance/verification of 3rd party inspection @ 2% of contract value in each year on satisfactory comprehensive maintenance of the SPV plant and satisfactory performance of the plant (generate specified quantity of power) for consecutive five (5) years from the handing over of the SPV system.

II. For projects completed beyond the Completion Period

a. 1st installment – 80% on completion of installation of SPV systems

After receipt of claim (Supply) from the Contractor with following documents duly verified by TEDA's concerned Nodal Officer/Engineer In-charge, payment will be made by Designated Payment Officer of TEDA within a reasonable period from the date of submission of invoice along with relevant documents.

1. Unconditional acceptance of the Letter of Acceptance and signing of contract agreement by the Contractor.
2. Submission of Contract Performance Security as per relevant Performance Security clause to TEDA
3. Material Dispatch Clearance Certificate (MDCC)/Dispatch Instructions (DI) for

dispatch of materials from the manufacturer's works. MDCC/DI shall be issued by TEDA.

4. Invoice issued by the Contractor
5. Duly Signed Installation Certificate with the following data:
 - i. Service Connection Number of beneficiary
 - ii. Date of commissioning
 - iii. Make and model of PV Modules
 - iv. Serial Nos. of PV modules, and Balance of systems

The installation certificate shall be signed by the beneficiary and Engineer-In charge designated by TEDA

b. Balance 20% - During the five (5) years Comprehensive Maintenance Period

Balance 20% of the contract value (inclusive of taxes) for total contract will be released after successful completion, commissioning and charging in all respect and also subject to clearance/verification of 3rd party inspection @ 4% of contract value in each year on satisfactory comprehensive maintenance of the SPV plant and satisfactory performance of the plant (generate specified quantity of power) for consecutive five (5) years from the handing over of the SPV system.

ANNEXES

[Insert forms and certificates to be used for the payment application/approval procedure.]



Appendix 11: Insurance Requirements

Insurances to be Taken Out by the Contractor

In accordance with the provisions of GC §-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, who should not unreasonably withhold such approval.

1. Transit-cum-Storage-cum-Erection Insurance

All the materials under the Solarization part will be required to be supplied up to the Beneficiary's site and shall have transit insurance against all transit risks, such as damage, loss, theft, fire, etc. The transit insurance period shall cover 60 days after the date of receipt of materials at installation site(s) to enable TEDA to check the stores fully. It will be the responsibility of the supplier to lodge claim against the insurance on receiving necessary advice from the consignee. Transit Insurance of the material shall remain the responsibility of the Contractor till the time of Commissioning.

The Contractor shall take an insurance policy for the health and safety of its employees, sub-contractors and other human resources involved in the execution of the Project. The insurance shall cover all health and safety liabilities, including accidents of all types.

2. Insurance for Comprehensive Maintenance:

The Contractor has to take the insurance for the whole Solar PV systems with inverter supplied and installed by them as per the Solarization part and as well as the metering system supplied by third party for the risk covering, theft, damage, fire and damage or loss due to natural calamities for five (5) years from the date of commissioning of the last system of the project.

- a.** The Contractor shall file insurance claim and shall be responsible to bring an insurance claim to a final settlement. And in such cases the Contractor has to restore the whole Solar PV system with inverter in working condition within three (3) days without waiting for settlement of insurance claim. Insurance coverage for five (5) years is compulsory.
- b.** The Contractor has to submit the Insurance Policy covering risks as mentioned above for the period of five (5) years to TEDA immediately after commissioning of the project, failing which, the payment towards installation and commissioning part will not be released until production of the insurance.

3. Application of Insurance Proceeds

- a.** Save as expressly provided in this Agreement or respective Insurances, the proceeds of any insurance claim made due to Loss or damage to the Grid-connected SPV system or any part of the Grid-connected SPV system shall be first applied to reinstatement, replacement or renewal or making good of such Loss or damage of the

GCRTS system.

4. Effect on liability of Implementing Agency

- a.** Notwithstanding any liability or obligation that may arise under this Agreement, any Loss, damage, liability, Payment, obligation or expense which is insured or not or for which the Contractor can claim compensation, under any Insurance shall not be charged to or payable by the Implementing Agency.



Appendix 12: Force Majeure**1. Force Majeure**

- 1.1.** “**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; and
 - f.** shortage of labour, materials or utilities where caused by circumstances that are themselves Force Majeure.
- 1.2.** 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 Party became or should have become aware of the occurrence of such event.
- 1.3.** The Party who has given such notice 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 GC §-40 (Extension of Time for Completion), taking into account such prevention, hindrance or delay, as the case may be.
- 1.4.** 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 fulfil its or their obligations under the Contract, but without prejudice to either Party’s right to terminate the Contract under GC §-37.6 and GC §-38.5.

- 1.5.** 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 GC §-32.2, GC §-38.3 and GC §-38.4
- 1.6.** If the performance of the Contract is substantially prevented, hindered or delayed for a single period of more than sixty (60) days or an aggregate period of more than one hundred and twenty (120) 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 GC §-38.5.
- 1.7.** In the event of termination pursuant to GC §-37.6, the rights and obligations of the Employer and the Contractor shall be as specified in GC §-42.1.2 and GC §-42.1.3.
- 1.8.** Notwithstanding GC §-37.5, Force Majeure shall not apply to any obligation of the Employer to make payments to the Contractor herein.



Appendix 13: Change in Laws and Regulations

1. Change in Laws and Regulations

1.1. If, after the Base Date, 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, 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.

1.2. Notification of Change in Law

1.2.1. If the Contractor is affected by a Change in Law in accordance with this clause and wishes to invoke a Change in Law provision, it shall give notice to the Implementing Agency of such Change in Law as soon as reasonably practicable after becoming aware of the same or should reasonably have known of the Change in Law.

1.2.2. Notwithstanding GC §-36.2.1, the Contractor shall be obliged to serve a notice to the Implementing Agency if it is beneficially affected by a Change in Law. Without prejudice to the factor of materiality or other provisions contained in this Agreement, the obligation to inform the Implementing Agency contained herein shall be material. However, in case the Contractor has not provided such notice, the Implementing Agency shall have the right to issue such notice to the Contractor.

1.2.3. Any notice served pursuant to Change in Law shall provide, amongst other things, precise details of:

- a.** The Change in Law; and
- b.** The effects on the Contractor of the matters relevant for Construction Period and the operation period for the Grid-connected SPV system.



Appendix 14: Suspension and Termination**1. Suspension****1.1. Suspension by the Employer**

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, protection 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 GC §-39 (Change in the Facilities), excluding the performance of the suspended obligations from the Contract.

1.2. Suspension by Contractor

If:

- a.** the Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause pursuant to Appendix 1 (Payment Terms and Procedures) to the Contract Agreement, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, with financing charges thereon as stipulated in GC §-12.4 (Delayed Payment), 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 GC §-10.2, or failure to obtain any Governmental permit necessary for the execution and/or completion of the

Facilities;

then, the Contractor may by notice to the Employer suspend performance of all or any of its obligations under the Contract, or reduce the rate of progress.

If the Contractor subsequently receives such payment approval, evidence or payment (as described in the relevant provision of the Contract and in the above notice) before giving a notice of termination, the Contractor shall resume normal working as soon as is reasonably practicable.

- 1.3.** If the Contractor's performance of its obligations is suspended or the rate of progress is reduced pursuant to GC §-41.1 and GC §-41.2 above, then the Time for Completion shall be extended in accordance with GC §-40.1.
- 1.4.** 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.

2. Termination

2.1. Termination by Employer for Employer's Convenience

- 2.1.1.** The Employer may at any time terminate the Contract for any reason by giving the Contractor a notice of termination that refers to this GC §-42.1 (Termination by Employer for Employer's Convenience).
- 2.1.2.** Upon receipt of the notice of termination under GC §-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, tidy 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, tidy and safe condition; and
 - d.** subject to the payment specified in GC §-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.

2.1.3. In the event of termination of the Contract under GC §-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

2.2. Termination by Employer for Contractor's Default

2.2.1. 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 GC §-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 GC §-43 (Assignment); or
- c. if the Contractor, in the judgment of the Employer has engaged in any corrupt or fraudulent practice, as defined in GC §-6 (Corrupt or Fraudulent Practices), in competing for or in executing the Contract.

2.2.2. 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 GC §-41.2 (Suspension by Contractor), 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; or
- d. refuses or is unable to provide sufficient materials, services or

labor to execute and complete the Facilities in the manner specified in the programme furnished under GC §-18.2 (Programme of Performance) 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, 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 GC §-42.2 (Termination by Employer for Contractor's Default).

2.2.3. Upon receipt of the notice of termination under GC §-42.2.1 or GC §-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, tidy 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; and
- e. deliver to the Employer all drawings, specifications and other documents prepared by the Contractor or its Subcontractor1s as of the date of termination in connection with the Facilities.

2.2.4. After termination in accordance with GC §-42.2.3 above wholly or partly, the Employer may 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 completion 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.

2.2.5. Subject to GC §-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, tidy and safe condition pursuant to paragraph (a) of GC §-42.2.3. Any sums due to 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.

2.2.6. If the Employer undertakes to complete 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 GC §-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 to the Contractor under GC §-42.2.5, the Contractor shall pay the balance to the Employer, and if such excess is less than the sums due to the Contractor under GC §-42.2.5, 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.

2.3. Termination by the Contractor

2.3.1. If:

- a.** the Contractor has not received the Project Manager's instruction under GC §-8.1 within one hundred and eighty (180) days after receipt of the Letter of Acceptance by the Contractor, 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 or failure to obtain any Governmental permit necessary for the execution and/or completion of the Facilities; or

- c.** the Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause pursuant to Appendix 1 (Payment Terms and Procedures) to the Contract Agreement, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, with financing charges thereon as stipulated in GC §-12.4 (Delayed Payment), 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, fails to remedy the breach or take steps to remedy the breach within fourteen (14) days after receipt of the Contractor's notice;

- d.** the Contractor does not receive the reasonable evidence within 42 days after giving notice under GC §-41.2 (Suspension by Contractor) in respect of a failure to comply with GC §-10.5;

then the Contractor may give a notice to the Employer thereof, and if the Employer has failed to pay the outstanding sum, to approve the invoice or supporting documents, to give its reasons for withholding such approval, or to remedy the breach within twenty-eight (28) days of such notice, or if the Contractor is still unable to carry out any of its obligations under the Contract for any reason attributable to the Employer within twenty-eight (28) days of the said notice, the Contractor may by a further notice to the Employer referring to this GC §-42.3.1, forthwith terminate the Contract.

2.3.2. If the Contract is terminated under GC §-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, tidy 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 GC §-42.3.4:
- 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.

2.3.3. If the Contract is terminated under GC §-42.3.1, the Employer shall pay to the Contractor all payments specified in GC §-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.

2.3.4. Termination by the Contractor pursuant to this GC §-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 this GC §-42.3.

2.4. In this GC §-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.

2.5. In this GC §-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 Appendix 1 (Payment Terms and Procedures) to the Contract Agreement.



Appendix 15: Indemnification**1. Patent Indemnity**

1.1. The Contractor shall, subject to the Employer's compliance with GC §-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;

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.

1.2. If any proceedings are brought or any claim is made against the Employer arising out of the matters referred to in GC §-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 defence 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.



Appendix 16: General Covenants**1. Representatives****1.1. Project Manager**

The Employer shall appoint the Project Manager and that person shall be named in the Contract Data. 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.

If any disagreement, claim or dispute may arise, the Project Manager shall consult with each Party in an endeavour to reach agreement.

1.2. Contractor's Representative & Construction Manager

1.2.1. The Contractor shall appoint the Contractor's Representative prior to the Effective Date. 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 GC §-17.2.1 shall apply thereto.

1.2.2. 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 GC §-17.2.1.

1.2.3. 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 GC §-17.2.3 shall be deemed to be an act or exercise by the Contractor's Representative.

2. Care of Facilities

2.1. The Contractor shall be responsible for the care and custody of the Facilities or any part thereof until the date of Operational Acceptance of the Facilities or that part, pursuant to GC §-25 (Commissioning and Operational Acceptance) or, 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 GC §-27 (Defects Liability).

3. Loss of or Damage to Property; Accident or Injury to Workers; Indemnification

3.1. Subject to GC §-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.

3.2. In case any accident occurs during the construction/erection or during guarantee period of 05 years for the activities undertaken by the Contractor thereby causing any minor or major or fatal injury to his employees/labourer due to any reason, whatsoever, it shall be the responsibility of the Contractor to promptly inform the same to the Engineer in charge of concerned section of TANGEDCO in prescribed form and also to all the authorities envisaged under the applicable laws. For any fatal/nonfatal accident to human or animal or any mishap within area of installation due to mishandling or reason whatsoever attributable to TANGEDCO at the time of commissioning of SPV system, Contractor has to pay compensation as provided under the relevant applicable Act.

3.3. If any proceedings are brought or any claim is made against the Employer that might subject the Contractor to liability under GC §-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 defence 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.

- 3.4.** 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 GC §-34 (Insurance), provided that such fire, explosion or other perils were not caused by any act or failure of the Contractor.
- 3.5.** The Party entitled to the benefit of an indemnity under this GC §-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.



Appendix 17: Claims, Disputes and Arbitration**1. Contractor's Claims**

1.1. 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 twenty-eight (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 twenty-eight (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. The Contractor shall submit copies to the Project Manager.

Within forty-two (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 twenty-eight (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 forty-two (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, after consulting with each Party in an endeavour to reach agreement in accordance with GC §-17.1, 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.

In the event that the Contractor and the Employer cannot agree on any matter relating

to a claim within the said above defined period of forty-two (42) days, thereafter either Party may refer the matter to the Arbitrator pursuant to GC §-45 (Disputes and Arbitration) hereof.

Each payment approval issued by the Project Manager shall include such amounts for any claim as have been reasonably substantiated as due under the relevant provision of the Contract. Unless and until the particulars supplied are sufficient to substantiate the whole of the claim, the Contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate.

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.

2. Disputes and Arbitration

2.1. Disputes

If any question, dispute or difference what so ever shall arises between TEDA and the Contractor/Bidder, in the connection with the agreement except as to matters, the decisions for which have been specifically provided, either party may forthwith give to the other notice in writing of existence of such question, dispute or difference.

Disputes shall be referred to and settled by an Arbitration for decision in accordance with GC §-45.3 (Arbitration).

2.2. Amicable Settlement

Where notice of dissatisfaction has been given under GC §-45.1 above, both Parties shall attempt to settle the dispute amicably before the commencement of arbitration. However, unless both Parties agree otherwise, arbitration may be commenced on or after the fifty-sixth (56th) day after the day on which notice of dissatisfaction and intention to commence arbitration was given, even if no attempt at amicable settlement has been made.

2.3. Arbitration

Any dispute between the Parties arising out of or in connection with the Contract not settled amicably in accordance with GC §-45.2 above shall be finally settled by arbitration.

The Principal Secretary/Secretary, Energy Department, Government of Tamil Nadu shall be the sole arbitrator. This reference shall be governed by the Indian Arbitration and Conciliation Act 1996, and the Rules made there under.

Arbitration with proceedings conducted in accordance with the laws in the jurisdiction of the state of Tamil Nadu.

The place of arbitration shall be Chennai, Tamil Nadu, India; and the arbitration shall be conducted in the language for communications defined in GC §-5.3 (Law and

Language).

The arbitrator shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Project Manager, relevant to the dispute. Nothing shall disqualify representatives of the Parties and the Project Manager from being called as a witness and giving evidence before the arbitrator on any matter whatsoever relevant to the dispute.

Arbitration may be commenced prior to or after completion of the Facilities. The obligations of the Parties and the Project Manager shall not be altered by reason of any arbitration being conducted during the progress of the work on the Facilities.

The dispute may be referred by either Party directly to arbitration under GC §-45.5 (Arbitration) without prejudice to any other rights the Party may have.

- 2.4.** Notwithstanding any reference to the arbitration, the Parties shall continue to perform their respective obligations under the Contract unless the Parties otherwise agree.



Appendix 18: Representations & Warranties**1. Representations and Warranties of Implementing Agency**

- 1.1. Implementing Agency hereby represents and warrants to and agrees with the Contractor as follows and acknowledges and confirms that the Contractor is relying on such representations and warranties in connection with the transactions described in this Agreement.
- 1.2. Implementing Agency has all requisite powers authorizing and has been duly authorized to execute and consummate this Agreement.
- 1.3. This Agreement is enforceable against Implementing Agency in accordance with its Terms and Conditions.
- 1.4. The consummation of the transactions contemplated by this Agreement on the part of Implementing Agency will not violate any provision of nor constitute a default under, nor give rise to a power to cancel any charter, mortgage, deed of trust or lien, lease, Agreement, license, permit, evidence of indebtedness, restriction, or other contract to which Implementing Agency is a Party or to which Implementing Agency is bound, which violation, default or power has not been waived.
- 1.5. Implementing Agency is not insolvent and no insolvency proceedings have been instituted, nor threatened or pending by or against Implementing Agency.
- 1.6. There are no actions, suits, claims, proceedings or investigations pending or, to the best of Implementing Agency's knowledge, threatened in writing against Implementing Agency at law, in equity, or otherwise, and whether civil or criminal in nature, before or by, any Court, Commission, Arbitrator or Governmental Agency or authority, and there are no outstanding judgments, decrees or orders of any such Court, Commission, Arbitrator or Governmental Agency or authorities, which materially adversely affect its ability to comply with its obligations under this Agreement.
- 1.7. Implementing Agency makes all the representations and warranties above to be valid as on the date of this Agreement.

2. Representations and Warranties of the Contractor

- 2.1. The Contractor hereby represents and warrants to and agrees with Implementing Agency as follows and acknowledges and confirms that Implementing Agency is relying on such representations and warranties in connection with the transactions described in this Agreement.
- 2.2. The Contractor has all requisite power authorizing and has been duly authorized to execute and consummate this Agreement.
- 2.3. This Agreement is enforceable against the Contractor in accordance with its Terms and Conditions.
- 2.4. The consummation of the transactions contemplated by this Agreement on the part of the Contractor will not violate any provision of nor constitute a default under, nor give rise to a power to cancel any charter, mortgage, deed of trust or lien, lease, Agreement, license, permit, evidence of indebtedness, restriction, or other contract to which the Contractor is a Party or to which the Contractor is bound which violation,

default or power has not been waived.

- 2.5. The Contractor is not insolvent and no insolvency proceedings have been instituted, or not threatened or pending by or against the Contractor.
- 2.6. There are no actions, suits, claims, proceedings or investigations pending or, to the best of Contractor's knowledge, threatened in writing against the Contractor at law, in equity, or otherwise, and whether civil or criminal in nature, before or by, any Court, Commission, Arbitrator or Governmental Agency or authority, and there are no outstanding judgments, decrees or orders of any such Court, Commission, Arbitrator or Governmental Agency or authorities, which materially adversely affect its ability to execute the GCRTS system or to comply with its obligations under this Agreement.
- 2.7. The Contractor makes all the representations and warranties above to be valid as on the date of this Agreement.



Appendix 19: Corrupt or Fraudulent Practices and Prevention Policy

1. Corrupt or Fraudulent Practices

- 1.1.** If the Employer determines, based on reasonable evidence, that the Contractor has engaged in any corrupt or fraudulent practice, in competing for or in executing the Contract, then the Employer may, after giving fourteen (14) days' notice to the Contractor, terminate the Contract and expel him from the Site, and the provisions of GC §-42 shall apply as if such expulsion had been made under GC §-42.2.1(c).
- 1.2.** Should any employee of the Contractor be determined, based on reasonable evidence, to have engaged in any corrupt or fraudulent practice during the execution of the Contract, then that employee shall be removed in accordance with GC §-17.2.5.

2. Fraud Prevention Policy

2.1. Background

2.1.1. There are certain Policies, procedures & systems to guide employees within and outside an organization. These systems have been designed to ensure that officials dealing and undertaking transactions conduct the same in a transparent & uniform manner & also describe certain requirements. These requirements interalia include "Whistle Blower Policy". This Policy envisages the companies to put in place a mechanism for employees to report to the Management about unethical behavior, actual or suspected fraud or violation of conduct or ethics Policy.

2.1.2. The Policy statement is given below for implementation with immediate effect:

2.2. Policy Objectives

2.2.1. The "Fraud Prevention Policy" is to provide a system for detection and prevention of fraud, reporting of any fraud that is detected or suspected and fair dealing of matters pertaining to fraud. The Policy will ensure and provide for the following:

- a.** To ensure that Management is aware of its responsibilities for detection and prevention of fraud and for establishing procedures for preventing fraud and/or detecting fraud when it occurs.
- b.** To provide a clear guidance to employees and others dealing with Contractor forbidding them from involvement in any fraudulent activity and the action to be taken by them where they suspect any fraudulent activity.
- c.** To conduct investigations into fraudulent activities.
- d.** To provide assurances that any and all suspected fraudulent activity will be fully investigated.

2.3. Scope Of Policy

2.3.1. The Policy applies to any fraud, or suspected fraud involving employees

(all full time, part time or employees appointed on adhoc/temporary/contract basis) as well as representatives of vendors, suppliers, contractors, consultants, service providers or any outside Agency(ies) doing any type of business with respect to this GCRTS system.

2.4. Definition Of Fraud

2.4.1. "Fraud" is a willful act intentionally committed by an individual(s) - by deception, suppression, cheating or any other fraudulent or any other illegal means, thereby, causing wrongful gain(s) to self or any other individual(s) and wrongful loss to other(s). Many a times such acts are undertaken with a view to deceive/mislead others leading them to do or prohibiting them from doing a bonafide act or take bonafide decision which is not based on material facts."

2.5. Actions Constituting Fraud

2.5.1. While fraudulent activity could have a very wide range of coverage, the following are some of the act(s) which constitute fraud. The list given below is only illustrative and not exhaustive.

2.5.2. Forgery or alteration of any document or account belonging to the Company

2.5.3. Forgery or alteration of cheque, bank draft or any other financial instrument etc.

2.5.4. Misappropriation of funds, securities, supplies or others assets by fraudulent means etc.

2.5.5. Falsifying records such as pay-rolls, removing the documents from files and/or replacing it by a fraudulent note etc.

2.5.6. Willful suppression of facts/deception in matters of appointment, placements, submission of reports, tender committee recommendations etc. as a result of which a wrongful gain(s) is made to one and wrongful loss(s) is caused to the others.

2.5.7. Utilizing Company funds for personal purposes.

2.5.8. Authorizing or receiving payments for goods not supplied or services not rendered.

2.5.9. Destruction, disposition, removal of records or any other assets of the Company with an ulterior motive to manipulate and misrepresent the facts so as to create suspicion/suppression/cheating as a result of which objective assessment/decision would not be arrived at.

2.5.10. Any other act that falls under the gamut of fraudulent activity.

2.6. Reporting Of Fraud

2.6.1. Any employee (full time, part time or employees appointed on

adhoc/temporary/contract basis), representative of vendors, suppliers, contractors, consultants, service providers or any other Agency (ies) doing any type of business with respect to this GCRTS system, as soon as he/she comes to know of any fraud or suspected fraud or any other fraudulent activity must report such incident(s). Such reporting shall be made to the designated Nodal Officer(s), nominated for the GCRTS system. If, however, there is shortage of time such report should be made to the immediate controlling officer whose duty shall be to ensure that input received is immediately communicated to the Nodal Officer. The reporting of the fraud normally should be in writing. In case the reporter is not willing to furnish a written statement of fraud but is in a position to give sequential and specific transaction of fraud/suspected fraud, then the officer receiving the information/Nodal Officer should record such details in writing as narrated by the reporter and also maintain the details about the identity of the official/employee/other person reporting such incident. Reports can be made in confidence and the person to whom the fraud or suspected fraud has been reported must maintain the confidentiality with respect to the reporter and such matter should under no circumstances be discussed with any unauthorized person.

2.6.2. All reports of fraud or suspected fraud shall be handled with utmost speed and shall be coordinated by Nodal Officer(s) to be nominated.

2.6.3. Officer receiving input about any suspected fraud/nodal officer(s) shall ensure that all relevant records documents and other evidence is being immediately taken into custody and being protected from being tampered with, destroyed or removed by suspected perpetrators of Fraud or by any other official under his influence.

2.7. Investigation Procedure

2.7.1. The "Nodal Officer" of each Party shall refer the details of the fraud/suspected fraud to the MD of their company, for further appropriate investigation and needful action who will assign the work to a department.

2.7.2. This input would be in addition to the intelligence, information and investigation of cases of fraud being investigated by the Assigned Department of their own as part of their Day to Day functioning.

2.7.3. After completion of the investigation, due & appropriate action, which could include administrative action, disciplinary action, civil or criminal action or closure of the matter if it is proved that fraud is not committed etc. depending upon the outcome of the investigation shall be undertaken.

2.7.4. Assigned Department shall apprise "Nodal Officer" of the results of the investigation undertaken by them. There shall be constant coordination maintained between the two.

2.8. Responsibility For Fraud Prevention

- 2.8.1.** Every employee (full time, part time, adhoc, temporary, contract), representative of vendors, suppliers, contractors, consultants, service providers or any other Agency(ies) doing any type of business with respect to this GCRTS system, is expected and shall be responsible to ensure that there is no fraudulent act being committed in their areas of responsibility/control. As soon as it is learnt that a fraud or suspected fraud has taken or is likely to take place they should immediately apprise the same to the concerned as per the procedure.
- 2.8.2.** All controlling officers shall share the responsibility of prevention and detection of fraud and for implementing the Fraud Prevention Policy of the Company. It is the responsibility of all controlling officers to ensure that there are mechanisms in place within their area of control to familiarize each employee with the types of improprieties that might occur in their area.
- 2.8.3.** Educate employees about Fraud Prevention and detection.
- 2.8.4.** Create a culture whereby employees are encouraged to report any fraud or suspected Fraud which comes to their knowledge, without any fear of victimization.
- 2.8.5.** Promote employee awareness of ethical principles subscribed to by the Company through CDA Rules.

2.9. Administration And Review Of The Policy

- 2.9.1.** Head of the organization of each Parties shall be responsible for the administration, interpretation, application of this Policy for their respective employee (full time, part time, adhoc, temporary, contract), representative of vendors, suppliers, contractors, consultants, service providers or any other Agency(ies) doing any type of business with respect to this GCRTS system.



Appendix 20: Miscellaneous Provisions**1. Amendment**

1.1. This Agreement may only be amended or supplemented by a written Agreement between the Parties or their successor and permitted assign and after duly obtaining the approval of the appropriate authority, if necessary and relevant.

2. Third Party Beneficiaries

2.1. This Agreement is solely for the benefit of the Parties and shall not be construed as creating any duty, standard of care or any liability to, any person not a Party to this Agreement.

3. Industry Standard

3.1. Except as otherwise set forth herein, for the purpose of the Agreement the normal standards of Performance within the solar photovoltaic power generation industry in the relevant market shall be the measure of whether a Party's Performance is reasonably and timely. Unless expressly defined herein, words having well-known technical or trade meaning or under popular market practice at the time of execution of Agreement or meaning under Law shall be so construed.

4. Waiver

4.1. No Waiver by either Party of any default or breach by the other Party in the Performance of any of the provisions of this Agreement shall be effective unless in writing duly executed by an authorized representative of such Party.

4.2. Neither the failure by either Party to insist on any occasion upon the Performance of the Terms, Conditions and provisions of this Agreement nor time or other indulgence granted by one Party to the other Parties shall act as a Waiver of such breach or acceptance of any variation or the relinquishment of any such right or any other right under this Agreement, which shall remain in full force and effect.

5. Entirety

5.1. This Agreement and the Annexures are intended by the Parties as the final expression of their Agreement and are intended also as a complete and exclusive statement of the Terms of their Agreement.

5.2. Except as provided in this Agreement, all prior written or oral understandings, offers or other communications of every kind pertaining to this Agreement or the sale or purchase of solar energy under this Agreement to Implementing Agency by the Contractor shall stand superseded and abrogated.

6. Confidentiality

6.1. The Parties undertake to hold in confidence this Agreement and not to disclose the Terms and Conditions of the transaction contemplated hereby to third Parties, except:

- a.** to their professional advisors;
- b.** to their officers, contractors, employees, agents or representatives, financiers, who need to have access to such information for the proper Performance of their activities; or

- c. disclosures required under Law.
 - d. without the prior written consent of the other Party.
 - 6.2. Provided that the Contractor agrees and acknowledges that Implementing Agency may at any time, disclose the Terms and Conditions of the Agreement and the GCRTS system Documents to any person, to the extent stipulated under the Law.
- 7. **Affirmation**
 - 7.1. The Contractor and Implementing Agency, each affirm that:
 - a. neither it nor its respective Directors, Employees, or Agents has paid or undertaken to pay or shall in the future pay any unlawful commission, bribe, pay-off or kick-back; and
 - a. it has not in any other manner paid any sums, whether in Indian currency or foreign currency and whether in India or abroad to the other Party to procure this Agreement, and the Contractor and Implementing Agency hereby undertake not to engage in any similar acts during the Term of Agreement.
- 8. **Severability**
 - 8.1. The invalidity or unenforceability, for any reason, of any part of this Agreement shall not prejudice or affect the validity or enforceability of the remainder of this Agreement, unless the part held invalid or unenforceable is fundamental to this Agreement or remainder of this Agreement.
- 9. **No Partnership**
 - 9.1. None of the provisions of this Agreement shall constitute a Partnership or Agency or any such similar relationship between the Contractor and Implementing Agency.
- 10. **Notices**
 - 10.1. All notices or other communications which are required to be given under this Agreement shall be in writing and in the English language.
 - 10.2. If to the Contractor, all notices or other communications which are required must be delivered personally or by registered post or facsimile or any other method duly acknowledged to the address(es) below:

[Insert the address of the contractor]
 - 10.3. If to Implementing Agency, all notices or communications must be delivered personally or by registered post or facsimile or any other mode duly acknowledged to the address(es) below:

The General Manager,
Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road,
Chennai – 600 006,
Tamil Nadu.
 - 10.4. All notices or communications given by e-mail or facsimile shall be confirmed by

sending a copy of the same via post office in an envelope properly addressed to the appropriate Party for delivery by registered mail. All notices shall be deemed validly delivered upon receipt evidenced by an acknowledgement of the recipient, unless the Party delivering the notice can prove in case of delivery through the registered post that the recipient refused to acknowledge the receipt of the notice despite efforts of the postal authorities.

- 10.5.** Any Party may by notice of at least fifteen (15) days to the other Party change the address and/or addresses to which such notices and communications to it are to be delivered or mailed.

11. Language

- 11.1.** All correspondence and communications between the Parties relating to this Agreement and all other documentation to be prepared and supplied under the Agreement shall be written in English, and the Agreement shall be construed and interpreted in accordance with English language convention and practice.
- 11.2.** If any of the correspondence, communications or documents is prepared in any language other than English, the English translation of such correspondence, communications or documents shall prevail in matters of interpretation.

12. Breach of Obligations

- 12.1.** The Parties acknowledge that a breach of any of the obligations contained herein would result in injuries as per Law. The Parties further acknowledge that the amount of the Liquidated Damages or the method of calculating the Liquidated Damages specified in this Agreement is a genuine and reasonable pre-estimate of the damages that may be suffered by the non-defaulting Party in each case specified under this Agreement.

13. Nomination Restriction

- 13.1.** Notwithstanding anything contained to the contrary in this Agreement, wherever a reference is made to the right of a Implementing Agency to nominate a third Party to receive benefits under this Agreement, such third Party shall have a financial standing comparable to that of Implementing Agency.

14. Commercial Acts

- 14.1.** Implementing Agency and Contractor unconditionally and irrevocably agree that the execution, delivery and Performance by each of them of this Agreement to which it is a Party constitute private and commercial acts rather than public or Governmental acts.

15. Restriction of Shareholders/Owners' Liability

- 15.1.** Parties expressly agree and acknowledge that none of the shareholders of the Parties here to shall be liable to the other Parties for any of the contractual obligations of the concerned Party under this Agreement. Further, the financial liabilities of the shareholder/s of each Party to this Agreement, in such Party, shall be restricted to the extent provided in Article 426 of the Indian Companies Act, 1956 as amended or replaced.
- 15.2.** The provisions of this Article 17.15 shall supersede any other prior Agreement or

understanding, whether oral or written, that may be existing between Implementing Agency, Contractor, Shareholders/Owners of the Contractor or Shareholders/Owners of Implementing Agency before the date of this Agreement, regarding the subject matter of this Agreement.

16. No Consequential or Indirect Losses

16.1. The liability of the Contractor and Implementing Agency shall be limited to that explicitly provided in this Agreement. Provided that notwithstanding anything contained in this Agreement, under no event shall Implementing Agency or the Contractor claim from one another any indirect or consequential Losses or damages.

17. Independent Entity

17.1. The Contractor shall be an independent entity performing its obligations pursuant to this Agreement.

17.2. Subject to the provisions of this Agreement, the Contractor shall be solely responsible for the manner in which its obligations under this Agreement are to be performed. All employees and representatives of the Contractor or Contractors engaged by the Contractor in connection with the Performance of the Agreement shall be under the complete control of the Contractor and shall not be deemed to be employees, representatives, Contractors of Implementing Agency and nothing contained in the Agreement or in any Agreement or contract awarded by the Contractor shall be construed to create any contractual relationship between any such employees, representatives or Contractors and Implementing Agency.

18. Compliance with Law

18.1. Despite anything contained in this Agreement but without prejudice to this Article, if any provision of this Agreement shall be in deviation or inconsistent with or repugnant to the provisions contained in the Electricity Act, 2003, or any rules and regulations made there under, such provision of this Agreement shall be deemed to be amended to the extent required to bring it into compliance with the aforesaid relevant provisions as amended from time to time.



Form FSR – Feasibility Survey Report

[On the Letter Head of the Contractor]

Sl.No	Parameters	Details
1.	Name of Region	<i>[Insert TANGEDCO's Region Name]</i>
2.	Name of Circle	<i>[Insert TANGEDCO's Circle Name]</i>
3.	Name of Division	<i>[Insert TANGEDCO's Division Name]</i>
4.	Name of Sub-Division	<i>[Insert TANGEDCO's Sub-Division Name]</i>
5.	Name of Section	<i>[Insert TANGEDCO's Section Name]</i>
6.	Name of the Office	<i>[Insert name of the office]</i>
7.	Site Address	<i>[Insert address of the site]</i>
8.	Latitude of the Site	
9.	Longitude of the Site	
10.	Available Shadow Free Area (in sq.m)	
11.	TANGEDCO's Service Connection Number	
12.	Santioned Load (in hp/kW)	
13.	Average Current Consumption (in kWh)	
14.	Existing Distribution Transformer Capacity and Grid-connected SPV system so far connected in the respective Distribution Transformer	
15.	Electrical single line diagram	
16.	Proposed Grid-connected SPV system capacity.	



Form NPD – Name Plate Details

[On the Letter Head of the Contractor]

[To be provided after award of Contract]



Form INC-1 – Installation Certificate from TEDA

(On the Letter Head of the Contractor)

Sl.No	Parameters	Details
1.	Name of Region	<i>[Insert TANGEDCO's Region Name]</i>
2.	Name of Circle	<i>[Insert TANGEDCO's Circle Name]</i>
3.	Name of Division	<i>[Insert TANGEDCO's Division Name]</i>
4.	Name of Sub-Division	<i>[Insert TANGEDCO's Sub-Division Name]</i>
5.	Name of Section	<i>[Insert TANGEDCO's Section Name]</i>
6.	Name of the Office	<i>[Insert name of the office]</i>
7.	Site Address	<i>[Insert address of the site]</i>
8.	Latitude of the Site	
9.	Longitude of the Site	
10.	Available Shadow Free Area (in sq.m)	
11.	TANGEDCO's Service Connection Number	
12.	Santioned Load (in hp/kW)	
13.	Average Current Consumption	
14.	Existing Distribution Transformer Capacity and Grid-connected SPV system so far connected in the respective Distribution Transformer	
15.	Electrical single line diagram	
16.	Proposed Grid-connected SPV system capacity.	
17.	Installed Grid-connected SPV system capacity.	

Certified thatkW PV Capacity Grid-Connected SPV system in reference to Work Order No:.....[Insert the Work Order No.] Dated:.....[Insert the date of Work Order] has been installed and commissioned at the place of the Beneficiary mentioned above and the system has been handed over to the Consumer in good working condition.

The details of material supplied and installed are as under :

Sl.No.	Item	Quantity	Make	Serial No.
1.				
2.				
3.				
4.				

Signature of Consumer

Signature of TEDA Engineer

Name of Consumer

Name of TEDA's Nodal Officer

Date:

Date:

Place:

Place:

Signature of and on behalf of contractor

Name of Representative to Beneficiary

Seal of the Contractor

Date:

Place:



Form FUG – Functional Guarantee

[On the Letter Head of the Contractor]

[To be provided after award of Contract]



Form OPA – Operational Acceptance

[To be provided jointly by the TEDA Engineer and the Contractor]

(To be provided after award of Contract)



Form GUC – Guarantee Card

[On the Letter Head of the Contractor]

1. **Name & Address of the supplier of the System:**
2. **Name of the Region/TANGEDCO**
3. **Date of supply of the system :**
4. **Details of PV Module (s) supplied in the System Make (Name of the Contractor)**
 - i. **Model Serial No(s)**
 - ii. **Wattage of the PV Module (s) under STC**
Guarantee valid up to
 - iii. **Details of Electronics & other BOS items:**
 - iv. **System Make (Name of the Contractor)**
Model
 - v. **Serial No(s) Guarantee valid up to**
 - vi. **Designation & Address of the person to be**
Contacted for claiming Guarantee
obligations

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



Form TOC – Taking over Certificate

[On the Letter Head of the Contractor]

[To be provided after award of Contract]



Form CCC – Contract Complete Certificate

[Issued by the TEDA Engineer]

Contract Completion Certificate

Following are certified in reference to Work Order No.....Date..... ffor Site Survey, Design, Supply, Installation, Testing, Commissioning and five (5) years Comprehensive Maintenance of Distributed Grid-Connected Solar PV Systems of various capacities for buildings of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions in the state of Tamil Nadu.

1. A contract agreement (including maintenance agreement) has been executed with the beneficiary.
2. The material has been supplied in good condition as per technical specification of tender document/work order.
3. The work has been completed within stipulated period/with a delay of ----- days.
4. Instruction Manual, Guarantee Card & Money Receipt has been provided to beneficiaries.
5. System has been installed at beneficiary site and working satisfactory.
6. The work as envisaged under the Contract to complete the CMC for the required period has been completed.

Signature for and on behalf of TEDA

Name:

Section Office:

Seal:

Date:

Place:



Form PCN – Payment Claim Note

[On the Letter Head of the Contractor]

Payment Claim Note No.

Date:

To

The General Manager,
Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road,
Chennai – 600 006,
Tamil Nadu,

Ref.: 1. *[Insert the Letter of Acceptance Letter No. and date]*

2. *[Insert the Work Order Reference No. and date]*

Please arrange to release payment to M/s -----*[Insert the Name of Contractor]* against supply, installation and commissioning of SPV Systems in reference to Letter of Acceptance and Work order issued vide references cited on Solarisation of Government Offices, Court Complexes, State-run Industrial Units and Educational Institutions under CAPEX model in *[Insert the name of TANGEDCO region]*.

Details as detailed under:

Sl.No.	Name of the Consumer	Service Connection No.	Address	Region	Invoice No. & Date	Amount in (₹)
1.						
2.						
3.						
4.						

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:

Enclosure:

1. Invoices in triplicate – NN Nos. *[Insert the number of invoices listed above]*

2. Installation Certificates in triplicate – NN Nos. *[Insert the number of invoices listed above]*



Form INR – Insurance Requirement

[On the Letter Head of the Contractor]

[To be provided after award of Contract]



Form DLF – Documents List for Approval

[On the Letter Head of the Contractor]

[To be provided after award of Contract]



Form MSR – Maintenance and Service Report

[On the Letter Head of the Contractor]

Details of Solar Photovoltaic System Installed

Beneficiary Profile

Technical Details

Preliminary Inspection Details

Difficulties in Operation/Problem Faced by User

Diagnosis Details/Repair Action

Date on which System was Last Attended

Quarterly Energy Generation Data

Remarks

(Signature of the authorized signatory)

Name:

Designation:

Company Seal:



Form QMR – Quarterly Maintenance Report

[On the Letter Head of the Contractor]

Date:

Work Order Ref.:

Name of the Contractor:

Plant Capacity:

Beneficiary's ID:

Beneficiary's Name:

Site Location:

Component	Activity	Description	
PV Module	Cleaning	Immediately clean any bird droppings/dark spots on module.	<input type="checkbox"/>
		Clean PV modules with plain water or mild dish washing detergent.	<input type="checkbox"/>
PV Array	Inspection	Check the PV modules and rack for any damage.	<input type="checkbox"/>
	Inspection	If any new objects, such as vegetation growth etc., are causing shading of the array. Remove if any.	<input type="checkbox"/>
	Vermin Removal	Remove bird nests or vermin from array and rack area.	<input type="checkbox"/>
Junction Boxes	Inspection	Inspect electrical boxes for corrosion, intrusion of water or vermin. Check position of switches and breakers. Check status of all protection devices.	<input type="checkbox"/>
	Inspection	Inspect cabling for signs of cracks, defects, loose connections, corrosion, overheating, arcing, short or open circuits, and ground faults.	<input type="checkbox"/>
Inverter	Inspection	Observe instantaneous operational indicators on the faceplate. Inspect Inverter housing or shelter for any physical maintenance. Check for connection tightness.	<input type="checkbox"/>
	Service	Clean or replace any air filters.	<input type="checkbox"/>
Instruments	Validation	Verify monitoring instruments (pyranometer etc.) with standard instruments to verify their operation within tolerance limits.	<input type="checkbox"/>
Transformer	Inspection	Inspect transformer oil level, temperature gauges, breather, silica gel, meter, connections etc.	<input type="checkbox"/>
Plant	Monitoring	Daily Operation and Performance Monitoring.	<input type="checkbox"/>
Spare Parts	Management	Manage inventory of spare parts.	<input type="checkbox"/>
Logbook	Documentation	Maintain daily log records.	<input type="checkbox"/>





**Tamil Nadu Energy Development Agency
Chennai, Tamil Nadu**

Section VIII

Annexures

This Section contains forms which, once completed, will form part of the Contract.

*Tamil Nadu Energy Development Agency,
5th Floor, E.V.K. Sampath Maaligai,
No.68, College Road, Chennai – 600 006,
Phone: 044-28242800,
e-mail: dgm2@teda.in, tender@teda.in
website: www.teda.in*

This page intentionally left blank

Annexure A – Pre-dispatch Inspection Protocol for Crystalline PV Modules

Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection

A. Pre-dispatch inspection procedure

1. Objective

The objective of this document is to establish General inspection protocol with objectivity for verification of Quality Parameters of Solar Modules by the customer (or its authorised inspection agency) prior to dispatch. The decision rules and procedure specified herein seek to uphold quality standards based on industry best practices and technical specifications laid out in tender documents as well as to control risks associated with item procurement.

2. Standard

Sampling for determining Acceptance Quality Level (AQL) shall follow ISO2859-1:1999.

3. Definitions

Lot: All products/items manufactured in one batch.

Notwithstanding the aforementioned definition, the customer or authorized inspection agency can lay down alternate/additional criteria for determining a lot.

Major Defect: A defect that reduces the usability or causes the product to fail or fulfil its nominal characteristic function.

Minor Defect: A defect that does not reduce the usability of the product, but does not meet the quality standard.

4. Inspection Schedule

Customer representative shall propose the schedule for Pre despatch Inspection of Finish ed Goods to the Customer well in advance, and in no case less than 3 working days prior to commencement of Inspection at a location within India and 7 days in case of a foreign country.

5. Scope of Inspection

Supplier representative will accompany the Inspector while doing the inspection which shall typically consist of 2 steps for clearance of each Lot:

BOM verification: To be conducted prior to the commencement of production.

The details of materials used will be verified from the ERP/Manufacturing data and corroborated with the Construction Data Form (CDF). This shall include verification of following:

Item	Method of verification
Shelf life of the following BOM items: <ul style="list-style-type: none"> ■ EVA ■ PV Module Backsheet ■ Sealant and Potting material (silicone) 	Verify the expiry date/shelf life and storage conditions The PV Module manufacturer shall submit all required information to prove that materials being used are within their shelf life.
Note: Supplier shall provide the necessary documents for approval of BOM as per IEC standards and tender Technical Specifications.	

Witness Tests:

Manufacturer shall assist the Inspecting agency to witness following checks, the details of which are provided elsewhere in this document:

- i. Flash test- As per sampling Plan
- ii. Visual Inspection- As per sampling Plan
- iii. EL Inspection-As per Sampling Plan
- iv. Electrical Characteristics (Other than Flash Test)- As per Sampling Plan

Note: The Supplier shall furnish soft and hard copy of the Production Quality Plan prior to commencement of the Inspection.

6. Sampling Process

- a. Supplier shall provide the list of modules in a lot ready for despatch, along with flash test data (Measured Electrical Data, P_{max}) prior to commencement of Inspection tests.

Note: Smallest lot size for Inspection: 20% of the capacity as per the PO.

- b. Supplier will arrange to move the PV Modules from FG to Inspection area.
- c. Same samples shall be used for all Witness Tests stated at 5.2 above
- d. Inspector shall commence Inspection process by randomly selecting samples from the list of serial nos. (pallet-wise) provided by Supplier as per ISO 2859: Single Sampling Plan for Normal Inspection, General Inspection plan level-II. However, the Inspector shall reserve the right to switch to tightened or reduced level of Inspection as per the lot quality.

7. Decision Rules for Acceptance/Rejection

Following is a summary of Decision Rules for Acceptance/Rejection of a given Sample in a lot offered for Inspection:

Table 1: AQL Levels	
Defect Type	Acceptance Quality Level (AQL)

Major (Ma)	2.5	
Minor (Mi)	4	
Table 2: Inspection Levels		
Inspection Steps	Inspection Item	Inspection Level
1	Flash Test	General Test Level 1
2	Visual Inspection	General Test Level 1
3	Electroluminescence Inspection	General Test Level 1
4	EC (Other than Flash Test)	10 Nos. per lot

8. Inspection Process

a. Electrical Inspection – Flash Tests

- For Electrical inspection following preparation will be done:
 - ◆ **Module Temp Stabilisation:** Modules will be kept in controlled environmental condition till it reaches $25 \pm 2^{\circ}\text{C}$
 - ◆ Calibration of Sun-simulator: Sun-simulator will be calibrated as per Calibration Reference .Reference should calibrated against Calibration Reference tested from reputed testing lab TUV/Fraunhofer etc. Testing of modules will be done at STC condition, AM=1.5

Note:

- i. All modules selected for sampling inspection will be re-tested in the sun-simulator. A P_{\max} retest (repeatability test) variation of $\pm 2\%$ on actual flash P_{\max} value will be acceptable.
- ii. The Supplier shall provide a valid calibration certificate of the apparatus used

b. Visual Inspection

- Customer representative will verify the module visual characteristics as per the Visual Acceptance norms.
- The Visual Inspection shall be carried out in a well-lit room. It shall be the responsibility of the Supplier to ensure adequate brightness in the room.

c. Electroluminescence (EL) Inspection

- The EL image shall have sufficient resolution for analysis of defects.

d. Electroluminescence (EL) Inspection

- Hi-pot test shall be done as per IEC procedure. The Supplier shall provide a valid calibration certificate of the apparatus used.

9. Re-inspection and review

In case of minor non-conformities like cleaning issues, label mismatch, etc. which can be easily reworked, Supplier shall rework/replace the modules and offer them for re-inspection to Inspector

10. Inspection Summary

Once the inspection is completed Customer Representative will compile his Inspection Summary Report and share with Supplier and give necessary recommendation on despatch depending upon the audit findings based on the observations made. This report shall be provided within same day of inspection (Format Attached).

11. Disclaimer

Inspection by Employer does not absolve the responsibility of the Supplier/vendor to ensure quality during production of the material and its transport to site. Any damages during transport/handling shall be replaced before erection at site as directed by Engineer-in-charge without any extra cost to the purchaser.

B. Sampling Plan

12. Sampling Plan as Per ISO 2859 - 1

Table 1 - Sample size code letters (see 10.1 and 10.2)

Lot size	Special inspection levels				General inspection levels		
	S-1	S-2	S-3	S-4	I	II	III
2 to 8	A	A	A	A	A	A	B
9 to 15	A	A	A	A	A	B	C
16 to 25	A	A	B	B	B	C	D
26 to 50	A	B	B	C	C	D	E
51 to 90	B	B	C	C	C	E	F
91 to 150	B	B	C	D	D	F	G
151 to 280	B	C	D	E	E	G	H
281 to 500	B	C	D	E	F	H	J
501 to 1 200	C	C	E	F	G	J	K
1 201 to 3 200	C	D	E	G	H	K	L
3 201 to 10 000	C	D	F	G	J	L	M
10 001 to 35 000	C	D	F	H	K	M	N
35 001 to 150 000	D	E	G	J	L	N	P
150 001 to 500 000	D	E	G	J	M	P	Q
500 001 and over	D	E	H	K	N	Q	R

13. Sampling Plan as Per ISO 2859 – 2 (Normal, Tightened and Reduced)

Table 2-A — Single sampling plans for normal inspection (Master table)

Sample size code letter	Sample size	Acceptance quality limit, AQL, in percent nonconforming items and nonconformities per 100 items (normal inspection)																											
		0,010	0,015	0,025	0,040	0,065	0,10	0,15	0,25	0,40	0,65	1,0	1,5	2,5	4,0	6,5	10	15	25	40	65	100	150	250	400	650	1 000		
		Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	
A	2																												
B	3																												
C	5																												
D	8																												
E	13																												
F	20																												
G	32																												
H	50																												
J	80																												
K	125																												
L	200																												
M	315																												
N	500																												
P	800																												
Q	1 250																												
R	2 000																												

↕ = Use the first sampling plan below the arrow. If sample size equals, or exceeds, lot size, carry out 100 % inspection.

↕ = Use the first sampling plan above the arrow.

Ac = Acceptance number

Re = Rejection number

Table 2-B — Single sampling plans for tightened inspection (Master table)

Sample size code letter	Sample size	Acceptance quality limit, AQL, in percent nonconforming items and nonconformities per 100 items (tightened inspection)																											
		0,010	0,015	0,025	0,040	0,065	0,10	0,15	0,25	0,40	0,65	1,0	1,5	2,5	4,0	6,5	10	15	25	40	65	100	150	250	400	650	1 000		
		Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	
A	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
B	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
C	5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
D	8	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
E	13	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
F	20	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
G	32	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
H	50	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
J	80	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
K	125	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
L	200	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
M	315	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
N	500	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
P	800	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
Q	1 250	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
R	2 000	0 1	↑	↓	1 2	2 3	3 4	5 6	8 9	12 13	18 19	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑		
S	3 150		1 2																										

↓ = Use the first sampling plan below the arrow. If sample size equals, or exceeds, lot size, carry out 100 % inspection.
 ↑ = Use the first sampling plan above the arrow.
 Ac = Acceptance number
 Re = Rejection number

Table 2-C — Single sampling plans for reduced inspection (Master table)

Sample size code letter	Sample size	Acceptance quality limit, AQL, in percent nonconforming items and nonconformities per 100 items (reduced inspection)																											
		0,010	0,015	0,025	0,040	0,065	0,10	0,15	0,25	0,40	0,65	1,0	1,5	2,5	4,0	6,5	10	15	25	40	65	100	150	250	400	650	1 000		
		Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	
A	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
B	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
C	2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
D	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
E	5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
F	8	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
G	13	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
H	20	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
J	32	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
K	50	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
L	80	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
M	125	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
N	200	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
P	315	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
Q	500	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		
R	800	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓		

↓ = Use the first sampling plan below the arrow. If sample size equals, or exceeds, lot size, carry out 100 % inspection.

↑ = Use the first sampling plan above the arrow.

Ac = Acceptance number

Re = Rejection number

C. Inspection Report

Customer inspection Report			
Ref. No. & Date:			
EPC Contractor:			
Client Details		Tamil Nadu Energy Development Agency	
Place of Inspection	Date of Inspection	Lot Size	Sample Quantity
Problem Quantity:			
Details:			
Inspection Result (OK/Not OK)			
Visual Inspection			
Problem Quantity:			
Details:			
Flash Test			
Problem Quantity:			
Details:			
Electroluminescence (EL) Inspection			
Problem Quantity:			
Details:			

Electrical Characteristics (Di-electric Current Withstand/Insulation Resistance/GND Continuity)				
Problem Quantity:				
Details:				
Remarks:				
Is the shipment qualified for dispatch?		<input type="checkbox"/>	Yes	<input type="checkbox"/>
				No
Manufacturer		EPC Contractor		TEDA
Enclosed:				
Enclosed:	Test Details, Flash Test Report, EL Test (Image – Soft Copy), EC Test Report			
<p>Disclaimer: This Inspection by SECI/Employer does not absolve the responsibility of the vendor to ensure quality during production of the material and its transport to site. Any damages during transport/handling shall be replaced before erection at site as directed by Engineer-in-charge without any extra cost to the purchaser.</p>				
Lot:			Date:	
Sl.No	Defect	Module ID	Major/Minor	Details



D